Computer Algebra Independent Integration Tests

Summer 2024

5-Inverse-trig-functions/5.1-Inverse-sine/267-5.1.5

Nasser M. Abbasi

May 18, 2024 Compiled on May 18, 2024 at 4:35am

Contents

CHAPTER 1

Introduction

This report gives the result of running the computer algebra independent integration test.The download section in on the main webpage contains links to download the problems in plain text format used for all CAS systems. The number of integrals in this report is [**183**]. This is test number [267].

1.1 Listing of CAS systems tested

The following are the CAS systems tested:

1. Mathematica 14 (January 9, 2024) on windows 10 pro.
2. Rubi 4.17.3 (Sept 25, 2023) on Mathematica 14 on windows 10m pro.
3. Maple 2024 (March 1, 2024) on windows 10 pro.
4. Maxima 5.47 (June 1, 2023) using Lisp SBCL 2.4.0 on Linux Manjaro 23.1.2 KDE via sagemath 10.3.
5. FriCAS 1.3.10 built with sbcl 2.3.11 (January 10, 2024) on Linux Manjaro 23.1.2 KDE via sagemath 10.3.
6. Giac/Xcas 1.9.0-99 on Linux via sagemath 10.3.
7. Sympy 1.12 using Python 3.11.6 (Nov 14 2023, 09:36:21) [GCC 13.2.1 20230801] on Linux Manjaro 23.1.2 KDE.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 on windows 10.
9. Reduce CSL rev 6687 (January 9, 2024) on Linux Manjaro 23.1.2 KDE.

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

Sympy was run directly in Python not via sagemath.

Reduce was called directly.

1.2 Results

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

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

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

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

System	% solved	% Failed
Mathematica	98.91 (181)	1.09 (2)
Rubi	98.36 (180)	1.64 (3)
Maple	89.07 (163)	10.93 (20)
Fricas	24.04 (44)	75.96 (139)
Giac	21.86 (40)	78.14 (143)
Maxima	19.13 (35)	80.87 (148)
Sympy	16.94 (31)	83.06 (152)
Reduce	15.85 (29)	84.15 (154)
Mupad	8.20 (15)	91.80 (168)

Table 1.1: Percentage solved for each CAS

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

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

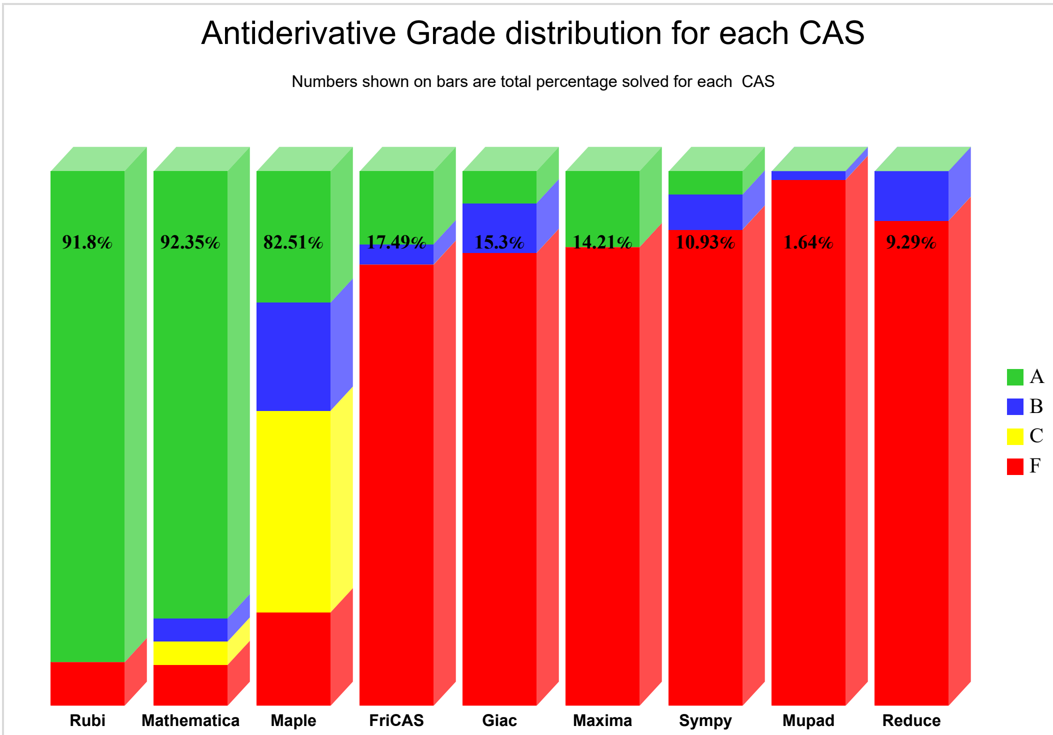
Table 1.2: Description of grading applied to integration result

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

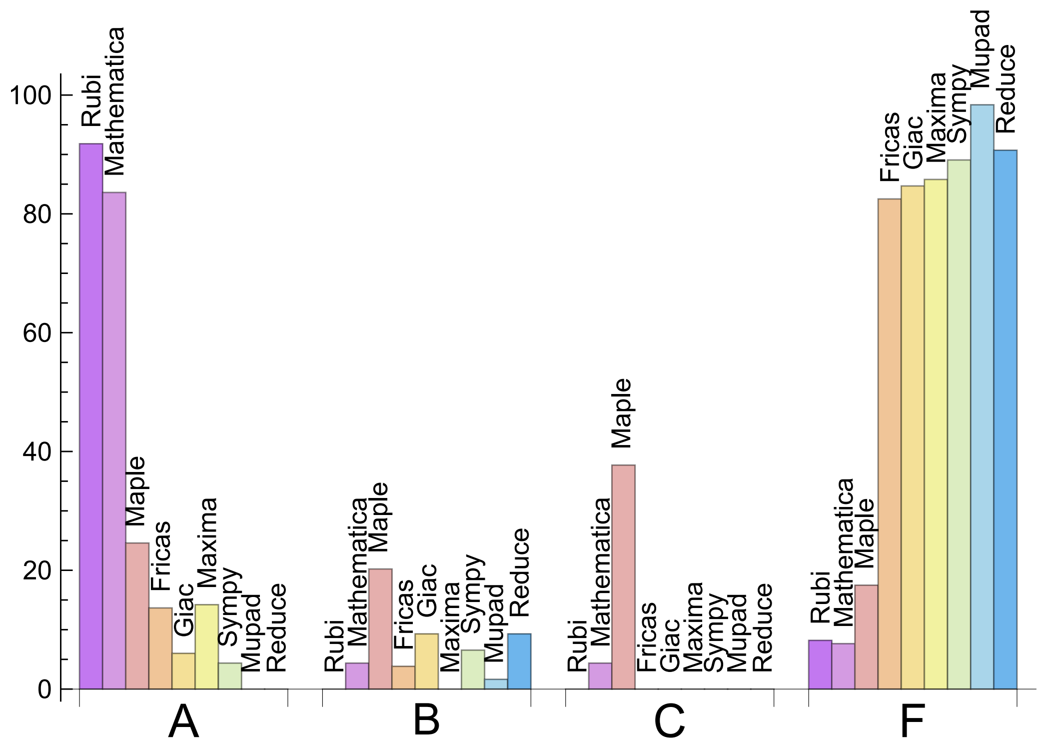
System	% A grade	% B grade	% C grade	% F grade
Rubi	91.803	0.000	0.000	8.197
Mathematica	83.607	4.372	4.372	7.650
Maple	24.590	20.219	37.705	17.486
Maxima	14.208	0.000	0.000	85.792
Fricas	13.661	3.825	0.000	82.514
Giac	6.011	9.290	0.000	84.699
Sympy	4.372	6.557	0.000	89.071
Mupad	0.000	1.639	0.000	98.361
Reduce	0.000	9.290	0.000	90.710

Table 1.3: Antiderivative Grade distribution of each CAS

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



The figure below compares the grades of the CAS systems.



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

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

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

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Mathematica	2	100.00	0.00	0.00
Rubi	3	100.00	0.00	0.00
Maple	20	100.00	0.00	0.00
Fricas	139	94.24	5.76	0.00
Giac	143	44.76	0.00	55.24
Maxima	148	63.51	0.00	36.49
Sympy	152	71.05	25.00	3.95
Reduce	154	100.00	0.00	0.00
Mupad	168	0.00	100.00	0.00

Table 1.4: Failure statistics for each CAS

1.3 Time and leaf size Performance

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

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

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

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

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

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

System	Mean time (sec)
Giac	0.23
Maxima	0.42
Mupad	0.71
Rubi	1.21
Maple	1.88
Sympy	2.30
Mathematica	3.36
Fricas	4.29
Reduce	7.30

Table 1.5: Time performance for each CAS

System	Mean size	Normalized mean	Median size	Normalized median
Mupad	35.47	1.16	25.00	1.11
Maxima	262.69	2.94	215.00	1.17
Reduce	284.86	2.31	132.00	1.60
Rubi	369.15	0.79	273.00	0.74
Fricas	513.68	2.48	318.00	1.39
Sympy	519.16	1.62	233.00	1.65
Giac	520.27	1.77	222.00	1.60
Mathematica	520.85	34.01	332.00	0.90
Maple	1346.27	2.67	758.00	2.31

Table 1.6: Leaf size performance for each CAS

1.4 Performance based on number of rules Rubi used

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

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

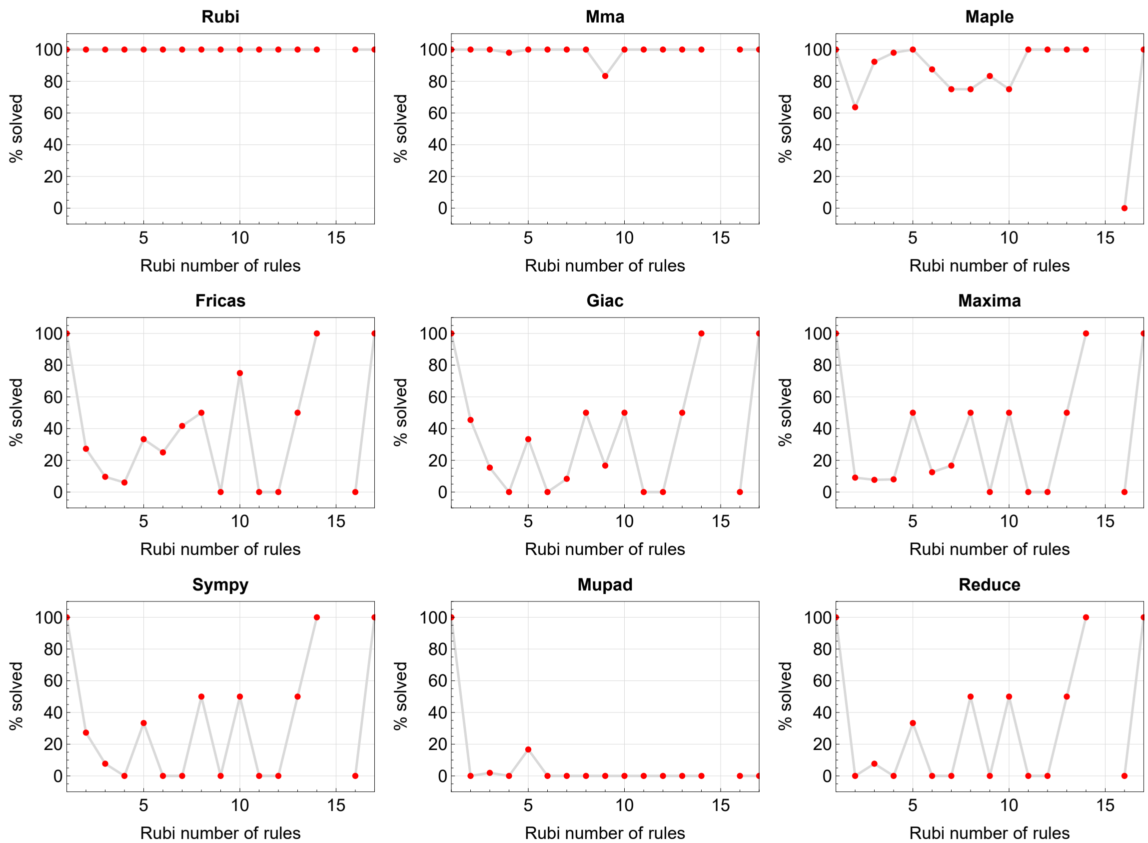


Figure 1.1: Solving statistics per number of Rubi rules used

1.5 Performance based on number of steps Rubi used

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

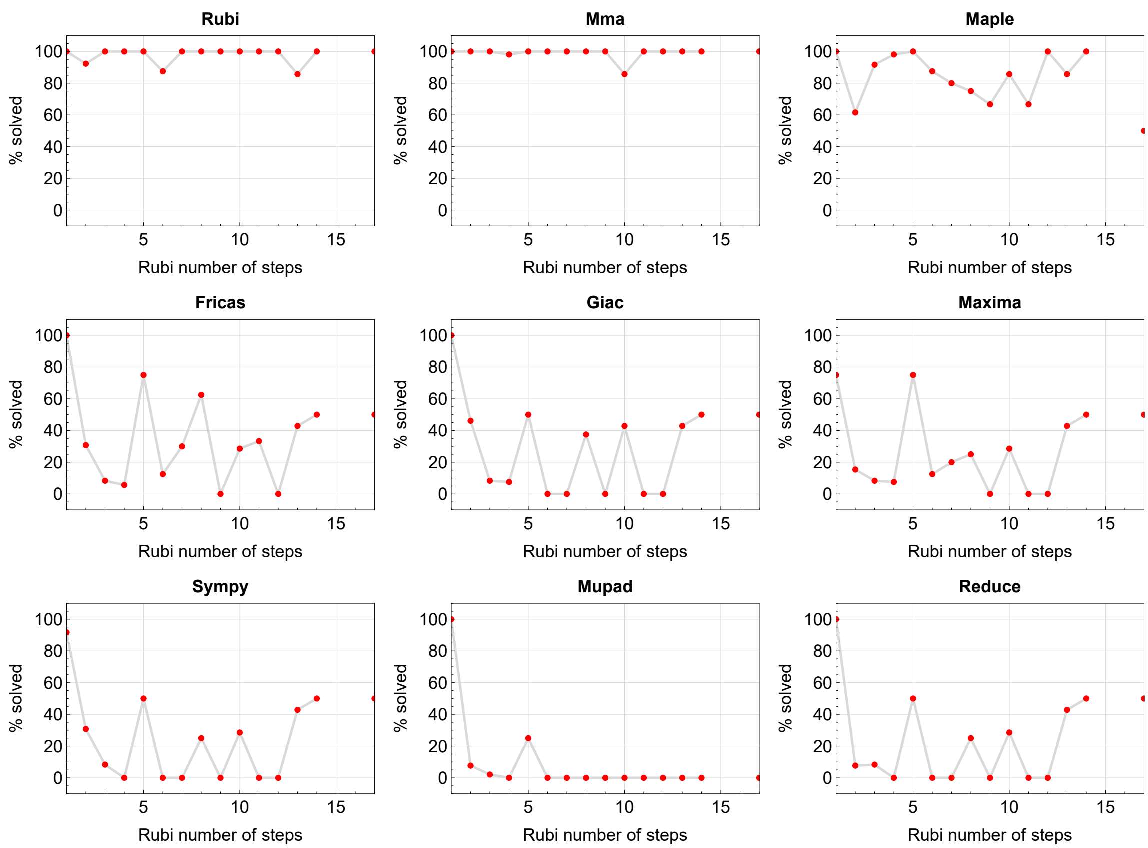


Figure 1.2: Solving statistics per number of Rubi steps used

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

1.6 Solved integrals histogram based on leaf size of result

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

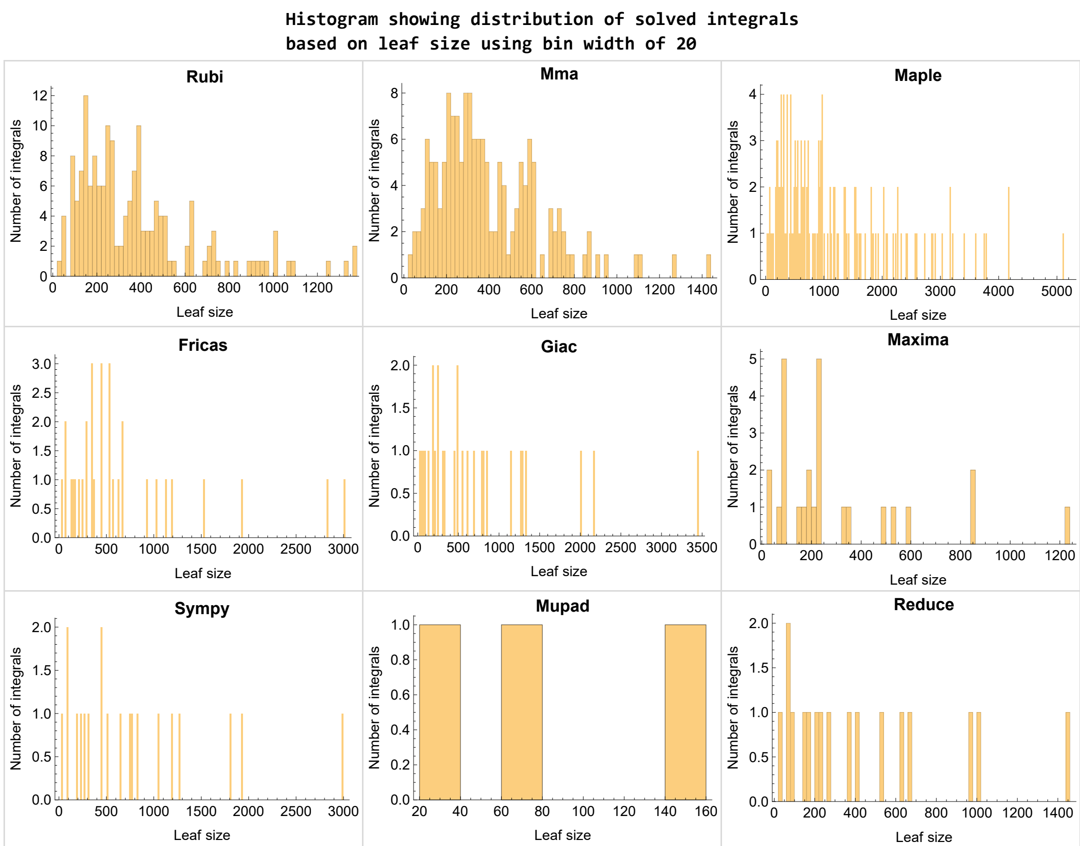


Figure 1.3: Solved integrals based on leaf size distribution

1.7 Solved integrals histogram based on CPU time used

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

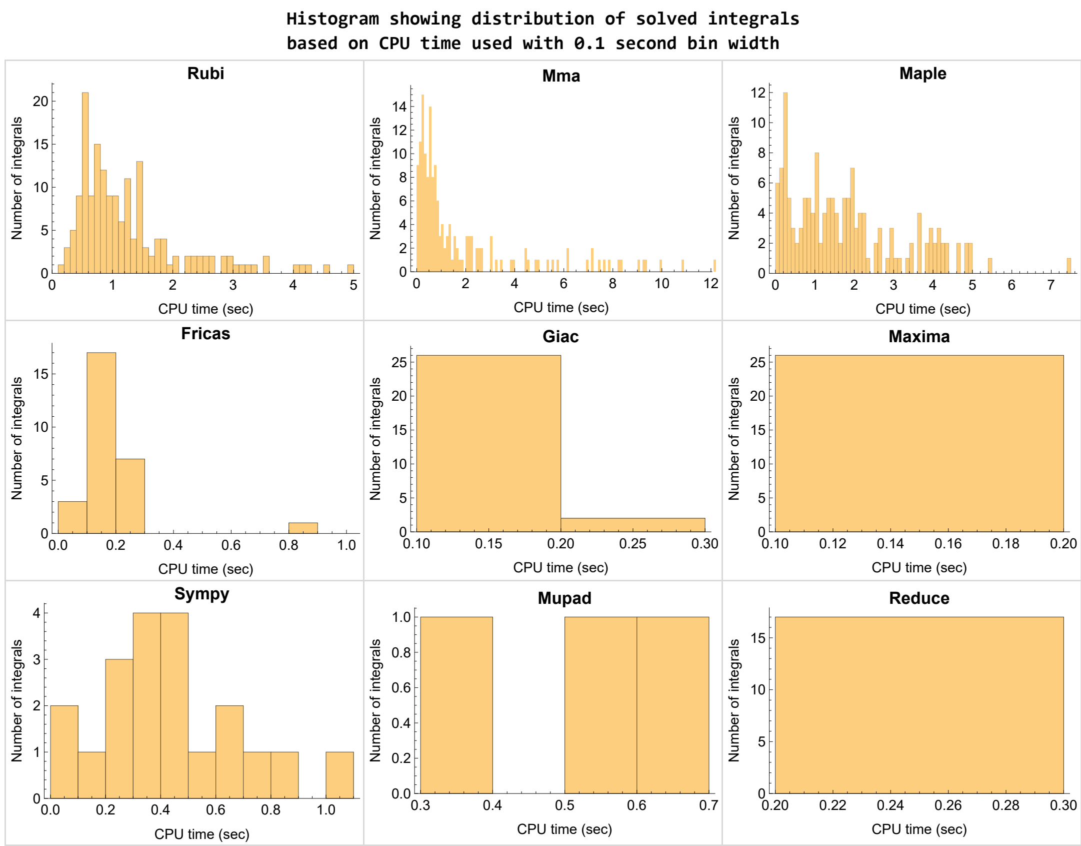


Figure 1.4: Solved integrals histogram based on CPU time used

1.8 Leaf size vs. CPU time used

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

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

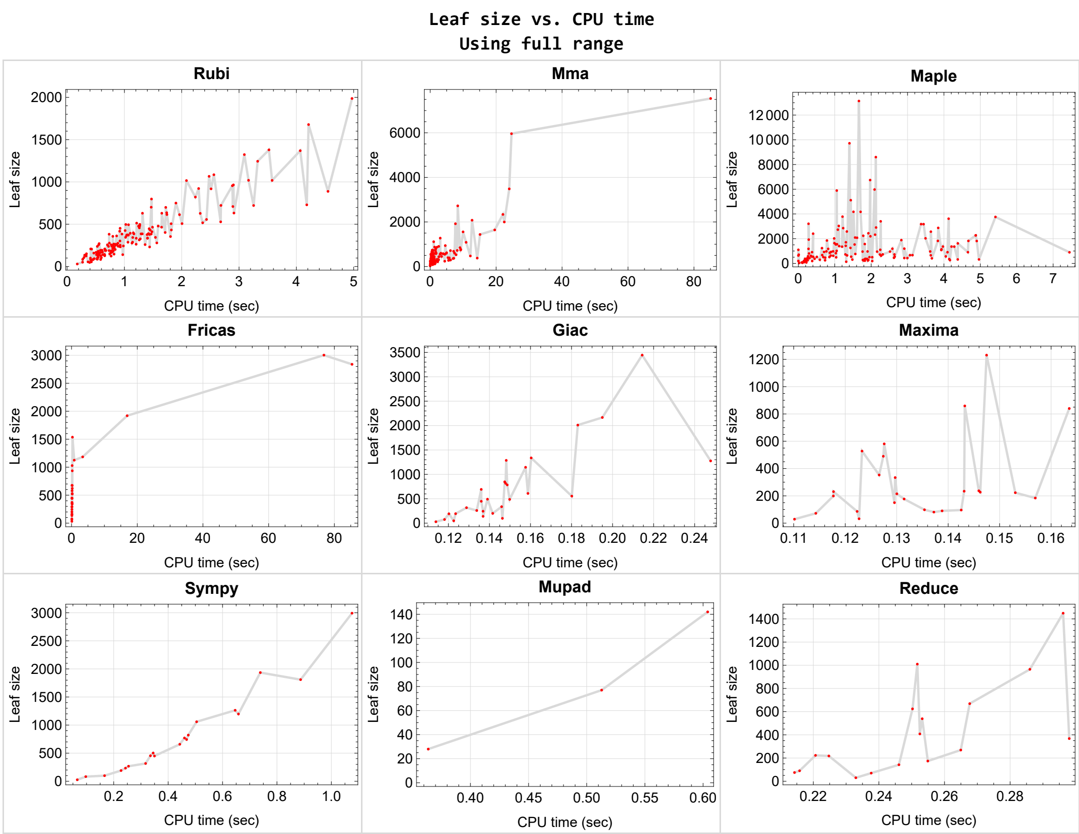


Figure 1.5: Leaf size vs. CPU time. Full range

1.9 list of integrals with no known antiderivative

{20, 21, 25, 26, 27, 29, 30, 96, 97, 98, 155, 160}

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Reduce {}

Mupad {}

1.11 list of integrals solved by CAS but failed verification

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

Rubi {101}

Mathematica {41, 74, 80, 86, 92, 94, 95, 99, 100, 101, 102, 103, 125, 130, 142, 151, 157, 158, 166, 175, 176, 181}

Maple $\{108, 116, 130\}$

Maxima Verification phase not currently implemented.

Fricas Verification phase not currently implemented.

Sympy Verification phase not currently implemented.

Giac Verification phase not currently implemented.

Reduce Verification phase not currently implemented.

Mupad Verification phase not currently implemented.

1.12 Timing

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

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

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

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

1.13 Verification

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

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

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

1.14 Important notes about some of the results

Important note about Maxima results

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

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

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

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

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

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

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

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

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

Important note about FriCAS result

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

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

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

Important note about finding leaf size of antiderivative

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

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

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

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

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

  except Exception as ee:
        leafCount =1
```

Important note about Mupad results

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

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

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

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

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

1.15 Current tree layout of integration tests

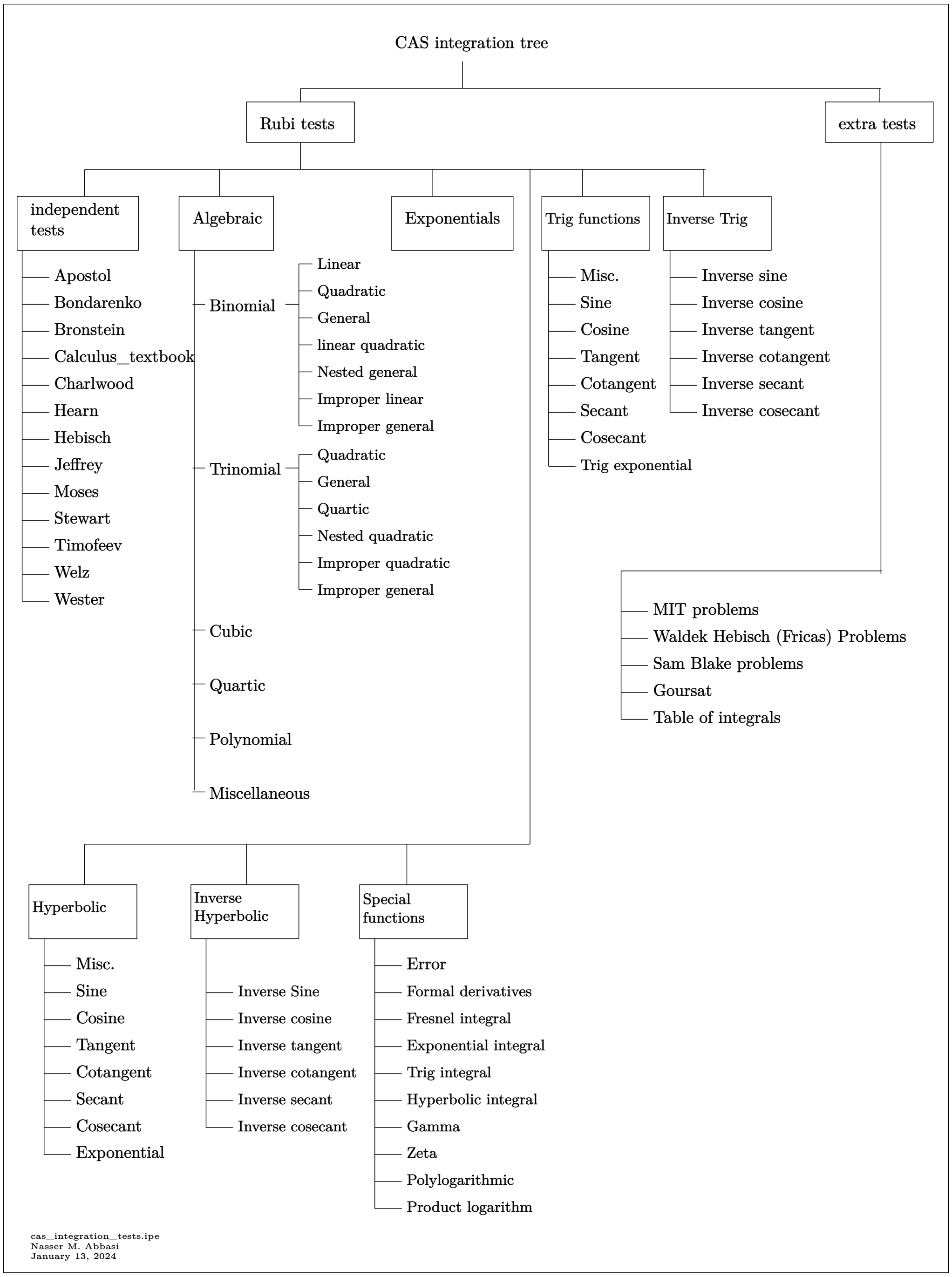
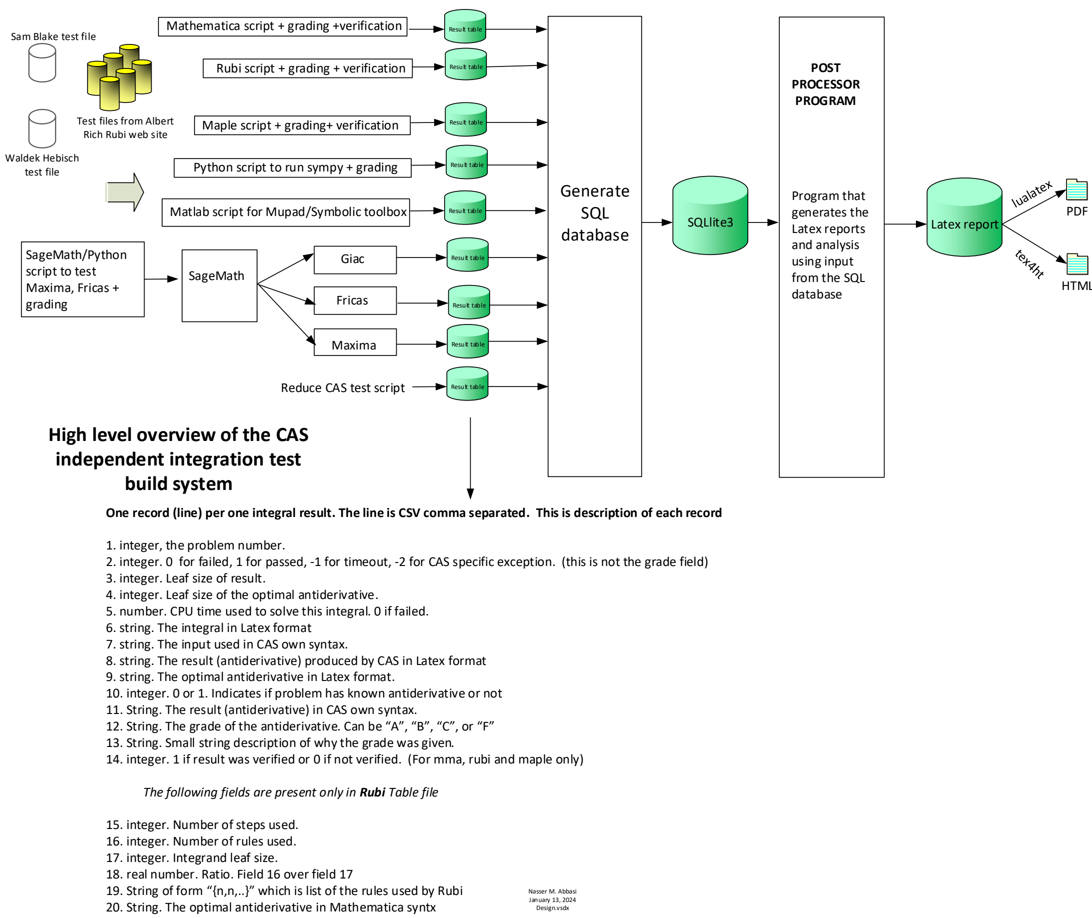


Figure 1.6: CAS integration tests tree

1.16 Design of the test system

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



CHAPTER 2

DETAILED SUMMARY TABLES OF RESULTS

2.1 List of integrals sorted by grade for each CAS

Rubi

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 28, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 99, 101, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183 }

B grade { }

C grade { }

F normal fail { 100, 102, 103 }

F(-1) timedout fail { }

F(-2) exception fail { }

Mma

A grade { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 81, 82, 83, 84, 85, 88, 89, 90, 92, 93, 94, 95, 99, 101, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 159, 161, 162, 163, 164, 165, 167, 168, 169, 170, 171, 172, 173, 174, 177, 178, 179, 180, 181, 182, 183 }

B grade { 80, 86, 87, 91, 100, 102, 157, 158 }

C grade { 7, 103, 127, 128, 129, 166, 175, 176 }

F normal fail { 28, 156 }

F(-1) timedout fail { }

F(-2) exception fail { }

Maple

A grade { 1, 2, 3, 4, 9, 10, 11, 12, 16, 17, 18, 19, 22, 23, 24, 31, 32, 33, 73, 79, 80, 85, 86, 88, 89, 90, 93, 107, 108, 112, 116, 120, 121, 125, 149, 150, 161, 162, 163, 170, 171, 172, 177, 178, 179 }

B grade { 5, 6, 7, 8, 14, 15, 34, 35, 36, 37, 38, 39, 40, 60, 74, 87, 91, 92, 94, 95, 130, 148, 152, 153, 154, 164, 165, 166, 167, 168, 169, 173, 174, 175, 176, 182, 183 }

C grade { 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 75, 76, 77, 78, 81, 82, 83, 84, 104, 105, 106, 109, 110, 111, 113, 114, 115, 117, 118, 119, 122, 123, 124, 126, 127, 128, 129, 131, 132, 133, 135, 136, 137, 139, 140, 141, 143, 144, 145 }

F normal fail { 13, 28, 41, 99, 100, 101, 102, 103, 134, 138, 142, 146, 147, 151, 156, 157, 158, 159, 180, 181 }

F(-1) timedout fail { }

F(-2) exception fail { }

Fricas

A grade { 1, 2, 3, 4, 9, 10, 11, 12, 31, 32, 33, 47, 61, 62, 63, 66, 161, 162, 163, 170, 171, 172, 177, 178, 179 }

B grade { 6, 7, 8, 36, 37, 38, 167 }

C grade { }

F normal fail { 5, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 28, 34, 35, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159, 164, 165, 166, 173, 174, 175, 176, 180, 181, 182, 183 }

F(-1) timedout fail { 39, 99, 100, 101, 102, 103, 168, 169 }

F(-2) exception fail { }

Maxima

A grade { 1, 2, 3, 4, 12, 31, 32, 33, 47, 60, 61, 62, 63, 64, 65, 66, 67, 68, 119, 145, 161, 162, 163, 170, 171, 172 }

B grade { }

C grade { }

F normal fail { 5, 8, 9, 10, 11, 13, 16, 17, 18, 19, 22, 23, 24, 28, 34, 37, 38, 39, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 91, 94, 95, 104, 105, 106, 109, 110, 111, 113, 114, 115, 117, 118, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 135, 136, 137, 139, 140, 141, 143, 144, 146, 147, 148, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159, 164, 167, 168, 169, 173, 176, 177, 178, 179, 180 }

F(-1) timedout fail { }

F(-2) exception fail { 6, 7, 14, 15, 35, 36, 40, 41, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 92, 93, 96, 97, 98, 99, 100, 101, 102, 103, 107, 108, 112, 116, 134, 138, 142, 165, 166, 174, 175, 181, 182, 183 }

Giac

A grade { 1, 2, 3, 4, 11, 12, 16, 17, 18, 19, 33 }

B grade { 6, 9, 10, 22, 23, 24, 31, 32, 161, 162, 163, 170, 171, 172, 177, 178, 179 }

C grade { }

F normal fail { 28, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 99, 100, 101, 102, 103, 156, 157, 158, 159 }

F(-1) timedout fail { }

F(-2) exception fail { 5, 7, 8, 13, 14, 15, 34, 35, 36, 37, 38, 39, 40, 41, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 164, 165, 166, 167, 168, 169, 173, 174, 175, 176, 180, 181, 182, 183 }

Mupad

A grade { }

B grade { 3, 4, 12 }

C grade { }

F normal fail { }

F(-1) timedout fail { 1, 2, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 28, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183 }

F(-2) exception fail { }

Sympy

A grade { 1, 2, 3, 4, 10, 11, 12, 33 }

B grade { 9, 31, 32, 161, 162, 163, 170, 171, 172, 177, 178, 179 }

C grade { }

F normal fail { 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 28, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 60, 61, 62, 63, 64, 66, 70, 71, 72, 73, 74, 77, 78, 79, 80, 87, 88, 89, 90, 91, 93, 99, 100, 101, 104, 105, 106, 107, 108, 111, 112, 116, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 137, 138, 146, 147, 148, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159, 164, 165, 166, 167, 168, 169, 173, 174, 175, 176, 180, 181, 182, 183 }

F(-1) timedout fail { 42, 48, 49, 54, 55, 56, 57, 58, 59, 65, 67, 68, 69, 75, 76, 81, 82, 83, 84, 85, 86, 92, 94, 95, 102, 103, 109, 110, 113, 114, 115, 135, 136, 139, 140, 141, 142, 155 }

F(-2) exception fail { 117, 118, 119, 143, 144, 145 }

Reduce

A grade { }

B grade { 1, 2, 3, 4, 11, 12, 31, 32, 33, 119, 145, 161, 162, 163, 170, 171, 172 }

C grade { }

F normal fail { 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 28, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 146, 147, 148, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159, 164, 165, 166, 167, 168, 169, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183 }

F(-1) timedout fail { }

F(-2) exception fail { }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	206	165	248	231	201	316	317	269	0
N.S.	1	1.12	0.90	1.35	1.26	1.09	1.72	1.72	1.46	0.00
time (sec)	N/A	0.427	0.093	0.255	0.118	0.103	0.317	0.129	0.265	0.000

Problem 2	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	151	121	178	150	135	190	194	174	0
N.S.	1	1.13	0.90	1.33	1.12	1.01	1.42	1.45	1.30	0.00
time (sec)	N/A	0.338	0.060	0.203	0.130	0.109	0.227	0.124	0.255	0.000

Problem 3	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	106	92	86	81	76	99	98	90	77
N.S.	1	1.15	1.00	0.93	0.88	0.83	1.08	1.07	0.98	0.84
time (sec)	N/A	0.295	0.024	0.122	0.137	0.093	0.166	0.146	0.216	0.513

Problem 4	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	30	29	31	26	29	30	28
N.S.	1	1.00	1.00	1.00	0.97	1.03	0.87	0.97	1.00	0.93
time (sec)	N/A	0.178	0.005	0.020	0.110	0.094	0.066	0.114	0.233	0.364

Problem 5	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	214	758	0	0	0	0	30	0
N.S.	1	1.00	0.93	3.31	0.00	0.00	0.00	0.00	0.13	0.00
time (sec)	N/A	0.821	0.101	1.565	0.000	0.000	0.000	0.000	0.225	0.000

Problem 6	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	B	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	83	187	0	371	0	200	75	0
N.S.	1	1.00	0.98	2.20	0.00	4.36	0.00	2.35	0.88	0.00
time (sec)	N/A	0.272	0.088	2.030	0.000	0.136	0.000	0.142	0.234	0.000

Problem 7	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F(-2)	B	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	134	207	295	0	673	0	0	159	0
N.S.	1	0.99	1.53	2.19	0.00	4.99	0.00	0.00	1.18	0.00
time (sec)	N/A	0.307	0.232	0.590	0.000	0.219	0.000	0.000	0.263	0.000

Problem 8	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	B	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	208	241	554	0	1125	0	0	262	0
N.S.	1	1.09	1.26	2.90	0.00	5.89	0.00	0.00	1.37	0.00
time (sec)	N/A	0.412	0.280	0.367	0.000	0.819	0.000	0.000	0.765	0.000

Problem 9	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	A	B	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	374	393	355	541	0	446	743	816	474	0
N.S.	1	1.05	0.95	1.45	0.00	1.19	1.99	2.18	1.27	0.00
time (sec)	N/A	1.103	0.284	1.451	0.000	0.120	0.468	0.148	0.259	0.000

Problem 10	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	A	A	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	266	249	374	0	290	454	487	339	0
N.S.	1	1.10	1.03	1.55	0.00	1.20	1.88	2.01	1.40	0.00
time (sec)	N/A	0.814	0.199	0.446	0.000	0.105	0.335	0.150	0.252	0.000

Problem 11	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	164	154	189	0	156	233	244	218	0
N.S.	1	1.15	1.08	1.33	0.00	1.10	1.64	1.72	1.54	0.00
time (sec)	N/A	0.583	0.549	0.380	0.000	0.116	0.243	0.137	0.225	0.000

Problem 12	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	51	47	72	72	65	82	75	75	142
N.S.	1	1.09	1.00	1.53	1.53	1.38	1.74	1.60	1.60	3.02
time (sec)	N/A	0.271	0.022	0.220	0.114	0.097	0.097	0.118	0.214	0.604

Problem 13	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	347	343	332	0	0	0	0	0	55	0
N.S.	1	0.99	0.96	0.00	0.00	0.00	0.00	0.00	0.16	0.00
time (sec)	N/A	1.145	0.211	0.000	0.000	0.000	0.000	0.000	0.245	0.000

Problem 14	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	309	287	231	642	0	0	0	0	149	0
N.S.	1	0.93	0.75	2.08	0.00	0.00	0.00	0.00	0.48	0.00
time (sec)	N/A	1.062	0.218	1.339	0.000	0.000	0.000	0.000	10.874	0.000

Problem 15	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	401	386	315	966	0	0	0	0	308	0
N.S.	1	0.96	0.79	2.41	0.00	0.00	0.00	0.00	0.77	0.00
time (sec)	N/A	1.414	0.639	1.901	0.000	0.000	0.000	0.000	0.358	0.000

Problem 16	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	393	377	304	327	0	0	0	609	79	0
N.S.	1	0.96	0.77	0.83	0.00	0.00	0.00	1.55	0.20	0.00
time (sec)	N/A	1.396	0.482	0.201	0.000	0.000	0.000	0.159	0.230	0.000

Problem 17	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	244	232	187	206	0	0	0	337	55	0
N.S.	1	0.95	0.77	0.84	0.00	0.00	0.00	1.38	0.23	0.00
time (sec)	N/A	0.928	0.300	0.162	0.000	0.000	0.000	0.146	0.216	0.000

Problem 18	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	109	98	103	0	0	0	139	31	0
N.S.	1	0.95	0.85	0.90	0.00	0.00	0.00	1.21	0.27	0.00
time (sec)	N/A	0.543	0.131	0.155	0.000	0.000	0.000	0.137	0.205	0.000

Problem 19	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	48	44	48	0	0	0	49	12	0
N.S.	1	0.91	0.83	0.91	0.00	0.00	0.00	0.92	0.23	0.00
time (sec)	N/A	0.393	0.009	0.112	0.000	0.000	0.000	0.123	0.207	0.000

Problem 20	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	20	25	15	20	27	20
N.S.	1	1.00	1.11	1.00	1.11	1.39	0.83	1.11	1.50	1.11
time (sec)	N/A	0.206	0.148	7.337	0.206	0.095	0.865	0.209	0.231	0.281

Problem 21	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	20	49	17	20	55	20
N.S.	1	1.00	1.11	1.00	1.11	2.72	0.94	1.11	3.06	1.11
time (sec)	N/A	0.209	0.268	1.634	0.205	0.100	1.791	0.848	0.243	0.289

Problem 22	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	362	362	290	526	0	0	0	1276	97	0
N.S.	1	1.00	0.80	1.45	0.00	0.00	0.00	3.52	0.27	0.00
time (sec)	N/A	0.864	1.301	0.507	0.000	0.000	0.000	0.248	0.221	0.000

Problem 23	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	149	202	0	0	0	554	59	0
N.S.	1	1.00	0.82	1.12	0.00	0.00	0.00	3.06	0.33	0.00
time (sec)	N/A	0.543	0.678	0.153	0.000	0.000	0.000	0.180	0.201	0.000

Problem 24	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	83	72	75	0	0	0	192	26	0
N.S.	1	0.97	0.84	0.87	0.00	0.00	0.00	2.23	0.30	0.00
time (sec)	N/A	0.585	0.048	0.095	0.000	0.000	0.000	0.120	0.191	0.000

Problem 25	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	297	51	17	20	58	20
N.S.	1	1.00	1.11	1.00	16.50	2.83	0.94	1.11	3.22	1.11
time (sec)	N/A	0.204	8.301	6.861	1.563	0.095	1.695	0.347	0.209	0.303

Problem 26	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	426	92	19	20	109	20
N.S.	1	1.00	1.11	1.00	23.67	5.11	1.06	1.11	6.06	1.11
time (sec)	N/A	0.204	10.316	2.185	2.698	0.094	8.480	0.991	0.249	0.286

Problem 27	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	227	32	17	20	117	20
N.S.	1	1.00	1.11	1.00	12.61	1.78	0.94	1.11	6.50	1.11
time (sec)	N/A	0.500	9.467	0.412	1.945	0.123	13.801	0.247	0.263	0.458

Problem 28	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	F	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	154	125	0	0	0	0	0	0	66	0
N.S.	1	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00
time (sec)	N/A	0.332	0.000	0.000	0.000	0.000	0.000	0.000	0.230	0.000

Problem 29	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	20	20	15	20	20	20
N.S.	1	1.00	1.11	1.00	1.11	1.11	0.83	1.11	1.11	1.11
time (sec)	N/A	0.200	0.282	3.018	0.233	0.094	0.920	0.180	200.028	0.261

Problem 30	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	20	18	237	34	17	20	34	20
N.S.	1	1.00	1.11	1.00	13.17	1.89	0.94	1.11	1.89	1.11
time (sec)	N/A	0.197	0.606	1.578	1.701	0.091	16.892	0.283	0.275	0.293

Problem 31	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	358	379	305	426	528	441	770	784	624	0
N.S.	1	1.06	0.85	1.19	1.47	1.23	2.15	2.19	1.74	0.00
time (sec)	N/A	1.439	0.242	0.306	0.123	0.150	0.460	0.149	0.250	0.000

Problem 32	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	261	275	211	296	353	295	502	491	408	0
N.S.	1	1.05	0.81	1.13	1.35	1.13	1.92	1.88	1.56	0.00
time (sec)	N/A	0.886	0.186	0.251	0.127	0.118	0.345	0.139	0.252	0.000

Problem 33	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	168	138	176	199	161	267	259	223	0
N.S.	1	1.04	0.85	1.09	1.23	0.99	1.65	1.60	1.38	0.00
time (sec)	N/A	0.505	0.110	0.167	0.118	0.126	0.254	0.134	0.221	0.000

Problem 34	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	344	345	322	1566	0	0	0	0	104	0
N.S.	1	1.00	0.94	4.55	0.00	0.00	0.00	0.00	0.30	0.00
time (sec)	N/A	1.021	0.323	1.825	0.000	0.000	0.000	0.000	0.209	0.000

Problem 35	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	358	354	334	954	0	0	0	0	189	0
N.S.	1	0.99	0.93	2.66	0.00	0.00	0.00	0.00	0.53	0.00
time (sec)	N/A	1.804	0.321	1.764	0.000	0.000	0.000	0.000	0.242	0.000

Problem 36	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	B	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	238	263	535	0	1184	0	0	1247	0
N.S.	1	1.18	1.30	2.65	0.00	5.86	0.00	0.00	6.17	0.00
time (sec)	N/A	0.527	0.423	0.407	0.000	3.388	0.000	0.000	3.432	0.000

Problem 37	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	B	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	257	271	321	908	0	1920	0	0	515	0
N.S.	1	1.05	1.25	3.53	0.00	7.47	0.00	0.00	2.00	0.00
time (sec)	N/A	0.559	0.453	0.375	0.000	16.928	0.000	0.000	1.086	0.000

Problem 38	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	B	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	360	382	418	1550	0	2839	0	0	23	0
N.S.	1	1.06	1.16	4.31	0.00	7.89	0.00	0.00	0.06	0.00
time (sec)	N/A	0.733	0.634	1.062	0.000	85.378	0.000	0.000	200.017	0.000

Problem 39	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	457	497	494	2406	0	0	0	0	23	0
N.S.	1	1.09	1.08	5.26	0.00	0.00	0.00	0.00	0.05	0.00
time (sec)	N/A	1.024	0.788	0.405	0.000	0.000	0.000	0.000	200.024	0.000

Problem 40	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	935	955	574	2321	0	0	0	0	25	0
N.S.	1	1.02	0.61	2.48	0.00	0.00	0.00	0.00	0.03	0.00
time (sec)	N/A	2.883	1.025	2.108	0.000	0.000	0.000	0.000	200.031	0.000

Problem 41	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1678	1678	903	0	0	0	0	0	27	0
N.S.	1	1.00	0.54	0.00	0.00	0.00	0.00	0.00	0.02	0.00
time (sec)	N/A	4.213	2.598	0.000	0.000	0.000	0.000	0.000	200.019	0.000

Problem 42	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	376	185	293	963	0	0	0	0	187	0
N.S.	1	0.49	0.78	2.56	0.00	0.00	0.00	0.00	0.50	0.00
time (sec)	N/A	0.804	2.282	3.622	0.000	0.000	0.000	0.000	0.346	0.000

Problem 43	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	273	140	260	727	0	0	0	0	134	0
N.S.	1	0.51	0.95	2.66	0.00	0.00	0.00	0.00	0.49	0.00
time (sec)	N/A	0.559	1.583	2.319	0.000	0.000	0.000	0.000	0.331	0.000

Problem 44	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	93	207	366	0	0	0	0	67	0
N.S.	1	0.69	1.54	2.73	0.00	0.00	0.00	0.00	0.50	0.00
time (sec)	N/A	0.473	0.886	1.885	0.000	0.000	0.000	0.000	0.286	0.000

Problem 45	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	88	200	308	0	0	0	0	67	0
N.S.	1	0.62	1.42	2.18	0.00	0.00	0.00	0.00	0.48	0.00
time (sec)	N/A	0.521	1.376	1.808	0.000	0.000	0.000	0.000	0.269	0.000

Problem 46	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	105	248	319	0	0	0	0	95	0
N.S.	1	0.65	1.53	1.97	0.00	0.00	0.00	0.00	0.59	0.00
time (sec)	N/A	0.598	2.040	4.963	0.000	0.000	0.000	0.000	0.264	0.000

Problem 47	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	106	114	449	215	520	0	0	166	0
N.S.	1	0.71	0.76	2.99	1.43	3.47	0.00	0.00	1.11	0.00
time (sec)	N/A	0.531	1.407	2.627	0.130	0.213	0.000	0.000	0.299	0.000

Problem 48	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	438	189	305	1194	0	0	0	0	239	0
N.S.	1	0.43	0.70	2.73	0.00	0.00	0.00	0.00	0.55	0.00
time (sec)	N/A	0.677	2.470	2.911	0.000	0.000	0.000	0.000	0.386	0.000

Problem 49	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	149	152	618	0	0	0	0	121	0
N.S.	1	0.65	0.66	2.68	0.00	0.00	0.00	0.00	0.52	0.00
time (sec)	N/A	0.743	1.570	2.273	0.000	0.000	0.000	0.000	0.338	0.000

Problem 50	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	273	140	260	723	0	0	0	0	134	0
N.S.	1	0.51	0.95	2.65	0.00	0.00	0.00	0.00	0.49	0.00
time (sec)	N/A	0.623	2.024	2.640	0.000	0.000	0.000	0.000	0.332	0.000

Problem 51	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	127	238	716	0	0	0	0	118	0
N.S.	1	0.52	0.98	2.96	0.00	0.00	0.00	0.00	0.49	0.00
time (sec)	N/A	0.656	4.417	2.241	0.000	0.000	0.000	0.000	0.303	0.000

Problem 52	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	135	291	264	0	0	0	0	153	0
N.S.	1	0.54	1.15	1.05	0.00	0.00	0.00	0.00	0.61	0.00
time (sec)	N/A	0.658	6.171	4.165	0.000	0.000	0.000	0.000	0.293	0.000

Problem 53	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	332	171	599	348	0	0	0	0	333	0
N.S.	1	0.52	1.80	1.05	0.00	0.00	0.00	0.00	1.00	0.00
time (sec)	N/A	0.618	7.402	4.146	0.000	0.000	0.000	0.000	0.315	0.000

Problem 54	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	352	201	303	897	0	0	0	0	176	0
N.S.	1	0.57	0.86	2.55	0.00	0.00	0.00	0.00	0.50	0.00
time (sec)	N/A	0.839	2.563	7.449	0.000	0.000	0.000	0.000	0.405	0.000

Problem 55	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	438	189	305	1188	0	0	0	0	239	0
N.S.	1	0.43	0.70	2.71	0.00	0.00	0.00	0.00	0.55	0.00
time (sec)	N/A	0.664	2.447	2.584	0.000	0.000	0.000	0.000	0.416	0.000

Problem 56	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	376	185	293	954	0	0	0	0	187	0
N.S.	1	0.49	0.78	2.54	0.00	0.00	0.00	0.00	0.50	0.00
time (sec)	N/A	0.770	2.181	2.518	0.000	0.000	0.000	0.000	0.348	0.000

Problem 57	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	345	172	274	951	0	0	0	0	173	0
N.S.	1	0.50	0.79	2.76	0.00	0.00	0.00	0.00	0.50	0.00
time (sec)	N/A	0.791	5.565	2.163	0.000	0.000	0.000	0.000	0.340	0.000

Problem 58	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	410	188	685	906	0	0	0	0	219	0
N.S.	1	0.46	1.67	2.21	0.00	0.00	0.00	0.00	0.53	0.00
time (sec)	N/A	0.732	7.108	4.659	0.000	0.000	0.000	0.000	0.364	0.000

Problem 59	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	432	208	847	407	0	0	0	0	474	0
N.S.	1	0.48	1.96	0.94	0.00	0.00	0.00	0.00	1.10	0.00
time (sec)	N/A	0.657	9.052	3.669	0.000	0.000	0.000	0.000	0.331	0.000

Problem 60	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	110	132	32	0	0	0	56	0
N.S.	1	1.00	2.00	2.40	0.58	0.00	0.00	0.00	1.02	0.00
time (sec)	N/A	0.365	1.020	1.315	0.123	0.000	0.000	0.000	0.300	0.000

Problem 61	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	82	79	234	96	348	0	0	83	0
N.S.	1	0.91	0.88	2.60	1.07	3.87	0.00	0.00	0.92	0.00
time (sec)	N/A	0.455	0.731	1.788	0.143	0.160	0.000	0.000	0.282	0.000

Problem 62	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	161	118	275	223	525	0	0	199	0
N.S.	1	0.85	0.62	1.45	1.17	2.76	0.00	0.00	1.05	0.00
time (sec)	N/A	0.531	0.797	1.772	0.153	0.234	0.000	0.000	0.274	0.000

Problem 63	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	81	106	233	98	354	0	0	85	0
N.S.	1	0.90	1.18	2.59	1.09	3.93	0.00	0.00	0.94	0.00
time (sec)	N/A	0.446	0.797	1.911	0.135	0.175	0.000	0.000	0.251	0.000

Problem 64	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	80	105	215	86	0	0	0	97	0
N.S.	1	0.82	1.07	2.19	0.88	0.00	0.00	0.00	0.99	0.00
time (sec)	N/A	0.411	0.928	1.827	0.122	0.000	0.000	0.000	0.283	0.000

Problem 65	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	159	180	499	234	0	0	0	262	0
N.S.	1	0.63	0.71	1.98	0.93	0.00	0.00	0.00	1.04	0.00
time (sec)	N/A	0.547	1.111	2.030	0.143	0.000	0.000	0.000	0.269	0.000

Problem 66	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	192	159	130	276	227	527	0	0	199	0
N.S.	1	0.83	0.68	1.44	1.18	2.74	0.00	0.00	1.04	0.00
time (sec)	N/A	0.555	0.834	1.924	0.146	0.202	0.000	0.000	0.259	0.000

Problem 67	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	253	157	184	502	237	0	0	0	262	0
N.S.	1	0.62	0.73	1.98	0.94	0.00	0.00	0.00	1.04	0.00
time (sec)	N/A	0.542	1.109	1.953	0.146	0.000	0.000	0.000	0.278	0.000

Problem 68	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	132	178	372	177	0	0	0	226	0
N.S.	1	0.69	0.94	1.96	0.93	0.00	0.00	0.00	1.19	0.00
time (sec)	N/A	0.537	0.963	1.839	0.131	0.000	0.000	0.000	0.293	0.000

Problem 69	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	613	334	555	1819	0	0	0	0	292	0
N.S.	1	0.54	0.91	2.97	0.00	0.00	0.00	0.00	0.48	0.00
time (sec)	N/A	1.403	3.085	4.672	0.000	0.000	0.000	0.000	0.486	0.000

Problem 70	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	455	252	437	1360	0	0	0	0	203	0
N.S.	1	0.55	0.96	2.99	0.00	0.00	0.00	0.00	0.45	0.00
time (sec)	N/A	0.926	2.641	4.208	0.000	0.000	0.000	0.000	0.386	0.000

Problem 71	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	222	146	288	634	0	0	0	0	100	0
N.S.	1	0.66	1.30	2.86	0.00	0.00	0.00	0.00	0.45	0.00
time (sec)	N/A	0.819	0.379	0.000	0.000	0.000	0.000	0.000	0.315	0.000

Problem 72	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	123	296	542	0	0	0	0	102	0
N.S.	1	0.64	1.55	2.84	0.00	0.00	0.00	0.00	0.53	0.00
time (sec)	N/A	0.768	2.186	2.648	0.000	0.000	0.000	0.000	0.275	0.000

Problem 73	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	530	263	547	318	0	0	0	0	146	0
N.S.	1	0.50	1.03	0.60	0.00	0.00	0.00	0.00	0.28	0.00
time (sec)	N/A	1.205	4.430	4.380	0.000	0.000	0.000	0.000	0.277	0.000

Problem 74	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	493	259	527	1138	0	0	0	0	295	0
N.S.	1	0.53	1.07	2.31	0.00	0.00	0.00	0.00	0.60	0.00
time (sec)	N/A	1.361	7.865	3.933	0.000	0.000	0.000	0.000	0.328	0.000

Problem 75	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	740	374	574	2270	0	0	0	0	380	0
N.S.	1	0.51	0.78	3.07	0.00	0.00	0.00	0.00	0.51	0.00
time (sec)	N/A	1.058	3.841	4.876	0.000	0.000	0.000	0.000	0.605	0.000

Problem 76	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	374	277	373	1101	0	0	0	0	190	0
N.S.	1	0.74	1.00	2.94	0.00	0.00	0.00	0.00	0.51	0.00
time (sec)	N/A	1.133	0.772	0.000	0.000	0.000	0.000	0.000	0.430	0.000

Problem 77	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	455	252	440	1356	0	0	0	0	203	0
N.S.	1	0.55	0.97	2.98	0.00	0.00	0.00	0.00	0.45	0.00
time (sec)	N/A	0.844	2.678	4.285	0.000	0.000	0.000	0.000	0.365	0.000

Problem 78	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	398	219	358	1361	0	0	0	0	189	0
N.S.	1	0.55	0.90	3.42	0.00	0.00	0.00	0.00	0.47	0.00
time (sec)	N/A	0.818	6.970	3.973	0.000	0.000	0.000	0.000	0.344	0.000

Problem 79	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	685	327	1086	564	0	0	0	0	256	0
N.S.	1	0.48	1.59	0.82	0.00	0.00	0.00	0.00	0.37	0.00
time (sec)	N/A	1.277	10.895	4.051	0.000	0.000	0.000	0.000	0.358	0.000

Problem 80	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	A	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	568	279	1438	651	0	0	0	0	595	0
N.S.	1	0.49	2.53	1.15	0.00	0.00	0.00	0.00	1.05	0.00
time (sec)	N/A	1.566	15.121	3.639	0.000	0.000	0.000	0.000	0.321	0.000

Problem 81	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	564	432	450	1617	0	0	0	0	281	0
N.S.	1	0.77	0.80	2.87	0.00	0.00	0.00	0.00	0.50	0.00
time (sec)	N/A	1.819	3.465	4.382	0.000	0.000	0.000	0.000	0.538	0.000

Problem 82	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	740	374	574	2264	0	0	0	0	380	0
N.S.	1	0.51	0.78	3.06	0.00	0.00	0.00	0.00	0.51	0.00
time (sec)	N/A	1.046	3.984	4.872	0.000	0.000	0.000	0.000	0.567	0.000

Problem 83	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	613	334	555	1810	0	0	0	0	292	0
N.S.	1	0.54	0.91	2.95	0.00	0.00	0.00	0.00	0.48	0.00
time (sec)	N/A	1.207	3.006	4.901	0.000	0.000	0.000	0.000	0.474	0.000

Problem 84	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	559	302	473	1820	0	0	0	0	282	0
N.S.	1	0.54	0.85	3.26	0.00	0.00	0.00	0.00	0.50	0.00
time (sec)	N/A	0.922	12.191	3.833	0.000	0.000	0.000	0.000	0.400	0.000

Problem 85	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	897	411	1642	1078	0	0	0	0	376	0
N.S.	1	0.46	1.83	1.20	0.00	0.00	0.00	0.00	0.42	0.00
time (sec)	N/A	1.481	19.580	3.928	0.000	0.000	0.000	0.000	0.411	0.000

Problem 86	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	A	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	717	344	2338	905	0	0	0	0	871	0
N.S.	1	0.48	3.26	1.26	0.00	0.00	0.00	0.00	1.21	0.00
time (sec)	N/A	1.542	22.064	4.098	0.000	0.000	0.000	0.000	0.398	0.000

Problem 87	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	B	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	159	197	0	0	0	0	91	0
N.S.	1	1.00	2.89	3.58	0.00	0.00	0.00	0.00	1.65	0.00
time (sec)	N/A	0.424	0.528	0.000	0.000	0.000	0.000	0.000	0.269	0.000

Problem 88	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	455	240	217	430	0	0	0	0	140	0
N.S.	1	0.53	0.48	0.95	0.00	0.00	0.00	0.00	0.31	0.00
time (sec)	N/A	0.890	2.278	2.911	0.000	0.000	0.000	0.000	0.296	0.000

Problem 89	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	896	465	369	666	0	0	0	0	358	0
N.S.	1	0.52	0.41	0.74	0.00	0.00	0.00	0.00	0.40	0.00
time (sec)	N/A	1.490	7.183	3.136	0.000	0.000	0.000	0.000	0.305	0.000

Problem 90	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	454	239	221	429	0	0	0	0	144	0
N.S.	1	0.53	0.49	0.94	0.00	0.00	0.00	0.00	0.32	0.00
time (sec)	N/A	0.910	2.238	2.995	0.000	0.000	0.000	0.000	0.288	0.000

Problem 91	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	B	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	140	550	705	0	0	0	0	165	0
N.S.	1	0.61	2.38	3.05	0.00	0.00	0.00	0.00	0.71	0.00
time (sec)	N/A	0.971	0.190	0.011	0.000	0.000	0.000	0.000	0.314	0.000

Problem 92	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	742	386	739	3173	0	0	0	0	479	0
N.S.	1	0.52	1.00	4.28	0.00	0.00	0.00	0.00	0.65	0.00
time (sec)	N/A	1.291	9.231	3.441	0.000	0.000	0.000	0.000	0.357	0.000

Problem 93	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	896	465	388	667	0	0	0	0	360	0
N.S.	1	0.52	0.43	0.74	0.00	0.00	0.00	0.00	0.40	0.00
time (sec)	N/A	1.649	5.792	3.067	0.000	0.000	0.000	0.000	0.280	0.000

Problem 94	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	742	386	764	3177	0	0	0	0	479	0
N.S.	1	0.52	1.03	4.28	0.00	0.00	0.00	0.00	0.65	0.00
time (sec)	N/A	1.166	9.309	3.372	0.000	0.000	0.000	0.000	0.305	0.000

Problem 95	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	386	231	722	2567	0	0	0	0	408	0
N.S.	1	0.60	1.87	6.65	0.00	0.00	0.00	0.00	1.06	0.00
time (sec)	N/A	1.440	8.213	3.641	0.000	0.000	0.000	0.000	0.311	0.000

Problem 96	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	29	23	0	25	26	25	230	25
N.S.	1	1.00	1.07	0.85	0.00	0.93	0.96	0.93	8.52	0.93
time (sec)	N/A	0.302	13.000	1.764	0.000	0.108	3.565	0.604	0.530	0.535

Problem 97	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	29	23	0	25	26	25	132	25
N.S.	1	1.00	1.07	0.85	0.00	0.93	0.96	0.93	4.89	0.93
time (sec)	N/A	0.286	16.418	1.287	0.000	0.106	3.111	0.314	0.481	5.396

Problem 98	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	F(-2)	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	29	23	0	46	26	25	74	25
N.S.	1	1.00	1.07	0.85	0.00	1.70	0.96	0.93	2.74	0.93
time (sec)	N/A	0.288	8.576	1.024	0.000	0.105	2.851	0.247	4.337	0.467

Problem 99	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F(-2)	F(-1)	F	F	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	258	258	396	0	0	0	0	0	148	0
N.S.	1	1.00	1.53	0.00	0.00	0.00	0.00	0.00	0.57	0.00
time (sec)	N/A	0.552	5.389	0.000	0.000	0.000	0.000	0.000	0.421	0.000

Problem 100	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	F	B	F	F(-2)	F(-1)	F	F	F	F(-1)
verified	N/A	N/A	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	769	0	1998	0	0	0	0	0	25	0
N.S.	1	0.00	2.60	0.00	0.00	0.00	0.00	0.00	0.03	0.00
time (sec)	N/A	0.000	22.485	0.000	0.000	0.000	0.000	0.000	200.023	0.000

Problem 101	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F(-2)	F(-1)	F	F	F	F(-1)
verified	N/A	No	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	618	798	377	0	0	0	0	0	25	0
N.S.	1	1.29	0.61	0.00	0.00	0.00	0.00	0.00	0.04	0.00
time (sec)	N/A	1.472	14.275	0.000	0.000	0.000	0.000	0.000	200.027	0.000

Problem 102	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	F	B	F	F(-2)	F(-1)	F(-1)	F	F	F(-1)
verified	N/A	N/A	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1133	0	3485	0	0	0	0	0	0	0
N.S.	1	0.00	3.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.000	23.987	0.000	0.000	0.000	0.000	0.000	1.738	0.000

Problem 103	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	F	C	F	F(-2)	F(-1)	F(-1)	F	F	F(-1)
verified	N/A	N/A	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1	0	5962	0	0	0	0	0	25	0
N.S.	1	0.00	5962.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00
time (sec)	N/A	0.000	24.668	0.000	0.000	0.000	0.000	0.000	200.033	0.000

Problem 104	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	646	371	356	1396	0	0	0	0	341	0
N.S.	1	0.57	0.55	2.16	0.00	0.00	0.00	0.00	0.53	0.00
time (sec)	N/A	1.069	0.261	1.120	0.000	0.000	0.000	0.000	0.263	0.000

Problem 105	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	443	263	237	973	0	0	0	0	223	0
N.S.	1	0.59	0.53	2.20	0.00	0.00	0.00	0.00	0.50	0.00
time (sec)	N/A	0.842	0.307	0.770	0.000	0.000	0.000	0.000	0.237	0.000

Problem 106	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	140	132	628	0	0	0	0	127	0
N.S.	1	0.61	0.57	2.72	0.00	0.00	0.00	0.00	0.55	0.00
time (sec)	N/A	0.513	0.146	0.889	0.000	0.000	0.000	0.000	0.277	0.000

Problem 107	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	736	517	368	823	0	0	0	0	110	0
N.S.	1	0.70	0.50	1.12	0.00	0.00	0.00	0.00	0.15	0.00
time (sec)	N/A	2.365	0.620	1.029	0.000	0.000	0.000	0.000	0.240	0.000

Problem 108	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD	TBD
size	860	632	600	1352	0	0	0	0	412	0
N.S.	1	0.73	0.70	1.57	0.00	0.00	0.00	0.00	0.48	0.00
time (sec)	N/A	2.911	1.839	1.201	0.000	0.000	0.000	0.000	0.234	0.000

Problem 109	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	904	498	463	2074	0	0	0	0	558	0
N.S.	1	0.55	0.51	2.29	0.00	0.00	0.00	0.00	0.62	0.00
time (sec)	N/A	1.269	0.677	1.612	0.000	0.000	0.000	0.000	0.279	0.000

Problem 110	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	645	367	332	1535	0	0	0	0	381	0
N.S.	1	0.57	0.51	2.38	0.00	0.00	0.00	0.00	0.59	0.00
time (sec)	N/A	1.037	0.287	1.029	0.000	0.000	0.000	0.000	0.294	0.000

Problem 111	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	346	193	216	1014	0	0	0	0	226	0
N.S.	1	0.56	0.62	2.93	0.00	0.00	0.00	0.00	0.65	0.00
time (sec)	N/A	0.609	0.174	1.052	0.000	0.000	0.000	0.000	0.247	0.000

Problem 112	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1062	709	507	1546	0	0	0	0	298	0
N.S.	1	0.67	0.48	1.46	0.00	0.00	0.00	0.00	0.28	0.00
time (sec)	N/A	2.892	0.940	1.029	0.000	0.000	0.000	0.000	0.232	0.000

Problem 113	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1188	630	587	2903	0	0	0	0	776	0
N.S.	1	0.53	0.49	2.44	0.00	0.00	0.00	0.00	0.65	0.00
time (sec)	N/A	1.653	0.592	2.135	0.000	0.000	0.000	0.000	0.358	0.000

Problem 114	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	871	481	390	2090	0	0	0	0	540	0
N.S.	1	0.55	0.45	2.40	0.00	0.00	0.00	0.00	0.62	0.00
time (sec)	N/A	1.268	0.409	1.559	0.000	0.000	0.000	0.000	0.318	0.000

Problem 115	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	475	256	251	1423	0	0	0	0	326	0
N.S.	1	0.54	0.53	3.00	0.00	0.00	0.00	0.00	0.69	0.00
time (sec)	N/A	0.704	0.244	1.302	0.000	0.000	0.000	0.000	0.260	0.000

Problem 116	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	No	TBD	TBD	TBD	TBD	TBD	TBD
size	1609	1019	787	2580	0	0	0	0	547	0
N.S.	1	0.63	0.49	1.60	0.00	0.00	0.00	0.00	0.34	0.00
time (sec)	N/A	3.166	1.690	1.332	0.000	0.000	0.000	0.000	0.276	0.000

Problem 117	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-2)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	422	262	343	856	0	0	0	0	234	0
N.S.	1	0.62	0.81	2.03	0.00	0.00	0.00	0.00	0.55	0.00
time (sec)	N/A	0.868	0.820	0.863	0.000	0.000	0.000	0.000	0.249	0.000

Problem 118	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-2)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	256	162	266	505	0	0	0	0	150	0
N.S.	1	0.63	1.04	1.97	0.00	0.00	0.00	0.00	0.59	0.00
time (sec)	N/A	0.763	0.525	0.685	0.000	0.000	0.000	0.000	0.223	0.000

Problem 119	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	F	F(-2)	F(-2)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	87	172	247	90	0	0	0	70	0
N.S.	1	0.73	1.45	2.08	0.76	0.00	0.00	0.00	0.59	0.00
time (sec)	N/A	0.530	0.225	0.734	0.139	0.000	0.000	0.000	0.238	0.000

Problem 120	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	380	288	232	508	0	0	0	0	156	0
N.S.	1	0.76	0.61	1.34	0.00	0.00	0.00	0.00	0.41	0.00
time (sec)	N/A	1.143	0.136	0.853	0.000	0.000	0.000	0.000	0.233	0.000

Problem 121	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	500	384	295	931	0	0	0	0	610	0
N.S.	1	0.77	0.59	1.86	0.00	0.00	0.00	0.00	1.22	0.00
time (sec)	N/A	1.469	0.298	0.898	0.000	0.000	0.000	0.000	0.260	0.000

Problem 122	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	305	213	185	724	0	0	0	0	373	0
N.S.	1	0.70	0.61	2.37	0.00	0.00	0.00	0.00	1.22	0.00
time (sec)	N/A	0.796	0.700	1.293	0.000	0.000	0.000	0.000	0.253	0.000

Problem 123	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	213	143	147	488	0	0	0	0	275	0
N.S.	1	0.67	0.69	2.29	0.00	0.00	0.00	0.00	1.29	0.00
time (sec)	N/A	0.651	0.466	1.039	0.000	0.000	0.000	0.000	0.234	0.000

Problem 124	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	100	126	305	0	0	0	0	154	0
N.S.	1	0.69	0.88	2.12	0.00	0.00	0.00	0.00	1.07	0.00
time (sec)	N/A	0.407	0.374	1.484	0.000	0.000	0.000	0.000	0.211	0.000

Problem 125	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	654	431	351	1101	0	0	0	0	470	0
N.S.	1	0.66	0.54	1.68	0.00	0.00	0.00	0.00	0.72	0.00
time (sec)	N/A	1.450	1.293	2.250	0.000	0.000	0.000	0.000	0.225	0.000

Problem 126	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	570	452	868	6743	0	0	0	0	1086	0
N.S.	1	0.79	1.52	11.83	0.00	0.00	0.00	0.00	1.91	0.00
time (sec)	N/A	0.925	2.058	1.972	0.000	0.000	0.000	0.000	0.272	0.000

Problem 127	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	330	277	366	5114	0	0	0	0	839	0
N.S.	1	0.84	1.11	15.50	0.00	0.00	0.00	0.00	2.54	0.00
time (sec)	N/A	0.738	0.795	1.440	0.000	0.000	0.000	0.000	0.232	0.000

Problem 128	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	259	192	285	3783	0	0	0	0	597	0
N.S.	1	0.74	1.10	14.61	0.00	0.00	0.00	0.00	2.31	0.00
time (sec)	N/A	0.582	0.621	1.213	0.000	0.000	0.000	0.000	0.235	0.000

Problem 129	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	216	159	208	2237	0	0	0	0	371	0
N.S.	1	0.74	0.96	10.36	0.00	0.00	0.00	0.00	1.72	0.00
time (sec)	N/A	0.466	0.471	1.783	0.000	0.000	0.000	0.000	0.258	0.000

Problem 130	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	No	No	TBD	TBD	TBD	TBD	TBD	TBD
size	1300	821	2078	8599	0	0	0	0	1557	0
N.S.	1	0.63	1.60	6.61	0.00	0.00	0.00	0.00	1.20	0.00
time (sec)	N/A	2.238	12.705	2.129	0.000	0.000	0.000	0.000	0.256	0.000

Problem 131	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1084	750	708	2728	0	0	0	0	502	0
N.S.	1	0.69	0.65	2.52	0.00	0.00	0.00	0.00	0.46	0.00
time (sec)	N/A	1.899	0.659	1.085	0.000	0.000	0.000	0.000	0.296	0.000

Problem 132	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	723	477	441	1852	0	0	0	0	338	0
N.S.	1	0.66	0.61	2.56	0.00	0.00	0.00	0.00	0.47	0.00
time (sec)	N/A	1.247	0.529	0.785	0.000	0.000	0.000	0.000	0.294	0.000

Problem 133	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	382	256	225	1236	0	0	0	0	198	0
N.S.	1	0.67	0.59	3.24	0.00	0.00	0.00	0.00	0.52	0.00
time (sec)	N/A	0.772	0.154	0.649	0.000	0.000	0.000	0.000	0.230	0.000

Problem 134	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1442	1018	516	0	0	0	0	0	154	0
N.S.	1	0.71	0.36	0.00	0.00	0.00	0.00	0.00	0.11	0.00
time (sec)	N/A	3.577	0.864	0.000	0.000	0.000	0.000	0.000	0.235	0.000

Problem 135	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1538	1066	872	4176	0	0	0	0	869	0
N.S.	1	0.69	0.57	2.72	0.00	0.00	0.00	0.00	0.57	0.00
time (sec)	N/A	2.477	1.349	1.514	0.000	0.000	0.000	0.000	0.374	0.000

Problem 136	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1044	699	616	3032	0	0	0	0	606	0
N.S.	1	0.67	0.59	2.90	0.00	0.00	0.00	0.00	0.58	0.00
time (sec)	N/A	1.721	0.601	1.110	0.000	0.000	0.000	0.000	0.291	0.000

Problem 137	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	568	384	395	2021	0	0	0	0	367	0
N.S.	1	0.68	0.70	3.56	0.00	0.00	0.00	0.00	0.65	0.00
time (sec)	N/A	0.958	0.374	0.984	0.000	0.000	0.000	0.000	0.287	0.000

Problem 138	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1970	1369	740	0	0	0	0	0	394	0
N.S.	1	0.69	0.38	0.00	0.00	0.00	0.00	0.00	0.20	0.00
time (sec)	N/A	4.068	1.550	0.000	0.000	0.000	0.000	0.000	0.307	0.000

Problem 139	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	2037	1379	1114	5977	0	0	0	0	1237	0
N.S.	1	0.68	0.55	2.93	0.00	0.00	0.00	0.00	0.61	0.00
time (sec)	N/A	3.522	1.070	2.094	0.000	0.000	0.000	0.000	0.444	0.000

Problem 140	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1401	922	742	4170	0	0	0	0	875	0
N.S.	1	0.66	0.53	2.98	0.00	0.00	0.00	0.00	0.62	0.00
time (sec)	N/A	2.295	0.779	1.709	0.000	0.000	0.000	0.000	0.370	0.000

Problem 141	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	773	513	470	2852	0	0	0	0	537	0
N.S.	1	0.66	0.61	3.69	0.00	0.00	0.00	0.00	0.69	0.00
time (sec)	N/A	1.214	0.506	1.231	0.000	0.000	0.000	0.000	0.322	0.000

Problem 142	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F(-2)	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	2897	1986	1275	0	0	0	0	0	703	0
N.S.	1	0.69	0.44	0.00	0.00	0.00	0.00	0.00	0.24	0.00
time (sec)	N/A	4.971	3.054	0.000	0.000	0.000	0.000	0.000	20.338	0.000

Problem 143	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-2)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	634	417	582	1636	0	0	0	0	410	0
N.S.	1	0.66	0.92	2.58	0.00	0.00	0.00	0.00	0.65	0.00
time (sec)	N/A	0.917	1.255	0.991	0.000	0.000	0.000	0.000	0.240	0.000

Problem 144	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	F	F	F(-2)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	382	240	400	928	0	0	0	0	278	0
N.S.	1	0.63	1.05	2.43	0.00	0.00	0.00	0.00	0.73	0.00
time (sec)	N/A	0.780	1.081	0.706	0.000	0.000	0.000	0.000	0.266	0.000

Problem 145	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	C	A	F	F(-2)	F(-2)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	128	118	460	184	0	0	0	142	0
N.S.	1	0.82	0.75	2.93	1.17	0.00	0.00	0.00	0.90	0.00
time (sec)	N/A	0.585	0.528	0.738	0.157	0.000	0.000	0.000	0.246	0.000

Problem 146	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	589	402	357	0	0	0	0	0	257	0
N.S.	1	0.68	0.61	0.00	0.00	0.00	0.00	0.00	0.44	0.00
time (sec)	N/A	1.711	0.238	0.000	0.000	0.000	0.000	0.000	0.224	0.000

Problem 147	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1106	721	651	0	0	0	0	0	1061	0
N.S.	1	0.65	0.59	0.00	0.00	0.00	0.00	0.00	0.96	0.00
time (sec)	N/A	3.254	0.483	0.000	0.000	0.000	0.000	0.000	0.268	0.000

Problem 148	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	677	447	325	1528	0	0	0	0	681	0
N.S.	1	0.66	0.48	2.26	0.00	0.00	0.00	0.00	1.01	0.00
time (sec)	N/A	1.432	2.117	1.545	0.000	0.000	0.000	0.000	0.247	0.000

Problem 149	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	513	314	259	974	0	0	0	0	505	0
N.S.	1	0.61	0.50	1.90	0.00	0.00	0.00	0.00	0.98	0.00
time (sec)	N/A	1.259	1.365	0.955	0.000	0.000	0.000	0.000	0.241	0.000

Problem 150	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	410	243	237	612	0	0	0	0	287	0
N.S.	1	0.59	0.58	1.49	0.00	0.00	0.00	0.00	0.70	0.00
time (sec)	N/A	0.982	0.890	0.958	0.000	0.000	0.000	0.000	0.264	0.000

Problem 151	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1137	722	597	0	0	0	0	0	790	0
N.S.	1	0.64	0.53	0.00	0.00	0.00	0.00	0.00	0.69	0.00
time (sec)	N/A	2.684	3.241	0.000	0.000	0.000	0.000	0.000	0.275	0.000

Problem 152	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1589	918	715	13140	0	0	0	0	0	0
N.S.	1	0.58	0.45	8.27	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	2.512	6.154	1.664	0.000	0.000	0.000	0.000	0.261	0.000

Problem 153	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	989	614	618	9720	0	0	0	0	1122	0
N.S.	1	0.62	0.62	9.83	0.00	0.00	0.00	0.00	1.13	0.00
time (sec)	N/A	1.741	4.994	1.404	0.000	0.000	0.000	0.000	0.257	0.000

Problem 154	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	617	398	591	5894	0	0	0	0	709	0
N.S.	1	0.65	0.96	9.55	0.00	0.00	0.00	0.00	1.15	0.00
time (sec)	N/A	1.156	4.878	1.055	0.000	0.000	0.000	0.000	0.246	0.000

Problem 155	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	F(-1)	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	37	33	35	47	0	35	36	35
N.S.	1	1.00	1.06	0.94	1.00	1.34	0.00	1.00	1.03	1.00
time (sec)	N/A	0.384	0.100	3.766	1.918	0.118	0.000	0.272	0.284	0.337

Problem 156	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	F	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	634	628	0	0	0	0	0	0	141	0
N.S.	1	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00
time (sec)	N/A	2.323	0.000	0.000	0.000	0.000	0.000	0.000	0.339	0.000

Problem 157	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	514	506	7541	0	0	0	0	0	101	0
N.S.	1	0.98	14.67	0.00	0.00	0.00	0.00	0.00	0.20	0.00
time (sec)	N/A	1.815	85.057	0.000	0.000	0.000	0.000	0.000	0.253	0.000

Problem 158	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	390	386	2724	0	0	0	0	0	61	0
N.S.	1	0.99	6.98	0.00	0.00	0.00	0.00	0.00	0.16	0.00
time (sec)	N/A	1.312	8.367	0.000	0.000	0.000	0.000	0.000	0.250	0.000

Problem 159	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	237	238	246	0	0	0	0	0	26	0
N.S.	1	1.00	1.04	0.00	0.00	0.00	0.00	0.00	0.11	0.00
time (sec)	N/A	0.723	0.015	0.000	0.000	0.000	0.000	0.000	0.236	0.000

Problem 160	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
verified	N/A	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	37	33	35	57	34	35	46	35
N.S.	1	1.00	1.06	0.94	1.00	1.63	0.97	1.00	1.31	1.00
time (sec)	N/A	0.350	0.211	1.573	0.890	0.093	8.687	0.296	0.243	0.297

Problem 161	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	523	556	463	609	859	676	1263	1337	1010	0
N.S.	1	1.06	0.89	1.16	1.64	1.29	2.41	2.56	1.93	0.00
time (sec)	N/A	2.432	0.308	0.344	0.143	0.129	0.646	0.160	0.252	0.000

Problem 162	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	369	389	307	434	581	449	821	847	669	0
N.S.	1	1.05	0.83	1.18	1.57	1.22	2.22	2.30	1.81	0.00
time (sec)	N/A	1.423	0.301	0.247	0.128	0.129	0.474	0.147	0.268	0.000

Problem 163	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	235	249	186	267	334	245	449	448	368	0
N.S.	1	1.06	0.79	1.14	1.42	1.04	1.91	1.91	1.57	0.00
time (sec)	N/A	0.799	0.177	0.217	0.130	0.116	0.350	0.136	0.298	0.000

Problem 164	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	476	476	457	2438	0	0	0	0	178	0
N.S.	1	1.00	0.96	5.12	0.00	0.00	0.00	0.00	0.37	0.00
time (sec)	N/A	1.250	0.539	1.924	0.000	0.000	0.000	0.000	0.233	0.000

Problem 165	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	460	457	432	1883	0	0	0	0	467	0
N.S.	1	0.99	0.94	4.09	0.00	0.00	0.00	0.00	1.02	0.00
time (sec)	N/A	1.261	0.570	2.830	0.000	0.000	0.000	0.000	0.268	0.000

Problem 166	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	488	478	940	2027	0	0	0	0	538	0
N.S.	1	0.98	1.93	4.15	0.00	0.00	0.00	0.00	1.10	0.00
time (sec)	N/A	1.589	4.589	3.494	0.000	0.000	0.000	0.000	4.259	0.000

Problem 167	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	B	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	349	357	442	1177	0	3003	0	0	783	0
N.S.	1	1.02	1.27	3.37	0.00	8.60	0.00	0.00	2.24	0.00
time (sec)	N/A	0.798	1.246	0.278	0.000	76.830	0.000	0.000	1.377	0.000

Problem 168	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	470	494	575	1924	0	0	0	0	28	0
N.S.	1	1.05	1.22	4.09	0.00	0.00	0.00	0.00	0.06	0.00
time (sec)	N/A	1.071	1.750	0.285	0.000	0.000	0.000	0.000	200.017	0.000

Problem 169	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F(-1)	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	593	630	682	3208	0	0	0	0	28	0
N.S.	1	1.06	1.15	5.41	0.00	0.00	0.00	0.00	0.05	0.00
time (sec)	N/A	1.315	1.645	0.279	0.000	0.000	0.000	0.000	200.019	0.000

Problem 170	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	689	729	619	802	1231	936	1809	2010	1449	0
N.S.	1	1.06	0.90	1.16	1.79	1.36	2.63	2.92	2.10	0.00
time (sec)	N/A	4.182	0.553	0.293	0.147	0.225	0.887	0.183	0.296	0.000

Problem 171	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	495	528	380	580	840	621	1197	1287	965	0
N.S.	1	1.07	0.77	1.17	1.70	1.25	2.42	2.60	1.95	0.00
time (sec)	N/A	2.679	0.531	0.266	0.164	0.225	0.658	0.148	0.286	0.000

Problem 172	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	316	336	253	370	490	341	658	692	539	0
N.S.	1	1.06	0.80	1.17	1.55	1.08	2.08	2.19	1.71	0.00
time (sec)	N/A	1.403	0.274	0.185	0.127	0.196	0.443	0.136	0.253	0.000

Problem 173	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	639	636	610	3403	0	0	0	0	256	0
N.S.	1	1.00	0.95	5.33	0.00	0.00	0.00	0.00	0.40	0.00
time (sec)	N/A	1.738	0.502	2.262	0.000	0.000	0.000	0.000	0.242	0.000

Problem 174	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	617	613	593	2873	0	0	0	0	635	0
N.S.	1	0.99	0.96	4.66	0.00	0.00	0.00	0.00	1.03	0.00
time (sec)	N/A	1.961	0.885	3.843	0.000	0.000	0.000	0.000	0.272	0.000

Problem 175	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1016	965	1556	3617	0	0	0	0	1201	0
N.S.	1	0.95	1.53	3.56	0.00	0.00	0.00	0.00	1.18	0.00
time (sec)	N/A	2.902	9.975	4.129	0.000	0.000	0.000	0.000	6.403	0.000

Problem 176	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	No	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1278	1244	1921	3757	0	0	0	0	1126	0
N.S.	1	0.97	1.50	2.94	0.00	0.00	0.00	0.00	0.88	0.00
time (sec)	N/A	3.325	7.666	5.416	0.000	0.000	0.000	0.000	1.955	0.000

Problem 177	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	A	B	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1016	1016	734	1706	0	1537	2992	3444	0	0
N.S.	1	1.00	0.72	1.68	0.00	1.51	2.94	3.39	0.00	0.00
time (sec)	N/A	2.083	0.599	1.306	0.000	0.275	1.076	0.214	0.399	0.000

Problem 178	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	A	B	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	701	701	534	1176	0	1029	1935	2166	1077	0
N.S.	1	1.00	0.76	1.68	0.00	1.47	2.76	3.09	1.54	0.00
time (sec)	N/A	1.467	0.303	0.819	0.000	0.182	0.739	0.195	0.324	0.000

Problem 179	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F	A	B	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	425	425	364	673	0	579	1059	1145	665	0
N.S.	1	1.00	0.86	1.58	0.00	1.36	2.49	2.69	1.56	0.00
time (sec)	N/A	1.013	0.207	0.655	0.000	0.168	0.505	0.158	0.258	0.000

Problem 180	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1085	1085	556	0	0	0	0	0	329	0
N.S.	1	1.00	0.51	0.00	0.00	0.00	0.00	0.00	0.30	0.00
time (sec)	N/A	2.561	0.442	0.000	0.000	0.000	0.000	0.000	0.279	0.000

Problem 181	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	No	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1323	1323	688	0	0	0	0	0	742	0
N.S.	1	1.00	0.52	0.00	0.00	0.00	0.00	0.00	0.56	0.00
time (sec)	N/A	3.093	0.793	0.000	0.000	0.000	0.000	0.000	5.933	0.000

Problem 182	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	520	507	307	1251	0	0	0	0	506	0
N.S.	1	0.98	0.59	2.41	0.00	0.00	0.00	0.00	0.97	0.00
time (sec)	N/A	2.005	0.274	1.431	0.000	0.000	0.000	0.000	11.108	0.000

Problem 183	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	F(-2)	F	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	907	888	526	2192	0	0	0	0	37	0
N.S.	1	0.98	0.58	2.42	0.00	0.00	0.00	0.00	0.04	0.00
time (sec)	N/A	4.552	0.526	1.980	0.000	0.000	0.000	0.000	200.027	0.000

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi only. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is also given. The larger this ratio is, the harder the integral is to solve. In this test file, problem number [24] had the largest ratio of [.9000000000000000022]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	8	8	1.12	16	0.500
2	A	5	5	1.13	16	0.312
3	A	5	5	1.15	14	0.357
4	A	1	1	1.00	8	0.125
5	A	6	5	1.00	16	0.312
6	A	4	3	1.00	16	0.188
7	A	5	4	0.99	16	0.250
8	A	7	6	1.09	16	0.375
9	A	3	3	1.05	18	0.167
10	A	3	3	1.10	18	0.167
11	A	3	3	1.15	16	0.188
12	A	3	3	1.09	10	0.300
13	A	7	6	0.99	18	0.333
14	A	10	9	0.93	18	0.500
15	A	14	13	0.96	18	0.722
16	A	4	3	0.96	18	0.167
17	A	4	3	0.95	18	0.167
18	A	4	3	0.95	16	0.188
19	A	8	7	0.91	10	0.700
20	N/A	1	0	1.00	18	0.000
21	N/A	1	0	1.00	18	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
22	A	2	2	1.00	18	0.111
23	A	2	2	1.00	16	0.125
24	A	10	9	0.97	10	0.900
25	N/A	1	0	1.00	18	0.000
26	N/A	1	0	1.00	18	0.000
27	N/A	2	0	1.00	18	0.000
28	A	4	4	0.81	16	0.250
29	N/A	1	0	1.00	18	0.000
30	N/A	1	0	1.00	18	0.000
31	A	13	13	1.06	21	0.619
32	A	10	10	1.05	21	0.476
33	A	8	8	1.04	19	0.421
34	A	4	4	1.00	21	0.190
35	A	6	6	0.99	21	0.286
36	A	8	7	1.18	21	0.333
37	A	8	7	1.05	21	0.333
38	A	11	10	1.06	21	0.476
39	A	13	12	1.09	21	0.571
40	A	4	4	1.02	23	0.174
41	A	2	2	1.00	25	0.080
42	A	4	4	0.49	30	0.133
43	A	4	4	0.51	30	0.133
44	A	4	4	0.69	30	0.133
45	A	4	4	0.62	30	0.133
46	A	4	4	0.65	30	0.133
47	A	7	7	0.71	30	0.233
48	A	4	4	0.43	30	0.133
49	A	7	7	0.65	30	0.233
50	A	4	4	0.51	30	0.133
51	A	4	4	0.52	30	0.133
52	A	4	4	0.54	30	0.133
53	A	4	4	0.52	30	0.133

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
54	A	9	9	0.57	30	0.300
55	A	4	4	0.43	30	0.133
56	A	4	4	0.49	30	0.133
57	A	4	4	0.50	30	0.133
58	A	4	4	0.46	30	0.133
59	A	4	4	0.48	30	0.133
60	A	2	2	1.00	30	0.067
61	A	7	7	0.91	30	0.233
62	A	4	4	0.85	30	0.133
63	A	6	6	0.90	30	0.200
64	A	3	3	0.82	30	0.100
65	A	4	4	0.63	30	0.133
66	A	4	4	0.83	30	0.133
67	A	4	4	0.62	30	0.133
68	A	5	5	0.69	30	0.167
69	A	4	4	0.54	32	0.125
70	A	4	4	0.55	32	0.125
71	A	6	6	0.66	32	0.188
72	A	4	4	0.64	32	0.125
73	A	4	4	0.50	32	0.125
74	A	4	4	0.53	32	0.125
75	A	4	4	0.51	32	0.125
76	A	11	11	0.74	32	0.344
77	A	4	4	0.55	32	0.125
78	A	7	6	0.55	32	0.188
79	A	4	4	0.48	32	0.125
80	A	4	4	0.49	32	0.125
81	A	13	13	0.77	32	0.406
82	A	4	4	0.51	32	0.125
83	A	4	4	0.54	32	0.125
84	A	7	6	0.54	32	0.188
85	A	4	4	0.46	32	0.125

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
86	A	4	4	0.48	32	0.125
87	A	2	2	1.00	32	0.062
88	A	4	4	0.53	32	0.125
89	A	4	4	0.52	32	0.125
90	A	4	4	0.53	32	0.125
91	A	9	8	0.61	32	0.250
92	A	4	4	0.52	32	0.125
93	A	4	4	0.52	32	0.125
94	A	4	4	0.52	32	0.125
95	A	12	11	0.60	32	0.344
96	N/A	1	0	1.00	27	0.000
97	N/A	1	0	1.00	27	0.000
98	N/A	1	0	1.00	27	0.000
99	A	3	3	1.00	27	0.111
100	F	0	0	N/A	0.000	N/A
101	A	2	2	1.29	27	0.074
102	F	0	0	N/A	0.000	N/A
103	F	0	0	N/A	0.000	N/A
104	A	3	3	0.57	31	0.097
105	A	3	3	0.59	31	0.097
106	A	3	3	0.61	29	0.103
107	A	7	7	0.70	31	0.226
108	A	7	7	0.73	31	0.226
109	A	3	3	0.55	31	0.097
110	A	3	3	0.57	31	0.097
111	A	3	3	0.56	29	0.103
112	A	3	3	0.67	31	0.097
113	A	3	3	0.53	31	0.097
114	A	3	3	0.55	31	0.097
115	A	3	3	0.54	29	0.103
116	A	3	3	0.63	31	0.097
117	A	3	3	0.62	31	0.097

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
118	A	3	3	0.63	31	0.097
119	A	3	3	0.73	29	0.103
120	A	10	9	0.76	31	0.290
121	A	14	13	0.77	31	0.419
122	A	3	3	0.70	31	0.097
123	A	3	3	0.67	31	0.097
124	A	6	6	0.69	29	0.207
125	A	3	3	0.66	31	0.097
126	A	3	3	0.79	31	0.097
127	A	3	3	0.84	31	0.097
128	A	3	3	0.74	31	0.097
129	A	3	3	0.74	29	0.103
130	A	3	3	0.63	31	0.097
131	A	3	3	0.69	33	0.091
132	A	3	3	0.66	33	0.091
133	A	3	3	0.67	31	0.097
134	A	7	7	0.71	33	0.212
135	A	3	3	0.69	33	0.091
136	A	3	3	0.67	33	0.091
137	A	3	3	0.68	31	0.097
138	A	3	3	0.69	33	0.091
139	A	3	3	0.68	33	0.091
140	A	3	3	0.66	33	0.091
141	A	3	3	0.66	31	0.097
142	A	3	3	0.69	33	0.091
143	A	6	5	0.66	33	0.152
144	A	6	5	0.63	33	0.152
145	A	3	3	0.82	31	0.097
146	A	11	10	0.68	33	0.303
147	A	17	16	0.65	33	0.485
148	A	3	3	0.66	33	0.091
149	A	3	3	0.61	33	0.091

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
150	A	3	3	0.59	31	0.097
151	A	3	3	0.64	33	0.091
152	A	3	3	0.58	33	0.091
153	A	3	3	0.62	33	0.091
154	A	3	3	0.65	31	0.097
155	N/A	1	0	1.00	35	0.000
156	A	10	9	0.99	35	0.257
157	A	9	8	0.98	35	0.229
158	A	8	7	0.99	33	0.212
159	A	8	7	1.00	25	0.280
160	N/A	1	0	1.00	35	0.000
161	A	14	14	1.06	26	0.538
162	A	13	13	1.05	26	0.500
163	A	10	10	1.06	24	0.417
164	A	4	4	1.00	26	0.154
165	A	4	4	0.99	26	0.154
166	A	4	4	0.98	26	0.154
167	A	8	7	1.02	26	0.269
168	A	10	9	1.05	26	0.346
169	A	13	12	1.06	26	0.462
170	A	17	17	1.06	31	0.548
171	A	14	14	1.07	31	0.452
172	A	13	13	1.06	29	0.448
173	A	4	4	1.00	31	0.129
174	A	4	4	0.99	31	0.129
175	A	4	4	0.95	31	0.129
176	A	4	4	0.97	31	0.129
177	A	2	2	1.00	28	0.071
178	A	2	2	1.00	28	0.071
179	A	2	2	1.00	26	0.077
180	A	2	2	1.00	28	0.071
181	A	2	2	1.00	28	0.071

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
182	A	3	3	0.98	33	0.091
183	A	4	4	0.98	35	0.114

CHAPTER 3

LISTING OF INTEGRALS

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

Optimal result

Integrand size = 16, antiderivative size = 184

$$\int (d+ex)^3(a+b\arcsin(cx))\,dx = \frac{bd(c^2d^2+e^2)\sqrt{1-c^2x^2}}{c^3} + \frac{3be(8c^2d^2+e^2)\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{be^3x^3\sqrt{1-c^2x^2}}{16c} - \frac{bde^2(1-c^2x^2)^{3/2}}{3c^3} - \frac{b(8c^4d^4+24c^2d^2e^2+3e^4)\arcsin(cx)}{32c^4e} + \frac{(d+ex)^4(a+b\arcsin(cx))}{4e}$$

output
```
b*d*(c^2*d^2+e^2)*(-c^2*x^2+1)^(1/2)/c^3+3/32*b*e*(8*c^2*d^2+e^2)*x*(-c^2*
x^2+1)^(1/2)/c^3+1/16*b*e^3*x^3*(-c^2*x^2+1)^(1/2)/c-1/3*b*d*e^2*(-c^2*x^2
+1)^(3/2)/c^3-1/32*b*(8*c^4*d^4+24*c^2*d^2*e^2+3*e^4)*arcsin(c*x)/c^4/e+1/
4*(e*x+d)^4*(a+b*arcsin(c*x))/e
```

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.90

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

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

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

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.12, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5242, 497, 25, 687, 25, 27, 676, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5242}$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))}{4e}-\frac{bc\int \frac{(d+ex)^4}{\sqrt{1-c^2x^2}}dx}{4e}$$

$$\Big\downarrow \text{497}$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))}{4e}-\frac{bc\left(-\frac{\int -\frac{(d+ex)^2\left(4d^2c^2+7dexc^2+3e^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)^3}{4c^2}\right)}{4e}$$

$$\Big\downarrow \text{25}$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))}{4e}-\frac{bc\left(\frac{\int \frac{(d+ex)^2\left(4d^2c^2+7dexc^2+3e^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)^3}{4c^2}\right)}{4e}$$

$$\Big\downarrow \text{ 687}$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))}{4e}-\frac{bc\left(\frac{-\frac{\int -\frac{c^2(d+ex)\left(d\left(12c^2d^2+23e^2\right)+e\left(26c^2d^2+9e^2\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{7}{3}de\sqrt{1-c^2x^2}(d+ex)^2}{4c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)^3}{4c^2}\right)}{4e}$$

$$\Big\downarrow \text{ 25}$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))}{4e}-\frac{bc\left(\frac{\frac{\int \frac{c^2(d+ex)\left(d\left(12c^2d^2+23e^2\right)+e\left(26c^2d^2+9e^2\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{7}{3}de\sqrt{1-c^2x^2}(d+ex)^2}{4c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)^3}{4c^2}\right)}{4e}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))}{4e}-\frac{bc\left(\frac{\frac{1}{3}\int \frac{(d+ex)\left(d\left(12c^2d^2+23e^2\right)+e\left(26c^2d^2+9e^2\right)x\right)}{\sqrt{1-c^2x^2}}dx-\frac{7}{3}de\sqrt{1-c^2x^2}(d+ex)^2}{4c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)^3}{4c^2}\right)}{4e}$$

$$\Big\downarrow \text{ 676}$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))}{4e}-\frac{bc\left(\frac{\frac{1}{3}\left(\frac{3\left(8c^4d^4+24c^2d^2e^2+3e^4\right)\int \frac{1}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{1}{2}e^2x\sqrt{1-c^2x^2}\left(\frac{9e^2}{c^2}+26d^2\right)-2de\sqrt{1-c^2x^2}\left(\frac{16e^2}{c^2}+19d^2\right)\right)-\frac{7}{3}de\sqrt{1-c^2x^2}(d+ex)^2}{4c^2}-\frac{e\sqrt{1-c^2}}{}\right.}{4e}$$

$$\Big\downarrow \text{ 223}$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))}{4e} - \frac{bc\left(\frac{\frac{1}{3}\left(\frac{3\arcsin(cx)\left(8c^4d^4+24c^2d^2e^2+3e^4\right)}{2c^3}-\frac{1}{2}e^2x\sqrt{1-c^2x^2}\left(\frac{9e^2}{c^2}+26d^2\right)-2de\sqrt{1-c^2x^2}\left(\frac{16e^2}{c^2}+19d^2\right)\right)-\frac{7}{3}de\sqrt{1-c^2x^2}(d+ex)^2}{4c^2} - \frac{e\sqrt{1-c^2x^2}(d}{4c^2}\right.}{4e}$$

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

output
```
((d + e*x)^4*(a + b*ArcSin[c*x]))/(4*e) - (b*c*(-1/4*(e*(d + e*x)^3*Sqrt[1
 - c^2*x^2])/c^2 + ((-7*d*e*(d + e*x)^2*Sqrt[1 - c^2*x^2])/3 + (-2*d*e*(19
*d^2 + (16*e^2)/c^2)*Sqrt[1 - c^2*x^2] - (e^2*(26*d^2 + (9*e^2)/c^2)*x*Sqr
t[1 - c^2*x^2])/2 + (3*(8*c^4*d^4 + 24*c^2*d^2*e^2 + 3*e^4)*ArcSin[c*x])/(
2*c^3))/3)/(4*c^2)))/(4*e)
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 497
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n - 1)*((a + b*x^2)^(p + 1)/(b*(n + 2*p + 1))), x] + Simp[1/(b
*(n + 2*p + 1))   Int[(c + d*x)^(n - 2)*(a + b*x^2)^p*Simp[b*c^2*(n + 2*p +
 1) - a*d^2*(n - 1) + 2*b*c*d*(n + p)*x, x], x], x] /; FreeQ[{a, b, c, d, n
, p}, x] && If[RationalQ[n], GtQ[n, 1], SumSimplerQ[n, -2]] && NeQ[n + 2*p
+ 1, 0] && IntQuadraticQ[a, 0, b, c, d, n, p, x]
```

rule 676
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(e*f + d*g)*((a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + (Sim
p[e*g*x*((a + c*x^2)^(p + 1)/(c*(2*p + 3))), x] - Simp[(a*e*g - c*d*f*(2*p
+ 3))/(c*(2*p + 3))   Int[(a + c*x^2)^p, x], x]) /; FreeQ[{a, c, d, e, f, g
, p}, x] &&  !LeQ[p, -1]
```

rule 687
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 2))
), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1)*(a + c*x^2)^p*Simp
[c*d*f*(m + 2*p + 2) - a*e*g*m + c*(e*f*(m + 2*p + 2) + d*g*m)*x, x], x], x
] /; FreeQ[{a, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] &&
 (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && Eq
Q[f, 0])
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.35

method	result
parts	$\frac{a(ex+d)^4}{4e}+\frac{b\left(\frac{c\,e^3\arcsin(cx)x^4}{4}+c\,e^2\arcsin(cx)x^3d+\frac{3ce\arcsin(cx)x^2d^2}{2}+\arcsin(cx)d^3cx+\frac{c\arcsin(cx)d^4}{4e}-\frac{c^4d^4\arcsin(\cdots}{\cdots}\right.}{\cdots}$
orering	$\frac{(14c^4e^4x^5+72c^4d\,e^3x^4+152c^4d^2e^2x^3+176x^2e\,d^3c^4+32c^4d^4x+3c^2e^4x^3+32c^2d\,e^3x^2-96c^2d^2e^2x-120e\,d^3c^2-12e^4x-\cdots}{32(ex+d)c^4}$
derivativedivides	$\frac{\frac{a(cxe+cd)^4}{4c^3e}+\frac{b\left(\frac{\arcsin(cx)c^4d^4}{4e}+\arcsin(cx)c^4d^3x+\frac{3e\arcsin(cx)c^4d^2x^2}{2}+e^2\arcsin(cx)c^4d\,x^3+\frac{\arcsin(cx)e^3c^4x^4}{4}-\frac{c^4d^4\arcsin(cx\cdots}{\cdots}\right.}{\cdots}}{\cdots}$
default	$\frac{\frac{a(cxe+cd)^4}{4c^3e}+\frac{b\left(\frac{\arcsin(cx)c^4d^4}{4e}+\arcsin(cx)c^4d^3x+\frac{3e\arcsin(cx)c^4d^2x^2}{2}+e^2\arcsin(cx)c^4d\,x^3+\frac{\arcsin(cx)e^3c^4x^4}{4}-\frac{c^4d^4\arcsin(cx\cdots}{\cdots}\right.}{\cdots}}{\cdots}$

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

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

Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.09

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

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

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

Sympy [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 316, normalized size of antiderivative = 1.72

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

input
```
integrate((e*x+d)**3*(a+b*asin(c*x)),x)
```

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

Maxima [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.26

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

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

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

Giac [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.72

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

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

output
```
1/4*a*e^3*x^4 + a*d*e^2*x^3 + b*d^3*x*arcsin(c*x) + a*d^3*x + (c^2*x^2 - 1
)*b*d*e^2*x*arcsin(c*x)/c^2 + 3/4*sqrt(-c^2*x^2 + 1)*b*d^2*e*x/c + 3/2*(c^
2*x^2 - 1)*b*d^2*e*arcsin(c*x)/c^2 + b*d*e^2*x*arcsin(c*x)/c^2 + sqrt(-c^2
*x^2 + 1)*b*d^3/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e^3*x/c^3 + 3/2*(c^2*x^2 -
 1)*a*d^2*e/c^2 + 3/4*b*d^2*e*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e^3*
arcsin(c*x)/c^4 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d*e^2/c^3 + 5/32*sqrt(-c^2*x^
2 + 1)*b*e^3*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e^3*arcsin(c*x)/c^4 + sqrt(-c^2*x
^2 + 1)*b*d*e^2/c^3 + 5/32*b*e^3*arcsin(c*x)/c^4
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))*(d + e*x)^3,x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^3, x)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 269, normalized size of antiderivative = 1.46

$$\int (d+ex)^3(a+b\arcsin(cx))\,dx$$
$$= \frac{96asin(cx)\,b\,c^4d^3x+144asin(cx)\,b\,c^4d^2e\,x^2+96asin(cx)\,b\,c^4d\,e^2x^3+24asin(cx)\,b\,c^4e^3x^4-72asin(cx)\,b}{}$$

input
```
int((e*x+d)^3*(a+b*asin(c*x)),x)
```

output
```
(96*asin(c*x)*b*c**4*d**3*x + 144*asin(c*x)*b*c**4*d**2*e*x**2 + 96*asin(c
*x)*b*c**4*d*e**2*x**3 + 24*asin(c*x)*b*c**4*e**3*x**4 - 72*asin(c*x)*b*c*
*2*d**2*e - 9*asin(c*x)*b*e**3 + 96*sqrt( - c**2*x**2 + 1)*b*c**3*d**3 + 7
2*sqrt( - c**2*x**2 + 1)*b*c**3*d**2*e*x + 32*sqrt( - c**2*x**2 + 1)*b*c**
3*d*e**2*x**2 + 6*sqrt( - c**2*x**2 + 1)*b*c**3*e**3*x**3 + 64*sqrt( - c**
2*x**2 + 1)*b*c*d*e**2 + 9*sqrt( - c**2*x**2 + 1)*b*c*e**3*x + 96*a*c**4*d
**3*x + 144*a*c**4*d**2*e*x**2 + 96*a*c**4*d*e**2*x**3 + 24*a*c**4*e**3*x*
*4)/(96*c**4)
```

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

Optimal result

Integrand size = 16, antiderivative size = 134

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

output
```
1/3*b*(3*c^2*d^2+e^2)*(-c^2*x^2+1)^(1/2)/c^3+1/2*b*d*e*x*(-c^2*x^2+1)^(1/2
)/c-1/9*b*e^2*(-c^2*x^2+1)^(3/2)/c^3-1/6*b*d*(2*d^2+3*e^2/c^2)*arcsin(c*x)
/e+1/3*(e*x+d)^3*(a+b*arcsin(c*x))/e
```

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.90

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

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

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

Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.13, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {5242, 497, 25, 676, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5242}$$

$$\frac{(d+ex)^3(a+b\arcsin(cx))}{3e}-\frac{bc\int \frac{(d+ex)^3}{\sqrt{1-c^2x^2}}dx}{3e}$$

$$\Big\downarrow \text{497}$$

$$\frac{(d+ex)^3(a+b\arcsin(cx))}{3e}-\frac{bc\left(-\frac{\int -\frac{(d+ex)\left(3d^2c^2+5dexc^2+2e^2\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)^2}{3c^2}\right)}{3e}$$

$$\Big\downarrow \text{25}$$

$$\frac{(d+ex)^3(a+b\arcsin(cx))}{3e}-\frac{bc\left(\frac{\int \frac{(d+ex)\left(3d^2c^2+5dexc^2+2e^2\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)^2}{3c^2}\right)}{3e}$$

$$\Big\downarrow \text{676}$$

$$\frac{(d+ex)^3(a+b\arcsin(cx))}{3e}-\frac{bc\left(\frac{\frac{3}{2}d(2c^2d^2+3e^2)\int\frac{1}{\sqrt{1-c^2x^2}}dx-\frac{2e\sqrt{1-c^2x^2}\left(4c^2d^2+e^2\right)}{c^2}-\frac{5}{2}de^2x\sqrt{1-c^2x^2}}{3c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)^2}{3c^2}\right)}{3e}$$

$$\Big\downarrow \text{223}$$

$$\frac{(d+ex)^3(a+b\arcsin(cx))}{3e}-\frac{bc\left(\frac{\frac{3d\arcsin(cx)\left(2c^2d^2+3e^2\right)}{2c}-\frac{2e\sqrt{1-c^2x^2}\left(4c^2d^2+e^2\right)}{c^2}-\frac{5}{2}de^2x\sqrt{1-c^2x^2}}{3c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)^2}{3c^2}\right)}{3e}$$

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

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

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 497
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n - 1)*((a + b*x^2)^(p + 1)/(b*(n + 2*p + 1))), x] + Simp[1/(b
*(n + 2*p + 1))   Int[(c + d*x)^(n - 2)*(a + b*x^2)^p*Simp[b*c^2*(n + 2*p +
 1) - a*d^2*(n - 1) + 2*b*c*d*(n + p)*x, x], x], x] /; FreeQ[{a, b, c, d, n
, p}, x] && If[RationalQ[n], GtQ[n, 1], SumSimplerQ[n, -2]] && NeQ[n + 2*p
+ 1, 0] && IntQuadraticQ[a, 0, b, c, d, n, p, x]
```

rule 676
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(e*f + d*g)*((a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + (Sim
p[e*g*x*((a + c*x^2)^(p + 1)/(c*(2*p + 3))), x] - Simp[(a*e*g - c*d*f*(2*p
+ 3))/(c*(2*p + 3))   Int[(a + c*x^2)^p, x], x]) /; FreeQ[{a, c, d, e, f, g
, p}, x] &&  !LeQ[p, -1]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.33

method	result
parts	$\frac{a(ex+d)^3}{3e}+\frac{b\left(\frac{c\,e^2\arcsin(cx)x^3}{3}+ce\arcsin(cx)x^2d+\arcsin(cx)d^2cx+\frac{c\arcsin(cx)d^3}{3e}-\frac{c^3d^3\arcsin(cx)+e^3\left(-\frac{c^2x^2\sqrt{-c^2x}}{3}\right.}{}\right.}{c}$
derivativedivides	$\frac{\frac{a(cxe+cd)^3}{3c^2e}+\frac{b\left(\frac{\arcsin(cx)c^3d^3}{3e}+\arcsin(cx)c^3d^2x+e\arcsin(cx)c^3d\,x^2+\frac{\arcsin(cx)c^3x^3e^2}{3}-\frac{c^3d^3\arcsin(cx)+e^3\left(-\frac{c^2x^2\sqrt{-c^2x^2+}}{3}\right.}{}\right.}{c^2}}{c}$
default	$\frac{\frac{a(cxe+cd)^3}{3c^2e}+\frac{b\left(\frac{\arcsin(cx)c^3d^3}{3e}+\arcsin(cx)c^3d^2x+e\arcsin(cx)c^3d\,x^2+\frac{\arcsin(cx)c^3x^3e^2}{3}-\frac{c^3d^3\arcsin(cx)+e^3\left(-\frac{c^2x^2\sqrt{-c^2x^2+}}{3}\right.}{}\right.}{c^2}}{c}$
orering	$\frac{(10c^4e^3x^4+42c^4d\,e^2x^3+72x^2e\,d^2c^4+18c^4d^3x+4c^2e^3x^2-27c^2d\,e^2x-45e\,c^2d^2-8e^3)(a+b\arcsin(cx))}{18c^4(ex+d)}-\frac{(2c^2e^2x^2+9}{}$

input
```
int((e*x+d)^2*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
1/3*a*(e*x+d)^3/e+b/c*(1/3*c*e^2*arcsin(c*x)*x^3+c*e*arcsin(c*x)*x^2*d+arc
sin(c*x)*d^2*c*x+1/3*c/e*arcsin(c*x)*d^3-1/3/c^2/e*(c^3*d^3*arcsin(c*x)+e^
3*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+3*d*c*e^2*(-1/2
*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))-3*d^2*c^2*e*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.01

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

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

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

Sympy [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.42

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

input
```
integrate((e*x+d)**2*(a+b*asin(c*x)),x)
```

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

Maxima [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.12

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

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

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

Giac [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.45

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

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

output
```
1/3*a*e^2*x^3 + b*d^2*x*arcsin(c*x) + a*d^2*x + 1/3*(c^2*x^2 - 1)*b*e^2*x*
arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b*d*e*x/c + (c^2*x^2 - 1)*b*d*e*a
rcsin(c*x)/c^2 + 1/3*b*e^2*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d^2/c
+ (c^2*x^2 - 1)*a*d*e/c^2 + 1/2*b*d*e*arcsin(c*x)/c^2 - 1/9*(-c^2*x^2 + 1)
^(3/2)*b*e^2/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*e^2/c^3
```

Mupad [F(-1)]

Timed out.

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

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

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

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.30

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

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

output
```
(18*asin(c*x)*b*c**3*d**2*x + 18*asin(c*x)*b*c**3*d*e*x**2 + 6*asin(c*x)*b
*c**3*e**2*x**3 - 9*asin(c*x)*b*c*d*e + 18*sqrt( - c**2*x**2 + 1)*b*c**2*d
**2 + 9*sqrt( - c**2*x**2 + 1)*b*c**2*d*e*x + 2*sqrt( - c**2*x**2 + 1)*b*c
**2*e**2*x**2 + 4*sqrt( - c**2*x**2 + 1)*b*e**2 + 18*a*c**3*d**2*x + 18*a*
c**3*d*e*x**2 + 6*a*c**3*e**2*x**3)/(18*c**3)
```

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

Optimal result

Integrand size = 14, antiderivative size = 92

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

output
```
b*d*(-c^2*x^2+1)^(1/2)/c+1/4*b*e*x*(-c^2*x^2+1)^(1/2)/c-1/4*b*(2*d^2+e^2/c
^2)*arcsin(c*x)/e+1/2*(e*x+d)^2*(a+b*arcsin(c*x))/e
```

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 92, normalized size of antiderivative = 1.00

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

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

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

Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.15, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.357$, Rules used = {5242, 497, 25, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5242}$$

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

$$\Big\downarrow \text{497}$$

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

$$\Big\downarrow \text{25}$$

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

$$\Big\downarrow \text{455}$$

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

$$\Big\downarrow \text{223}$$

$$\frac{(d+ex)^2(a+b\arcsin(cx))}{2e}-\frac{bc\left(\frac{\frac{\arcsin(cx)(2c^2d^2+e^2)}{c}-3de\sqrt{1-c^2x^2}}{2c^2}-\frac{e\sqrt{1-c^2x^2}(d+ex)}{2c^2}\right)}{2e}$$

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

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

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 497
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n - 1)*((a + b*x^2)^(p + 1)/(b*(n + 2*p + 1))), x] + Simp[1/(b
*(n + 2*p + 1))   Int[(c + d*x)^(n - 2)*(a + b*x^2)^p*Simp[b*c^2*(n + 2*p +
 1) - a*d^2*(n - 1) + 2*b*c*d*(n + p)*x, x], x], x] /; FreeQ[{a, b, c, d, n
, p}, x] && If[RationalQ[n], GtQ[n, 1], SumSimplerQ[n, -2]] && NeQ[n + 2*p
+ 1, 0] && IntQuadraticQ[a, 0, b, c, d, n, p, x]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.93

method	result
parts	$a\left(\frac{1}{2}e\,x^{2}+dx\right)+\frac{b\left(\frac{c\arcsin(cx)e\,x^{2}}{2}+\arcsin(cx)cxd-\frac{e\left(-\frac{cx\sqrt{-c^{2}x^{2}+1}}{2}+\frac{\arcsin(cx)}{2}\right)-2dc\sqrt{-c^{2}x^{2}+1}}{2c}\right)}{c}$
derivativedivides	$\frac{\frac{a\left(c^{2}dx+\frac{1}{2}c^{2}e\,x^{2}\right)}{c}+\frac{b\left(\arcsin(cx)d\,c^{2}x+\frac{\arcsin(cx)c^{2}e\,x^{2}}{2}-\frac{e\left(-\frac{cx\sqrt{-c^{2}x^{2}+1}}{2}+\frac{\arcsin(cx)}{2}\right)}{2}+dc\sqrt{-c^{2}x^{2}+1}\right)}{c}}{c}$
default	$\frac{\frac{a\left(c^{2}dx+\frac{1}{2}c^{2}e\,x^{2}\right)}{c}+\frac{b\left(\arcsin(cx)d\,c^{2}x+\frac{\arcsin(cx)c^{2}e\,x^{2}}{2}-\frac{e\left(-\frac{cx\sqrt{-c^{2}x^{2}+1}}{2}+\frac{\arcsin(cx)}{2}\right)}{2}+dc\sqrt{-c^{2}x^{2}+1}\right)}{c}}{c}$
orering	$\frac{(3x^{3}c^{2}e^{2}+10c^{2}d\,x^{2}e+4d^{2}c^{2}x-2e^{2}x-5de)(a+b\arcsin(cx))}{4c^{2}(ex+d)}-\frac{(ex+4d)(cx-1)(cx+1)\left(e(a+b\arcsin(cx))+\frac{(ex+d)bc}{\sqrt{-c^{2}x^{2}+}}\right.}{4c^{2}(ex+d)}$

input
```
int((e*x+d)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/2*e*x^2+d*x)+b/c*(1/2*c*arcsin(c*x)*e*x^2+arcsin(c*x)*c*x*d-1/2/c*(e*
(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))-2*d*c*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.83

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

input
```
integrate((e*x+d)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/4*(2*a*c^2*e*x^2 + 4*a*c^2*d*x + (2*b*c^2*e*x^2 + 4*b*c^2*d*x - b*e)*arc
sin(c*x) + (b*c*e*x + 4*b*c*d)*sqrt(-c^2*x^2 + 1))/c^2
```

Sympy [A] (verification not implemented)

Time = 0.17 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.08

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

input
```
integrate((e*x+d)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d*x + a*e*x**2/2 + b*d*x*asin(c*x) + b*e*x**2*asin(c*x)/2 + b
*d*sqrt(-c**2*x**2 + 1)/c + b*e*x*sqrt(-c**2*x**2 + 1)/(4*c) - b*e*asin(c*
x)/(4*c**2), Ne(c, 0)), (a*(d*x + e*x**2/2), True))
```

Maxima [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.88

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

input
```
integrate((e*x+d)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/2*a*e*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsi
n(c*x)/c^3))*b*e + a*d*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d/c
```

Giac [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.07

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

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

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

Mupad [B] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.84

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

input
```
int((a + b*asin(c*x))*(d + e*x),x)
```

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

Reduce [B] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.98

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

input
```
int((e*x+d)*(a+b*asin(c*x)),x)
```

output
```
(4*asin(c*x)*b*c**2*d*x + 2*asin(c*x)*b*c**2*e*x**2 - asin(c*x)*b*e + 4*sq
rt( - c**2*x**2 + 1)*b*c*d + sqrt( - c**2*x**2 + 1)*b*c*e*x + 4*a*c**2*d*x
 + 2*a*c**2*e*x**2)/(4*c**2)
```

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

Optimal result

Integrand size = 8, antiderivative size = 30

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

output
```
a*x+b*(-c^2*x^2+1)^(1/2)/c+b*x*arcsin(c*x)
```

Mathematica [A] (verified)

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

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

input
```
Integrate[a + b*ArcSin[c*x],x]
```

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

Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \; 2009$$

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

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

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

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

Maple [A] (verified)

Time = 0.02 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00

method	result	size
default	$ax + \frac{b\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	30
parts	$ax + \frac{b\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	30
derivativedivides	$\frac{cxa+b\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$	32
orering	$x(a+b\arcsin(cx)) - \frac{(cx-1)(cx+1)b}{c\sqrt{-c^2x^2+1}}$	40

input
```
int(a+b*arcsin(c*x),x,method=_RETURNVERBOSE)
```

output
```
a*x+b/c*(c*x*arcsin(c*x)+(-c^2*x^2+1)^(1/2))
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.03

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

input
```
integrate(a+b*arcsin(c*x),x, algorithm="fricas")
```

output
```
(b*c*x*arcsin(c*x) + a*c*x + sqrt(-c^2*x^2 + 1)*b)/c
```

Sympy [A] (verification not implemented)

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

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

input
```
integrate(a+b*asin(c*x),x)
```

output
```
a*x + b*Piecewise((x*asin(c*x) + sqrt(-c**2*x**2 + 1)/c, Ne(c, 0)), (0, Tr
ue))
```

Maxima [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.97

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

input
```
integrate(a+b*arcsin(c*x),x, algorithm="maxima")
```

output
```
a*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b/c
```

Giac [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.97

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

input
```
integrate(a+b*arcsin(c*x),x, algorithm="giac")
```

output
```
a*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b/c
```

Mupad [B] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.93

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

input
```
int(a + b*asin(c*x),x)
```

output
```
a*x + (b*(1 - c^2*x^2)^(1/2))/c + b*x*asin(c*x)
```

Reduce [B] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00

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

input
```
int(a+b*asin(c*x),x)
```

output
```
(asin(c*x)*b*c*x + sqrt( - c**2*x**2 + 1)*b + a*c*x)/c
```

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

Optimal result

Integrand size = 16, antiderivative size = 229

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

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

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 214, normalized size of antiderivative = 0.93

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

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

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

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {5240, 5030, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{ 5240}$$

$$\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cd+cex}\,d\arcsin(cx)$$

$$\Big\downarrow \text{ 5030}$$

$$\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}}\,d\arcsin(cx)+\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}}\,d\arcsin(cx)-\frac{i(a+b\arcsin(cx))^2}{2be}$$

$$\Big\downarrow \text{2620}$$

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

$$\Big\downarrow \text{2715}$$

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

$$\Big\downarrow \text{2838}$$

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

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

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

Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Maple [B] (verified)

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

Time = 1.56 (sec) , antiderivative size = 758, normalized size of antiderivative = 3.31

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

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

output
```
a/e*ln(e*x+d)+b/c*(-1/2*I*arcsin(c*x)^2*c/e+1/e*c^3*arcsin(c*x)/(c^2*d^2-e
^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-
c^2*d^2+e^2)^(1/2)))*d^2+1/e*c^3*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*
x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2))
)*d^2-e*c*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e
+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-e*c*arcsin(c*x)/(c^2*
d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d
*c-(-c^2*d^2+e^2)^(1/2)))-I/e*c^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*
x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-I/
e*c^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^
2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+I*e*c/(c^2*d^2-e^2)*dilog((I*d
*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2
)^(1/2)))+I*e*c/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-
c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2))))
```

Fricas [F]

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

input
```
integrate((a+b*arcsin(c*x))/(e*x+d),x, algorithm="fricas")
```

output
```
integral((b*arcsin(c*x) + a)/(e*x + d), x)
```

Sympy [F]

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

input
```
integrate((a+b*asin(c*x))/(e*x+d),x)
```

output
```
Integral((a + b*asin(c*x))/(d + e*x), x)
```

Maxima [F]

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

input
```
integrate((a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxima")
```

output
```
b*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x) + a*l
og(e*x + d)/e
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{d+ex}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))/(d + e*x),x)
```

output
```
int((a + b*asin(c*x))/(d + e*x), x)
```

Reduce [F]

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

input
```
int((a+b*asin(c*x))/(e*x+d),x)
```

output
```
(int(asin(c*x)/(d + e*x),x)*b*e + log(d + e*x)*a)/e
```

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

Optimal result

Integrand size = 16, antiderivative size = 85

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

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

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.98

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

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

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

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {5242, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{ 5242}$$

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

$$\Big\downarrow \text{ 488}$$

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

$$\Big\downarrow \text{ 217}$$

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

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

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

Defintions of rubi rules used

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 186 vs. $2(79) = 158$.

Time = 2.03 (sec) , antiderivative size = 187, normalized size of antiderivative = 2.20

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

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

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

Fricas [B] (verification not implemented)

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

Time = 0.14 (sec) , antiderivative size = 371, normalized size of antiderivative = 4.36

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

$$= \left[-\frac{2\,ac^2d^2-2\,ae^2+\sqrt{-c^2d^2+e^2}(bcex+bcd)\log\left(\frac{2\,c^2dex-c^2d^2+(2\,c^4d^2-c^2e^2)x^2-2\,\sqrt{-c^2d^2+e^2}\,(c^2dx+e)\,\sqrt{-c^2x^2+1}+}{e^2x^2+2\,dex+d^2}\right.}{2\,(c^2d^3e-de^3+(c^2d^2e^2-e^4)x)}\right.$$

$$\left.-\frac{ac^2d^2-ae^2-\sqrt{c^2d^2-e^2}(bcex+bcd)\arctan\left(\frac{\sqrt{c^2d^2-e^2}\,(c^2dx+e)\sqrt{-c^2x^2+1}}{c^2d^2-(c^4d^2-c^2e^2)x^2-e^2}\right)+(bc^2d^2-be^2)\arcsin(cx)}{c^2d^3e-de^3+(c^2d^2e^2-e^4)x}\right]$$

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

output
```
[-1/2*(2*a*c^2*d^2 - 2*a*e^2 + sqrt(-c^2*d^2 + e^2)*(b*c*e*x + b*c*d)*log(
(2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 - 2*sqrt(-c^2*d^2 + e^2
)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 2
*(b*c^2*d^2 - b*e^2)*arcsin(c*x))/(c^2*d^3*e - d*e^3 + (c^2*d^2*e^2 - e^4)
*x), -(a*c^2*d^2 - a*e^2 - sqrt(c^2*d^2 - e^2)*(b*c*e*x + b*c*d)*arctan(sq
rt(c^2*d^2 - e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c
^2*e^2)*x^2 - e^2)) + (b*c^2*d^2 - b*e^2)*arcsin(c*x))/(c^2*d^3*e - d*e^3
+ (c^2*d^2*e^2 - e^4)*x)]
```

Sympy [F]

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

input
```
integrate((a+b*asin(c*x))/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^2} \, dx = \text{Exception raised: ValueError}$$

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

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 200 vs. $2(79) = 158$.

Time = 0.14 (sec) , antiderivative size = 200, normalized size of antiderivative = 2.35

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^2}\,dx = -\frac{be^2\left(\frac{2c^2\arctan\left(\frac{\frac{cde\left(\sqrt{-\frac{(ex+d)^2\left(c-\frac{cd}{ex+d}\right)^2}{e^2}+1}-1\right)}{(ex+d)\left(c-\frac{cd}{ex+d}\right)}-e}{\sqrt{c^2d^2-e^2}}\right)}{\sqrt{c^2d^2-e^2}\,e^3}+\frac{c^2\arcsin\left(-\frac{c\left(d-\frac{\frac{(ex+d)\left(c-\frac{cd}{ex+d}\right)e}{c}+de}{e}\right)}{e}\right)}{\left((ex+d)\left(c-\frac{cd}{ex+d}\right)+cd\right)e^3}\right)}{c} - \frac{a}{(ex+d)e}$$

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

output
```
-b*e^2*(2*c^2*arctan((c*d*e*(sqrt(-(e*x + d)^2*(c - c*d/(e*x + d))^2/e^2 +
 1) - 1)/((e*x + d)*(c - c*d/(e*x + d))) - e)/sqrt(c^2*d^2 - e^2))/(sqrt(c
^2*d^2 - e^2)*e^3) + c^2*arcsin(-c*(d - ((e*x + d)*(c - c*d/(e*x + d))*e/c
 + d*e)/e)/e)/(((e*x + d)*(c - c*d/(e*x + d)) + c*d)*e^3))/c - a/((e*x + d
)*e)
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))/(d + e*x)^2,x)
```

output
```
int((a + b*asin(c*x))/(d + e*x)^2, x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^2}\,dx = \frac{\left(\int \frac{asin(cx)}{e^2x^2+2dex+d^2}dx\right)b\,d^2+\left(\int \frac{asin(cx)}{e^2x^2+2dex+d^2}dx\right)bdex+ax}{d\,(ex+d)}$$

input
```
int((a+b*asin(c*x))/(e*x+d)^2,x)
```

output
```
(int(asin(c*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b*d**2 + int(asin(c*x)/(d**
2 + 2*d*e*x + e**2*x**2),x)*b*d*e*x + a*x)/(d*(d + e*x))
```

3.7 $\int \frac{a+b\arcsin(cx)}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 135

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

output
```
1/2*b*c*(-c^2*x^2+1)^(1/2)/(c^2*d^2-e^2)/(e*x+d)-1/2*(a+b*arcsin(c*x))/e/(
e*x+d)^2+1/2*b*c^3*d*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(
1/2))/e/(c^2*d^2-e^2)^(3/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.23 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.53

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

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

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

Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.99, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {5242, 491, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5242}$$

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

$$\Big\downarrow \text{491}$$

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

$$\Big\downarrow \text{488}$$

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

$$\Big\downarrow \text{217}$$

$$\frac{bc\left(\frac{c^2d\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)}{(c^2d^2-e^2)^{3/2}}+\frac{e\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}\right)}{2e}-\frac{a+b\arcsin(cx)}{2e(d+ex)^2}$$

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

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

Defintions of rubi rules used

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 491
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n + 1)*((a + b*x^2)^(p + 1)/((n + 1)*(b*c^2 + a*d^2))), x] + S
imp[b*(c/(b*c^2 + a*d^2))   Int[(c + d*x)^(n + 1)*(a + b*x^2)^p, x], x] /;
FreeQ[{a, b, c, d, n, p}, x] && EqQ[n + 2*p + 3, 0]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 294 vs. $2(121) = 242$.

Time = 0.59 (sec) , antiderivative size = 295, normalized size of antiderivative = 2.19

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

input
```
int((a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
-1/2*a/(e*x+d)^2/e-1/2*b*c^2/(c*e*x+c*d)^2/e*arcsin(c*x)+1/2*b*c^2/e/(c^2*
d^2-e^2)/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2
)^(1/2)-1/2*b*c^3/e^2*d/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c
^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*
c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 322 vs. $2(121) = 242$.

Time = 0.22 (sec) , antiderivative size = 673, normalized size of antiderivative = 4.99

$$\int \frac{a + b\arcsin(cx)}{(d + ex)^3}\, dx$$
$$= \left[-\frac{2\, ac^4d^4 - 4\, ac^2d^2e^2 + 2\, ae^4 - (bc^3de^2x^2 + 2\, bc^3d^2ex + bc^3d^3)\sqrt{-c^2d^2 + e^2}\log\left(\frac{2\, c^2dex - c^2d^2 + (2\, c^4d^2 - c^2e^2)}{}\right.}{4\, (c^4d^6e - 2\, c^2d^4e^3 + d^2e^5 + (} \right.$$
$$-\frac{ac^4d^4 - 2\, ac^2d^2e^2 + ae^4 - (bc^3de^2x^2 + 2\, bc^3d^2ex + bc^3d^3)\sqrt{c^2d^2 - e^2}\arctan\left(\frac{\sqrt{c^2d^2 - e^2}\,(c^2dx + e)\sqrt{-c^2x^2 + 1}}{c^2d^2 - (c^4d^2 - c^2e^2)x^2 - e^2}\right.}{2\, (c^4d^6e - 2\, c^2d^4e^3 + d^2e^5 + (c^4d^4e^3 - 2\, c^2d^2e^5 -}$$

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

output
```
[-1/4*(2*a*c^4*d^4 - 4*a*c^2*d^2*e^2 + 2*a*e^4 - (b*c^3*d*e^2*x^2 + 2*b*c^
3*d^2*e*x + b*c^3*d^3)*sqrt(-c^2*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (
2*c^4*d^2 - c^2*e^2)*x^2 + 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*
x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 2*(b*c^4*d^4 - 2*b*c^2*d^2*
e^2 + b*e^4)*arcsin(c*x) - 2*(b*c^3*d^3*e - b*c*d*e^3 + (b*c^3*d^2*e^2 - b
*c*e^4)*x)*sqrt(-c^2*x^2 + 1))/(c^4*d^6*e - 2*c^2*d^4*e^3 + d^2*e^5 + (c^4
*d^4*e^3 - 2*c^2*d^2*e^5 + e^7)*x^2 + 2*(c^4*d^5*e^2 - 2*c^2*d^3*e^4 + d*e
^6)*x), -1/2*(a*c^4*d^4 - 2*a*c^2*d^2*e^2 + a*e^4 - (b*c^3*d*e^2*x^2 + 2*b
*c^3*d^2*e*x + b*c^3*d^3)*sqrt(c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 - e^2)*(
c^2*d*x + e)*sqrt(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2))
 + (b*c^4*d^4 - 2*b*c^2*d^2*e^2 + b*e^4)*arcsin(c*x) - (b*c^3*d^3*e - b*c*
d*e^3 + (b*c^3*d^2*e^2 - b*c*e^4)*x)*sqrt(-c^2*x^2 + 1))/(c^4*d^6*e - 2*c^
2*d^4*e^3 + d^2*e^5 + (c^4*d^4*e^3 - 2*c^2*d^2*e^5 + e^7)*x^2 + 2*(c^4*d^5
*e^2 - 2*c^2*d^3*e^4 + d*e^6)*x)]
```

Sympy [F]

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^3} \, dx = \int \frac{a + b \operatorname{asin}(cx)}{(d + ex)^3} \, dx$$

input
```
integrate((a+b*asin(c*x))/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^3} \, dx = \text{Exception raised: ValueError}$$

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

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^3}\,dx = \text{Exception raised: RuntimeError}$$

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

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))/(d + e*x)^3,x)
```

output
```
int((a + b*asin(c*x))/(d + e*x)^3, x)
```

Reduce [F]

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

input
```
int((a+b*asin(c*x))/(e*x+d)^3,x)
```

output
```
(2*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*d**2
*e + 4*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*
d*e**2*x + 2*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3)
,x)*b*e**3*x**2 - a)/(2*e*(d**2 + 2*d*e*x + e**2*x**2))
```

3.8 $\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 191

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

output
```
1/6*b*c*(-c^2*x^2+1)^(1/2)/(c^2*d^2-e^2)/(e*x+d)^2+1/2*b*c^3*d*(-c^2*x^2+1
)^(1/2)/(c^2*d^2-e^2)^2/(e*x+d)-1/3*(a+b*arcsin(c*x))/e/(e*x+d)^3+1/6*b*c^
3*(2*c^2*d^2+e^2)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2
))/e/(c^2*d^2-e^2)^(5/2)
```

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 241, normalized size of antiderivative = 1.26

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx = \frac{1}{6}\left(-\frac{2a}{e(d+ex)^3}+\frac{b\sqrt{1-c^2x^2}(-ce^2+c^3d(4d+3ex))}{(-c^2d^2+e^2)^2(d+ex)^2} - \frac{2b\arcsin(cx)}{e(d+ex)^3}+\frac{bc^3(2c^2d^2+e^2)\log(d+ex)}{e(-cd+e)^2(cd+e)^2\sqrt{-c^2d^2+e^2}} - \frac{bc^3(2c^2d^2+e^2)\log\left(e+c^2dx+\sqrt{-c^2d^2+e^2}\sqrt{1-c^2x^2}\right)}{e(-cd+e)^2(cd+e)^2\sqrt{-c^2d^2+e^2}}\right)$$

input
```
Integrate[(a + b*ArcSin[c*x])/(d + e*x)^4,x]
```

output
```
((-2*a)/(e*(d + e*x)^3) + (b*Sqrt[1 - c^2*x^2]*(-(c*e^2) + c^3*d*(4*d + 3*
e*x)))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (2*b*ArcSin[c*x])/(e*(d + e*x)
^3) + (b*c^3*(2*c^2*d^2 + e^2)*Log[d + e*x])/(e*(-(c*d) + e)^2*(c*d + e)^2
*Sqrt[-(c^2*d^2) + e^2]) - (b*c^3*(2*c^2*d^2 + e^2)*Log[e + c^2*d*x + Sqrt
[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/(e*(-(c*d) + e)^2*(c*d + e)^2*Sqrt[
-(c^2*d^2) + e^2]))/6
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.09, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {5242, 498, 25, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx$$

$$\Big\downarrow \; 5242$$

$$\frac{bc\int \frac{1}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3e} - \frac{a+b\arcsin(cx)}{3e(d+ex)^3}$$

$$\Big\downarrow \; 498$$

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

$\big\downarrow$ 25

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

$\big\downarrow$ 679

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

$\big\downarrow$ 488

$$\frac{bc\left(\frac{c^2\left(\frac{3de\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{(2c^2d^2+e^2)\int \frac{1}{-c^2d^2+e^2-\frac{(dxc^2+e)^2}{1-c^2x^2}}d\frac{dxc^2+e}{\sqrt{1-c^2x^2}}}{c^2d^2-e^2}\right)}{2(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}}{2(c^2d^2-e^2)(d+ex)^2}\right)}{3e}-\frac{a+b\arcsin(cx)}{3e(d+ex)^3}$$

$\big\downarrow$ 217

$$\frac{bc\left(\frac{c^2\left(\frac{(2c^2d^2+e^2)\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)}{(c^2d^2-e^2)^{3/2}}+\frac{3de\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}\right)}{2(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}}{2(c^2d^2-e^2)(d+ex)^2}\right)}{3e}-\frac{a+b\arcsin(cx)}{3e(d+ex)^3}$$

input
```
Int[(a + b*ArcSin[c*x])/(d + e*x)^4,x]
```

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

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 498
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n + 1)*((a + b*x^2)^(p + 1)/((n + 1)*(b*c^2 + a*d^2))), x] + S
imp[b/((n + 1)*(b*c^2 + a*d^2))   Int[(c + d*x)^(n + 1)*(a + b*x^2)^p*(c*(n
 + 1) - d*(n + 2*p + 3)*x), x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[n
, -1] && ((LtQ[n, -1] && IntQuadraticQ[a, 0, b, c, d, n, p, x]) || (SumSimp
lerQ[n, 1] && IntegerQ[p]) || ILtQ[Simplify[n + 2*p + 3], 0])
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 553 vs. $2(173) = 346$.

Time = 0.37 (sec) , antiderivative size = 554, normalized size of antiderivative = 2.90

method	result
parts	$-\frac{a}{3(ex+d)^3 e}-\frac{b c^3 \arcsin(cx)}{3(cxe+cd)^3 e}+\frac{b c^3 \sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{6e^2(c^2d^2-e^2)\left(cx+\frac{dc}{e}\right)^2}+\frac{b c^4 d \sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}}}{2e(c^2d^2-e^2)^2\left(cx+\frac{dc}{e}\right.}$
derivativedivides	$\frac{-\frac{a c^4}{3(cxe+cd)^3 e}-\frac{b c^4 \arcsin(cx)}{3(cxe+cd)^3 e}+\frac{b c^4 \sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{6e^2\left(c^2d^2-e^2\right)\left(cx+\frac{dc}{e}\right)^2}+\frac{b c^5 d \sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{2e\left(c^2d^2-e^2\right)^2\left(cx+\frac{dc}{e}\right)}}{}$
default	$\frac{-\frac{a c^4}{3(cxe+cd)^3 e}-\frac{b c^4 \arcsin(cx)}{3(cxe+cd)^3 e}+\frac{b c^4 \sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{6e^2\left(c^2d^2-e^2\right)\left(cx+\frac{dc}{e}\right)^2}+\frac{b c^5 d \sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}-\frac{c^2d^2-e^2}{e^2}}}{2e\left(c^2d^2-e^2\right)^2\left(cx+\frac{dc}{e}\right)}}{}$

input
```
int((a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
-1/3*a/(e*x+d)^3/e-1/3*b*c^3/(c*e*x+c*d)^3/e*arcsin(c*x)+1/6*b*c^3/e^2/(c^
2*d^2-e^2)/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)
/e^2)^(1/2)+1/2*b*c^4/e*d/(c^2*d^2-e^2)^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*
c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-1/2*b*c^5/e^2*d^2/(c^2*d^2-e^2)^2
/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2
*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e
^2)/e^2)^(1/2))/(c*x+d*c/e))+1/6*b*c^3/e^2/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e
^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e
^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c
*x+d*c/e))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 550 vs. $2(173) = 346$.

Time = 0.82 (sec) , antiderivative size = 1125, normalized size of antiderivative = 5.89

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^4} \, dx = \text{Too large to display}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fricas")
```

output
```
[-1/12*(4*a*c^6*d^6 - 12*a*c^4*d^4*e^2 + 12*a*c^2*d^2*e^4 - 4*a*e^6 + (2*b
*c^5*d^5 + b*c^3*d^3*e^2 + (2*b*c^5*d^2*e^3 + b*c^3*e^5)*x^3 + 3*(2*b*c^5*
d^3*e^2 + b*c^3*d*e^4)*x^2 + 3*(2*b*c^5*d^4*e + b*c^3*d^2*e^3)*x)*sqrt(-c^
2*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 - 2*sq
rt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*
d*e*x + d^2)) + 4*(b*c^6*d^6 - 3*b*c^4*d^4*e^2 + 3*b*c^2*d^2*e^4 - b*e^6)*
arcsin(c*x) - 2*(4*b*c^5*d^5*e - 5*b*c^3*d^3*e^3 + b*c*d*e^5 + 3*(b*c^5*d^
3*e^3 - b*c^3*d*e^5)*x^2 + (7*b*c^5*d^4*e^2 - 8*b*c^3*d^2*e^4 + b*c*e^6)*x
)*sqrt(-c^2*x^2 + 1))/(c^6*d^9*e - 3*c^4*d^7*e^3 + 3*c^2*d^5*e^5 - d^3*e^7
 + (c^6*d^6*e^4 - 3*c^4*d^4*e^6 + 3*c^2*d^2*e^8 - e^10)*x^3 + 3*(c^6*d^7*e
^3 - 3*c^4*d^5*e^5 + 3*c^2*d^3*e^7 - d*e^9)*x^2 + 3*(c^6*d^8*e^2 - 3*c^4*d
^6*e^4 + 3*c^2*d^4*e^6 - d^2*e^8)*x), -1/6*(2*a*c^6*d^6 - 6*a*c^4*d^4*e^2
+ 6*a*c^2*d^2*e^4 - 2*a*e^6 - (2*b*c^5*d^5 + b*c^3*d^3*e^2 + (2*b*c^5*d^2*
e^3 + b*c^3*e^5)*x^3 + 3*(2*b*c^5*d^3*e^2 + b*c^3*d*e^4)*x^2 + 3*(2*b*c^5*
d^4*e + b*c^3*d^2*e^3)*x)*sqrt(c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 - e^2)*(
c^2*d*x + e)*sqrt(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2))
 + 2*(b*c^6*d^6 - 3*b*c^4*d^4*e^2 + 3*b*c^2*d^2*e^4 - b*e^6)*arcsin(c*x) -
 (4*b*c^5*d^5*e - 5*b*c^3*d^3*e^3 + b*c*d*e^5 + 3*(b*c^5*d^3*e^3 - b*c^3*d
*e^5)*x^2 + (7*b*c^5*d^4*e^2 - 8*b*c^3*d^2*e^4 + b*c*e^6)*x)*sqrt(-c^2*x^2
 + 1))/(c^6*d^9*e - 3*c^4*d^7*e^3 + 3*c^2*d^5*e^5 - d^3*e^7 + (c^6*d^6*...
```

Sympy [F]

$$\int \frac{a + b \arcsin(cx)}{(d + ex)^4} \, dx = \int \frac{a + b \operatorname{asin}(cx)}{(d + ex)^4} \, dx$$

input
```
integrate((a+b*asin(c*x))/(e*x+d)**4,x)
```

output
```
Integral((a + b*asin(c*x))/(d + e*x)**4, x)
```

Maxima [F]

$$\int \frac{a + b\arcsin(cx)}{(d + ex)^4}\, dx = \int \frac{b\arcsin\left(cx\right) + a}{\left(ex + d\right)^4}\, dx$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="maxima")
```

output
```
-1/3*(3*(c*e^4*x^3 + 3*c*d*e^3*x^2 + 3*c*d^2*e^2*x + c*d^3*e)*integrate(1/
3*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))/(c^4*e^4*x^7 + 3*c^4*d*e^3*x^6
- 3*c^2*d^2*e^2*x^3 - c^2*d^3*e*x^2 + (3*c^4*d^2*e^2 - c^2*e^4)*x^5 + (c^4
*d^3*e - 3*c^2*d*e^3)*x^4 + (c^2*e^4*x^5 + 3*c^2*d*e^3*x^4 - 3*d^2*e^2*x -
 d^3*e + (3*c^2*d^2*e^2 - e^4)*x^3 + (c^2*d^3*e - 3*d*e^3)*x^2)*e^(log(c*x
 + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))*
b/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e) - 1/3*a/(e^4*x^3 + 3*d*e^3
*x^2 + 3*d^2*e^2*x + d^3*e)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a + b\arcsin(cx)}{(d + ex)^4}\, dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))/(d + e*x)^4,x)
```

output
```
int((a + b*asin(c*x))/(d + e*x)^4, x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx = \frac{3\left(\int \frac{asin(cx)}{e^4x^4+4d\,e^3x^3+6d^2e^2x^2+4d^3ex+d^4}dx\right)b\,d^3e+9\left(\int \frac{asin(cx)}{e^4x^4+4d\,e^3x^3+6d^2e^2x^2+4d^3ex+d^4}dx\right)b\,d^2e^2x+9\left(\int \frac{}{e^4x^4+4d\,e^3x^3}\right.}{3e\left(e^3x^3+3d\,e^2x^2+3d^2ex+\right.}$$

input
```
int((a+b*asin(c*x))/(e*x+d)^4,x)
```

output
```
(3*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e
**4*x**4),x)*b*d**3*e + 9*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x
**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**2*e**2*x + 9*int(asin(c*x)/(d**4
+ 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d*e**3*x
**2 + 3*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**
3 + e**4*x**4),x)*b*e**4*x**3 - a)/(3*e*(d**3 + 3*d**2*e*x + 3*d*e**2*x**2
 + e**3*x**3))
```

3.9 $\int (d+ex)^3(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 18, antiderivative size = 374

$$\begin{aligned}\int (d+ex)^3(a+b\arcsin(cx))^2\,dx &= -2b^2d^3x-\frac{4b^2de^2x}{3c^2}-\frac{3}{4}b^2d^2ex^2-\frac{3b^2e^3x^2}{32c^2}-\frac{2}{9}b^2de^2x^3\\
&\quad-\frac{1}{32}b^2e^3x^4+\frac{2bd^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\\
&\quad+\frac{4bde^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3}\\
&\quad+\frac{3bd^2ex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}\\
&\quad+\frac{3be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}\\
&\quad+\frac{2bde^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c}\\
&\quad+\frac{be^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}\\
&\quad-\frac{d^4(a+b\arcsin(cx))^2}{4e}-\frac{3d^2e(a+b\arcsin(cx))^2}{4c^2}\\
&\quad-\frac{3e^3(a+b\arcsin(cx))^2}{32c^4}\\
&\quad+\frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e}\end{aligned}$$

output
```
-2*b^2*d^3*x-4/3*b^2*d*e^2*x/c^2-3/4*b^2*d^2*e*x^2-3/32*b^2*e^3*x^2/c^2-2/
9*b^2*d*e^2*x^3-1/32*b^2*e^3*x^4+2*b*d^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*
x))/c+4/3*b*d*e^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c^3+3/2*b*d^2*e*x*(
-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+3/16*b*e^3*x*(-c^2*x^2+1)^(1/2)*(a+b
*arcsin(c*x))/c^3+2/3*b*d*e^2*x^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+1
/8*b*e^3*x^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c-1/4*d^4*(a+b*arcsin(c*
x))^2/e-3/4*d^2*e*(a+b*arcsin(c*x))^2/c^2-3/32*e^3*(a+b*arcsin(c*x))^2/c^4
+1/4*(e*x+d)^4*(a+b*arcsin(c*x))^2/e
```

Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 355, normalized size of antiderivative = 0.95

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

input
```
Integrate[(d + e*x)^3*(a + b*ArcSin[c*x])^2,x]
```

output
```
(c*(72*a^2*c^3*x*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^3*x^3) + 6*a*b*Sqrt[
1 - c^2*x^2]*(e^2*(64*d + 9*e*x) + c^2*(96*d^3 + 72*d^2*e*x + 32*d*e^2*x^2
 + 6*e^3*x^3)) - b^2*c*x*(3*e^2*(128*d + 9*e*x) + c^2*(576*d^3 + 216*d^2*e
*x + 64*d*e^2*x^2 + 9*e^3*x^3))) + 6*b*(3*a*(-24*c^2*d^2*e - 3*e^3 + 8*c^4
*x*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^3*x^3)) + b*c*Sqrt[1 - c^2*x^2]*(e
^2*(64*d + 9*e*x) + c^2*(96*d^3 + 72*d^2*e*x + 32*d*e^2*x^2 + 6*e^3*x^3)))
*ArcSin[c*x] + 9*b^2*(-24*c^2*d^2*e - 3*e^3 + 8*c^4*x*(4*d^3 + 6*d^2*e*x +
 4*d*e^2*x^2 + e^3*x^3))*ArcSin[c*x]^2)/(288*c^4)
```

Rubi [A] (verified)

Time = 1.10 (sec) , antiderivative size = 393, normalized size of antiderivative = 1.05, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {5242, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \; 5242$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e}-\frac{bc\int \frac{(d+ex)^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{2e}$$

$$\Big\downarrow \; 5262$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e}-$$
$$\frac{bc\int \left(\frac{(a+b\arcsin(cx))d^4}{\sqrt{1-c^2x^2}}+\frac{4ex(a+b\arcsin(cx))d^3}{\sqrt{1-c^2x^2}}+\frac{6e^2x^2(a+b\arcsin(cx))d^2}{\sqrt{1-c^2x^2}}+\frac{4e^3x^3(a+b\arcsin(cx))d}{\sqrt{1-c^2x^2}}+\frac{e^4x^4(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{2e}$$

$$\Big\downarrow \; 2009$$

$$\frac{(d+ex)^4(a+b\arcsin(cx))^2}{4e}-$$
$$bc\left(\frac{3e^4(a+b\arcsin(cx))^2}{16bc^5}+\frac{3d^2e^2(a+b\arcsin(cx))^2}{2bc^3}-\frac{4d^3e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}-\frac{3d^2e^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}-\frac{4de^3x^2\sqrt{1-c}\right.$$

input
```
Int[(d + e*x)^3*(a + b*ArcSin[c*x])^2,x]
```

output
```
((d + e*x)^4*(a + b*ArcSin[c*x])^2)/(4*e) - (b*c*((4*b*d^3*e*x)/c + (8*b*d
*e^3*x)/(3*c^3) + (3*b*d^2*e^2*x^2)/(2*c) + (3*b*e^4*x^2)/(16*c^3) + (4*b*
d*e^3*x^3)/(9*c) + (b*e^4*x^4)/(16*c) - (4*d^3*e*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/c^2 - (8*d*e^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^4
) - (3*d^2*e^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^2 - (3*e^4*x*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c^4) - (4*d*e^3*x^2*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/(3*c^2) - (e^4*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]))/(4*c^2) + (d^4*(a + b*ArcSin[c*x])^2)/(2*b*c) + (3*d^2*e^2*(a + b*
ArcSin[c*x])^2)/(2*b*c^3) + (3*e^4*(a + b*ArcSin[c*x])^2)/(16*b*c^5)))/(2*
e)
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [A] (verified)

Time = 1.45 (sec) , antiderivative size = 541, normalized size of antiderivative = 1.45

method	result
derivativedivides	$\frac{\frac{a^2(cxe+cd)^4}{4c^3e}+\frac{b^2\left(c^3d^3\left(\arcsin(cx)^2cx-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{3e\,c^2d^2\left(2\arcsin(cx)^2x^2c^2+2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx-a\right.}{4}$
default	$\frac{\frac{a^2(cxe+cd)^4}{4c^3e}+\frac{b^2\left(c^3d^3\left(\arcsin(cx)^2cx-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{3e\,c^2d^2\left(2\arcsin(cx)^2x^2c^2+2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx-a\right.}{4}$
orering	$\frac{(111c^4e^5x^6+699e^4c^4x^5d+1928x^4e^3d^2c^4+3480e^2c^4x^3d^3+672c^4d^4e\,x^2+63c^2e^5x^4+192c^4d^5x+1079c^2d\,e^4x^3-1632x^2}{192(ex+d)^2c^4}$
parts	$\frac{a^2(ex+d)^4}{4e}+\frac{b^2\left(288\arcsin(cx)^2c^4x^4e^3+1152\arcsin(cx)^2c^4x^3d\,e^2+1728\arcsin(cx)^2c^4x^2d^2e+1152\arcsin(cx)^2c^4x\right.}{}$

input
```
int((e*x+d)^3*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(1/4*a^2/c^3*(c*e*x+c*d)^4/e+b^2/c^3*(c^3*d^3*(arcsin(c*x)^2*c*x-2*c*x
+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+3/4*e*c^2*d^2*(2*arcsin(c*x)^2*x^2*c^2+
2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-arcsin(c*x)^2-c^2*x^2)+1/9*c*d*e^2*(9
*arcsin(c*x)^2*c^3*x^3+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*c^3*x^3+
12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)+1/128*e^3*(32*arcsin(c*x)^2*x^4*
c^4+16*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^3*c^3-4*c^4*x^4+24*arcsin(c*x)*(-c
^2*x^2+1)^(1/2)*c*x-12*arcsin(c*x)^2-12*c^2*x^2-9))+2*a*b/c^3*(1/4/e*arcsi
n(c*x)*c^4*d^4+arcsin(c*x)*c^4*d^3*x+3/2*e*arcsin(c*x)*c^4*d^2*x^2+e^2*arc
sin(c*x)*c^4*d*x^3+1/4*arcsin(c*x)*e^3*c^4*x^4-1/4/e*(c^4*d^4*arcsin(c*x)+
e^4*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin
(c*x))+4*d*c*e^3*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+
6*c^2*d^2*e^2*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))-4*c^3*d^3*e*(-
c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 446, normalized size of antiderivative = 1.19

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx$$
$$= \frac{9\,(8\,a^2-b^2)c^4e^3x^4+32\,(9\,a^2-2\,b^2)c^4de^2x^3+27\,(8\,(2\,a^2-b^2)c^4d^2e-b^2c^2e^3)x^2+9\,(8\,b^2c^4e^3x^4+32\,b^2c}{}$$

input
```
integrate((e*x+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
1/288*(9*(8*a^2 - b^2)*c^4*e^3*x^4 + 32*(9*a^2 - 2*b^2)*c^4*d*e^2*x^3 + 27
*(8*(2*a^2 - b^2)*c^4*d^2*e - b^2*c^2*e^3)*x^2 + 9*(8*b^2*c^4*e^3*x^4 + 32
*b^2*c^4*d*e^2*x^3 + 48*b^2*c^4*d^2*e*x^2 + 32*b^2*c^4*d^3*x - 24*b^2*c^2*
d^2*e - 3*b^2*e^3)*arcsin(c*x)^2 + 96*(3*(a^2 - 2*b^2)*c^4*d^3 - 4*b^2*c^2
*d*e^2)*x + 18*(8*a*b*c^4*e^3*x^4 + 32*a*b*c^4*d*e^2*x^3 + 48*a*b*c^4*d^2*
e*x^2 + 32*a*b*c^4*d^3*x - 24*a*b*c^2*d^2*e - 3*a*b*e^3)*arcsin(c*x) + 6*(
6*a*b*c^3*e^3*x^3 + 32*a*b*c^3*d*e^2*x^2 + 96*a*b*c^3*d^3 + 64*a*b*c*d*e^2
 + 9*(8*a*b*c^3*d^2*e + a*b*c*e^3)*x + (6*b^2*c^3*e^3*x^3 + 32*b^2*c^3*d*e
^2*x^2 + 96*b^2*c^3*d^3 + 64*b^2*c*d*e^2 + 9*(8*b^2*c^3*d^2*e + b^2*c*e^3)
*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 743 vs. $2(364) = 728$.

Time = 0.47 (sec) , antiderivative size = 743, normalized size of antiderivative = 1.99

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)**3*(a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*d**3*x + 3*a**2*d**2*e*x**2/2 + a**2*d*e**2*x**3 + a**2*e*
*3*x**4/4 + 2*a*b*d**3*x*asin(c*x) + 3*a*b*d**2*e*x**2*asin(c*x) + 2*a*b*d
*e**2*x**3*asin(c*x) + a*b*e**3*x**4*asin(c*x)/2 + 2*a*b*d**3*sqrt(-c**2*x
**2 + 1)/c + 3*a*b*d**2*e*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*a*b*d*e**2*x**2
*sqrt(-c**2*x**2 + 1)/(3*c) + a*b*e**3*x**3*sqrt(-c**2*x**2 + 1)/(8*c) - 3
*a*b*d**2*e*asin(c*x)/(2*c**2) + 4*a*b*d*e**2*sqrt(-c**2*x**2 + 1)/(3*c**3
) + 3*a*b*e**3*x*sqrt(-c**2*x**2 + 1)/(16*c**3) - 3*a*b*e**3*asin(c*x)/(16
*c**4) + b**2*d**3*x*asin(c*x)**2 - 2*b**2*d**3*x + 3*b**2*d**2*e*x**2*asi
n(c*x)**2/2 - 3*b**2*d**2*e*x**2/4 + b**2*d*e**2*x**3*asin(c*x)**2 - 2*b**
2*d*e**2*x**3/9 + b**2*e**3*x**4*asin(c*x)**2/4 - b**2*e**3*x**4/32 + 2*b*
*2*d**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/c + 3*b**2*d**2*e*x*sqrt(-c**2*x**2
 + 1)*asin(c*x)/(2*c) + 2*b**2*d*e**2*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/
(3*c) + b**2*e**3*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(8*c) - 3*b**2*d**2*
e*asin(c*x)**2/(4*c**2) - 4*b**2*d*e**2*x/(3*c**2) - 3*b**2*e**3*x**2/(32*
c**2) + 4*b**2*d*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(3*c**3) + 3*b**2*e**
3*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(16*c**3) - 3*b**2*e**3*asin(c*x)**2/(3
2*c**4), Ne(c, 0)), (a**2*(d**3*x + 3*d**2*e*x**2/2 + d*e**2*x**3 + e**3*x
**4/4), True))
```

Maxima [F]

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx=\int (ex+d)^3(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((e*x+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
1/4*a^2*e^3*x^4 + a^2*d*e^2*x^3 + b^2*d^3*x*arcsin(c*x)^2 + 3/2*a^2*d^2*e*
x^2 + 3/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c
^3))*a*b*d^2*e + 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 +
2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*d*e^2 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-
c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*
a*b*e^3 - 2*b^2*d^3*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^3*x + 2
*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^3/c + 1/4*(b^2*e^3*x^4 + 4*b
^2*d*e^2*x^3 + 6*b^2*d^2*e*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))
^2 + integrate(1/2*(b^2*c*e^3*x^4 + 4*b^2*c*d*e^2*x^3 + 6*b^2*c*d^2*e*x^2)
*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(
c^2*x^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 816 vs. $2(334) = 668$.

Time = 0.15 (sec) , antiderivative size = 816, normalized size of antiderivative = 2.18

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
1/4*a^2*e^3*x^4 + a^2*d*e^2*x^3 + b^2*d^3*x*arcsin(c*x)^2 + 2*a*b*d^3*x*ar
csin(c*x) + (c^2*x^2 - 1)*b^2*d*e^2*x*arcsin(c*x)^2/c^2 + 3/2*sqrt(-c^2*x^
2 + 1)*b^2*d^2*e*x*arcsin(c*x)/c + a^2*d^3*x - 2*b^2*d^3*x + 2*(c^2*x^2 -
1)*a*b*d*e^2*x*arcsin(c*x)/c^2 + 3/2*(c^2*x^2 - 1)*b^2*d^2*e*arcsin(c*x)^2
/c^2 + b^2*d*e^2*x*arcsin(c*x)^2/c^2 + 3/2*sqrt(-c^2*x^2 + 1)*a*b*d^2*e*x/
c + 2*sqrt(-c^2*x^2 + 1)*b^2*d^3*arcsin(c*x)/c - 1/8*(-c^2*x^2 + 1)^(3/2)*
b^2*e^3*x*arcsin(c*x)/c^3 - 2/9*(c^2*x^2 - 1)*b^2*d*e^2*x/c^2 + 3*(c^2*x^2
 - 1)*a*b*d^2*e*arcsin(c*x)/c^2 + 2*a*b*d*e^2*x*arcsin(c*x)/c^2 + 3/4*b^2*
d^2*e*arcsin(c*x)^2/c^2 + 1/4*(c^2*x^2 - 1)^2*b^2*e^3*arcsin(c*x)^2/c^4 +
2*sqrt(-c^2*x^2 + 1)*a*b*d^3/c - 1/8*(-c^2*x^2 + 1)^(3/2)*a*b*e^3*x/c^3 -
2/3*(-c^2*x^2 + 1)^(3/2)*b^2*d*e^2*arcsin(c*x)/c^3 + 5/16*sqrt(-c^2*x^2 +
1)*b^2*e^3*x*arcsin(c*x)/c^3 + 3/2*(c^2*x^2 - 1)*a^2*d^2*e/c^2 - 3/4*(c^2*
x^2 - 1)*b^2*d^2*e/c^2 - 14/9*b^2*d*e^2*x/c^2 + 3/2*a*b*d^2*e*arcsin(c*x)/
c^2 + 1/2*(c^2*x^2 - 1)^2*a*b*e^3*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)*b^2*
e^3*arcsin(c*x)^2/c^4 - 2/3*(-c^2*x^2 + 1)^(3/2)*a*b*d*e^2/c^3 + 5/16*sqrt
(-c^2*x^2 + 1)*a*b*e^3*x/c^3 + 2*sqrt(-c^2*x^2 + 1)*b^2*d*e^2*arcsin(c*x)/
c^3 - 3/8*b^2*d^2*e/c^2 - 1/32*(c^2*x^2 - 1)^2*b^2*e^3/c^4 + (c^2*x^2 - 1)
*a*b*e^3*arcsin(c*x)/c^4 + 5/32*b^2*e^3*arcsin(c*x)^2/c^4 + 2*sqrt(-c^2*x^
2 + 1)*a*b*d*e^2/c^3 - 5/32*(c^2*x^2 - 1)*b^2*e^3/c^4 + 5/16*a*b*e^3*arcsi
n(c*x)/c^4 - 17/256*b^2*e^3/c^4
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+e\,x)^3\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + e*x)^3,x)
```

output
```
int((a + b*asin(c*x))^2*(d + e*x)^3, x)
```

Reduce [F]

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx$$
$$=\frac{48\left(\int asin(cx)^2\,x^3dx\right)b^2c^4e^3+72a^2c^4d^2e\,x^2+48a^2c^4d\,e^2x^3-36b^2c^4d^2e\,x^2+72\sqrt{-c^2x^2+1}\,asin(cx)\,b^2c}{}$$

input
```
int((e*x+d)^3*(a+b*asin(c*x))^2,x)
```

output
```
(48*asin(c*x)**2*b**2*c**4*d**3*x + 72*asin(c*x)**2*b**2*c**4*d**2*e*x**2
- 36*asin(c*x)**2*b**2*c**2*d**2*e + 96*sqrt( - c**2*x**2 + 1)*asin(c*x)*b
**2*c**3*d**3 + 72*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*c**3*d**2*e*x + 9
6*asin(c*x)*a*b*c**4*d**3*x + 144*asin(c*x)*a*b*c**4*d**2*e*x**2 + 96*asin
(c*x)*a*b*c**4*d*e**2*x**3 + 24*asin(c*x)*a*b*c**4*e**3*x**4 - 72*asin(c*x
)*a*b*c**2*d**2*e - 9*asin(c*x)*a*b*e**3 + 96*sqrt( - c**2*x**2 + 1)*a*b*c
**3*d**3 + 72*sqrt( - c**2*x**2 + 1)*a*b*c**3*d**2*e*x + 32*sqrt( - c**2*x
**2 + 1)*a*b*c**3*d*e**2*x**2 + 6*sqrt( - c**2*x**2 + 1)*a*b*c**3*e**3*x**
3 + 64*sqrt( - c**2*x**2 + 1)*a*b*c*d*e**2 + 9*sqrt( - c**2*x**2 + 1)*a*b*
c*e**3*x + 48*int(asin(c*x)**2*x**3,x)*b**2*c**4*e**3 + 144*int(asin(c*x)*
*2*x**2,x)*b**2*c**4*d*e**2 + 48*a**2*c**4*d**3*x + 72*a**2*c**4*d**2*e*x*
*2 + 48*a**2*c**4*d*e**2*x**3 + 12*a**2*c**4*e**3*x**4 - 96*b**2*c**4*d**3
*x - 36*b**2*c**4*d**2*e*x**2)/(48*c**4)
```

3.10 $\int (d+ex)^2(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 18, antiderivative size = 242

$$\begin{aligned}\int (d+ex)^2(a+b\arcsin(cx))^2\,dx &= -2b^2d^2x-\frac{4b^2e^2x}{9c^2}-\frac{1}{2}b^2dex^2-\frac{2}{27}b^2e^2x^3\\ &\quad+\frac{2bd^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\\ &\quad+\frac{4be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}\\ &\quad+\frac{bdex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\\ &\quad+\frac{2be^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}\\ &\quad-\frac{d^3(a+b\arcsin(cx))^2}{3e}-\frac{de(a+b\arcsin(cx))^2}{2c^2}\\ &\quad+\frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e}\end{aligned}$$

output

```
-2*b^2*d^2*x-4/9*b^2*e^2*x/c^2-1/2*b^2*d*e*x^2-2/27*b^2*e^2*x^3+2*b*d^2*(-
c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+4/9*b*e^2*(-c^2*x^2+1)^(1/2)*(a+b*arc
sin(c*x))/c^3+b*d*e*x*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+2/9*b*e^2*x^2
*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c-1/3*d^3*(a+b*arcsin(c*x))^2/e-1/2*
d*e*(a+b*arcsin(c*x))^2/c^2+1/3*(e*x+d)^3*(a+b*arcsin(c*x))^2/e
```

Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.03

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx$$
$$= \frac{18a^2c^3x(3d^2+3dex+e^2x^2)+6ab\sqrt{1-c^2x^2}(4e^2+c^2(18d^2+9dex+2e^2x^2))-b^2cx(24e^2+c^2(108d^2+\cdots}{\cdots}$$

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

output
```
(18*a^2*c^3*x*(3*d^2 + 3*d*e*x + e^2*x^2) + 6*a*b*Sqrt[1 - c^2*x^2]*(4*e^2
 + c^2*(18*d^2 + 9*d*e*x + 2*e^2*x^2)) - b^2*c*x*(24*e^2 + c^2*(108*d^2 +
27*d*e*x + 4*e^2*x^2)) + 6*b*(-9*a*c*d*e + 6*a*c^3*x*(3*d^2 + 3*d*e*x + e^
2*x^2) + b*Sqrt[1 - c^2*x^2]*(4*e^2 + c^2*(18*d^2 + 9*d*e*x + 2*e^2*x^2)))
*ArcSin[c*x] + 9*b^2*c*(6*c^2*d^2*x + 2*c^2*e^2*x^3 + 3*d*e*(-1 + 2*c^2*x^
2))*ArcSin[c*x]^2)/(54*c^3)
```

Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.10, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {5242, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \; 5242$$

$$\frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e}-\frac{2bc\int \frac{(d+ex)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{3e}$$

$$\Big\downarrow \; 5262$$

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

$$\Big\downarrow \text{ 2009}$$

$$\frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e} - \frac{2bc\left(\frac{3de^2(a+b\arcsin(cx))^2}{4bc^3}-\frac{3d^2e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}-\frac{3de^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^2}-\frac{e^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^2}-\frac{2e^3\sqrt{}}{}\right.}{3e}$$

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

output
```
((d + e*x)^3*(a + b*ArcSin[c*x])^2)/(3*e) - (2*b*c*((3*b*d^2*e*x)/c + (2*b
*e^3*x)/(3*c^3) + (3*b*d*e^2*x^2)/(4*c) + (b*e^3*x^3)/(9*c) - (3*d^2*e*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^2 - (2*e^3*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(3*c^4) - (3*d*e^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
(2*c^2) - (e^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^2) + (d^3*(
a + b*ArcSin[c*x])^2)/(2*b*c) + (3*d*e^2*(a + b*ArcSin[c*x])^2)/(4*b*c^3))
)/(3*e)
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [A] (verified)

Time = 0.45 (sec) , antiderivative size = 374, normalized size of antiderivative = 1.55

method	result
derivativedivides	$\frac{a^2(cxe+cd)^3}{3c^2e}+\frac{b^2\left(c^2d^2\left(\arcsin(cx)^2cx-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{dce\left(2\arcsin(cx)^2x^2c^2+2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx-\arcsin\ldots\right.}{2}\ldots}{c^2\ldots}$
default	$\frac{a^2(cxe+cd)^3}{3c^2e}+\frac{b^2\left(c^2d^2\left(\arcsin(cx)^2cx-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{dce\left(2\arcsin(cx)^2x^2c^2+2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx-\arcsin\ldots\right.}{2}\ldots}{c^2\ldots}$
parts	$\frac{a^2(ex+d)^3}{3e}+\frac{b^2\left(18\arcsin(cx)^2c^3x^3e^2+54\arcsin(cx)^2c^3x^2de+54\arcsin(cx)^2c^3x\,d^2+12\sqrt{-c^2x^2+1}\,\arcsin(cx)c^2x^2e\ldots\right.}{\ldots}$
orering	$\frac{(38c^4e^4x^5+206c^4d\,e^3x^4+531c^4d^2e^2x^3+162x^2e\,d^3c^4+54c^4d^4x+48c^2e^4x^3-174c^2d\,e^3x^2-540c^2d^2e^2x-135e\,d^3c^2-96\ldots}{54(ex+d)^2c^4}$

input
```
int((e*x+d)^2*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(1/3*a^2/c^2*(c*e*x+c*d)^3/e+b^2/c^2*(c^2*d^2*(arcsin(c*x)^2*c*x-2*c*x
+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2))+1/2*d*c*e*(2*arcsin(c*x)^2*x^2*c^2+2*ar
csin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-arcsin(c*x)^2-c^2*x^2)+1/27*e^2*(9*arcsin
(c*x)^2*c^3*x^3+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*c^3*x^3+12*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x))+2*a*b/c^2*(1/3/e*arcsin(c*x)*c^3*d^3+a
rcsin(c*x)*c^3*d^2*x+e*arcsin(c*x)*c^3*d*x^2+1/3*arcsin(c*x)*c^3*x^3*e^2-1
/3/e*(c^3*d^3*arcsin(c*x)+e^3*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x
^2+1)^(1/2))+3*d*c*e^2*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))-3*d^2
*c^2*e*(-c^2*x^2+1)^(1/2))))
```

Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 290, normalized size of antiderivative = 1.20

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx$$
$$= \frac{2\,(9\,a^2-2\,b^2)c^3e^2x^3+27\,(2\,a^2-b^2)c^3dex^2+9\,(2\,b^2c^3e^2x^3+6\,b^2c^3dex^2+6\,b^2c^3d^2x-3\,b^2cde)\arcsin\,(cx}{}$$

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

output
```
1/54*(2*(9*a^2 - 2*b^2)*c^3*e^2*x^3 + 27*(2*a^2 - b^2)*c^3*d*e*x^2 + 9*(2*
b^2*c^3*e^2*x^3 + 6*b^2*c^3*d*e*x^2 + 6*b^2*c^3*d^2*x - 3*b^2*c*d*e)*arcsi
n(c*x)^2 + 6*(9*(a^2 - 2*b^2)*c^3*d^2 - 4*b^2*c*e^2)*x + 18*(2*a*b*c^3*e^2
*x^3 + 6*a*b*c^3*d*e*x^2 + 6*a*b*c^3*d^2*x - 3*a*b*c*d*e)*arcsin(c*x) + 6*
(2*a*b*c^2*e^2*x^2 + 9*a*b*c^2*d*e*x + 18*a*b*c^2*d^2 + 4*a*b*e^2 + (2*b^2
*c^2*e^2*x^2 + 9*b^2*c^2*d*e*x + 18*b^2*c^2*d^2 + 4*b^2*e^2)*arcsin(c*x))*
sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 454, normalized size of antiderivative = 1.88

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx$$
$$= \begin{cases} a^2d^2x + a^2dex^2 + \frac{a^2e^2x^3}{3} + 2abd^2x\,\mathrm{asin}\,(cx) + 2abdex^2\,\mathrm{asin}\,(cx) + \frac{2abe^2x^3\,\mathrm{asin}\,(cx)}{3} + \frac{2abd^2\sqrt{-c^2x^2+1}}{c} + \frac{abdex}{} \\ a^2\left(d^2x + dex^2 + \frac{e^2x^3}{3}\right) \end{cases}$$

input
```
integrate((e*x+d)**2*(a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*d**2*x + a**2*d*e*x**2 + a**2*e**2*x**3/3 + 2*a*b*d**2*x*a
sin(c*x) + 2*a*b*d*e*x**2*asin(c*x) + 2*a*b*e**2*x**3*asin(c*x)/3 + 2*a*b*
d**2*sqrt(-c**2*x**2 + 1)/c + a*b*d*e*x*sqrt(-c**2*x**2 + 1)/c + 2*a*b*e**
2*x**2*sqrt(-c**2*x**2 + 1)/(9*c) - a*b*d*e*asin(c*x)/c**2 + 4*a*b*e**2*sq
rt(-c**2*x**2 + 1)/(9*c**3) + b**2*d**2*x*asin(c*x)**2 - 2*b**2*d**2*x + b
**2*d*e*x**2*asin(c*x)**2 - b**2*d*e*x**2/2 + b**2*e**2*x**3*asin(c*x)**2/
3 - 2*b**2*e**2*x**3/27 + 2*b**2*d**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/c + b
**2*d*e*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/c + 2*b**2*e**2*x**2*sqrt(-c**2*x
**2 + 1)*asin(c*x)/(9*c) - b**2*d*e*asin(c*x)**2/(2*c**2) - 4*b**2*e**2*x/
(9*c**2) + 4*b**2*e**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c**3), Ne(c, 0)),
 (a**2*(d**2*x + d*e*x**2 + e**2*x**3/3), True))
```

Maxima [F]

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

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

output
```
1/3*a^2*e^2*x^3 + b^2*d^2*x*arcsin(c*x)^2 + a^2*d*e*x^2 + (2*x^2*arcsin(c*
x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d*e + 2/9*(3*x^3*
arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a
*b*e^2 - 2*b^2*d^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d^2*x + 2*
(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b*d^2/c + 1/3*(b^2*e^2*x^3 + 3*b^
2*d*e*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + integrate(2/3*(b
^2*c*e^2*x^3 + 3*b^2*c*d*e*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x,
sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 487 vs. $2(218) = 436$.

Time = 0.15 (sec) , antiderivative size = 487, normalized size of antiderivative = 2.01

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx = \frac{1}{3}\,a^2e^2x^3 + b^2d^2x\arcsin(cx)^2 + 2\,abd^2x\arcsin(cx) + \frac{(c^2x^2-1)b^2e^2x\arcsin(cx)^2}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}b^2dex\arcsin(cx)}{c} + a^2d^2x - 2\,b^2d^2x + \frac{2\,(c^2x^2-1)abe^2x\arcsin(cx)}{3\,c^2} + \frac{(c^2x^2-1)b^2de\arcsin(cx)^2}{c^2} + \frac{b^2e^2x\arcsin(cx)^2}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}abdex}{c} + \frac{2\,\sqrt{-c^2x^2+1}b^2d^2\arcsin(cx)}{c} - \frac{2\,(c^2x^2-1)b^2e^2x}{27\,c^2} + \frac{2\,(c^2x^2-1)abde\arcsin(cx)}{c^2} + \frac{2\,abe^2x\arcsin(cx)}{3\,c^2} + \frac{b^2de\arcsin(cx)^2}{2\,c^2} + \frac{2\,\sqrt{-c^2x^2+1}abd^2}{c} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}b^2e^2\arcsin(cx)}{9\,c^3} + \frac{(c^2x^2-1)a^2de}{c^2} - \frac{(c^2x^2-1)b^2de}{2\,c^2} - \frac{14\,b^2e^2x}{27\,c^2} + \frac{abde\arcsin(cx)}{c^2} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}abe^2}{9\,c^3} + \frac{2\,\sqrt{-c^2x^2+1}b^2e^2\arcsin(cx)}{3\,c^3} - \frac{b^2de}{4\,c^2} + \frac{2\,\sqrt{-c^2x^2+1}abe^2}{3\,c^3}$$

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

output
```
1/3*a^2*e^2*x^3 + b^2*d^2*x*arcsin(c*x)^2 + 2*a*b*d^2*x*arcsin(c*x) + 1/3*
(c^2*x^2 - 1)*b^2*e^2*x*arcsin(c*x)^2/c^2 + sqrt(-c^2*x^2 + 1)*b^2*d*e*x*a
rcsin(c*x)/c + a^2*d^2*x - 2*b^2*d^2*x + 2/3*(c^2*x^2 - 1)*a*b*e^2*x*arcsi
n(c*x)/c^2 + (c^2*x^2 - 1)*b^2*d*e*arcsin(c*x)^2/c^2 + 1/3*b^2*e^2*x*arcsi
n(c*x)^2/c^2 + sqrt(-c^2*x^2 + 1)*a*b*d*e*x/c + 2*sqrt(-c^2*x^2 + 1)*b^2*d
^2*arcsin(c*x)/c - 2/27*(c^2*x^2 - 1)*b^2*e^2*x/c^2 + 2*(c^2*x^2 - 1)*a*b*
d*e*arcsin(c*x)/c^2 + 2/3*a*b*e^2*x*arcsin(c*x)/c^2 + 1/2*b^2*d*e*arcsin(c
*x)^2/c^2 + 2*sqrt(-c^2*x^2 + 1)*a*b*d^2/c - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*
e^2*arcsin(c*x)/c^3 + (c^2*x^2 - 1)*a^2*d*e/c^2 - 1/2*(c^2*x^2 - 1)*b^2*d*
e/c^2 - 14/27*b^2*e^2*x/c^2 + a*b*d*e*arcsin(c*x)/c^2 - 2/9*(-c^2*x^2 + 1)
^(3/2)*a*b*e^2/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b^2*e^2*arcsin(c*x)/c^3 - 1/4*
b^2*d*e/c^2 + 2/3*sqrt(-c^2*x^2 + 1)*a*b*e^2/c^3
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+e\,x)^2\,dx$$

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

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

Reduce [F]

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx$$
$$= \frac{18asin(cx)^2\,b^2c^3d^2x + 18asin(cx)^2\,b^2c^3de\,x^2 - 9asin(cx)^2\,b^2cde + 36\sqrt{-c^2x^2+1}\,asin(cx)\,b^2c^2d^2 + 18\sqrt{}}{}$$

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

output
```
(18*asin(c*x)**2*b**2*c**3*d**2*x + 18*asin(c*x)**2*b**2*c**3*d*e*x**2 - 9
*asin(c*x)**2*b**2*c*d*e + 36*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*c**2*d
**2 + 18*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*c**2*d*e*x + 36*asin(c*x)*a
*b*c**3*d**2*x + 36*asin(c*x)*a*b*c**3*d*e*x**2 + 12*asin(c*x)*a*b*c**3*e*
*2*x**3 - 18*asin(c*x)*a*b*c*d*e + 36*sqrt( - c**2*x**2 + 1)*a*b*c**2*d**2
 + 18*sqrt( - c**2*x**2 + 1)*a*b*c**2*d*e*x + 4*sqrt( - c**2*x**2 + 1)*a*b
*c**2*e**2*x**2 + 8*sqrt( - c**2*x**2 + 1)*a*b*e**2 + 18*int(asin(c*x)**2*
x**2,x)*b**2*c**3*e**2 + 18*a**2*c**3*d**2*x + 18*a**2*c**3*d*e*x**2 + 6*a
**2*c**3*e**2*x**3 - 36*b**2*c**3*d**2*x - 9*b**2*c**3*d*e*x**2)/(18*c**3)
```

3.11 $\int (d+ex)(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 16, antiderivative size = 142

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

output
```
-2*b^2*d*x-1/4*b^2*e*x^2+2*b*d*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+1/2*
b*e*x*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c-1/2*d^2*(a+b*arcsin(c*x))^2/e
-1/4*e*(a+b*arcsin(c*x))^2/c^2+1/2*(e*x+d)^2*(a+b*arcsin(c*x))^2/e
```

Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.08

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

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

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

Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.15, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {5242, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \; 5242$$

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

$$\Big\downarrow \; 5262$$

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

$$\Big\downarrow \text{2009}$$

$$\frac{(d+ex)^2(a+b\arcsin(cx))^2}{2e} - \frac{bc\left(\frac{e^2(a+b\arcsin(cx))^2}{4bc^3} - \frac{2de\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2} - \frac{e^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^2} + \frac{d^2(a+b\arcsin(cx))^2}{2bc} + \frac{2bdex}{c} + \frac{be^2x^2}{4c}\right)}{e}$$

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

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

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [A] (verified)

Time = 0.38 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.33

method	result
parts	$a^2\left(\frac{1}{2}e\,x^2+dx\right)+\frac{b^2\left(\frac{e\left(2\arcsin(cx)^2x^2c^2+2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx-\arcsin(cx)^2-c^2x^2\right)}{4c}+d\left(\arcsin(cx)^2cx-2cx+2\right.\right.}{c}$
derivativedivides	$\frac{\frac{a^2\left(c^2dx+\frac{1}{2}c^2e\,x^2\right)}{c}+\frac{b^2\left(dc\left(\arcsin(cx)^2cx-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{e\left(2\arcsin(cx)^2x^2c^2+2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx-\mathrm{arc}\right.}{4}\right.}{c}}{c}$
default	$\frac{\frac{a^2\left(c^2dx+\frac{1}{2}c^2e\,x^2\right)}{c}+\frac{b^2\left(dc\left(\arcsin(cx)^2cx-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{e\left(2\arcsin(cx)^2x^2c^2+2\arcsin(cx)\sqrt{-c^2x^2+1}\,cx-\mathrm{arc}\right.}{4}\right.}{c}}{c}$
orering	$\frac{(7x^4e^3c^2+33c^2d\,e^2x^3+20x^2e\,d^2c^2+8c^2d^3x-6x^2e^3-30d\,e^2x-10d^2e)(a+b\arcsin(cx))^2}{8(ex+d)^2c^2}-\frac{(3c^2e^2x^4+17d\,c^2e\,x^3-4e}{}$

input
```
int((e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
a^2*(1/2*e*x^2+d*x)+b^2/c*(1/4*e*(2*arcsin(c*x)^2*x^2*c^2+2*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)*c*x-arcsin(c*x)^2-c^2*x^2)/c+d*(arcsin(c*x)^2*c*x-2*c*x+2
*arcsin(c*x)*(-c^2*x^2+1)^(1/2)))+2*a*b/c*(1/2*c*arcsin(c*x)*e*x^2+arcsin(
c*x)*c*x*d-1/2/c*(e*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))-2*d*c*(-
c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.10

$$\int(d+ex)(a+b\arcsin(cx))^2\,dx$$
$$=\frac{(2\,a^2-b^2)c^2ex^2+4\,(a^2-2\,b^2)c^2dx+(2\,b^2c^2ex^2+4\,b^2c^2dx-b^2e)\arcsin(cx)^2+2\,(2\,abc^2ex^2+4\,abc^2dx}{4\,c^2}$$

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

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

Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.64

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx$$
$$=\begin{cases} a^2dx+\frac{a^2ex^2}{2}+2abdx\,\mathrm{asin}\,(cx)+abex^2\,\mathrm{asin}\,(cx)+\frac{2abd\sqrt{-c^2x^2+1}}{c}+\frac{abex\sqrt{-c^2x^2+1}}{2c}-\frac{abe\,\mathrm{asin}\,(cx)}{2c^2}+b^2dx\,\mathrm{asi} \\ a^2\left(dx+\frac{ex^2}{2}\right) \end{cases}$$

input
```
integrate((e*x+d)*(a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*d*x + a**2*e*x**2/2 + 2*a*b*d*x*asin(c*x) + a*b*e*x**2*asi
n(c*x) + 2*a*b*d*sqrt(-c**2*x**2 + 1)/c + a*b*e*x*sqrt(-c**2*x**2 + 1)/(2*
c) - a*b*e*asin(c*x)/(2*c**2) + b**2*d*x*asin(c*x)**2 - 2*b**2*d*x + b**2*
e*x**2*asin(c*x)**2/2 - b**2*e*x**2/4 + 2*b**2*d*sqrt(-c**2*x**2 + 1)*asin
(c*x)/c + b**2*e*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2*c) - b**2*e*asin(c*x)
**2/(4*c**2), Ne(c, 0)), (a**2*(d*x + e*x**2/2), True))
```

Maxima [F]

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

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

output
```
b^2*d*x*arcsin(c*x)^2 + 1/2*a^2*e*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-
c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e + 1/2*(x^2*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1))^2 + 2*c*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*x^
2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x))*b^2*e - 2*
b^2*d*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*x + 2*(c*x*arcsin(c*x
) + sqrt(-c^2*x^2 + 1))*a*b*d/c
```

Giac [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.72

$$\begin{aligned}\int (d+ex)(a+b\arcsin(cx))^2\,dx = {} & b^2dx\arcsin(cx)^2 + 2\,abdx\arcsin(cx) \\ & + \frac{\sqrt{-c^2x^2+1}b^2ex\arcsin(cx)}{2\,c} + a^2dx \\ & - 2\,b^2dx + \frac{(c^2x^2-1)b^2e\arcsin(cx)^2}{2\,c^2} \\ & + \frac{\sqrt{-c^2x^2+1}abex}{2\,c} + \frac{2\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{c} \\ & + \frac{(c^2x^2-1)abe\arcsin(cx)}{c^2} + \frac{b^2e\arcsin(cx)^2}{4\,c^2} \\ & + \frac{2\sqrt{-c^2x^2+1}abd}{c} + \frac{(c^2x^2-1)a^2e}{2\,c^2} \\ & - \frac{(c^2x^2-1)b^2e}{4\,c^2} + \frac{abe\arcsin(cx)}{2\,c^2} - \frac{b^2e}{8\,c^2}\end{aligned}$$

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

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

Mupad [F(-1)]

Timed out.

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+e\,x)\,dx$$

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

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

Reduce [B] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.54

$$\int (d+ex)(a+b\arcsin(cx))^2\,dx$$
$$= \frac{4asin(cx)^2\,b^2c^2dx + 2asin(cx)^2\,b^2c^2e\,x^2 - asin(cx)^2\,b^2e + 8\sqrt{-c^2x^2+1}\,asin(cx)\,b^2cd + 2\sqrt{-c^2x^2+1}\,as}{}$$

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

output
```
(4*asin(c*x)**2*b**2*c**2*d*x + 2*asin(c*x)**2*b**2*c**2*e*x**2 - asin(c*x
)**2*b**2*e + 8*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*c*d + 2*sqrt( - c**2
*x**2 + 1)*asin(c*x)*b**2*c*e*x + 8*asin(c*x)*a*b*c**2*d*x + 4*asin(c*x)*a
*b*c**2*e*x**2 - 2*asin(c*x)*a*b*e + 8*sqrt( - c**2*x**2 + 1)*a*b*c*d + 2*
sqrt( - c**2*x**2 + 1)*a*b*c*e*x + 4*a**2*c**2*d*x + 2*a**2*c**2*e*x**2 -
8*b**2*c**2*d*x - b**2*c**2*e*x**2 + b**2*e)/(4*c**2)
```

3.12 $\int (a+b \arcsin (c x))^2 \, dx$

Optimal result

Integrand size = 10, antiderivative size = 47

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

output
```
-2*b^2*x+2*b*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+x*(a+b*arcsin(c*x))^2
```

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

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

input
```
Integrate[(a + b*ArcSin[c*x])^2,x]
```

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

Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.09, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {5130, 5182, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{ 5130}$$

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

$$\Big\downarrow \text{ 5182}$$

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

$$\Big\downarrow \text{ 24}$$

$$x(a+b\arcsin(cx))^2-2bc\left(\frac{bx}{c}-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}\right)$$

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

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

Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.53

method	result	size
derivativedivides	$\frac{cx\,a^{2}+b^{2}\left(\arcsin\left(cx\right)^{2}cx-2cx+2\arcsin\left(cx\right)\sqrt{-c^{2}x^{2}+1}\right)+2ab\left(cx\arcsin\left(cx\right)+\sqrt{-c^{2}x^{2}+1}\right)}{c}$	72
default	$\frac{cx\,a^{2}+b^{2}\left(\arcsin\left(cx\right)^{2}cx-2cx+2\arcsin\left(cx\right)\sqrt{-c^{2}x^{2}+1}\right)+2ab\left(cx\arcsin\left(cx\right)+\sqrt{-c^{2}x^{2}+1}\right)}{c}$	72
parts	$x\,a^{2}+\frac{b^{2}\left(\arcsin\left(cx\right)^{2}cx-2cx+2\arcsin\left(cx\right)\sqrt{-c^{2}x^{2}+1}\right)}{c}+\frac{2ab\left(cx\arcsin\left(cx\right)+\sqrt{-c^{2}x^{2}+1}\right)}{c}$	73
orering	$x\left(a+b\arcsin\left(cx\right)\right)^{2}+\frac{2\left(a+b\arcsin\left(cx\right)\right)b}{c\sqrt{-c^{2}x^{2}+1}}+\frac{x\left(cx-1\right)\left(cx+1\right)\left(\frac{2b^{2}c^{2}}{-c^{2}x^{2}+1}+\frac{2\left(a+b\arcsin\left(cx\right)\right)b\,c^{3}x}{\left(-c^{2}x^{2}+1\right)^{\frac{3}{2}}}\right)}{c^{2}}$	103

input
```
int((a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(c*x*a^2+b^2*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
)+2*a*b*(c*x*arcsin(c*x)+(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.38

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

input
```
integrate((a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
(b^2*c*x*arcsin(c*x)^2 + 2*a*b*c*x*arcsin(c*x) + (a^2 - 2*b^2)*c*x + 2*sqr
t(-c^2*x^2 + 1)*(b^2*arcsin(c*x) + a*b))/c
```

Sympy [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.74

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

input
```
integrate((a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*x + 2*a*b*x*asin(c*x) + 2*a*b*sqrt(-c**2*x**2 + 1)/c + b**
2*x*asin(c*x)**2 - 2*b**2*x + 2*b**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/c, Ne(
c, 0)), (a**2*x, True))
```

Maxima [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.53

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

input
```
integrate((a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
b^2*x*arcsin(c*x)^2 - 2*b^2*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*x
 + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*a*b/c
```

Giac [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.60

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

input
```
integrate((a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
b^2*x*arcsin(c*x)^2 + 2*a*b*x*arcsin(c*x) + a^2*x - 2*b^2*x + 2*sqrt(-c^2*
x^2 + 1)*b^2*arcsin(c*x)/c + 2*sqrt(-c^2*x^2 + 1)*a*b/c
```

Mupad [B] (verification not implemented)

Time = 0.60 (sec) , antiderivative size = 142, normalized size of antiderivative = 3.02

$$\int (a+b\arcsin(cx))^2\,dx = \begin{cases} b^2\left(x\left(\mathrm{asin}(c\,x)^2-2\right)+2\,\mathrm{asin}(c\,x)\,\sqrt{\frac{1}{c^2}-x^2}\right)+a^2\,x+\frac{2\,a\,b\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} & \text{if } 0<c \\ a^2\,x+b^2\,x\left(\mathrm{asin}(c\,x)^2-2\right)+\frac{2\,b^2\,\mathrm{asin}(c\,x)\,\sqrt{1-c^2\,x^2}}{c}+\frac{2\,a\,b\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} & \text{if } \neg 0<c \end{cases}$$

input
```
int((a + b*asin(c*x))^2,x)
```

output
```
piecewise(0 < c, b^2*(x*(asin(c*x)^2 - 2) + 2*asin(c*x)*(1/c^2 - x^2)^(1/2
)) + a^2*x + (2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c, ~0 < c, a^
2*x + b^2*x*(asin(c*x)^2 - 2) + (2*b^2*asin(c*x)*(- c^2*x^2 + 1)^(1/2))/c
+ (2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c)
```

Reduce [B] (verification not implemented)

Time = 0.21 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.60

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

input
```
int((a+b*asin(c*x))^2,x)
```

output
```
(asin(c*x)**2*b**2*c*x + 2*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2 + 2*asin(
c*x)*a*b*c*x + 2*sqrt( - c**2*x**2 + 1)*a*b + a**2*c*x - 2*b**2*c*x)/c
```

3.13 $\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 347

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx = -\frac{i(a+b\arcsin(cx))^3}{3be} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{2ib(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{2ib(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{2b^2\,\mathrm{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{2b^2\,\mathrm{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}$$

output
```
-1/3*I*(a+b*arcsin(c*x))^3/b/e+(a+b*arcsin(c*x))^2*ln(1-I*e*(I*c*x+(-c^2*x
^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e+(a+b*arcsin(c*x))^2*ln(1-I*e*(I*
c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e-2*I*b*(a+b*arcsin(c*x
))*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e-2
*I*b*(a+b*arcsin(c*x))*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*
d^2-e^2)^(1/2)))/e+2*b^2*polylog(3,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^
2*d^2-e^2)^(1/2)))/e+2*b^2*polylog(3,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(
c^2*d^2-e^2)^(1/2)))/e
```

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 332, normalized size of antiderivative = 0.96

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx = \frac{-\frac{i(a+b\arcsin(cx))^3}{b}+3(a+b\arcsin(cx))^2\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)+3(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx}}{cd+\sqrt{c^2d^2-e}}\right.}{}$$

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

output
```
(((-I)*(a + b*ArcSin[c*x])^3)/b + 3*(a + b*ArcSin[c*x])^2*Log[1 + (I*e*E^(
I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 3*(a + b*ArcSin[c*x])^2*
Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] + 6*b*((-I)*(
a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2
- e^2])] + b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2]
)]) + 6*b*((-I)*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*
d + Sqrt[c^2*d^2 - e^2])] + b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sq
rt[c^2*d^2 - e^2])]))/(3*e)
```

Rubi [A] (verified)

Time = 1.15 (sec) , antiderivative size = 343, normalized size of antiderivative = 0.99, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {5240, 5030, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5240}$$

$$\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd+cex}d\arcsin(cx)$$

$$\Big\downarrow \text{5030}$$

$$\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}}d\arcsin(cx)+\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}}d\arcsin(cx)-\frac{i(a+b\arcsin(cx))^3}{3be}$$

$$\Big\downarrow \text{2620}$$

$$-\frac{2b\int (a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)}{e}-\frac{2b\int (a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{i(a+b\arcsin(cx))^3}{3be}$$

$$\Big\downarrow \text{3011}$$

$$-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)-ib\int\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)\right)}{e}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)-ib\int\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{i(a+b\arcsin(cx))^3}{3be}$$

$$\Big\downarrow \text{2720}$$

$$-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)de^{i\arcsin(cx)}\right)}{e}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)de^{i\arcsin(cx)}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{i(a+b\arcsin(cx))^3}{3be}$$

$$\Big\downarrow \text{7143}$$

$$-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)-b\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)\right)}{e}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)-b\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{i(a+b\arcsin(cx))^3}{3be}$$

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

output
```
((-1/3*I)*(a + b*ArcSin[c*x])^3)/(b*e) + ((a + b*ArcSin[c*x])^2*Log[1 - (I
*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e + ((a + b*ArcSin[c*x
])^2*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e - (2*
b*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^
2*d^2 - e^2])] - b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2
- e^2])]))/e - (2*b*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x
]))/(c*d + Sqrt[c^2*d^2 - e^2])] - b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c
*d + Sqrt[c^2*d^2 - e^2])]))/e
```

Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Maple [F]

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

input
```
int((a+b*arcsin(c*x))^2/(e*x+d),x)
```

output
```
int((a+b*arcsin(c*x))^2/(e*x+d),x)
```

Fricas [F]

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

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

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(e*x + d), x)
```

Sympy [F]

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

input
```
integrate((a+b*asin(c*x))**2/(e*x+d),x)
```

output
```
Integral((a + b*asin(c*x))**2/(d + e*x), x)
```

Maxima [F]

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

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

output
```
a^2*log(e*x + d)/e + integrate((b^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1))^2 + 2*a*b*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(e*x + d), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a + b \arcsin(cx))^2}{d + ex} \, dx = \text{Exception raised: RuntimeError}$$

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

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))^2/(d + e*x),x)
```

output
```
int((a + b*asin(c*x))^2/(d + e*x), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx=\frac{2\left(\int \frac{asin(cx)}{ex+d}dx\right)abe+\left(\int \frac{asin(cx)^2}{ex+d}dx\right)b^2e+\log(ex+d)\,a^2}{e}$$

input
```
int((a+b*asin(c*x))^2/(e*x+d),x)
```

output
```
(2*int(asin(c*x)/(d + e*x),x)*a*b*e + int(asin(c*x)**2/(d + e*x),x)*b**2*e
 + log(d + e*x)*a**2)/e
```

3.14 $\int \frac{(a+b \arcsin(cx))^2}{(d+ex)^2} dx$

Optimal result

Integrand size = 18, antiderivative size = 309

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

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

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 231, normalized size of antiderivative = 0.75

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

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

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

Rubi [A] (verified)

Time = 1.06 (sec) , antiderivative size = 287, normalized size of antiderivative = 0.93, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5242, 5272, 3042, 3804, 2694, 27, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \; 5242$$

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

$$\Big\downarrow \; 5272$$

$$\frac{2bc\int \frac{a+b\arcsin(cx)}{cd+cex}d\arcsin(cx)}{e} - \frac{(a+b\arcsin(cx))^2}{e(d+ex)}$$

$\Big\downarrow$ 3042

$$\frac{2bc\int \frac{a+b\arcsin(cx)}{cd+e\sin(\arcsin(cx))}d\arcsin(cx)}{e}-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}$$

$\Big\downarrow$ 3804

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2ce^{i\arcsin(cx)}d-iee^{2i\arcsin(cx)}+ie}d\arcsin(cx)}{e}$$

$\Big\downarrow$ 2694

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\left(\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}\right)}d\arcsin(cx)}{\sqrt{c^2d^2-e^2}}-\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}\right)}d\arcsin(cx)}{\sqrt{c^2d^2-e^2}}\right)}{e}$$

$\Big\downarrow$ 27

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\left(\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}}d\arcsin(cx)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}}d\arcsin(cx)}{2\sqrt{c^2d^2-e^2}}\right)}{e}$$

$\Big\downarrow$ 2620

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\left(\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{b\int\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)}{e}\right)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{b\int\log\left(\cdots\right.}{}\right.}{2\sqrt{c^2d^2-e^2}}\cdots\right)}{e}$$

$\Big\downarrow$ 2715

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\left(\frac{ie\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)de^{i\arcsin(cx)}}{e}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}\right)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{iee^{i\arcs\cdots}}{cd-\sqrt{c^2\cdots}}\right.}{e}\right.}{}\cdots\right)}{e}$$

$\downarrow$ 2838

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+$$
$$\frac{4bc\left(\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{ib\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}\right)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{ib\operatorname{PolyLog}\left(2,\frac{ie}{cd}\right.}{e}\right.}{2\sqrt{c^2d^2-e^2}}}{e}$$

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

output
```
-((a + b*ArcSin[c*x])^2/(e*(d + e*x))) + (4*b*c*(((-1/2*I)*e*(((a + b*ArcS
in[c*x])*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e -
 (I*b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e))
/Sqrt[c^2*d^2 - e^2] + ((I/2)*e*(((a + b*ArcSin[c*x])*Log[1 - (I*e*E^(I*Ar
cSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e - (I*b*PolyLog[2, (I*e*E^(I*Ar
cSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e))/Sqrt[c^2*d^2 - e^2]))/e
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 641 vs. $2(319) = 638$.

Time = 1.34 (sec) , antiderivative size = 642, normalized size of antiderivative = 2.08

method	result
derivativedivides	$\frac{-\frac{a^2c^2}{(cxe+cd)e}+b^2c^2\left(-\frac{\arcsin(cx)^2}{(cxe+cd)e}-\frac{2\sqrt{-c^2d^2+e^2}\,\arcsin(cx)\ln\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d^2+e^2}}{idc-\sqrt{-c^2d^2+e^2}}\right)}{e\left(c^2d^2-e^2\right)}+\frac{2\sqrt{-c^2d^2+e^2}\,\mathrm{arcs}}{}\right.}{}$
default	$\frac{-\frac{a^2c^2}{(cxe+cd)e}+b^2c^2\left(-\frac{\arcsin(cx)^2}{(cxe+cd)e}-\frac{2\sqrt{-c^2d^2+e^2}\,\arcsin(cx)\ln\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d^2+e^2}}{idc-\sqrt{-c^2d^2+e^2}}\right)}{e\left(c^2d^2-e^2\right)}+\frac{2\sqrt{-c^2d^2+e^2}\,\mathrm{arcs}}{}\right.}{}$
parts	$-\frac{a^2}{(ex+d)e}+\frac{b^2\left(-\frac{\arcsin(cx)^2c^2}{e(cxe+cd)}-\frac{2\sqrt{-c^2d^2+e^2}\,c^2\arcsin(cx)\ln\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c^2d^2+e^2}}{idc-\sqrt{-c^2d^2+e^2}}\right)}{\left(c^2d^2-e^2\right)e}+\frac{2\sqrt{-c^2d^2+e^2}}{}\right.}{}$

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

output
```
1/c*(-a^2*c^2/(c*e*x+c*d)/e+b^2*c^2*(-arcsin(c*x)^2/(c*e*x+c*d)/e-2*(-c^2*
d^2+e^2)^(1/2)/e/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(
1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+2*(-c^2*d^2+e^
2)^(1/2)/e/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*
e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+2*I*(-c^2*d^2+e^2)^(
1/2)/e/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e
^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-2*I*(-c^2*d^2+e^2)^(1/2)/e/(c^2*d
^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I
*d*c+(-c^2*d^2+e^2)^(1/2))))+2*a*b*c^2*(-1/(c*e*x+c*d)/e*arcsin(c*x)-1/e^2
/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2
*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e
^2)/e^2)^(1/2))/(c*x+d*c/e))))
```

Fricas [F]

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

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

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(e^2*x^2 + 2*d*e*x
+ d^2), x)
```

Sympy [F]

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

input
```
integrate((a+b*asin(c*x))**2/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))**2/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx=\text{Exception raised: ValueError}$$

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

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \text{Exception raised: RuntimeError}$$

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

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))^2/(d + e*x)^2,x)
```

output
```
int((a + b*asin(c*x))^2/(d + e*x)^2, x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \frac{2\left(\int \frac{asin(cx)}{e^2x^2+2dex+d^2}dx\right)ab\,d^2+2\left(\int \frac{asin(cx)}{e^2x^2+2dex+d^2}dx\right)abdex+\left(\int \frac{asin(cx)^2}{e^2x^2+2dex+d^2}dx\right)b^2d^2+\left(\int \frac{asin(cx)^2}{e^2x^2+2dex+d^2}dx\right)}{d\,(ex+d)}$$

input
```
int((a+b*asin(c*x))^2/(e*x+d)^2,x)
```

output
```
(2*int(asin(c*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*a*b*d**2 + 2*int(asin(c*x
)/(d**2 + 2*d*e*x + e**2*x**2),x)*a*b*d*e*x + int(asin(c*x)**2/(d**2 + 2*d
*e*x + e**2*x**2),x)*b**2*d**2 + int(asin(c*x)**2/(d**2 + 2*d*e*x + e**2*x
**2),x)*b**2*d*e*x + a**2*x)/(d*(d + e*x))
```

3.15 $\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 401

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx &= \frac{bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2} \\ &\quad - \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} \\ &\quad + \frac{ibc^3d(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} \\ &\quad - \frac{b^2c^2\log(d+ex)}{e(c^2d^2-e^2)} - \frac{b^2c^3d\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}} \\ &\quad + \frac{b^2c^3d\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e(c^2d^2-e^2)^{3/2}}\end{aligned}$$

output
```
b*c*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/(c^2*d^2-e^2)/(e*x+d)-1/2*(a+b*ar
csin(c*x))^2/e/(e*x+d)^2-I*b*c^3*d*(a+b*arcsin(c*x))*ln(1-I*e*(I*c*x+(-c^2
*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e/(c^2*d^2-e^2)^(3/2)+I*b*c^3*d*
(a+b*arcsin(c*x))*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(
1/2)))/e/(c^2*d^2-e^2)^(3/2)-b^2*c^2*ln(e*x+d)/e/(c^2*d^2-e^2)-b^2*c^3*d*p
olylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e/(c^2*
d^2-e^2)^(3/2)+b^2*c^3*d*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^
2*d^2-e^2)^(1/2)))/e/(c^2*d^2-e^2)^(3/2)
```

Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 315, normalized size of antiderivative = 0.79

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$= \frac{\frac{2bce\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(d+ex)} - \frac{(a+b\arcsin(cx))^2}{(d+ex)^2} - \frac{2b^2c^2\log(d+ex)}{c^2d^2-e^2} + \frac{2bc^3d\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\cdots\right.\right.\right.}{\cdots}}{2e}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/(d + e*x)^3,x]
```

output
```
((2*b*c*e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/((c^2*d^2 - e^2)*(d + e*x
)) - (a + b*ArcSin[c*x])^2/(d + e*x)^2 - (2*b^2*c^2*Log[d + e*x])/(c^2*d^2
 - e^2) + (2*b*c^3*d*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcSin[c
*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c
*d + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d -
Sqrt[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c
^2*d^2 - e^2])]))/(c^2*d^2 - e^2)^(3/2))/(2*e)
```

Rubi [A] (verified)

Time = 1.41 (sec) , antiderivative size = 386, normalized size of antiderivative = 0.96, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.722, Rules used = {5242, 5272, 3042, 3805, 3042, 3147, 16, 3804, 2694, 27, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$\Big\downarrow \text{ 5242}$$

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

$$\Big\downarrow \text{ 5272}$$

$$\frac{bc^2\int \frac{a+b\arcsin(cx)}{(cd+cex)^2}d\arcsin(cx)}{e}-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{bc^2\int \frac{a+b\arcsin(cx)}{(cd+e\sin(\arcsin(cx)))^2}d\arcsin(cx)}{e}-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}$$

$$\Big\downarrow \text{ 3805}$$

$$\frac{bc^2\left(\frac{cd\int \frac{a+b\arcsin(cx)}{cd+cex}d\arcsin(cx)}{c^2d^2-e^2}-\frac{be\int \frac{\sqrt{1-c^2x^2}}{cd+cex}d\arcsin(cx)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}\right)}{e}-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{bc^2\left(\frac{cd\int \frac{a+b\arcsin(cx)}{cd+e\sin(\arcsin(cx))}d\arcsin(cx)}{c^2d^2-e^2}-\frac{be\int \frac{\cos(\arcsin(cx))}{cd+e\sin(\arcsin(cx))}d\arcsin(cx)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}\right)}{e}-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}$$

$$\Big\downarrow \text{ 3147}$$

$$\frac{bc^2\left(\frac{cd\int \frac{a+b\arcsin(cx)}{cd+e\sin(\arcsin(cx))}d\arcsin(cx)}{c^2d^2-e^2}-\frac{b\int \frac{1}{cd+cex}d(cex)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}\right)}{e}-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}$$

$$\Big\downarrow \ 16$$

$$\frac{bc^2\left(\frac{cd\int \frac{a+b\arcsin(cx)}{cd+e\sin(\arcsin(cx))}d\arcsin(cx)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}-\frac{b\log(cd+cex)}{c^2d^2-e^2}\right)}{e}-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}$$

$$\Big\downarrow \ 3804$$

$$-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}+\frac{bc^2\left(\frac{2cd\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2ce^{i\arcsin(cx)}d-iee^{2i\arcsin(cx)}+ie}d\arcsin(cx)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}-\frac{b\log(cd+cex)}{c^2d^2-e^2}\right)}{e}$$

$$\Big\downarrow \ 2694$$

$$-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}+\frac{bc^2\left(\frac{2cd\left(\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}\right)}d\arcsin(cx)}{\sqrt{c^2d^2-e^2}}-\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}\right)}d\arcsin(cx)}{\sqrt{c^2d^2-e^2}}\right)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}-\cdots\right)}{e}$$

$$\Big\downarrow \ 27$$

$$-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}+\frac{bc^2\left(\frac{2cd\left(\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}}d\arcsin(cx)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}}d\arcsin(cx)}{2\sqrt{c^2d^2-e^2}}\right)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}-\frac{b\log(\cdots}{c^2\cdots}\right)}{e}$$

$$\Big\downarrow \ 2620$$

$$-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}+\frac{bc^2\left(\frac{2cd\left(\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{b\int\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)}{e}\right)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{b\int\log\ldots}{\ldots}\right)}{2\sqrt{c^2d^2-e^2}}\ldots\right)}{c^2d^2-e^2}\ldots\right)}{e}$$

$\downarrow$ 2715

$$-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}+\frac{bc^2\left(\frac{2cd\left(\frac{ie\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)de^{i\arcsin(cx)}}{e}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}\right)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{\ldots}}\right)\ldots}{e}\ldots\right)}{\ldots}\right)}{c^2d^2-e^2}\ldots\right)}{e}$$

$\downarrow$ 2838

$$-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}+\frac{bc^2\left(\frac{2cd\left(\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{ib\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}\right)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{ib\,\mathrm{PolyLog}\left(2,\ldots\right)}{\ldots}\right)}{2\sqrt{c^2d^2-e^2}}\ldots\right)}{c^2d^2-e^2}\ldots\right)}{e}$$

input
```
Int[(a + b*ArcSin[c*x])^2/(d + e*x)^3,x]
```

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

Defintions of rubi rules used

rule 16
```
Int[(c_.)/((a_.) + (b_.)*(x_)), x_Symbol] :> Simp[c*(Log[RemoveContent[a +
b*x, x]]/b), x] /; FreeQ[{a, b, c}, x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3147
```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Simp[1/(b^p*f)   Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)
/2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
 - 1)/2] && NeQ[a^2 - b^2, 0]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 3805
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Simp[a/(a^2 - b^2)   Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x]
, x] - Simp[b*d*(m/(f*(a^2 - b^2)))   Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(
a + b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 -
b^2, 0] && IGtQ[m, 0]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 965 vs. $2(407) = 814$.

Time = 1.90 (sec) , antiderivative size = 966, normalized size of antiderivative = 2.41

method	result
derivativedivides	$-\frac{a^2c^3}{2(cxe+cd)^2e}+b^2c^3\left(-\frac{\arcsin(cx)\left(2ic^2d^2+4ic^2dex+2ie^2c^2x^2+c^2d^2\arcsin(cx)-2\sqrt{-c^2x^2+1}\,cde-2\sqrt{-c^2x^2+1}\,c\,e^2x-e^2\,\mathrm{arcsi}\ldots\right.}{2(cxe+cd)^2\left(c^2d^2-e^2\right)e}\right.$
default	$-\frac{a^2c^3}{2(cxe+cd)^2e}+b^2c^3\left(-\frac{\arcsin(cx)\left(2ic^2d^2+4ic^2dex+2ie^2c^2x^2+c^2d^2\arcsin(cx)-2\sqrt{-c^2x^2+1}\,cde-2\sqrt{-c^2x^2+1}\,c\,e^2x-e^2\,\mathrm{arcsi}\ldots\right.}{2(cxe+cd)^2\left(c^2d^2-e^2\right)e}\right.$
parts	$-\frac{a^2}{2(ex+d)^2e}+\frac{b^2\left(-\frac{c^3\arcsin(cx)\left(2ic^2d^2+4ic^2dex+2ie^2c^2x^2+c^2d^2\arcsin(cx)-2\sqrt{-c^2x^2+1}\,cde-2\sqrt{-c^2x^2+1}\,c\,e^2x-e^2\,\mathrm{ar}\ldots\right.}{2(cxe+cd)^2\left(c^2d^2-e^2\right)e}\right.}{\ldots}$

input
```
int((a+b*arcsin(c*x))^2/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
1/c*(-1/2*a^2*c^3/(c*e*x+c*d)^2/e+b^2*c^3*(-1/2*arcsin(c*x)*(2*I*c^2*d^2+4
*I*c^2*d*e*x+2*I*e^2*c^2*x^2+c^2*d^2*arcsin(c*x)-2*(-c^2*x^2+1)^(1/2)*c*d*
e-2*(-c^2*x^2+1)^(1/2)*c*e^2*x-e^2*arcsin(c*x))/(c*e*x+c*d)^2/(c^2*d^2-e^2
)/e-1/e/(c^2*d^2-e^2)*ln(I*(I*c*x+(-c^2*x^2+1)^(1/2))^2*e-2*d*c*(I*c*x+(-c
^2*x^2+1)^(1/2))-I*e)+2/e/(c^2*d^2-e^2)*ln(I*c*x+(-c^2*x^2+1)^(1/2))-1/e*(
-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2
+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*c*d+1/e*(
-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2
+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*c*d+I/e*(
-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2)
)*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*c*d-I/e*(-c^2*d^2+
e^2)^(1/2)/(c^2*d^2-e^2)^2*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2
*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*c*d)-a*b*c^3/(c*e*x+c*d)^2/
e*arcsin(c*x)+a*b*c^3/e/(c^2*d^2-e^2)/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*
(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-a*b*c^4/e^2*d/(c^2*d^2-e^2)/(-(c^2*d^
2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^
2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(
1/2))/(c*x+d*c/e)))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(ex+d)^3}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(e^3*x^3 + 3*d*e^2*
x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F]

$$\int \frac{(a + b\arcsin(cx))^2}{(d + ex)^3}\,dx = \int \frac{(a + b\operatorname{asin}(cx))^2}{(d + ex)^3}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))**2/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a + b\arcsin(cx))^2}{(d + ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a + b\arcsin(cx))^2}{(d + ex)^3}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx=\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d+e\,x\right)}^3}\,dx$$

input
```
int((a + b*asin(c*x))^2/(d + e*x)^3,x)
```

output
```
int((a + b*asin(c*x))^2/(d + e*x)^3, x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$
$$=\frac{4\left(\int \frac{asin(cx)}{e^3x^3+3d\,e^2x^2+3d^2ex+d^3}dx\right)ab\,d^2e+8\left(\int \frac{asin(cx)}{e^3x^3+3d\,e^2x^2+3d^2ex+d^3}dx\right)abd\,e^2x+4\left(\int \frac{asin(cx)}{e^3x^3+3d\,e^2x^2+3d^2ex+d^3}dx\right)}{}$$

input
```
int((a+b*asin(c*x))^2/(e*x+d)^3,x)
```

output
```
(4*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*a*b*d*
*2*e + 8*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*
a*b*d*e**2*x + 4*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x
**3),x)*a*b*e**3*x**2 + 2*int(asin(c*x)**2/(d**3 + 3*d**2*e*x + 3*d*e**2*x
**2 + e**3*x**3),x)*b**2*d**2*e + 4*int(asin(c*x)**2/(d**3 + 3*d**2*e*x +
3*d*e**2*x**2 + e**3*x**3),x)*b**2*d*e**2*x + 2*int(asin(c*x)**2/(d**3 + 3
*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b**2*e**3*x**2 - a**2)/(2*e*(d**
2 + 2*d*e*x + e**2*x**2))
```

3.16 $\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 393

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = \frac{d^3\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{3de^2\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} - \frac{3de^2\cos\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} - \frac{3d^2e\operatorname{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{2bc^2} - \frac{e^3\operatorname{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{4bc^4} + \frac{e^3\operatorname{CosIntegral}\left(\frac{4a}{b}+4\arcsin(cx)\right)\sin\left(\frac{4a}{b}\right)}{8bc^4} + \frac{d^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{3de^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} + \frac{3d^2e\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2} + \frac{e^3\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{4bc^4} - \frac{3de^2\sin\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} - \frac{e^3\cos\left(\frac{4a}{b}\right)\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{8bc^4}$$

output

```
d^3*cos(a/b)*Ci(a/b+arcsin(c*x))/b/c+3/4*d*e^2*cos(a/b)*Ci(a/b+arcsin(c*x)
)/b/c^3-3/4*d*e^2*cos(3*a/b)*Ci(3*a/b+3*arcsin(c*x))/b/c^3-3/2*d^2*e*Ci(2*
a/b+2*arcsin(c*x))*sin(2*a/b)/b/c^2-1/4*e^3*Ci(2*a/b+2*arcsin(c*x))*sin(2*
a/b)/b/c^4+1/8*e^3*Ci(4*a/b+4*arcsin(c*x))*sin(4*a/b)/b/c^4+d^3*sin(a/b)*S
i(a/b+arcsin(c*x))/b/c+3/4*d*e^2*sin(a/b)*Si(a/b+arcsin(c*x))/b/c^3+3/2*d^
2*e*cos(2*a/b)*Si(2*a/b+2*arcsin(c*x))/b/c^2+1/4*e^3*cos(2*a/b)*Si(2*a/b+2
*arcsin(c*x))/b/c^4-3/4*d*e^2*sin(3*a/b)*Si(3*a/b+3*arcsin(c*x))/b/c^3-1/8
*e^3*cos(4*a/b)*Si(4*a/b+4*arcsin(c*x))/b/c^4
```

Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 304, normalized size of antiderivative = 0.77

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx$$
$$= \frac{d^3\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)\right)}{bc}$$
$$+\frac{3de^2\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)-\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}\right.\right.}{4bc^3}$$
$$+\frac{e^3\left(-2\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right)+\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{4a}{b}\right)+2\cos\left(\frac{2a}{b}\right.\right.}{8bc^4}$$
$$+\frac{3d^2e\left(-\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)+\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)\right)}{2bc^2}$$

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

output
```
(d^3*(Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + Sin[a/b]*SinIntegral[a/b +
 ArcSin[c*x]]))/(b*c) + (3*d*e^2*(Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]]
- Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + Sin[a/b]*SinIntegral[a
/b + ArcSin[c*x]] - Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])]))/(4*b
*c^3) + (e^3*(-2*CosIntegral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] + CosInte
gral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] + 2*Cos[(2*a)/b]*SinIntegral[2*(a
/b + ArcSin[c*x])] - Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])]))/(8*
b*c^4) + (3*d^2*e*(-(CosIntegral[(2*a)/b + 2*ArcSin[c*x]]*Sin[(2*a)/b]) +
Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]]))/(2*b*c^2)
```

Rubi [A] (verified)

Time = 1.40 (sec) , antiderivative size = 377, normalized size of antiderivative = 0.96, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {5246, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \; 5246$$

$$\frac{\int \frac{(cd+cex)^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}d\arcsin(cx)}{c^4}$$

$$\Big\downarrow \; 7293$$

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

$$\Big\downarrow \; 2009$$

$$\frac{\frac{c^3d^3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}+\frac{c^3d^3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}-\frac{3c^2d^2e\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2b}+\frac{3c^2d^2e\cos\left(\frac{2a}{b}\right.}{}}{}$$

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

output
```
((c^3*d^3*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/b + (3*c*d*e^2*Cos[a/b]
*CosIntegral[a/b + ArcSin[c*x]])/(4*b) - (3*c*d*e^2*Cos[(3*a)/b]*CosIntegr
al[(3*a)/b + 3*ArcSin[c*x]])/(4*b) - (3*c^2*d^2*e*CosIntegral[(2*a)/b + 2*
ArcSin[c*x]]*Sin[(2*a)/b])/(2*b) - (e^3*CosIntegral[(2*a)/b + 2*ArcSin[c*x
]]*Sin[(2*a)/b])/(4*b) + (e^3*CosIntegral[(4*a)/b + 4*ArcSin[c*x]]*Sin[(4*
a)/b])/(8*b) + (c^3*d^3*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/b + (3*c*
d*e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*b) + (3*c^2*d^2*e*Cos[(2
*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b) + (e^3*Cos[(2*a)/b]*Sin
Integral[(2*a)/b + 2*ArcSin[c*x]])/(4*b) - (3*c*d*e^2*Sin[(3*a)/b]*SinInte
gral[(3*a)/b + 3*ArcSin[c*x]])/(4*b) - (e^3*Cos[(4*a)/b]*SinIntegral[(4*a)
/b + 4*ArcSin[c*x]])/(8*b))/c^4
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 327, normalized size of antiderivative = 0.83

method	result
derivativedivides	$8\ \mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^3d^3+8\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)c^3d^3-12\sin\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)c^2d^2e+12\ \mathrm{Si}(2\operatorname{arc}$
default	$8\ \mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^3d^3+8\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)c^3d^3-12\sin\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)c^2d^2e+12\ \mathrm{Si}(2\operatorname{arc}$

input
```
int((e*x+d)^3/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
1/8/c^4*(8*Ci(arcsin(c*x)+a/b)*cos(a/b)*c^3*d^3+8*sin(a/b)*Si(arcsin(c*x)+
a/b)*c^3*d^3-12*sin(2*a/b)*Ci(2*arcsin(c*x)+2*a/b)*c^2*d^2*e+12*Si(2*arcsi
n(c*x)+2*a/b)*cos(2*a/b)*c^2*d^2*e+6*Ci(arcsin(c*x)+a/b)*cos(a/b)*c*d*e^2-
6*sin(3*a/b)*Si(3*arcsin(c*x)+3*a/b)*c*d*e^2-6*cos(3*a/b)*Ci(3*arcsin(c*x)
+3*a/b)*c*d*e^2+6*sin(a/b)*Si(arcsin(c*x)+a/b)*c*d*e^2-2*sin(2*a/b)*Ci(2*a
rcsin(c*x)+2*a/b)*e^3+2*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*e^3-cos(4*a/b)*
Si(4*arcsin(c*x)+4*a/b)*e^3+sin(4*a/b)*Ci(4*arcsin(c*x)+4*a/b)*e^3)/b
```

Fricas [F]

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = \int \frac{(ex+d)^3}{b\arcsin(cx)+a}\,dx$$

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

output
```
integral((e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = \int \frac{(d+ex)^3}{a+b\,\mathrm{asin}(cx)}\,dx$$

input
```
integrate((e*x+d)**3/(a+b*asin(c*x)),x)
```

output
```
Integral((d + e*x)**3/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = \int \frac{(ex+d)^3}{b\arcsin(cx)+a}\,dx$$

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

output
```
integrate((e*x + d)^3/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

Time = 0.16 (sec) , antiderivative size = 609, normalized size of antiderivative = 1.55

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = \text{Too large to display}$$

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

output
```
-3*d*e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d^3*cos(
a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) + e^3*cos(a/b)^3*cos_integral(4
*a/b + 4*arcsin(c*x))*sin(a/b)/(b*c^4) - 3*d^2*e*cos(a/b)*cos_integral(2*a
/b + 2*arcsin(c*x))*sin(a/b)/(b*c^2) - e^3*cos(a/b)^4*sin_integral(4*a/b +
 4*arcsin(c*x))/(b*c^4) - 3*d*e^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b +
 3*arcsin(c*x))/(b*c^3) + 3*d^2*e*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin
(c*x))/(b*c^2) + d^3*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c) + 9/4*
d*e^2*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + 3/4*d*e^2*cos
(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c^3) - 1/2*e^3*cos(a/b)*cos_integ
ral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b*c^4) - 1/2*e^3*cos(a/b)*cos_integra
l(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b*c^4) + e^3*cos(a/b)^2*sin_integral(4*
a/b + 4*arcsin(c*x))/(b*c^4) + 3/4*d*e^2*sin(a/b)*sin_integral(3*a/b + 3*a
rcsin(c*x))/(b*c^3) - 3/2*d^2*e*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^2
) + 1/2*e^3*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^4) + 3/4*d
*e^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^3) - 1/8*e^3*sin_integr
al(4*a/b + 4*arcsin(c*x))/(b*c^4) - 1/4*e^3*sin_integral(2*a/b + 2*arcsin(
c*x))/(b*c^4)
```

Mupad [F(-1)]

Timed out.

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

input
```
int((d + e*x)^3/(a + b*asin(c*x)),x)
```

output
```
int((d + e*x)^3/(a + b*asin(c*x)), x)
```

Reduce [F]

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

input
```
int((e*x+d)^3/(a+b*asin(c*x)),x)
```

output
```
int(x**3/(asin(c*x)*b + a),x)*e**3 + 3*int(x**2/(asin(c*x)*b + a),x)*d*e**
2 + 3*int(x/(asin(c*x)*b + a),x)*d**2*e + int(1/(asin(c*x)*b + a),x)*d**3
```

3.17 $\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 244

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = \frac{d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} - \frac{e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} - \frac{de\,\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{bc^2} + \frac{d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} + \frac{de\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} - \frac{e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3}$$

output
```
d^2*cos(a/b)*Ci(a/b+arcsin(c*x))/b/c+1/4*e^2*cos(a/b)*Ci(a/b+arcsin(c*x))/
b/c^3-1/4*e^2*cos(3*a/b)*Ci(3*a/b+3*arcsin(c*x))/b/c^3-d*e*Ci(2*a/b+2*arcs
in(c*x))*sin(2*a/b)/b/c^2+d^2*sin(a/b)*Si(a/b+arcsin(c*x))/b/c+1/4*e^2*sin
(a/b)*Si(a/b+arcsin(c*x))/b/c^3+d*e*cos(2*a/b)*Si(2*a/b+2*arcsin(c*x))/b/c
^2-1/4*e^2*sin(3*a/b)*Si(3*a/b+3*arcsin(c*x))/b/c^3
```

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.77

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx$$
$$= \frac{(4c^2d^2+e^2)\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)-e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)-4cde}{}$$

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

output
```
((4*c^2*d^2 + e^2)*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - e^2*Cos[(3*a)
/b]*CosIntegral[3*(a/b + ArcSin[c*x])] - 4*c*d*e*CosIntegral[2*(a/b + ArcS
in[c*x])]*Sin[(2*a)/b] + 4*c^2*d^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]]
 + e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 4*c*d*e*Cos[(2*a)/b]*SinI
ntegral[2*(a/b + ArcSin[c*x])] - e^2*Sin[(3*a)/b]*SinIntegral[3*(a/b + Arc
Sin[c*x])])/(4*b*c^3)
```

Rubi [A] (verified)

Time = 0.93 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.95, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {5246, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx$$
$$\Big\downarrow \ 5246$$
$$\frac{\int \frac{(cd+cex)^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}d\arcsin(cx)}{c^3}$$
$$\Big\downarrow \ 7293$$
$$\frac{\int \left(\frac{c^2\sqrt{1-c^2x^2}d^2}{a+b\arcsin(cx)}+\frac{ce\sin(2\arcsin(cx))d}{a+b\arcsin(cx)}+\frac{c^2e^2x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\right)d\arcsin(cx)}{c^3}$$

$$\Big\downarrow \text{2009}$$

$$\frac{c^2d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}+\frac{c^2d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}-\frac{cde\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{b}+\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosInte}}{}$$

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

output
```
((c^2*d^2*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/b + (e^2*Cos[a/b]*CosIn
tegral[a/b + ArcSin[c*x]])/(4*b) - (e^2*Cos[(3*a)/b]*CosIntegral[(3*a)/b +
 3*ArcSin[c*x]])/(4*b) - (c*d*e*CosIntegral[(2*a)/b + 2*ArcSin[c*x]]*Sin[(
2*a)/b])/b + (c^2*d^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/b + (e^2*Si
n[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*b) + (c*d*e*Cos[(2*a)/b]*SinInte
gral[(2*a)/b + 2*ArcSin[c*x]])/b - (e^2*Sin[(3*a)/b]*SinIntegral[(3*a)/b +
 3*ArcSin[c*x]])/(4*b))/c^3
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 206, normalized size of antiderivative = 0.84

method	result
derivativedivides	$\frac{4\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^2d^2+4\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^2d^2+4\,\mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)cde-4\,\mathrm{Ci}\left(2\arcsin\right.}{}$
default	$\frac{4\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^2d^2+4\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^2d^2+4\,\mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)cde-4\,\mathrm{Ci}\left(2\arcsin\right.}{}$

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

output
```
1/4/c^3*(4*Ci(arcsin(c*x)+a/b)*cos(a/b)*c^2*d^2+4*Si(arcsin(c*x)+a/b)*sin(
a/b)*c^2*d^2+4*Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*c*d*e-4*Ci(2*arcsin(c*x)
+2*a/b)*sin(2*a/b)*c*d*e+Ci(arcsin(c*x)+a/b)*cos(a/b)*e^2-Si(3*arcsin(c*x)
+3*a/b)*sin(3*a/b)*e^2-Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*e^2+Si(arcsin(c*
x)+a/b)*sin(a/b)*e^2)/b
```

Fricas [F]

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

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

output
```
integral((e^2*x^2 + 2*d*e*x + d^2)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

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

input
```
integrate((e*x+d)**2/(a+b*asin(c*x)),x)
```

output
```
Integral((d + e*x)**2/(a + b*asin(c*x)), x)
```

Maxima [F]

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

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

output
```
integrate((e*x + d)^2/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 337, normalized size of antiderivative = 1.38

$$\begin{aligned}\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = &-\frac{e^2\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} \\ &+\frac{d^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} \\ &-\frac{2de\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} \\ &-\frac{e^2\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} \\ &+\frac{2de\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} \\ &+\frac{d^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} \\ &+\frac{3e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} \\ &+\frac{e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} \\ &+\frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} \\ &-\frac{de\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2}+\frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3}\end{aligned}$$

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

output
```
-e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d^2*cos(a/b)
*cos_integral(a/b + arcsin(c*x))/(b*c) - 2*d*e*cos(a/b)*cos_integral(2*a/b
 + 2*arcsin(c*x))*sin(a/b)/(b*c^2) - e^2*cos(a/b)^2*sin(a/b)*sin_integral(
3*a/b + 3*arcsin(c*x))/(b*c^3) + 2*d*e*cos(a/b)^2*sin_integral(2*a/b + 2*a
rcsin(c*x))/(b*c^2) + d^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c) +
 3/4*e^2*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + 1/4*e^2*co
s(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c^3) + 1/4*e^2*sin(a/b)*sin_inte
gral(3*a/b + 3*arcsin(c*x))/(b*c^3) - d*e*sin_integral(2*a/b + 2*arcsin(c*
x))/(b*c^2) + 1/4*e^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^3)
```

Mupad [F(-1)]

Timed out.

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

input
```
int((d + e*x)^2/(a + b*asin(c*x)),x)
```

output
```
int((d + e*x)^2/(a + b*asin(c*x)), x)
```

Reduce [F]

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

input
```
int((e*x+d)^2/(a+b*asin(c*x)),x)
```

output
```
int(x**2/(asin(c*x)*b + a),x)*e**2 + 2*int(x/(asin(c*x)*b + a),x)*d*e + in
t(1/(asin(c*x)*b + a),x)*d**2
```

3.18 $\int \frac{d+ex}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 115

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \frac{d\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\,\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{2bc^2} + \frac{d\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2}$$

output
```
d*cos(a/b)*Ci(a/b+arcsin(c*x))/b/c-1/2*e*Ci(2*a/b+2*arcsin(c*x))*sin(2*a/b
)/b/c^2+d*sin(a/b)*Si(a/b+arcsin(c*x))/b/c+1/2*e*cos(2*a/b)*Si(2*a/b+2*arc
sin(c*x))/b/c^2
```

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.85

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \frac{2cd\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)-e\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right)+2cd\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}\right.}{2bc^2}$$

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

output
```
(2*c*d*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - e*CosIntegral[2*(a/b + Ar
cSin[c*x])]*Sin[(2*a)/b] + 2*c*d*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] +
 e*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(2*b*c^2)
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 109, normalized size of antiderivative = 0.95, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {5246, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{ 5246}$$

$$\frac{\int \frac{(cd+cex)\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}d\arcsin(cx)}{c^2}$$

$$\Big\downarrow \text{ 7293}$$

$$\frac{\int \left(\frac{c\sqrt{1-c^2x^2}d}{a+b\arcsin(cx)}+\frac{cex\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\right)d\arcsin(cx)}{c^2}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{\frac{cd\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}-\frac{e\sin\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2b}+\frac{cd\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}+\frac{e\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2b}}{c^2}$$

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

output
```
((c*d*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/b - (e*CosIntegral[(2*a)/b
+ 2*ArcSin[c*x]]*Sin[(2*a)/b])/(2*b) + (c*d*Sin[a/b]*SinIntegral[a/b + Arc
Sin[c*x]])/b + (e*Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b)
)/c^2
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [A] (verified)

Time = 0.16 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.90

method	result
derivativedivides	$\frac{\frac{d\left(\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{b}+\frac{e\left(\operatorname{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\operatorname{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2cb}}{c}$
default	$\frac{\frac{d\left(\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{b}+\frac{e\left(\operatorname{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\operatorname{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2cb}}{c}$

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

output
```
1/c*(d*(Si(arcsin(c*x)+a/b)*sin(a/b)+Ci(arcsin(c*x)+a/b)*cos(a/b))/b+1/2/c
*e/b*(Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)-Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b
)))
```

Fricas [F]

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

input
```
integrate((e*x+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral((e*x + d)/(b*arcsin(c*x) + a), x)
```

Sympy [F]

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

input
```
integrate((e*x+d)/(a+b*asin(c*x)),x)
```

output
```
Integral((d + e*x)/(a + b*asin(c*x)), x)
```

Maxima [F]

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

input
```
integrate((e*x+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
integrate((e*x + d)/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.21

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \frac{d\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} + \frac{e\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{d\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2\,bc^2}$$

input
```
integrate((e*x+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
d*cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) - e*cos(a/b)*cos_integral
(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b*c^2) + e*cos(a/b)^2*sin_integral(2*a/b
 + 2*arcsin(c*x))/(b*c^2) + d*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*
c) - 1/2*e*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^2)
```

Mupad [F(-1)]

Timed out.

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

input
```
int((d + e*x)/(a + b*asin(c*x)),x)
```

output
```
int((d + e*x)/(a + b*asin(c*x)), x)
```

Reduce [F]

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \left(\int \frac{x}{asin\,(cx)\,b+a}dx\right)e+\left(\int \frac{1}{asin\,(cx)\,b+a}dx\right)d$$

input
```
int((e*x+d)/(a+b*asin(c*x)),x)
```

output
```
int(x/(asin(c*x)*b + a),x)*e + int(1/(asin(c*x)*b + a),x)*d
```

3.19 $\int \frac{1}{a+b \arcsin(cx)}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 53

$$\int \frac{1}{a+b \arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

output
```
cos(a/b)*Ci((a+b*arcsin(c*x))/b)/b/c+sin(a/b)*Si((a+b*arcsin(c*x))/b)/b/c
```

Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.83

$$\int \frac{1}{a+b \arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}$$

input
```
Integrate[(a + b*ArcSin[c*x])^(-1),x]
```

output
```
(Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + Sin[a/b]*SinIntegral[a/b + ArcS
in[c*x]])/(b*c)
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.91, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.700$, Rules used = {5134, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{a+b\arcsin(cx)}\,dx$$

$$\Big\downarrow \text{5134}$$

$$\frac{\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

$$\Big\downarrow \text{3784}$$

$$\frac{\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

$$\Big\downarrow \text{25}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))+\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))+\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

$$\Big\downarrow \text{3780}$$

$$\frac{\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

$$\Big\downarrow \text{3783}$$

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

input
```
Int[(a + b*ArcSin[c*x])^(-1),x]
```

output
```
(Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b] + Sin[a/b]*SinIntegral[(a + b
*ArcSin[c*x])/b])/(b*c)
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.91

method	result	size
derivativedivides	$\frac{\frac{\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$	48
default	$\frac{\frac{\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$	48

input
```
int(1/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
1/c*(Si(arcsin(c*x)+a/b)*sin(a/b)/b+Ci(arcsin(c*x)+a/b)*cos(a/b)/b)
```

Fricas [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{b\arcsin{(cx)}+a}\,dx$$

input
```
integrate(1/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral(1/(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{a+b\operatorname{asin}{(cx)}}\,dx$$

input
```
integrate(1/(a+b*asin(c*x)),x)
```

output
```
Integral(1/(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{b\arcsin{(cx)}+a}\,dx$$

input
```
integrate(1/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
integrate(1/(b*arcsin(c*x) + a), x)
```

Giac [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.92

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin{(cx)}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin{(cx)}\right)}{bc}$$

input
```
integrate(1/(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) + sin(a/b)*sin_integral(a/b
 + arcsin(c*x))/(b*c)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

input
```
int(1/(a + b*asin(c*x)),x)
```

output
```
int(1/(a + b*asin(c*x)), x)
```

Reduce [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx = \int \frac{1}{asin\,(cx)\,b+a}dx$$

input
```
int(1/(a+b*asin(c*x)),x)
```

output
```
int(1/(asin(c*x)*b + a),x)
```

3.20 $\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \mathrm{Int}\left(\frac{1}{(d+ex)(a+b\arcsin(cx))},x\right)$$

output
```
Defer(Int)(1/(e*x+d)/(a+b*arcsin(c*x)),x)
```

Mathematica [N/A]

Not integrable

Time = 0.15 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$$

input
```
Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])),x]
```

output
```
Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])), x]
```

Rubi [N/A]

Not integrable

Time = 0.21 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$$
$$\Big\downarrow \text{5300}$$
$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}dx$$

input
```
Int[1/((d + e*x)*(a + b*ArcSin[c*x])),x]
```

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 7.34 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ex+d)\,(a+b\arcsin\,(cx))}dx$$

input
```
int(1/(e*x+d)/(a+b*arcsin(c*x)),x)
```

output
```
int(1/(e*x+d)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.39

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral(1/(a*e*x + a*d + (b*e*x + b*d)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 0.86 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.83

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\operatorname{asin}{(cx)})\,(d+ex)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*asin(c*x)),x)
```

output
```
Integral(1/((a + b*asin(c*x))*(d + e*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.21 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
integrate(1/((e*x + d)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.21 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
integrate(1/((e*x + d)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c\,x))\,\,(d+e\,x)}\,dx$$

input
```
int(1/((a + b*asin(c*x))*(d + e*x)),x)
```

output
```
int(1/((a + b*asin(c*x))*(d + e*x)), x)
```

Reduce [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.50

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{asin\,(cx)\,bd + asin\,(cx)\,bex + ad + aex}dx$$

input
```
int(1/(e*x+d)/(a+b*asin(c*x)),x)
```

output
```
int(1/(asin(c*x)*b*d + asin(c*x)*b*e*x + a*d + a*e*x),x)
```

3.21 $\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{(d+ex)^2(a+b\arcsin(cx))},x\right)$$

output
```
Defer(Int)(1/(e*x+d)^2/(a+b*arcsin(c*x)),x)
```

Mathematica [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx$$

input
```
Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])),x]
```

output
```
Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])), x]
```

Rubi [N/A]

Not integrable

Time = 0.21 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx$$

$$\Big\downarrow \text{5300}$$

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}dx$$

input
```
Int[1/((d + e*x)^2*(a + b*ArcSin[c*x])),x]
```

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 1.63 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ex+d)^2\,(a+b\arcsin(cx))}dx$$

input
```
int(1/(e*x+d)^2/(a+b*arcsin(c*x)),x)
```

output
```
int(1/(e*x+d)^2/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 49, normalized size of antiderivative = 2.72

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral(1/(a*e^2*x^2 + 2*a*d*e*x + a*d^2 + (b*e^2*x^2 + 2*b*d*e*x + b*d^2
)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.79 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\operatorname{asin}(cx))\,(d+ex)^2}\,dx$$

input
```
integrate(1/(e*x+d)**2/(a+b*asin(c*x)),x)
```

output
```
Integral(1/((a + b*asin(c*x))*(d + e*x)**2), x)
```

Maxima [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
integrate(1/((e*x + d)^2*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.85 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
integrate(1/((e*x + d)^2*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
int(1/((a + b*asin(c*x))*(d + e*x)^2),x)
```

output
```
int(1/((a + b*asin(c*x))*(d + e*x)^2), x)
```

Reduce [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 55, normalized size of antiderivative = 3.06

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{asin(cx)\,b\,d^2+2asin(cx)\,bdex+asin(cx)\,b\,e^2x^2+a\,d^2+2adex+a\,e^2x^2}dx$$

input

```
int(1/(e*x+d)^2/(a+b*asin(c*x)),x)
```

output

```
int(1/(asin(c*x)*b*d**2 + 2*asin(c*x)*b*d*e*x + asin(c*x)*b*e**2*x**2 + a*
d**2 + 2*a*d*e*x + a*e**2*x**2),x)
```

3.22 $\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 362

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

output
```
-d^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))-2*d*e*x*(-c^2*x^2+1)^(1/2)/b
/c/(a+b*arcsin(c*x))-e^2*x^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))+2*d*
e*cos(2*a/b)*Ci(2*(a+b*arcsin(c*x))/b)/b^2/c^2+d^2*Ci((a+b*arcsin(c*x))/b)
*sin(a/b)/b^2/c+1/4*e^2*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^3-3/4*e^2*C
i(3*(a+b*arcsin(c*x))/b)*sin(3*a/b)/b^2/c^3-d^2*cos(a/b)*Si((a+b*arcsin(c*
x))/b)/b^2/c-1/4*e^2*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c^3+2*d*e*sin(2*
a/b)*Si(2*(a+b*arcsin(c*x))/b)/b^2/c^2+3/4*e^2*cos(3*a/b)*Si(3*(a+b*arcsin
(c*x))/b)/b^2/c^3
```

Mathematica [A] (verified)

Time = 1.30 (sec) , antiderivative size = 290, normalized size of antiderivative = 0.80

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = -\frac{\frac{4bc^2d^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}+\frac{8bc^2dex\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}+\frac{4bc^2e^2x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}-8cde\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)-(4c^2$$

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

output
```
-1/4*((4*b*c^2*d^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (8*b*c^2*d*e*x
*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (4*b*c^2*e^2*x^2*Sqrt[1 - c^2*x^
2])/(a + b*ArcSin[c*x]) - 8*c*d*e*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin
[c*x])] - (4*c^2*d^2 + e^2)*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] + 3*e^
2*CosIntegral[3*(a/b + ArcSin[c*x])]*Sin[(3*a)/b] + 4*c^2*d^2*Cos[a/b]*Sin
Integral[a/b + ArcSin[c*x]] + e^2*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]]
- 8*c*d*e*Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - 3*e^2*Cos[(3*a
)/b]*SinIntegral[3*(a/b + ArcSin[c*x])])/(b^2*c^3)
```

Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 362, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {5244, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5244}$$

$$\int \left(\frac{d^2}{(a+b\arcsin(cx))^2}+\frac{2dex}{(a+b\arcsin(cx))^2}+\frac{e^2x^2}{(a+b\arcsin(cx))^2}\right)dx$$

$$\Big\downarrow \text{2009}$$

$$\frac{e^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3}-\frac{3e^2\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}-\frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3}+\frac{3e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}+\frac{2de\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}+\frac{2de\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}+\frac{d^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{2dex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{e^2x^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

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

output
```
-((d^2*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (2*d*e*x*Sqrt[1 - c
^2*x^2])/(b*c*(a + b*ArcSin[c*x])) - (e^2*x^2*Sqrt[1 - c^2*x^2])/(b*c*(a +
 b*ArcSin[c*x])) + (2*d*e*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))
/b])/(b^2*c^2) + (d^2*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b^2*c)
 + (e^2*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b^2*c^3) - (3*e^2*
CosIntegral[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b^2*c^3) - (d^2*Co
s[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c) - (e^2*Cos[a/b]*SinInte
gral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^3) + (2*d*e*Sin[(2*a)/b]*SinIntegral
[(2*(a + b*ArcSin[c*x]))/b])/(b^2*c^2) + (3*e^2*Cos[(3*a)/b]*SinIntegral[(
3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^3)
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Maple [A] (verified)

Time = 0.51 (sec) , antiderivative size = 526, normalized size of antiderivative = 1.45

method	result
derivativedivides	$\frac{4\arcsin(cx)\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b\,c^2d^2-4\arcsin(cx)\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b\,c^2d^2+8\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx\right.}{}$
default	$\frac{4\arcsin(cx)\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b\,c^2d^2-4\arcsin(cx)\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b\,c^2d^2+8\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx\right.}{}$

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

output
```
1/4/c^3*(4*arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*c^2*d^2-4*arcsin(c*x
)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*c^2*d^2+8*arcsin(c*x)*Si(2*arcsin(c*x)+2*
a/b)*sin(2*a/b)*b*c*d*e+8*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*b
*c*d*e+4*Ci(arcsin(c*x)+a/b)*sin(a/b)*a*c^2*d^2-4*Si(arcsin(c*x)+a/b)*cos(
a/b)*a*c^2*d^2+arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*e^2+3*arcsin(c*x
)*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b*e^2-3*arcsin(c*x)*Ci(3*arcsin(c*x)+
3*a/b)*sin(3*a/b)*b*e^2-arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*e^2-4*(
-c^2*x^2+1)^(1/2)*b*c^2*d^2+8*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a*c*d*e+8
*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a*c*d*e+Ci(arcsin(c*x)+a/b)*sin(a/b)*a
*e^2+3*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a*e^2-3*Ci(3*arcsin(c*x)+3*a/b)*
sin(3*a/b)*a*e^2-Si(arcsin(c*x)+a/b)*cos(a/b)*a*e^2-4*sin(2*arcsin(c*x))*d
*c*e*b-(-c^2*x^2+1)^(1/2)*b*e^2+cos(3*arcsin(c*x))*b*e^2)/(a+b*arcsin(c*x)
)/b^2
```

Fricas [F]

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

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

output
```
integral((e^2*x^2 + 2*d*e*x + d^2)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x)
+ a^2), x)
```

Sympy [F]

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

input
```
integrate((e*x+d)**2/(a+b*asin(c*x))**2,x)
```

output
```
Integral((d + e*x)**2/(a + b*asin(c*x))**2, x)
```

Maxima [F]

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

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

output
```
-((e^2*x^2 + 2*d*e*x + d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1) - (b^2*c*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((3*c^2*e^2*x^3 + 4*c
^2*d*e*x^2 - 2*d*e + (c^2*d^2 - 2*e^2)*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*
b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1))), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c
)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1276 vs. $2(348) = 696$.

Time = 0.25 (sec) , antiderivative size = 1276, normalized size of antiderivative = 3.52

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

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

output
```
4*b*c*d*e*arcsin(c*x)*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*
c^3*arcsin(c*x) + a*b^2*c^3) - 3*b*e^2*arcsin(c*x)*cos(a/b)^2*cos_integral
(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*c^2
*d^2*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(
c*x) + a*b^2*c^3) + 3*b*e^2*arcsin(c*x)*cos(a/b)^3*sin_integral(3*a/b + 3*
arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*b*c*d*e*arcsin(c*x)*cos
(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
a*b^2*c^3) - b*c^2*d^2*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x)
)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*a*c*d*e*cos(a/b)^2*cos_integral(2*
a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3*a*e^2*cos(a/b)^
2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^
2*c^3) + a*c^2*d^2*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsi
n(c*x) + a*b^2*c^3) + 3*a*e^2*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x
))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*a*c*d*e*cos(a/b)*sin(a/b)*sin_int
egral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - a*c^2*d^2
*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) - 2*sqrt(-c^2*x^2 + 1)*b*c^2*d*e*x/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2
*b*c*d*e*arcsin(c*x)*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c
*x) + a*b^2*c^3) + 3/4*b*e^2*arcsin(c*x)*cos_integral(3*a/b + 3*arcsin(c*x
))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*b*e^2*arcsin(c*x)*c...
```

Mupad [F(-1)]

Timed out.

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

input
```
int((d + e*x)^2/(a + b*asin(c*x))^2,x)
```

output
```
int((d + e*x)^2/(a + b*asin(c*x))^2, x)
```

Reduce [F]

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = \left(\int \frac{x^2}{asin(cx)^2 b^2+2asin(cx)ab+a^2}dx\right)e^2 + 2\left(\int \frac{x}{asin(cx)^2 b^2+2asin(cx)ab+a^2}dx\right)de + \left(\int \frac{1}{asin(cx)^2 b^2+2asin(cx)ab+a^2}dx\right)d^2$$

input
```
int((e*x+d)^2/(a+b*asin(c*x))^2,x)
```

output
```
int(x**2/(asin(c*x)**2*b**2 + 2*asin(c*x)*a*b + a**2),x)*e**2 + 2*int(x/(a
sin(c*x)**2*b**2 + 2*asin(c*x)*a*b + a**2),x)*d*e + int(1/(asin(c*x)**2*b*
*2 + 2*asin(c*x)*a*b + a**2),x)*d**2
```

3.23 $\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 16, antiderivative size = 181

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

output
```
-d*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))-e*x*(-c^2*x^2+1)^(1/2)/b/c/(a+
b*arcsin(c*x))+e*cos(2*a/b)*Ci(2*(a+b*arcsin(c*x))/b)/b^2/c^2+d*Ci((a+b*ar
csin(c*x))/b)*sin(a/b)/b^2/c-d*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c+e*si
n(2*a/b)*Si(2*(a+b*arcsin(c*x))/b)/b^2/c^2
```

Mathematica [A] (verified)

Time = 0.68 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.82

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx$$
$$= \frac{-\frac{bc(d+ex)\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + e\log(a+b\arcsin(cx)) + cd\left(\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{ar}\right.\right.}{}$$

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

output
```
(-((b*c*(d + e*x)*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])) + e*Log[a + b*Ar
cSin[c*x]] + c*d*(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - Cos[a/b]*SinIn
tegral[a/b + ArcSin[c*x]]) + e*(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c
*x])] - Log[a + b*ArcSin[c*x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[
c*x])]))/(b^2*c^2)
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5244, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx$$
$$\Big\downarrow \; 5244$$
$$\int \left(\frac{d}{(a+b\arcsin(cx))^2}+\frac{ex}{(a+b\arcsin(cx))^2}\right)dx$$
$$\Big\downarrow \; 2009$$

$$\frac{e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}+\frac{e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}+\frac{d\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{ex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

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

output
```
-((d*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (e*x*Sqrt[1 - c^2*x^2
])/(b*c*(a + b*ArcSin[c*x])) + (e*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSi
n[c*x]))/b])/(b^2*c^2) + (d*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(
b^2*c) - (d*Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c) + (e*Sin[
(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b^2*c^2)
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

Maple [A] (verified)

Time = 0.15 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.12

method	result
derivativedivides	$\frac{\frac{d\left(\arcsin(cx)\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b-\arcsin(cx)\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)a-\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\text{c}}{(a+b\arcsin(cx))b^2}}{c}$
default	$\frac{\frac{d\left(\arcsin(cx)\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b-\arcsin(cx)\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)a-\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\text{c}}{(a+b\arcsin(cx))b^2}}{c}$

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

output
```
1/c*(d*(arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b-arcsin(c*x)*Si(arcsin(c
*x)+a/b)*cos(a/b)*b+Ci(arcsin(c*x)+a/b)*sin(a/b)*a-Si(arcsin(c*x)+a/b)*cos
(a/b)*a-(-c^2*x^2+1)^(1/2)*b)/(a+b*arcsin(c*x))/b^2-1/2*sin(2*arcsin(c*x))
*e/b/c/(a+b*arcsin(c*x))+1/c*e/b^2*(Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)+Ci(
2*arcsin(c*x)+2*a/b)*cos(2*a/b)))
```

Fricas [F]

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

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

output
```
integral((e*x + d)/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]

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

input
```
integrate((e*x+d)/(a+b*asin(c*x))**2,x)
```

output
```
Integral((d + e*x)/(a + b*asin(c*x))**2, x)
```

Maxima [F]

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

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

output
```
-(sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d) - (b^2*c*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1)) + a*b*c)*integrate((2*c^2*e*x^2 + c^2*d*x - e)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)/(a*b*c^3*x^2 - a*b*c + (b^2*c^3*x^2 - b^2*c)*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 554 vs. $2(177) = 354$.

Time = 0.18 (sec) , antiderivative size = 554, normalized size of antiderivative = 3.06

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx = \text{Too large to display}$$

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

output
```
2*b*e*arcsin(c*x)*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*
arcsin(c*x) + a*b^2*c^2) + b*c*d*arcsin(c*x)*cos_integral(a/b + arcsin(c*x
))*sin(a/b)/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 2*b*e*arcsin(c*x)*cos(a/b)
*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2
*c^2) - b*c*d*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^
2*arcsin(c*x) + a*b^2*c^2) + 2*a*e*cos(a/b)^2*cos_integral(2*a/b + 2*arcsi
n(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + a*c*d*cos_integral(a/b + arcsi
n(c*x))*sin(a/b)/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) + 2*a*e*cos(a/b)*sin(a/
b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) -
 a*c*d*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b
^2*c^2) - sqrt(-c^2*x^2 + 1)*b*c*e*x/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) - b
*e*arcsin(c*x)*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*arcsin(c*x) +
a*b^2*c^2) - sqrt(-c^2*x^2 + 1)*b*c*d/(b^3*c^2*arcsin(c*x) + a*b^2*c^2) -
a*e*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^2*arcsin(c*x) + a*b^2*c^2)
```

Mupad [F(-1)]

Timed out.

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

input
```
int((d + e*x)/(a + b*asin(c*x))^2,x)
```

output
```
int((d + e*x)/(a + b*asin(c*x))^2, x)
```

Reduce [F]

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

input
```
int((e*x+d)/(a+b*asin(c*x))^2,x)
```

output
```
int(x/(asin(c*x)**2*b**2 + 2*asin(c*x)*a*b + a**2),x)*e + int(1/(asin(c*x)
**2*b**2 + 2*asin(c*x)*a*b + a**2),x)*d
```

3.24 $\int \frac{1}{(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 10, antiderivative size = 86

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}+\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}$$

output
```
-(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))+Ci((a+b*arcsin(c*x))/b)*sin(a/b)
/b^2/c-cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c
```

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.84

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

input
```
Integrate[(a + b*ArcSin[c*x])^(-2),x]
```

output
```
(-((b*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])) + CosIntegral[a/b + ArcSin[c
*x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c)
```

Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.97, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.900$, Rules used = {5132, 5224, 25, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(cx))^2}dx$$

$$\Big\downarrow \text{5132}$$

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

$$\Big\downarrow \text{5224}$$

$$-\frac{\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \text{25}$$

$$\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \text{3784}$$

$$-\frac{-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))-\cos\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \; 25$$

$$-\frac{\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \; 3042$$

$$-\frac{\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))-\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \; 3780$$

$$-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)-\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \; 3783$$

$$-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)-\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

input
```
Int[(a + b*ArcSin[c*x])^(-2),x]
```

output
```
-(Sqrt[1 - c^2*x^2]/(b*c*(a + b*ArcSin[c*x]))) - (-(CosIntegral[(a + b*Arc
Sin[c*x])/b]*Sin[a/b]) + Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2
*c)
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.87

method	result	size
derivativedivides	$\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b}+\frac{\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b^2}}{c}$	75
default	$\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b}+\frac{\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b^2}}{c}$	75

input
```
int(1/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(-(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))/b+(Ci(arcsin(c*x)+a/b)*sin(a/b)
-Si(arcsin(c*x)+a/b)*cos(a/b))/b^2)
```

Fricas [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
integral(1/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx=\int \frac{1}{(a+b\operatorname{asin}(cx))^2}\,dx$$

input
```
integrate(1/(a+b*asin(c*x))**2,x)
```

output
```
Integral((a + b*asin(c*x))**(-2), x)
```

Maxima [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(b\arcsin{(cx)}+a)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
((b^2*c^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c^2)*integrate(
sqrt(c*x + 1)*sqrt(-c*x + 1)*x/(a*b*c^2*x^2 - a*b + (b^2*c^2*x^2 - b^2)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x) - sqrt(c*x + 1)*sqrt(-c*x +
1))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 192 vs. 2(84) = 168.

Time = 0.12 (sec) , antiderivative size = 192, normalized size of antiderivative = 2.23

$$\begin{aligned}\int \frac{1}{(a+b\arcsin(cx))^2}\,dx &= \frac{b\arcsin{(cx)}\operatorname{Ci}\left(\frac{a}{b}+\arcsin{(cx)}\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin{(cx)}+ab^2c} \\ &\quad - \frac{b\arcsin{(cx)}\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin{(cx)}\right)}{b^3c\arcsin{(cx)}+ab^2c} \\ &\quad + \frac{a\operatorname{Ci}\left(\frac{a}{b}+\arcsin{(cx)}\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin{(cx)}+ab^2c} \\ &\quad - \frac{a\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin{(cx)}\right)}{b^3c\arcsin{(cx)}+ab^2c} - \frac{\sqrt{-c^2x^2+1}\,b}{b^3c\arcsin{(cx)}+ab^2c}\end{aligned}$$

input
```
integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
b*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x)
+ a*b^2*c) - b*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c
*arcsin(c*x) + a*b^2*c) + a*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*
c*arcsin(c*x) + a*b^2*c) - a*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3
*c*arcsin(c*x) + a*b^2*c) - sqrt(-c^2*x^2 + 1)*b/(b^3*c*arcsin(c*x) + a*b^
2*c)
```

Mupad [F(-1)]

Timed out.

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

input
```
int(1/(a + b*asin(c*x))^2,x)
```

output
```
int(1/(a + b*asin(c*x))^2, x)
```

Reduce [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{asin\left(cx\right)^2 b^2+2asin\left(cx\right)ab+a^2}dx$$

input
```
int(1/(a+b*asin(c*x))^2,x)
```

output
```
int(1/(asin(c*x)**2*b**2 + 2*asin(c*x)*a*b + a**2),x)
```

3.25 $\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{1}{(d+ex)(a+b\arcsin(cx))^2},x\right)$$

output
```
Defer(Int)(1/(e*x+d)/(a+b*arcsin(c*x))^2,x)
```

Mathematica [N/A]

Not integrable

Time = 8.30 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$$

input
```
Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])^2),x]
```

output
```
Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])^2), x]
```

Rubi [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2} \, dx$$

$$\Big\downarrow \ 5300$$

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}dx$$

input
```
Int[1/((d + e*x)*(a + b*ArcSin[c*x])^2),x]
```

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 6.86 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ex+d)\left(a+b\arcsin\left(cx\right)\right)^{2}}dx$$

input
```
int(1/(e*x+d)/(a+b*arcsin(c*x))^2,x)
```

output
```
int(1/(e*x+d)/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 51, normalized size of antiderivative = 2.83

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
integral(1/(a^2*e*x + a^2*d + (b^2*e*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*e*x
 + a*b*d)*arcsin(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 1.70 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\operatorname{asin}(cx))^2(d+ex)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*asin(c*x))**2,x)
```

output
```
Integral(1/((a + b*asin(c*x))**2*(d + e*x)), x)
```

Maxima [N/A]

Not integrable

Time = 1.56 (sec) , antiderivative size = 297, normalized size of antiderivative = 16.50

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
((a*b*c*e*x + a*b*c*d + (b^2*c*e*x + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)))*integrate((c^2*d*x + e)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*
c^3*e^2*x^4 + 2*a*b*c^3*d*e*x^3 - 2*a*b*c*d*e*x - a*b*c*d^2 + (a*b*c^3*d^2
 - a*b*c*e^2)*x^2 + (b^2*c^3*e^2*x^4 + 2*b^2*c^3*d*e*x^3 - 2*b^2*c*d*e*x -
 b^2*c*d^2 + (b^2*c^3*d^2 - b^2*c*e^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))), x) - sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*e*x + a*b*c*d + (
b^2*c*e*x + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
integrate(1/((e*x + d)*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
int(1/((a + b*asin(c*x))^2*(d + e*x)),x)
```

output
```
int(1/((a + b*asin(c*x))^2*(d + e*x)), x)
```

Reduce [N/A]

Not integrable

Time = 0.21 (sec) , antiderivative size = 58, normalized size of antiderivative = 3.22

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$$
$$= \int \frac{1}{asin(cx)^2 b^2 d + asin(cx)^2 b^2 ex + 2asin(cx)\,abd + 2asin(cx)\,abex + a^2 d + a^2 ex}dx$$

input
```
int(1/(e*x+d)/(a+b*asin(c*x))^2,x)
```

output
```
int(1/(asin(c*x)**2*b**2*d + asin(c*x)**2*b**2*e*x + 2*asin(c*x)*a*b*d + 2
*asin(c*x)*a*b*e*x + a**2*d + a**2*e*x),x)
```

3.26 $\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{1}{(d+ex)^2(a+b\arcsin(cx))^2},x\right)$$

output
```
Defer(Int)(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x)
```

Mathematica [N/A]

Not integrable

Time = 10.32 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$$

input
```
Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])^2),x]
```

output
```
Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])^2), x]
```

Rubi [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$$

$$\Big\downarrow \text{ 5300}$$

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}dx$$

input
```
Int[1/((d + e*x)^2*(a + b*ArcSin[c*x])^2),x]
```

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 2.18 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ex+d)^2\,(a+b\arcsin(cx))^2}dx$$

input
```
int(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x)
```

output
```
int(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 92, normalized size of antiderivative = 5.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
integral(1/(a^2*e^2*x^2 + 2*a^2*d*e*x + a^2*d^2 + (b^2*e^2*x^2 + 2*b^2*d*e
*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*e^2*x^2 + 2*a*b*d*e*x + a*b*d^2)*arcs
in(c*x)), x)
```

Sympy [N/A]

Not integrable

Time = 8.48 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.06

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))^2\,(d+ex)^2}\,dx$$

input
```
integrate(1/(e*x+d)**2/(a+b*asin(c*x))**2,x)
```

output
```
Integral(1/((a + b*asin(c*x))**2*(d + e*x)**2), x)
```

Maxima [N/A]

Not integrable

Time = 2.70 (sec) , antiderivative size = 426, normalized size of antiderivative = 23.67

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
-((a*b*c*e^2*x^2 + 2*a*b*c*d*e*x + a*b*c*d^2 + (b^2*c*e^2*x^2 + 2*b^2*c*d*
e*x + b^2*c*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((c^
2*e*x^2 - c^2*d*x - 2*e)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*e^3*x^5 + 3
*a*b*c^3*d*e^2*x^4 - 3*a*b*c*d^2*e*x - a*b*c*d^3 + (3*a*b*c^3*d^2*e - a*b*
c*e^3)*x^3 + (a*b*c^3*d^3 - 3*a*b*c*d*e^2)*x^2 + (b^2*c^3*e^3*x^5 + 3*b^2*
c^3*d*e^2*x^4 - 3*b^2*c*d^2*e*x - b^2*c*d^3 + (3*b^2*c^3*d^2*e - b^2*c*e^3
)*x^3 + (b^2*c^3*d^3 - 3*b^2*c*d*e^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))), x) + sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*e^2*x^2 + 2*a*b*c*
d*e*x + a*b*c*d^2 + (b^2*c*e^2*x^2 + 2*b^2*c*d*e*x + b^2*c*d^2)*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

Giac [N/A]

Not integrable

Time = 0.99 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
integrate(1/((e*x + d)^2*(b*arcsin(c*x) + a)^2), x)
```

Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
int(1/((a + b*asin(c*x))^2*(d + e*x)^2),x)
```

output
```
int(1/((a + b*asin(c*x))^2*(d + e*x)^2), x)
```

Reduce [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 109, normalized size of antiderivative = 6.06

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$$
$$= \int \frac{1}{asin\left(cx\right)^2 b^2d^2 + 2asin\left(cx\right)^2 b^2dex + asin\left(cx\right)^2 b^2e^2x^2 + 2asin\left(cx\right)ab\,d^2 + 4asin\left(cx\right)abdex + 2asin\left(\right.}$$

input
```
int(1/(e*x+d)^2/(a+b*asin(c*x))^2,x)
```

output
```
int(1/(asin(c*x)**2*b**2*d**2 + 2*asin(c*x)**2*b**2*d*e*x + asin(c*x)**2*b
**2*e**2*x**2 + 2*asin(c*x)*a*b*d**2 + 4*asin(c*x)*a*b*d*e*x + 2*asin(c*x)
*a*b*e**2*x**2 + a**2*d**2 + 2*a**2*d*e*x + a**2*e**2*x**2),x)
```

3.27 $\int (d+ex)^p(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

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

output
```
(e*x+d)^(p+1)*(a+b*arcsin(c*x))^2/e/(p+1)-2*b*c*Defer(Int)((e*x+d)^(p+1)*(
a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)/e/(p+1)
```

Mathematica [N/A]

Not integrable

Time = 9.47 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

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

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

Rubi [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5242}$$

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

$$\Big\downarrow \text{5300}$$

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

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

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

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

input
```
int((e*x+d)^p*(a+b*arcsin(c*x))^2,x)
```

output
```
int((e*x+d)^p*(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.78

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

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

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*(e*x + d)^p, x)
```

Sympy [N/A]

Not integrable

Time = 13.80 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int (d+ex)^p(a+b\arcsin(cx))^2 dx = \int (a+b\operatorname{asin}(cx))^2 (d+ex)^p dx$$

input
```
integrate((e*x+d)**p*(a+b*asin(c*x))**2,x)
```

output
```
Integral((a + b*asin(c*x))**2*(d + e*x)**p, x)
```

Maxima [N/A]

Not integrable

Time = 1.94 (sec) , antiderivative size = 227, normalized size of antiderivative = 12.61

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

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

output
```
(e*x + d)^(p + 1)*a^2/(e*(p + 1)) + ((b^2*e*x + b^2*d)*(e*x + d)^p*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + (e*p + e)*integrate(2*((b^2*c*e*x
+ b^2*c*d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^p*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) - (a*b*e*p + a*b*e - (a*b*c^2*e*p + a*b*c^2*e)*x^2)*(
e*x + d)^p*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/((c^2*e*p + c^2*e)*
x^2 - e*p - e), x))/(e*p + e)
```

Giac [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

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

output
```
integrate((b*arcsin(c*x) + a)^2*(e*x + d)^p, x)
```

Mupad [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int (d+ex)^p(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+e\,x)^p\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + e*x)^p,x)
```

output
```
int((a + b*asin(c*x))^2*(d + e*x)^p, x)
```

Reduce [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 117, normalized size of antiderivative = 6.50

$$\int (d+ex)^p(a+b\arcsin(cx))^2\,dx = \frac{(ex+d)^p\,a^2d+(ex+d)^p\,a^2ex+2\left(\int (ex+d)^p\,asin(cx)\,dx\right)abep+2\left(\int (ex+d)^p\,asin(cx)\,dx\right)abe+\left(\int\right.}{e\,(p+1)}$$

input
```
int((e*x+d)^p*(a+b*asin(c*x))^2,x)
```

output
```
((d + e*x)**p*a**2*d + (d + e*x)**p*a**2*e*x + 2*int((d + e*x)**p*asin(c*x
),x)*a*b*e*p + 2*int((d + e*x)**p*asin(c*x),x)*a*b*e + int((d + e*x)**p*as
in(c*x)**2,x)*b**2*e*p + int((d + e*x)**p*asin(c*x)**2,x)*b**2*e)/(e*(p +
1))
```

3.28 $\int (d+ex)^p(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 16, antiderivative size = 154

$$\int (d+ex)^p(a+b\arcsin(cx))\,dx = -\frac{bc(d+ex)^{2+p}\sqrt{1-\frac{c(d+ex)}{cd-e}}\sqrt{1-\frac{c(d+ex)}{cd+e}}\operatorname{AppellF1}\left(2+p,\frac{1}{2},\frac{1}{2},3+p,\frac{c(d+ex)}{cd-e},\frac{c(d+ex)}{cd+e}\right)}{e^2(1+p)(2+p)\sqrt{1-c^2x^2}} + \frac{(d+ex)^{1+p}(a+b\arcsin(cx))}{e(1+p)}$$

output
```
-b*c*(e*x+d)^(2+p)*(1-c*(e*x+d)/(c*d-e))^(1/2)*(1-c*(e*x+d)/(c*d+e))^(1/2)
*AppellF1(2+p,1/2,1/2,3+p,c*(e*x+d)/(c*d-e),c*(e*x+d)/(c*d+e))/e^2/(p+1)/(
2+p)/(-c^2*x^2+1)^(1/2)+(e*x+d)^(p+1)*(a+b*arcsin(c*x))/e/(p+1)
```

Mathematica [F]

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

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

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

Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.81, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {5242, 513, 156, 155}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{ 5242}$$

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

$$\Big\downarrow \text{ 513}$$

$$\frac{(d+ex)^{p+1}(a+b\arcsin(cx))}{e(p+1)}-\frac{bc\int \frac{(d+ex)^{p+1}}{\sqrt{1-cx}\sqrt{cx+1}}dx}{e(p+1)}$$

$$\Big\downarrow \text{ 156}$$

$$\frac{(d+ex)^{p+1}(a+b\arcsin(cx))}{e(p+1)}-\frac{b(cd+e)(d+ex)^p\left(\frac{c(d+ex)}{cd+e}\right)^{-p}\int \frac{\left(\frac{cd}{cd+e}+\frac{cex}{cd+e}\right)^{p+1}}{\sqrt{1-cx}\sqrt{cx+1}}dx}{e(p+1)}$$

$$\Big\downarrow \text{ 155}$$

$$\frac{(d+ex)^{p+1}(a+b\arcsin(cx))}{e(p+1)}+\frac{\sqrt{2}b\sqrt{1-cx}(cd+e)(d+ex)^p\left(\frac{c(d+ex)}{cd+e}\right)^{-p}\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-p-1,\frac{3}{2},\frac{1}{2}(1-cx),\frac{e(1-cx)}{cd+e}\right)}{ce(p+1)}$$

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

output
```
(Sqrt[2]*b*(c*d + e)*Sqrt[1 - c*x]*(d + e*x)^p*AppellF1[1/2, 1/2, -1 - p,
3/2, (1 - c*x)/2, (e*(1 - c*x))/(c*d + e)])/(c*e*(1 + p)*((c*(d + e*x))/(c
*d + e))^p) + ((d + e*x)^(1 + p)*(a + b*ArcSin[c*x]))/(e*(1 + p))
```

Defintions of rubi rules used

rule 155
```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_] :> Simp[((a + b*x)^(m + 1)/(b*(m + 1)*Simplify[b/(b*c - a*d)]^n*
Simplify[b/(b*e - a*f)]^p))*AppellF1[m + 1, -n, -p, m + 2, (-d)*((a + b*x)/
(b*c - a*d)), (-f)*((a + b*x)/(b*e - a*f))], x] /; FreeQ[{a, b, c, d, e, f,
 m, n, p}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[Sim
plify[b/(b*c - a*d)], 0] && GtQ[Simplify[b/(b*e - a*f)], 0] &&  !(GtQ[Simpl
ify[d/(d*a - c*b)], 0] && GtQ[Simplify[d/(d*e - c*f)], 0] && SimplerQ[c + d
*x, a + b*x]) &&  !(GtQ[Simplify[f/(f*a - e*b)], 0] && GtQ[Simplify[f/(f*c
- e*d)], 0] && SimplerQ[e + f*x, a + b*x])
```

rule 156
```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_] :> Simp[(e + f*x)^FracPart[p]/(Simplify[b/(b*e - a*f)]^IntPart[p
]*(b*((e + f*x)/(b*e - a*f)))^FracPart[p])   Int[(a + b*x)^m*(c + d*x)^n*Si
mp[b*(e/(b*e - a*f)) + b*f*(x/(b*e - a*f)), x]^p, x], x] /; FreeQ[{a, b, c,
 d, e, f, m, n, p}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] &
& GtQ[Simplify[b/(b*c - a*d)], 0] &&  !GtQ[Simplify[b/(b*e - a*f)], 0]
```

rule 513
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
a^p   Int[(c + d*x)^n*(1 + Rt[-b/a, 2]*x)^p*(1 - Rt[-b/a, 2]*x)^p, x], x] /
; FreeQ[{a, b, c, d, n, p}, x] && GtQ[a, 0] && NegQ[b/a]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

Maple [F]

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

input
```
int((e*x+d)^p*(a+b*arcsin(c*x)),x)
```

output
```
int((e*x+d)^p*(a+b*arcsin(c*x)),x)
```

Fricas [F]

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

input
```
integrate((e*x+d)^p*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral((b*arcsin(c*x) + a)*(e*x + d)^p, x)
```

Sympy [F]

$$\int (d+ex)^p(a+b\arcsin(cx))\,dx = \int (a+b\operatorname{asin}(cx))\,(d+ex)^p\,dx$$

input
```
integrate((e*x+d)**p*(a+b*asin(c*x)),x)
```

output
```
Integral((a + b*asin(c*x))*(d + e*x)**p, x)
```

Maxima [F]

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

input
```
integrate((e*x+d)^p*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
((e*x + d)*(e*x + d)^p*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (e*p +
 e)*integrate((c*e*x + c*d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^p/((c^2
*e*p + c^2*e)*x^2 - e*p - e), x))*b/(e*p + e) + (e*x + d)^(p + 1)*a/(e*(p
+ 1))
```

Giac [F]

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

input
```
integrate((e*x+d)^p*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)*(e*x + d)^p, x)
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))*(d + e*x)^p,x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^p, x)
```

Reduce [F]

$$\int (d+ex)^p(a+b\arcsin(cx))\,dx$$
$$=\frac{(ex+d)^p\,ad+(ex+d)^p\,aex+\left(\int(ex+d)^p\,asin(cx)\,dx\right)bep+\left(\int(ex+d)^p\,asin(cx)\,dx\right)be}{e\,(p+1)}$$

input
```
int((e*x+d)^p*(a+b*asin(c*x)),x)
```

output
```
((d + e*x)**p*a*d + (d + e*x)**p*a*e*x + int((d + e*x)**p*asin(c*x),x)*b*e
*p + int((d + e*x)**p*asin(c*x),x)*b*e)/(e*(p + 1))
```

3.29 $\int \frac{(d+ex)^p}{a+b\arcsin(cx)}\,dx$

Optimal result

Integrand size = 18, antiderivative size = 18

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

output
```
Defer(Int)((e*x+d)^p/(a+b*arcsin(c*x)),x)
```

Mathematica [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

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

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

Rubi [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{ 5300}$$

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

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

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 3.02 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

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

input
```
int((e*x+d)^p/(a+b*arcsin(c*x)),x)
```

output
```
int((e*x+d)^p/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
integrate((e*x+d)^p/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral((e*x + d)^p/(b*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 0.92 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.83

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

input
```
integrate((e*x+d)**p/(a+b*asin(c*x)),x)
```

output
```
Integral((d + e*x)**p/(a + b*asin(c*x)), x)
```

Maxima [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
integrate((e*x+d)^p/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
integrate((e*x + d)^p/(b*arcsin(c*x) + a), x)
```

Giac [N/A]

Not integrable

Time = 0.18 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
integrate((e*x+d)^p/(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
integrate((e*x + d)^p/(b*arcsin(c*x) + a), x)
```

Mupad [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
int((d + e*x)^p/(a + b*asin(c*x)),x)
```

output
```
int((d + e*x)^p/(a + b*asin(c*x)), x)
```

Reduce [N/A]

Not integrable

Time = 200.03 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
int((e*x+d)^p/(a+b*asin(c*x)),x)
```

output
```
int((e*x+d)^p/(a+b*asin(c*x)),x)
```

3.30 $\int \frac{(d+ex)^p}{(a+b\arcsin(cx))^2} dx$

Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{(d+ex)^p}{(a+b\arcsin(cx))^2} dx = \operatorname{Int}\left(\frac{(d+ex)^p}{(a+b\arcsin(cx))^2}, x\right)$$

output
```
Defer(Int)((e*x+d)^p/(a+b*arcsin(c*x))^2,x)
```

Mathematica [N/A]

Not integrable

Time = 0.61 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
Integrate[(d + e*x)^p/(a + b*ArcSin[c*x])^2,x]
```

output
```
Integrate[(d + e*x)^p/(a + b*ArcSin[c*x])^2, x]
```

Rubi [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{ 5300}$$

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

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

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 1.58 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

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

input
```
int((e*x+d)^p/(a+b*arcsin(c*x))^2,x)
```

output
```
int((e*x+d)^p/(a+b*arcsin(c*x))^2,x)
```

Fricas [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.89

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

input
```
integrate((e*x+d)^p/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
integral((e*x + d)^p/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

Sympy [N/A]

Not integrable

Time = 16.89 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int \frac{(d+ex)^p}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(d+ex)^p}{(a+b\operatorname{asin}(cx))^2}\,dx$$

input
```
integrate((e*x+d)**p/(a+b*asin(c*x))**2,x)
```

output
```
Integral((d + e*x)**p/(a + b*asin(c*x))**2, x)
```

Maxima [N/A]

Not integrable

Time = 1.70 (sec) , antiderivative size = 237, normalized size of antiderivative = 13.17

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

input
```
integrate((e*x+d)^p/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
-(sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^p - (b^2*c*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((c^2*d*x + (c^2*e*p + c^2*e)*x^2 -
 e*p)*sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^p/(a*b*c^3*e*x^3 + a*b*c^3*d*
x^2 - a*b*c*e*x - a*b*c*d + (b^2*c^3*e*x^3 + b^2*c^3*d*x^2 - b^2*c*e*x - b
^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x))/(b^2*c*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

Giac [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
integrate((e*x+d)^p/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
integrate((e*x + d)^p/(b*arcsin(c*x) + a)^2, x)
```

Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^p}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(d+e\,x)^p}{(a+b\,\mathrm{asin}\,(c\,x))^2}\,dx$$

input
```
int((d + e*x)^p/(a + b*asin(c*x))^2,x)
```

output
```
int((d + e*x)^p/(a + b*asin(c*x))^2, x)
```

Reduce [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.89

$$\int \frac{(d+ex)^p}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(ex+d)^p}{asin(cx)^2 b^2 + 2asin(cx)ab + a^2}dx$$

input
```
int((e*x+d)^p/(a+b*asin(c*x))^2,x)
```

output
```
int((d + e*x)**p/(asin(c*x)**2*b**2 + 2*asin(c*x)*a*b + a**2),x)
```

3.31 $\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 358

$$\begin{aligned}
&\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx \\
&= \frac{b(5c^4d^3f+e^3g+5c^2de(ef+dg))\sqrt{1-c^2x^2}}{5c^5} \\
&\quad + \frac{b(8c^2d^2(3ef+dg)+3e^2(ef+3dg))\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{be^2(ef+3dg)x^3\sqrt{1-c^2x^2}}{16c} \\
&\quad - \frac{be(2e^2g+5c^2d(ef+dg))\,(1-c^2x^2)^{3/2}}{15c^5} + \frac{be^3g(1-c^2x^2)^{5/2}}{25c^5} \\
&\quad - \frac{b(8c^2d^2(3ef+dg)+3e^2(ef+3dg))\arcsin(cx)}{32c^4} + d^3fx(a+b\arcsin(cx)) \\
&\quad + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) + de(ef+dg)x^3(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}e^2(ef+3dg)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^3gx^5(a+b\arcsin(cx))
\end{aligned}$$

output
```
1/5*b*(5*c^4*d^3*f+e^3*g+5*c^2*d*e*(d*g+e*f))*(-c^2*x^2+1)^(1/2)/c^5+1/32*
b*(8*c^2*d^2*(d*g+3*e*f)+3*e^2*(3*d*g+e*f))*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*
b*e^2*(3*d*g+e*f)*x^3*(-c^2*x^2+1)^(1/2)/c-1/15*b*e*(2*e^2*g+5*c^2*d*(d*g+
e*f))*(-c^2*x^2+1)^(3/2)/c^5+1/25*b*e^3*g*(-c^2*x^2+1)^(5/2)/c^5-1/32*b*(8
*c^2*d^2*(d*g+3*e*f)+3*e^2*(3*d*g+e*f))*arcsin(c*x)/c^4+d^3*f*x*(a+b*arcsi
n(c*x))+1/2*d^2*(d*g+3*e*f)*x^2*(a+b*arcsin(c*x))+d*e*(d*g+e*f)*x^3*(a+b*a
rcsin(c*x))+1/4*e^2*(3*d*g+e*f)*x^4*(a+b*arcsin(c*x))+1/5*e^3*g*x^5*(a+b*a
rcsin(c*x))
```

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 305, normalized size of antiderivative = 0.85

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{120ac^5x(10d^3(2f+gx)+10d^2ex(3f+2gx)+5de^2x^2(4f+3gx)+e^3x^3(5f+4gx))+b\sqrt{1-c^2x^2}(256e}{}$$

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

output
```
(120*a*c^5*x*(10*d^3*(2*f + g*x) + 10*d^2*e*x*(3*f + 2*g*x) + 5*d*e^2*x^2*
(4*f + 3*g*x) + e^3*x^3*(5*f + 4*g*x)) + b*Sqrt[1 - c^2*x^2]*(256*e^3*g +
2*c^4*(300*d^3*(4*f + g*x) + 100*d^2*e*x*(9*f + 4*g*x) + 25*d*e^2*x^2*(16*
f + 9*g*x) + 3*e^3*x^3*(25*f + 16*g*x)) + c^2*e*(1600*d^2*g + 25*d*e*(64*f
 + 27*g*x) + e^2*x*(225*f + 128*g*x))) + 15*b*c*(-40*c^2*d^2*(3*e*f + d*g)
 - 15*e^2*(e*f + 3*d*g) + 8*c^4*x*(10*d^3*(2*f + g*x) + 10*d^2*e*x*(3*f +
2*g*x) + 5*d*e^2*x^2*(4*f + 3*g*x) + e^3*x^3*(5*f + 4*g*x)))*ArcSin[c*x])/
(2400*c^5)
```

Rubi [A] (verified)

Time = 1.44 (sec) , antiderivative size = 379, normalized size of antiderivative = 1.06, number of steps used = 13, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.619$, Rules used = {5248, 27, 2340, 25, 2340, 25, 2340, 25, 27, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5248}$$

$$-bc\int \frac{x\left(4e^3gx^4+5e^2(ef+3dg)x^3+20de(ef+dg)x^2+10d^2(3ef+dg)x+20d^3f\right)}{20\sqrt{1-c^2x^2}}dx+d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{20}bc\int \frac{x\left(4e^3gx^4+5e^2(ef+3dg)x^3+20de(ef+dg)x^2+10d^2(3ef+dg)x+20d^3f\right)}{\sqrt{1-c^2x^2}}dx+d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \text{2340}$$

$$-\frac{1}{20}bc\left(-\frac{\int -\frac{x\left(100c^2fd^3+50c^2(3ef+dg)xd^2+25c^2e^2(ef+3dg)x^3+4e\left(25d(ef+dg)c^2+4e^2g\right)x^2\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{4e^3gx^4\sqrt{1-c^2x^2}}{5c^2}\right)+d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \text{25}$$

$$-\frac{1}{20}bc\left(\frac{\int \frac{x(100c^2fd^3+50c^2(3ef+dg)xd^2+25c^2e^2(ef+3dg)x^3+4e(25d(ef+dg)c^2+4e^2g)x^2)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{4e^3gx^4\sqrt{1-c^2x^2}}{5c^2}\right)+$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{20}bc\left(\frac{-\frac{\int -\frac{x\left(400d^3fc^4+16e\left(25d(ef+dg)c^2+4e^2g\right)x^2c^2+25\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}e^2x^3\sqrt{1-c^2x^2}(3dg+ef)}{5c^2}-\frac{4\ldots}{}\right.$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 25

$$-\frac{1}{20}bc\left(\frac{\frac{\int \frac{x\left(400d^3fc^4+16e\left(25d(ef+dg)c^2+4e^2g\right)x^2c^2+25\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}e^2x^3\sqrt{1-c^2x^2}(3dg+ef)}{5c^2}-\frac{4e^3g\ldots}{}\right.$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{20}bc\left(\frac{\frac{-\frac{\int -\frac{c^2x\left(75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2+16\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}ex^2\sqrt{1-c^2x^2}\left(25c^2d(dg+ef)+4e^2g\right)}{4c^2}-\frac{25}{4}e^{\ldots}}{5c^2}\right.$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 25

$$-\frac{1}{20}bc\left(\frac{\frac{\frac{\int \frac{c^2x\left(75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2+16\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}ex^2\sqrt{1-c^2x^2}\left(25c^2d(dg+ef)+4e^2g\right)}{4c^2}-\frac{25}{4}e^2x^3}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{20}bc\left(\frac{\frac{\frac{1}{3}\int \frac{x\left(75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2+16\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}ex^2\sqrt{1-c^2x^2}\left(25c^2d(dg+ef)+4e^2g\right)}{4c^2}-\frac{25}{4}e^2x^3}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 533$$

$$-\frac{1}{20}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{\int \frac{c^2\left(75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)+32\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)x\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{75}{2}x\sqrt{1-c^2x^2}\left(8c^2d^2(dg+3ef)+3e^2(3dg+ef)\right)\right)-}{4c^2}}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{20}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\int \frac{75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)+32\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)x}{\sqrt{1-c^2x^2}}dx-\frac{75}{2}x\sqrt{1-c^2x^2}\left(8c^2d^2(dg+3ef)+3e^2(3dg+ef)\right)\right)-\frac{16}{3}e}{4c^2}}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 455

$$-\frac{1}{20}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{1}{2}\left(75\left(8c^2d^2(dg+3ef)+3e^2(3dg+ef)\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-\frac{32\sqrt{1-c^2x^2}\left(75c^4d^3f+50c^2de(dg+ef)+8e^3g\right)}{c^2}\right)-\frac{75}{2}x\sqrt{1-c^2x^2}\left(8c^2d^2(dg+3e\right.}{4c^2}}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 223

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))-\frac{1}{20}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{1}{2}\left(\frac{75\arcsin(cx)\left(8c^2d^2(dg+3ef)+3e^2(3dg+ef)\right)}{c}-\frac{32\sqrt{1-c^2x^2}\left(75c^4d^3f+50c^2de(dg+ef)+8e^3g\right)}{c^2}\right)-\frac{75}{2}x\sqrt{1-c^2x^2}\left(8c^2d^2(dg+3ef)+3e^2(3d\right.}{4c^2}}{5c^2}\right.$$

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

output
```
d^3*f*x*(a + b*ArcSin[c*x]) + (d^2*(3*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/
2 + d*e*(e*f + d*g)*x^3*(a + b*ArcSin[c*x]) + (e^2*(e*f + 3*d*g)*x^4*(a +
b*ArcSin[c*x]))/4 + (e^3*g*x^5*(a + b*ArcSin[c*x]))/5 - (b*c*((-4*e^3*g*x^
4*Sqrt[1 - c^2*x^2])/(5*c^2) + ((-25*e^2*(e*f + 3*d*g)*x^3*Sqrt[1 - c^2*x^
2])/4 + ((-16*e*(4*e^2*g + 25*c^2*d*(e*f + d*g))*x^2*Sqrt[1 - c^2*x^2])/3
+ ((-75*(8*c^2*d^2*(3*e*f + d*g) + 3*e^2*(e*f + 3*d*g))*x*Sqrt[1 - c^2*x^2
])/2 + ((-32*(75*c^4*d^3*f + 8*e^3*g + 50*c^2*d*e*(e*f + d*g))*Sqrt[1 - c^
2*x^2])/c^2 + (75*(8*c^2*d^2*(3*e*f + d*g) + 3*e^2*(e*f + 3*d*g))*ArcSin[c
*x])/c)/2)/3)/(4*c^2))/(5*c^2)))/20
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.31 (sec) , antiderivative size = 426, normalized size of antiderivative = 1.19

method	result
parts	$a\left(\frac{e^3 g\,x^5}{5}+\frac{(3d\,e^2 g+e^3 f)x^4}{4}+\frac{(3d^2 eg+3d\,e^2 f)x^3}{3}+\frac{(d^3 g+3d^2 ef)x^2}{2}+d^3 fx\right)+\frac{b\left(\frac{c\arcsin(cx)e^3 g\,x^5}{5}+\frac{3c}{}\right.}{}$
derivativedivides	$\frac{a\left(\frac{e^3 g\,c^5 x^5}{5}+\frac{\left(3cd\,e^2 g+e^3 fc\right)c^4 x^4}{4}+\frac{\left(3e\,c^2 d^2 g+3c^2 d\,e^2 f\right)c^3 x^3}{3}+\frac{\left(d^3 c^3 g+3e\,c^3 d^2 f\right)c^2 x^2}{2}+c^5 d^3 fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)e^3 g\,c^5 x^5}{5}+\right.}{}$
default	$\frac{a\left(\frac{e^3 g\,c^5 x^5}{5}+\frac{\left(3cd\,e^2 g+e^3 fc\right)c^4 x^4}{4}+\frac{\left(3e\,c^2 d^2 g+3c^2 d\,e^2 f\right)c^3 x^3}{3}+\frac{\left(d^3 c^3 g+3e\,c^3 d^2 f\right)c^2 x^2}{2}+c^5 d^3 fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)e^3 g\,c^5 x^5}{5}+\right.}{}$
orering	$\frac{(864c^6 e^4 g^2 x^7+4176c^6 d\,e^3 g^2 x^6+1968c^6 e^4 fg\,x^6+7850c^6 d^2 e^2 g^2 x^5+9980c^6 d\,e^3 fg\,x^5+1050c^6 e^4 f^2 x^5+6800c^6 d^3 e\,g^2 x^4}{}$

input
```
int((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/5*e^3*g*x^5+1/4*(3*d*e^2*g+e^3*f)*x^4+1/3*(3*d^2*e*g+3*d*e^2*f)*x^3+1
/2*(d^3*g+3*d^2*e*f)*x^2+d^3*f*x)+b/c*(1/5*c*arcsin(c*x)*e^3*g*x^5+3/4*c*a
rcsin(c*x)*x^4*d*e^2*g+1/4*c*arcsin(c*x)*x^4*e^3*f+c*arcsin(c*x)*x^3*d^2*e
*g+c*arcsin(c*x)*x^3*d*e^2*f+1/2*c*arcsin(c*x)*x^2*d^3*g+3/2*c*arcsin(c*x)
*x^2*d^2*e*f+arcsin(c*x)*d^3*f*c*x-1/60/c^4*(15*c*e^2*(3*d*g+e*f)*(-1/4*c^
3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+60*d*
c^2*e*(d*g+e*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+3
0*c^3*d^2*(d*g+3*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+12*e^3
*g*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(
-c^2*x^2+1)^(1/2))-60*c^4*d^3*f*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 441, normalized size of antiderivative = 1.23

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{480\,ac^5e^3gx^5 + 2400\,ac^5d^3fx + 600\,(ac^5e^3f + 3\,ac^5de^2g)x^4 + 2400\,(ac^5de^2f + ac^5d^2eg)x^3 + 1200\,(3\,ac^5}{}$$

input
```
integrate((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/2400*(480*a*c^5*e^3*g*x^5 + 2400*a*c^5*d^3*f*x + 600*(a*c^5*e^3*f + 3*a*
c^5*d*e^2*g)*x^4 + 2400*(a*c^5*d*e^2*f + a*c^5*d^2*e*g)*x^3 + 1200*(3*a*c^
5*d^2*e*f + a*c^5*d^3*g)*x^2 + 15*(32*b*c^5*e^3*g*x^5 + 160*b*c^5*d^3*f*x
+ 40*(b*c^5*e^3*f + 3*b*c^5*d*e^2*g)*x^4 + 160*(b*c^5*d*e^2*f + b*c^5*d^2*
e*g)*x^3 + 80*(3*b*c^5*d^2*e*f + b*c^5*d^3*g)*x^2 - 15*(8*b*c^3*d^2*e + b*
c*e^3)*f - 5*(8*b*c^3*d^3 + 9*b*c*d*e^2)*g)*arcsin(c*x) + (96*b*c^4*e^3*g*
x^4 + 150*(b*c^4*e^3*f + 3*b*c^4*d*e^2*g)*x^3 + 32*(25*b*c^4*d*e^2*f + (25
*b*c^4*d^2*e + 4*b*c^2*e^3)*g)*x^2 + 800*(3*b*c^4*d^3 + 2*b*c^2*d*e^2)*f +
 64*(25*b*c^2*d^2*e + 4*b*e^3)*g + 75*(3*(8*b*c^4*d^2*e + b*c^2*e^3)*f + (
8*b*c^4*d^3 + 9*b*c^2*d*e^2)*g)*x)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 770 vs. $2(345) = 690$.

Time = 0.46 (sec) , antiderivative size = 770, normalized size of antiderivative = 2.15

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)**3*(g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**3*f*x + a*d**3*g*x**2/2 + 3*a*d**2*e*f*x**2/2 + a*d**2*e*g
*x**3 + a*d*e**2*f*x**3 + 3*a*d*e**2*g*x**4/4 + a*e**3*f*x**4/4 + a*e**3*g
*x**5/5 + b*d**3*f*x*asin(c*x) + b*d**3*g*x**2*asin(c*x)/2 + 3*b*d**2*e*f*
x**2*asin(c*x)/2 + b*d**2*e*g*x**3*asin(c*x) + b*d*e**2*f*x**3*asin(c*x) +
 3*b*d*e**2*g*x**4*asin(c*x)/4 + b*e**3*f*x**4*asin(c*x)/4 + b*e**3*g*x**5
*asin(c*x)/5 + b*d**3*f*sqrt(-c**2*x**2 + 1)/c + b*d**3*g*x*sqrt(-c**2*x**
2 + 1)/(4*c) + 3*b*d**2*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**2*e*g*x**2
*sqrt(-c**2*x**2 + 1)/(3*c) + b*d*e**2*f*x**2*sqrt(-c**2*x**2 + 1)/(3*c) +
 3*b*d*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e**3*f*x**3*sqrt(-c**2*
x**2 + 1)/(16*c) + b*e**3*g*x**4*sqrt(-c**2*x**2 + 1)/(25*c) - b*d**3*g*as
in(c*x)/(4*c**2) - 3*b*d**2*e*f*asin(c*x)/(4*c**2) + 2*b*d**2*e*g*sqrt(-c*
*2*x**2 + 1)/(3*c**3) + 2*b*d*e**2*f*sqrt(-c**2*x**2 + 1)/(3*c**3) + 9*b*d
*e**2*g*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 3*b*e**3*f*x*sqrt(-c**2*x**2 +
1)/(32*c**3) + 4*b*e**3*g*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) - 9*b*d*e**2
*g*asin(c*x)/(32*c**4) - 3*b*e**3*f*asin(c*x)/(32*c**4) + 8*b*e**3*g*sqrt(
-c**2*x**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d**3*f*x + d**3*g*x**2/2 + 3*d**
2*e*f*x**2/2 + d**2*e*g*x**3 + d*e**2*f*x**3 + 3*d*e**2*g*x**4/4 + e**3*f*
x**4/4 + e**3*g*x**5/5), True))
```

Maxima [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 528, normalized size of antiderivative = 1.47

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{5}ae^3gx^5 + \frac{1}{4}ae^3fx^4 + \frac{3}{4}ade^2gx^4 + ade^2fx^3 + ad^2egx^3 + \frac{3}{2}ad^2efx^2 + \frac{1}{2}ad^3gx^2 + \frac{3}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2ef + \frac{1}{3}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde^2f + \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^3f + \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^3g + \frac{1}{3}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2eg + \frac{3}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bde^2g + \frac{1}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^3g + ad^3fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^3f}{c}$$

input
```
integrate((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/5*a*e^3*g*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^4 + a*d*e^2*f*x^3 + a*
d^2*e*g*x^3 + 3/2*a*d^2*e*f*x^2 + 1/2*a*d^3*g*x^2 + 3/4*(2*x^2*arcsin(c*x)
 + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e*f + 1/3*(3*x^3*
arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b
*d*e^2*f + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqr
t(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3*f + 1/4*(2*x^2*arcsin(
c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3*g + 1/3*(3*x^
3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))
*b*d^2*e*g + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*s
qrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e^2*g + 1/75*(15*x^5*a
rcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4
+ 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^3*g + a*d^3*f*x + (c*x*arcsin(c*x) + sq
rt(-c^2*x^2 + 1))*b*d^3*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 784 vs. $2(330) = 660$.

Time = 0.15 (sec) , antiderivative size = 784, normalized size of antiderivative = 2.19

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/5*a*e^3*g*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^4 + a*d*e^2*f*x^3 + a*
d^2*e*g*x^3 + b*d^3*f*x*arcsin(c*x) + a*d^3*f*x + (c^2*x^2 - 1)*b*d*e^2*f*
x*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*b*d^2*e*g*x*arcsin(c*x)/c^2 + 3/4*sqrt(-
c^2*x^2 + 1)*b*d^2*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d^3*g*x/c + 3/2*(c^2
*x^2 - 1)*b*d^2*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^3*g*arcsin(c*x
)/c^2 + b*d*e^2*f*x*arcsin(c*x)/c^2 + b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/5*(c
^2*x^2 - 1)^2*b*e^3*g*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^3*f/c - 1
/16*(-c^2*x^2 + 1)^(3/2)*b*e^3*f*x/c^3 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d*e^2
*g*x/c^3 + 3/2*(c^2*x^2 - 1)*a*d^2*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d^3*g/c^2
 + 3/4*b*d^2*e*f*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e^3*f*arcsin(c*x)
/c^4 + 1/4*b*d^3*g*arcsin(c*x)/c^2 + 3/4*(c^2*x^2 - 1)^2*b*d*e^2*g*arcsin(
c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e^3*g*x*arcsin(c*x)/c^4 - 1/3*(-c^2*x^2 + 1
)^(3/2)*b*d*e^2*f/c^3 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d^2*e*g/c^3 + 5/32*sqrt
(-c^2*x^2 + 1)*b*e^3*f*x/c^3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d*e^2*g*x/c^3 +
1/2*(c^2*x^2 - 1)*b*e^3*f*arcsin(c*x)/c^4 + 3/2*(c^2*x^2 - 1)*b*d*e^2*g*ar
csin(c*x)/c^4 + 1/5*b*e^3*g*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d*e^2
*f/c^3 + sqrt(-c^2*x^2 + 1)*b*d^2*e*g/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2
*x^2 + 1)*b*e^3*g/c^5 + 5/32*b*e^3*f*arcsin(c*x)/c^4 + 15/32*b*d*e^2*g*arc
sin(c*x)/c^4 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e^3*g/c^5 + 1/5*sqrt(-c^2*x^2 +
 1)*b*e^3*g/c^5
```

Mupad [F(-1)]

Timed out.

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

input
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^3,x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^3, x)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 624, normalized size of antiderivative = 1.74

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{2400 asin(cx)\, b\, c^5 d^3 f x + 1200 asin(cx)\, b\, c^5 d^3 g\, x^2 + 600 asin(cx)\, b\, c^5 e^3 f\, x^4 + 480 asin(cx)\, b\, c^5 e^3 g\, x^5 - 180}{}$$

input
```
int((e*x+d)^3*(g*x+f)*(a+b*asin(c*x)),x)
```

output
```
(2400*asin(c*x)*b*c**5*d**3*f*x + 1200*asin(c*x)*b*c**5*d**3*g*x**2 + 3600
*asin(c*x)*b*c**5*d**2*e*f*x**2 + 2400*asin(c*x)*b*c**5*d**2*e*g*x**3 + 24
00*asin(c*x)*b*c**5*d*e**2*f*x**3 + 1800*asin(c*x)*b*c**5*d*e**2*g*x**4 +
600*asin(c*x)*b*c**5*e**3*f*x**4 + 480*asin(c*x)*b*c**5*e**3*g*x**5 - 600*
asin(c*x)*b*c**3*d**3*g - 1800*asin(c*x)*b*c**3*d**2*e*f - 675*asin(c*x)*b
*c*d*e**2*g - 225*asin(c*x)*b*c*e**3*f + 2400*sqrt( - c**2*x**2 + 1)*b*c**
4*d**3*f + 600*sqrt( - c**2*x**2 + 1)*b*c**4*d**3*g*x + 1800*sqrt( - c**2*
x**2 + 1)*b*c**4*d**2*e*f*x + 800*sqrt( - c**2*x**2 + 1)*b*c**4*d**2*e*g*x
**2 + 800*sqrt( - c**2*x**2 + 1)*b*c**4*d*e**2*f*x**2 + 450*sqrt( - c**2*x
**2 + 1)*b*c**4*d*e**2*g*x**3 + 150*sqrt( - c**2*x**2 + 1)*b*c**4*e**3*f*x
**3 + 96*sqrt( - c**2*x**2 + 1)*b*c**4*e**3*g*x**4 + 1600*sqrt( - c**2*x**
2 + 1)*b*c**2*d**2*e*g + 1600*sqrt( - c**2*x**2 + 1)*b*c**2*d*e**2*f + 675
*sqrt( - c**2*x**2 + 1)*b*c**2*d*e**2*g*x + 225*sqrt( - c**2*x**2 + 1)*b*c
**2*e**3*f*x + 128*sqrt( - c**2*x**2 + 1)*b*c**2*e**3*g*x**2 + 256*sqrt( -
 c**2*x**2 + 1)*b*e**3*g + 2400*a*c**5*d**3*f*x + 1200*a*c**5*d**3*g*x**2
+ 3600*a*c**5*d**2*e*f*x**2 + 2400*a*c**5*d**2*e*g*x**3 + 2400*a*c**5*d*e*
*2*f*x**3 + 1800*a*c**5*d*e**2*g*x**4 + 600*a*c**5*e**3*f*x**4 + 480*a*c**
5*e**3*g*x**5)/(2400*c**5)
```

3.32 $\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 21, antiderivative size = 261

$$\begin{aligned}
&\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx \\
&= \frac{b(3c^2d^2f+e(ef+2dg))\sqrt{1-c^2x^2}}{3c^3}+\frac{b(3e^2g+8c^2d(2ef+dg))\,x\sqrt{1-c^2x^2}}{32c^3} \\
&\quad +\frac{be^2gx^3\sqrt{1-c^2x^2}}{16c}-\frac{be(ef+2dg)\,(1-c^2x^2)^{3/2}}{9c^3} \\
&\quad -\frac{b(3e^2g+8c^2d(2ef+dg))\arcsin(cx)}{32c^4} \\
&\quad +d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad +\frac{1}{3}e(ef+2dg)x^3(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))
\end{aligned}$$

output

```
1/3*b*(3*c^2*d^2*f+e*(2*d*g+e*f))*(-c^2*x^2+1)^(1/2)/c^3+1/32*b*(3*e^2*g+8
*c^2*d*(d*g+2*e*f))*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*e^2*g*x^3*(-c^2*x^2+1)
^(1/2)/c-1/9*b*e*(2*d*g+e*f)*(-c^2*x^2+1)^(3/2)/c^3-1/32*b*(3*e^2*g+8*c^2*
d*(d*g+2*e*f))*arcsin(c*x)/c^4+d^2*f*x*(a+b*arcsin(c*x))+1/2*d*(d*g+2*e*f)
*x^2*(a+b*arcsin(c*x))+1/3*e*(2*d*g+e*f)*x^3*(a+b*arcsin(c*x))+1/4*e^2*g*x
^4*(a+b*arcsin(c*x))
```

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 211, normalized size of antiderivative = 0.81

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{24ac^4x(6d^2(2f+gx)+4dex(3f+2gx)+e^2x^2(4f+3gx))+bc\sqrt{1-c^2x^2}(e(64ef+128dg+27egx)+}{}$$

input
```
Integrate[(d + e*x)^2*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

output
```
(24*a*c^4*x*(6*d^2*(2*f + g*x) + 4*d*e*x*(3*f + 2*g*x) + e^2*x^2*(4*f + 3*
g*x)) + b*c*Sqrt[1 - c^2*x^2]*(e*(64*e*f + 128*d*g + 27*e*g*x) + 2*c^2*(36
*d^2*(4*f + g*x) + 8*d*e*x*(9*f + 4*g*x) + e^2*x^2*(16*f + 9*g*x))) + 3*b*
(-9*e^2*g - 24*c^2*d*(2*e*f + d*g) + 8*c^4*x*(6*d^2*(2*f + g*x) + 4*d*e*x*
(3*f + 2*g*x) + e^2*x^2*(4*f + 3*g*x)))*ArcSin[c*x])/(288*c^4)
```

Rubi [A] (verified)

Time = 0.89 (sec) , antiderivative size = 275, normalized size of antiderivative = 1.05, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules used = {5248, 27, 2340, 25, 2340, 25, 27, 533, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{ 5248}$$

$$-bc\int \frac{x(3e^2gx^3+4e(ef+2dg)x^2+6d(2ef+dg)x+12d^2f)}{12\sqrt{1-c^2x^2}}dx+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{1}{12}bc\int \frac{x\left(3e^2gx^3+4e(ef+2dg)x^2+6d(2ef+dg)x+12d^2f\right)}{\sqrt{1-c^2x^2}}dx+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 2340}$$

$$-\frac{1}{12}bc\left(-\frac{\int -\frac{x\left(48c^2fd^2+16c^2e(ef+2dg)x^2+3\left(8d(2ef+dg)c^2+3e^2g\right)x\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{1}{12}bc\left(\frac{\int \frac{x\left(48c^2fd^2+16c^2e(ef+2dg)x^2+3\left(8d(2ef+dg)c^2+3e^2g\right)x\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 2340}$$

$$-\frac{1}{12}bc\left(\frac{-\frac{\int -\frac{c^2x\left(16\left(9c^2fd^2+2e(ef+2dg)\right)+9\left(8d(2ef+dg)c^2+3e^2g\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}ex^2\sqrt{1-c^2x^2}(2dg+ef)}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{1}{12}bc\left(\frac{\frac{\int \frac{c^2x\left(16\left(9c^2fd^2+2e(ef+2dg)\right)+9\left(8d(2ef+dg)c^2+3e^2g\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}ex^2\sqrt{1-c^2x^2}(2dg+ef)}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\int \frac{x(16(9c^2fd^2+2e(ef+2dg))+9(8d(2ef+dg)c^2+3e^2g)x)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}ex^2\sqrt{1-c^2x^2}(2dg+ef)}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)$$
$$d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$\downarrow$ 533

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{\int \frac{32\left(9c^2fd^2+2e(ef+2dg)\right)xc^2+9\left(8d(2ef+dg)c^2+3e^2g\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3e^2g}{c^2}+8d(dg+2ef)\right)\right)-\frac{16}{3}ex^2\sqrt{1-c}}{4c^2}\right.$$
$$d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$\downarrow$ 455

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{9\left(8c^2d(dg+2ef)+3e^2g\right)\int \frac{1}{\sqrt{1-c^2x^2}}dx-32\sqrt{1-c^2x^2}(9c^2d^2f+2e(2dg+ef))}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3e^2g}{c^2}+8d(dg+2ef)\right)\right)}{4c^2}\right.$$
$$d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$\downarrow$ 223

$$d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))-$$
$$\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{9\arcsin(cx)\left(8c^2d(dg+2ef)+3e^2g\right)}{c}-32\sqrt{1-c^2x^2}(9c^2d^2f+2e(2dg+ef))}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3e^2g}{c^2}+8d(dg+2ef)\right)\right)-\frac{16}{3}e}{4c^2}\right.$$

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

output
```
d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2
+ (e*(e*f + 2*d*g)*x^3*(a + b*ArcSin[c*x]))/3 + (e^2*g*x^4*(a + b*ArcSin[c
*x]))/4 - (b*c*((-3*e^2*g*x^3*Sqrt[1 - c^2*x^2])/(4*c^2) + ((-16*e*(e*f +
2*d*g)*x^2*Sqrt[1 - c^2*x^2])/3 + ((-9*((3*e^2*g)/c^2 + 8*d*(2*e*f + d*g))
*x*Sqrt[1 - c^2*x^2])/2 + (-32*(9*c^2*d^2*f + 2*e*(e*f + 2*d*g))*Sqrt[1 -
c^2*x^2] + (9*(3*e^2*g + 8*c^2*d*(2*e*f + d*g))*ArcSin[c*x])/c)/(2*c^2))/3
)/(4*c^2)))/12
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.13

method	result
parts	$a\left(\frac{e^2 g\,x^4}{4}+\frac{(2deg+e^2 f)x^3}{3}+\frac{(d^2 g+2def)x^2}{2}+d^2 f x\right)+\frac{b\left(\frac{c\arcsin(cx)e^2 g\,x^4}{4}+\frac{2c\arcsin(cx)x^3 deg}{3}+\frac{c\arcsin(cx\cdots}{3}\cdots\right.}{\cdots}$
derivativedivides	$\frac{a\left(\frac{e^2 g\,c^4 x^4}{4}+\frac{\left(2cdeg+c\,e^2 f\right)c^3 x^3}{3}+\frac{\left(c^2 d^2 g+2def\,c^2\right)c^2 x^2}{2}+c^4 d^2 f x\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)e^2 g\,c^4 x^4}{4}+\frac{2\arcsin(cx)c^4 deg\,x^3}{3}+\arcsin(cx\cdots\right.}{\cdots}$
default	$\frac{a\left(\frac{e^2 g\,c^4 x^4}{4}+\frac{\left(2cdeg+c\,e^2 f\right)c^3 x^3}{3}+\frac{\left(c^2 d^2 g+2def\,c^2\right)c^2 x^2}{2}+c^4 d^2 f x\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)e^2 g\,c^4 x^4}{4}+\frac{2\arcsin(cx)c^4 deg\,x^3}{3}+\arcsin(cx\cdots\right.}{\cdots}$
orering	$\frac{(126c^4e^3g^2x^6+474c^4d\,e^2g^2x^5+300c^4e^3fg\,x^5+616c^4d^2e\,g^2x^4+1240c^4d\,e^2fg\,x^4+160c^4e^3f^2x^4+216c^4d^3g^2x^3+2064c\cdots}{\cdots}$

input
```
int((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/4*e^2*g*x^4+1/3*(2*d*e*g+e^2*f)*x^3+1/2*(d^2*g+2*d*e*f)*x^2+d^2*f*x)+
b/c*(1/4*c*arcsin(c*x)*e^2*g*x^4+2/3*c*arcsin(c*x)*x^3*d*e*g+1/3*c*arcsin(
c*x)*x^3*e^2*f+1/2*c*arcsin(c*x)*x^2*d^2*g+c*arcsin(c*x)*x^2*d*e*f+arcsin(
c*x)*d^2*f*c*x-1/12/c^3*(4*e*c*(2*d*g+e*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2
)-2/3*(-c^2*x^2+1)^(1/2))+6*d*c^2*(d*g+2*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)
+1/2*arcsin(c*x))+3*e^2*g*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x
^2+1)^(1/2)+3/8*arcsin(c*x))-12*c^3*d^2*f*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.13

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{72\,ac^4e^2gx^4+288\,ac^4d^2fx+96\,(ac^4e^2f+2\,ac^4deg)x^3+144\,(2\,ac^4def+ac^4d^2g)x^2+3\,(24\,bc^4e^2gx^4+9}{}$$

input
```
integrate((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/288*(72*a*c^4*e^2*g*x^4 + 288*a*c^4*d^2*f*x + 96*(a*c^4*e^2*f + 2*a*c^4*
d*e*g)*x^3 + 144*(2*a*c^4*d*e*f + a*c^4*d^2*g)*x^2 + 3*(24*b*c^4*e^2*g*x^4
 + 96*b*c^4*d^2*f*x - 48*b*c^2*d*e*f + 32*(b*c^4*e^2*f + 2*b*c^4*d*e*g)*x^
3 + 48*(2*b*c^4*d*e*f + b*c^4*d^2*g)*x^2 - 3*(8*b*c^2*d^2 + 3*b*e^2)*g)*ar
csin(c*x) + (18*b*c^3*e^2*g*x^3 + 128*b*c*d*e*g + 32*(b*c^3*e^2*f + 2*b*c^
3*d*e*g)*x^2 + 32*(9*b*c^3*d^2 + 2*b*c*e^2)*f + 9*(16*b*c^3*d*e*f + (8*b*c
^3*d^2 + 3*b*c*e^2)*g)*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 502 vs. $2(250) = 500$.

Time = 0.34 (sec) , antiderivative size = 502, normalized size of antiderivative = 1.92

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^2fx+\frac{ad^2gx^2}{2}+adefx^2+\frac{2adegx^3}{3}+\frac{ae^2fx^3}{3}+\frac{ae^2gx^4}{4}+bd^2fx\operatorname{asin}(cx)+\frac{bd^2gx^2\operatorname{asin}(cx)}{2}+bdefx^2\operatorname{asin}(c \\ a\left(d^2fx+\frac{d^2gx^2}{2}+defx^2+\frac{2degx^3}{3}+\frac{e^2fx^3}{3}+\frac{e^2gx^4}{4}\right) \end{cases}$$

input
```
integrate((e*x+d)**2*(g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**2*f*x + a*d**2*g*x**2/2 + a*d*e*f*x**2 + 2*a*d*e*g*x**3/3
+ a*e**2*f*x**3/3 + a*e**2*g*x**4/4 + b*d**2*f*x*asin(c*x) + b*d**2*g*x**2
*asin(c*x)/2 + b*d*e*f*x**2*asin(c*x) + 2*b*d*e*g*x**3*asin(c*x)/3 + b*e**
2*f*x**3*asin(c*x)/3 + b*e**2*g*x**4*asin(c*x)/4 + b*d**2*f*sqrt(-c**2*x**
2 + 1)/c + b*d**2*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d*e*f*x*sqrt(-c**2*x*
*2 + 1)/(2*c) + 2*b*d*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*f*x**2*
sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) - b
*d**2*g*asin(c*x)/(4*c**2) - b*d*e*f*asin(c*x)/(2*c**2) + 4*b*d*e*g*sqrt(-
c**2*x**2 + 1)/(9*c**3) + 2*b*e**2*f*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e
**2*g*x*sqrt(-c**2*x**2 + 1)/(32*c**3) - 3*b*e**2*g*asin(c*x)/(32*c**4), N
e(c, 0)), (a*(d**2*f*x + d**2*g*x**2/2 + d*e*f*x**2 + 2*d*e*g*x**3/3 + e**
2*f*x**3/3 + e**2*g*x**4/4), True))
```

Maxima [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 353, normalized size of antiderivative = 1.35

$$
\begin{aligned}
\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx &= \frac{1}{4}\,ae^2gx^4 + \frac{1}{3}\,ae^2fx^3 + \frac{2}{3}\,adegx^3 + adefx^2 \\
&\quad + \frac{1}{2}\,ad^2gx^2 + \frac{1}{2}\left(2\,x^2\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin\left(cx\right)}{c^3}\right)\right)bdef \\
&\quad + \frac{1}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2f \\
&\quad + \frac{1}{4}\left(2\,x^2\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin\left(cx\right)}{c^3}\right)\right)bd^2g \\
&\quad + \frac{2}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdeg \\
&\quad + \frac{1}{32}\left(8\,x^4\arcsin\left(cx\right) + \left(\frac{2\,\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\,\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\,\arcsin\left(cx\right)}{c^5}\right)c\right)be^2g \\
&\quad + ad^2fx + \frac{\left(cx\arcsin\left(cx\right) + \sqrt{-c^2x^2+1}\right)bd^2f}{c}
\end{aligned}
$$

input
```
integrate((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/4*a*e^2*g*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + a*d*e*f*x^2 + 1/2*a*
d^2*g*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(
c*x)/c^3))*b*d*e*f + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^
2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^2*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(
-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*g + 2/9*(3*x^3*arcsin(c*x) +
 c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e*g + 1/32
*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)
*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^2*g + a*d^2*f*x + (c*x*arcsin(c*x) + sq
rt(-c^2*x^2 + 1))*b*d^2*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 491 vs. $2(237) = 474$.

Time = 0.14 (sec) , antiderivative size = 491, normalized size of antiderivative = 1.88

$$\begin{aligned}
&\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx \\
&= \frac{1}{4}ae^2gx^4 + \frac{1}{3}ae^2fx^3 + \frac{2}{3}adegx^3 + bd^2fx\arcsin(cx) + ad^2fx \\
&\quad + \frac{(c^2x^2-1)be^2fx\arcsin(cx)}{3\,c^2} + \frac{2\,(c^2x^2-1)bdegx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}bdefx}{2\,c} \\
&\quad + \frac{\sqrt{-c^2x^2+1}bd^2gx}{4\,c} + \frac{(c^2x^2-1)bdef\arcsin(cx)}{c^2} + \frac{(c^2x^2-1)bd^2g\arcsin(cx)}{2\,c^2} \\
&\quad + \frac{be^2fx\arcsin(cx)}{3\,c^2} + \frac{2\,bdegx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}bd^2f}{c} \\
&\quad - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2gx}{16\,c^3} + \frac{(c^2x^2-1)adef}{c^2} + \frac{(c^2x^2-1)ad^2g}{2\,c^2} + \frac{bdef\arcsin(cx)}{2\,c^2} \\
&\quad + \frac{bd^2g\arcsin(cx)}{4\,c^2} + \frac{(c^2x^2-1)^2be^2g\arcsin(cx)}{4\,c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2f}{9\,c^3} \\
&\quad - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}bdeg}{9\,c^3} + \frac{5\,\sqrt{-c^2x^2+1}be^2gx}{32\,c^3} + \frac{(c^2x^2-1)be^2g\arcsin(cx)}{2\,c^4} \\
&\quad + \frac{\sqrt{-c^2x^2+1}be^2f}{3\,c^3} + \frac{2\,\sqrt{-c^2x^2+1}bdeg}{3\,c^3} + \frac{5\,be^2g\arcsin(cx)}{32\,c^4}
\end{aligned}$$

input
```
integrate((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/4*a*e^2*g*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + b*d^2*f*x*arcsin(c*x
) + a*d^2*f*x + 1/3*(c^2*x^2 - 1)*b*e^2*f*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2
 - 1)*b*d*e*g*x*arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b*d*e*f*x/c + 1/4
*sqrt(-c^2*x^2 + 1)*b*d^2*g*x/c + (c^2*x^2 - 1)*b*d*e*f*arcsin(c*x)/c^2 +
1/2*(c^2*x^2 - 1)*b*d^2*g*arcsin(c*x)/c^2 + 1/3*b*e^2*f*x*arcsin(c*x)/c^2
+ 2/3*b*d*e*g*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d^2*f/c - 1/16*(-c^
2*x^2 + 1)^(3/2)*b*e^2*g*x/c^3 + (c^2*x^2 - 1)*a*d*e*f/c^2 + 1/2*(c^2*x^2
- 1)*a*d^2*g/c^2 + 1/2*b*d*e*f*arcsin(c*x)/c^2 + 1/4*b*d^2*g*arcsin(c*x)/c
^2 + 1/4*(c^2*x^2 - 1)^2*b*e^2*g*arcsin(c*x)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2
)*b*e^2*f/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*d*e*g/c^3 + 5/32*sqrt(-c^2*x^2
+ 1)*b*e^2*g*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e^2*g*arcsin(c*x)/c^4 + 1/3*sqrt(
-c^2*x^2 + 1)*b*e^2*f/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b*d*e*g/c^3 + 5/32*b*e^
2*g*arcsin(c*x)/c^4
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx=\int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d+e\,x\right)}^2\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^2,x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^2, x)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 408, normalized size of antiderivative = 1.56

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$=\frac{288asin(cx)\,b\,c^4d^2fx+144asin(cx)\,b\,c^4d^2g\,x^2+288asin(cx)\,b\,c^4def\,x^2+192asin(cx)\,b\,c^4deg\,x^3+96as}{}$$

input
```
int((e*x+d)^2*(g*x+f)*(a+b*asin(c*x)),x)
```

output

```
(288*asin(c*x)*b*c**4*d**2*f*x + 144*asin(c*x)*b*c**4*d**2*g*x**2 + 288*as
in(c*x)*b*c**4*d*e*f*x**2 + 192*asin(c*x)*b*c**4*d*e*g*x**3 + 96*asin(c*x)
*b*c**4*e**2*f*x**3 + 72*asin(c*x)*b*c**4*e**2*g*x**4 - 72*asin(c*x)*b*c**
2*d**2*g - 144*asin(c*x)*b*c**2*d*e*f - 27*asin(c*x)*b*e**2*g + 288*sqrt(
- c**2*x**2 + 1)*b*c**3*d**2*f + 72*sqrt( - c**2*x**2 + 1)*b*c**3*d**2*g*x
 + 144*sqrt( - c**2*x**2 + 1)*b*c**3*d*e*f*x + 64*sqrt( - c**2*x**2 + 1)*b
*c**3*d*e*g*x**2 + 32*sqrt( - c**2*x**2 + 1)*b*c**3*e**2*f*x**2 + 18*sqrt(
 - c**2*x**2 + 1)*b*c**3*e**2*g*x**3 + 128*sqrt( - c**2*x**2 + 1)*b*c*d*e*
g + 64*sqrt( - c**2*x**2 + 1)*b*c*e**2*f + 27*sqrt( - c**2*x**2 + 1)*b*c*e
**2*g*x + 288*a*c**4*d**2*f*x + 144*a*c**4*d**2*g*x**2 + 288*a*c**4*d*e*f*
x**2 + 192*a*c**4*d*e*g*x**3 + 96*a*c**4*e**2*f*x**3 + 72*a*c**4*e**2*g*x*
*4)/(288*c**4)
```

3.33 $\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 19, antiderivative size = 162

$$\begin{aligned}\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx &= \frac{b(9c^2df+2eg)\sqrt{1-c^2x^2}}{9c^3}+\frac{b(ef+dg)x\sqrt{1-c^2x^2}}{4c} \\ &\quad+\frac{begx^2\sqrt{1-c^2x^2}}{9c}-\frac{b(ef+dg)\arcsin(cx)}{4c^2}+dfx(a+b\arcsin(cx)) \\ &\quad+\frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))\end{aligned}$$

output
```
1/9*b*(9*c^2*d*f+2*e*g)*(-c^2*x^2+1)^(1/2)/c^3+1/4*b*(d*g+e*f)*x*(-c^2*x^2
+1)^(1/2)/c+1/9*b*e*g*x^2*(-c^2*x^2+1)^(1/2)/c-1/4*b*(d*g+e*f)*arcsin(c*x)
/c^2+d*f*x*(a+b*arcsin(c*x))+1/2*(d*g+e*f)*x^2*(a+b*arcsin(c*x))+1/3*e*g*x
^3*(a+b*arcsin(c*x))
```

Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.85

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$$
$$=\frac{6ac^3x(3d(2f+gx)+ex(3f+2gx))+b\sqrt{1-c^2x^2}(8eg+c^2(9d(4f+gx)+ex(9f+4gx)))+3bc(12c^2d\ldots}{36c^3}$$

input
```
Integrate[(d + e*x)*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

output
```
(6*a*c^3*x*(3*d*(2*f + g*x) + e*x*(3*f + 2*g*x)) + b*Sqrt[1 - c^2*x^2]*(8*
e*g + c^2*(9*d*(4*f + g*x) + e*x*(9*f + 4*g*x))) + 3*b*c*(12*c^2*d*f*x + 4
*c^2*e*g*x^3 + 3*d*g*(-1 + 2*c^2*x^2) + e*f*(-3 + 6*c^2*x^2))*ArcSin[c*x])
/(36*c^3)
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.04, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.421, Rules used = {5248, 27, 2340, 25, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5248}$$

$$-bc\int \frac{x\left(2egx^2+3(ef+dg)x+6df\right)}{6\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{6}bc\int \frac{x\left(2egx^2+3(ef+dg)x+6df\right)}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$$\Big\downarrow \text{2340}$$

$$-\frac{1}{6}bc\left(-\frac{\int -\frac{x(9(ef+dg)xc^2+2(9dfc^2+2eg))}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$$\Big\downarrow \text{25}$$

$$-\frac{1}{6}bc\left(\frac{\int \frac{x(9(ef+dg)xc^2+2(9dfc^2+2eg))}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$$\Big\downarrow \text{533}$$

$$-\frac{1}{6}bc\left(\frac{\frac{\int \frac{c^2(9(ef+dg)+4(9dfc^2+2eg)x)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}(dg+ef)}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{6}bc\left(\frac{\frac{1}{2}\int \frac{9(ef+dg)+4(9dfc^2+2eg)x}{\sqrt{1-c^2x^2}}dx-\frac{9}{2}x\sqrt{1-c^2x^2}(dg+ef)}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$$\Big\downarrow \text{455}$$

$$-\frac{1}{6}bc\left(\frac{\frac{1}{2}\left(9(dg+ef)\int \frac{1}{\sqrt{1-c^2x^2}}dx-4\sqrt{1-c^2x^2}\left(\frac{2eg}{c^2}+9df\right)\right)-\frac{9}{2}x\sqrt{1-c^2x^2}(dg+ef)}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$$\Big\downarrow \text{223}$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))-\frac{1}{6}bc\left(\frac{\frac{1}{2}\left(\frac{9\arcsin(cx)(dg+ef)}{c}-4\sqrt{1-c^2x^2}\left(\frac{2eg}{c^2}+9df\right)\right)-\frac{9}{2}x\sqrt{1-c^2x^2}(dg+ef)}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)$$

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

output
```
d*f*x*(a + b*ArcSin[c*x]) + ((e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + (e*g
*x^3*(a + b*ArcSin[c*x]))/3 - (b*c*((-2*e*g*x^2*Sqrt[1 - c^2*x^2])/(3*c^2)
 + ((-9*(e*f + d*g)*x*Sqrt[1 - c^2*x^2])/2 + (-4*(9*d*f + (2*e*g)/c^2)*Sqr
t[1 - c^2*x^2] + (9*(e*f + d*g)*ArcSin[c*x])/c)/2)/(3*c^2)))/6
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.09

method	result
parts	$a\left(\frac{eg\,x^{3}}{3}+\frac{(dg+ef)x^{2}}{2}+dfx\right)+\frac{b\left(\frac{c\arcsin(cx)eg\,x^{3}}{3}+\frac{c\arcsin(cx)x^{2}dg}{2}+\frac{c\arcsin(cx)x^{2}ef}{2}+\arcsin(cx)dfcx-\frac{3c(dg}{}\right.}{}$
derivativedivides	$\frac{a\left(\frac{eg\,c^{3}x^{3}}{3}+\frac{(cdg+cef)c^{2}x^{2}}{2}+d\,c^{3}fx\right)}{c^{2}}+\frac{b\left(\frac{\arcsin(cx)eg\,c^{3}x^{3}}{3}+\frac{\arcsin(cx)c^{3}dg\,x^{2}}{2}+\frac{\arcsin(cx)c^{3}ef\,x^{2}}{2}+\arcsin(cx)d\,c^{3}fx-\frac{c(dg+}{}\right.}{c}$
default	$\frac{a\left(\frac{eg\,c^{3}x^{3}}{3}+\frac{(cdg+cef)c^{2}x^{2}}{2}+d\,c^{3}fx\right)}{c^{2}}+\frac{b\left(\frac{\arcsin(cx)eg\,c^{3}x^{3}}{3}+\frac{\arcsin(cx)c^{3}dg\,x^{2}}{2}+\frac{\arcsin(cx)c^{3}ef\,x^{2}}{2}+\arcsin(cx)d\,c^{3}fx-\frac{c(dg+}{}\right.}{c}$
orering	$(20c^{4}e^{2}g^{2}x^{5}+52c^{4}de\,g^{2}x^{4}+52c^{4}e^{2}fg\,x^{4}+27c^{4}d^{2}g^{2}x^{3}+174c^{4}defg\,x^{3}+27c^{4}e^{2}f^{2}x^{3}+90c^{4}d^{2}fg\,x^{2}+90c^{4}de\,f^{2}x^{2}+36c$

input
```
int((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/3*e*g*x^3+1/2*(d*g+e*f)*x^2+d*f*x)+b/c*(1/3*c*arcsin(c*x)*e*g*x^3+1/2
*c*arcsin(c*x)*x^2*d*g+1/2*c*arcsin(c*x)*x^2*e*f+arcsin(c*x)*d*f*c*x-1/6/c
^2*(3*c*(d*g+e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+2*e*g*(-1/
3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-6*d*c^2*f*(-c^2*x^2+1
)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 161, normalized size of antiderivative = 0.99

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \frac{12\,ac^3egx^3+36\,ac^3dfx+18\,(ac^3ef+ac^3dg)x^2+3\,(4\,bc^3egx^3+12\,bc^3dfx-3\,bcef-3\,bcdg+6\,(bc^3ef}{36\,c^3}$$

input
```
integrate((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/36*(12*a*c^3*e*g*x^3 + 36*a*c^3*d*f*x + 18*(a*c^3*e*f + a*c^3*d*g)*x^2 +
 3*(4*b*c^3*e*g*x^3 + 12*b*c^3*d*f*x - 3*b*c*e*f - 3*b*c*d*g + 6*(b*c^3*e*
f + b*c^3*d*g)*x^2)*arcsin(c*x) + (4*b*c^2*e*g*x^2 + 36*b*c^2*d*f + 8*b*e*
g + 9*(b*c^2*e*f + b*c^2*d*g)*x)*sqrt(-c^2*x^2 + 1))/c^3
```

Sympy [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.65

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \begin{cases} adfx+\frac{adgx^2}{2}+\frac{aefx^2}{2}+\frac{aegx^3}{3}+bdfx\operatorname{asin}(cx)+\frac{bdgx^2\operatorname{asin}(cx)}{2}+\frac{befx^2\operatorname{asin}(cx)}{2}+\frac{begx^3\operatorname{asin}(cx)}{3}+\frac{bdf\sqrt{-c^2x^2+1}}{c} \\ a\left(dfx+\frac{dgx^2}{2}+\frac{efx^2}{2}+\frac{egx^3}{3}\right) \end{cases}$$

input
```
integrate((e*x+d)*(g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d*f*x + a*d*g*x**2/2 + a*e*f*x**2/2 + a*e*g*x**3/3 + b*d*f*x*
asin(c*x) + b*d*g*x**2*asin(c*x)/2 + b*e*f*x**2*asin(c*x)/2 + b*e*g*x**3*a
sin(c*x)/3 + b*d*f*sqrt(-c**2*x**2 + 1)/c + b*d*g*x*sqrt(-c**2*x**2 + 1)/(
4*c) + b*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*e*g*x**2*sqrt(-c**2*x**2 + 1
)/(9*c) - b*d*g*asin(c*x)/(4*c**2) - b*e*f*asin(c*x)/(4*c**2) + 2*b*e*g*sq
rt(-c**2*x**2 + 1)/(9*c**3), Ne(c, 0)), (a*(d*f*x + d*g*x**2/2 + e*f*x**2/
2 + e*g*x**3/3), True))
```

Maxima [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.23

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \frac{1}{3}\,aegx^3 + \frac{1}{2}\,aefx^2 + \frac{1}{2}\,adgx^2 + \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bef + \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdg + \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)beg + adfx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bdf}{c}$$

input
```
integrate((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/3*a*e*g*x^3 + 1/2*a*e*f*x^2 + 1/2*a*d*g*x^2 + 1/4*(2*x^2*arcsin(c*x) + c
*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*e*f + 1/4*(2*x^2*arcsin(c
*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*g + 1/9*(3*x^3*a
rcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*
e*g + a*d*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*f/c
```

Giac [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.60

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \frac{1}{3}\,aegx^3 + bdfx\arcsin(cx) + adfx + \frac{(c^2x^2-1)begx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}befx}{4\,c} + \frac{\sqrt{-c^2x^2+1}bdgx}{4\,c} + \frac{(c^2x^2-1)bef\arcsin(cx)}{2\,c^2} + \frac{(c^2x^2-1)bdg\arcsin(cx)}{2\,c^2} + \frac{begx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}bdf}{c} + \frac{(c^2x^2-1)aef}{2\,c^2} + \frac{(c^2x^2-1)adg}{2\,c^2} + \frac{bef\arcsin(cx)}{4\,c^2} + \frac{bdg\arcsin(cx)}{4\,c^2} - \frac{(-c^2x^2+1)^{\frac{3}{2}}beg}{9\,c^3} + \frac{\sqrt{-c^2x^2+1}beg}{3\,c^3}$$

input
```
integrate((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/3*a*e*g*x^3 + b*d*f*x*arcsin(c*x) + a*d*f*x + 1/3*(c^2*x^2 - 1)*b*e*g*x*
arcsin(c*x)/c^2 + 1/4*sqrt(-c^2*x^2 + 1)*b*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1
)*b*d*g*x/c + 1/2*(c^2*x^2 - 1)*b*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*
b*d*g*arcsin(c*x)/c^2 + 1/3*b*e*g*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b
*d*f/c + 1/2*(c^2*x^2 - 1)*a*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d*g/c^2 + 1/4*b
*e*f*arcsin(c*x)/c^2 + 1/4*b*d*g*arcsin(c*x)/c^2 - 1/9*(-c^2*x^2 + 1)^(3/2
)*b*e*g/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*e*g/c^3
```

Mupad [F(-1)]

Timed out.

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

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

input
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x),x)
```

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

Reduce [B] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.38

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

$$= \frac{36asin(cx)\,b\,c^3df\,x + 18asin(cx)\,b\,c^3dg\,x^2 + 18asin(cx)\,b\,c^3ef\,x^2 + 12asin(cx)\,b\,c^3eg\,x^3 - 9asin(cx)\,bcdg}{}$$

input
```
int((e*x+d)*(g*x+f)*(a+b*asin(c*x)),x)
```

output
```
(36*asin(c*x)*b*c**3*d*f*x + 18*asin(c*x)*b*c**3*d*g*x**2 + 18*asin(c*x)*b
*c**3*e*f*x**2 + 12*asin(c*x)*b*c**3*e*g*x**3 - 9*asin(c*x)*b*c*d*g - 9*as
in(c*x)*b*c*e*f + 36*sqrt( - c**2*x**2 + 1)*b*c**2*d*f + 9*sqrt( - c**2*x*
*2 + 1)*b*c**2*d*g*x + 9*sqrt( - c**2*x**2 + 1)*b*c**2*e*f*x + 4*sqrt( - c
**2*x**2 + 1)*b*c**2*e*g*x**2 + 8*sqrt( - c**2*x**2 + 1)*b*e*g + 36*a*c**3
*d*f*x + 18*a*c**3*d*g*x**2 + 18*a*c**3*e*f*x**2 + 12*a*c**3*e*g*x**3)/(36
*c**3)
```

3.34 $\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 344

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = {} & \frac{bg\sqrt{1-c^2x^2}}{ce}-\frac{ib(ef-dg)\arcsin(cx)^2}{2e^2} \\ & +\frac{gx(a+b\arcsin(cx))}{e} \\ & +\frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} \\ & +\frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} \\ & -\frac{b(ef-dg)\arcsin(cx)\log(d+ex)}{e^2} \\ & +\frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2} \\ & -\frac{ib(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} \\ & -\frac{ib(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2}\end{aligned}$$

output
```
b*g*(-c^2*x^2+1)^(1/2)/c/e-1/2*I*b*(-d*g+e*f)*arcsin(c*x)^2/e^2+g*x*(a+b*a
rcsin(c*x))/e+b*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))
/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2+b*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(
-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2-b*(-d*g+e*f)*arcsin(c*x)
*ln(e*x+d)/e^2+(-d*g+e*f)*(a+b*arcsin(c*x))*ln(e*x+d)/e^2-I*b*(-d*g+e*f)*p
olylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2-I*b
*(-d*g+e*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1
/2)))/e^2
```

Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 322, normalized size of antiderivative = 0.94

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \frac{\frac{beg\sqrt{1-c^2x^2}}{c} - \frac{1}{2}ib(ef-dg)\arcsin(cx)^2 + egx(a+b\arcsin(cx)) + b(ef-dg)\arcsin(cx)\log\left(1+\frac{iee^{i\arcsin}}{-cd+\sqrt{c^2d}}\right.}{}$$

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

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

Rubi [A] (verified)

Time = 1.02 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5252}$$

$$-bc\int \frac{egx+(ef-dg)\log(d+ex)}{e^2\sqrt{1-c^2x^2}}dx+\frac{(ef-dg)\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{gx(a+b\arcsin(cx))}{e}$$

$$\Big\downarrow \text{27}$$

$$-\frac{bc\int \frac{egx+(ef-dg)\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{e^2}+\frac{(ef-dg)\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{gx(a+b\arcsin(cx))}{e}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int \left(\frac{egx}{\sqrt{1-c^2x^2}}+\frac{(ef-dg)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{e^2}+\frac{(ef-dg)\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{gx(a+b\arcsin(cx))}{e}$$

$$\Big\downarrow \text{2009}$$

$$\frac{(ef-dg)\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{gx(a+b\arcsin(cx))}{e}-\frac{bc\left(\frac{i(ef-dg)\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{i(ef-dg)\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{\arcsin(cx)(ef-dg)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{\arcsin(\ldots}{\ldots}\right.}{e^2}$$

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

output
```
(g*x*(a + b*ArcSin[c*x]))/e + ((e*f - d*g)*(a + b*ArcSin[c*x])*Log[d + e*x
])/e^2 - (b*c*(-((e*g*Sqrt[1 - c^2*x^2])/c^2) + ((I/2)*(e*f - d*g)*ArcSin[
c*x]^2)/c - ((e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d
- Sqrt[c^2*d^2 - e^2])])/c - ((e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*Ar
cSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + ((e*f - d*g)*ArcSin[c*x]*Log
[d + e*x])/c + (I*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sq
rt[c^2*d^2 - e^2])])/c + (I*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))
/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/e^2
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1565 vs. $2(357) = 714$.

Time = 1.82 (sec) , antiderivative size = 1566, normalized size of antiderivative = 4.55

method	result	size
parts	Expression too large to display	1566
derivativedivides	Expression too large to display	1584
default	Expression too large to display	1584

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

output
```
a*(g/e*x+(-d*g+e*f)/e^2*ln(e*x+d))+I*b*c^2/e^2*d^3*g/(c^2*d^2-e^2)*dilog((
I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+
e^2)^(1/2)))-I*b*c^2/e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1
/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+I*b*e*f/(c^
2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))
/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+b*d*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(
I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1
/2)))+b*d*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))
*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*e*f*arcsin(c*x)/(
c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/
(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I
*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/
2)))-b*c^2/e^2*d^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+
1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+b*c^2/e*f*
arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2
+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2+b*c^2/e*f*arcsin(c*x)/(c^2*
d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d
*c+(-c^2*d^2+e^2)^(1/2)))*d^2-b*c^2/e^2*d^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln
((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^
2+e^2)^(1/2)))+I*b*c^2/e^2*d^3*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^...
```

Fricas [F]

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

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="fricas")
```

output
```
integral((a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(e*x + d), x)
```

Sympy [F]

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

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x), x)
```

Maxima [F]

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

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxima")
```

output
```
a*g*(x/e - d*log(e*x + d)/e^2) + a*f*log(e*x + d)/e + integrate((b*g*x + b
*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x), x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx$$
$$=\frac{asin(cx)\,bcegx+\sqrt{-c^2x^2+1}\,beg-\left(\int \frac{asin(cx)}{ex+d}dx\right)bcdeg+\left(\int \frac{asin(cx)}{ex+d}dx\right)bc\,e^2f-\log(ex+d)\,acdg+\mathrm{lo}}{c\,e^2}$$

input
```
int((g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

output
```
(asin(c*x)*b*c*e*g*x + sqrt( - c**2*x**2 + 1)*b*e*g - int(asin(c*x)/(d + e
*x),x)*b*c*d*e*g + int(asin(c*x)/(d + e*x),x)*b*c*e**2*f - log(d + e*x)*a*
c*d*g + log(d + e*x)*a*c*e*f + a*c*e*g*x)/(c*e**2)
```

3.35 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 358

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = & -\frac{ibg\arcsin(cx)^2}{2e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} \\ & +\frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\ & +\frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} \\ & +\frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} \\ & -\frac{bg\arcsin(cx)\log(d+ex)}{e^2} \\ & +\frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} \\ & -\frac{ibg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} \\ & -\frac{ibg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2}\end{aligned}$$

output
```
-1/2*I*b*g*arcsin(c*x)^2/e^2-(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)+b*c*
(-d*g+e*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/
(c^2*d^2-e^2)^(1/2)+b*g*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c
*d-(c^2*d^2-e^2)^(1/2)))/e^2+b*g*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^
(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2-b*g*arcsin(c*x)*ln(e*x+d)/e^2+g*(a+b
*arcsin(c*x))*ln(e*x+d)/e^2-I*b*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))
/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2-I*b*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1
/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2
```

Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 334, normalized size of antiderivative = 0.93

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

$$= \frac{-\frac{1}{2}ibg\arcsin(cx)^2 - \frac{(ef-dg)(a+b\arcsin(cx))}{d+ex} + \frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}} + bg\arcsin(cx)\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
((-1/2*I)*b*g*ArcSin[c*x]^2 - ((e*f - d*g)*(a + b*ArcSin[c*x]))/(d + e*x)
+ (b*c*(e*f - d*g)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*
x^2])])/Sqrt[c^2*d^2 - e^2] + b*g*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*x
]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + b*g*ArcSin[c*x]*Log[1 - (I*e*E^(I*Ar
cSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - b*g*ArcSin[c*x]*Log[d + e*x] +
g*(a + b*ArcSin[c*x])*Log[d + e*x] - I*b*g*PolyLog[2, (I*e*E^(I*ArcSin[c*x
]))/(c*d - Sqrt[c^2*d^2 - e^2])] - I*b*g*PolyLog[2, (I*e*E^(I*ArcSin[c*x])
)/(c*d + Sqrt[c^2*d^2 - e^2])])/e^2
```

Rubi [A] (verified)

Time = 1.80 (sec) , antiderivative size = 354, normalized size of antiderivative = 0.99, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {5252, 25, 27, 7292, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{ 5252}$$

$$-bc\int -\frac{ef-dg-g(d+ex)\log(d+ex)}{e^2(d+ex)\sqrt{1-c^2x^2}}dx-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 25}$$

$$bc\int \frac{ef-dg-g(d+ex)\log(d+ex)}{e^2(d+ex)\sqrt{1-c^2x^2}}dx-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{bc\int \frac{ef-dg-g(d+ex)\log(d+ex)}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 7292}$$

$$\frac{bc\int \frac{ef\left(1-\frac{dg}{ef}\right)-g(d+ex)\log(d+ex)}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 7293}$$

$$\frac{bc\int \left(\frac{ef-dg}{(d+ex)\sqrt{1-c^2x^2}}-\frac{g\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 2009}$$

$$-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{bc\left(-\frac{ig\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{ig\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{g\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{g\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2}\cdots}\right)}{c}\cdots\right.}{e^2}$$

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

output
```
-(((e*f - d*g)*(a + b*ArcSin[c*x]))/(e^2*(d + e*x))) + (g*(a + b*ArcSin[c*
x])*Log[d + e*x])/e^2 + (b*c*(((-1/2*I)*g*ArcSin[c*x]^2)/c + ((e*f - d*g)*
ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^
2 - e^2] + (g*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*
d^2 - e^2])])/c + (g*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sq
rt[c^2*d^2 - e^2])])/c - (g*ArcSin[c*x]*Log[d + e*x])/c - (I*g*PolyLog[2,
(I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - (I*g*PolyLog[2,
(I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/e^2
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 953 vs. 2(367) = 734.

Time = 1.76 (sec) , antiderivative size = 954, normalized size of antiderivative = 2.66

method	result
derivativedivides	$\frac{ac\left(\frac{c(dg-ef)}{e^2(cxe+cd)}+\frac{g\ln(cxe+cd)}{e^2}\right)+bc\left(-\frac{ig\arcsin(cx)^2}{2e^2}+\frac{(dg-ef)\arcsin(cx)c}{e^2(cxe+cd)}-\frac{ig\operatorname{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e+\sqrt{-c^2d^2+e^2}}{idc+\sqrt{-c^2d^2+e^2}}\right.}{e^2\left(c^2d^2-e^2\right)}\right.}{}$
default	$\frac{ac\left(\frac{c(dg-ef)}{e^2(cxe+cd)}+\frac{g\ln(cxe+cd)}{e^2}\right)+bc\left(-\frac{ig\arcsin(cx)^2}{2e^2}+\frac{(dg-ef)\arcsin(cx)c}{e^2(cxe+cd)}-\frac{ig\operatorname{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e+\sqrt{-c^2d^2+e^2}}{idc+\sqrt{-c^2d^2+e^2}}\right.}{e^2\left(c^2d^2-e^2\right)}\right.}{}$
parts	$a\left(\frac{g\ln(ex+d)}{e^2}-\frac{-dg+ef}{e^2(ex+d)}\right)+\frac{b\left(-\frac{icg\arcsin(cx)^2}{2e^2}+\frac{(dg-ef)c^2\arcsin(cx)}{e^2(cxe+cd)}+\frac{2c^2f\arctan\left(\frac{2\left(icx+\sqrt{-c^2x^2+1}\right)e+2idc}{2\sqrt{c^2d^2-e^2}}\right)}{e\sqrt{c^2d^2-e^2}}\right.}{}$

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(a*c*(c*(d*g-e*f)/e^2/(c*e*x+c*d)+g/e^2*ln(c*e*x+c*d))+b*c*(-1/2*I*g*a
rcsin(c*x)^2/e^2+(d*g-e*f)*arcsin(c*x)*c/e^2/(c*e*x+c*d)-I/e^2*g/(c^2*d^2-
e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*
c+(-c^2*d^2+e^2)^(1/2)))*c^2*d^2+I*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c
^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+1/e
^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^
2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*c^2*d^2+1/e^2*g*arcsin(c*x
)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2
))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*c^2*d^2-g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I
*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e
^2)^(1/2)))-g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2
))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*g/(c^2*d^2-e^2)
*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-
c^2*d^2+e^2)^(1/2)))-2*I/e*c*f/(c^2*d^2-e^2)^(1/2)*arctanh(1/2*(2*I*e*(I*c
*x+(-c^2*x^2+1)^(1/2))-2*c*d)/(c^2*d^2-e^2)^(1/2))-I/e^2*g/(c^2*d^2-e^2)*d
ilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^
2*d^2+e^2)^(1/2)))*c^2*d^2+2*I/e^2*d*c*g/(c^2*d^2-e^2)^(1/2)*arctanh(1/2*(
2*I*e*(I*c*x+(-c^2*x^2+1)^(1/2))-2*c*d)/(c^2*d^2-e^2)^(1/2))))
```

Fricas [F]

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

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fricas")
```

output
```
integral((a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(e^2*x^2 + 2*d*e*x + d^
2), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\operatorname{asin}(cx))\,(f+gx)}{(d+ex)^2}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx=\int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d+e\,x)^2}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^2,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^2, x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \frac{\left(\int \frac{asin(cx)}{e^2x^2+2dex+d^2}dx\right)b\,d^2e^2f+\left(\int \frac{asin(cx)}{e^2x^2+2dex+d^2}dx\right)bd\,e^3fx+\left(\int \frac{asin(cx)x}{e^2x^2+2dex+d^2}dx\right)b\,d^2e^2g+\left(\int \frac{asin(cx)x}{e^2x^2+2dex+d^2}\right.}{d\,e^2\,(ex+d)}$$

input
```
int((g*x+f)*(a+b*asin(c*x))/(e*x+d)^2,x)
```

output
```
(int(asin(c*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b*d**2*e**2*f + int(asin(c*
x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b*d*e**3*f*x + int((asin(c*x)*x)/(d**2
+ 2*d*e*x + e**2*x**2),x)*b*d**2*e**2*g + int((asin(c*x)*x)/(d**2 + 2*d*e*
x + e**2*x**2),x)*b*d*e**3*g*x + log(d + e*x)*a*d**2*g + log(d + e*x)*a*d*
e*g*x - a*d*e*g*x + a*e**2*f*x)/(d*e**2*(d + e*x))
```

3.36 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 202

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{2e\left(c^2d^2-e^2\right)(d+ex)} + \frac{bg^2\arcsin(cx)}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2} - \frac{bc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^2\left(c^2d^2-e^2\right)^{3/2}}$$

output
```
1/2*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)+1/2*b*g^2*ar
csin(c*x)/e^2/(-d*g+e*f)-1/2*(g*x+f)^2*(a+b*arcsin(c*x))/(-d*g+e*f)/(e*x+d
)^2-1/2*b*c*(2*e^2*g-c^2*d*(d*g+e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/
2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(3/2)
```

Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.30

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$

$$= \frac{\frac{a(-ef+dg)}{(d+ex)^2}-\frac{2ag}{d+ex}-\frac{bce(ef-dg)\sqrt{1-c^2x^2}}{(-c^2d^2+e^2)(d+ex)}-\frac{b(dg+e(f+2gx))\arcsin(cx)}{(d+ex)^2}+\frac{bc(-2e^2g+c^2d(ef+dg))\log(d+ex)}{(cd-e)(cd+e)\sqrt{-c^2d^2+e^2}}+\frac{bc(-2e^2g+c^2d(ef}{(}}{2e^2}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
((a*(-(e*f) + d*g))/(d + e*x)^2 - (2*a*g)/(d + e*x) - (b*c*e*(e*f - d*g)*S
qrt[1 - c^2*x^2])/((-(c^2*d^2) + e^2)*(d + e*x)) - (b*(d*g + e*(f + 2*g*x)
)*ArcSin[c*x])/(d + e*x)^2 + (b*c*(-2*e^2*g + c^2*d*(e*f + d*g))*Log[d + e
*x])/((c*d - e)*(c*d + e)*Sqrt[-(c^2*d^2) + e^2]) + (b*c*(-2*e^2*g + c^2*d
*(e*f + d*g))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])
/((-(c*d) + e)*(c*d + e)*Sqrt[-(c^2*d^2) + e^2]))/(2*e^2)
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.18, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {5252, 27, 715, 719, 223, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int -\frac{(f+gx)^2}{2(ef-dg)(d+ex)^2\sqrt{1-c^2x^2}}dx-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{(f+gx)^2}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \textcolor{blue}{715}$$

$$\frac{bc\left(\frac{\int \frac{c^2df^2-g(2ef-dg)+\left(\frac{c^2d^2}{e}-e\right)g^2x}{(d+ex)\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \textcolor{blue}{719}$$

$$\frac{bc\left(\frac{\frac{g^2(cd-e)(cd+e)\int \frac{1}{\sqrt{1-c^2x^2}}dx}{e^2}-\frac{(ef-dg)\left(2e^2g-c^2d(dg+ef)\right)\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^2}}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \textcolor{blue}{223}$$

$$\frac{bc\left(\frac{\frac{g^2\arcsin(cx)(cd-e)(cd+e)}{ce^2}-\frac{(ef-dg)\left(2e^2g-c^2d(dg+ef)\right)\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^2}}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \textcolor{blue}{488}$$

$$\frac{bc\left(\frac{\frac{(ef-dg)\left(2e^2g-c^2d(dg+ef)\right)\int \frac{1}{-c^2d^2+e^2-\frac{\left(dxc^2+e\right)^2}{1-c^2x^2}}d\frac{dxc^2+e}{\sqrt{1-c^2x^2}}}{e^2}+\frac{g^2\arcsin(cx)(cd-e)(cd+e)}{ce^2}}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \textcolor{blue}{217}$$

$$\frac{bc\left(\frac{\frac{g^2\arcsin(cx)(cd-e)(cd+e)}{ce^2}-\frac{(ef-dg)\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)\left(2e^2g-c^2d(dg+ef)\right)}{e^2\sqrt{c^2d^2-e^2}}}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

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

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 715
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_) + (c_.)*(x_)^
2)^(p_), x_Symbol] :> With[{Q = PolynomialQuotient[(f + g*x)^n, d + e*x, x]
, R = PolynomialRemainder[(f + g*x)^n, d + e*x, x]}, Simp[(e*R*(d + e*x)^(m
 + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + Simp[1/((m + 1)*
(c*d^2 + a*e^2))   Int[(d + e*x)^(m + 1)*(a + c*x^2)^p*ExpandToSum[(m + 1)*
(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*R*(m + 2*p + 3)*x, x], x], x]] /; F
reeQ[{a, c, d, e, f, g, p}, x] && IGtQ[n, 1] && ILtQ[m, -1] && NeQ[c*d^2 +
a*e^2, 0] && (NeQ[m + n, 0] || EqQ[p, -2^(-1)])
```

rule 719
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] +
Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c,
d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 534 vs. $2(186) = 372$.

Time = 0.41 (sec) , antiderivative size = 535, normalized size of antiderivative = 2.65

method	result
parts	$a\left(-\frac{-dg+ef}{2e^2(ex+d)^2}-\frac{g}{e^2(ex+d)}\right)+\frac{b\left(\frac{c^3\arcsin(cx)dg}{2e^2(cxe+cd)^2}-\frac{c^3\arcsin(cx)f}{2e(cxe+cd)^2}-\frac{c^2\arcsin(cx)g}{e^2(cxe+cd)}+\frac{c^2\left(-\frac{2g\ln\left(\frac{-\frac{2(c^2d^2-e^2)}{e^2}+\frac{2}{}}{}\right)}{}\right.}{}\right.}{}$
derivativedivides	$\frac{ac^2\left(-\frac{g}{e^2(cxe+cd)}+\frac{c(dg-ef)}{2e^2(cxe+cd)^2}\right)+bc^2\left(-\frac{\arcsin(cx)g}{e^2(cxe+cd)}+\frac{\arcsin(cx)cdg}{2e^2(cxe+cd)^2}-\frac{\arcsin(cx)cf}{2e(cxe+cd)^2}+\frac{-\frac{2g\ln\left(\frac{-\frac{2(c^2d^2-e^2)}{e^2}+\frac{2dc(cx+}{e}}{}\right)}{}}{}\right.}{}$
	$ac^2\left(-\frac{g}{e^2(cxe+cd)}+\frac{c(dg-ef)}{2e^2(cxe+cd)^2}\right)+bc^2\left(-\frac{\arcsin(cx)g}{e^2(cxe+cd)}+\frac{\arcsin(cx)cdg}{2e^2(cxe+cd)^2}-\frac{\arcsin(cx)cf}{2e(cxe+cd)^2}+\frac{-\frac{2g\ln\left(\frac{-\frac{2(c^2d^2-e^2)}{e^2}+\frac{2dc(cx+}{e}}{}\right)}{}}{}\right.$

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/2*(-d*g+e*f)/e^2/(e*x+d)^2-g/e^2/(e*x+d))+b/c*(1/2*c^3*arcsin(c*x)/e
^2/(c*e*x+c*d)^2*d*g-1/2*c^3*arcsin(c*x)/e/(c*e*x+c*d)^2*f-c^2*arcsin(c*x)
*g/e^2/(c*e*x+c*d)+1/2*c^2/e^2*(-2*g/e/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(
c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d
*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))-c*(d*g-
e*f)/e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c
/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2
)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2
)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e
)))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 578 vs. $2(185) = 370$.

Time = 3.39 (sec) , antiderivative size = 1184, normalized size of antiderivative = 5.86

$$\int \frac{(f + gx)(a + b \arcsin(cx))}{(d + ex)^3} \, dx = \text{Too large to display}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fricas")
```

output
```
[-1/4*(4*(a*c^4*d^4*e - 2*a*c^2*d^2*e^3 + a*e^5)*g*x + (b*c^3*d^3*e*f + (b
*c^3*d*e^3*f + (b*c^3*d^2*e^2 - 2*b*c*e^4)*g)*x^2 + (b*c^3*d^4 - 2*b*c*d^2
*e^2)*g + 2*(b*c^3*d^2*e^2*f + (b*c^3*d^3*e - 2*b*c*d*e^3)*g)*x)*sqrt(-c^2
*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 - 2*sqr
t(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d
*e*x + d^2)) + 2*(a*c^4*d^4*e - 2*a*c^2*d^2*e^3 + a*e^5)*f + 2*(a*c^4*d^5
- 2*a*c^2*d^3*e^2 + a*d*e^4)*g + 2*(2*(b*c^4*d^4*e - 2*b*c^2*d^2*e^3 + b*e
^5)*g*x + (b*c^4*d^4*e - 2*b*c^2*d^2*e^3 + b*e^5)*f + (b*c^4*d^5 - 2*b*c^2
*d^3*e^2 + b*d*e^4)*g)*arcsin(c*x) - 2*sqrt(-c^2*x^2 + 1)*((b*c^3*d^3*e^2
- b*c*d*e^4)*f - (b*c^3*d^4*e - b*c*d^2*e^3)*g + ((b*c^3*d^2*e^3 - b*c*e^5
)*f - (b*c^3*d^3*e^2 - b*c*d*e^4)*g)*x))/(c^4*d^6*e^2 - 2*c^2*d^4*e^4 + d^
2*e^6 + (c^4*d^4*e^4 - 2*c^2*d^2*e^6 + e^8)*x^2 + 2*(c^4*d^5*e^3 - 2*c^2*d
^3*e^5 + d*e^7)*x), -1/2*(2*(a*c^4*d^4*e - 2*a*c^2*d^2*e^3 + a*e^5)*g*x -
(b*c^3*d^3*e*f + (b*c^3*d*e^3*f + (b*c^3*d^2*e^2 - 2*b*c*e^4)*g)*x^2 + (b*
c^3*d^4 - 2*b*c*d^2*e^2)*g + 2*(b*c^3*d^2*e^2*f + (b*c^3*d^3*e - 2*b*c*d*e
^3)*g)*x)*sqrt(c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 - e^2)*(c^2*d*x + e)*sqr
t(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2)) + (a*c^4*d^4*e
- 2*a*c^2*d^2*e^3 + a*e^5)*f + (a*c^4*d^5 - 2*a*c^2*d^3*e^2 + a*d*e^4)*g +
 (2*(b*c^4*d^4*e - 2*b*c^2*d^2*e^3 + b*e^5)*g*x + (b*c^4*d^4*e - 2*b*c^2*d
^2*e^3 + b*e^5)*f + (b*c^4*d^5 - 2*b*c^2*d^3*e^2 + b*d*e^4)*g)*arcsin(c...
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{(d+ex)^3}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^3,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^3, x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Too large to display}$$

input
```
int((g*x+f)*(a+b*asin(c*x))/(e*x+d)^3,x)
```

output
```
(6*int(asin(c*x)/(3*c**2*d**5 + 9*c**2*d**4*e*x + 9*c**2*d**3*e**2*x**2 +
3*c**2*d**2*e**3*x**3 + d**3*e**2 + 3*d**2*e**3*x + 3*d*e**4*x**2 + e**5*x
**3),x)*b*c**2*d**5*e*f + 12*int(asin(c*x)/(3*c**2*d**5 + 9*c**2*d**4*e*x
+ 9*c**2*d**3*e**2*x**2 + 3*c**2*d**2*e**3*x**3 + d**3*e**2 + 3*d**2*e**3*
x + 3*d*e**4*x**2 + e**5*x**3),x)*b*c**2*d**4*e**2*f*x + 6*int(asin(c*x)/(
3*c**2*d**5 + 9*c**2*d**4*e*x + 9*c**2*d**3*e**2*x**2 + 3*c**2*d**2*e**3*x
**3 + d**3*e**2 + 3*d**2*e**3*x + 3*d*e**4*x**2 + e**5*x**3),x)*b*c**2*d**
3*e**3*f*x**2 + 2*int(asin(c*x)/(3*c**2*d**5 + 9*c**2*d**4*e*x + 9*c**2*d*
*3*e**2*x**2 + 3*c**2*d**2*e**3*x**3 + d**3*e**2 + 3*d**2*e**3*x + 3*d*e**
4*x**2 + e**5*x**3),x)*b*d**3*e**3*f + 4*int(asin(c*x)/(3*c**2*d**5 + 9*c*
*2*d**4*e*x + 9*c**2*d**3*e**2*x**2 + 3*c**2*d**2*e**3*x**3 + d**3*e**2 +
3*d**2*e**3*x + 3*d*e**4*x**2 + e**5*x**3),x)*b*d**2*e**4*f*x + 2*int(asin
(c*x)/(3*c**2*d**5 + 9*c**2*d**4*e*x + 9*c**2*d**3*e**2*x**2 + 3*c**2*d**2
*e**3*x**3 + d**3*e**2 + 3*d**2*e**3*x + 3*d*e**4*x**2 + e**5*x**3),x)*b*d
*e**5*f*x**2 + 6*int((asin(c*x)*x)/(3*c**2*d**5 + 9*c**2*d**4*e*x + 9*c**2
*d**3*e**2*x**2 + 3*c**2*d**2*e**3*x**3 + d**3*e**2 + 3*d**2*e**3*x + 3*d*
e**4*x**2 + e**5*x**3),x)*b*c**2*d**5*e*g + 12*int((asin(c*x)*x)/(3*c**2*d
**5 + 9*c**2*d**4*e*x + 9*c**2*d**3*e**2*x**2 + 3*c**2*d**2*e**3*x**3 + d*
*3*e**2 + 3*d**2*e**3*x + 3*d*e**4*x**2 + e**5*x**3),x)*b*c**2*d**4*e**2*g
*x + 6*int((asin(c*x)*x)/(3*c**2*d**5 + 9*c**2*d**4*e*x + 9*c**2*d**3*e...
```

3.37 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 257

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx &= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{6e\left(c^2d^2-e^2\right)(d+ex)^2}+\frac{bc(c^2df-eg)\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)}\\&\quad-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}\\&\quad+\frac{bc^3(e^2(ef-4dg)+c^2d^2(2ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e^2\left(c^2d^2-e^2\right)^{5/2}}\end{aligned}$$

output
```
1/6*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)^2+1/2*b*c*(c
^2*d*f-e*g)*(-c^2*x^2+1)^(1/2)/(c^2*d^2-e^2)^2/(e*x+d)-1/3*(-d*g+e*f)*(a+b
*arcsin(c*x))/e^2/(e*x+d)^3-1/2*g*(a+b*arcsin(c*x))/e^2/(e*x+d)^2+1/6*b*c^
3*(e^2*(-4*d*g+e*f)+c^2*d^2*(d*g+2*e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^
(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(5/2)
```

Mathematica [A] (verified)

Time = 0.45 (sec) , antiderivative size = 321, normalized size of antiderivative = 1.25

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$
$$= \frac{\frac{a(-2ef+2dg)}{(d+ex)^3}-\frac{3ag}{(d+ex)^2}+\frac{bce\sqrt{1-c^2x^2}(c^2d(4def-d^2g+3e^2fx)-e^2(2dg+e(f+3gx)))}{(-c^2d^2+e^2)^2(d+ex)^2}-\frac{b(2ef+dg+3egx)\arcsin(cx)}{(d+ex)^3}+\frac{bc^3(e^2(ef-4d}{(-cd+}}{6e^2}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
((a*(-2*e*f + 2*d*g))/(d + e*x)^3 - (3*a*g)/(d + e*x)^2 + (b*c*e*Sqrt[1 -
c^2*x^2]*(c^2*d*(4*d*e*f - d^2*g + 3*e^2*f*x) - e^2*(2*d*g + e*(f + 3*g*x)
)))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (b*(2*e*f + d*g + 3*e*g*x)*ArcSin
[c*x])/(d + e*x)^3 + (b*c^3*(e^2*(e*f - 4*d*g) + c^2*d^2*(2*e*f + d*g))*Lo
g[d + e*x])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]) - (b*c^3*(
e^2*(e*f - 4*d*g) + c^2*d^2*(2*e*f + d*g))*Log[e + c^2*d*x + Sqrt[-(c^2*d^
2) + e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2)
+ e^2]))/(6*e^2)
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.05, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5252, 27, 688, 27, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$

$$\Big\downarrow \; 5252$$

$$-bc\int -\frac{2ef+dg+3egx}{6e^2(d+ex)^3\sqrt{1-c^2x^2}}dx-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$$\Big\downarrow \; 27$$

$$\frac{bc\int \frac{2ef+dg+3egx}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$\downarrow$ 688

$$\frac{bc\left(\frac{\int -\frac{2\left(-d(2ef+dg)c^2+e(ef-dg)xc^2+3e^2g\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}\right)}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$\downarrow$ 27

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\int \frac{-d(2ef+dg)c^2+e(ef-dg)xc^2+3e^2g}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$\downarrow$ 679

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}-\frac{-\frac{c^2\left(c^2d^2(dg+2ef)+e^2(ef-4dg)\right)\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}-\frac{3e^2\sqrt{1-c^2x^2}\left(c^2df-eg\right)}{\left(c^2d^2-e^2\right)(d+ex)}}{c^2d^2-e^2}\right)}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$\downarrow$ 488

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\frac{c^2\left(c^2d^2(dg+2ef)+e^2(ef-4dg)\right)\int \frac{1}{-c^2d^2+e^2-\frac{\left(dxc^2+e\right)^2}{1-c^2x^2}}d\frac{dxc^2+e}{\sqrt{1-c^2x^2}}}{c^2d^2-e^2}-\frac{3e^2\sqrt{1-c^2x^2}\left(c^2df-eg\right)}{\left(c^2d^2-e^2\right)(d+ex)}}{c^2d^2-e^2}\right)}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$\downarrow$ 217

$$-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}+\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}-\frac{-\frac{c^2\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)\left(c^2d^2(dg+2ef)+e^2(ef-4dg)\right)}{\left(c^2d^2-e^2\right)^{3/2}}-\frac{3e^2\sqrt{1-c^2x^2}\left(c^2df-eg\right)}{\left(c^2d^2-e^2\right)(d+ex)}}{c^2d^2-e^2}\right)}{6e^2}$$

input

```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output

```
-1/3*((e*f - d*g)*(a + b*ArcSin[c*x]))/(e^2*(d + e*x)^3) - (g*(a + b*ArcSi
n[c*x]))/(2*e^2*(d + e*x)^2) + (b*c*((e*(e*f - d*g)*Sqrt[1 - c^2*x^2])/((c
^2*d^2 - e^2)*(d + e*x)^2) - ((-3*e^2*(c^2*d*f - e*g)*Sqrt[1 - c^2*x^2])/(
(c^2*d^2 - e^2)*(d + e*x)) - (c^2*(e^2*(e*f - 4*d*g) + c^2*d^2*(2*e*f + d*
g))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^
2 - e^2)^(3/2))/(c^2*d^2 - e^2)))/(6*e^2)
```

Defintions of rubi rules used

rule 27

```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217

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

rule 488

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

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 907 vs. $2(237) = 474$.

Time = 0.38 (sec) , antiderivative size = 908, normalized size of antiderivative = 3.53

method	result
parts	$a\left(-\frac{g}{2e^2(ex+d)^2}-\frac{-dg+ef}{3e^2(ex+d)^3}\right)+\frac{b\left(\frac{c^4\arcsin(cx)dg}{3e^2(cxe+cd)^3}-\frac{c^4\arcsin(cx)f}{3e(cxe+cd)^3}-\frac{c^3\arcsin(cx)g}{2e^2(cxe+cd)^2}+\frac{c^3\left(3g\left(\frac{e^2\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\ldots}}{\left(c^2d^2-\ldots\right.}\right.\right.}{\ldots}\right.}{\ldots}$

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/2*g/e^2/(e*x+d)^2-1/3*(-d*g+e*f)/e^2/(e*x+d)^3)+b/c*(1/3*c^4*arcsin(
c*x)/e^2/(c*e*x+c*d)^3*d*g-1/3*c^4*arcsin(c*x)/e/(c*e*x+c*d)^3*f-1/2*c^3*a
rcsin(c*x)*g/e^2/(c*e*x+c*d)^2+1/6*c^3/e^2*(3*g/e^2*(1/(c^2*d^2-e^2)*e^2/(
c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*
c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*
c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+
d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))-2*c*(d*g-e*f)/e^3*(1/2/(c^2
*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e
^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-
(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-
e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/
e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d
^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^
2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^
2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*
x+d*c/e)))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 946 vs. $2(237) = 474$.

Time = 16.93 (sec) , antiderivative size = 1920, normalized size of antiderivative = 7.47

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fricas")
```

output
```
[-1/12*(6*(a*c^6*d^6*e - 3*a*c^4*d^4*e^3 + 3*a*c^2*d^2*e^5 - a*e^7)*g*x -
sqrt(-c^2*d^2 + e^2)*(((2*b*c^5*d^2*e^4 + b*c^3*e^6)*f + (b*c^5*d^3*e^3 -
4*b*c^3*d*e^5)*g)*x^3 + 3*((2*b*c^5*d^3*e^3 + b*c^3*d*e^5)*f + (b*c^5*d^4*
e^2 - 4*b*c^3*d^2*e^4)*g)*x^2 + (2*b*c^5*d^5*e + b*c^3*d^3*e^3)*f + (b*c^5
*d^6 - 4*b*c^3*d^4*e^2)*g + 3*((2*b*c^5*d^4*e^2 + b*c^3*d^2*e^4)*f + (b*c^
5*d^5*e - 4*b*c^3*d^3*e^3)*g)*x)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 -
 c^2*e^2)*x^2 + 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) +
2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 4*(a*c^6*d^6*e - 3*a*c^4*d^4*e^3 + 3*a
*c^2*d^2*e^5 - a*e^7)*f + 2*(a*c^6*d^7 - 3*a*c^4*d^5*e^2 + 3*a*c^2*d^3*e^4
 - a*d*e^6)*g + 2*(3*(b*c^6*d^6*e - 3*b*c^4*d^4*e^3 + 3*b*c^2*d^2*e^5 - b*
e^7)*g*x + 2*(b*c^6*d^6*e - 3*b*c^4*d^4*e^3 + 3*b*c^2*d^2*e^5 - b*e^7)*f +
 (b*c^6*d^7 - 3*b*c^4*d^5*e^2 + 3*b*c^2*d^3*e^4 - b*d*e^6)*g)*arcsin(c*x)
- 2*sqrt(-c^2*x^2 + 1)*(3*((b*c^5*d^3*e^4 - b*c^3*d*e^6)*f - (b*c^3*d^2*e^
5 - b*c*e^7)*g)*x^2 + (4*b*c^5*d^5*e^2 - 5*b*c^3*d^3*e^4 + b*c*d*e^6)*f -
(b*c^5*d^6*e + b*c^3*d^4*e^3 - 2*b*c*d^2*e^5)*g + ((7*b*c^5*d^4*e^3 - 8*b*
c^3*d^2*e^5 + b*c*e^7)*f - (b*c^5*d^5*e^2 + 4*b*c^3*d^3*e^4 - 5*b*c*d*e^6)
*g)*x))/(c^6*d^9*e^2 - 3*c^4*d^7*e^4 + 3*c^2*d^5*e^6 - d^3*e^8 + (c^6*d^6*
e^5 - 3*c^4*d^4*e^7 + 3*c^2*d^2*e^9 - e^11)*x^3 + 3*(c^6*d^7*e^4 - 3*c^4*d
^5*e^6 + 3*c^2*d^3*e^8 - d*e^10)*x^2 + 3*(c^6*d^8*e^3 - 3*c^4*d^6*e^5 + 3*
c^2*d^4*e^7 - d^2*e^9)*x), -1/6*(3*(a*c^6*d^6*e - 3*a*c^4*d^4*e^3 + 3*a...
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{(d+ex)^4}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**4,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**4, x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="maxima")
```

output
```
-1/6*(3*e*x + d)*a*g/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/3
*a*f/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e) - 1/6*((3*b*e*g*x + 2*b
*e*f + b*d*g)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 6*(e^5*x^3 + 3*
d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2)*integrate(1/6*(3*b*c*e*g*x + 2*b*c*e*f
+ b*c*d*g)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))/(c^4*e^5*x^7 + 3*c^4*d
*e^4*x^6 - 3*c^2*d^2*e^3*x^3 - c^2*d^3*e^2*x^2 + (3*c^4*d^2*e^3 - c^2*e^5)
*x^5 + (c^4*d^3*e^2 - 3*c^2*d*e^4)*x^4 + (c^2*e^5*x^5 + 3*c^2*d*e^4*x^4 -
3*d^2*e^3*x - d^3*e^2 + (3*c^2*d^2*e^3 - e^5)*x^3 + (c^2*d^3*e^2 - 3*d*e^4
)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))/(e^5*x^3 + 3*d*e^4*x^2 + 3*d
^2*e^3*x + d^3*e^2)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx=\int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{{(d+e\,x)}^4}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^4,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^4, x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$
$$=\frac{6\left(\int \frac{asin(cx)}{e^4x^4+4d\,e^3x^3+6d^2e^2x^2+4d^3ex+d^4}dx\right)b\,d^3e^2f+18\left(\int \frac{asin(cx)}{e^4x^4+4d\,e^3x^3+6d^2e^2x^2+4d^3ex+d^4}dx\right)b\,d^2e^3fx+18\left(\int \frac{}{e^4x^4}\right.}{}$$

input
```
int((g*x+f)*(a+b*asin(c*x))/(e*x+d)^4,x)
```

output
```
(6*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e
**4*x**4),x)*b*d**3*e**2*f + 18*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*
e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**2*e**3*f*x + 18*int(asin(c*
x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b
*d*e**4*f*x**2 + 6*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4
*d*e**3*x**3 + e**4*x**4),x)*b*e**5*f*x**3 + 6*int((asin(c*x)*x)/(d**4 + 4
*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**3*e**2*g
 + 18*int((asin(c*x)*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x
**3 + e**4*x**4),x)*b*d**2*e**3*g*x + 18*int((asin(c*x)*x)/(d**4 + 4*d**3*
e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d*e**4*g*x**2 + 6
*int((asin(c*x)*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 +
 e**4*x**4),x)*b*e**5*g*x**3 - a*d*g - 2*a*e*f - 3*a*e*g*x)/(6*e**2*(d**3
+ 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3))
```

3.38 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 360

$$\begin{aligned}
&\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx \\
&= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{12e\left(c^2d^2-e^2\right)(d+ex)^3} - \frac{bc(4e^2g-c^2d(5ef-dg))\sqrt{1-c^2x^2}}{24e\left(c^2d^2-e^2\right)^2(d+ex)^2} \\
&\quad + \frac{bc^3(4e^2(ef-4dg)+c^2d^2(11ef+dg))\sqrt{1-c^2x^2}}{24e\left(c^2d^2-e^2\right)^3(d+ex)} \\
&\quad - \frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3} \\
&\quad - \frac{bc^3(4e^4g-c^2de^2(9ef-13dg)-2c^4d^3(3ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{24e^2\left(c^2d^2-e^2\right)^{7/2}}
\end{aligned}$$

output
```
1/12*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)^3-1/24*b*c*
(4*e^2*g-c^2*d*(-d*g+5*e*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)^2/(e*x+d)^
2+1/24*b*c^3*(4*e^2*(-4*d*g+e*f)+c^2*d^2*(d*g+11*e*f))*(-c^2*x^2+1)^(1/2)/
e/(c^2*d^2-e^2)^3/(e*x+d)-1/4*(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)^4-1
/3*g*(a+b*arcsin(c*x))/e^2/(e*x+d)^3-1/24*b*c^3*(4*e^4*g-c^2*d*e^2*(-13*d*
g+9*e*f)-2*c^4*d^3*(d*g+3*e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c
^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(7/2)
```

Mathematica [A] (verified)

Time = 0.63 (sec) , antiderivative size = 418, normalized size of antiderivative = 1.16

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$$
$$= \frac{\frac{a(-6ef+6dg)}{(d+ex)^4} - \frac{8ag}{(d+ex)^3} - \frac{be\sqrt{1-c^2x^2}\left(c^5d^2\left(-2d^3g+11e^3fx^2+d^2e(18f+gx)+de^2x(27f+gx)\right)+2ce^4(dg+e(f+2gx))-c^3e^2\left(15d^3g-4e^3f\cdots\right.\right.}{(-c^2d^2+e^2)^3(d+ex)^3}}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

output
```
((a*(-6*e*f + 6*d*g))/(d + e*x)^4 - (8*a*g)/(d + e*x)^3 - (b*e*Sqrt[1 - c^
2*x^2]*(c^5*d^2*(-2*d^3*g + 11*e^3*f*x^2 + d^2*e*(18*f + g*x) + d*e^2*x*(2
7*f + g*x)) + 2*c*e^4*(d*g + e*(f + 2*g*x)) - c^3*e^2*(15*d^3*g - 4*e^3*f*
x^2 + 5*d^2*e*(f + 7*g*x) + d*e^2*x*(-3*f + 16*g*x))))/((-(c^2*d^2) + e^2)
^3*(d + e*x)^3) - (2*b*(3*e*f + d*g + 4*e*g*x)*ArcSin[c*x])/(d + e*x)^4 +
(b*c^3*(4*e^4*g - 2*c^4*d^3*(3*e*f + d*g) + c^2*d*e^2*(-9*e*f + 13*d*g))*L
og[d + e*x])/((-(c*d) + e)^3*(c*d + e)^3*Sqrt[-(c^2*d^2) + e^2]) + (b*c^3*
(-4*e^4*g + c^2*d*e^2*(9*e*f - 13*d*g) + 2*c^4*d^3*(3*e*f + d*g))*Log[e +
c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^3*(c*d
+ e)^3*Sqrt[-(c^2*d^2) + e^2]))/(24*e^2)
```

Rubi [A] (verified)

Time = 0.73 (sec) , antiderivative size = 382, normalized size of antiderivative = 1.06, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules used = {5252, 27, 688, 27, 688, 25, 27, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$$
$$\Big\downarrow \text{5252}$$
$$-bc\int -\frac{3ef+dg+4egx}{12e^2(d+ex)^4\sqrt{1-c^2x^2}}dx - \frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{3ef+dg+4egx}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{\int -\frac{3\left(-d(3ef+dg)c^2+2e(ef-dg)xc^2+4e^2g\right)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\int \frac{-d(3ef+dg)c^2+2e(ef-dg)xc^2+4e^2g}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{\int -\frac{c^2\left(2\left(c^2(3ef+dg)d^2+2e^2(ef-3dg)\right)+e\left(4e^2g-c^2d(5ef-dg)\right)x\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2\left(c^2d^2-e^2\right)}+\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}}{c^2d^2-e^2}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{25}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\int \frac{c^2\left(2\left(c^2(3ef+dg)d^2+2e^2(ef-3dg)\right)+e\left(4e^2g-c^2d(5ef-dg)\right)x\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{c^2\int\frac{2\left(c^2(3ef+dg)d^2+2e^2(ef-3dg)\right)+e\left(4e^2g-c^2d(5ef-dg)\right)x}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$\Big\downarrow$ 679

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(dg+11ef)+4e^2(ef-4dg)\right)}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{\left(-2c^4d^3(dg+3ef)-c^2de^2(9ef-13dg)+4e\cdots\right.}{c^2d^2-e^2}\cdots\right.}{2\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\cdots}{12e^2}\cdots$$

$$\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$\Big\downarrow$ 488

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{c^2\left(\frac{\left(-2c^4d^3(dg+3ef)-c^2de^2(9ef-13dg)+4e^4g\right)\int\frac{1}{-c^2d^2+e^2-\frac{\left(dxc^2+e\right)^2}{1-c^2x^2}}d\frac{dxc^2+e}{\sqrt{1-c^2x^2}}}{c^2d^2-e^2}+\cdots\right.}{2\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\cdots}{12e^2}\cdots$$

$$\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$\Big\downarrow$ 217

$$-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}+\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(dg+11ef)+4e^2(ef-4dg)\right)}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)\left(-2c^4d^3(\cdots\right.}{\left(c^2d^2-e^2\cdots\right.}\right.}{2\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right.}{12e^2}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

output
```
-1/4*((e*f - d*g)*(a + b*ArcSin[c*x]))/(e^2*(d + e*x)^4) - (g*(a + b*ArcSi
n[c*x]))/(3*e^2*(d + e*x)^3) + (b*c*((e*(e*f - d*g)*Sqrt[1 - c^2*x^2])/((c
^2*d^2 - e^2)*(d + e*x)^3) - ((e*(4*e^2*g - c^2*d*(5*e*f - d*g))*Sqrt[1 -
c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2) - (c^2*((e*(4*e^2*(e*f - 4*d*g)
+ c^2*d^2*(11*e*f + d*g))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) -
 ((4*e^4*g - c^2*d*e^2*(9*e*f - 13*d*g) - 2*c^4*d^3*(3*e*f + d*g))*ArcTan[
(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3
/2)))/(2*(c^2*d^2 - e^2)))/(c^2*d^2 - e^2)))/(12*e^2)
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1549 vs. $2(336) = 672$.

Time = 1.06 (sec) , antiderivative size = 1550, normalized size of antiderivative = 4.31

method	result	size
parts	Expression too large to display	1550
derivativedivides	Expression too large to display	1554
default	Expression too large to display	1554

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/3*g/e^2/(e*x+d)^3-1/4*(-d*g+e*f)/e^2/(e*x+d)^4)+b/c*(1/4*c^5*arcsin(
c*x)/e^2/(c*e*x+c*d)^4*d*g-1/4*c^5*arcsin(c*x)/e/(c*e*x+c*d)^4*f-1/3*c^4*a
rcsin(c*x)*g/e^2/(c*e*x+c*d)^3+1/12*c^4/e^2*(4*g/e^3*(1/2/(c^2*d^2-e^2)*e^
2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/
2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^
2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*
d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*
d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)
^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln(
(-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(
c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))-3
*c*(d*g-e*f)/e^4*(1/3/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^3*(-(c*x+d*c/e)^2+2*d*
c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+5/3*d*c*e/(c^2*d^2-e^2)*(1/2/(c^2
*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e
^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-
(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-
e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/
e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d
^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^
2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)...
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1407 vs. $2(334) = 668$.

Time = 85.38 (sec) , antiderivative size = 2839, normalized size of antiderivative = 7.89

$$\int \frac{(f + gx)(a + b \arcsin(cx))}{(d + ex)^5} \, dx = \text{Too large to display}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="fricas")
```

output
```
[-1/48*(16*(a*c^8*d^8*e - 4*a*c^6*d^6*e^3 + 6*a*c^4*d^4*e^5 - 4*a*c^2*d^2*
e^7 + a*e^9)*g*x + ((3*(2*b*c^7*d^3*e^5 + 3*b*c^5*d*e^7)*f + (2*b*c^7*d^4*
e^4 - 13*b*c^5*d^2*e^6 - 4*b*c^3*e^8)*g)*x^4 + 4*(3*(2*b*c^7*d^4*e^4 + 3*b
*c^5*d^2*e^6)*f + (2*b*c^7*d^5*e^3 - 13*b*c^5*d^3*e^5 - 4*b*c^3*d*e^7)*g)*
x^3 + 6*(3*(2*b*c^7*d^5*e^3 + 3*b*c^5*d^3*e^5)*f + (2*b*c^7*d^6*e^2 - 13*b
*c^5*d^4*e^4 - 4*b*c^3*d^2*e^6)*g)*x^2 + 3*(2*b*c^7*d^7*e + 3*b*c^5*d^5*e^
3)*f + (2*b*c^7*d^8 - 13*b*c^5*d^6*e^2 - 4*b*c^3*d^4*e^4)*g + 4*(3*(2*b*c^
7*d^6*e^2 + 3*b*c^5*d^4*e^4)*f + (2*b*c^7*d^7*e - 13*b*c^5*d^5*e^3 - 4*b*c
^3*d^3*e^5)*g)*x)*sqrt(-c^2*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4
*d^2 - c^2*e^2)*x^2 - 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 +
 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 12*(a*c^8*d^8*e - 4*a*c^6*d^6*e^
3 + 6*a*c^4*d^4*e^5 - 4*a*c^2*d^2*e^7 + a*e^9)*f + 4*(a*c^8*d^9 - 4*a*c^6*
d^7*e^2 + 6*a*c^4*d^5*e^4 - 4*a*c^2*d^3*e^6 + a*d*e^8)*g + 4*(4*(b*c^8*d^8
*e - 4*b*c^6*d^6*e^3 + 6*b*c^4*d^4*e^5 - 4*b*c^2*d^2*e^7 + b*e^9)*g*x + 3*
(b*c^8*d^8*e - 4*b*c^6*d^6*e^3 + 6*b*c^4*d^4*e^5 - 4*b*c^2*d^2*e^7 + b*e^9
)*f + (b*c^8*d^9 - 4*b*c^6*d^7*e^2 + 6*b*c^4*d^5*e^4 - 4*b*c^2*d^3*e^6 + b
*d*e^8)*g)*arcsin(c*x) - 2*sqrt(-c^2*x^2 + 1)*(((11*b*c^7*d^4*e^5 - 7*b*c^
5*d^2*e^7 - 4*b*c^3*e^9)*f + (b*c^7*d^5*e^4 - 17*b*c^5*d^3*e^6 + 16*b*c^3*
d*e^8)*g)*x^3 + ((38*b*c^7*d^5*e^4 - 31*b*c^5*d^3*e^6 - 7*b*c^3*d*e^8)*f +
 (2*b*c^7*d^6*e^3 - 53*b*c^5*d^4*e^5 + 55*b*c^3*d^2*e^7 - 4*b*c*e^9)*g)...
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx=\int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{(d+ex)^5}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**5,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**5, x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^5}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="maxima")
```

output
```
-1/12*(4*e*x + d)*a*g/(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x
 + d^4*e^2) - 1/4*a*f/(e^5*x^4 + 4*d*e^4*x^3 + 6*d^2*e^3*x^2 + 4*d^3*e^2*x
 + d^4*e) - 1/12*((4*b*e*g*x + 3*b*e*f + b*d*g)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)) + 12*(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x
 + d^4*e^2)*integrate(1/12*(4*b*c*e*g*x + 3*b*c*e*f + b*c*d*g)*e^(1/2*log(
c*x + 1) + 1/2*log(-c*x + 1))/(c^4*e^6*x^8 + 4*c^4*d*e^5*x^7 - 4*c^2*d^3*e
^3*x^3 - c^2*d^4*e^2*x^2 + (6*c^4*d^2*e^4 - c^2*e^6)*x^6 + 4*(c^4*d^3*e^3
- c^2*d*e^5)*x^5 + (c^4*d^4*e^2 - 6*c^2*d^2*e^4)*x^4 + (c^2*e^6*x^6 + 4*c^
2*d*e^5*x^5 - 4*d^3*e^3*x - d^4*e^2 + (6*c^2*d^2*e^4 - e^6)*x^4 + 4*(c^2*d
^3*e^3 - d*e^5)*x^3 + (c^2*d^4*e^2 - 6*d^2*e^4)*x^2)*e^(log(c*x + 1) + log
(-c*x + 1))), x))/(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x + d
^4*e^2)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx=\int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{{\left(d+e\,x\right)}^5}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^5,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^5, x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx=\int \frac{(gx+f)\,(asin(cx)\,b+a)}{(ex+d)^5}dx$$

input
```
int((g*x+f)*(a+b*asin(c*x))/(e*x+d)^5,x)
```

output
```
int((g*x+f)*(a+b*asin(c*x))/(e*x+d)^5,x)
```

3.39 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$

Optimal result

Integrand size = 21, antiderivative size = 457

$$\begin{aligned}
&\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx \\
&= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{20e\left(c^2d^2-e^2\right)(d+ex)^4}-\frac{bc\left(5e^2g-c^2d(7ef-2dg)\right)\sqrt{1-c^2x^2}}{60e\left(c^2d^2-e^2\right)^2(d+ex)^3} \\
&\quad+\frac{bc^3\left(e^2(9ef-34dg)+c^2d^2(26ef-dg)\right)\sqrt{1-c^2x^2}}{120e\left(c^2d^2-e^2\right)^3(d+ex)^2} \\
&\quad-\frac{bc^3\left(4e^4g-c^2de^2(11ef-18dg)-c^4d^3(10ef+dg)\right)\sqrt{1-c^2x^2}}{24e\left(c^2d^2-e^2\right)^4(d+ex)} \\
&\quad-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} \\
&\quad+\frac{bc^5\left(c^2d^2e^2(24ef-19dg)+3e^4(ef-6dg)+2c^4d^4(4ef+dg)\right)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{40e^2\left(c^2d^2-e^2\right)^{9/2}}
\end{aligned}$$

output
```
1/20*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)^4-1/60*b*c*
(5*e^2*g-c^2*d*(-2*d*g+7*e*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)^2/(e*x+d
)^3+1/120*b*c^3*(e^2*(-34*d*g+9*e*f)+c^2*d^2*(-d*g+26*e*f))*(-c^2*x^2+1)^(
1/2)/e/(c^2*d^2-e^2)^3/(e*x+d)^2-1/24*b*c^3*(4*e^4*g-c^2*d*e^2*(-18*d*g+11
*e*f)-c^4*d^3*(d*g+10*e*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)^4/(e*x+d)-1
/5*(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)^5-1/4*g*(a+b*arcsin(c*x))/e^2/
(e*x+d)^4+1/40*b*c^5*(c^2*d^2*e^2*(-19*d*g+24*e*f)+3*e^4*(-6*d*g+e*f)+2*c^
4*d^4*(d*g+4*e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/
2))/e^2/(c^2*d^2-e^2)^(9/2)
```

Mathematica [A] (verified)

Time = 0.79 (sec) , antiderivative size = 494, normalized size of antiderivative = 1.08

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$$
$$= \frac{\frac{3a(-8ef+8dg)}{(d+ex)^5} - \frac{30ag}{(d+ex)^4} + \frac{bce\sqrt{1-c^2x^2}\left(-6\left(-c^2d^2+e^2\right)^3(ef-dg)-2\left(-c^2d^2+e^2\right)^2\left(5e^2g+c^2d(-7ef+2dg)\right)(d+ex)-c^2\left(c^2d^2-e^2\right)\left(c^2d^2(\right.\right.}{\left(-c^2d^2+e^2\right)^4(c}}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

output
```
((3*a*(-8*e*f + 8*d*g))/(d + e*x)^5 - (30*a*g)/(d + e*x)^4 + (b*c*e*Sqrt[1
 - c^2*x^2]*(-6*(-(c^2*d^2) + e^2)^3*(e*f - d*g) - 2*(-(c^2*d^2) + e^2)^2*
(5*e^2*g + c^2*d*(-7*e*f + 2*d*g))*(d + e*x) - c^2*(c^2*d^2 - e^2)*(c^2*d^
2*(-26*e*f + d*g) + e^2*(-9*e*f + 34*d*g))*(d + e*x)^2 + 5*c^2*(-4*e^4*g +
 c^2*d*e^2*(11*e*f - 18*d*g) + c^4*d^3*(10*e*f + d*g))*(d + e*x)^3))/((-(c
^2*d^2) + e^2)^4*(d + e*x)^4) - (6*b*(4*e*f + d*g + 5*e*g*x)*ArcSin[c*x])/
(d + e*x)^5 + (3*b*c^5*(c^2*d^2*e^2*(24*e*f - 19*d*g) + 3*e^4*(e*f - 6*d*g
) + 2*c^4*d^4*(4*e*f + d*g))*Log[d + e*x])/((-(c*d) + e)^4*(c*d + e)^4*Sqr
t[-(c^2*d^2) + e^2]) - (3*b*c^5*(c^2*d^2*e^2*(24*e*f - 19*d*g) + 3*e^4*(e*
f - 6*d*g) + 2*c^4*d^4*(4*e*f + d*g))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) +
e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^4*(c*d + e)^4*Sqrt[-(c^2*d^2) + e^2
]))/(120*e^2)
```

Rubi [A] (verified)

Time = 1.02 (sec) , antiderivative size = 497, normalized size of antiderivative = 1.09, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {5252, 27, 688, 27, 688, 25, 27, 688, 25, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int -\frac{4ef+dg+5egx}{20e^2(d+ex)^5\sqrt{1-c^2x^2}}dx-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{4ef+dg+5egx}{(d+ex)^5\sqrt{1-c^2x^2}}dx}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{\int -\frac{4\left(-d(4ef+dg)c^2+3e(ef-dg)xc^2+5e^2g\right)}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{4(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\int \frac{-d(4ef+dg)c^2+3e(ef-dg)xc^2+5e^2g}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{\int -\frac{c^2\left(3\left(c^2(4ef+dg)d^2+e^2(3ef-8dg)\right)+2e\left(5e^2g-c^2d(7ef-2dg)\right)x\right)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3\left(c^2d^2-e^2\right)}+\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}}{c^2d^2-e^2}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\Big\downarrow$ 25

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\int \frac{c^2\left(3\left(c^2(4ef+dg)d^2+e^2(3ef-8dg)\right)+2e\left(5e^2g-c^2d(7ef-2dg)\right)x\right)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\Big\downarrow$ 27

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\int \frac{3\left(c^2(4ef+dg)d^2+e^2(3ef-8dg)\right)+2e\left(5e^2g-c^2d(7ef-2dg)\right)x}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\Big\downarrow$ 688

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{\int -\frac{e\left(c^2(26ef-dg)d^2+e^2(9ef-34dg)\right)xc^2+2\left(-3d^3(4ef+dg)c^4-de^2(23ef-28dg)c^2+\right.}{(d+ex)^2\sqrt{1-c^2x^2}}}{2\left(c^2d^2-e^2\right)}\right.}{3\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right.}{20e^2}$$

$$\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\Big\downarrow$ 25

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(26ef-dg)+e^2(9ef-34dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\int\frac{e\left(c^2(26ef-dg)d^2+e^2(9ef-34dg)\right)x\ldots}{(\ldots}}{\ldots}\right)}{3\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\ldots\right)}{20e^2}$$

$$\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\Big\downarrow$ 679

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(26ef-dg)+e^2(9ef-34dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{5e\sqrt{1-c^2x^2}\left(c^4\left(-d^3\right)(dg+10ef)-c^2d\ldots\right.}{\left(c^2d^2-e^2\right)(d+ex\ldots}\ldots\right)}{\ldots}}{c^2d^2-e^2}\ldots\right)}{20e^2}$$

$$\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\Big\downarrow$ 488

$$bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(26ef-dg)+e^2(9ef-34dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{3c^2\left(2c^4d^4(dg+4ef)+c^2d^2e^2(24ef-19\cdots\right.}{\cdots}\right.}{\cdots}}{c^2d^2-\cdots}\right.$$

$$\overline{\qquad 20e^2 \cdots}$$

$$\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\downarrow$ 217

$$-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}+$$

$$bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(26ef-dg)+e^2(9ef-34dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\frac{5e\sqrt{1-c^2x^2}\left(c^4\left(-d^3\right)(dg+10ef)-c^2d\cdots\right.}{\left(c^2d^2-e^2\right)(d+e\cdots}}{\cdots}\right.}{\cdots}}{c^2d^2-e^2\cdots}\right.$$

$$\overline{\qquad 20e^2 \cdots}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

output
```
-1/5*((e*f - d*g)*(a + b*ArcSin[c*x]))/(e^2*(d + e*x)^5) - (g*(a + b*ArcSi
n[c*x]))/(4*e^2*(d + e*x)^4) + (b*c*((e*(e*f - d*g)*Sqrt[1 - c^2*x^2])/((c
^2*d^2 - e^2)*(d + e*x)^4) - ((e*(5*e^2*g - c^2*d*(7*e*f - 2*d*g))*Sqrt[1
- c^2*x^2])/(3*(c^2*d^2 - e^2)*(d + e*x)^3) - (c^2*((e*(e^2*(9*e*f - 34*d*
g) + c^2*d^2*(26*e*f - d*g))*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*
x)^2) - ((5*e*(4*e^4*g - c^2*d*e^2*(11*e*f - 18*d*g) - c^4*d^3*(10*e*f + d
*g))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - (3*c^2*(c^2*d^2*e^2*
(24*e*f - 19*d*g) + 3*e^4*(e*f - 6*d*g) + 2*c^4*d^4*(4*e*f + d*g))*ArcTan[
(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3
/2))/(2*(c^2*d^2 - e^2))))/(3*(c^2*d^2 - e^2)))/(c^2*d^2 - e^2)))/(20*e^2)
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2405 vs. $2(429) = 858$.

Time = 0.40 (sec) , antiderivative size = 2406, normalized size of antiderivative = 5.26

method	result	size
parts	Expression too large to display	2406
derivativedivides	Expression too large to display	2420
default	Expression too large to display	2420

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/5*(-d*g+e*f)/e^2/(e*x+d)^5-1/4*g/e^2/(e*x+d)^4)-1/4*b*c^4*arcsin(c*x
)*g/e^2/(c*e*x+c*d)^4+1/5*b*c^5*arcsin(c*x)/e^2/(c*e*x+c*d)^5*d*g-1/5*b*c^
5*arcsin(c*x)/e/(c*e*x+c*d)^5*f+1/12*b*c^4/e^4*g/(c^2*d^2-e^2)/(c*x+d*c/e)
^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+17/60*b*c^
5/e^3*g*d/(c^2*d^2-e^2)^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e
)-(c^2*d^2-e^2)/e^2)^(1/2)+13/12*b*c^6/e^2*g*d^2/(c^2*d^2-e^2)^3/(c*x+d*c/
e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-11/8*b*c^7
/e^3*g*d^3/(c^2*d^2-e^2)^3/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)
/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*
c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))+9/20*b*c^5/e^3*g*d/
(c^2*d^2-e^2)^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/
e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*
c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))-1/6*b*c^4/e^2*g/(c^2*d^2-e^2)^
2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)
-1/20*b*c^5/e^5/(c^2*d^2-e^2)/(c*x+d*c/e)^4*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d
*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*d*g+1/20*b*c^5/e^4/(c^2*d^2-e^2)/(c*x+d*c/e
)^4*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f-7/60*b*
c^6/e^4*d^2/(c^2*d^2-e^2)^2/(c*x+d*c/e)^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c
/e)-(c^2*d^2-e^2)/e^2)^(1/2)*g+7/60*b*c^6/e^3*d/(c^2*d^2-e^2)^2/(c*x+d*c/e
)^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f-7/24...
```

Fricas [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="fricas")
```

output
```
Timed out
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx)}{(d+ex)^6}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**6,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**6, x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^6}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="maxima")
```

output
```
-1/20*(5*e*x + d)*a*g/(e^7*x^5 + 5*d*e^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4
*x^2 + 5*d^4*e^3*x + d^5*e^2) - 1/5*a*f/(e^6*x^5 + 5*d*e^5*x^4 + 10*d^2*e^
4*x^3 + 10*d^3*e^3*x^2 + 5*d^4*e^2*x + d^5*e) - 1/20*((5*b*e*g*x + 4*b*e*f
 + b*d*g)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 20*(e^7*x^5 + 5*d*e
^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4*x^2 + 5*d^4*e^3*x + d^5*e^2)*integrat
e(1/20*(5*b*c*e*g*x + 4*b*c*e*f + b*c*d*g)*e^(1/2*log(c*x + 1) + 1/2*log(-
c*x + 1))/(c^4*e^7*x^9 + 5*c^4*d*e^6*x^8 - 5*c^2*d^4*e^3*x^3 - c^2*d^5*e^2
*x^2 + (10*c^4*d^2*e^5 - c^2*e^7)*x^7 + 5*(2*c^4*d^3*e^4 - c^2*d*e^6)*x^6
+ 5*(c^4*d^4*e^3 - 2*c^2*d^2*e^5)*x^5 + (c^4*d^5*e^2 - 10*c^2*d^3*e^4)*x^4
 + (c^2*e^7*x^7 + 5*c^2*d*e^6*x^6 - 5*d^4*e^3*x - d^5*e^2 + (10*c^2*d^2*e^
5 - e^7)*x^5 + 5*(2*c^2*d^3*e^4 - d*e^6)*x^4 + 5*(c^2*d^4*e^3 - 2*d^2*e^5)
*x^3 + (c^2*d^5*e^2 - 10*d^3*e^4)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))),
x))/(e^7*x^5 + 5*d*e^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4*x^2 + 5*d^4*e^3*x
 + d^5*e^2)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d+e\,x)^6}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^6,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^6, x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(gx+f)\,(asin(cx)\,b+a)}{(ex+d)^6}dx$$

input
```
int((g*x+f)*(a+b*asin(c*x))/(e*x+d)^6,x)
```

output
```
int((g*x+f)*(a+b*asin(c*x))/(e*x+d)^6,x)
```

3.40 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 23, antiderivative size = 935

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e\,(c^2d^2-e^2)\,(d+ex)} + \frac{abg^2\arcsin(cx)}{e^2(ef-dg)} + \frac{b^2c(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)}{e\,(c^2d^2-e^2)\,(d+ex)} + \frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} - \frac{abc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\,(c^2d^2-e^2)^{3/2}} - \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} - \frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\,(c^2d^2-e^2)^{3/2}} + \frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\,(c^2d^2-e^2)^{3/2}} - \frac{b^2c^2(ef-dg)\log(d+ex)}{e^2\,(c^2d^2-e^2)} - \frac{2b^2cg\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} - \frac{b^2c^3d(ef-dg)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\,(c^2d^2-e^2)^{3/2}} + \frac{2b^2cg\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} + \frac{b^2c^3d(ef-dg)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\,(c^2d^2-e^2)^{3/2}}$$

output
```
a*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)+a*b*g^2*arcsin
(c*x)/e^2/(-d*g+e*f)+b^2*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)*arcsin(c*x)/e/(c^
2*d^2-e^2)/(e*x+d)+1/2*b^2*g^2*arcsin(c*x)^2/e^2/(-d*g+e*f)-1/2*(g*x+f)^2*
(a+b*arcsin(c*x))^2/(-d*g+e*f)/(e*x+d)^2-a*b*c*(2*e^2*g-c^2*d*(d*g+e*f))*a
rctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2
)^(3/2)-2*I*b^2*c*g*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(
c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)-I*b^2*c^3*d*(-d*g+e*f)*arcsin
(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2/(
c^2*d^2-e^2)^(3/2)+2*I*b^2*c*g*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1
/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+I*b^2*c^3*d*(-d*g+
e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1
/2)))/e^2/(c^2*d^2-e^2)^(3/2)-b^2*c^2*(-d*g+e*f)*ln(e*x+d)/e^2/(c^2*d^2-e^
2)-2*b^2*c*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(
1/2)))/e^2/(c^2*d^2-e^2)^(1/2)-b^2*c^3*d*(-d*g+e*f)*polylog(2,I*e*(I*c*x+(
-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(3/2)+2*b^
2*c*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/
e^2/(c^2*d^2-e^2)^(1/2)+b^2*c^3*d*(-d*g+e*f)*polylog(2,I*e*(I*c*x+(-c^2*x^
2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(3/2)
```

Mathematica [A] (verified)

Time = 1.02 (sec) , antiderivative size = 574, normalized size of antiderivative = 0.61

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$= \frac{-\frac{(ef-dg)(a+b\arcsin(cx))^2}{(d+ex)^2} - \frac{2g(a+b\arcsin(cx))^2}{d+ex} + \frac{4bcg\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)-b\,\mathrm{P}}{\sqrt{c^2d^2-e^2}}}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

output
```
(-(((e*f - d*g)*(a + b*ArcSin[c*x])^2)/(d + e*x)^2) - (2*g*(a + b*ArcSin[c
*x])^2)/(d + e*x) + (4*b*c*g*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*
ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c
*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))
/(c*d - Sqrt[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d
+ Sqrt[c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e^2] + (2*b*c*(e*f - d*g)*(e*Sqrt
[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - b*c*Sqrt[c^2*d^2 -
 e^2]*(d + e*x)*Log[d + e*x] - I*c^2*d*(d + e*x)*((a + b*ArcSin[c*x])*(Log
[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*
e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) - I*b*PolyLog[2, (I*e*E
^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] + I*b*PolyLog[2, (I*e*E^(I*
ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])))/((c^2*d^2 - e^2)^(3/2)*(d +
e*x)))/(2*e^2)
```

Rubi [A] (verified)

Time = 2.88 (sec) , antiderivative size = 955, normalized size of antiderivative = 1.02, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {5254, 27, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$\Big\downarrow \text{5254}$$

$$-2bc\int -\frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2\sqrt{1-c^2x^2}}dx-\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{ef-dg}-\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{5298}$$

$$\frac{bc\int \left(\frac{b\arcsin(cx)(f+gx)^2}{(d+ex)^2\sqrt{1-c^2x^2}}+\frac{a(f+gx)^2}{(d+ex)^2\sqrt{1-c^2x^2}}\right)dx}{ef-dg}-\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{2009}$$

$$\frac{bc\left(\frac{b\arcsin(cx)^2g^2}{2ce^2}+\frac{a\arcsin(cx)g^2}{ce^2}-\frac{2ib(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)g}{e^2\sqrt{c^2d^2-e^2}}+\frac{2ib(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)g}{e^2\sqrt{c^2d^2-e^2}}\right.}{}$$

$$\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

output
```
-1/2*((f + g*x)^2*(a + b*ArcSin[c*x])^2)/((e*f - d*g)*(d + e*x)^2) + (b*c*
((a*(e*f - d*g)^2*Sqrt[1 - c^2*x^2])/(e*(c^2*d^2 - e^2)*(d + e*x)) + (a*g^
2*ArcSin[c*x])/(c*e^2) + (b*(e*f - d*g)^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(
e*(c^2*d^2 - e^2)*(d + e*x)) + (b*g^2*ArcSin[c*x]^2)/(2*c*e^2) - (a*(e*f -
 d*g)*(2*e^2*g - c^2*d*(e*f + d*g))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e
^2]*Sqrt[1 - c^2*x^2])])/(e^2*(c^2*d^2 - e^2)^(3/2)) - ((2*I)*b*g*(e*f - d
*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2]
)])/(e^2*Sqrt[c^2*d^2 - e^2]) - (I*b*c^2*d*(e*f - d*g)^2*ArcSin[c*x]*Log[1
 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*(c^2*d^2 - e
^2)^(3/2)) + ((2*I)*b*g*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c
*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) + (I*b*c^2*d
*(e*f - d*g)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2
*d^2 - e^2])])/(e^2*(c^2*d^2 - e^2)^(3/2)) - (b*c*(e*f - d*g)^2*Log[d + e*
x])/(e^2*(c^2*d^2 - e^2)) - (2*b*g*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin
[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) - (b*c^2*d
*(e*f - d*g)^2*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^
2])])/(e^2*(c^2*d^2 - e^2)^(3/2)) + (2*b*g*(e*f - d*g)*PolyLog[2, (I*e*E^(
I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) +
(b*c^2*d*(e*f - d*g)^2*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*
d^2 - e^2])])/(e^2*(c^2*d^2 - e^2)^(3/2))))/(e*f - d*g)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5254
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_)*((f_.)
 + (g_.)*(x_))^(p_.), x_Symbol] :> With[{u = IntHide[(f + g*x)^p*(d + e*x)^
m, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c*n   Int[SimplifyInteg
rand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x], x]] /; Free
Q[{a, b, c, d, e, f, g}, x] && IGtQ[n, 0] && IGtQ[p, 0] && ILtQ[m, 0] && Lt
Q[m + p + 1, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2320 vs. $2(941) = 1882$.

Time = 2.11 (sec) , antiderivative size = 2321, normalized size of antiderivative = 2.48

method	result	size
derivativedivides	Expression too large to display	2321
default	Expression too large to display	2321
parts	Expression too large to display	2336

input
```
int((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
1/c*(a^2*c^2*(-g/e^2/(c*e*x+c*d)+1/2*c*(d*g-e*f)/e^2/(c*e*x+c*d)^2)+b^2*c^
2*(-1/2*arcsin(c*x)*(-2*I*c^3*d*e^2*g*x^2+4*I*c^3*d*e^2*f*x+2*I*c^3*e^3*f*
x^2+2*(-c^2*x^2+1)^(1/2)*c^2*d^2*e*g-2*(-c^2*x^2+1)^(1/2)*c^2*d*e^2*f-2*(-
c^2*x^2+1)^(1/2)*c^2*e^3*f*x-2*I*c^3*d^3*g+2*I*c^3*d^2*e*f-e^2*c*d*g*arcsi
n(c*x)-2*arcsin(c*x)*e^3*g*c*x+2*(-c^2*x^2+1)^(1/2)*c^2*d*e^2*g*x-4*I*c^3*
d^2*e*g*x+2*arcsin(c*x)*c^3*d^2*e*g*x-e^3*c*f*arcsin(c*x)+c^3*d^3*g*arcsin
(c*x)+e*c^3*d^2*f*arcsin(c*x))/e^2/(c^2*d^2-e^2)/(c*e*x+c*d)^2-1/e/(c^2*d^
2-e^2)*c*f*ln(I*(I*c*x+(-c^2*x^2+1)^(1/2))^2*e-2*d*c*(I*c*x+(-c^2*x^2+1)^(
1/2))-I*e)+2/e/(c^2*d^2-e^2)*c*f*ln(I*c*x+(-c^2*x^2+1)^(1/2))+1/e^2/(c^2*d
^2-e^2)*d*c*g*ln(I*(I*c*x+(-c^2*x^2+1)^(1/2))^2*e-2*d*c*(I*c*x+(-c^2*x^2+1
)^(1/2))-I*e)-2/e^2/(c^2*d^2-e^2)*d*c*g*ln(I*c*x+(-c^2*x^2+1)^(1/2))+2*(-c
^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*g*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2
+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-2*(-c^2*d
^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*g*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^
(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I/e^2*(-c^2*d
^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*d^2*g*c^2*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(
1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-I/e*(-c^2*d^2+
e^2)^(1/2)/(c^2*d^2-e^2)^2*d*c^2*f*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))
*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-1/e^2*(-c^2*d^2+e^2
)^(1/2)/(c^2*d^2-e^2)^2*d^2*g*c^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^...
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)^2}{(ex+d)^3}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="fricas")
```

output
```
integral((a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(c*x)^2 + 2*(a*b*g*x +
 a*b*f)*arcsin(c*x))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2\,(f+gx)}{(d+ex)^3}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))**2/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d+e\,x\right)^3}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d + e*x)^3,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d + e*x)^3, x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(gx+f)\left(asin(cx)\,b+a\right)^2}{\left(ex+d\right)^3}dx$$

input
```
int((g*x+f)*(a+b*asin(c*x))^2/(e*x+d)^3,x)
```

output
```
int((g*x+f)*(a+b*asin(c*x))^2/(e*x+d)^3,x)
```

3.41 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 1678

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Too large to display}$$

output
```
-2*I*a*b*g^2*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(
1/2)))/e^3-2*I*b^2*g^2*arcsin(c*x)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2)
)/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-2*I*b^2*g^2*arcsin(c*x)*polylog(2,I*e*(I*
c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+2*a*b*g^2*arcsin(c*
x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3+2*a*
b*g^2*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(
1/2)))/e^3+2*b^2*g^2*polylog(3,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^
2-e^2)^(1/2)))/e^3+2*b^2*g^2*polylog(3,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d
-(c^2*d^2-e^2)^(1/2)))/e^3-1/2*a^2*(-d*g+e*f)^2/e^3/(e*x+d)^2+b^2*c*(-d*g+
e*f)^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)/e^2/(c^2*d^2-e^2)/(e*x+d)+a*b*c*(-d*
g+e*f)^2*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)-a*b*c*(-d*g+e*f)*(4*
e^2*g-c^2*d*(3*d*g+e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+
1)^(1/2))/e^3/(c^2*d^2-e^2)^(3/2)-2*a^2*g*(-d*g+e*f)/e^3/(e*x+d)-1/2*b^2*(
-d*g+e*f)^2*arcsin(c*x)^2/e^3/(e*x+d)^2-1/3*I*b^2*g^2*arcsin(c*x)^3/e^3-b^
2*c^2*(-d*g+e*f)^2*ln(e*x+d)/e^3/(c^2*d^2-e^2)-a*b*(-d*g+e*f)^2*arcsin(c*x
)/e^3/(e*x+d)^2+b^2*g^2*arcsin(c*x)^2*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/
(c*d+(c^2*d^2-e^2)^(1/2)))/e^3+b^2*g^2*arcsin(c*x)^2*ln(1-I*e*(I*c*x+(-c^2
*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+I*b^2*c^3*d*(-d*g+e*f)^2*arc
sin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^
3/(c^2*d^2-e^2)^(3/2)-I*b^2*c^3*d*(-d*g+e*f)^2*arcsin(c*x)*ln(1-I*e*(I*...
```

Mathematica [A] (warning: unable to verify)

Time = 2.60 (sec) , antiderivative size = 903, normalized size of antiderivative = 0.54

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$= \frac{-\frac{3(ef-dg)^2(a+b\arcsin(cx))^2}{(d+ex)^2}+\frac{12g(-ef+dg)(a+b\arcsin(cx))^2}{d+ex}-\frac{2ig^2(a+b\arcsin(cx))^3}{b}+6g^2(a+b\arcsin(cx))^2\log\left(1+\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

output
```
((-3*(e*f - d*g)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^2 + (12*g*(-(e*f) + d*
g)*(a + b*ArcSin[c*x])^2)/(d + e*x) - ((2*I)*g^2*(a + b*ArcSin[c*x])^3)/b
+ 6*g^2*(a + b*ArcSin[c*x])^2*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sq
rt[c^2*d^2 - e^2])] + 6*g^2*(a + b*ArcSin[c*x])^2*Log[1 - (I*e*E^(I*ArcSin
[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] + (24*b*c*g*(-(e*f) + d*g)*(I*(a + b*
ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2
])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) + b*Po
lyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - b*PolyLog[
2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e
^2] + (6*b*c^2*(e*f - d*g)^2*((e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c
*d + c*e*x) - b*Log[d + e*x] + (c*d*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*
e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*A
rcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin
[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x])
)/(c*d + Sqrt[c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e^2]))/(c^2*d^2 - e^2) - 1
2*b*g^2*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - S
qrt[c^2*d^2 - e^2])] - b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^
2*d^2 - e^2])]) - 12*b*g^2*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*Arc
Sin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - b*PolyLog[3, (I*e*E^(I*ArcSin[c*
x]))/(c*d + Sqrt[c^2*d^2 - e^2])]))/(6*e^3)
```

Rubi [A] (verified)

Time = 4.21 (sec) , antiderivative size = 1678, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.080$, Rules used = {5258, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$\Big\downarrow \text{5258}$$

$$\int \left(\frac{a^2(f+gx)^2}{(d+ex)^3}+\frac{2ab\arcsin(cx)(f+gx)^2}{(d+ex)^3}+\frac{b^2\arcsin(cx)^2(f+gx)^2}{(d+ex)^3}\right)dx$$

$$\Big\downarrow \text{2009}$$

$$-\frac{ib^2d(ef-dg)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}+\frac{ib^2d(ef-dg)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}-\frac{b^2d(ef-dg)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}+\frac{b^2d(ef-dg)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}-\frac{b^2(ef-dg)^2\log(d+ex)c^2}{e^3\left(c^2d^2-e^2\right)}+\frac{b^2(ef-dg)^2\sqrt{1-c^2x^2}\arcsin(cx)c}{e^2\left(c^2d^2-e^2\right)(d+ex)}-\frac{ab(ef-dg)\left(4e^2g-c^2d(ef+3dg)\right)\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)c}{e^3\left(c^2d^2-e^2\right)^{3/2}}-\frac{4ib^2g(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}+\frac{4ib^2g(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}-\frac{4b^2g(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}+\frac{4b^2g(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}+\frac{ab(ef-dg)^2\sqrt{1-c^2x^2}c}{e^2\left(c^2d^2-e^2\right)(d+ex)}-\frac{ib^2g^2\arcsin(cx)^3}{3e^3}-\frac{iabg^2\arcsin(cx)^2}{e^3}-\frac{2b^2g(ef-dg)\arcsin(cx)^2}{e^3(d+ex)}-\frac{b^2(ef-dg)^2\arcsin(cx)^2}{2e^3(d+ex)^2}-\frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)}-\frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2}+\frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2abg^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2abg^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{a^2g^2\log(d+ex)}{e^3}-\frac{2iabg^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2iabg^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2b^2g^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2b^2g^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2a^2g(ef-dg)}{e^3(d+ex)}-\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

output
```
-1/2*(a^2*(e*f - d*g)^2)/(e^3*(d + e*x)^2) - (2*a^2*g*(e*f - d*g))/(e^3*(d
 + e*x)) + (a*b*c*(e*f - d*g)^2*Sqrt[1 - c^2*x^2])/(e^2*(c^2*d^2 - e^2)*(d
 + e*x)) - (a*b*(e*f - d*g)^2*ArcSin[c*x])/(e^3*(d + e*x)^2) - (4*a*b*g*(e
*f - d*g)*ArcSin[c*x])/(e^3*(d + e*x)) + (b^2*c*(e*f - d*g)^2*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(e^2*(c^2*d^2 - e^2)*(d + e*x)) - (I*a*b*g^2*ArcSin[c*x
]^2)/e^3 - (b^2*(e*f - d*g)^2*ArcSin[c*x]^2)/(2*e^3*(d + e*x)^2) - (2*b^2*
g*(e*f - d*g)*ArcSin[c*x]^2)/(e^3*(d + e*x)) - ((I/3)*b^2*g^2*ArcSin[c*x]^
3)/e^3 - (a*b*c*(e*f - d*g)*(4*e^2*g - c^2*d*(e*f + 3*d*g))*ArcTan[(e + c^
2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e^3*(c^2*d^2 - e^2)^(3/2
)) + (2*a*b*g^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^
2*d^2 - e^2])])/e^3 - ((4*I)*b^2*c*g*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*
E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2*d^2 - e^2])
 - (I*b^2*c^3*d*(e*f - d*g)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/
(c*d - Sqrt[c^2*d^2 - e^2])])/(e^3*(c^2*d^2 - e^2)^(3/2)) + (b^2*g^2*ArcSi
n[c*x]^2*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^3
 + (2*a*b*g^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*
d^2 - e^2])])/e^3 + ((4*I)*b^2*c*g*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^
(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2*d^2 - e^2]) +
 (I*b^2*c^3*d*(e*f - d*g)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c
*d + Sqrt[c^2*d^2 - e^2])])/(e^3*(c^2*d^2 - e^2)^(3/2)) + (b^2*g^2*ArcS...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5258
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_)*((d_) + (e_.)*(x_))^(m_.)
, x_Symbol] :> Int[ExpandIntegrand[Px*(d + e*x)^m*(a + b*ArcSin[c*x])^n, x]
, x] /; FreeQ[{a, b, c, d, e}, x] && PolynomialQ[Px, x] && IGtQ[n, 0] && In
tegerQ[m]
```

Maple [F]

$$\int \frac{(gx+f)^2 (a+b\arcsin(cx))^2}{(ex+d)^3} dx$$

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x)
```

output
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x)
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3} dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(ex+d)^3} dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="fricas")
```

output
```
integral((a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin
(c*x))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3} dx = \int \frac{(a+b\operatorname{asin}(cx))^2 (f+gx)^2}{(d+ex)^3} dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))**2/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**2/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d+e\,x)^3}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d + e*x)^3,x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d + e*x)^3, x)
```

Reduce [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(gx+f)^2\,(asin(cx)\,b+a)^2}{(ex+d)^3}dx$$

input
```
int((g*x+f)^2*(a+b*asin(c*x))^2/(e*x+d)^3,x)
```

output
```
int((g*x+f)^2*(a+b*asin(c*x))^2/(e*x+d)^3,x)
```

3.42 $\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 376

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{2bd^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{3bcd^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} - \frac{2bc^2d^2x^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} - \frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) - \frac{2d^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{5d^2\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}$$

output
```
2/3*b*d^2*x*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-3/16*b*c*d
^2*x^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-2/9*b*c^2*d^2*x
^3*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16*b*c^3*d^2*x^4*
(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+3/8*d^2*x*(c*d*x+d)^(1
/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))+1/4*c^2*d^2*x^3*(c*d*x+d)^(1/2)*(-c
*f*x+f)^(1/2)*(a+b*arcsin(c*x))-2/3*d^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(
-c^2*x^2+1)*(a+b*arcsin(c*x))/c+5/16*d^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*
(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 2.28 (sec) , antiderivative size = 293, normalized size of antiderivative = 0.78

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{360bd^2\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2-720ad^{5/2}\sqrt{f}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cf}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right.}{}$$

input

```
Integrate[(d + c*d*x)^(5/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

output

```
(360*b*d^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*d^(5/2)*S
qrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqr
t[d]*Sqrt[f]*(-1 + c^2*x^2))] + d^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-256*
b*c*x*(-3 + c^2*x^2) + 48*a*Sqrt[1 - c^2*x^2]*(-16 + 9*c*x + 16*c^2*x^2 +
6*c^3*x^3) + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]]) + 12*b*d^2
*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-64*(1 - c^2*x^2)^(3/2) + 24
*Sin[2*ArcSin[c*x]] - 3*Sin[4*ArcSin[c*x]]))/(1152*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.49, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\int d^2(cx+1)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d^2\sqrt{cdx+d}\sqrt{f-cfx}\int (cx+1)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$\Big\downarrow$ 5262

$$\frac{d^2\sqrt{cdx+d}\sqrt{f-cfx}\int \left(c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^2+2c\sqrt{1-c^2x^2}(a+b\arcsin(cx))x+\sqrt{1-c^2x^2}(a+b\right.}{\sqrt{1-c^2x^2}}$$

$\Big\downarrow$ 2009

$$\frac{d^2\sqrt{cdx+d}\sqrt{f-cfx}\left(\frac{3}{8}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c}+\frac{1}{4}c^2x^3\sqrt{1-c^2x^2}(a+b\arcsi\right.}{\sqrt{1-c^2x^2}}$$

input
```
Int[(d + c*d*x)^(5/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*((2*b*x)/3 - (3*b*c*x^2)/16 - (2*b*c^
2*x^3)/9 - (b*c^3*x^4)/16 + (3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/8
+ (c^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/4 - (2*(1 - c^2*x^2)^(3/
2)*(a + b*ArcSin[c*x]))/(3*c) + (5*(a + b*ArcSin[c*x])^2)/(16*b*c)))/Sqrt[
1 - c^2*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 3.62 (sec) , antiderivative size = 963, normalized size of antiderivative = 2.56

method	result
default	$-\frac{a(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}}{4fc}-\frac{5ad(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}{12fc}-\frac{5a\,d^{2}\sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}}{8fc}+\frac{5a\,d^{2}\sqrt{-cfx+f}\,\sqrt{cdx+d}}{8c}+\frac{5a\,d^{3}f}{}$
parts	$-\frac{a(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}}{4fc}-\frac{5ad(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}{12fc}-\frac{5a\,d^{2}\sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}}{8fc}+\frac{5a\,d^{2}\sqrt{-cfx+f}\,\sqrt{cdx+d}}{8c}+\frac{5a\,d^{3}f}{}$

input
```
int((c*d*x+d)^(5/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVER
BOSE)
```

output
```
-1/4*a/f/c*(c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)-5/12*a*d/f/c*(c*d*x+d)^(3/2)*(
-c*f*x+f)^(3/2)-5/8*a*d^2/f/c*(c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)+5/8*a*d^2/c
*(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2)+5/8*a*d^3*f*((-c*f*x+f)*(c*d*x+d))^(1/2)
/(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*f)^(1/2)*arctan((c^2*d*f)^(1/2)*x
/(-c^2*d*f*x^2+d*f)^(1/2))+b*(-5/16*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(
-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d^2+1/256*(d*(c*x+1))^(1/2)*
(-f*(c*x-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^
2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x)
)*d^2/c/(c^2*x^2-1)+1/36*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(4*c^4*x^4-5
*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3
*arcsin(c*x))*d^2/c/(c^2*x^2-1)-1/4*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(
I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)-I)*d^2/c/(c^2*x^2-1)+1/16
*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^
3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d^2/c/(c^2*x^2-1)-3/2
56*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-
I)*(5*I+12*arcsin(c*x))*cos(3*arcsin(c*x))*d^2/c/(c^2*x^2-1)+1/256*(d*(c*x
+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(17*I+2
8*arcsin(c*x))*sin(3*arcsin(c*x))*d^2/c/(c^2*x^2-1)-1/9*(d*(c*x+1))^(1/2)*
(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(2*I+3*arcsin(c*x)
)*cos(2*arcsin(c*x))*d^2/c/(c^2*x^2-1)-1/18*(d*(c*x+1))^(1/2)*(-f*(c*x-...
```

Fricas [F]

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int(cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm=
"fricas")
```

output
```
integral((a*c^2*d^2*x^2 + 2*a*c*d^2*x + a*d^2 + (b*c^2*d^2*x^2 + 2*b*c*d^2
*x + b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\text{Timed out}$$

input
```
integrate((c*d*x+d)**(5/2)*(-c*f*x+f)**(1/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm=
"maxima")
```

output
```
b*sqrt(d)*sqrt(f)*integrate((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)*
sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/24*(15*s
qrt(-c^2*d*f*x^2 + d*f)*d^2*x + 15*d^3*f*arcsin(c*x)/(sqrt(d*f)*c) - 6*(-c
^2*d*f*x^2 + d*f)^(3/2)*d*x/f - 16*(-c^2*d*f*x^2 + d*f)^(3/2)*d/(c*f))*a
```

Giac [F]

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm=
"giac")
```

output
```
integrate((c*d*x + d)^(5/2)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,\left(d+c\,d\,x\right)^{5/2}\,\sqrt{f-c\,f\,x}\,dx$$

input
```
int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(1/2),x)
```

output
```
int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(1/2), x)
```

Reduce [F]

$$\int (d+cdx)^{5/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\frac{\sqrt{f}\,\sqrt{d}\,d^2\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+6\sqrt{cx+1}\,\sqrt{-cx+1}\,a\,c^3x^3+16\sqrt{cx+1}\,\sqrt{-cx+1}\,a$$

input
```
int((c*d*x+d)^(5/2)*(-c*f*x+f)^(1/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(f)*sqrt(d)*d**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a + 6*sqrt(c*x
 + 1)*sqrt( - c*x + 1)*a*c**3*x**3 + 16*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c
**2*x**2 + 9*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c*x - 16*sqrt(c*x + 1)*sqrt(
 - c*x + 1)*a + 24*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**2,x)*b*
c**3 + 48*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x,x)*b*c**2 + 24*in
t(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*b*c))/(24*c)
```

3.43 $\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 273

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{bdx\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} - \frac{bcdx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} - \frac{bc^2dx^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} + \frac{1}{2}dx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) - \frac{d\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} + \frac{d\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

output
```
1/3*b*d*x*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/4*b*c*d*x^
2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/9*b*c^2*d*x^3*(c*d
*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/2*d*x*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(1/2)*(a+b*arcsin(c*x))-1/3*d*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(-
c^2*x^2+1)*(a+b*arcsin(c*x))/c+1/4*d*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b
*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 1.58 (sec) , antiderivative size = 260, normalized size of antiderivative = 0.95

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{18bd\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2-36ad^{3/2}\sqrt{f}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right)}{}$$

input
```
Integrate[(d + c*d*x)^(3/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

output
```
(18*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 36*a*d^(3/2)*Sqrt[
f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]
*Sqrt[f]*(-1 + c^2*x^2))] + d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-8*b*c*x*(-
3 + c^2*x^2) + 12*a*Sqrt[1 - c^2*x^2]*(-2 + 3*c*x + 2*c^2*x^2) + 9*b*Cos[2
*ArcSin[c*x]]) + 6*b*d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-4*(1
- c^2*x^2)^(3/2) + 3*Sin[2*ArcSin[c*x]]))/(72*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.51, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\int d(cx+1)\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d\sqrt{cdx+d}\sqrt{f-cfx}\int (cx+1)\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d\sqrt{cdx+d}\sqrt{f-cfx}\int \left(cx\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{d\sqrt{cdx+d}\sqrt{f-cfx}\left(\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c}+\frac{(a+b\arcsin(cx))^2}{4bc}-\frac{1}{9}bc^2x^3-\frac{1}{4}b\right.}{\sqrt{1-c^2x^2}}$$

input
```
Int[(d + c*d*x)^(3/2)*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*((b*x)/3 - (b*c*x^2)/4 - (b*c^2*x^3)/9
+ (x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 - ((1 - c^2*x^2)^(3/2)*(a +
b*ArcSin[c*x]))/(3*c) + (a + b*ArcSin[c*x])^2/(4*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.32 (sec) , antiderivative size = 727, normalized size of antiderivative = 2.66

method	result
default	$-\frac{a(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}{3fc}-\frac{ad\sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}}{2fc}+\frac{ad\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2c}+\frac{a\,d^{2}f\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^{2}}}{\sqrt{-c^{2}df}}\right.}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^{2}df}}$
parts	$-\frac{a(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}{3fc}-\frac{ad\sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}}{2fc}+\frac{ad\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2c}+\frac{a\,d^{2}f\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^{2}}}{\sqrt{-c^{2}df}}\right.}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^{2}df}}$

input
```
int((c*d*x+d)^(3/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVER
BOSE)
```

output
```
-1/3*a/f/c*(c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)-1/2*a*d/f/c*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(3/2)+1/2*a*d/c*(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2)+1/2*a*d^2*f*((-c
*f*x+f)*(c*d*x+d))^(1/2)/(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*f)^(1/2)*
arctan((c^2*d*f)^(1/2)*x/(-c^2*d*f*x^2+d*f)^(1/2))+b*(-1/4*(-f*(c*x-1))^(1
/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d+1/7
2*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+
1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d/c/(c^2*
x^2-1)+1/16*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*
x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(I+2*arcsin(c*x))*d/c/(c^2*x
^2-1)-1/8*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c
^2*x^2-1)*(arcsin(c*x)-I)*d/c/(c^2*x^2-1)+1/16*(d*(c*x+1))^(1/2)*(-f*(c*x-
1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2
*c*x)*(-I+2*arcsin(c*x))*d/c/(c^2*x^2-1)-1/18*(d*(c*x+1))^(1/2)*(-f*(c*x-1
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(2*I+3*arcsin(c*x))*cos(2*ar
csin(c*x))*d/c/(c^2*x^2-1)-1/36*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^
2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(5*I+3*arcsin(c*x))*sin(2*arcsin(c*x))*d/c
/(c^2*x^2-1))
```

Fricas [F]

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm=
"fricas")
```

output
```
integral((a*c*d*x + a*d + (b*c*d*x + b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqr
t(-c*f*x + f), x)
```

Sympy [F]

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int (d(cx+1))^{\frac{3}{2}}\sqrt{-f(cx-1)}(a+b\operatorname{asin}(cx))\,dx$$

input
```
integrate((c*d*x+d)**(3/2)*(-c*f*x+f)**(1/2)*(a+b*asin(c*x)),x)
```

output
```
Integral((d*(c*x + 1))**(3/2)*sqrt(-f*(c*x - 1))*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm=
"maxima")
```

output
```
b*sqrt(d)*sqrt(f)*integrate((c*d*x + d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/6*(3*sqrt(-c^2*d*f*x^2 + d*f
)*d*x + 3*d^2*f*arcsin(c*x)/(sqrt(d*f)*c) - 2*(-c^2*d*f*x^2 + d*f)^(3/2)/(
c*f))*a
```

Giac [F]

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm=
"giac")
```

output
```
integrate((c*d*x + d)^(3/2)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{3/2}\,\sqrt{f-c\,f\,x}\,dx$$

input
```
int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(1/2),x)
```

output
```
int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(1/2), x)
```

Reduce [F]

$$\int (d+cdx)^{3/2}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{\sqrt{f}\,\sqrt{d}\,d\left(-6asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+2\sqrt{cx+1}\,\sqrt{-cx+1}\,a\,c^2x^2+3\sqrt{cx+1}\,\sqrt{-cx+1}\,acx\right.}{}$$

input
```
int((c*d*x+d)^(3/2)*(-c*f*x+f)^(1/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(f)*sqrt(d)*d*( - 6*asin(sqrt( - c*x + 1)/sqrt(2))*a + 2*sqrt(c*x + 1
)*sqrt( - c*x + 1)*a*c**2*x**2 + 3*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c*x -
2*sqrt(c*x + 1)*sqrt( - c*x + 1)*a + 6*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*
asin(c*x)*x,x)*b*c**2 + 6*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*
b*c))/(6*c)
```

3.44 $\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 134

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = -\frac{bcx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} + \frac{1}{2}x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

output
```
-1/4*b*c*x^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/2*x*(c*
d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))+1/4*(c*d*x+d)^(1/2)*(-c*f*
x+f)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.54

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \frac{1}{2}ax\sqrt{-f(-1+cx)}\sqrt{d(1+cx)} - \frac{a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{-f(-1+cx)}\sqrt{d(1+cx)}}{\sqrt{d}\sqrt{f}(-1+cx)(1+cx)}\right)}{2c} + \frac{b\sqrt{d+cdx}\sqrt{f-cfx}\sqrt{-df\,(1-c^2x^2)}(\cos(2\arcsin(cx)) + 2\arcsin(cx)(\arcsin(cx) + \sin(2\arcsin(cx))}{8c\sqrt{(-d-cdx)(f-cfx)}\sqrt{1-c^2x^2}}$$

input
```
Integrate[Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

output
```
(a*x*Sqrt[-(f*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/2 - (a*Sqrt[d]*Sqrt[f]*ArcTa
n[(c*x*Sqrt[-(f*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[f]*(-1 + c*x
)*(1 + c*x))])/(2*c) + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[-(d*f*(1 -
c^2*x^2))]*(Cos[2*ArcSin[c*x]] + 2*ArcSin[c*x]*(ArcSin[c*x] + Sin[2*ArcSin
[c*x]])))/(8*c*Sqrt[(-d - c*d*x)*(f - c*f*x)]*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.69, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 5156, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{cdx+d}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5156}$$

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\left(\frac{1}{2}\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx-\frac{1}{2}bc\int xdx+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{15}$$

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\left(\frac{1}{2}\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{4}bcx^2\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5152}$$

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\left(\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\frac{(a+b\arcsin(cx))^2}{4bc}-\frac{1}{4}bcx^2\right)}{\sqrt{1-c^2x^2}}$$

input
```
Int[Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]),x]
```

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

Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.88 (sec) , antiderivative size = 366, normalized size of antiderivative = 2.73

method	result
default	$\frac{a\sqrt{-cfx+f}\,(cdx+d)^{\frac{3}{2}}}{2cd}-\frac{a\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2c}+\frac{adf\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^2df}\,x}{\sqrt{-c^2df\,x^2+df}}\right)}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^2df}}+b\Bigg(-\frac{\sqrt{-f(cx-1)}\,\sqrt{\cdots}}{\cdots}$
parts	$\frac{a\sqrt{-cfx+f}\,(cdx+d)^{\frac{3}{2}}}{2cd}-\frac{a\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2c}+\frac{adf\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^2df}\,x}{\sqrt{-c^2df\,x^2+df}}\right)}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^2df}}+b\Bigg(-\frac{\sqrt{-f(cx-1)}\,\sqrt{\cdots}}{\cdots}$

input
```
int((c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVER
BOSE)
```

output
```
1/2*a/c/d*(-c*f*x+f)^(1/2)*(c*d*x+d)^(3/2)-1/2*a/c*(-c*f*x+f)^(1/2)*(c*d*x
+d)^(1/2)+1/2*a*d*f*((-c*f*x+f)*(c*d*x+d))^(1/2)/(-c*f*x+f)^(1/2)/(c*d*x+d
)^(1/2)/(c^2*d*f)^(1/2)*arctan((c^2*d*f)^(1/2)*x/(-c^2*d*f*x^2+d*f)^(1/2))
+b*(-1/4*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^
2-1)*arcsin(c*x)^2+1/16*(I+2*arcsin(c*x))*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(
1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x
)/c/(c^2*x^2-1)+1/16*(-I+2*arcsin(c*x))*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/
2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)/c
/(c^2*x^2-1))
```

Fricas [F]

$$\int\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$$
$$=\int\sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin\left(cx\right)+a)\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm=
"fricas")
```

output
```
integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Sympy [F]

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int \sqrt{d\,(cx+1)}\sqrt{-f\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))\;dx$$

input
```
integrate((c*d*x+d)**(1/2)*(-c*f*x+f)**(1/2)*(a+b*asin(c*x)),x)
```

output
```
Integral(sqrt(d*(c*x + 1))*sqrt(-f*(c*x - 1))*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin\,(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm=
"maxima")
```

output
```
b*sqrt(d)*sqrt(f)*integrate(sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1)), x) + 1/2*(sqrt(-c^2*d*f*x^2 + d*f)*x + d*f*arcs
in(c*x)/(sqrt(d*f)*c))*a
```

Giac [F]

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$$
$$=\int \sqrt{cdx+d}\sqrt{-cfx+f}(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm=
"giac")
```

output
```
integrate(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$$
$$=\int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}\,\sqrt{f-c\,f\,x}\,dx$$

input
```
int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(1/2),x)
```

output
```
int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(1/2), x)
```

Reduce [F]

$$\int \sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))\,dx$$
$$=\frac{\sqrt{f}\,\sqrt{d}\left(-2asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+\sqrt{cx+1}\,\sqrt{-cx+1}\,acx+2\left(\int\sqrt{cx+1}\,\sqrt{-cx+1}\,asin(cx)\,dx\right)bc\right)}{2c}$$

input
```
int((c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(f)*sqrt(d)*( - 2*asin(sqrt( - c*x + 1)/sqrt(2))*a + sqrt(c*x + 1)*sq
rt( - c*x + 1)*a*c*x + 2*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*b
*c))/(2*c)
```

3.45 $\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 141

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = -\frac{bfx\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
-b*f*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+f*(-c^2*x^2+1)*
(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/2*f*(-c^2*x^2+1)^(1
/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 1.38 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.42

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{\frac{2\sqrt{d+cdx}\sqrt{f-cfx}\left(-bcx+a\sqrt{1-c^2x^2}\right)}{\sqrt{1-c^2x^2}} + 2b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx) + \frac{b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2}{\sqrt{1-c^2x^2}} - 2a\sqrt{d}\sqrt{f}\,\mathrm{a}}{2cd}$$

input
```
Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

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

Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.62, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{cdx+d}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{f(1-cx)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f\sqrt{1-c^2x^2}\int \frac{(1-cx)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{f\sqrt{1-c^2x^2}\int \left(\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}-\frac{cx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{f\sqrt{1-c^2x^2}\left(\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{2bc}-bx\right)}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

input
```
Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

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

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.81 (sec) , antiderivative size = 308, normalized size of antiderivative = 2.18

method	result
default	$\frac{a\sqrt{-cfx+f}\,\sqrt{cdx+d}}{cd}+\frac{af\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^2df}\,x}{\sqrt{-c^2df\,x^2+df}}\right)}{\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^2df}}+b\left(-\frac{\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin(}{2(cx+1)dc(cx-1)}\right.$
parts	$\frac{a\sqrt{-cfx+f}\,\sqrt{cdx+d}}{cd}+\frac{af\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^2df}\,x}{\sqrt{-c^2df\,x^2+df}}\right)}{\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^2df}}+b\left(-\frac{\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin(}{2(cx+1)dc(cx-1)}\right.$

input
```
int((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
a/c/d*(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2)+a*f*((-c*f*x+f)*(c*d*x+d))^(1/2)/(-
c*f*x+f)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*f)^(1/2)*arctan((c^2*d*f)^(1/2)*x/(-
c^2*d*f*x^2+d*f)^(1/2))+b*(-1/2*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2
*x^2+1)^(1/2)/(c*x+1)/d/c/(c*x-1)*arcsin(c*x)^2+1/2*(d*(c*x+1))^(1/2)*(-f*
(c*x-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*(arcsin(c*x)+I)/(c*x+1
)/d/c/(c*x-1)+1/2*(arcsin(c*x)-I)*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*
(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)/(c*x+1)/d/c/(c*x-1))
```

Fricas [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{\sqrt{-cfx+f}(b\arcsin{(cx)}+a)}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Sympy [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-f\left(cx-1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)}{\sqrt{d\left(cx+1\right)}}\,dx$$

input
```
integrate((-c*f*x+f)**(1/2)*(a+b*asin(c*x))/(c*d*x+d)**(1/2),x)
```

output
```
Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/sqrt(d*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-cfx+f}\left(b\arcsin\left(cx\right)+a\right)}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm=
"maxima")
```

output
```
a*(f*arcsin(c*x)/(c*d*sqrt(f/d)) + sqrt(-c^2*d*f*x^2 + d*f)/(c*d)) + b*sqr
t(f)*integrate(sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/s
qrt(c*x + 1), x)/sqrt(d)
```

Giac [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-cfx+f}\left(b\arcsin\left(cx\right)+a\right)}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm=
"giac")
```

output
```
integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{f-c\,f\,x}}{\sqrt{d+c\,d\,x}}\,dx$$

input
```
int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(1/2),x)
```

output
```
int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(1/2), x)
```

Reduce [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{f}\left(-2asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+\sqrt{cx+1}\,\sqrt{-cx+1}\,a+\left(\int \frac{\sqrt{-cx+1}\,asin(cx)}{\sqrt{cx+1}}dx\right)bc\right)}{\sqrt{d}\,c}$$

input
```
int((-c*f*x+f)^(1/2)*(a+b*asin(c*x))/(c*d*x+d)^(1/2),x)
```

output
```
(sqrt(f)*( - 2*asin(sqrt( - c*x + 1)/sqrt(2))*a + sqrt(c*x + 1)*sqrt( - c*
x + 1)*a + int((sqrt( - c*x + 1)*asin(c*x))/sqrt(c*x + 1),x)*b*c))/(sqrt(d
)*c)
```

3.46 $\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 162

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = -\frac{2f^2(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{2bf^2\left(1-c^2x^2\right)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

output
```
-2*f^2*(-c*x+1)*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f
)^(3/2)-1/2*f^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)
/(-c*f*x+f)^(3/2)+2*b*f^2*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/(
-c*f*x+f)^(3/2)
```

Mathematica [A] (verified)

Time = 2.04 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.53

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = -\frac{\frac{4a\sqrt{d+cdx}\sqrt{f-cfx}}{1+cx} - 2a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right) + \frac{b\sqrt{d+cdx}\sqrt{f-cfx}\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)\left(\arcsin(cx)(4+\arcsin(cx))-8\right.\right.}{}}{2cd^{2}}$$

input
```
Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

output
```
-1/2*((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(1 + c*x) - 2*a*Sqrt[d]*Sqrt[f
]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt[f]*(-1 + c^2*
x^2))] + (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*
x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + (
(-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[A
rcSin[c*x]/2])))/(c*d^2)
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 105, normalized size of antiderivative = 0.65, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(cdx+d)^{3/2}}dx$$

$$\Big\downarrow \; 5178$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\int \frac{f^2(1-cx)^2(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \; 27$$

$$\frac{f^2\left(1-c^2x^2\right)^{3/2}\int \frac{(1-cx)^2(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \; 5274$$

$$\frac{f^2\left(1-c^2x^2\right)^{3/2}\int \left(\frac{2(1-cx)(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}-\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\right)dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \; 2009$$

$$\frac{f^2(1-c^2x^2)^{3/2}\left(-\frac{2(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{2bc}+\frac{2b\log(cx+1)}{c}\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

input
```
Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

output
```
(f^2*(1 - c^2*x^2)^(3/2)*((-2*(1 - c*x)*(a + b*ArcSin[c*x]))/(c*Sqrt[1 - c
^2*x^2]) - (a + b*ArcSin[c*x])^2/(2*b*c) + (2*b*Log[1 + c*x])/c))/((d + c*
d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.96 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.97

method	result
default	$\frac{\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,b\arcsin(cx)^2}{2(cx+1)(cx-1)d^2c}+\frac{\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)a}{(cx+1)(cx-1)d^2c}+\frac{4i\sqrt{d(cx+1)}\,\sqrt{-f(cx-}{(cx+1)(}$

input
```
int((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
1/2*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c*x+1)/(c*x-1
)/d^2/c*b*arcsin(c*x)^2+(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^
(1/2)/(c*x+1)/(c*x-1)/d^2/c*arcsin(c*x)*a+4*I*(d*(c*x+1))^(1/2)*(-f*(c*x-1
))^(1/2)*(-c^2*x^2+1)^(1/2)/(c*x+1)/(c*x-1)/d^2/c*b*arcsin(c*x)-2*(a+b*arc
sin(c*x))*(I*(-c^2*x^2+1)^(1/2)+c*x-1)*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2
)/d^2/c/(c^2*x^2-1)-4*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1
/2)/(c*x+1)/(c*x-1)/d^2/c*b*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)
```

Fricas [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{\sqrt{-cfx+f}\,(b\arcsin{(cx)}+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm=
"fricas")
```

output
```
integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*d^2*x^2
 + 2*c*d^2*x + d^2), x)
```

Sympy [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-f\,(cx-1)}(a+b\operatorname{asin}(cx))}{(d\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)**(1/2)*(a+b*asin(c*x))/(c*d*x+d)**(3/2),x)
```

output
```
Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/(d*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-cfx+f}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm=
"maxima")
```

output
```
-a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^2*x + c*d^2) + f*arcsin(c*x)/(c*d^2*
sqrt(f/d))) + b*sqrt(f)*integrate(sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))/((c*d*x + d)*sqrt(c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-cfx+f}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm=
"giac")
```

output
```
integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{f-c\,f\,x}}{(d+c\,d\,x)^{3/2}}\,dx$$

input
```
int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(3/2),x)
```

output
```
int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(3/2), x)
```

Reduce [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \frac{\sqrt{f}\left(2\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a-2\sqrt{-cx+1}\,a+\sqrt{cx+1}\left(\int \frac{\sqrt{-cx+}}{\sqrt{cx+1}\,c}\right.\right.}{\sqrt{d}\,\sqrt{cx+1}\,cd}$$

input
```
int((-c*f*x+f)^(1/2)*(a+b*asin(c*x))/(c*d*x+d)^(3/2),x)
```

output
```
(sqrt(f)*(2*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a - 2*sqrt( - c*x
 + 1)*a + sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c*
x + sqrt(c*x + 1)),x)*b*c))/(sqrt(d)*sqrt(c*x + 1)*c*d)
```

3.47 $\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 150

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = -\frac{2bf\sqrt{1-c^2x^2}}{3cd^2(1+cx)\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{3cdf(d+cdx)^{3/2}} - \frac{bf\sqrt{1-c^2x^2}\log(1+cx)}{3cd^2\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
-2/3*b*f*(-c^2*x^2+1)^(1/2)/c/d^2/(c*x+1)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
-1/3*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/c/d/f/(c*d*x+d)^(3/2)-1/3*b*f*(-c^
2*x^2+1)^(1/2)*ln(c*x+1)/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 1.41 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.76

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = -\frac{f\sqrt{d+cdx}\left((-1+cx)\left(-a+acx-b\sqrt{1-c^2x^2}\right)+b(-1+cx)^2\arcsin(cx)+b(1+cx)\sqrt{1-c^2x^2}\log(-\ldots\right.}{3cd^3(1+cx)^2\sqrt{f-cfx}}$$

input
```
Integrate[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

output
```
-1/3*(f*Sqrt[d + c*d*x]*((-1 + c*x)*(-a + a*c*x - b*Sqrt[1 - c^2*x^2]) + b
*(-1 + c*x)^2*ArcSin[c*x] + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x
))]))/(c*d^3*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.71, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.233$, Rules used = {5178, 27, 5260, 27, 456, 49, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(cdx+d)^{5/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{5/2}\int \frac{f^3(1-cx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f^3(1-c^2x^2)^{5/2}\int \frac{(1-cx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{f^3(1-c^2x^2)^{5/2}\left(-bc\int -\frac{(1-cx)^3}{3c(1-c^2x^2)^2}dx-\frac{(1-cx)^3(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f^3(1-c^2x^2)^{5/2}\left(\frac{1}{3}b\int \frac{(1-cx)^3}{(1-c^2x^2)^2}dx-\frac{(1-cx)^3(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{456}$$

$$\frac{f^3(1-c^2x^2)^{5/2}\left(\frac{1}{3}b\int \frac{1-cx}{(cx+1)^2}dx-\frac{(1-cx)^3(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{49}$$

$$\frac{f^3\left(1-c^2x^2\right)^{5/2}\left(\frac{1}{3}b\int\left(\frac{2}{(cx+1)^2}+\frac{1}{-cx-1}\right)dx-\frac{(1-cx)^3(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \ 2009$$

$$\frac{f^3\left(1-c^2x^2\right)^{5/2}\left(\frac{1}{3}b\left(-\frac{2}{c(cx+1)}-\frac{\log(cx+1)}{c}\right)-\frac{(1-cx)^3(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

input
```
Int[(Sqrt[f - c*f*x]*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

output
```
(f^3*(1 - c^2*x^2)^(5/2)*(-1/3*((1 - c*x)^3*(a + b*ArcSin[c*x]))/(c*(1 - c
^2*x^2)^(3/2)) + (b*(-2/(c*(1 + c*x)) - Log[1 + c*x]/c))/3))/((d + c*d*x)^
(5/2)*(f - c*f*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 49
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x]
&& IGtQ[m, 0] && IGtQ[m + n + 2, 0]
```

rule 456
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
(c + d*x)^(n + p)*(a/c + (b/d)*x)^p, x] /; FreeQ[{a, b, c, d, n, p}, x] &&
EqQ[b*c^2 + a*d^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[c, 0] &&  !Integ
erQ[n]))
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.63 (sec) , antiderivative size = 449, normalized size of antiderivative = 2.99

method	result
default	$a\left(-\frac{\sqrt{-cfx+f}}{cd(cdx+d)^{\frac{3}{2}}}-f\left(-\frac{\sqrt{-cfx+f}}{3fdc(cdx+d)^{\frac{3}{2}}}-\frac{\sqrt{-cfx+f}}{3fc\,d^{2}\sqrt{cdx+d}}\right)\right)+\frac{b\left(i\ln\left(icx+\sqrt{-c^{2}x^{2}+1}+i\right)x^{3}c^{3}+3i\ln\left(icx+\sqrt{-c^{2}x^{2}+\right.\right.}{}$
parts	$a\left(-\frac{\sqrt{-cfx+f}}{cd(cdx+d)^{\frac{3}{2}}}-f\left(-\frac{\sqrt{-cfx+f}}{3fdc(cdx+d)^{\frac{3}{2}}}-\frac{\sqrt{-cfx+f}}{3fc\,d^{2}\sqrt{cdx+d}}\right)\right)+\frac{b\left(i\ln\left(icx+\sqrt{-c^{2}x^{2}+1}+i\right)x^{3}c^{3}+3i\ln\left(icx+\sqrt{-c^{2}x^{2}+\right.\right.}{}$

input
```
int((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
a*(-1/c/d*(-c*f*x+f)^(1/2)/(c*d*x+d)^(3/2)-f*(-1/3/f/d/c/(c*d*x+d)^(3/2)*(
-c*f*x+f)^(1/2)-1/3/f/c/d^2/(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)))+1/3*b*(I*ln
(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x^3*c^3+3*I*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c^
2*x^2-(-c^2*x^2+1)^(1/2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x^2*c^2+I*c^2*x^2+
3*c^2*x^2*arcsin(c*x)+3*I*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x*c+2*I*c*x-c*x*(
-c^2*x^2+1)^(1/2)+I*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+(-c^2*x^2+1)^(1/2)*ln(I
*c*x+(-c^2*x^2+1)^(1/2)+I)+I+arcsin(c*x)+(-c^2*x^2+1)^(1/2))*(-I*c*x*(-c^2
*x^2+1)^(1/2)+c^2*x^2-I*(-c^2*x^2+1)^(1/2)-2*c*x+1)*(d*(c*x+1))^(1/2)*(-f*
(c*x-1))^(1/2)/(3*c^5*x^5+3*c^4*x^4-2*c^3*x^3-2*c^2*x^2-c*x-1)/c/d^3
```

Fricas [A] (verification not implemented)

Time = 0.21 (sec) , antiderivative size = 520, normalized size of antiderivative = 3.47

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \left[\frac{(bc^3dx^3+bc^2dx^2-bcdx-bd)\sqrt{\frac{f}{d}}\log\left(\frac{c^6fx^6+4\,c^5fx^5+5\,c^4fx^4-4\,c^2fx^2-4}{}\right.}{}\right.$$

$$-\frac{(bc^3dx^3+bc^2dx^2-bcdx-bd)\sqrt{-\frac{f}{d}}\arctan\left(\frac{(c^2x^2+2\,cx+2)\sqrt{-c^2x^2+1}\sqrt{cdx+d}\sqrt{-cfx+f}\sqrt{-\frac{f}{d}}}{c^4fx^4+2\,c^3fx^3-c^2fx^2-2\,cfx}\right)-\left(ac^2x^2-2\sqrt{-c}\right.}{3\left(c^4d^3x^3+c^3d^3x^2-c^2d^3x-\right.}$$

input
```
integrate((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm=
"fricas")
```

output
```
[1/6*((b*c^3*d*x^3 + b*c^2*d*x^2 - b*c*d*x - b*d)*sqrt(f/d)*log((c^6*f*x^6
 + 4*c^5*f*x^5 + 5*c^4*f*x^4 - 4*c^2*f*x^2 - 4*c*f*x + (c^4*x^4 + 4*c^3*x^
3 + 6*c^2*x^2 + 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)
*sqrt(f/d) - 2*f)/(c^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) + 2*(a*c^2*x^2 - 2*sq
rt(-c^2*x^2 + 1)*b*c*x - 2*a*c*x + (b*c^2*x^2 - 2*b*c*x + b)*arcsin(c*x) +
 a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*x^3 + c^3*d^3*x^2 - c^2*d^3
*x - c*d^3), -1/3*((b*c^3*d*x^3 + b*c^2*d*x^2 - b*c*d*x - b*d)*sqrt(-f/d)*
arctan((c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*
x + f)*sqrt(-f/d)/(c^4*f*x^4 + 2*c^3*f*x^3 - c^2*f*x^2 - 2*c*f*x)) - (a*c^
2*x^2 - 2*sqrt(-c^2*x^2 + 1)*b*c*x - 2*a*c*x + (b*c^2*x^2 - 2*b*c*x + b)*a
rcsin(c*x) + a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*x^3 + c^3*d^3*x
^2 - c^2*d^3*x - c*d^3)]
```

Sympy [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{\sqrt{-f\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))}{(d\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)**(1/2)*(a+b*asin(c*x))/(c*d*x+d)**(5/2),x)
```

output
```
Integral(sqrt(-f*(c*x - 1))*(a + b*asin(c*x))/(d*(c*x + 1))**(5/2), x)
```

Maxima [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.43

$$\begin{aligned}\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx &= -\frac{1}{3}\,bc\left(\frac{2\sqrt{f}}{c^3d^{\frac{5}{2}}x+c^2d^{\frac{5}{2}}}+\frac{\sqrt{f}\log\left(cx+1\right)}{c^2d^{\frac{5}{2}}}\right)\\&\quad-\frac{1}{3}\,b\left(\frac{2\sqrt{-c^2dfx^2+df}}{c^3d^3x^2+2\,c^2d^3x+cd^3}-\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3x+cd^3}\right)\arcsin\left(cx\right)\\&\quad-\frac{1}{3}\,a\left(\frac{2\sqrt{-c^2dfx^2+df}}{c^3d^3x^2+2\,c^2d^3x+cd^3}-\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3x+cd^3}\right)\end{aligned}$$

input
```
integrate((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm=
"maxima")
```

output
```
-1/3*b*c*(2*sqrt(f)/(c^3*d^(5/2)*x + c^2*d^(5/2)) + sqrt(f)*log(c*x + 1)/(
c^2*d^(5/2))) - 1/3*b*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*x^2 + 2*c^2*d^3
*x + c*d^3) - sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*x + c*d^3))*arcsin(c*x) -
1/3*a*(2*sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*x^2 + 2*c^2*d^3*x + c*d^3) - sq
rt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*x + c*d^3))
```

Giac [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{\sqrt{-cfx+f}(b\arcsin{(cx)}+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm=
"giac")
```

output
```
integrate(sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{f-c\,f\,x}}{{(d+c\,d\,x)}^{5/2}}\,dx$$

input
```
int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(5/2),x)
```

output
```
int(((a + b*asin(c*x))*(f - c*f*x)^(1/2))/(d + c*d*x)^(5/2), x)
```

Reduce [F]

$$\int \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \frac{\sqrt{f}\left(\sqrt{-cx+1}\,acx-\sqrt{-cx+1}\,a+3\sqrt{cx+1}\left(\int \frac{\sqrt{-cx+1}\,asin(cx}{\sqrt{cx+1}\,c^2x^2+2\sqrt{cx+1}\,cx}\right.\right.}{3\sqrt{d}\,\sqrt{cx+1}\,c}$$

input
```
int((-c*f*x+f)^(1/2)*(a+b*asin(c*x))/(c*d*x+d)^(5/2),x)
```

output
```
(sqrt(f)*(sqrt( - c*x + 1)*a*c*x - sqrt( - c*x + 1)*a + 3*sqrt(c*x + 1)*in
t((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*
c*x + sqrt(c*x + 1)),x)*b*c**2*x + 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*a
sin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),
x)*b*c))/(3*sqrt(d)*sqrt(c*x + 1)*c*d**2*(c*x + 1))
```

3.48 $\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 438

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\frac{bd^2fx\sqrt{d+cdx}\sqrt{f-cfx}}{5\sqrt{1-c^2x^2}}-\frac{3bcd^2fx^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}-\frac{2bc^2d^2fx^3\sqrt{d+cdx}\sqrt{f-cfx}}{15\sqrt{1-c^2x^2}}+\frac{bc^4d^2fx^5\sqrt{d+cdx}\sqrt{f-cfx}}{25\sqrt{1-c^2x^2}}+\frac{bd^2f\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)^{3/2}}{16c}+\frac{3}{8}d^2fx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))+\frac{1}{4}d^2fx\sqrt{d+cdx}\sqrt{f-cfx}\left(1-c^2x^2\right)(a+b\arcsin(cx))-\frac{d^2\cdots}{\cdots}$$

output
```
1/5*b*d^2*f*x*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-3/16*b*c
*d^2*f*x^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-2/15*b*c^2*
d^2*f*x^3*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/25*b*c^4*d
^2*f*x^5*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*b*d^2*f*
(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(-c^2*x^2+1)^(3/2)/c+3/8*d^2*f*x*(c*d*x+d
)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))+1/4*d^2*f*x*(c*d*x+d)^(1/2)*(-c
*f*x+f)^(1/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))-1/5*d^2*f*(c*d*x+d)^(1/2)*(-c
*f*x+f)^(1/2)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c+3/16*d^2*f*(c*d*x+d)^(1/2
)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 2.47 (sec) , antiderivative size = 305, normalized size of antiderivative = 0.70

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d^2f\left(1800b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2-3600a\sqrt{d}\sqrt{f}\sqrt{1-c^2x^2}\,\text{arcta}\right.}{}$$

input
```
Integrate[(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*f*(1800*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 3600*a*Sqrt
[d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(128*
b*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) - 240*a*Sqrt[1 - c^2*x^2]*(8 - 25*c*x
- 16*c^2*x^2 + 10*c^3*x^3 + 8*c^4*x^4) + 1200*b*Cos[2*ArcSin[c*x]] + 75*b*
Cos[4*ArcSin[c*x]]) - 60*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(32
*(1 - c^2*x^2)^(5/2) - 40*Sin[2*ArcSin[c*x]] - 5*Sin[4*ArcSin[c*x]])))/(96
00*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 189, normalized size of antiderivative = 0.43, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(cdx+d)^{3/2}(f-cfx)^{3/2}\int d(cx+1)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d(cdx+d)^{3/2}(f-cfx)^{3/2}\int (cx+1)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$\Big\downarrow \text{ 5262}$$

$$\frac{d(cdx+d)^{3/2}(f-cfx)^{3/2}\int \left(cx(a+b\arcsin(cx))\left(1-c^2x^2\right)^{3/2}+(a+b\arcsin(cx))\left(1-c^2x^2\right)^{3/2}\right)dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{d(cdx+d)^{3/2}(f-cfx)^{3/2}\left(\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{3}{8}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{\left(1-c^2x^2\right)^{5/2}(a-}{5c}\right.}{\left(1-c^2x^2\right)^{3/2}}$$

input
```
Int[(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*((b*x)/5 - (5*b*c*x^2)/16 - (2*b*c^
2*x^3)/15 + (b*c^3*x^4)/16 + (b*c^4*x^5)/25 + (3*x*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x]))/8 + (x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 - ((1 -
c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c) + (3*(a + b*ArcSin[c*x])^2)/(16*
b*c)))/(1 - c^2*x^2)^(3/2)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.91 (sec) , antiderivative size = 1194, normalized size of antiderivative = 2.73

method	result	size
default	Expression too large to display	1194
parts	Expression too large to display	1194

input
```
int((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVER
BOSE)
```

output
```
-1/5*a/f/c*(c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)-1/4*a*d/f/c*(c*d*x+d)^(3/2)*(-
c*f*x+f)^(5/2)-1/4*a*d^2/f/c*(c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)+1/8*a*d^2/c*
(-c*f*x+f)^(3/2)*(c*d*x+d)^(1/2)+3/8*a*d^2*f/c*(-c*f*x+f)^(1/2)*(c*d*x+d)^
(1/2)+3/8*a*d^3*f^2*((-c*f*x+f)*(c*d*x+d))^(1/2)/(-c*f*x+f)^(1/2)/(c*d*x+d
)^(1/2)/(c^2*d*f)^(1/2)*arctan((c^2*d*f)^(1/2)*x/(-c^2*d*f*x^2+d*f)^(1/2))
+b*(-3/16*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x
^2-1)*arcsin(c*x)^2*d^2*f-1/800*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(16*c
^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^
2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d^2*f/c
/(c^2*x^2-1)-1/256*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(-8*I*(-c^2*x^2+1)
^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2
*x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x))*d^2*f/c/(c^2*x^2-1)-1/16*(d*(c*x+1)
)^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*
x)-I)*d^2*f/c/(c^2*x^2-1)+1/16*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(2*I*(
-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcs
in(c*x))*d^2*f/c/(c^2*x^2-1)-1/1200*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(
I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(11*I+45*arcsin(c*x))*cos(4*arcsin(c*x
))*d^2*f/c/(c^2*x^2-1)-1/600*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^2*x
^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(7*I+15*arcsin(c*x))*sin(4*arcsin(c*x))*d^2*f
/c/(c^2*x^2-1)-1/256*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^2*x^2-c*...
```

Fricas [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm=
"fricas")
```

output
```
integral(-(a*c^3*d^2*f*x^3 + a*c^2*d^2*f*x^2 - a*c*d^2*f*x - a*d^2*f + (b*
c^3*d^2*f*x^3 + b*c^2*d^2*f*x^2 - b*c*d^2*f*x - b*d^2*f)*arcsin(c*x))*sqrt
(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\text{Timed out}$$

input
```
integrate((c*d*x+d)**(5/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm=
"maxima")
```

output
```
b*sqrt(d)*sqrt(f)*integrate(-(c^3*d^2*f*x^3 + c^2*d^2*f*x^2 - c*d^2*f*x -
d^2*f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)), x) + 1/40*(15*sqrt(-c^2*d*f*x^2 + d*f)*d^2*f*x + 15*d^3*f^2*arcsin(c
*x)/(sqrt(d*f)*c) + 10*(-c^2*d*f*x^2 + d*f)^(3/2)*d*x - 8*(-c^2*d*f*x^2 +
d*f)^(5/2)/(c*f))*a
```

Giac [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm=
"giac")
```

output
```
integrate((c*d*x + d)^(5/2)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{5/2}\,(f-c\,f\,x)^{3/2}\,dx$$

input
```
int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2),x)
```

output
```
int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(3/2), x)
```

Reduce [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\frac{\sqrt{f}\,\sqrt{d}\,d^2f\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a-8\sqrt{cx+1}\,\sqrt{-cx+1}\,a\,c^4x^4-10\sqrt{cx+}\right.}{}$$

input
```
int((c*d*x+d)^(5/2)*(-c*f*x+f)^(3/2)*(a+b*asin(c*x)),x)
```

output

```
(sqrt(f)*sqrt(d)*d**2*f*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a - 8*sqrt(c
*x + 1)*sqrt( - c*x + 1)*a*c**4*x**4 - 10*sqrt(c*x + 1)*sqrt( - c*x + 1)*a
*c**3*x**3 + 16*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c**2*x**2 + 25*sqrt(c*x +
 1)*sqrt( - c*x + 1)*a*c*x - 8*sqrt(c*x + 1)*sqrt( - c*x + 1)*a - 40*int(s
qrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**3,x)*b*c**4 - 40*int(sqrt(c*x +
 1)*sqrt( - c*x + 1)*asin(c*x)*x**2,x)*b*c**3 + 40*int(sqrt(c*x + 1)*sqrt(
 - c*x + 1)*asin(c*x)*x,x)*b*c**2 + 40*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*
asin(c*x),x)*b*c))/(40*c)
```

3.49 $\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 231

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = -\frac{3bcdfx^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}+\frac{bdf\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)^{3/2}}{16c}$$
$$+\frac{3}{8}dfx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))+\frac{1}{4}dfx\sqrt{d+cdx}\sqrt{f-cfx}\left(1-c^2x^2\right)(a+b\arcsin(cx))+\frac{3df\sqrt{}}{}$$

output
```
-3/16*b*c*d*f*x^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16
*b*d*f*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(-c^2*x^2+1)^(3/2)/c+3/8*d*f*x*(c*
d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))+1/4*d*f*x*(c*d*x+d)^(1/2)*
(-c*f*x+f)^(1/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))+3/16*d*f*(c*d*x+d)^(1/2)*(
-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 1.57 (sec) , antiderivative size = 152, normalized size of antiderivative = 0.66

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \frac{df\sqrt{d+cdx}\sqrt{f-cfx}\left(-a^2+2abcx(5-2c^2x^2)\sqrt{1-c^2x^2}+b^2c^2x^2(-5+\ldots\right.}{16bc\sqrt{1\ldots}}$$

input
```
Integrate[(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-a^2 + 2*a*b*c*x*(5 - 2*c^2*x^2)*Sqr
t[1 - c^2*x^2] + b^2*c^2*x^2*(-5 + c^2*x^2) + 2*b*(3*a + b*c*x*(5 - 2*c^2*
x^2)*Sqrt[1 - c^2*x^2])*ArcSin[c*x] + 3*b^2*ArcSin[c*x]^2))/(16*b*c*Sqrt[1
 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.65, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.233$, Rules used = {5178, 5158, 244, 2009, 5156, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(cdx+d)^{3/2}(f-cfx)^{3/2}\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{5158}$$

$$\frac{(cdx+d)^{3/2}(f-cfx)^{3/2}\left(\frac{3}{4}\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))dx-\frac{1}{4}bc\int x\left(1-c^2x^2\right)dx+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\,\text{a}\ldots\right.}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{244}$$

$$\frac{(cdx+d)^{3/2}(f-cfx)^{3/2}\left(\frac{3}{4}\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx-\frac{1}{4}bc\int\left(x-c^2x^3\right)dx+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\text{ar}\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$\downarrow$ 2009

$$\frac{(cdx+d)^{3/2}(f-cfx)^{3/2}\left(\frac{3}{4}\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))-\frac{1}{4}bc\left(\frac{x^2}{2}-\right.\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$\downarrow$ 5156

$$\frac{(cdx+d)^{3/2}(f-cfx)^{3/2}\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx-\frac{1}{2}bc\int xdx+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)+\frac{1}{4}x\left(1-c^2x^2\right)\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$\downarrow$ 15

$$\frac{(cdx+d)^{3/2}(f-cfx)^{3/2}\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{4}bcx^2\right)+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}\right.}{\left(1-c^2x^2\right)^{3/2}}$$

$\downarrow$ 5152

$$\frac{(cdx+d)^{3/2}(f-cfx)^{3/2}\left(\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{3}{4}\left(\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\frac{(a+b\arcsin(cx}{4bc}\right.\right.}{\left(1-c^2x^2\right)^{3/2}}$$

input
```
Int[(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(-1/4*(b*c*(x^2/2 - (c^2*x^4)/4)) + (
x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*(-1/4*(b*c*x^2) + (x*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 + (a + b*ArcSin[c*x])^2/(4*b*c)))/4)
)/(1 - c^2*x^2)^(3/2)
```

Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 244
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[Expand
Integrand[(c*x)^m*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x] && IGtQ[p
, 0]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5158
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (S
imp[2*d*(p/(2*p + 1))   Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x],
x] - Simp[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[x*(1
- c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.27 (sec) , antiderivative size = 618, normalized size of antiderivative = 2.68

method	result
default	$-\frac{a(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}}{4fc}-\frac{ad\sqrt{cdx+d}\,(-cfx+f)^{\frac{5}{2}}}{4fc}+\frac{ad(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{8c}+\frac{3adf\sqrt{-cfx+f}\,\sqrt{cdx+d}}{8c}+\frac{3a\,d^{2}f^{2}\sqrt{(-}}{}$
parts	$-\frac{a(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}}{4fc}-\frac{ad\sqrt{cdx+d}\,(-cfx+f)^{\frac{5}{2}}}{4fc}+\frac{ad(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{8c}+\frac{3adf\sqrt{-cfx+f}\,\sqrt{cdx+d}}{8c}+\frac{3a\,d^{2}f^{2}\sqrt{(-}}{}$

input
```
int((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVER
BOSE)
```

output
```
-1/4*a/f/c*(c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)-1/4*a*d/f/c*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(5/2)+1/8*a*d/c*(-c*f*x+f)^(3/2)*(c*d*x+d)^(1/2)+3/8*a*d*f/c*(-c*
f*x+f)^(1/2)*(c*d*x+d)^(1/2)+3/8*a*d^2*f^2*((-c*f*x+f)*(c*d*x+d))^(1/2)/(-
c*f*x+f)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*f)^(1/2)*arctan((c^2*d*f)^(1/2)*x/(-
c^2*d*f*x^2+d*f)^(1/2))+b*(-3/16*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^
2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d*f-1/256*(d*(c*x+1))^(1/2)*(-f
*(c*x-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1
)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x))*d
*f/c/(c^2*x^2-1)+1/16*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(2*I*(-c^2*x^2+
1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*
d*f/c/(c^2*x^2-1)-1/256*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^2*x^2-c*
x*(-c^2*x^2+1)^(1/2)-I)*(17*I+28*arcsin(c*x))*cos(3*arcsin(c*x))*d*f/c/(c^
2*x^2-1)+3/256*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*
c*x+c^2*x^2-1)*(5*I+12*arcsin(c*x))*sin(3*arcsin(c*x))*d*f/c/(c^2*x^2-1))
```

Fricas [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm=
"fricas")
```

output
```
integral(-(a*c^2*d*f*x^2 - a*d*f + (b*c^2*d*f*x^2 - b*d*f)*arcsin(c*x))*sq
rt(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\text{Timed out}$$

input
```
integrate((c*d*x+d)**(3/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm=
"maxima")
```

output
```
b*sqrt(d)*sqrt(f)*integrate(-(c^2*d*f*x^2 - d*f)*sqrt(c*x + 1)*sqrt(-c*x +
 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/8*(3*sqrt(-c^2*d*f*
x^2 + d*f)*d*f*x + 3*d^2*f^2*arcsin(c*x)/(sqrt(d*f)*c) + 2*(-c^2*d*f*x^2 +
 d*f)^(3/2)*x)*a
```

Giac [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm=
"giac")
```

output
```
integrate((c*d*x + d)^(3/2)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{3/2}\,(f-c\,f\,x)^{3/2}\,dx$$

input
```
int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2),x)
```

output
```
int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2), x)
```

Reduce [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{f}\,\sqrt{d}\,df\left(-6asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a-2\sqrt{cx+1}\,\sqrt{-cx+1}\,a\,c^3x^3+5\sqrt{cx+1}\,\sqrt{\right.}}{}$$

input
```
int((c*d*x+d)^(3/2)*(-c*f*x+f)^(3/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(f)*sqrt(d)*d*f*( - 6*asin(sqrt( - c*x + 1)/sqrt(2))*a - 2*sqrt(c*x +
 1)*sqrt( - c*x + 1)*a*c**3*x**3 + 5*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c*x
- 8*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**2,x)*b*c**3 + 8*int(sq
rt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*b*c))/(8*c)
```

3.50 $\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 273

$$\begin{aligned}\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \\ -\frac{bfx\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}}-\frac{bcfx^2\sqrt{d+cdx}\sqrt{f-cfx}}{4\sqrt{1-c^2x^2}} \\ +\frac{bc^2fx^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}}+\frac{1}{2}fx\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) \\ +\frac{f\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx))}{3c} \\ +\frac{f\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}\end{aligned}$$

output
```
-1/3*b*f*x*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/4*b*c*f*x
^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/9*b*c^2*f*x^3*(c*
d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/2*f*x*(c*d*x+d)^(1/2)*(
-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))+1/3*f*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(
-c^2*x^2+1)*(a+b*arcsin(c*x))/c+1/4*f*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+
b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 2.02 (sec) , antiderivative size = 260, normalized size of antiderivative = 0.95

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \frac{18bf\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2-36a\sqrt{d}f^{3/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right)}{}$$

input
```
Integrate[Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(18*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 36*a*Sqrt[d]*f^(3/
2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]
*Sqrt[f]*(-1 + c^2*x^2))] + f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(12*a*(2 + 3
*c*x - 2*c^2*x^2)*Sqrt[1 - c^2*x^2] + 8*b*c*x*(-3 + c^2*x^2) + 9*b*Cos[2*A
rcSin[c*x]]) + 6*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(4*(1 - c
^2*x^2)^(3/2) + 3*Sin[2*ArcSin[c*x]]))/(72*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.51, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{cdx+d}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\int f(1-cx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f\sqrt{cdx+d}\sqrt{f-cfx}\int (1-cx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \textbf{5262}$$

$$\frac{f\sqrt{cdx+d}\sqrt{f-cfx}\int \left(\sqrt{1-c^2x^2}(a+b\arcsin(cx))-cx\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \textbf{2009}$$

$$\frac{f\sqrt{cdx+d}\sqrt{f-cfx}\left(\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c}+\frac{(a+b\arcsin(cx))^2}{4bc}+\frac{1}{9}bc^2x^3-\frac{1}{4}b\right.}{\sqrt{1-c^2x^2}}$$

input
```
Int[Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-1/3*(b*x) - (b*c*x^2)/4 + (b*c^2*x^3)
/9 + (x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 + ((1 - c^2*x^2)^(3/2)*(a
 + b*ArcSin[c*x]))/(3*c) + (a + b*ArcSin[c*x])^2/(4*b*c)))/Sqrt[1 - c^2*x^
2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.64 (sec) , antiderivative size = 723, normalized size of antiderivative = 2.65

method	result
default	$-\frac{a\sqrt{cdx+d}\,(-cfx+f)^{\frac{5}{2}}}{3fc}+\frac{a(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{6c}+\frac{af\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2c}+\frac{ad\,f^{2}\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^{2}df}\,x}{\sqrt{-c^{2}df\,x^{2}}}\right.}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^{2}df}}$
parts	$-\frac{a\sqrt{cdx+d}\,(-cfx+f)^{\frac{5}{2}}}{3fc}+\frac{a(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{6c}+\frac{af\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2c}+\frac{ad\,f^{2}\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^{2}df}\,x}{\sqrt{-c^{2}df\,x^{2}}}\right.}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^{2}df}}$

input
```
int((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVER
BOSE)
```

output
```
-1/3*a/f/c*(c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)+1/6*a/c*(-c*f*x+f)^(3/2)*(c*d*
x+d)^(1/2)+1/2*a*f/c*(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2)+1/2*a*d*f^2*((-c*f*x
+f)*(c*d*x+d))^(1/2)/(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*f)^(1/2)*arct
an((c^2*d*f)^(1/2)*x/(-c^2*d*f*x^2+d*f)^(1/2))+b*(-1/4*(-f*(c*x-1))^(1/2)*
(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f-1/72*(d
*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(
1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*f/c/(c^2*x^2-
1)+1/16*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*
c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(I+2*arcsin(c*x))*f/c/(c^2*x^2-1
)+1/8*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x
^2-1)*(arcsin(c*x)-I)*f/c/(c^2*x^2-1)+1/16*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^
(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x
)*(-I+2*arcsin(c*x))*f/c/(c^2*x^2-1)+1/18*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(
1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(2*I+3*arcsin(c*x))*cos(2*arcsin
(c*x))*f/c/(c^2*x^2-1)+1/36*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^2*x^
2-c*x*(-c^2*x^2+1)^(1/2)-I)*(5*I+3*arcsin(c*x))*sin(2*arcsin(c*x))*f/c/(c^
2*x^2-1))
```

Fricas [F]

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm=
"fricas")
```

output
```
integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sq
rt(-c*f*x + f), x)
```

Sympy [F]

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int \sqrt{d\,(cx+1)}(-f(cx-1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))\,\,dx$$

input
```
integrate((c*d*x+d)**(1/2)*(-c*f*x+f)**(3/2)*(a+b*asin(c*x)),x)
```

output
```
Integral(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(3/2)*(a + b*asin(c*x)), x)
```

Maxima [F]

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}(-cfx+f)^{\frac{3}{2}}(b\arcsin\,(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm=
"maxima")
```

output
```
b*sqrt(d)*sqrt(f)*integrate(-(c*f*x - f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/6*(3*sqrt(-c^2*d*f*x^2 + d*
f)*f*x + 3*d*f^2*arcsin(c*x)/(sqrt(d*f)*c) + 2*(-c^2*d*f*x^2 + d*f)^(3/2)/
(c*d))*a
```

Giac [F]

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int \sqrt{cdx+d}(-cfx+f)^{\frac{3}{2}}(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*arcsin(c*x)),x, algorithm=
"giac")
```

output
```
integrate(sqrt(c*d*x + d)*(-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}\,(f-c\,f\,x)^{3/2}\,dx$$

input
```
int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(3/2),x)
```

output
```
int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(3/2), x)
```

Reduce [F]

$$\int \sqrt{d+cdx}(f-cfx)^{3/2}(a+b\arcsin(cx))\,dx=\frac{\sqrt{f}\,\sqrt{d}\,f\left(-6asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a-2\sqrt{cx+1}\,\sqrt{-cx+1}\,a\,c^2x^2+3\sqrt{cx+1}\,\sqrt{-cx+1}\,acx$$

input
```
int((c*d*x+d)^(1/2)*(-c*f*x+f)^(3/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(f)*sqrt(d)*f*( - 6*asin(sqrt( - c*x + 1)/sqrt(2))*a - 2*sqrt(c*x + 1
)*sqrt( - c*x + 1)*a*c**2*x**2 + 3*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c*x +
2*sqrt(c*x + 1)*sqrt( - c*x + 1)*a - 6*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*
asin(c*x)*x,x)*b*c**2 + 6*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*
b*c))/(6*c)
```

3.51 $\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 242

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = -\frac{2bf^2x\sqrt{1-c^2x^2}}{\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{bcf^2x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{2f^2(1-c^2x^2)\,(a+b\arcsin(cx))}{c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{f^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{3f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

output

```
-2*b*f^2*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/4*b*c*f^2
*x^2*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+2*f^2*(-c^2*x^2+1
)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/2*f^2*x*(-c^2*x^2
+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*f^2*(-c^2*x^2+1
)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 4.42 (sec) , antiderivative size = 238, normalized size of antiderivative = 0.98

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{-4bf(-4+cx)\sqrt{d+cdx}\sqrt{f-cfx}\sqrt{1-c^2x^2}\arcsin(cx)+6bf\sqrt{d}}{}$$

input
```
Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

output
```
(-4*b*f*(-4 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*ArcSi
n[c*x] + 6*b*f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 12*a*Sqrt[d
]*f^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(
Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] - f*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(16*b
*c*x + 4*a*(-4 + c*x)*Sqrt[1 - c^2*x^2] + b*Cos[2*ArcSin[c*x]]))/(8*c*d*Sq
rt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.52, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{cdx+d}}\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{f^2(1-cx)^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f^2\sqrt{1-c^2x^2}\int \frac{(1-cx)^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{f^2\sqrt{1-c^2x^2}\int\left(\frac{c^2(a+b\arcsin(cx))x^2}{\sqrt{1-c^2x^2}}-\frac{2c(a+b\arcsin(cx))x}{\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{f^2\sqrt{1-c^2x^2}\left(-\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\frac{2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{3(a+b\arcsin(cx))^2}{4bc}+\frac{1}{4}bcx^2-2bx\right)}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

input
```
Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

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

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.24 (sec) , antiderivative size = 716, normalized size of antiderivative = 2.96

method	result
default	$\frac{a(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{2cd}+\frac{3af\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2cd}+\frac{3a\,f^{2}\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^{2}df}\,x}{\sqrt{-c^{2}df\,x^{2}+df}}\right)}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^{2}df}}+b\Bigg(-\frac{3\sqrt{-f(cx-}$
parts	$\frac{a(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{2cd}+\frac{3af\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2cd}+\frac{3a\,f^{2}\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^{2}df}\,x}{\sqrt{-c^{2}df\,x^{2}+df}}\right)}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^{2}df}}+b\Bigg(-\frac{3\sqrt{-f(cx-}$

input
```
int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
1/2*a/c/d*(-c*f*x+f)^(3/2)*(c*d*x+d)^(1/2)+3/2*a*f/c/d*(-c*f*x+f)^(1/2)*(c
*d*x+d)^(1/2)+3/2*a*f^2*((-c*f*x+f)*(c*d*x+d))^(1/2)/(-c*f*x+f)^(1/2)/(c*d
*x+d)^(1/2)/(c^2*d*f)^(1/2)*arctan((c^2*d*f)^(1/2)*x/(-c^2*d*f*x^2+d*f)^(1
/2))+b*(-3/4*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c*x+
1)/d/c/(c*x-1)*arcsin(c*x)^2*f-1/32*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(
4*c^3*x^3-2*c^2*x^2-4*I*x^2*c^2*(-c^2*x^2+1)^(1/2)-3*c*x+2*I*(-c^2*x^2+1)^
(1/2)*c*x+1+I*(-c^2*x^2+1)^(1/2))*(I+2*arcsin(c*x))*f/(c*x+1)/d/c/(c*x-1)+
1/2*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(-I*(-c^2*x^2+1)^(1/2)+c*x-1)*(ar
csin(c*x)+I)*f/(c*x+1)/d/c/(c*x-1)+(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I
*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)-I)*f/(c*x+1)/d/c/(c*x-1)-1
/32*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*c*x+2*c^2
*x^2-I*(-c^2*x^2+1)^(1/2)-c*x-1)*(-I+2*arcsin(c*x))*f/(c*x+1)/d/c/(c*x-1)+
1/16*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)+c*x-1)*(7*
I+8*arcsin(c*x))*cos(2*arcsin(c*x))*f/(c*x+1)/d/c/(c*x-1)+1/8*(d*(c*x+1))^
(1/2)*(-f*(c*x-1))^(1/2)*(I*c*x-I-(-c^2*x^2+1)^(1/2))*(4*I+3*arcsin(c*x))*
sin(2*arcsin(c*x))*f/(c*x+1)/d/c/(c*x-1))
```

Fricas [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(-c*f*x + f)/s
qrt(c*d*x + d), x)
```

Sympy [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(-f(cx-1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{\sqrt{d(cx+1)}}\,dx$$

input
```
integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(1/2),x)
```

output
```
Integral((-f*(c*x - 1))**(3/2)*(a + b*asin(c*x))/sqrt(d*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm=
"maxima")
```

output
```
-1/2*(sqrt(-c^2*d*f*x^2 + d*f)*f*x/d - 3*f^2*arcsin(c*x)/(sqrt(d*f)*c) - 4
*sqrt(-c^2*d*f*x^2 + d*f)*f/(c*d))*a - b*sqrt(f)*integrate((c*f*x - f)*sqr
t(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt(c*x + 1), x)/s
qrt(d)
```

Giac [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm=
"giac")
```

output
```
integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,{(f-c\,f\,x)}^{3/2}}{\sqrt{d+c\,d\,x}}\,dx$$

input
```
int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(1/2),x)
```

output
```
int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(1/2), x)
```

Reduce [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{f}\,f\left(-6asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a-\sqrt{cx+1}\,\sqrt{-cx+1}\,acx+4\sqrt{cx+1}\,\sqrt{}\right.}{2\cdot}$$

input
```
int((-c*f*x+f)^(3/2)*(a+b*asin(c*x))/(c*d*x+d)^(1/2),x)
```

output
```
(sqrt(f)*f*( - 6*asin(sqrt( - c*x + 1)/sqrt(2))*a - sqrt(c*x + 1)*sqrt( -
c*x + 1)*a*c*x + 4*sqrt(c*x + 1)*sqrt( - c*x + 1)*a - 2*int((sqrt( - c*x +
 1)*asin(c*x)*x)/sqrt(c*x + 1),x)*b*c**2 + 2*int((sqrt( - c*x + 1)*asin(c*
x))/sqrt(c*x + 1),x)*b*c))/(2*sqrt(d)*c)
```

3.52 $\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 252

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \frac{bf^3x(1-c^2x^2)^{3/2}}{(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{4f^3(1-cx)\left(1-c^2x^2\right)(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{f^3\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{c(d+cdx)^{3/2}(f-cfx)^{3/2}} - \frac{3f^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{2bc(d+cdx)^{3/2}(f-cfx)^{3/2}} + \frac{4bf^3\left(1-c^2x^2\right)^{3/2}\log(1+cx)}{c(d+cdx)^{3/2}(f-cfx)^{3/2}}$$

output
```
b*f^3*x*(-c^2*x^2+1)^(3/2)/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-4*f^3*(-c*x+1)
*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-f^3*(-c
^2*x^2+1)^2*(a+b*arcsin(c*x))/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)-3/2*f^3*(
-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
+4*b*f^3*(-c^2*x^2+1)^(3/2)*ln(c*x+1)/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)
```

Mathematica [A] (verified)

Time = 6.17 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.15

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \frac{f\left(6a\sqrt{d}\sqrt{f}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cfx}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right)-\frac{\sqrt{d+cdx}\sqrt{f-cfx}\csc^2\left(\frac{1}{2}\arcsin(cx)\right)}{}\right.}{}$$

input
```
Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

output
```
(f*(6*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt
[d]*Sqrt[f]*(-1 + c^2*x^2))] - (Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Csc[ArcSin
[c*x]/2]^2*(2*b*(5 + c*x)*(-1 + c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 3*b
*(-1 - c*x + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + 2*(b*c*x*(-1 - c*x + Sqrt[
1 - c^2*x^2]) + a*(5 + c*x)*(-1 + c*x + Sqrt[1 - c^2*x^2]) + 8*b*(-1 - c*x
 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])))/(2*S
qrt[1 - c^2*x^2]*(1 + Cot[ArcSin[c*x]/2]))))/(2*c*d^2)
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.54, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(cdx+d)^{3/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{3/2}\int \frac{f^3(1-cx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f^3(1-c^2x^2)^{3/2}\int \frac{(1-cx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{f^3(1-c^2x^2)^{3/2}\int\left(\frac{cx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}-\frac{3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{4(1-cx)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}\right)dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{f^3(1-c^2x^2)^{3/2}\left(-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}-\frac{4(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}-\frac{3(a+b\arcsin(cx))^2}{2bc}+\frac{4b\log(cx+1)}{c}+bx\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

input
```
Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

output
```
(f^3*(1 - c^2*x^2)^(3/2)*(b*x - (4*(1 - c*x)*(a + b*ArcSin[c*x]))/(c*Sqrt[
1 - c^2*x^2]) - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c - (3*(a + b*ArcS
in[c*x])^2)/(2*b*c) + (4*b*Log[1 + c*x])/c))/((d + c*d*x)^(3/2)*(f - c*f*x
)^(3/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.16 (sec) , antiderivative size = 264, normalized size of antiderivative = 1.05

method	result
default	$\frac{\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\left(8i\arcsin(cx)bcx+3bcx\arcsin(cx)^2+2\arcsin(cx)\sqrt{-c^2x^2+1}\,bcx-2x^2c^2b-8iacx+6\arcsin(cx)\right.}{}$

input
```
int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
1/2*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c/(c^3*x^3
+c^2*x^2-c*x-1)*(8*I*arcsin(c*x)*b*c*x+3*b*c*x*arcsin(c*x)^2+2*arcsin(c*x)
*(-c^2*x^2+1)^(1/2)*b*c*x-2*x^2*c^2*b-8*I*a*c*x+6*arcsin(c*x)*a*c*x+2*(-c^
2*x^2+1)^(1/2)*a*c*x-16*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*b*c*x-8*I*a+3*arcsi
n(c*x)^2*b+10*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*b-2*x*b*c+8*I*b*arcsin(c*x)+6
*arcsin(c*x)*a+10*(-c^2*x^2+1)^(1/2)*a-16*b*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)
)*f
```

Fricas [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm=
"fricas")
```

output
```
integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sq
rt(-c*f*x + f)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Sympy [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(-f(cx-1))^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})}{(d\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(3/2),x)
```

output
```
Integral((-f*(c*x - 1))**(3/2)*(a + b*asin(c*x))/(d*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin{(cx)}+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm=
"maxima")
```

output
```
-b*sqrt(d)*sqrt(f)*integrate((c*f*x - f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
 + a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^3*d^3*x^2 + 2*c^2*d^3*x + c*d^3) - 6*s
qrt(-c^2*d*f*x^2 + d*f)*f/(c^2*d^2*x + c*d^2) - 3*f^2*arcsin(c*x)/(c*d^2*s
qrt(f/d)))
```

Giac [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm=
"giac")
```

output
```
integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(f-c\,f\,x)^{3/2}}{(d+c\,d\,x)^{3/2}}\,dx$$

input
```
int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(3/2),x)
```

output
```
int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(3/2), x)
```

Reduce [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \frac{\sqrt{f}\,f\left(6\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a-\sqrt{-cx+1}\,acx-5\sqrt{-cx+1}\,a}{\sqrt{d}}$$

input
```
int((-c*f*x+f)^(3/2)*(a+b*asin(c*x))/(c*d*x+d)^(3/2),x)
```

output
```
(sqrt(f)*f*(6*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a - sqrt( - c*x
 + 1)*a*c*x - 5*sqrt( - c*x + 1)*a - sqrt(c*x + 1)*int((sqrt( - c*x + 1)*a
sin(c*x)*x)/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b*c**2 + sqrt(c*x + 1)*
int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b*
c))/(sqrt(d)*sqrt(c*x + 1)*c*d)
```

3.53 $\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 332

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = -\frac{4bf^2\sqrt{1-c^2x^2}}{3cd^2(1+cx)\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{bf^2\sqrt{1-c^2x^2}\arcsin(cx)^2}{2cd^2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{2f^2(1-cx)(a+b\arcsin(cx))}{cd^2\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{2f^2(1-cx)^3(a+b\arcsin(cx))}{3cd^2\sqrt{d+cdx}\sqrt{f-cfx}\,(1-c^2x^2)} + \frac{f^2\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{cd^2\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{8bf^2\sqrt{1-c^2x^2}\log(1+cx)}{3cd^2\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
-4/3*b*f^2*(-c^2*x^2+1)^(1/2)/c/d^2/(c*x+1)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/
2)-1/2*b*f^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2/c/d^2/(c*d*x+d)^(1/2)/(-c*f*
x+f)^(1/2)+2*f^2*(-c*x+1)*(a+b*arcsin(c*x))/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+
f)^(1/2)-2/3*f^2*(-c*x+1)^3*(a+b*arcsin(c*x))/c/d^2/(c*d*x+d)^(1/2)/(-c*f*
x+f)^(1/2)/(-c^2*x^2+1)+f^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*(a+b*arcsin(c*x
))/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-8/3*b*f^2*(-c^2*x^2+1)^(1/2)*ln(
c*x+1)/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 7.40 (sec) , antiderivative size = 599, normalized size of antiderivative = 1.80

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

output
```
(f*((16*a*(1 + 2*c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(1 + c*x)^2 - 12*a*
Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt[d]*Sqrt
[f]*(-1 + c^2*x^2))] - (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]
/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcSin[c*x] + 9*ArcS
in[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcS
in[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos[ArcSin[c*x]/2]
+ Sin[ArcSin[c*x]/2]]) + 2*(-4 + 2*(2 + 7*Sqrt[1 - c^2*x^2])*ArcSin[c*x] +
 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - 28*(2 + Sqrt[1 - c^2*x^2])*Log[
Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/((-1 + c*x)
*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (2*b*Sqrt[d + c*d*x]*Sqrt[
f - c*f*x]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/
2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[Ar
cSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]]) + 2*(-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^
2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))
/((-1 + c*x)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4)))/(12*c*d^3)
```

Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 171, normalized size of antiderivative = 0.52, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(cdx+d)^{5/2}}\,dx$$

$$\big\downarrow \text{5178}$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\int \frac{f^4(1-cx)^4(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\big\downarrow \text{27}$$

$$\frac{f^4\left(1-c^2x^2\right)^{5/2}\int \frac{(1-cx)^4(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\big\downarrow \text{5260}$$

$$\frac{f^4\left(1-c^2x^2\right)^{5/2}\left(-bc\int \left(-\frac{2(1-cx)^3}{3c(1-c^2x^2)^2}+\frac{2(1-cx)}{c(1-c^2x^2)}+\frac{\arcsin(cx)}{c\sqrt{1-c^2x^2}}\right)dx-\frac{2(1-cx)^3(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}+\frac{2(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}\right.}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\big\downarrow \text{2009}$$

$$\frac{f^4\left(1-c^2x^2\right)^{5/2}\left(-\frac{2(1-cx)^3(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}+\frac{2(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}+\frac{\arcsin(cx)(a+b\arcsin(cx))}{c}-bc\left(\frac{\arcsin(cx)^2}{2c^2}+\frac{4}{3c^2(cx+}\right.\right.}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

input
```
Int[((f - c*f*x)^(3/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

output
```
(f^4*(1 - c^2*x^2)^(5/2)*((-2*(1 - c*x)^3*(a + b*ArcSin[c*x]))/(3*c*(1 - c
^2*x^2)^(3/2)) + (2*(1 - c*x)*(a + b*ArcSin[c*x]))/(c*Sqrt[1 - c^2*x^2]) +
 (ArcSin[c*x]*(a + b*ArcSin[c*x]))/c - b*c*(4/(3*c^2*(1 + c*x)) + ArcSin[c
*x]^2/(2*c^2) + (8*Log[1 + c*x])/(3*c^2))))/((d + c*d*x)^(5/2)*(f - c*f*x)
^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.15 (sec) , antiderivative size = 348, normalized size of antiderivative = 1.05

method	result
default	$-\frac{\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\left(32i\arcsin(cx)bcx+3\arcsin(cx)^2b\,c^2x^2-32iacx+6\arcsin(cx)a\,c^2x^2-32\ln\left(icx+\sqrt{-c^2x^2+\right.\right.}{}$

input
```
int((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
-1/6*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^3*x^3+3*c^
2*x^2+3*c*x+1)/d^3/(c*x-1)/c*(32*I*arcsin(c*x)*b*c*x+3*arcsin(c*x)^2*b*c^2
*x^2-32*I*a*c*x+6*arcsin(c*x)*a*c^2*x^2-32*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*
b*c^2*x^2+16*I*arcsin(c*x)*b*c^2*x^2+6*b*c*x*arcsin(c*x)^2+16*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)*b*c*x-16*I*a*c^2*x^2+12*arcsin(c*x)*a*c*x+16*(-c^2*x^2+
1)^(1/2)*a*c*x-64*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*b*c*x-16*I*a+3*arcsin(c*x
)^2*b+8*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*b-8*x*b*c+16*I*b*arcsin(c*x)+6*arcs
in(c*x)*a+8*(-c^2*x^2+1)^(1/2)*a-32*b*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-8*b)*
f
```

Fricas [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin{(cx)}+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm=
"fricas")
```

output
```
integral(-(a*c*f*x - a*f + (b*c*f*x - b*f)*arcsin(c*x))*sqrt(c*d*x + d)*sq
rt(-c*f*x + f)/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-f(cx-1))^{\frac{3}{2}}\,(a+b\operatorname{asin}{(cx)})}{(d\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)**(3/2)*(a+b*asin(c*x))/(c*d*x+d)**(5/2),x)
```

output
```
Integral((-f*(c*x - 1))**(3/2)*(a + b*asin(c*x))/(d*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin{(cx)}+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm=
"maxima")
```

output
```
-b*sqrt(d)*sqrt(f)*integrate((c*f*x - f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*
d^3*x + d^3), x) - 1/3*a*((-c^2*d*f*x^2 + d*f)^(3/2)/(c^4*d^4*x^3 + 3*c^3*
d^4*x^2 + 3*c^2*d^4*x + c*d^4) + 2*sqrt(-c^2*d*f*x^2 + d*f)*f/(c^3*d^3*x^2
 + 2*c^2*d^3*x + c*d^3) - 7*sqrt(-c^2*d*f*x^2 + d*f)*f/(c^2*d^3*x + c*d^3)
 - 3*f^2*arcsin(c*x)/(c*d^3*sqrt(f/d)))
```

Giac [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{(-cfx+f)^{\frac{3}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm=
"giac")
```

output
```
integrate((-c*f*x + f)^(3/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f-c\,f\,x\right)^{3/2}}{\left(d+c\,d\,x\right)^{5/2}}\,dx$$

input
```
int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(5/2),x)
```

output
```
int(((a + b*asin(c*x))*(f - c*f*x)^(3/2))/(d + c*d*x)^(5/2), x)
```

Reduce [F]

$$\int \frac{(f-cfx)^{3/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \frac{\sqrt{f}\,f\left(-6\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)acx-6\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a\right.}{}$$

input
```
int((-c*f*x+f)^(3/2)*(a+b*asin(c*x))/(c*d*x+d)^(5/2),x)
```

output
```
(sqrt(f)*f*( - 6*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a*c*x - 6*sq
rt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a + 8*sqrt( - c*x + 1)*a*c*x +
4*sqrt( - c*x + 1)*a - 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)*x)/
(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b*c**3*
x - 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)*x)/(sqrt(c*x + 1)*c**2
*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b*c**2 + 3*sqrt(c*x + 1)*i
nt((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)
*c*x + sqrt(c*x + 1)),x)*b*c**2*x + 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*
asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1))
,x)*b*c))/(3*sqrt(d)*sqrt(c*x + 1)*c*d**2*(c*x + 1))
```

3.54 $\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 352

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = -\frac{5bcd^2f^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{32\sqrt{1-c^2x^2}} + \frac{5bd^2f^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)^{3/2}}{96c} + \frac{bd^2f^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)^{5/2}}{36c} + \frac{5}{16}d^2f^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{5}{24}d^2f^2x\sqrt{d+cdx}\sqrt{f-cfx}\left(1-c^2x^2\right)(a+b\arcsin(cx))+$$

output
```
-5/32*b*c*d^2*f^2*x^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+
5/96*b*d^2*f^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(-c^2*x^2+1)^(3/2)/c+1/36*
b*d^2*f^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(-c^2*x^2+1)^(5/2)/c+5/16*d^2*f
^2*x*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))+5/24*d^2*f^2*x*(c*
d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))+1/6*d^2*f^2*x
*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))+5/32*d^
2*f^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1
)^(1/2)
```

Mathematica [A] (verified)

Time = 2.56 (sec) , antiderivative size = 303, normalized size of antiderivative = 0.86

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \frac{d^2f^2\left(360b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2-720a\sqrt{d}\sqrt{f}\sqrt{1-c^2x^2}\arctan\right.}{}$$

input
```
Integrate[(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*f^2*(360*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*Sqrt
[d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(1584
*a*c*x*Sqrt[1 - c^2*x^2] - 1248*a*c^3*x^3*Sqrt[1 - c^2*x^2] + 384*a*c^5*x^
5*Sqrt[1 - c^2*x^2] + 270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*ArcSin[c*x]] +
 2*b*Cos[6*ArcSin[c*x]]) + 12*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x
]*(45*Sin[2*ArcSin[c*x]] + 9*Sin[4*ArcSin[c*x]] + Sin[6*ArcSin[c*x]])))/(2
304*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 201, normalized size of antiderivative = 0.57, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {5178, 5158, 241, 5158, 244, 2009, 5156, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(cdx+d)^{5/2}(f-cfx)^{5/2}\int \left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))dx}{(1-c^2x^2)^{5/2}}$$

$$\Big\downarrow \text{5158}$$

$$\frac{(cdx+d)^{5/2}(f-cfx)^{5/2}\left(\frac{5}{6}\int\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx-\frac{1}{6}bc\int x\left(1-c^2x^2\right)^2dx+\frac{1}{6}x\left(1-c^2x^2\right)^{5/2}(a\right.}{\left(1-c^2x^2\right)^{5/2}}$$

$$\Big\downarrow \; 241$$

$$\frac{(cdx+d)^{5/2}(f-cfx)^{5/2}\left(\frac{5}{6}\int\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx+\frac{1}{6}x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{b(1-c^2x}{36c}\right.}{\left(1-c^2x^2\right)^{5/2}}$$

$$\Big\downarrow \; 5158$$

$$\frac{(cdx+d)^{5/2}(f-cfx)^{5/2}\left(\frac{5}{6}\left(\frac{3}{4}\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx-\frac{1}{4}bc\int x\left(1-c^2x^2\right)dx+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+\right.\right.}{\left(1-c^2x^2\right)^{5/2}}$$

$$\Big\downarrow \; 244$$

$$\frac{(cdx+d)^{5/2}(f-cfx)^{5/2}\left(\frac{5}{6}\left(\frac{3}{4}\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx-\frac{1}{4}bc\int\left(x-c^2x^3\right)dx+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\right.\right.}{\left(1-c^2x^2\right)^{5/2}}$$

$$\Big\downarrow \; 2009$$

$$\frac{(cdx+d)^{5/2}(f-cfx)^{5/2}\left(\frac{5}{6}\left(\frac{3}{4}\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))-\frac{1}{4}bc\left(\frac{x^2}{2}\right.\right.\right.}{\left(1-c^2x^2\right)^{5/2}}$$

$$\Big\downarrow \; 5156$$

$$\frac{(cdx+d)^{5/2}(f-cfx)^{5/2}\left(\frac{5}{6}\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx-\frac{1}{2}bc\int xdx+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)+\frac{1}{4}x\left(1-c^2\right.\right.\right.}{\left(1-c^2x^2\right)^{5/2}}$$

$$\Big\downarrow \; 15$$

$$\frac{(cdx+d)^{5/2}(f-cfx)^{5/2}\left(\frac{5}{6}\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{1}{4}bcx^2\right)+\frac{1}{4}x\left(1-c^2x^2\right)^{3}\right.\right.}{\left(1-c^2x^2\right)^{5/2}}$$

$$\Big\downarrow \; 5152$$

$$\frac{(cdx+d)^{5/2}(f-cfx)^{5/2}\left(\frac{1}{6}x(1-c^2x^2)^{5/2}(a+b\arcsin(cx))+\frac{5}{6}\left(\frac{1}{4}x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))+\frac{3}{4}\left(\frac{1}{2}x\sqrt{\right.\right.\right.}{(1-c^2x^2)^{5/2}}$$

input
```
Int[(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)*((b*(1 - c^2*x^2)^3)/(36*c) + (x*(1 -
 c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/6 + (5*(-1/4*(b*c*(x^2/2 - (c^2*x^4)/
4)) + (x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (3*(-1/4*(b*c*x^2) +
 (x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 + (a + b*ArcSin[c*x])^2/(4*b*
c)))/4))/6))/(1 - c^2*x^2)^(5/2)
```

Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 241
```
Int[(x_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(a + b*x^2)^(p + 1)/
(2*b*(p + 1)), x] /; FreeQ[{a, b, p}, x] && NeQ[p, -1]
```

rule 244
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[Expand
Integrand[(c*x)^m*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x] && IGtQ[p
, 0]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5158
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (S
imp[2*d*(p/(2*p + 1))   Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x],
x] - Simp[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[x*(1
- c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 7.45 (sec) , antiderivative size = 897, normalized size of antiderivative = 2.55

method	result
default	$-\frac{a(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{7}{2}}}{6fc}-\frac{ad(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{7}{2}}}{6fc}-\frac{a\,d^{2}\sqrt{cdx+d}\,(-cfx+f)^{\frac{7}{2}}}{8fc}+\frac{a\,d^{2}(-cfx+f)^{\frac{5}{2}}\sqrt{cdx+d}}{24c}+\frac{5a\,d^{2}f(-$
parts	$-\frac{a(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{7}{2}}}{6fc}-\frac{ad(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{7}{2}}}{6fc}-\frac{a\,d^{2}\sqrt{cdx+d}\,(-cfx+f)^{\frac{7}{2}}}{8fc}+\frac{a\,d^{2}(-cfx+f)^{\frac{5}{2}}\sqrt{cdx+d}}{24c}+\frac{5a\,d^{2}f(-$

input
```
int((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVER
BOSE)
```

output
```
-1/6*a/f/c*(c*d*x+d)^(5/2)*(-c*f*x+f)^(7/2)-1/6*a*d/f/c*(c*d*x+d)^(3/2)*(-
c*f*x+f)^(7/2)-1/8*a*d^2/f/c*(c*d*x+d)^(1/2)*(-c*f*x+f)^(7/2)+1/24*a*d^2/c
*(-c*f*x+f)^(5/2)*(c*d*x+d)^(1/2)+5/48*a*d^2*f/c*(-c*f*x+f)^(3/2)*(c*d*x+d
)^(1/2)+5/16*a*d^2*f^2/c*(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2)+5/16*a*d^3*f^3*(
(-c*f*x+f)*(c*d*x+d))^(1/2)/(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*f)^(1/
2)*arctan((c^2*d*f)^(1/2)*x/(-c^2*d*f*x^2+d*f)^(1/2))+b*(-5/32*(-f*(c*x-1)
)^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d
^2*f^2+1/2304*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/
2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^
2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(I+6*arcsin(
c*x))*d^2*f^2/c/(c^2*x^2-1)+15/256*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(2
*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*
arcsin(c*x))*d^2*f^2/c/(c^2*x^2-1)-1/4608*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(
1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(29*I+96*arcsin(c*x))*cos(5*arcs
in(c*x))*d^2*f^2/c/(c^2*x^2-1)+5/4608*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)
*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(5*I+24*arcsin(c*x))*sin(5*arcsin(c*
x))*d^2*f^2/c/(c^2*x^2-1)-3/512*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^
2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(11*I+16*arcsin(c*x))*cos(3*arcsin(c*x))*d
^2*f^2/c/(c^2*x^2-1)+9/512*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x
^2+1)^(1/2)*c*x+c^2*x^2-1)*(3*I+8*arcsin(c*x))*sin(3*arcsin(c*x))*d^2*f...
```

Fricas [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm=
"fricas")
```

output
```
integral((a*c^4*d^2*f^2*x^4 - 2*a*c^2*d^2*f^2*x^2 + a*d^2*f^2 + (b*c^4*d^2
*f^2*x^4 - 2*b*c^2*d^2*f^2*x^2 + b*d^2*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*s
qrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((c*d*x+d)**(5/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm=
"maxima")
```

output
```
b*sqrt(d)*sqrt(f)*integrate((c^4*d^2*f^2*x^4 - 2*c^2*d^2*f^2*x^2 + d^2*f^2
)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)),
 x) + 1/48*(15*sqrt(-c^2*d*f*x^2 + d*f)*d^2*f^2*x + 15*d^3*f^3*arcsin(c*x)
/(sqrt(d*f)*c) + 10*(-c^2*d*f*x^2 + d*f)^(3/2)*d*f*x + 8*(-c^2*d*f*x^2 + d
*f)^(5/2)*x)*a
```

Giac [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\int (cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm=
"giac")
```

output
```
integrate((c*d*x + d)^(5/2)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{5/2}\,(f-c\,f\,x)^{5/2}\,dx$$

input
```
int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2),x)
```

output
```
int((a + b*asin(c*x))*(d + c*d*x)^(5/2)*(f - c*f*x)^(5/2), x)
```

Reduce [F]

$$\int (d+cdx)^{5/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\frac{\sqrt{f}\,\sqrt{d}\,d^2f^2\left(-30\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+8\sqrt{cx+1}\,\sqrt{-cx+1}\,a\,c^5x^5-26\sqrt{cx\cdots}\right.}{}$$

input
```
int((c*d*x+d)^(5/2)*(-c*f*x+f)^(5/2)*(a+b*asin(c*x)),x)
```

output

```
(sqrt(f)*sqrt(d)*d**2*f**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a + 8*sqr
t(c*x + 1)*sqrt( - c*x + 1)*a*c**5*x**5 - 26*sqrt(c*x + 1)*sqrt( - c*x + 1
)*a*c**3*x**3 + 33*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c*x + 48*int(sqrt(c*x
+ 1)*sqrt( - c*x + 1)*asin(c*x)*x**4,x)*b*c**5 - 96*int(sqrt(c*x + 1)*sqrt
( - c*x + 1)*asin(c*x)*x**2,x)*b*c**3 + 48*int(sqrt(c*x + 1)*sqrt( - c*x +
 1)*asin(c*x),x)*b*c))/(48*c)
```

3.55 $\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 438

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = -\frac{bdf^2x\sqrt{d+cdx}\sqrt{f-cfx}}{5\sqrt{1-c^2x^2}} - \frac{3bcdf^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}} + \frac{2bc^2df^2x^3\sqrt{d+cdx}\sqrt{f-cfx}}{15\sqrt{1-c^2x^2}} - \frac{bc^4df^2x^5\sqrt{d+cdx}\sqrt{f-cfx}}{25\sqrt{1-c^2x^2}} + \frac{bdf^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)^{3/2}}{16c} + \frac{3}{8}df^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) + \frac{1}{4}df^2x\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)(a+b\arcsin(cx)) + \frac{df^2}{}$$

output
```
-1/5*b*d*f^2*x*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-3/16*b*
c*d*f^2*x^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+2/15*b*c^2
*d*f^2*x^3*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/25*b*c^4*
d*f^2*x^5*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*b*d*f^2
*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*(-c^2*x^2+1)^(3/2)/c+3/8*d*f^2*x*(c*d*x+
d)^(1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))+1/4*d*f^2*x*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(1/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))+1/5*d*f^2*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(1/2)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))/c+3/16*d*f^2*(c*d*x+d)^(1/
2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 2.45 (sec) , antiderivative size = 305, normalized size of antiderivative = 0.70

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \frac{df^2\left(1800b\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2-3600a\sqrt{d}\sqrt{f}\sqrt{1-c^2x^2}\arctan\right.}{}$$

input
```
Integrate[(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*f^2*(1800*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 3600*a*Sqrt
[d]*Sqrt[f]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-128
*b*c*x*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 240*a*Sqrt[1 - c^2*x^2]*(8 + 25*c*x
 - 16*c^2*x^2 - 10*c^3*x^3 + 8*c^4*x^4) + 1200*b*Cos[2*ArcSin[c*x]] + 75*b
*Cos[4*ArcSin[c*x]]) + 60*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(3
2*(1 - c^2*x^2)^(5/2) + 40*Sin[2*ArcSin[c*x]] + 5*Sin[4*ArcSin[c*x]])))/(9
600*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 189, normalized size of antiderivative = 0.43, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{ 5178}$$

$$\frac{(cdx+d)^{3/2}(f-cfx)^{3/2}\int f(1-cx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{f(cdx+d)^{3/2}(f-cfx)^{3/2}\int (1-cx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$\Big\downarrow \; 5262$$

$$\frac{f(cdx+d)^{3/2}(f-cfx)^{3/2}\int \left(\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))-cx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\right)dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$\Big\downarrow \; 2009$$

$$\frac{f(cdx+d)^{3/2}(f-cfx)^{3/2}\left(\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{3}{8}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\frac{(1-c^2x^2)^{5/2}(a\cdots}{5c\cdots}\right.}{\left(1-c^2x^2\right)^{3/2}}$$

input
```
Int[(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(f*(d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)*(-1/5*(b*x) - (5*b*c*x^2)/16 + (2*b
*c^2*x^3)/15 + (b*c^3*x^4)/16 - (b*c^4*x^5)/25 + (3*x*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/8 + (x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + ((1
 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c) + (3*(a + b*ArcSin[c*x])^2)/(
16*b*c)))/(1 - c^2*x^2)^(3/2)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.58 (sec) , antiderivative size = 1188, normalized size of antiderivative = 2.71

method	result	size
default	Expression too large to display	1188
parts	Expression too large to display	1188

input
```
int((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVER
BOSE)
```

output

```
-1/5*a/f/c*(c*d*x+d)^(3/2)*(-c*f*x+f)^(7/2)-3/20*a*d/f/c*(c*d*x+d)^(1/2)*(
-c*f*x+f)^(7/2)+1/20*a*d/c*(-c*f*x+f)^(5/2)*(c*d*x+d)^(1/2)+1/8*a*d*f/c*(-
c*f*x+f)^(3/2)*(c*d*x+d)^(1/2)+3/8*a*d*f^2/c*(-c*f*x+f)^(1/2)*(c*d*x+d)^(1
/2)+3/8*a*d^2*f^3*((-c*f*x+f)*(c*d*x+d))^(1/2)/(-c*f*x+f)^(1/2)/(c*d*x+d)^
(1/2)/(c^2*d*f)^(1/2)*arctan((c^2*d*f)^(1/2)*x/(-c^2*d*f*x^2+d*f)^(1/2))+b
*(-3/16*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2
-1)*arcsin(c*x)^2*d*f^2+1/800*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(16*c^6
*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+
1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(I+5*arcsin(c*x))*d*f^2/c/(
c^2*x^2-1)-1/256*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(
1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x
^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x))*d*f^2/c/(c^2*x^2-1)+1/16*(d*(c*x+1))^
(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)
-I)*d*f^2/c/(c^2*x^2-1)+1/16*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(2*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin
(c*x))*d*f^2/c/(c^2*x^2-1)+1/1200*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*
(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(11*I+45*arcsin(c*x))*cos(4*arcsin(c*x))
*d*f^2/c/(c^2*x^2-1)+1/600*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^2*x^2
-c*x*(-c^2*x^2+1)^(1/2)-I)*(7*I+15*arcsin(c*x))*sin(4*arcsin(c*x))*d*f^2/c
/(c^2*x^2-1)-1/256*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^2*x^2-c*x*...
```

Fricas [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

input

```
integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm=
"fricas")
```

output

```
integral((a*c^3*d*f^2*x^3 - a*c^2*d*f^2*x^2 - a*c*d*f^2*x + a*d*f^2 + (b*c
^3*d*f^2*x^3 - b*c^2*d*f^2*x^2 - b*c*d*f^2*x + b*d*f^2)*arcsin(c*x))*sqrt(
c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((c*d*x+d)**(3/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm=
"maxima")
```

output
```
b*sqrt(d)*sqrt(f)*integrate((c^3*d*f^2*x^3 - c^2*d*f^2*x^2 - c*d*f^2*x + d
*f^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
1)), x) + 1/40*(15*sqrt(-c^2*d*f*x^2 + d*f)*d*f^2*x + 15*d^2*f^3*arcsin(c*
x)/(sqrt(d*f)*c) + 10*(-c^2*d*f*x^2 + d*f)^(3/2)*f*x + 8*(-c^2*d*f*x^2 + d
*f)^(5/2)/(c*d))*a
```

Giac [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm=
"giac")
```

output
```
integrate((c*d*x + d)^(3/2)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(d+c\,d\,x)^{3/2}\,(f-c\,f\,x)^{5/2}\,dx$$

input
```
int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2),x)
```

output
```
int((a + b*asin(c*x))*(d + c*d*x)^(3/2)*(f - c*f*x)^(5/2), x)
```

Reduce [F]

$$\int (d+cdx)^{3/2}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{f}\,\sqrt{d}\,d\,f^2\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+8\sqrt{cx+1}\,\sqrt{-cx+1}\,a\,c^4x^4-10\sqrt{cx+\right.}{}$$

input
```
int((c*d*x+d)^(3/2)*(-c*f*x+f)^(5/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(f)*sqrt(d)*d*f**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a + 8*sqrt(c
*x + 1)*sqrt( - c*x + 1)*a*c**4*x**4 - 10*sqrt(c*x + 1)*sqrt( - c*x + 1)*a
*c**3*x**3 - 16*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c**2*x**2 + 25*sqrt(c*x +
 1)*sqrt( - c*x + 1)*a*c*x + 8*sqrt(c*x + 1)*sqrt( - c*x + 1)*a + 40*int(s
qrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**3,x)*b*c**4 - 40*int(sqrt(c*x +
 1)*sqrt( - c*x + 1)*asin(c*x)*x**2,x)*b*c**3 - 40*int(sqrt(c*x + 1)*sqrt(
 - c*x + 1)*asin(c*x)*x,x)*b*c**2 + 40*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*
asin(c*x),x)*b*c))/(40*c)
```

3.56 $\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 30, antiderivative size = 376

$$\begin{aligned}\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx =& -\frac{2bf^2x\sqrt{d+cdx}\sqrt{f-cfx}}{3\sqrt{1-c^2x^2}} \\ &-\frac{3bcf^2x^2\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}+\frac{2bc^2f^2x^3\sqrt{d+cdx}\sqrt{f-cfx}}{9\sqrt{1-c^2x^2}} \\ &-\frac{bc^3f^2x^4\sqrt{d+cdx}\sqrt{f-cfx}}{16\sqrt{1-c^2x^2}}+\frac{3}{8}f^2x\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) \\ &+\frac{1}{4}c^2f^2x^3\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx)) \\ &+\frac{2f^2\sqrt{d+cdx}\sqrt{f-cfx}(1-c^2x^2)\,(a+b\arcsin(cx))}{3c} \\ &+\frac{5f^2\sqrt{d+cdx}\sqrt{f-cfx}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}\end{aligned}$$

output

```
-2/3*b*f^2*x*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-3/16*b*c*
f^2*x^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+2/9*b*c^2*f^2*
x^3*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16*b*c^3*f^2*x^4
*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+3/8*f^2*x*(c*d*x+d)^(
1/2)*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))+1/4*c^2*f^2*x^3*(c*d*x+d)^(1/2)*(-
c*f*x+f)^(1/2)*(a+b*arcsin(c*x))+2/3*f^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)*
(-c^2*x^2+1)*(a+b*arcsin(c*x))/c+5/16*f^2*(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)
*(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 2.18 (sec) , antiderivative size = 293, normalized size of antiderivative = 0.78

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \frac{360bf^2\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2-720a\sqrt{d}f^{5/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{f-cf}}{\sqrt{d}\sqrt{f}(-1+c^2x^2)}\right.}{}$$

input
```
Integrate[Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(360*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 720*a*Sqrt[d]*f
^(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqr
t[d]*Sqrt[f]*(-1 + c^2*x^2))] + f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(256*b
*c*x*(-3 + c^2*x^2) + 48*a*Sqrt[1 - c^2*x^2]*(16 + 9*c*x - 16*c^2*x^2 + 6*
c^3*x^3) + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]]) - 12*b*f^2*S
qrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]*(-64*(1 - c^2*x^2)^(3/2) - 24*S
in[2*ArcSin[c*x]] + 3*Sin[4*ArcSin[c*x]]))/(1152*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.49, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{cdx+d}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{ 5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{f-cfx}\int f^2(1-cx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{f^2\sqrt{cdx+d}\sqrt{f-cfx}\int (1-cx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{f^2\sqrt{cdx+d}\sqrt{f-cfx}\int \left(c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^2-2c\sqrt{1-c^2x^2}(a+b\arcsin(cx))x+\sqrt{1-c^2x^2}(a+b\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{f^2\sqrt{cdx+d}\sqrt{f-cfx}\left(\frac{3}{8}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\frac{2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c}+\frac{1}{4}c^2x^3\sqrt{1-c^2x^2}(a+b\arcsin\right.}{\sqrt{1-c^2x^2}}$$

input
```
Int[Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*((-2*b*x)/3 - (3*b*c*x^2)/16 + (2*b*c
^2*x^3)/9 - (b*c^3*x^4)/16 + (3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/8
 + (c^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/4 + (2*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x]))/(3*c) + (5*(a + b*ArcSin[c*x])^2)/(16*b*c)))/Sqrt
[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.52 (sec) , antiderivative size = 954, normalized size of antiderivative = 2.54

method	result
default	$-\frac{a\sqrt{cdx+d}\,(-cfx+f)^{\frac{7}{2}}}{4fc}+\frac{a(-cfx+f)^{\frac{5}{2}}\sqrt{cdx+d}}{12c}+\frac{5af(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{24c}+\frac{5a\,f^{2}\sqrt{-cfx+f}\,\sqrt{cdx+d}}{8c}+\frac{5ad\,f^{3}\sqrt{(-cf}}{8}$
parts	$-\frac{a\sqrt{cdx+d}\,(-cfx+f)^{\frac{7}{2}}}{4fc}+\frac{a(-cfx+f)^{\frac{5}{2}}\sqrt{cdx+d}}{12c}+\frac{5af(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{24c}+\frac{5a\,f^{2}\sqrt{-cfx+f}\,\sqrt{cdx+d}}{8c}+\frac{5ad\,f^{3}\sqrt{(-cf}}{8}$

input
```
int((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVER
BOSE)
```

output
```
-1/4*a/f/c*(c*d*x+d)^(1/2)*(-c*f*x+f)^(7/2)+1/12*a/c*(-c*f*x+f)^(5/2)*(c*d
*x+d)^(1/2)+5/24*a*f/c*(-c*f*x+f)^(3/2)*(c*d*x+d)^(1/2)+5/8*a*f^2/c*(-c*f*
x+f)^(1/2)*(c*d*x+d)^(1/2)+5/8*a*d*f^3*((-c*f*x+f)*(c*d*x+d))^(1/2)/(-c*f*
x+f)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*f)^(1/2)*arctan((c^2*d*f)^(1/2)*x/(-c^2*
d*f*x^2+d*f)^(1/2))+b*(-5/16*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^
2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f^2+1/256*(d*(c*x+1))^(1/2)*(-f*(c*
x-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1
/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x))*f^2/c
/(c^2*x^2-1)-1/36*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(4*c^4*x^4-5*c^2*x^
2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin
(c*x))*f^2/c/(c^2*x^2-1)+1/4*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2
*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)-I)*f^2/c/(c^2*x^2-1)+1/16*(d*(c*
x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I
*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*f^2/c/(c^2*x^2-1)-3/256*(d*(
c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(5*I
+12*arcsin(c*x))*cos(3*arcsin(c*x))*f^2/c/(c^2*x^2-1)+1/256*(d*(c*x+1))^(1
/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(17*I+28*arcsi
n(c*x))*sin(3*arcsin(c*x))*f^2/c/(c^2*x^2-1)+1/9*(d*(c*x+1))^(1/2)*(-f*(c*
x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(2*I+3*arcsin(c*x))*cos(2
*arcsin(c*x))*f^2/c/(c^2*x^2-1)+1/18*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/...
```

Fricas [F]

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx = \int \sqrt{cdx+d}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm=
"fricas")
```

output
```
integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2
*x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\text{Timed out}$$

input
```
integrate((c*d*x+d)**(1/2)*(-c*f*x+f)**(5/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\int \sqrt{cdx+d}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm=
"maxima")
```

output
```
b*sqrt(d)*sqrt(f)*integrate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(c*x + 1)*
sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/24*(15*s
qrt(-c^2*d*f*x^2 + d*f)*f^2*x + 15*d*f^3*arcsin(c*x)/(sqrt(d*f)*c) - 6*(-c
^2*d*f*x^2 + d*f)^(3/2)*f*x/d + 16*(-c^2*d*f*x^2 + d*f)^(3/2)*f/(c*d))*a
```

Giac [F]

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\int \sqrt{cdx+d}(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*arcsin(c*x)),x, algorithm=
"giac")
```

output
```
integrate(sqrt(c*d*x + d)*(-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a), x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\int (a+b\,\mathrm{asin}(c\,x))\,\sqrt{d+c\,d\,x}\,(f-c\,f\,x)^{5/2}\,dx$$

input
```
int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(5/2),x)
```

output
```
int((a + b*asin(c*x))*(d + c*d*x)^(1/2)*(f - c*f*x)^(5/2), x)
```

Reduce [F]

$$\int \sqrt{d+cdx}(f-cfx)^{5/2}(a+b\arcsin(cx))\,dx=\frac{\sqrt{f}\,\sqrt{d}\,f^2\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+6\sqrt{cx+1}\,\sqrt{-cx+1}\,a\,c^3x^3-16\sqrt{cx+1}\,\sqrt{-cx+1}\right.}{}$$

input
```
int((c*d*x+d)^(1/2)*(-c*f*x+f)^(5/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(f)*sqrt(d)*f**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a + 6*sqrt(c*x
 + 1)*sqrt( - c*x + 1)*a*c**3*x**3 - 16*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c
**2*x**2 + 9*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c*x + 16*sqrt(c*x + 1)*sqrt(
 - c*x + 1)*a + 24*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**2,x)*b*
c**3 - 48*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x,x)*b*c**2 + 24*in
t(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*b*c))/(24*c)
```

3.57 $\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 345

$$\begin{aligned}\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx &= -\frac{11bf^3x\sqrt{1-c^2x^2}}{3\sqrt{d+cdx}\sqrt{f-cfx}} \\ &+ \frac{3bcf^3x^2\sqrt{1-c^2x^2}}{4\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{bc^2f^3x^3\sqrt{1-c^2x^2}}{9\sqrt{d+cdx}\sqrt{f-cfx}} \\ &+ \frac{11f^3(1-c^2x^2)\,(a+b\arcsin(cx))}{3c\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{3f^3x(1-c^2x^2)\,(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{f-cfx}} \\ &+ \frac{cf^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{5f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc\sqrt{d+cdx}\sqrt{f-cfx}}\end{aligned}$$

output

```
-11/3*b*f^3*x*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+3/4*b*c*
f^3*x^2*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/9*b*c^2*f^3*
x^3*(-c^2*x^2+1)^(1/2)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+11/3*f^3*(-c^2*x^2
+1)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-3/2*f^3*x*(-c^2*x
^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/3*c*f^3*x^2*(-c
^2*x^2+1)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+5/4*f^3*(-c^2
*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 5.56 (sec) , antiderivative size = 274, normalized size of antiderivative = 0.79

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \frac{90bf^2\sqrt{d+cdx}\sqrt{f-cfx}\arcsin(cx)^2-180a\sqrt{d}f^{5/2}\sqrt{1-c^2x^2}\,\mathrm{arct}$$

input
```
Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

output
```
(90*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*ArcSin[c*x]^2 - 180*a*Sqrt[d]*f^
(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])/(Sqrt
[d]*Sqrt[f]*(-1 + c^2*x^2))] - 6*b*f^2*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Arc
Sin[c*x]*(9*(-5 + 2*c*x)*Sqrt[1 - c^2*x^2] + Cos[3*ArcSin[c*x]]) + f^2*Sqr
t[d + c*d*x]*Sqrt[f - c*f*x]*(-270*b*c*x + 12*a*Sqrt[1 - c^2*x^2]*(22 - 9*
c*x + 2*c^2*x^2) - 27*b*Cos[2*ArcSin[c*x]] + 2*b*Sin[3*ArcSin[c*x]]))/(72*
c*d*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.79 (sec) , antiderivative size = 172, normalized size of antiderivative = 0.50, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{cdx+d}}dx$$

$$\Big\downarrow \text{ 5178}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{f^3(1-cx)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{f^3\sqrt{1-c^2x^2}\int \frac{(1-cx)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{f^3\sqrt{1-c^2x^2}\int \left(-\frac{c^3(a+b\arcsin(cx))x^3}{\sqrt{1-c^2x^2}}+\frac{3c^2(a+b\arcsin(cx))x^2}{\sqrt{1-c^2x^2}}-\frac{3c(a+b\arcsin(cx))x}{\sqrt{1-c^2x^2}}+\frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{f^3\sqrt{1-c^2x^2}\left(\frac{1}{3}cx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{3}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+\frac{11\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c}+\frac{5(a}{}\right.}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

input
```
Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/Sqrt[d + c*d*x],x]
```

output
```
(f^3*Sqrt[1 - c^2*x^2]*((-11*b*x)/3 + (3*b*c*x^2)/4 - (b*c^2*x^3)/9 + (11*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c) - (3*x*Sqrt[1 - c^2*x^2]*(a +
 b*ArcSin[c*x]))/2 + (c*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/3 + (5*
(a + b*ArcSin[c*x])^2)/(4*b*c)))/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.16 (sec) , antiderivative size = 951, normalized size of antiderivative = 2.76

method	result
default	$\frac{a(-cfx+f)^{\frac{5}{2}}\sqrt{cdx+d}}{3cd}+\frac{5af(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{6cd}+\frac{5a\,f^{2}\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2cd}+\frac{5a\,f^{3}\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^{2} \cdots}}{\sqrt{-c^{2}df \cdots}}\right.}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^{2}df}}$
parts	$\frac{a(-cfx+f)^{\frac{5}{2}}\sqrt{cdx+d}}{3cd}+\frac{5af(-cfx+f)^{\frac{3}{2}}\sqrt{cdx+d}}{6cd}+\frac{5a\,f^{2}\sqrt{-cfx+f}\,\sqrt{cdx+d}}{2cd}+\frac{5a\,f^{3}\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^{2} \cdots}}{\sqrt{-c^{2}df \cdots}}\right.}{2\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^{2}df}}$

input
```
int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
1/3*a/c/d*(-c*f*x+f)^(5/2)*(c*d*x+d)^(1/2)+5/6*a*f/c/d*(-c*f*x+f)^(3/2)*(c
*d*x+d)^(1/2)+5/2*a*f^2/c/d*(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2)+5/2*a*f^3*((-
c*f*x+f)*(c*d*x+d))^(1/2)/(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*f)^(1/2)
*arctan((c^2*d*f)^(1/2)*x/(-c^2*d*f*x^2+d*f)^(1/2))+b*(-5/4*(-f*(c*x-1))^(
1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c*x+1)/d/c/(c*x-1)*arcsin(c*x)^
2*f^2+1/144*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(-4*c^3*x^3-8*I*(-c^2*x^2
+1)^(1/2)*x^3*c^3+8*c^4*x^4+3*c*x+4*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+4*I*c*x*(
-c^2*x^2+1)^(1/2)-8*c^2*x^2-I*(-c^2*x^2+1)^(1/2)+1)*(I+3*arcsin(c*x))*f^2/
(c*x+1)/d/c/(c*x-1)+15/16*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(-I*(-c^2*x
^2+1)^(1/2)+c*x-1)*(arcsin(c*x)+I)*f^2/(c*x+1)/d/c/(c*x-1)+15/8*(d*(c*x+1)
)^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*
x)-I)*f^2/(c*x+1)/d/c/(c*x-1)-3/32*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(2
*I*(-c^2*x^2+1)^(1/2)*c*x+2*c^2*x^2-I*(-c^2*x^2+1)^(1/2)-c*x-1)*(-I+2*arcs
in(c*x))*f^2/(c*x+1)/d/c/(c*x-1)+1/96*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)
*(I*c*x-I-(-c^2*x^2+1)^(1/2))*(9*I+14*arcsin(c*x))*cos(3*arcsin(c*x))*f^2/
(c*x+1)/d/c/(c*x-1)-1/288*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^
2+1)^(1/2)+c*x-1)*(23*I+54*arcsin(c*x))*sin(3*arcsin(c*x))*f^2/(c*x+1)/d/c
/(c*x-1)+1/144*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)+
c*x-1)*(132*arcsin(c*x)+109*I)*cos(2*arcsin(c*x))*f^2/(c*x+1)/d/c/(c*x-1)+
1/72*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*c*x-I-(-c^2*x^2+1)^(1/2))*...
```

Fricas [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2
*x + b*f^2)*arcsin(c*x))*sqrt(-c*f*x + f)/sqrt(c*d*x + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \text{Timed out}$$

input
```
integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(1/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm=
"maxima")
```

output
```
1/6*(2*sqrt(-c^2*d*f*x^2 + d*f)*c*f^2*x^2/d - 9*sqrt(-c^2*d*f*x^2 + d*f)*f
^2*x/d + 15*f^3*arcsin(c*x)/(sqrt(d*f)*c) + 22*sqrt(-c^2*d*f*x^2 + d*f)*f^
2/(c*d))*a + b*sqrt(f)*integrate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x
 + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/sqrt(c*x + 1), x)/sqrt(d)
```

Giac [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2),x, algorithm=
"giac")
```

output
```
integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f-c\,f\,x\right)^{5/2}}{\sqrt{d+c\,d\,x}}\,dx$$

input
```
int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(1/2),x)
```

output
```
int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(1/2), x)
```

Reduce [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{\sqrt{d+cdx}}\,dx=\frac{\sqrt{f}\,f^2\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+2\sqrt{cx+1}\,\sqrt{-cx+1}\,a\,c^2x^2-9\sqrt{cx}\right.}{}$$

input
```
int((-c*f*x+f)^(5/2)*(a+b*asin(c*x))/(c*d*x+d)^(1/2),x)
```

output
```
(sqrt(f)*f**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a + 2*sqrt(c*x + 1)*sq
rt( - c*x + 1)*a*c**2*x**2 - 9*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*c*x + 22*s
qrt(c*x + 1)*sqrt( - c*x + 1)*a + 6*int((sqrt( - c*x + 1)*asin(c*x)*x**2)/
sqrt(c*x + 1),x)*b*c**3 - 12*int((sqrt( - c*x + 1)*asin(c*x)*x)/sqrt(c*x +
 1),x)*b*c**2 + 6*int((sqrt( - c*x + 1)*asin(c*x))/sqrt(c*x + 1),x)*b*c))/
(6*sqrt(d)*c)
```

3.58 $\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 410

$$\begin{aligned}\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx &= \frac{4bf^3x\sqrt{1-c^2x^2}}{d\sqrt{d+cdx}\sqrt{f-cfx}} \\ &- \frac{bcf^3x^2\sqrt{1-c^2x^2}}{4d\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{15bf^3\sqrt{1-c^2x^2}\arcsin(cx)^2}{4cd\sqrt{d+cdx}\sqrt{f-cfx}} \\ &- \frac{8f^3(1-cx)(a+b\arcsin(cx))}{cd\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{4f^3(1-c^2x^2)(a+b\arcsin(cx))}{cd\sqrt{d+cdx}\sqrt{f-cfx}} \\ &+ \frac{f^3x(1-c^2x^2)(a+b\arcsin(cx))}{2d\sqrt{d+cdx}\sqrt{f-cfx}} \\ &- \frac{15f^3\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{2cd\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{8bf^3\sqrt{1-c^2x^2}\log(1+cx)}{cd\sqrt{d+cdx}\sqrt{f-cfx}}\end{aligned}$$

output
```
4*b*f^3*x*(-c^2*x^2+1)^(1/2)/d/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/4*b*c*f^
3*x^2*(-c^2*x^2+1)^(1/2)/d/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+15/4*b*f^3*(-c
^2*x^2+1)^(1/2)*arcsin(c*x)^2/c/d/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-8*f^3*(
-c*x+1)*(a+b*arcsin(c*x))/c/d/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-4*f^3*(-c^2
*x^2+1)*(a+b*arcsin(c*x))/c/d/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/2*f^3*x*(
-c^2*x^2+1)*(a+b*arcsin(c*x))/d/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-15/2*f^3*
(-c^2*x^2+1)^(1/2)*arcsin(c*x)*(a+b*arcsin(c*x))/c/d/(c*d*x+d)^(1/2)/(-c*f
*x+f)^(1/2)+8*b*f^3*(-c^2*x^2+1)^(1/2)*ln(c*x+1)/c/d/(c*d*x+d)^(1/2)/(-c*f
*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 7.11 (sec) , antiderivative size = 685, normalized size of antiderivative = 1.67

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

output
```
(f^2*(8*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*Sqrt[1 - c^2*x^2]*(-24 - 7*c*x +
 c^2*x^2)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 120*a*Sqrt[d]*Sqrt[f
]*(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x])
/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2
]) - 8*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2]*(Ar
cSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2
]]) + ((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[Arc
Sin[c*x]/2]])*Sin[ArcSin[c*x]/2]) - 32*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[f
- c*f*x]*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (c*x +
 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2]
 + (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - b*(1 + c*x)*Sqrt[d + c*
d*x]*Sqrt[f - c*f*x]*(20*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]) - 2*(16*c*x + Cos[2*ArcSin[c*x]] + 32*Log[Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 2*ArcSin[c*x]
*(24*Cos[ArcSin[c*x]/2] + 7*Cos[(3*ArcSin[c*x])/2] + Cos[(5*ArcSin[c*x])/2
] - 24*Sin[ArcSin[c*x]/2] + 7*Sin[(3*ArcSin[c*x])/2] - Sin[(5*ArcSin[c*x])
/2]))))/(16*c*d^2*(1 + c*x)*Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin[Ar
cSin[c*x]/2]))
```

Rubi [A] (verified)

Time = 0.73 (sec) , antiderivative size = 188, normalized size of antiderivative = 0.46, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(cdx+d)^{3/2}}\,dx$$

$\Big\downarrow$ 5178

$$\frac{\left(1-c^2x^2\right)^{3/2}\int \frac{f^4(1-cx)^4(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$\Big\downarrow$ 27

$$\frac{f^4\left(1-c^2x^2\right)^{3/2}\int \frac{(1-cx)^4(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$\Big\downarrow$ 5260

$$\frac{f^4\left(1-c^2x^2\right)^{3/2}\left(-bc\int \left(\frac{x}{2}-\frac{15\arcsin(cx)}{2c\sqrt{1-c^2x^2}}-\frac{4}{c}-\frac{8(1-cx)}{c(1-c^2x^2)}\right)dx+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{4\sqrt{1-c^2x^2}(a+b\arc}{c}\right.}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$\Big\downarrow$ 2009

$$\frac{f^4\left(1-c^2x^2\right)^{3/2}\left(\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}-\frac{8(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}-\frac{15\arcsin(cx)(a+}{2c}\right.}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

input
```
Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(3/2),x]
```

output
```
(f^4*(1 - c^2*x^2)^(3/2)*((-8*(1 - c*x)*(a + b*ArcSin[c*x]))/(c*Sqrt[1 - c
^2*x^2]) - (4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (x*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x]))/2 - (15*ArcSin[c*x]*(a + b*ArcSin[c*x]))/(2*c) -
b*c*((-4*x)/c + x^2/4 - (15*ArcSin[c*x]^2)/(4*c^2) - (8*Log[1 + c*x])/c^2)
))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.66 (sec) , antiderivative size = 906, normalized size of antiderivative = 2.21

method	result
default	$\frac{15\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,b\arcsin(cx)^2 f^2}{4(cx+1)(cx-1)d^2c} + \frac{15\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)a f^2}{2(cx+1)(cx-1)d^2c} + \frac{\sqrt{-f(cx-1)}}{}$

input
```
int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
15/4*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c*x+1)/(c*x-
1)/d^2/c*b*arcsin(c*x)^2*f^2+15/2*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c
^2*x^2+1)^(1/2)/(c*x+1)/(c*x-1)/d^2/c*arcsin(c*x)*a*f^2+1/32*(-f*(c*x-1))^
(1/2)*(d*(c*x+1))^(1/2)*(4*c^3*x^3-2*c^2*x^2-4*I*x^2*c^2*(-c^2*x^2+1)^(1/2
)-3*c*x+2*I*(-c^2*x^2+1)^(1/2)*c*x+1+I*(-c^2*x^2+1)^(1/2))*(I*b+2*b*arcsin
(c*x)+2*a)*f^2/(c*x+1)/(c*x-1)/d^2/c-(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*
(-I*(-c^2*x^2+1)^(1/2)+c*x-1)*(b*arcsin(c*x)+I*b+a)*f^2/(c*x+1)/(c*x-1)/d^
2/c-2*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x
^2-1)*(b*arcsin(c*x)-I*b+a)*f^2/(c*x+1)/(c*x-1)/d^2/c+1/32*(-f*(c*x-1))^(1
/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*c*x+2*c^2*x^2-I*(-c^2*x^2+1)
^(1/2)-c*x-1)*(-I*b+2*b*arcsin(c*x)+2*a)*f^2/(c*x+1)/(c*x-1)/d^2/c+16*I*(d
*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c*x+1)/(c*x-1)/d^2/
c*arcsin(c*x)*b*f^2-8*f^2*(a+b*arcsin(c*x))*(I*(-c^2*x^2+1)^(1/2)+c*x-1)*(
-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/d^2/c/(c^2*x^2-1)-16*(-f*(c*x-1))^(1/2
)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c*x+1)/(c*x-1)/d^2/c*b*ln(I*c*x+(-
c^2*x^2+1)^(1/2)+I)*f^2-1/16*(I*(-c^2*x^2+1)^(1/2)+c*x-1)*(-f*(c*x-1))^(1/
2)*(d*(c*x+1))^(1/2)*(15*I*b+16*b*arcsin(c*x)+16*a)*cos(2*arcsin(c*x))*f^2
/(c*x+1)/(c*x-1)/d^2/c-1/8*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*c*x-I-(
-c^2*x^2+1)^(1/2))*(8*I*b+7*b*arcsin(c*x)+7*a)*sin(2*arcsin(c*x))*f^2/(c*x
+1)/(c*x-1)/d^2/c
```

Fricas [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin{(cx)}+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm=
"fricas")
```

output
```
integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2
*x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^2*d^2*x^2 + 2
*c*d^2*x + d^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \text{Timed out}$$

input
```
integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(3/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm=
"maxima")
```

output
```
-1/2*(c^2*f^3*x^3/(sqrt(-c^2*d*f*x^2 + d*f)*d) - 8*c*f^3*x^2/(sqrt(-c^2*d*
f*x^2 + d*f)*d) - 17*f^3*x/(sqrt(-c^2*d*f*x^2 + d*f)*d) + 15*f^3*arcsin(c*
x)/(sqrt(d*f)*c*d) + 24*f^3/(sqrt(-c^2*d*f*x^2 + d*f)*c*d))*a + b*sqrt(f)*
integrate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x + 1)*arctan2(c*x, sqrt
(c*x + 1)*sqrt(-c*x + 1))/((c*d*x + d)*sqrt(c*x + 1)), x)/sqrt(d)
```

Giac [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(3/2),x, algorithm=
"giac")
```

output
```
integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f-c\,f\,x\right)^{5/2}}{\left(d+c\,d\,x\right)^{3/2}}\,dx$$

input
```
int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(3/2),x)
```

output
```
int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(3/2), x)
```

Reduce [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{3/2}}\,dx=\frac{\sqrt{f}\,f^2\left(30\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+\sqrt{-cx+1}\,a\,c^2x^2-7\sqrt{-cx+}\right.}{}$$

input
```
int((-c*f*x+f)^(5/2)*(a+b*asin(c*x))/(c*d*x+d)^(3/2),x)
```

output
```
(sqrt(f)*f**2*(30*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a + sqrt( -
 c*x + 1)*a*c**2*x**2 - 7*sqrt( - c*x + 1)*a*c*x - 24*sqrt( - c*x + 1)*a +
 2*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)*x**2)/(sqrt(c*x + 1)*c*x
+ sqrt(c*x + 1)),x)*b*c**3 - 4*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*
x)*x)/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b*c**2 + 2*sqrt(c*x + 1)*int(
(sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b*c))/
(2*sqrt(d)*sqrt(c*x + 1)*c*d)
```

3.59 $\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 432

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = -\frac{bf^3x\sqrt{1-c^2x^2}}{d^2\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{8bf^3\sqrt{1-c^2x^2}}{3cd^2(1+cx)\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{5bf^3\sqrt{1-c^2x^2}\arcsin(cx)^2}{2cd^2\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{20f^3(1-cx)(a+b\arcsin(cx))}{3cd^2\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{2f^3(1-cx)^4(a+b\arcsin(cx))}{3cd^2\sqrt{d+cdx}\sqrt{f-cfx}\,(1-c^2x^2)}+\frac{5f^3(1-c^2x^2)\,(a+b\arcsin(cx))}{3cd^2\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{5f^3\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{cd^2\sqrt{d+cdx}\sqrt{f-cfx}}-\frac{28bf^3\sqrt{1-c^2x^2}\log(1+cx)}{3cd^2\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
-b*f^3*x*(-c^2*x^2+1)^(1/2)/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-8/3*b*f^3
*(-c^2*x^2+1)^(1/2)/c/d^2/(c*x+1)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-5/2*b*f
^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
+20/3*f^3*(-c*x+1)*(a+b*arcsin(c*x))/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2
)-2/3*f^3*(-c*x+1)^4*(a+b*arcsin(c*x))/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1
/2)/(-c^2*x^2+1)+5/3*f^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c/d^2/(c*d*x+d)^(1
/2)/(-c*f*x+f)^(1/2)+5*f^3*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*(a+b*arcsin(c*x)
)/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-28/3*b*f^3*(-c^2*x^2+1)^(1/2)*ln(
c*x+1)/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 9.05 (sec) , antiderivative size = 847, normalized size of antiderivative = 1.96

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

output
```
(f^2*((4*a*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(23 + 34*c*x + 3*c^2*x^2))/(1 +
 c*x)^2 - 60*a*Sqrt[d]*Sqrt[f]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
)/(Sqrt[d]*Sqrt[f]*(-1 + c^2*x^2))] + (2*b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]
*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*Arc
Sin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2
]]) + Cos[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 2*(2 + 7*Sqrt[1 - c^2*x^
2])*ArcSin[c*x] + 3*(2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 - 28*(2 + Sqrt[1
 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]
/2]))/((1 - c*x)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) + (2*b*Sqrt[
d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[
(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*
x]/2]]) - Cos[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2]
 + Sin[ArcSin[c*x]/2]]) + 2*(-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*
(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[
ArcSin[c*x]/2]))/((1 - c*x)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) +
 (b*Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/
2])*(2*(4 + 6*c*x + 6*c^2*x^2 + 52*(1 + c*x)*Log[Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 18*ArcSin[c*x
]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + ArcSin[c*x]*(-24*Cos[...
```

Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 208, normalized size of antiderivative = 0.48, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(cdx+d)^{5/2}}\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\int \frac{f^5(1-cx)^5(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f^5\left(1-c^2x^2\right)^{5/2}\int \frac{(1-cx)^5(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{f^5\left(1-c^2x^2\right)^{5/2}\left(-bc\int \left(-\frac{2(1-cx)^4}{3c\left(1-c^2x^2\right)^2}+\frac{20(1-cx)}{3c\left(1-c^2x^2\right)}+\frac{5\arcsin(cx)}{c\sqrt{1-c^2x^2}}+\frac{5}{3c}\right)dx-\frac{2(1-cx)^4(a+b\arcsin(cx))}{3c\left(1-c^2x^2\right)^{3/2}}+\frac{20(1-cx)(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}\right.}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{f^5\left(1-c^2x^2\right)^{5/2}\left(-\frac{2(1-cx)^4(a+b\arcsin(cx))}{3c\left(1-c^2x^2\right)^{3/2}}+\frac{20(1-cx)(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}+\frac{5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c}+\frac{5\arcsin(cx)(a+b\arcsin(cx))}{c}\right.}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

input
```
Int[((f - c*f*x)^(5/2)*(a + b*ArcSin[c*x]))/(d + c*d*x)^(5/2),x]
```

output
```
(f^5*(1 - c^2*x^2)^(5/2)*((-2*(1 - c*x)^4*(a + b*ArcSin[c*x]))/(3*c*(1 - c
^2*x^2)^(3/2)) + (20*(1 - c*x)*(a + b*ArcSin[c*x]))/(3*c*Sqrt[1 - c^2*x^2]
) + (5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c) + (5*ArcSin[c*x]*(a +
b*ArcSin[c*x]))/c - b*c*(x/c + 8/(3*c^2*(1 + c*x)) + (5*ArcSin[c*x]^2)/(2*
c^2) + (28*Log[1 + c*x])/(3*c^2))))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 3.67 (sec) , antiderivative size = 407, normalized size of antiderivative = 0.94

method	result
default	$-\frac{\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\left(-16b+60\arcsin(cx)acx+68\sqrt{-c^2x^2+1}\,acx-22xbc-6b\,c^3x^3+6a\,c^2x^2\sqrt{-c^2x^2+1}+15\,\mathrm{arcsi}\right.}{}$

input
```
int((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
-1/6*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^3/(c^4*x^
4+2*c^3*x^3-2*c*x-1)*(-16*b+60*arcsin(c*x)*a*c*x+68*(-c^2*x^2+1)^(1/2)*a*c
*x-22*x*b*c-6*b*c^3*x^3+6*a*c^2*x^2*(-c^2*x^2+1)^(1/2)+15*arcsin(c*x)^2*b*
c^2*x^2+30*arcsin(c*x)*a*c^2*x^2-12*x^2*c^2*b+6*b*c^2*x^2*arcsin(c*x)*(-c^
2*x^2+1)^(1/2)+30*b*c*x*arcsin(c*x)^2+46*(-c^2*x^2+1)^(1/2)*a+68*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)*b*c*x+46*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*b+15*arcsin(
c*x)^2*b+30*arcsin(c*x)*a-112*b*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-224*ln(I*c*
x+(-c^2*x^2+1)^(1/2)+I)*b*c*x-112*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*b*c^2*x^2
+112*I*arcsin(c*x)*b*c*x+56*I*arcsin(c*x)*b*c^2*x^2+56*I*b*arcsin(c*x)-56*
I*a-112*I*a*c*x-56*I*a*c^2*x^2)*f^2
```

Fricas [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm=
"fricas")
```

output
```
integral((a*c^2*f^2*x^2 - 2*a*c*f^2*x + a*f^2 + (b*c^2*f^2*x^2 - 2*b*c*f^2
*x + b*f^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*f*x + f)/(c^3*d^3*x^3 + 3
*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\text{Timed out}$$

input
```
integrate((-c*f*x+f)**(5/2)*(a+b*asin(c*x))/(c*d*x+d)**(5/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm=
"maxima")
```

output
```
1/3*(3*(-c^2*d*f*x^2 + d*f)^(5/2)/(c^5*d^5*x^4 + 4*c^4*d^5*x^3 + 6*c^3*d^5
*x^2 + 4*c^2*d^5*x + c*d^5) - 5*(-c^2*d*f*x^2 + d*f)^(3/2)*f/(c^4*d^4*x^3
+ 3*c^3*d^4*x^2 + 3*c^2*d^4*x + c*d^4) - 10*sqrt(-c^2*d*f*x^2 + d*f)*f^2/(
c^3*d^3*x^2 + 2*c^2*d^3*x + c*d^3) + 35*sqrt(-c^2*d*f*x^2 + d*f)*f^2/(c^2*
d^3*x + c*d^3) + 15*f^3*arcsin(c*x)/(c*d^3*sqrt(f/d)))*a + b*sqrt(f)*integ
rate((c^2*f^2*x^2 - 2*c*f^2*x + f^2)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))/((c^2*d^2*x^2 + 2*c*d^2*x + d^2)*sqrt(c*x + 1)), x)/s
qrt(d)
```

Giac [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cfx+f)^{\frac{5}{2}}(b\arcsin(cx)+a)}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*f*x+f)^(5/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2),x, algorithm=
"giac")
```

output
```
integrate((-c*f*x + f)^(5/2)*(b*arcsin(c*x) + a)/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(f-c\,f\,x\right)^{5/2}}{\left(d+c\,d\,x\right)^{5/2}}\,dx$$

input
```
int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(5/2),x)
```

output
```
int(((a + b*asin(c*x))*(f - c*f*x)^(5/2))/(d + c*d*x)^(5/2), x)
```

Reduce [F]

$$\int \frac{(f-cfx)^{5/2}(a+b\arcsin(cx))}{(d+cdx)^{5/2}}\,dx=\frac{\sqrt{f}\,f^2\left(-30\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)acx-30\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)\right.}{}$$

input
```
int((-c*f*x+f)^(5/2)*(a+b*asin(c*x))/(c*d*x+d)^(5/2),x)
```

output
```
(sqrt(f)*f**2*( - 30*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a*c*x -
30*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a + 3*sqrt( - c*x + 1)*a*c
**2*x**2 + 34*sqrt( - c*x + 1)*a*c*x + 23*sqrt( - c*x + 1)*a + 3*sqrt(c*x
+ 1)*int((sqrt( - c*x + 1)*asin(c*x)*x**2)/(sqrt(c*x + 1)*c**2*x**2 + 2*sq
rt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b*c**4*x + 3*sqrt(c*x + 1)*int((sqrt(
- c*x + 1)*asin(c*x)*x**2)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x
+ sqrt(c*x + 1)),x)*b*c**3 - 6*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*
x)*x)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b
*c**3*x - 6*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)*x)/(sqrt(c*x + 1
)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b*c**2 + 3*sqrt(c*x
+ 1)*int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*
x + 1)*c*x + sqrt(c*x + 1)),x)*b*c**2*x + 3*sqrt(c*x + 1)*int((sqrt( - c*x
 + 1)*asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x
 + 1)),x)*b*c))/(3*sqrt(d)*sqrt(c*x + 1)*c*d**2*(c*x + 1))
```

3.60 $\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 55

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx = \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
1/2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^
(1/2)
```

Mathematica [A] (verified)

Time = 1.02 (sec) , antiderivative size = 110, normalized size of antiderivative = 2.00

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

input
```
Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]),x]
```

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

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {5178, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{cdx+d}\sqrt{f-cfx}}dx$$

$$\Big\downarrow \text{ 5178}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{f-cfx}}$$

$$\Big\downarrow \text{ 5152}$$

$$\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{cdx+d}\sqrt{f-cfx}}$$

input
```
Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]),x]
```

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

Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 131 vs. $2(47) = 94$.

Time = 1.32 (sec) , antiderivative size = 132, normalized size of antiderivative = 2.40

method	result	size
default	$\frac{a\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^2df}\,x}{\sqrt{-c^2df\,x^2+df}}\right)}{\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^2df}}-\frac{b\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{2dfc(c^2x^2-1)}$	132
parts	$\frac{a\sqrt{(-cfx+f)(cdx+d)}\,\arctan\left(\frac{\sqrt{c^2df}\,x}{\sqrt{-c^2df\,x^2+df}}\right)}{\sqrt{-cfx+f}\,\sqrt{cdx+d}\,\sqrt{c^2df}}-\frac{b\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2}{2dfc(c^2x^2-1)}$	132

input
```
int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
a*((-c*f*x+f)*(c*d*x+d))^(1/2)/(-c*f*x+f)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*f)^
(1/2)*arctan((c^2*d*f)^(1/2)*x/(-c^2*d*f*x^2+d*f)^(1/2))-1/2*b*(-f*(c*x-1)
)^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/f/c/(c^2*x^2-1)*arcsin(c*x)
^2
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{cdx+d}\sqrt{-cfx+f}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm=
"fricas")
```

output
```
integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^2*d*f*x^
2 - d*f), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx = \int \frac{a+b\,\mathrm{asin}\,(cx)}{\sqrt{d(cx+1)}\sqrt{-f(cx-1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*sqrt(-f*(c*x - 1))), x)
```

Maxima [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.58

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx = \frac{b\arcsin(cx)^2}{2\sqrt{df}c} + \frac{a\arcsin(cx)}{\sqrt{df}c}$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm=
"maxima")
```

output
```
1/2*b*arcsin(c*x)^2/(sqrt(d*f)*c) + a*arcsin(c*x)/(sqrt(d*f)*c)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx=\int \frac{b\arcsin(cx)+a}{\sqrt{cdx+d}\sqrt{-cfx+f}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x, algorithm=
"giac")
```

output
```
integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*sqrt(-c*f*x + f)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{d+c\,d\,x}\,\sqrt{f-c\,f\,x}}\,dx$$

input
```
int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(1/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}\sqrt{f-cfx}}\,dx=\frac{-2asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a+\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)bc}{\sqrt{f}\,\sqrt{d}\,c}$$

input
```
int((a+b*asin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2),x)
```

output
```
( - 2*asin(sqrt( - c*x + 1)/sqrt(2))*a + int(asin(c*x)/(sqrt(c*x + 1)*sqrt
( - c*x + 1)),x)*b*c)/(sqrt(f)*sqrt(d)*c)
```

3.61 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 90

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx=-\frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{cdf\sqrt{d+cdx}}+\frac{b\sqrt{1-c^2x^2}\log(1+cx)}{cd\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
-(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/c/d/f/(c*d*x+d)^(1/2)+b*(-c^2*x^2+1)^(
1/2)*ln(c*x+1)/c/d/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 0.73 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.88

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx=\frac{\sqrt{d+cdx}\left(a(-1+cx)+b(-1+cx)\arcsin(cx)+b\sqrt{1-c^2x^2}\log(-f(1+c\right.}{cd^2(1+cx)\sqrt{f-cfx}}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*Sqrt[f - c*f*x]),x]
```

output
```
(Sqrt[d + c*d*x]*(a*(-1 + c*x) + b*(-1 + c*x)*ArcSin[c*x] + b*Sqrt[1 - c^2
*x^2]*Log[-(f*(1 + c*x))]))/(c*d^2*(1 + c*x)*Sqrt[f - c*f*x])
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.91, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.233$, Rules used = {5178, 27, 5260, 25, 27, 451, 16}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{3/2}\sqrt{f-cfx}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\int \frac{f(1-cx)(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f\left(1-c^2x^2\right)^{3/2}\int \frac{(1-cx)(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{f\left(1-c^2x^2\right)^{3/2}\left(-bc\int -\frac{1-cx}{c(1-c^2x^2)}dx-\frac{(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{25}$$

$$\frac{f\left(1-c^2x^2\right)^{3/2}\left(bc\int \frac{1-cx}{c(1-c^2x^2)}dx-\frac{(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f\left(1-c^2x^2\right)^{3/2}\left(b\int \frac{1-cx}{1-c^2x^2}dx-\frac{(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{451}$$

$$\frac{f\left(1-c^2x^2\right)^{3/2}\left(b\int \frac{1}{cx+1}dx-\frac{(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{16}$$

$$\frac{f(1-c^2x^2)^{3/2}\left(\frac{b\log(cx+1)}{c}-\frac{(1-cx)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*Sqrt[f - c*f*x]),x]
```

output
```
(f*(1 - c^2*x^2)^(3/2)*(-(((1 - c*x)*(a + b*ArcSin[c*x]))/(c*Sqrt[1 - c^2*
x^2])) + (b*Log[1 + c*x])/c))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Defintions of rubi rules used

rule 16
```
Int[(c_.)/((a_.) + (b_.)*(x_)), x_Symbol] :> Simp[c*(Log[RemoveContent[a +
b*x, x]]/b), x] /; FreeQ[{a, b, c}, x]
```

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 451
```
Int[((c_) + (d_.)*(x_))/((a_) + (b_.)*(x_)^2), x_Symbol] :> Simp[c^2/a   In
t[1/(c - d*x), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b*c^2 + a*d^2, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.79 (sec) , antiderivative size = 234, normalized size of antiderivative = 2.60

method	result
default	$-\frac{a\sqrt{-cfx+f}}{fdc\sqrt{cdx+d}}+b\left(\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-f(cx-1)}\,\arcsin(cx)}{d^2fc(c^2x^2-1)}-\frac{\arcsin(cx)\sqrt{d(cx+1)}\,\sqrt{-f(cx-1)}\,\left(i\sqrt{-c^2x^2+1}+cx-\right.}{(cx+1)c\,d^2f(cx-1)}\right.$
parts	$-\frac{a\sqrt{-cfx+f}}{fdc\sqrt{cdx+d}}+b\left(\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-f(cx-1)}\,\arcsin(cx)}{d^2fc(c^2x^2-1)}-\frac{\arcsin(cx)\sqrt{d(cx+1)}\,\sqrt{-f(cx-1)}\,\left(i\sqrt{-c^2x^2+1}+cx-\right.}{(cx+1)c\,d^2f(cx-1)}\right.$

input
```
int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
-a/f/d/c/(c*d*x+d)^(1/2)*(-c*f*x+f)^(1/2)+b*(2*I*(-c^2*x^2+1)^(1/2)*(d*(c*
x+1))^(1/2)*(-f*(c*x-1))^(1/2)/d^2/f/c/(c^2*x^2-1)*arcsin(c*x)-arcsin(c*x)
*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)+c*x-1)/(c*x+1)
/c/d^2/f/(c*x-1)-2*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)
/d^2/f/c/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I))
```

Fricas [A] (verification not implemented)

Time = 0.16 (sec) , antiderivative size = 348, normalized size of antiderivative = 3.87

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx = \left[\frac{(bcx+b)\sqrt{df}\log\left(\frac{c^6dfx^6+4c^5dfx^5+5c^4dfx^4-4c^2dfx^2-4cdfx-(c^4x^4+4c^3x^3+6c^2x^2+4c\cdots}{c^4x^4+2c^3x^3-2cx-1}\right.}{2(c^2d^2\cdots}\right.$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm=
"fricas")
```

output
```
[1/2*((b*c*x + b)*sqrt(d*f)*log((c^6*d*f*x^6 + 4*c^5*d*f*x^5 + 5*c^4*d*f*x
^4 - 4*c^2*d*f*x^2 - 4*c*d*f*x - (c^4*x^4 + 4*c^3*x^3 + 6*c^2*x^2 + 4*c*x)
*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(d*f) - 2*d*f)/(c
^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) - 2*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*a
rcsin(c*x) + a))/(c^2*d^2*f*x + c*d^2*f), ((b*c*x + b)*sqrt(-d*f)*arctan((
c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*s
qrt(-d*f)/(c^4*d*f*x^4 + 2*c^3*d*f*x^3 - c^2*d*f*x^2 - 2*c*d*f*x)) - sqrt(
c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a))/(c^2*d^2*f*x + c*d^2*f)]
```

Sympy [F]

$$\int \frac{a + b \arcsin(cx)}{(d + cdx)^{3/2}\sqrt{f - cfx}}\, dx = \int \frac{a + b \operatorname{asin}(cx)}{(d(cx + 1))^{\frac{3}{2}}\sqrt{-f(cx - 1)}}\, dx$$

input
```
integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/((d*(c*x + 1))**(3/2)*sqrt(-f*(c*x - 1))), x)
```

Maxima [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.07

$$\int \frac{a + b \arcsin(cx)}{(d + cdx)^{3/2}\sqrt{f - cfx}}\, dx = -\frac{\sqrt{-c^2dfx^2 + df}\, b \arcsin(cx)}{c^2d^2fx + cd^2f} - \frac{\sqrt{-c^2dfx^2 + df}\, a}{c^2d^2fx + cd^2f} + \frac{b \log(cx + 1)}{cd^{\frac{3}{2}}\sqrt{f}}$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm=
"maxima")
```

output
```
-sqrt(-c^2*d*f*x^2 + d*f)*b*arcsin(c*x)/(c^2*d^2*f*x + c*d^2*f) - sqrt(-c^
2*d*f*x^2 + d*f)*a/(c^2*d^2*f*x + c*d^2*f) + b*log(c*x + 1)/(c*d^(3/2)*sqr
t(f))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx=\int \frac{b\arcsin{(cx)}+a}{(cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x, algorithm=
"giac")
```

output
```
integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*sqrt(-c*f*x + f)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{{(d+c\,d\,x)}^{3/2}\,\sqrt{f-c\,f\,x}}\,dx$$

input
```
int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(1/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}\sqrt{f-cfx}}\,dx=\frac{-\sqrt{-cx+1}\,a+\sqrt{cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,cx+\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)bc}{\sqrt{f}\,\sqrt{d}\,\sqrt{cx+1}\,cd}$$

input
```
int((a+b*asin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2),x)
```

output
```
( - sqrt( - c*x + 1)*a + sqrt(c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt(
- c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b*c)/(sqrt(f)*sqrt(d)*
sqrt(c*x + 1)*c*d)
```

3.62 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 190

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = -\frac{b\sqrt{1-c^2x^2}}{3cd^2(1+cx)\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{3cdf(d+cdx)^{3/2}} - \frac{\sqrt{f-cfx}(a+b\arcsin(cx))}{3cd^2f\sqrt{d+cdx}} + \frac{b\sqrt{1-c^2x^2}\log(1+cx)}{3cd^2\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
-1/3*b*(-c^2*x^2+1)^(1/2)/c/d^2/(c*x+1)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1
/3*(-c*f*x+f)^(1/2)*(a+b*arcsin(c*x))/c/d/f/(c*d*x+d)^(3/2)-1/3*(-c*f*x+f)
^(1/2)*(a+b*arcsin(c*x))/c/d^2/f/(c*d*x+d)^(1/2)+1/3*b*(-c^2*x^2+1)^(1/2)*
ln(c*x+1)/c/d^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 0.80 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.62

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = \frac{\sqrt{d+cdx}\left((2+cx)\left(-a+acx-b\sqrt{1-c^2x^2}\right)+b(-2+cx+c^2x^2)\arcsin(\right.}{3cd^3(1+cx)^2\sqrt{f-cfx}}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*Sqrt[f - c*f*x]),x]
```

output
```
(Sqrt[d + c*d*x]*((2 + c*x)*(-a + a*c*x - b*Sqrt[1 - c^2*x^2]) + b*(-2 + c
*x + c^2*x^2)*ArcSin[c*x] + b*(1 + c*x)*Sqrt[1 - c^2*x^2]*Log[-(f*(1 + c*x
))]))/(3*c*d^3*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 161, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{5/2}\sqrt{f-cfx}}\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\int \frac{f^2(1-cx)^2(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{f^2\left(1-c^2x^2\right)^{5/2}\int \frac{(1-cx)^2(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{f^2\left(1-c^2x^2\right)^{5/2}\left(-bc\int \left(\frac{x}{3(1-c^2x^2)}-\frac{2(1-cx)}{3c(1-c^2x^2)^2}\right)dx+\frac{x(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}-\frac{2(1-cx)(a+b\arcsin(cx))}{3c\left(1-c^2x^2\right)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{f^2(1-c^2x^2)^{5/2}\left(\frac{x(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}-\frac{2(1-cx)(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}-bc\left(-\frac{\text{arctanh}(cx)}{3c^2}+\frac{1-cx}{3c^2(1-c^2x^2)}-\frac{\log(1-c^2x^2)}{6c^2}\right)\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*Sqrt[f - c*f*x]),x]
```

output
```
(f^2*(1 - c^2*x^2)^(5/2)*((-2*(1 - c*x)*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2
*x^2)^(3/2)) + (x*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) - b*c*((1 - c
*x)/(3*c^2*(1 - c^2*x^2)) - ArcTanh[c*x]/(3*c^2) - Log[1 - c^2*x^2]/(6*c^2
))))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.77 (sec) , antiderivative size = 275, normalized size of antiderivative = 1.45

method	result
default	$a\left(-\frac{\sqrt{-cfx+f}}{3fdc(cdx+d)^{\frac{3}{2}}}-\frac{\sqrt{-cfx+f}}{3fc\,d^{2}\sqrt{cdx+d}}\right)+\frac{b\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^{2}x^{2}+1}\,\left(i\arcsin(cx)x^{2}c^{2}-2\ln\left(icx+\sqrt{-c^{2}x^{2}+1}+i\right)\right.}{}$
parts	$a\left(-\frac{\sqrt{-cfx+f}}{3fdc(cdx+d)^{\frac{3}{2}}}-\frac{\sqrt{-cfx+f}}{3fc\,d^{2}\sqrt{cdx+d}}\right)+\frac{b\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^{2}x^{2}+1}\,\left(i\arcsin(cx)x^{2}c^{2}-2\ln\left(icx+\sqrt{-c^{2}x^{2}+1}+i\right)\right.}{}$

input
```
int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
a*(-1/3/f/d/c/(c*d*x+d)^(3/2)*(-c*f*x+f)^(1/2)-1/3/f/c/d^2/(c*d*x+d)^(1/2)
*(-c*f*x+f)^(1/2))+1/3*b*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)
^(1/2)*(I*arcsin(c*x)*c^2*x^2-2*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c^2*x^2+arc
sin(c*x)*(-c^2*x^2+1)^(1/2)*c*x+2*I*arcsin(c*x)*c*x-4*ln(I*c*x+(-c^2*x^2+1
)^(1/2)+I)*x*c+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+I*arcsin(c*x)+c*x-2*ln(I*c
*x+(-c^2*x^2+1)^(1/2)+I)+1)/d^3/f/c/(c^4*x^4+2*c^3*x^3-2*c*x-1)
```

Fricas [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 525, normalized size of antiderivative = 2.76

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx=\left[\frac{(bc^3x^3+bc^2x^2-bcx-b)\sqrt{df}\log\left(\frac{c^6dfx^6+4c^5dfx^5+5c^4dfx^4-4c^2dfx^2-4cdfx-(c^4x}{c^4x^4}\right.}{}\right.$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm=
"fricas")
```

output
```
[1/6*((b*c^3*x^3 + b*c^2*x^2 - b*c*x - b)*sqrt(d*f)*log((c^6*d*f*x^6 + 4*c
^5*d*f*x^5 + 5*c^4*d*f*x^4 - 4*c^2*d*f*x^2 - 4*c*d*f*x - (c^4*x^4 + 4*c^3*
x^3 + 6*c^2*x^2 + 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x +
f)*sqrt(d*f) - 2*d*f)/(c^4*x^4 + 2*c^3*x^3 - 2*c*x - 1)) - 2*(a*c^2*x^2 +
sqrt(-c^2*x^2 + 1)*b*c*x + a*c*x + (b*c^2*x^2 + b*c*x - 2*b)*arcsin(c*x) -
 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*f*x^3 + c^3*d^3*f*x^2 - c
^2*d^3*f*x - c*d^3*f), 1/3*((b*c^3*x^3 + b*c^2*x^2 - b*c*x - b)*sqrt(-d*f)
*arctan((c^2*x^2 + 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f
*x + f)*sqrt(-d*f)/(c^4*d*f*x^4 + 2*c^3*d*f*x^3 - c^2*d*f*x^2 - 2*c*d*f*x)
) - (a*c^2*x^2 + sqrt(-c^2*x^2 + 1)*b*c*x + a*c*x + (b*c^2*x^2 + b*c*x - 2
*b)*arcsin(c*x) - 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d^3*f*x^3 +
c^3*d^3*f*x^2 - c^2*d^3*f*x - c*d^3*f)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx=\int \frac{a+b\operatorname{asin}(cx)}{(d(cx+1))^{\frac{5}{2}}\sqrt{-f(cx-1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/((d*(c*x + 1))**(5/2)*sqrt(-f*(c*x - 1))), x)
```

Maxima [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.17

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx &= -\frac{1}{3}bc\left(\frac{1}{c^3d^{\frac{5}{2}}\sqrt{f}x+c^2d^{\frac{5}{2}}\sqrt{f}}-\frac{\log(cx+1)}{c^2d^{\frac{5}{2}}\sqrt{f}}\right)\\&\quad-\frac{1}{3}b\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3d^3fx^2+2\,c^2d^3fx+cd^3f}+\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3fx+cd^3f}\right)\arcsin(cx)\\&\quad-\frac{1}{3}a\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3d^3fx^2+2\,c^2d^3fx+cd^3f}+\frac{\sqrt{-c^2dfx^2+df}}{c^2d^3fx+cd^3f}\right)\end{aligned}$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm=
"maxima")
```

output
```
-1/3*b*c*(1/(c^3*d^(5/2)*sqrt(f)*x + c^2*d^(5/2)*sqrt(f)) - log(c*x + 1)/(
c^2*d^(5/2)*sqrt(f))) - 1/3*b*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*f*x^2 + 2
*c^2*d^3*f*x + c*d^3*f) + sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*f*x + c*d^3*f)
)*arcsin(c*x) - 1/3*a*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d^3*f*x^2 + 2*c^2*d^3
*f*x + c*d^3*f) + sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d^3*f*x + c*d^3*f))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx=\int \frac{b\arcsin{(cx)}+a}{(cdx+d)^{\frac{5}{2}}\sqrt{-cfx+f}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x, algorithm=
"giac")
```

output
```
integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*sqrt(-c*f*x + f)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{{(d+c\,d\,x)}^{5/2}\,\sqrt{f-c\,f\,x}}\,dx$$

input
```
int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(1/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}\sqrt{f-cfx}}\,dx = \frac{-\sqrt{-cx+1}\,acx-2\sqrt{-cx+1}\,a+3\sqrt{cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2+2\sqrt{cx+1}\,\sqrt{-\cdots}}\cdots\right.}{3\sqrt{\cdots}}$$

input
```
int((a+b*asin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(1/2),x)
```

output
```
( - sqrt( - c*x + 1)*a*c*x - 2*sqrt( - c*x + 1)*a + 3*sqrt(c*x + 1)*int(as
in(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*sqrt(
- c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b*c**2*x + 3*sqrt(c*x
+ 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 + 2*sqrt(c*x
+ 1)*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b*c)/(3*sqr
t(f)*sqrt(d)*sqrt(c*x + 1)*c*d**2*(c*x + 1))
```

3.63 $\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 90

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx=\frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{cdf\sqrt{f-cfx}}+\frac{b\sqrt{1-c^2x^2}\log(1-cx)}{cf\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
(c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/c/d/f/(-c*f*x+f)^(1/2)+b*(-c^2*x^2+1)^(1
/2)*ln(-c*x+1)/c/f/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 0.80 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.18

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx=\frac{\sqrt{d+cdx}\sqrt{f-cfx}\left(-a\sqrt{1-c^2x^2}-b\sqrt{1-c^2x^2}\arcsin(cx)+b(-1+cx)\,\mathrm{l}\right.}{cdf^2(-1+cx)\sqrt{1-c^2x^2}}$$

input
```
Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)),x]
```

output
```
(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-(a*Sqrt[1 - c^2*x^2]) - b*Sqrt[1 - c^2*
x^2]*ArcSin[c*x] + b*(-1 + c*x)*Log[f - c*f*x]))/(c*d*f^2*(-1 + c*x)*Sqrt[
1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.90, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {5178, 27, 5260, 27, 451, 16}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{cdx+d}(f-cfx)^{3/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\int \frac{d(cx+1)(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d\left(1-c^2x^2\right)^{3/2}\int \frac{(cx+1)(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{d\left(1-c^2x^2\right)^{3/2}\left(\frac{(cx+1)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}-bc\int \frac{cx+1}{c\left(1-c^2x^2\right)}dx\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d\left(1-c^2x^2\right)^{3/2}\left(\frac{(cx+1)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}-b\int \frac{cx+1}{1-c^2x^2}dx\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{451}$$

$$\frac{d\left(1-c^2x^2\right)^{3/2}\left(\frac{(cx+1)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}-b\int \frac{1}{1-cx}dx\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{16}$$

$$\frac{d\left(1-c^2x^2\right)^{3/2}\left(\frac{(cx+1)(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}+\frac{b\log(1-cx)}{c}\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

input
```
Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(3/2)),x]
```

output
```
(d*(1 - c^2*x^2)^(3/2)*(((1 + c*x)*(a + b*ArcSin[c*x]))/(c*Sqrt[1 - c^2*x^
2]) + (b*Log[1 - c*x])/c))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Defintions of rubi rules used

rule 16
```
Int[(c_.)/((a_.) + (b_.)*(x_)), x_Symbol] :> Simp[c*(Log[RemoveContent[a +
b*x, x]]/b), x] /; FreeQ[{a, b, c}, x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 451
```
Int[((c_) + (d_.)*(x_))/((a_) + (b_.)*(x_)^2), x_Symbol] :> Simp[c^2/a   In
t[1/(c - d*x), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b*c^2 + a*d^2, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.91 (sec) , antiderivative size = 233, normalized size of antiderivative = 2.59

method	result
default	$\frac{a\sqrt{cdx+d}}{fdc\sqrt{-cfx+f}}+b\left(\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-f(cx-1)}\,\arcsin(cx)}{d\,f^2c(c^2x^2-1)}-\frac{\arcsin(cx)\left(i\sqrt{-c^2x^2+1}+cx+1\right)\sqrt{d(cx+1)}\,\sqrt{-f(cx-}{(cx-1)cd\,f^2(cx+1)}\right.$
parts	$\frac{a\sqrt{cdx+d}}{fdc\sqrt{-cfx+f}}+b\left(\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-f(cx-1)}\,\arcsin(cx)}{d\,f^2c(c^2x^2-1)}-\frac{\arcsin(cx)\left(i\sqrt{-c^2x^2+1}+cx+1\right)\sqrt{d(cx+1)}\,\sqrt{-f(cx-}{(cx-1)cd\,f^2(cx+1)}\right.$

input
```
int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
a/f/d/c/(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2)+b*(2*I*(-c^2*x^2+1)^(1/2)*(d*(c*x
+1))^(1/2)*(-f*(c*x-1))^(1/2)/d/f^2/c/(c^2*x^2-1)*arcsin(c*x)-arcsin(c*x)*
(I*(-c^2*x^2+1)^(1/2)+c*x+1)*(d*(c*x+1))^(1/2)*(-f*(c*x-1))^(1/2)/(c*x-1)/
c/d/f^2/(c*x+1)-2*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/
d/f^2/c/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [A] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 354, normalized size of antiderivative = 3.93

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx = \left[\frac{(bcx-b)\sqrt{df}\log\left(\frac{c^6dfx^6-4\,c^5dfx^5+5\,c^4dfx^4-4\,c^2dfx^2+4\,cdfx-(c^4x^4-4\,c^3x^3+6\,c^2x^2-4\,ca}{c^4x^4-2\,c^3x^3+2\,cx-1}\right.}{2\,(c^2df}\right.$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm=
"fricas")
```

output
```
[1/2*((b*c*x - b)*sqrt(d*f)*log((c^6*d*f*x^6 - 4*c^5*d*f*x^5 + 5*c^4*d*f*x
^4 - 4*c^2*d*f*x^2 + 4*c*d*f*x - (c^4*x^4 - 4*c^3*x^3 + 6*c^2*x^2 - 4*c*x)
*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*sqrt(d*f) - 2*d*f)/(c
^4*x^4 - 2*c^3*x^3 + 2*c*x - 1)) - 2*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*a
rcsin(c*x) + a))/(c^2*d*f^2*x - c*d*f^2), ((b*c*x - b)*sqrt(-d*f)*arctan((
c^2*x^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x + f)*s
qrt(-d*f)/(c^4*d*f*x^4 - 2*c^3*d*f*x^3 - c^2*d*f*x^2 + 2*c*d*f*x)) - sqrt(
c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a))/(c^2*d*f^2*x - c*d*f^2)]
```

Sympy [F]

$$\int \frac{a + b\arcsin(cx)}{\sqrt{d + cdx}(f - cfx)^{3/2}}\, dx = \int \frac{a + b\,\mathrm{asin}\,(cx)}{\sqrt{d\,(cx + 1)}\,(-f\,(cx - 1))^{\frac{3}{2}}}\, dx$$

input
```
integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(3/2)), x)
```

Maxima [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.09

$$\int \frac{a + b\arcsin(cx)}{\sqrt{d + cdx}(f - cfx)^{3/2}}\, dx = -\frac{\sqrt{-c^2dfx^2 + df}b\arcsin(cx)}{c^2df^2x - cdf^2} - \frac{\sqrt{-c^2dfx^2 + df}a}{c^2df^2x - cdf^2} + \frac{b\log(cx - 1)}{c\sqrt{d}f^{\frac{3}{2}}}$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm=
"maxima")
```

output
```
-sqrt(-c^2*d*f*x^2 + d*f)*b*arcsin(c*x)/(c^2*d*f^2*x - c*d*f^2) - sqrt(-c^
2*d*f*x^2 + d*f)*a/(c^2*d*f^2*x - c*d*f^2) + b*log(c*x - 1)/(c*sqrt(d)*f^(
3/2))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{cdx+d}(-cfx+f)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x, algorithm=
"giac")
```

output
```
integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*(-c*f*x + f)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{d+c\,d\,x}\,(f-c\,f\,x)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{3/2}}\,dx = \frac{-\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,cx-\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)bc+\sqrt{cx+1}\,a}{\sqrt{f}\,\sqrt{d}\,\sqrt{-cx+1}\,cf}$$

input
```
int((a+b*asin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2),x)
```

output
```
( - sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x - s
qrt(c*x + 1)*sqrt( - c*x + 1)),x)*b*c + sqrt(c*x + 1)*a)/(sqrt(f)*sqrt(d)*
sqrt( - c*x + 1)*c*f)
```

3.64 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 98

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx=\frac{x(a+b\arcsin(cx))}{df\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{b\sqrt{1-c^2x^2}\log\left(1-c^2x^2\right)}{2cdf\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
x*(a+b*arcsin(c*x))/d/f/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/2*b*(-c^2*x^2+1
)^(1/2)*ln(-c^2*x^2+1)/c/d/f/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 0.93 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.07

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx=\frac{\sqrt{d+cdx}\left(2acx+2bcx\arcsin(cx)+b\sqrt{1-c^2x^2}\log(-f(1+cx))+b\sqrt{1\right.}{2cd^2f(1+cx)\sqrt{f-cfx}}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x]
```

output
```
(Sqrt[d + c*d*x]*(2*a*c*x + 2*b*c*x*ArcSin[c*x] + b*Sqrt[1 - c^2*x^2]*Log[
-(f*(1 + c*x))] + b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x]))/(2*c*d^2*f*(1 + c*x
)*Sqrt[f - c*f*x])
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.82, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {5178, 5160, 240}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{3/2}\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{5160}$$

$$\frac{(1-c^2x^2)^{3/2}\left(\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}-bc\int \frac{x}{1-c^2x^2}dx\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

$$\Big\downarrow \text{240}$$

$$\frac{(1-c^2x^2)^{3/2}\left(\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{b\log(1-c^2x^2)}{2c}\right)}{(cdx+d)^{3/2}(f-cfx)^{3/2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x]
```

output
```
((1 - c^2*x^2)^(3/2)*((x*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2] + (b*Log[1
 - c^2*x^2])/(2*c)))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2))
```

Defintions of rubi rules used

rule 240
```
Int[(x_)/((a_) + (b_.)*(x_)^2), x_Symbol] :> Simp[Log[RemoveContent[a + b*x
^2, x]]/(2*b), x] /; FreeQ[{a, b}, x]
```

rule 5160
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Simp[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[x*((a + b*ArcSin[c*x
])^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.83 (sec) , antiderivative size = 215, normalized size of antiderivative = 2.19

method	result
default	$a\left(-\frac{1}{fdc\sqrt{cdx+d}\,\sqrt{-cfx+f}}+\frac{\sqrt{cdx+d}}{fc\,d^{2}\sqrt{-cfx+f}}\right)+\frac{b\left(i\arcsin(cx)x^{2}c^{2}-\ln\left(1+\left(icx+\sqrt{-c^{2}x^{2}+1}\right)^{2}\right)x^{2}c^{2}+\arcsin(cx)\sqrt{-c^{2}x}\right.}{(c^{4}x}$
parts	$a\left(-\frac{1}{fdc\sqrt{cdx+d}\,\sqrt{-cfx+f}}+\frac{\sqrt{cdx+d}}{fc\,d^{2}\sqrt{-cfx+f}}\right)+\frac{b\left(i\arcsin(cx)x^{2}c^{2}-\ln\left(1+\left(icx+\sqrt{-c^{2}x^{2}+1}\right)^{2}\right)x^{2}c^{2}+\arcsin(cx)\sqrt{-c^{2}x}\right.}{(c^{4}x}$

input
```
int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
a*(-1/f/d/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/f/c/d^2/(-c*f*x+f)^(1/2)*(c
*d*x+d)^(1/2))+b*(I*arcsin(c*x)*c^2*x^2-ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)
*x^2*c^2+arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-I*arcsin(c*x)+ln(1+(I*c*x+(-c^
2*x^2+1)^(1/2))^2))*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2
)/(c^4*x^4-2*c^2*x^2+1)/c/d^2/f^2
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \int \frac{b\arcsin\left(cx\right)+a}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm=
"fricas")
```

output
```
integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^4*d^2*f^2
*x^4 - 2*c^2*d^2*f^2*x^2 + d^2*f^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \int \frac{a+b\operatorname{asin}\left(cx\right)}{\left(d\left(cx+1\right)\right)^{\frac{3}{2}}\left(-f\left(cx-1\right)\right)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))/((d*(c*x + 1))**(3/2)*(-f*(c*x - 1))**(3/2)), x
)
```

Maxima [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.88

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \frac{bx\arcsin(cx)}{\sqrt{-c^2dfx^2+df}\,df} + \frac{ax}{\sqrt{-c^2dfx^2+df}\,df} - \frac{b\sqrt{\frac{1}{df}}\log\left(x^2-\frac{1}{c^2}\right)}{2\,cdf}$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm=
"maxima")
```

output
```
b*x*arcsin(c*x)/(sqrt(-c^2*d*f*x^2 + d*f)*d*f) + a*x/(sqrt(-c^2*d*f*x^2 +
d*f)*d*f) - 1/2*b*sqrt(1/(d*f))*log(x^2 - 1/c^2)/(c*d*f)
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x, algorithm=
"giac")
```

output
```
integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*(-c*f*x + f)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(d+c\,d\,x)^{3/2}\,(f-c\,f\,x)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{3/2}}\,dx = \frac{-\sqrt{cx+1}\,\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2-\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)b+ax}{\sqrt{f}\,\sqrt{d}\,\sqrt{cx+1}\,\sqrt{-cx+1}\,df}$$

input
```
int((a+b*asin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2),x)
```

output
```
( - sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*
x + 1)*c**2*x**2 - sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b + a*x)/(sqrt(f)*sq
rt(d)*sqrt(c*x + 1)*sqrt( - c*x + 1)*d*f)
```

3.65 $\int \frac{a+b \arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 252

$$\int \frac{a+b \arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = -\frac{b\sqrt{1-c^2x^2}}{6cd^2f(1+cx)\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{a+b\arcsin(cx)}{3cdf(d+cdx)^{3/2}\sqrt{f-cfx}} + \frac{2x(a+b\arcsin(cx))}{3d^2f\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{b\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6cd^2f\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2f\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
-1/6*b*(-c^2*x^2+1)^(1/2)/c/d^2/f/(c*x+1)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
-1/3*(a+b*arcsin(c*x))/c/d/f/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2)+2/3*x*(a+b*a
rcsin(c*x))/d^2/f/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/6*b*(-c^2*x^2+1)^(1/2
)*arctanh(c*x)/c/d^2/f/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/3*b*(-c^2*x^2+1)
^(1/2)*ln(-c^2*x^2+1)/c/d^2/f/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 1.11 (sec) , antiderivative size = 180, normalized size of antiderivative = 0.71

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \frac{\sqrt{d+cdx}\left(-4a+8acx+8ac^2x^2-2b\sqrt{1-c^2x^2}+4b(-1+2cx+2c^2x^2\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x]
```

output
```
(Sqrt[d + c*d*x]*(-4*a + 8*a*c*x + 8*a*c^2*x^2 - 2*b*Sqrt[1 - c^2*x^2] + 4
*b*(-1 + 2*c*x + 2*c^2*x^2)*ArcSin[c*x] + 5*b*(1 + c*x)*Sqrt[1 - c^2*x^2]*
Log[-(f*(1 + c*x))] + 3*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 3*b*c*x*Sqrt[
1 - c^2*x^2]*Log[f - c*f*x]))/(12*c*d^3*f*(1 + c*x)^2*Sqrt[f - c*f*x])
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.63, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{5/2}(f-cfx)^{3/2}}dx$$

$$\Big\downarrow \; 5178$$

$$\frac{(1-c^2x^2)^{5/2}\int \frac{f(1-cx)(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \; 27$$

$$\frac{f(1-c^2x^2)^{5/2}\int \frac{(1-cx)(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \; 5260$$

$$\frac{f\left(1-c^2x^2\right)^{5/2}\left(-bc\int \left(\frac{2x}{3(1-c^2x^2)}-\frac{1-cx}{3c(1-c^2x^2)^2}\right)dx+\frac{2x(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}-\frac{(1-cx)(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{f\left(1-c^2x^2\right)^{5/2}\left(\frac{2x(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}-\frac{(1-cx)(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}-bc\left(-\frac{\operatorname{arctanh}(cx)}{6c^2}+\frac{1-cx}{6c^2(1-c^2x^2)}-\frac{\log(1-c^2x^2)}{3c^2}\right)\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x]
```

output
```
(f*(1 - c^2*x^2)^(5/2)*(-1/3*((1 - c*x)*(a + b*ArcSin[c*x]))/(c*(1 - c^2*x
^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) - b*c*((1 - c
*x)/(6*c^2*(1 - c^2*x^2)) - ArcTanh[c*x]/(6*c^2) - Log[1 - c^2*x^2]/(3*c^2
))))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.03 (sec) , antiderivative size = 499, normalized size of antiderivative = 1.98

method	result
default	$a\left(-\frac{1}{3fdc(cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}}+\frac{-\frac{2}{3fdc\sqrt{cdx+d}\,\sqrt{-cfx+f}}+\frac{2\sqrt{cdx+d}}{3fc\,d^{2}\sqrt{-cfx+f}}}{d}\right)+\frac{b\left(-4i\arcsin(cx)xc-5\ln\left(icx+\sqrt{-c^{2}x^{2}+1}+\right.\right.}{}$
parts	$a\left(-\frac{1}{3fdc(cdx+d)^{\frac{3}{2}}\sqrt{-cfx+f}}+\frac{-\frac{2}{3fdc\sqrt{cdx+d}\,\sqrt{-cfx+f}}+\frac{2\sqrt{cdx+d}}{3fc\,d^{2}\sqrt{-cfx+f}}}{d}\right)+\frac{b\left(-4i\arcsin(cx)xc-5\ln\left(icx+\sqrt{-c^{2}x^{2}+1}+\right.\right.}{}$

input
```
int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
a*(-1/3/f/d/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(1/2)+2/3/d*(-1/f/d/c/(c*d*x+d)^(
1/2)/(-c*f*x+f)^(1/2)+1/f/c/d^2/(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2)))+1/6*b*(
-4*I*arcsin(c*x)*c*x-5*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x^3*c^3-3*ln(I*c*x+(
-c^2*x^2+1)^(1/2)-I)*x^3*c^3+4*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2+4*I*
arcsin(c*x)*c^3*x^3-5*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c^2*x^2-3*ln(I*c*x+(-
c^2*x^2+1)^(1/2)-I)*x^2*c^2+4*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x+4*I*arcsi
n(c*x)*c^2*x^2+c^2*x^2+5*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x*c+3*ln(I*c*x+(-c
^2*x^2+1)^(1/2)-I)*x*c-2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-4*I*arcsin(c*x)+5*
ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)+3*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)-1)*(-f*(c*
x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^5*x^5+c^4*x^4-2*c^3*x^
3-2*c^2*x^2+c*x+1)/c/d^3/f^2
```

Fricas [F]

$$\int \frac{a + b\arcsin(cx)}{(d + cdx)^{5/2}(f - cfx)^{3/2}}\,dx = \int \frac{b\arcsin(cx) + a}{(cdx + d)^{\frac{5}{2}}(-cfx + f)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm=
"fricas")
```

output
```
integral(sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^5*d^3*f^2
*x^5 + c^4*d^3*f^2*x^4 - 2*c^3*d^3*f^2*x^3 - 2*c^2*d^3*f^2*x^2 + c*d^3*f^2
*x + d^3*f^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin(cx)}{(d + cdx)^{5/2}(f - cfx)^{3/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(3/2),x)
```

output
```
Timed out
```

Maxima [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 234, normalized size of antiderivative = 0.93

$$\int \frac{a + b\arcsin(cx)}{(d + cdx)^{5/2}(f - cfx)^{3/2}}\,dx = -\frac{1}{12}bc\left(\frac{2\sqrt{d}\sqrt{f}}{c^3d^3f^2x + c^2d^3f^2} - \frac{5\log(cx+1)}{c^2d^{\frac{5}{2}}f^{\frac{3}{2}}} - \frac{3\log(cx-1)}{c^2d^{\frac{5}{2}}f^{\frac{3}{2}}}\right) - \frac{1}{3}b\left(\frac{1}{\sqrt{-c^2dfx^2 + df}c^2d^2fx + \sqrt{-c^2dfx^2 + df}cd^2f} - \frac{2x}{\sqrt{-c^2dfx^2 + df}d^2f}\right)\arcsin(cx) - \frac{1}{3}a\left(\frac{1}{\sqrt{-c^2dfx^2 + df}c^2d^2fx + \sqrt{-c^2dfx^2 + df}cd^2f} - \frac{2x}{\sqrt{-c^2dfx^2 + df}d^2f}\right)$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm=
"maxima")
```

output
```
-1/12*b*c*(2*sqrt(d)*sqrt(f)/(c^3*d^3*f^2*x + c^2*d^3*f^2) - 5*log(c*x + 1
)/(c^2*d^(5/2)*f^(3/2)) - 3*log(c*x - 1)/(c^2*d^(5/2)*f^(3/2))) - 1/3*b*(1
/(sqrt(-c^2*d*f*x^2 + d*f)*c^2*d^2*f*x + sqrt(-c^2*d*f*x^2 + d*f)*c*d^2*f)
 - 2*x/(sqrt(-c^2*d*f*x^2 + d*f)*d^2*f))*arcsin(c*x) - 1/3*a*(1/(sqrt(-c^2
*d*f*x^2 + d*f)*c^2*d^2*f*x + sqrt(-c^2*d*f*x^2 + d*f)*c*d^2*f) - 2*x/(sqr
t(-c^2*d*f*x^2 + d*f)*d^2*f))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x, algorithm=
"giac")
```

output
```
integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*(-c*f*x + f)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(d+c\,d\,x)^{5/2}\,(f-c\,f\,x)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{3/2}}\,dx = \frac{-3\sqrt{cx+1}\,\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^3x^3+\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2-\sqrt{cx+1}\,\sqrt{-cx+}}\right.}{}$$

input
```
int((a+b*asin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(3/2),x)
```

output
```
( - 3*sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( -
c*x + 1)*c**3*x**3 + sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x +
 1)*sqrt( - c*x + 1)*c*x - sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b*c**2*x - 3
*sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x +
 1)*c**3*x**3 + sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)*s
qrt( - c*x + 1)*c*x - sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b*c + 2*a*c**2*x*
*2 + 2*a*c*x - a)/(3*sqrt(f)*sqrt(d)*sqrt(c*x + 1)*sqrt( - c*x + 1)*c*d**2
*f*(c*x + 1))
```

3.66 $\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 192

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx &= -\frac{b\sqrt{1-c^2x^2}}{3cf^2(1-cx)\sqrt{d+cdx}\sqrt{f-cfx}} \\ &+ \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{3cdf(f-cfx)^{3/2}} \\ &+ \frac{\sqrt{d+cdx}(a+b\arcsin(cx))}{3cdf^2\sqrt{f-cfx}} + \frac{b\sqrt{1-c^2x^2}\log(1-cx)}{3cf^2\sqrt{d+cdx}\sqrt{f-cfx}}\end{aligned}$$

output
```
-1/3*b*(-c^2*x^2+1)^(1/2)/c/f^2/(-c*x+1)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+
1/3*(c*d*x+d)^(1/2)*(a+b*arcsin(c*x))/c/d/f/(-c*f*x+f)^(3/2)+1/3*(c*d*x+d)
^(1/2)*(a+b*arcsin(c*x))/c/d/f^2/(-c*f*x+f)^(1/2)+1/3*b*(-c^2*x^2+1)^(1/2)
*ln(-c*x+1)/c/f^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 130, normalized size of antiderivative = 0.68

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\sqrt{f-cfx}\left(-\left((-2+cx)\left(-b+bcx+a\sqrt{1-c^2x^2}\right)\right)-b(-2+cx}{3cdf^3(-1+cx)^2\sqrt{1-c^2}}$$

input
```
Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)),x]
```

output
```
(Sqrt[d + c*d*x]*Sqrt[f - c*f*x]*(-((-2 + c*x)*(-b + b*c*x + a*Sqrt[1 - c^
2*x^2])) - b*(-2 + c*x)*Sqrt[1 - c^2*x^2]*ArcSin[c*x] + b*(-1 + c*x)^2*Log
[f - c*f*x]))/(3*c*d*f^3*(-1 + c*x)^2*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.83, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {5178, 27, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{cdx+d}(f-cfx)^{5/2}}\,dx$$

$$\Big\downarrow \; 5178$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\int \frac{d^2(cx+1)^2(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \; 27$$

$$\frac{d^2\left(1-c^2x^2\right)^{5/2}\int \frac{(cx+1)^2(a+b\arcsin(cx))}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \; 5260$$

$$\frac{d^2\left(1-c^2x^2\right)^{5/2}\left(-bc\int \left(\frac{x}{3(1-c^2x^2)}+\frac{2(cx+1)}{3c(1-c^2x^2)^2}\right)dx+\frac{x(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}+\frac{2(cx+1)(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{d^2(1-c^2x^2)^{5/2}\left(\frac{x(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}+\frac{2(cx+1)(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}-bc\left(\frac{\text{arctanh}(cx)}{3c^2}+\frac{cx+1}{3c^2(1-c^2x^2)}-\frac{\log(1-c^2x^2)}{6c^2}\right)\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

input
```
Int[(a + b*ArcSin[c*x])/(Sqrt[d + c*d*x]*(f - c*f*x)^(5/2)),x]
```

output
```
(d^2*(1 - c^2*x^2)^(5/2)*((2*(1 + c*x)*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*
x^2)^(3/2)) + (x*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) - b*c*((1 + c*
x)/(3*c^2*(1 - c^2*x^2)) + ArcTanh[c*x]/(3*c^2) - Log[1 - c^2*x^2]/(6*c^2)
)))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.92 (sec) , antiderivative size = 276, normalized size of antiderivative = 1.44

method	result
default	$a\left(\frac{\sqrt{cdx+d}}{3fdc(-cfx+f)^{\frac{3}{2}}}+\frac{\sqrt{cdx+d}}{3cd\,f^{2}\sqrt{-cfx+f}}\right)+\frac{b\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^{2}x^{2}+1}\,\left(i\arcsin(cx)x^{2}c^{2}-2\ln\left(icx+\sqrt{-c^{2}x^{2}+1}-\right.\right.}{}$
parts	$a\left(\frac{\sqrt{cdx+d}}{3fdc(-cfx+f)^{\frac{3}{2}}}+\frac{\sqrt{cdx+d}}{3cd\,f^{2}\sqrt{-cfx+f}}\right)+\frac{b\sqrt{-f(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^{2}x^{2}+1}\,\left(i\arcsin(cx)x^{2}c^{2}-2\ln\left(icx+\sqrt{-c^{2}x^{2}+1}-\right.\right.}{}$

input
```
int((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
a*(1/3/f/d/c/(-c*f*x+f)^(3/2)*(c*d*x+d)^(1/2)+1/3/c/d/f^2/(-c*f*x+f)^(1/2)
*(c*d*x+d)^(1/2))+1/3*b*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^
(1/2)*(I*arcsin(c*x)*c^2*x^2-2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*x^2*c^2+arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*c*x-2*I*arcsin(c*x)*c*x+4*ln(I*c*x+(-c^2*x^2+1)
^(1/2)-I)*x*c-2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+I*arcsin(c*x)-c*x-2*ln(I*c*
x+(-c^2*x^2+1)^(1/2)-I)+1)/f^3/d/c/(c^4*x^4-2*c^3*x^3+2*c*x-1)
```

Fricas [A] (verification not implemented)

Time = 0.20 (sec) , antiderivative size = 527, normalized size of antiderivative = 2.74

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx=\left[\frac{(bc^{3}x^{3}-bc^{2}x^{2}-bcx+b)\sqrt{df}\log\left(\frac{c^{6}dfx^{6}-4c^{5}dfx^{5}+5c^{4}dfx^{4}-4c^{2}dfx^{2}+4cdfx-(c^{4}x}{c^{4}x^{4}}\right.}{}\right.$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm=
"fricas")
```

output
```
[1/6*((b*c^3*x^3 - b*c^2*x^2 - b*c*x + b)*sqrt(d*f)*log((c^6*d*f*x^6 - 4*c
^5*d*f*x^5 + 5*c^4*d*f*x^4 - 4*c^2*d*f*x^2 + 4*c*d*f*x - (c^4*x^4 - 4*c^3*
x^3 + 6*c^2*x^2 - 4*c*x)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f*x +
f)*sqrt(d*f) - 2*d*f)/(c^4*x^4 - 2*c^3*x^3 + 2*c*x - 1)) - 2*(a*c^2*x^2 +
sqrt(-c^2*x^2 + 1)*b*c*x - a*c*x + (b*c^2*x^2 - b*c*x - 2*b)*arcsin(c*x) -
 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d*f^3*x^3 - c^3*d*f^3*x^2 - c
^2*d*f^3*x + c*d*f^3), 1/3*((b*c^3*x^3 - b*c^2*x^2 - b*c*x + b)*sqrt(-d*f)
*arctan((c^2*x^2 - 2*c*x + 2)*sqrt(-c^2*x^2 + 1)*sqrt(c*d*x + d)*sqrt(-c*f
*x + f)*sqrt(-d*f)/(c^4*d*f*x^4 - 2*c^3*d*f*x^3 - c^2*d*f*x^2 + 2*c*d*f*x)
) - (a*c^2*x^2 + sqrt(-c^2*x^2 + 1)*b*c*x - a*c*x + (b*c^2*x^2 - b*c*x - 2
*b)*arcsin(c*x) - 2*a)*sqrt(c*d*x + d)*sqrt(-c*f*x + f))/(c^4*d*f^3*x^3 -
c^3*d*f^3*x^2 - c^2*d*f^3*x + c*d*f^3)]
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx=\int \frac{a+b\operatorname{asin}(cx)}{\sqrt{d(cx+1)}\,(-f(cx-1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*asin(c*x))/(c*d*x+d)**(1/2)/(-c*f*x+f)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))/(sqrt(d*(c*x + 1))*(-f*(c*x - 1))**(5/2)), x)
```

Maxima [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.18

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx=\frac{1}{3}\,bc\left(\frac{1}{c^3\sqrt{d}f^{\frac{5}{2}}x-c^2\sqrt{d}f^{\frac{5}{2}}}+\frac{\log(cx-1)}{c^2\sqrt{d}f^{\frac{5}{2}}}\right)+\frac{1}{3}\,b\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3df^3x^2-2\,c^2df^3x+cdf^3}-\frac{\sqrt{-c^2dfx^2+df}}{c^2df^3x-cdf^3}\right)\arcsin(cx)+\frac{1}{3}\,a\left(\frac{\sqrt{-c^2dfx^2+df}}{c^3df^3x^2-2\,c^2df^3x+cdf^3}-\frac{\sqrt{-c^2dfx^2+df}}{c^2df^3x-cdf^3}\right)$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm=
"maxima")
```

output
```
1/3*b*c*(1/(c^3*sqrt(d)*f^(5/2)*x - c^2*sqrt(d)*f^(5/2)) + log(c*x - 1)/(c
^2*sqrt(d)*f^(5/2))) + 1/3*b*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d*f^3*x^2 - 2*
c^2*d*f^3*x + c*d*f^3) - sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d*f^3*x - c*d*f^3))
*arcsin(c*x) + 1/3*a*(sqrt(-c^2*d*f*x^2 + d*f)/(c^3*d*f^3*x^2 - 2*c^2*d*f^
3*x + c*d*f^3) - sqrt(-c^2*d*f*x^2 + d*f)/(c^2*d*f^3*x - c*d*f^3))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{cdx+d}(-cfx+f)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x, algorithm=
"giac")
```

output
```
integrate((b*arcsin(c*x) + a)/(sqrt(c*d*x + d)*(-c*f*x + f)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{d+c\,d\,x}\,{(f-c\,f\,x)}^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))/((d + c*d*x)^(1/2)*(f - c*f*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+cdx}(f-cfx)^{5/2}}\,dx = \frac{3\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2-2\sqrt{cx+1}\,\sqrt{-cx+1}\,cx+\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)b\,c^2x - 3}{3\sqrt{f}}$$

input
```
int((a+b*asin(c*x))/(c*d*x+d)^(1/2)/(-c*f*x+f)^(5/2),x)
```

output
```
(3*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**
2 - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1))
,x)*b*c**2*x - 3*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x
 + 1)*c**2*x**2 - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqr
t( - c*x + 1)),x)*b*c + sqrt(c*x + 1)*a*c*x - 2*sqrt(c*x + 1)*a)/(3*sqrt(f
)*sqrt(d)*sqrt( - c*x + 1)*c*f**2*(c*x - 1))
```

3.67 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 253

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = -\frac{b\sqrt{1-c^2x^2}}{6cdf^2(1-cx)\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{a+b\arcsin(cx)}{3cdf\sqrt{d+cdx}(f-cfx)^{3/2}} + \frac{2x(a+b\arcsin(cx))}{3df^2\sqrt{d+cdx}\sqrt{f-cfx}} - \frac{b\sqrt{1-c^2x^2}\,\text{arctanh}(cx)}{6cdf^2\sqrt{d+cdx}\sqrt{f-cfx}} + \frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cdf^2\sqrt{d+cdx}\sqrt{f-cfx}}$$

output
```
-1/6*b*(-c^2*x^2+1)^(1/2)/c/d/f^2/(-c*x+1)/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2
)+1/3*(a+b*arcsin(c*x))/c/d/f/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2)+2/3*x*(a+b*
arcsin(c*x))/d/f^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)-1/6*b*(-c^2*x^2+1)^(1/
2)*arctanh(c*x)/c/d/f^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/3*b*(-c^2*x^2+1
)^(1/2)*ln(-c^2*x^2+1)/c/d/f^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 1.11 (sec) , antiderivative size = 184, normalized size of antiderivative = 0.73

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\left(-4a-8acx+8ac^2x^2+2b\sqrt{1-c^2x^2}+4b(-1-2cx+2c^2x^2\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x]
```

output
```
(Sqrt[d + c*d*x]*(-4*a - 8*a*c*x + 8*a*c^2*x^2 + 2*b*Sqrt[1 - c^2*x^2] + 4
*b*(-1 - 2*c*x + 2*c^2*x^2)*ArcSin[c*x] + 3*b*(-1 + c*x)*Sqrt[1 - c^2*x^2]
*Log[-(f*(1 + c*x))] - 5*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 5*b*c*x*Sqrt
[1 - c^2*x^2]*Log[f - c*f*x]))/(12*c*d^2*f^2*Sqrt[f - c*f*x]*(-1 + c^2*x^2
))
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 157, normalized size of antiderivative = 0.62, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {5178, 27, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{3/2}(f-cfx)^{5/2}}\,dx$$

$$\Big\downarrow \; 5178$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\int \frac{d(cx+1)(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \; 27$$

$$\frac{d\left(1-c^2x^2\right)^{5/2}\int \frac{(cx+1)(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \; 5260$$

$$\frac{d\left(1-c^2x^2\right)^{5/2}\left(-bc\int\left(\frac{2x}{3(1-c^2x^2)}+\frac{cx+1}{3c(1-c^2x^2)^2}\right)dx+\frac{2x(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}+\frac{(cx+1)(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \ 2009$$

$$\frac{d\left(1-c^2x^2\right)^{5/2}\left(\frac{2x(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}+\frac{(cx+1)(a+b\arcsin(cx))}{3c(1-c^2x^2)^{3/2}}-bc\left(\frac{\text{arctanh}(cx)}{6c^2}+\frac{cx+1}{6c^2(1-c^2x^2)}-\frac{\log(1-c^2x^2)}{3c^2}\right)\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x]
```

output
```
(d*(1 - c^2*x^2)^(5/2)*(((1 + c*x)*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)
^(3/2)) + (2*x*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) - b*c*((1 + c*x)
/(6*c^2*(1 - c^2*x^2)) + ArcTanh[c*x]/(6*c^2) - Log[1 - c^2*x^2]/(3*c^2)))
)/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.95 (sec) , antiderivative size = 502, normalized size of antiderivative = 1.98

method	result
default	$a\left(-\frac{1}{fdc\sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}}+\frac{\frac{2\sqrt{cdx+d}}{3fdc(-cfx+f)^{\frac{3}{2}}}+\frac{2\sqrt{cdx+d}}{3cd\,f^{2}\sqrt{-cfx+f}}}{d}\right)+\frac{b\left(-4i\arcsin(cx)xc-3\ln\left(icx+\sqrt{-c^{2}x^{2}+1}+i\right)x^{3}c^{3}-\right.}{}$
parts	$a\left(-\frac{1}{fdc\sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}}+\frac{\frac{2\sqrt{cdx+d}}{3fdc(-cfx+f)^{\frac{3}{2}}}+\frac{2\sqrt{cdx+d}}{3cd\,f^{2}\sqrt{-cfx+f}}}{d}\right)+\frac{b\left(-4i\arcsin(cx)xc-3\ln\left(icx+\sqrt{-c^{2}x^{2}+1}+i\right)x^{3}c^{3}-\right.}{}$

input
```
int((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
a*(-1/f/d/c/(c*d*x+d)^(1/2)/(-c*f*x+f)^(3/2)+2/d*(1/3/f/d/c/(-c*f*x+f)^(3/
2)*(c*d*x+d)^(1/2)+1/3/c/d/f^2/(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2)))+1/6*b*(-
4*I*arcsin(c*x)*c*x-3*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x^3*c^3-5*ln(I*c*x+(-
c^2*x^2+1)^(1/2)-I)*x^3*c^3+4*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2+4*I*a
rcsin(c*x)*c^3*x^3+3*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c^2*x^2+5*ln(I*c*x+(-c
^2*x^2+1)^(1/2)-I)*x^2*c^2-4*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-4*I*arcsin
(c*x)*c^2*x^2-c^2*x^2+3*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x*c+5*ln(I*c*x+(-c^
2*x^2+1)^(1/2)-I)*x*c-2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+4*I*arcsin(c*x)-3*l
n(I*c*x+(-c^2*x^2+1)^(1/2)+I)-5*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)+1)*(-f*(c*x
-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^5*x^5-c^4*x^4-2*c^3*x^3
+2*c^2*x^2+c*x-1)/d^2/f^3/c
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx=\int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm=
"fricas")
```

output
```
integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^5*d^2*f^
3*x^5 - c^4*d^2*f^3*x^4 - 2*c^3*d^2*f^3*x^3 + 2*c^2*d^2*f^3*x^2 + c*d^2*f^
3*x - d^2*f^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx=\text{Timed out}$$

input
```
integrate((a+b*asin(c*x))/(c*d*x+d)**(3/2)/(-c*f*x+f)**(5/2),x)
```

output
```
Timed out
```

Maxima [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.94

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx=\frac{1}{12}\,bc\left(\frac{2\sqrt{d}\sqrt{f}}{c^3d^2f^3x-c^2d^2f^3}+\frac{3\log\left(cx+1\right)}{c^2d^{\frac{3}{2}}f^{\frac{5}{2}}}+\frac{5\log\left(cx-1\right)}{c^2d^{\frac{3}{2}}f^{\frac{5}{2}}}\right)$$
$$-\frac{1}{3}\,b\left(\frac{1}{\sqrt{-c^2dfx^2+df}c^2df^2x-\sqrt{-c^2dfx^2+df}cdf^2}-\frac{2\,x}{\sqrt{-c^2dfx^2+df}df^2}\right)\arcsin\left(cx\right)$$
$$-\frac{1}{3}\,a\left(\frac{1}{\sqrt{-c^2dfx^2+df}c^2df^2x-\sqrt{-c^2dfx^2+df}cdf^2}-\frac{2\,x}{\sqrt{-c^2dfx^2+df}df^2}\right)$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm=
"maxima")
```

output
```
1/12*b*c*(2*sqrt(d)*sqrt(f)/(c^3*d^2*f^3*x - c^2*d^2*f^3) + 3*log(c*x + 1)
/(c^2*d^(3/2)*f^(5/2)) + 5*log(c*x - 1)/(c^2*d^(3/2)*f^(5/2))) - 1/3*b*(1/
(sqrt(-c^2*d*f*x^2 + d*f)*c^2*d*f^2*x - sqrt(-c^2*d*f*x^2 + d*f)*c*d*f^2)
- 2*x/(sqrt(-c^2*d*f*x^2 + d*f)*d*f^2))*arcsin(c*x) - 1/3*a*(1/(sqrt(-c^2*
d*f*x^2 + d*f)*c^2*d*f^2*x - sqrt(-c^2*d*f*x^2 + d*f)*c*d*f^2) - 2*x/(sqrt
(-c^2*d*f*x^2 + d*f)*d*f^2))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \int \frac{b\arcsin{(cx)}+a}{(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x, algorithm=
"giac")
```

output
```
integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(3/2)*(-c*f*x + f)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{{(d+c\,d\,x)}^{3/2}\,{(f-c\,f\,x)}^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))/((d + c*d*x)^(3/2)*(f - c*f*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{3/2}(f-cfx)^{5/2}}\,dx = \frac{3\sqrt{cx+1}\,\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^3x^3-\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2-\sqrt{cx+1}\,\sqrt{-cx+1}\,c}\right.}{}$$

input
```
int((a+b*asin(c*x))/(c*d*x+d)^(3/2)/(-c*f*x+f)^(5/2),x)
```

output
```
(3*sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x
 + 1)*c**3*x**3 - sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)
*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b*c**2*x - 3*sq
rt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)
*c**3*x**3 - sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)*sqrt
( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b*c + 2*a*c**2*x**2
- 2*a*c*x - a)/(3*sqrt(f)*sqrt(d)*sqrt(c*x + 1)*sqrt( - c*x + 1)*c*d*f**2*
(c*x - 1))
```

3.68 $\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx$

Optimal result

Integrand size = 30, antiderivative size = 190

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = & -\frac{b}{6cd^2f^2\sqrt{d+cdx}\sqrt{f-cfx}\sqrt{1-c^2x^2}}+\frac{x(a+b\arcsin(cx))}{3df(d+cdx)^{3/2}(f-cfx)^{3/2}} \\ & +\frac{2x(a+b\arcsin(cx))}{3d^2f^2\sqrt{d+cdx}\sqrt{f-cfx}}+\frac{b\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2f^2\sqrt{d+cdx}\sqrt{f-cfx}}\end{aligned}$$

output
```
-1/6*b/c/d^2/f^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)/(-c^2*x^2+1)^(1/2)+1/3*x
*(a+b*arcsin(c*x))/d/f/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+2/3*x*(a+b*arcsin(
c*x))/d^2/f^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)+1/3*b*(-c^2*x^2+1)^(1/2)*ln
(-c^2*x^2+1)/c/d^2/f^2/(c*d*x+d)^(1/2)/(-c*f*x+f)^(1/2)
```

Mathematica [A] (verified)

Time = 0.96 (sec) , antiderivative size = 178, normalized size of antiderivative = 0.94

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\left(-6acx+4ac^3x^3+b\sqrt{1-c^2x^2}+2bcx(-3+2c^2x^2)\arcsin(cx\right.}{6cd^3}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x]
```

output
```
(Sqrt[d + c*d*x]*(-6*a*c*x + 4*a*c^3*x^3 + b*Sqrt[1 - c^2*x^2] + 2*b*c*x*(
-3 + 2*c^2*x^2)*ArcSin[c*x] - 2*b*(1 - c^2*x^2)^(3/2)*Log[-(f*(1 + c*x))]
- 2*b*Sqrt[1 - c^2*x^2]*Log[f - c*f*x] + 2*b*c^2*x^2*Sqrt[1 - c^2*x^2]*Log
[f - c*f*x]))/(6*c*d^3*(-1 + c*x)*Sqrt[f - c*f*x]*(f + c*f*x)^2)
```

Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.69, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {5178, 5162, 241, 5160, 240}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}dx$$

$$\Big\downarrow \text{ 5178}$$

$$\frac{(1-c^2x^2)^{5/2}\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{ 5162}$$

$$\frac{(1-c^2x^2)^{5/2}\left(\frac{2}{3}\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}dx-\frac{1}{3}bc\int \frac{x}{(1-c^2x^2)^2}dx+\frac{x(a+b\arcsin(cx))}{3(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{ 241}$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\left(\frac{2}{3}\int \frac{a+b\arcsin(cx)}{(1-c^2x^2)^{3/2}}dx+\frac{x(a+b\arcsin(cx))}{3(1-c^2x^2)^{3/2}}-\frac{b}{6c(1-c^2x^2)}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{5160}$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\left(\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}-bc\int \frac{x}{1-c^2x^2}dx\right)+\frac{x(a+b\arcsin(cx))}{3(1-c^2x^2)^{3/2}}-\frac{b}{6c(1-c^2x^2)}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

$$\Big\downarrow \text{240}$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\left(\frac{x(a+b\arcsin(cx))}{3(1-c^2x^2)^{3/2}}+\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{b\log(1-c^2x^2)}{2c}\right)-\frac{b}{6c(1-c^2x^2)}\right)}{(cdx+d)^{5/2}(f-cfx)^{5/2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x]
```

output
```
((1 - c^2*x^2)^(5/2)*(-1/6*b/(c*(1 - c^2*x^2)) + (x*(a + b*ArcSin[c*x]))/(
3*(1 - c^2*x^2)^(3/2)) + (2*((x*(a + b*ArcSin[c*x]))/Sqrt[1 - c^2*x^2] + (
b*Log[1 - c^2*x^2])/(2*c)))/3))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2))
```

Defintions of rubi rules used

rule 240
```
Int[(x_)/((a_) + (b_.)*(x_)^2), x_Symbol] :> Simp[Log[RemoveContent[a + b*x
^2, x]]/(2*b), x] /; FreeQ[{a, b}, x]
```

rule 241
```
Int[(x_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(a + b*x^2)^(p + 1)/
(2*b*(p + 1)), x] /; FreeQ[{a, b, p}, x] && NeQ[p, -1]
```

rule 5160
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Simp[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[x*((a + b*ArcSin[c*x
])^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

rule 5162
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Simp[(2*p + 3)/(2*d*(p + 1))   Int[(d + e*x^2)^(p + 1)*(a + b*Ar
cSin[c*x])^n, x], x] + Simp[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2
*x^2)^p]   Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p,
 -1] && NeQ[p, -3/2]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.84 (sec) , antiderivative size = 372, normalized size of antiderivative = 1.96

method	result
default	$a\left(-\frac{1}{3fdc(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}+\frac{-\frac{1}{fdc\sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}}+\frac{\frac{2\sqrt{cdx+d}}{3fdc(-cfx+f)^{\frac{3}{2}}}+\frac{2\sqrt{cdx+d}}{3cd\,f^{2}\sqrt{-cfx+f}}}{d}}{d}\right)+\frac{b\Big(4i\arcsin(cx)x^4c^4-4}{}$
parts	$a\left(-\frac{1}{3fdc(cdx+d)^{\frac{3}{2}}(-cfx+f)^{\frac{3}{2}}}+\frac{-\frac{1}{fdc\sqrt{cdx+d}\,(-cfx+f)^{\frac{3}{2}}}+\frac{\frac{2\sqrt{cdx+d}}{3fdc(-cfx+f)^{\frac{3}{2}}}+\frac{2\sqrt{cdx+d}}{3cd\,f^{2}\sqrt{-cfx+f}}}{d}}{d}\right)+\frac{b\Big(4i\arcsin(cx)x^4c^4-4}{}$

input
```
int((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
a*(-1/3/f/d/c/(c*d*x+d)^(3/2)/(-c*f*x+f)^(3/2)+1/d*(-1/f/d/c/(c*d*x+d)^(1/
2)/(-c*f*x+f)^(3/2)+2/d*(1/3/f/d/c/(-c*f*x+f)^(3/2)*(c*d*x+d)^(1/2)+1/3/c/
d/f^2/(-c*f*x+f)^(1/2)*(c*d*x+d)^(1/2))))+1/6*b*(4*I*arcsin(c*x)*c^4*x^4-4
*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*x^4*c^4+4*(-c^2*x^2+1)^(1/2)*arcsin(c*
x)*x^3*c^3-8*I*arcsin(c*x)*x^2*c^2+8*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*x^
2*c^2-6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-c^2*x^2+4*I*arcsin(c*x)-4*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)+1)*(-f*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^
2*x^2+1)^(1/2)/c/(c^6*x^6-3*c^4*x^4+3*c^2*x^2-1)/d^3/f^3
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(cdx+d)^{\frac{5}{2}}(-cfx+f)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm=
"fricas")
```

output
```
integral(-sqrt(c*d*x + d)*sqrt(-c*f*x + f)*(b*arcsin(c*x) + a)/(c^6*d^3*f^
3*x^6 - 3*c^4*d^3*f^3*x^4 + 3*c^2*d^3*f^3*x^2 - d^3*f^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(c*x))/(c*d*x+d)**(5/2)/(-c*f*x+f)**(5/2),x)
```

output
```
Timed out
```

Maxima [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.93

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \frac{1}{6}\,bc\left(\frac{1}{c^4d^{\frac{5}{2}}f^{\frac{5}{2}}x^2 - c^2d^{\frac{5}{2}}f^{\frac{5}{2}}} + \frac{2\,\log\left(cx+1\right)}{c^2d^{\frac{5}{2}}f^{\frac{5}{2}}} + \frac{2\,\log\left(cx-1\right)}{c^2d^{\frac{5}{2}}f^{\frac{5}{2}}}\right) + \frac{1}{3}\,b\left(\frac{x}{\left(-c^2dfx^2+df\right)^{\frac{3}{2}}df} + \frac{2\,x}{\sqrt{-c^2dfx^2+df}\,d^2f^2}\right)\arcsin\left(cx\right) + \frac{1}{3}\,a\left(\frac{x}{\left(-c^2dfx^2+df\right)^{\frac{3}{2}}df} + \frac{2\,x}{\sqrt{-c^2dfx^2+df}\,d^2f^2}\right)$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm=
"maxima")
```

output
```
1/6*b*c*(1/(c^4*d^(5/2)*f^(5/2)*x^2 - c^2*d^(5/2)*f^(5/2)) + 2*log(c*x + 1
)/(c^2*d^(5/2)*f^(5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2)*f^(5/2))) + 1/3*b*(x
/((-c^2*d*f*x^2 + d*f)^(3/2)*d*f) + 2*x/(sqrt(-c^2*d*f*x^2 + d*f)*d^2*f^2)
)*arcsin(c*x) + 1/3*a*(x/((-c^2*d*f*x^2 + d*f)^(3/2)*d*f) + 2*x/(sqrt(-c^2
*d*f*x^2 + d*f)*d^2*f^2))
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx = \int \frac{b\arcsin\left(cx\right)+a}{\left(cdx+d\right)^{\frac{5}{2}}\left(-cfx+f\right)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x, algorithm=
"giac")
```

output
```
integrate((b*arcsin(c*x) + a)/((c*d*x + d)^(5/2)*(-c*f*x + f)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{(d+c\,d\,x)^{5/2}\,(f-c\,f\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))/((d + c*d*x)^(5/2)*(f - c*f*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+cdx)^{5/2}(f-cfx)^{5/2}}\,dx=\frac{3\sqrt{cx+1}\,\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^4x^4-2\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2+\sqrt{cx+1}\,\sqrt{-cx+1}}\right.}{3\sqrt{f}}$$

input
```
int((a+b*asin(c*x))/(c*d*x+d)^(5/2)/(-c*f*x+f)^(5/2),x)
```

output
```
(3*sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x
 + 1)*c**4*x**4 - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 + sqrt(c*x +
1)*sqrt( - c*x + 1)),x)*b*c**2*x**2 - 3*sqrt(c*x + 1)*sqrt( - c*x + 1)*int
(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**4*x**4 - 2*sqrt(c*x + 1)*sqr
t( - c*x + 1)*c**2*x**2 + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b + 2*a*c**2*
x**3 - 3*a*x)/(3*sqrt(f)*sqrt(d)*sqrt(c*x + 1)*sqrt( - c*x + 1)*d**2*f**2*
(c**2*x**2 - 1))
```

3.69 $\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 613

$$
\begin{aligned}
&\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{8b^2d^2\sqrt{d+cdx}\sqrt{e-cex}}{9c} \\
&-\frac{15}{64}b^2d^2x\sqrt{d+cdx}\sqrt{e-cex}-\frac{1}{32}b^2c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex} \\
&+\frac{4b^2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c} \\
&+\frac{15b^2d^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} \\
&+\frac{4bd^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&-\frac{3bcd^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&-\frac{4bc^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&-\frac{bc^3d^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&+\frac{3}{8}d^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&+\frac{1}{4}c^2d^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&-\frac{2d^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c} \\
&+\frac{5d^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}}
\end{aligned}
$$

output
```
8/9*b^2*d^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-15/64*b^2*d^2*x*(c*d*x+d)^(
1/2)*(-c*e*x+e)^(1/2)-1/32*b^2*c^2*d^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2
)+4/27*b^2*d^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)/c+15/64*b^2*d
^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(1/2)+4/3*b
*d^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/
2)-3/8*b*c*d^2*x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^
2*x^2+1)^(1/2)-4/9*b*c^2*d^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arc
sin(c*x))/(-c^2*x^2+1)^(1/2)-1/8*b*c^3*d^2*x^4*(c*d*x+d)^(1/2)*(-c*e*x+e)^
(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+3/8*d^2*x*(c*d*x+d)^(1/2)*(-c*e
*x+e)^(1/2)*(a+b*arcsin(c*x))^2+1/4*c^2*d^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)
^(1/2)*(a+b*arcsin(c*x))^2-2/3*d^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*
x^2+1)*(a+b*arcsin(c*x))^2/c+5/24*d^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+
b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 3.09 (sec) , antiderivative size = 555, normalized size of antiderivative = 0.91

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{1440b^2d^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-4320a^2d^{5/2}\sqrt{e}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{}}{\sqrt{d}\sqrt{e}(-1+}\right.}{}$$

input
```
Integrate[(d + c*d*x)^(5/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(1440*b^2*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2*d^(
5/2)*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
)/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 12*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*ArcSin[c*x]*(576*b*c*x - 768*a*Sqrt[1 - c^2*x^2] + 768*a*c^2*x^2*Sqrt
[1 - c^2*x^2] + 144*b*Cos[2*ArcSin[c*x]] - 9*b*Cos[4*ArcSin[c*x]] + 288*a*
Sin[2*ArcSin[c*x]] + 64*b*Sin[3*ArcSin[c*x]] - 36*a*Sin[4*ArcSin[c*x]]) -
72*b*d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(-60*a + 48*b*Sqrt[
1 - c^2*x^2] + 16*b*Cos[3*ArcSin[c*x]] - 24*b*Sin[2*ArcSin[c*x]] + 3*b*Sin
[4*ArcSin[c*x]]) + d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1728*a*b*Cos[2*Arc
Sin[c*x]] + 256*b^2*Cos[3*ArcSin[c*x]] + 3*(3072*a*b*c*x - 1024*a*b*c^3*x^
3 - 1536*a^2*Sqrt[1 - c^2*x^2] + 2304*b^2*Sqrt[1 - c^2*x^2] + 864*a^2*c*x*
Sqrt[1 - c^2*x^2] + 1536*a^2*c^2*x^2*Sqrt[1 - c^2*x^2] + 576*a^2*c^3*x^3*S
qrt[1 - c^2*x^2] - 36*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Sin[2*ArcSin[c*x]]
+ 9*b^2*Sin[4*ArcSin[c*x]])))/(6912*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.40 (sec) , antiderivative size = 334, normalized size of antiderivative = 0.54, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\int d^2(cx+1)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d^2\sqrt{cdx+d}\sqrt{e-cex}\int (cx+1)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d^2\sqrt{cdx+d}\sqrt{e-cex}\int \left(c^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+2cx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\sqrt{1-c^2x^2}(a+\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{d^2\sqrt{cdx+d}\sqrt{e-cex}\left(-\frac{1}{8}bc^3x^4(a+b\arcsin(cx))-\frac{4}{9}bc^2x^3(a+b\arcsin(cx))+\frac{3}{8}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\right.}{}$$

input
```
Int[(d + c*d*x)^(5/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((8*b^2*Sqrt[1 - c^2*x^2])/(9*c) - (1
5*b^2*x*Sqrt[1 - c^2*x^2])/64 - (b^2*c^2*x^3*Sqrt[1 - c^2*x^2])/32 + (4*b^
2*(1 - c^2*x^2)^(3/2))/(27*c) + (15*b^2*ArcSin[c*x])/(64*c) + (4*b*x*(a +
b*ArcSin[c*x]))/3 - (3*b*c*x^2*(a + b*ArcSin[c*x]))/8 - (4*b*c^2*x^3*(a +
b*ArcSin[c*x]))/9 - (b*c^3*x^4*(a + b*ArcSin[c*x]))/8 + (3*x*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x])^2)/8 + (c^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x])^2)/4 - (2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c) + (5*(a +
b*ArcSin[c*x])^3)/(24*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.67 (sec) , antiderivative size = 1819, normalized size of antiderivative = 2.97

method	result	size
default	Expression too large to display	1819
parts	Expression too large to display	1819

input
```
int((c*d*x+d)^(5/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNV
ERBOSE)
```

output
```
-1/4*a^2/c/e*(c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)-5/12*a^2*d/c/e*(c*d*x+d)^(3/
2)*(-c*e*x+e)^(3/2)-5/8*a^2*d^2/c/e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)+5/8*a
^2*d^2/c*(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)+5/8*a^2*d^3*e*((c*d*x+d)*(-c*e*x
+e))^(1/2)/(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*e)^(1/2)*arctan((c^2*d*
e)^(1/2)*x/(-c^2*d*e*x^2+d*e)^(1/2))+b^2*(-5/24*(-e*(c*x-1))^(1/2)*(d*(c*x
+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*d^2+1/512*(-e*(c
*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+
8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I
*arcsin(c*x)+8*arcsin(c*x)^2-1)*d^2/c/(c^2*x^2-1)+1/108*(-e*(c*x-1))^(1/2)
*(d*(c*x+1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I
*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d^2/c/(c^2*
x^2-1)-1/4*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+
c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*d^2/c/(c^2*x^2-1)+1/16*(-e*(c
*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I
*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*arcsin(c*x)^2-1-2*I*arcsin(c*x))*d^2/c/(c^2*
x^2-1)-3/512*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2
+1)^(1/2)-I)*(20*I*arcsin(c*x)+24*arcsin(c*x)^2-11)*cos(3*arcsin(c*x))*d^2
/c/(c^2*x^2-1)+1/512*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^
(1/2)*c*x+c^2*x^2-1)*(68*I*arcsin(c*x)+56*arcsin(c*x)^2-31)*sin(3*arcsin(c
*x))*d^2/c/(c^2*x^2-1)-1/27*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c...
```

Fricas [F]

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx=\int (cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}(b\arcsin{(cx)}+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorith
m="fricas")
```

output
```
integral((a^2*c^2*d^2*x^2 + 2*a^2*c*d^2*x + a^2*d^2 + (b^2*c^2*d^2*x^2 + 2
*b^2*c*d^2*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + 2*a*b*c*d^2*x
 + a*b*d^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((c*d*x+d)**(5/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a + b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorith
m="giac")
```

output
```
integrate((c*d*x + d)^(5/2)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}\,\sqrt{e-c\,e\,x}\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(1/2),x)
```

output
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(1/2), x)
```

Reduce [F]

$$\int (d+cdx)^{5/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx=\frac{\sqrt{e}\,\sqrt{d}\,d^2\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2+6\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2c^3x^3+16\sqrt{cx+1}\,\sqrt{-cx+}\right.}{}$$

input
```
int((c*d*x+d)^(5/2)*(-c*e*x+e)^(1/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(e)*sqrt(d)*d**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + 6*sqrt(
c*x + 1)*sqrt( - c*x + 1)*a**2*c**3*x**3 + 16*sqrt(c*x + 1)*sqrt( - c*x +
1)*a**2*c**2*x**2 + 9*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2*c*x - 16*sqrt(c*
x + 1)*sqrt( - c*x + 1)*a**2 + 48*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(
c*x)*x**2,x)*a*b*c**3 + 96*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x,
x)*a*b*c**2 + 48*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*a*b*c + 2
4*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2*x**2,x)*b**2*c**3 + 48*i
nt(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2*x,x)*b**2*c**2 + 24*int(sqr
t(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2,x)*b**2*c))/(24*c)
```

3.70 $\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 455

$$\begin{aligned}
\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx &= \frac{4b^2d\sqrt{d+cdx}\sqrt{e-cex}}{9c} \\
&- \frac{1}{4}b^2dx\sqrt{d+cdx}\sqrt{e-cex} + \frac{2b^2d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c} \\
&+ \frac{b^2d\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} \\
&+ \frac{2bdx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&- \frac{bcdx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&- \frac{2bc^2dx^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} \\
&+ \frac{1}{2}dx\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 \\
&- \frac{d\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} \\
&+ \frac{d\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}
\end{aligned}$$

output
```
4/9*b^2*d*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-1/4*b^2*d*x*(c*d*x+d)^(1/2)*(
-c*e*x+e)^(1/2)+2/27*b^2*d*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)/c
+1/4*b^2*d*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(1/
2)+2/3*b*d*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+
1)^(1/2)-1/2*b*c*d*x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/
(-c^2*x^2+1)^(1/2)-2/9*b*c^2*d*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*a
rcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/2*d*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a
+b*arcsin(c*x))^2-1/3*d*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)*(a+b
*arcsin(c*x))^2/c+1/6*d*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))
^3/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 2.64 (sec) , antiderivative size = 437, normalized size of antiderivative = 0.96

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{36b^2d\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-108a^2d^{3/2}\sqrt{e}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)}{}$$

input
```
Integrate[(d + c*d*x)^(3/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(36*b^2*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108*a^2*d^(3/2)*
Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sq
rt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 18*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Ar
cSin[c*x]^2*(-6*a + 3*b*Sqrt[1 - c^2*x^2] + b*Cos[3*ArcSin[c*x]] - 3*b*Sin
[2*ArcSin[c*x]]) + d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(12*(9*b^2*Sqrt[1 - c
^2*x^2] - 4*a*b*c*x*(-3 + c^2*x^2) + 3*a^2*Sqrt[1 - c^2*x^2]*(-2 + 3*c*x +
 2*c^2*x^2)) + 54*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]] - 27*b
^2*Sin[2*ArcSin[c*x]]) + 6*b*d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]
*(9*b*Cos[2*ArcSin[c*x]] + 2*(9*b*c*x - 12*a*Sqrt[1 - c^2*x^2] + 12*a*c^2*
x^2*Sqrt[1 - c^2*x^2] + 9*a*Sin[2*ArcSin[c*x]] + b*Sin[3*ArcSin[c*x]])))/(
216*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.93 (sec) , antiderivative size = 252, normalized size of antiderivative = 0.55, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\int d(cx+1)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d\sqrt{cdx+d}\sqrt{e-cex}\int (cx+1)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d\sqrt{cdx+d}\sqrt{e-cex}\int \left(cx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$d\sqrt{cdx+d}\sqrt{e-cex}\left(-\frac{2}{9}bc^2x^3(a+b\arcsin(cx))+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{3c}-\right.$$

input
```
Int[(d + c*d*x)^(3/2)*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((4*b^2*Sqrt[1 - c^2*x^2])/(9*c) - (b^2
*x*Sqrt[1 - c^2*x^2])/4 + (2*b^2*(1 - c^2*x^2)^(3/2))/(27*c) + (b^2*ArcSin
[c*x])/(4*c) + (2*b*x*(a + b*ArcSin[c*x]))/3 - (b*c*x^2*(a + b*ArcSin[c*x]
))/2 - (2*b*c^2*x^3*(a + b*ArcSin[c*x]))/9 + (x*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x])^2)/2 - ((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c) + (a
+ b*ArcSin[c*x])^3/(6*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.21 (sec) , antiderivative size = 1360, normalized size of antiderivative = 2.99

method	result	size
default	Expression too large to display	1360
parts	Expression too large to display	1360

input
```
int((c*d*x+d)^(3/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNV
ERBOSE)
```

output
```
-1/3*a^2/c/e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)-1/2*a^2*d/c/e*(c*d*x+d)^(1/2
)*(-c*e*x+e)^(3/2)+1/2*a^2*d/c*(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)+1/2*a^2*d^
2*e*((c*d*x+d)*(-c*e*x+e))^(1/2)/(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*e
)^(1/2)*arctan((c^2*d*e)^(1/2)*x/(-c^2*d*e*x^2+d*e)^(1/2))+b^2*(-1/6*(-e*(
c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*
x)^3*d+1/216*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I
*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)
+9*arcsin(c*x)^2-2)*d/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1
/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)
*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)*d/c/(c^2*x^2-1)-1/8*(-e*(c*x-1))^(1/2
)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)^2-2-
2*I*arcsin(c*x))*d/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)
*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*
arcsin(c*x)^2-1-2*I*arcsin(c*x))*d/c/(c^2*x^2-1)-1/54*(-e*(c*x-1))^(1/2)*(
d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(12*I*arcsin(c*x)+9*
arcsin(c*x)^2-14)*cos(2*arcsin(c*x))*d/c/(c^2*x^2-1)-1/108*(-e*(c*x-1))^(1
/2)*(d*(c*x+1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(30*I*arcsin(c*
x)+9*arcsin(c*x)^2-26)*sin(2*arcsin(c*x))*d/c/(c^2*x^2-1))+2*a*b*(-1/4*(-e
*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(
c*x)^2*d+1/72*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(4*c^4*x^4-5*c^2*x^2...
```

Fricas [F]

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx=\int(cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorith
m="fricas")
```

output
```
integral((a^2*c*d*x + a^2*d + (b^2*c*d*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*c
*d*x + a*b*d)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F]

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx=\int (d(cx+1))^{\frac{3}{2}}\sqrt{-e\,(cx-1)}(a+b\,\mathrm{asin}\,(cx))^2\,dx$$

input
```
integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

output
```
Integral((d*(c*x + 1))**(3/2)*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx=\int (cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorith
m="giac")
```

output
```
integrate((c*d*x + d)^(3/2)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,\sqrt{e-c\,e\,x}\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(1/2),x)
```

output
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(1/2), x)
```

Reduce [F]

$$\int (d+cdx)^{3/2}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{e}\,\sqrt{d}\,d\left(-6asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2+2\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2c^2x^2+3\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2 \right.}{}$$

input
```
int((c*d*x+d)^(3/2)*(-c*e*x+e)^(1/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(e)*sqrt(d)*d*( - 6*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + 2*sqrt(c*x
+ 1)*sqrt( - c*x + 1)*a**2*c**2*x**2 + 3*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*
*2*c*x - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2 + 12*int(sqrt(c*x + 1)*sqrt
( - c*x + 1)*asin(c*x)*x,x)*a*b*c**2 + 12*int(sqrt(c*x + 1)*sqrt( - c*x +
1)*asin(c*x),x)*a*b*c + 6*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2*
x,x)*b**2*c**2 + 6*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2,x)*b**2
*c))/(6*c)
```

3.71 $\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 222

$$\begin{aligned}\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx &= -\frac{1}{4}b^2x\sqrt{d+cdx}\sqrt{e-cex}+\frac{b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}\\ &\quad-\frac{bcx^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}\\ &\quad+\frac{1}{2}x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2+\frac{\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}\end{aligned}$$

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

Mathematica [A] (verified)

Time = 0.38 (sec) , antiderivative size = 288, normalized size of antiderivative = 1.30

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$
$$= \frac{4b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 12a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right) + 6b\sqrt{d+cdx}\sqrt{e-}$$

input
```
Integrate[Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(4*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*Sqrt
[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d
]*Sqrt[e]*(-1 + c^2*x^2))] + 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*
x]*(b*Cos[2*ArcSin[c*x]] + 2*a*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d + c*d*x]*S
qrt[e - c*e*x]*ArcSin[c*x]^2*(2*a + b*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d + c*d
*x]*Sqrt[e - c*e*x]*(4*a^2*c*x*Sqrt[1 - c^2*x^2] + 2*a*b*Cos[2*ArcSin[c*x]
] - b^2*Sin[2*ArcSin[c*x]]))/(24*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.66, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {5178, 5156, 5138, 262, 223, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{cdx+d}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{ 5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\int \sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 5156}$$

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

$\Big\downarrow$ 5138

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(-bc\left(\frac{1}{2}x^2(a+b\arcsin(cx))-\frac{1}{2}bc\int \frac{x^2}{\sqrt{1-c^2x^2}}dx\right)+\frac{1}{2}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x\sqrt{1-c^2x^2}(a+\right.}{\sqrt{1-c^2x^2}}$$

$\Big\downarrow$ 262

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(-bc\left(\frac{1}{2}x^2(a+b\arcsin(cx))-\frac{1}{2}bc\left(\frac{\int \frac{1}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{x\sqrt{1-c^2x^2}}{2c^2}\right)\right)+\frac{1}{2}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x\right.}{\sqrt{1-c^2x^2}}$$

$\Big\downarrow$ 223

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(\frac{1}{2}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-bc\left(\frac{1}{2}x^2(a+b\arcsin(cx))-\frac{1}{2}bc\left(\right.\right.\right.}{\sqrt{1-c^2x^2}}$$

$\Big\downarrow$ 5152

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\left(\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-bc\left(\frac{1}{2}x^2(a+b\arcsin(cx))-\frac{1}{2}bc\left(\frac{\arcsin(cx)}{2c^3}-\frac{x\sqrt{1-c^2x^2}}{2c^2}\right)\right)\right.}{\sqrt{1-c^2x^2}}$$

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

output
```
(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^2)/2 + (a + b*ArcSin[c*x])^3/(6*b*c) - b*c*((x^2*(a + b*ArcSin[c*x]))/2 -
 (b*c*(-1/2*(x*Sqrt[1 - c^2*x^2])/c^2 + ArcSin[c*x]/(2*c^3)))/2)))/Sqrt[1
- c^2*x^2]
```

Defintions of rubi rules used

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.00 (sec) , antiderivative size = 634, normalized size of antiderivative = 2.86

method	result
default	$-\frac{a^2\sqrt{cdx+d}\,(-cxe+e)^{\frac{3}{2}}}{2ce}+\frac{a^2\sqrt{-cxe+e}\,\sqrt{cdx+d}}{2c}+\frac{a^2de\sqrt{(cdx+d)(-cxe+e)}\,\arctan\left(\frac{\sqrt{c^2de}\,x}{\sqrt{-c^2d\,x^2e+de}}\right)}{2\sqrt{-cxe+e}\,\sqrt{cdx+d}\,\sqrt{c^2de}}+b^2\Bigg(-\frac{\sqrt{-e(cx-}$
parts	$-\frac{a^2\sqrt{cdx+d}\,(-cxe+e)^{\frac{3}{2}}}{2ce}+\frac{a^2\sqrt{-cxe+e}\,\sqrt{cdx+d}}{2c}+\frac{a^2de\sqrt{(cdx+d)(-cxe+e)}\,\arctan\left(\frac{\sqrt{c^2de}\,x}{\sqrt{-c^2d\,x^2e+de}}\right)}{2\sqrt{-cxe+e}\,\sqrt{cdx+d}\,\sqrt{c^2de}}+b^2\Bigg(-\frac{\sqrt{-e(cx-}$

input
```
int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNV
ERBOSE)
```

output
```
-1/2*a^2/c/e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)+1/2*a^2/c*(-c*e*x+e)^(1/2)*(
c*d*x+d)^(1/2)+1/2*a^2*d*e*((c*d*x+d)*(-c*e*x+e))^(1/2)/(-c*e*x+e)^(1/2)/(
c*d*x+d)^(1/2)/(c^2*d*e)^(1/2)*arctan((c^2*d*e)^(1/2)*x/(-c^2*d*e*x^2+d*e)
^(1/2))+b^2*(-1/6*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/
c/(c^2*x^2-1)*arcsin(c*x)^3+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-2*
I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*I*ar
csin(c*x)+2*arcsin(c*x)^2-1)/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x
+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-
2*c*x)*(2*arcsin(c*x)^2-1-2*I*arcsin(c*x))/c/(c^2*x^2-1))+2*a*b*(-1/4*(-e*
(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c
*x)^2+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x
^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(I+2*arcsin(c*x))/c/(c^2*x^2-
1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c
^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))/c/(c^2*x^2-1))
```

Fricas [F]

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorith
m="fricas")
```

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e), x)
```

Sympy [F]

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \int \sqrt{d(cx+1)}\sqrt{-e(cx-1)}(a+b\,\mathrm{asin}(cx))^2\,dx$$

input
```
integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2,x)
```

output
```
Integral(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{cdx+d}\sqrt{-cex+e}(b\arcsin{(cx)}+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2,x, algorith
m="giac")
```

output
```
integrate(sqrt(c*d*x + d)*sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\,dx$$
$$=\int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,\sqrt{e-c\,e\,x}\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2),x)
```

output
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(1/2), x)
```

Reduce [F]

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

input
```
int((c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(e)*sqrt(d)*( - 2*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + sqrt(c*x + 1)
*sqrt( - c*x + 1)*a**2*c*x + 4*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x
),x)*a*b*c + 2*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2,x)*b**2*c))
/(2*c)
```

3.72 $\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 191

$$\begin{aligned}\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = &-\frac{2b^2e(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}}\\ &-\frac{2bex\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}}\\ &+\frac{e(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}\\ &+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

output
```
-2*b^2*e*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*b*e*x*(-c^2*x^2
+1)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+e*(-c^2*x^2+1
)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*e*(-c^2*x^2+1
)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Mathematica [A] (verified)

Time = 2.19 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.55

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx$$
$$= \frac{3\sqrt{d+cdx}\sqrt{e-cex}\left(-2abcx+a^2\sqrt{1-c^2x^2}-2b^2\sqrt{1-c^2x^2}\right)-6b\sqrt{d+cdx}\sqrt{e-cex}\left(bcx-a\sqrt{1-c^2\right.}}{}$$

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

output
```
(3*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-2*a*b*c*x + a^2*Sqrt[1 - c^2*x^2] - 2
*b^2*Sqrt[1 - c^2*x^2]) - 6*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(b*c*x - a*S
qrt[1 - c^2*x^2])*ArcSin[c*x] + 3*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a + b
*Sqrt[1 - c^2*x^2])*ArcSin[c*x]^2 + b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Ar
cSin[c*x]^3 - 3*a^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d +
 c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))])/(3*c*d*Sqrt[1
- c^2*x^2])
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.64, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{cdx+d}}\,dx$$
$$\Big\downarrow \text{5178}$$
$$\frac{\sqrt{1-c^2x^2}\int \frac{e(1-cx)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{e-cex}}$$
$$\Big\downarrow \text{27}$$

$$\frac{e\sqrt{1-c^2x^2}\int \frac{(1-cx)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{e-cex}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{e\sqrt{1-c^2x^2}\int \left(\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{cx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{cdx+d}\sqrt{e-cex}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e\sqrt{1-c^2x^2}\left(\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c}+\frac{(a+b\arcsin(cx))^3}{3bc}-2abx-2b^2x\arcsin(cx)-\frac{2b^2\sqrt{1-c^2x^2}}{c}\right)}{\sqrt{cdx+d}\sqrt{e-cex}}$$

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

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

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.65 (sec) , antiderivative size = 542, normalized size of antiderivative = 2.84

method	result
default	$\frac{a^2\sqrt{-cxe+e}\,\sqrt{cdx+d}}{cd}+\frac{a^2e\sqrt{(cdx+d)(-cxe+e)}\,\arctan\left(\frac{\sqrt{c^2de}\,x}{\sqrt{-c^2dx^2e+de}}\right)}{\sqrt{-cxe+e}\,\sqrt{cdx+d}\,\sqrt{c^2de}}+b^2\left(-\frac{\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin}{3(cx+1)dc(cx-1)}\right.$
parts	$\frac{a^2\sqrt{-cxe+e}\,\sqrt{cdx+d}}{cd}+\frac{a^2e\sqrt{(cdx+d)(-cxe+e)}\,\arctan\left(\frac{\sqrt{c^2de}\,x}{\sqrt{-c^2dx^2e+de}}\right)}{\sqrt{-cxe+e}\,\sqrt{cdx+d}\,\sqrt{c^2de}}+b^2\left(-\frac{\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin}{3(cx+1)dc(cx-1)}\right.$

input
```
int((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x,method=_RETURNV
ERBOSE)
```

output
```
a^2/c/d*(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)+a^2*e*((c*d*x+d)*(-c*e*x+e))^(1/2
)/(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*e)^(1/2)*arctan((c^2*d*e)^(1/2)*
x/(-c^2*d*e*x^2+d*e)^(1/2))+b^2*(-1/3*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)
*(-c^2*x^2+1)^(1/2)/(c*x+1)/d/c/(c*x-1)*arcsin(c*x)^3+1/2*(-e*(c*x-1))^(1/
2)*(d*(c*x+1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*(arcsin(c*x)^2-2
+2*I*arcsin(c*x))/(c*x+1)/d/c/(c*x-1)+1/2*(arcsin(c*x)^2-2-2*I*arcsin(c*x)
)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1
)/(c*x+1)/d/c/(c*x-1))+2*a*b*(-1/2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-
c^2*x^2+1)^(1/2)/(c*x+1)/d/c/(c*x-1)*arcsin(c*x)^2+1/2*(-e*(c*x-1))^(1/2)*
(d*(c*x+1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*(arcsin(c*x)+I)/(c*
x+1)/d/c/(c*x-1)+1/2*(arcsin(c*x)-I)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*
(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)/(c*x+1)/d/c/(c*x-1))
```

Fricas [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorith
m="fricas")
```

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(-c*e*x + e)/sq
rt(c*d*x + d), x)
```

Sympy [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-e(cx-1)}(a+b\operatorname{asin}(cx))^2}{\sqrt{d(cx+1)}}\,dx$$

input
```
integrate((-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2),x)
```

output
```
Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/sqrt(d*(c*x + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin{(cx)}+a)^2}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorith
m="giac")
```

output
```
integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

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

input
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(1/2),x)
```

output
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(1/2), x)
```

Reduce [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx$$
$$=\frac{\sqrt{e}\left(-2asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2+\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2+2\left(\int\frac{\sqrt{-cx+1}\,asin(cx)}{\sqrt{cx+1}}dx\right)abc+\left(\int\frac{\sqrt{-cx+1}\,asin(cx)^2}{\sqrt{cx+1}}dx\right)\right.}{\sqrt{d}\,c}$$

input
```
int((-c*e*x+e)^(1/2)*(a+b*asin(c*x))^2/(c*d*x+d)^(1/2),x)
```

output
```
(sqrt(e)*( - 2*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + sqrt(c*x + 1)*sqrt( -
 c*x + 1)*a**2 + 2*int((sqrt( - c*x + 1)*asin(c*x))/sqrt(c*x + 1),x)*a*b*c
 + int((sqrt( - c*x + 1)*asin(c*x)**2)/sqrt(c*x + 1),x)*b**2*c))/(sqrt(d)*
c)
```

3.73 $\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 530

$$
\begin{aligned}
\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx =
&-\frac{2e^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}+\frac{2e^2x(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&-\frac{2ie^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}}-\frac{e^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^3}{3bc(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&-\frac{8ibe^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+\frac{4be^2(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&+\frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&-\frac{4ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\
&-\frac{2ib^2e^2(1-c^2x^2)^{3/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}
\end{aligned}
$$

output
```
-2*e^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
+2*e^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
-2*I*e^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+
e)^(3/2)-1/3*e^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(3/2
)/(-c*e*x+e)^(3/2)-8*I*b*e^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I
*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*b*e^2*(-c^2*
x^2+1)^(3/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x
+d)^(3/2)/(-c*e*x+e)^(3/2)+4*I*b^2*e^2*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*
c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I*b^2*e^2*(-
c^2*x^2+1)^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)
/(-c*e*x+e)^(3/2)-2*I*b^2*e^2*(-c^2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x
^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
```

Mathematica [A] (verified)

Time = 4.43 (sec) , antiderivative size = 547, normalized size of antiderivative = 1.03

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \frac{-\frac{6a^2\sqrt{d+cdx}\sqrt{e-cex}}{1+cx}+3a^2\sqrt{d}\sqrt{e}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right)-\frac{3ab\sqrt{d+cdx}\sqrt{e}}{}}{}$$

input
```
Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

output
```
((-6*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(1 + c*x) + 3*a^2*Sqrt[d]*Sqrt[e
]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*
x^2))] - (3*a*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*(ArcSi
n[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])
 + ((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2])) + (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-6 - 6*I)*Arc
Sin[c*x]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/2]) - ArcSin[c*x]^3*(Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 6*ArcSin[c*x]*(I*Pi + 4*Log[1 - I
*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 12*Pi*(2*
Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin[c*x])] - 2*Log[Cos[A
rcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2]) - (24*I)*PolyLog[2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*
x]/2] + Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] + Sin
[ArcSin[c*x]/2])))/(3*c*d^2)
```

Rubi [A] (verified)

Time = 1.20 (sec) , antiderivative size = 263, normalized size of antiderivative = 0.50, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{3/2}\int \frac{e^2(1-cx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^2(1-c^2x^2)^{3/2}\int \frac{(1-cx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{e^2(1-c^2x^2)^{3/2}\int \left(\frac{2(1-cx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e^2(1-c^2x^2)^{3/2}\left(-\frac{8ib\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c}+\frac{2x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2(a+b\arcsin(cx))^2}{c\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^3}{3bc}-\frac{2i(a+\cdots}{\cdots}\right.}{(cdx\cdots}$$

input
```
Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

output
```
(e^2*(1 - c^2*x^2)^(3/2)*(((-2*I)*(a + b*ArcSin[c*x])^2)/c - (2*(a + b*Arc
Sin[c*x])^2)/(c*Sqrt[1 - c^2*x^2]) + (2*x*(a + b*ArcSin[c*x])^2)/Sqrt[1 -
c^2*x^2] - (a + b*ArcSin[c*x])^3/(3*b*c) - ((8*I)*b*(a + b*ArcSin[c*x])*Ar
cTan[E^(I*ArcSin[c*x])])/c + (4*b*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*Arc
Sin[c*x])])/c + ((4*I)*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c - ((4*I)*
b^2*PolyLog[2, I*E^(I*ArcSin[c*x])])/c - ((2*I)*b^2*PolyLog[2, -E^((2*I)*A
rcSin[c*x])])/c))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Maple [A] (verified)

Time = 4.38 (sec) , antiderivative size = 318, normalized size of antiderivative = 0.60

method	result
default	$\frac{\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,(a+b\arcsin(cx))^3}{3(cx+1)(cx-1)d^2cb} - \frac{2\left(\arcsin(cx)^2b^2+2\arcsin(cx)ab+a^2\right)\left(i\sqrt{-c^2x^2+1}+cx-1\right)\sqrt{-e(cx-1}}{d^2c(c^2x^2-1)}$

input
```
int((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x,method=_RETURNV
ERBOSE)
```

output
```
1/3*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/(c*x+1)/(c*x-1
)/d^2/c*(a+b*arcsin(c*x))^3/b-2*(arcsin(c*x)^2*b^2+2*arcsin(c*x)*a*b+a^2)*
(I*(-c^2*x^2+1)^(1/2)+c*x-1)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/d^2/c/(c
^2*x^2-1)+4*I*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/(c*x
+1)/(c*x-1)/d^2/c*b*(2*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*b+
arcsin(c*x)^2*b+2*I*a*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-2*I*a*ln(I*c*x+(-c^2*
x^2+1)^(1/2))+2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*b)
```

Fricas [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin{(cx)}+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorith
m="fricas")
```

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^2*d^2*x^2 + 2*c*d^2*x + d^2), x)
```

Sympy [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-e\left(cx-1\right)}\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{\left(d\left(cx+1\right)\right)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2),x)
```

output
```
Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/(d*(c*x + 1))**(3/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \int \frac{\sqrt{-cex+e}\left(b\arcsin\left(cx\right)+a\right)^2}{\left(cdx+d\right)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorith
m="giac")
```

output
```
integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{e-c\,e\,x}}{(d+c\,d\,x)^{3/2}}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(3/2),x)
```

output
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(3/2), x)
```

Reduce [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\frac{\sqrt{e}\left(2\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2-2\sqrt{-cx+1}\,a^2+2\sqrt{cx+1}\left(\int\frac{\sqrt{-}}{\sqrt{cx}}\right.\right.}{\sqrt{d}\,\sqrt{cx+1}\,c}$$

input
```
int((-c*e*x+e)^(1/2)*(a+b*asin(c*x))^2/(c*d*x+d)^(3/2),x)
```

output
```
(sqrt(e)*(2*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 - 2*sqrt( -
c*x + 1)*a**2 + 2*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x
 + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c + sqrt(c*x + 1)*int((sqrt( - c*x + 1)*
asin(c*x)**2)/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2*c))/(sqrt(d)*sqr
t(c*x + 1)*c*d)
```

3.74 $\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 493

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \frac{ie\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4b^2e\sqrt{1-c^2x^2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{2be\sqrt{1-c^2x^2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4be\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{4ib^2e\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}}$$

output
```
1/3*I*e*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/c/d^2/(c*d*x+d)^(1/2)/(-c*e
*x+e)^(1/2)-4/3*b^2*e*(-c^2*x^2+1)^(1/2)*cot(1/4*Pi+1/2*arcsin(c*x))/c/d^2
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*e*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x
))^2*cot(1/4*Pi+1/2*arcsin(c*x))/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/
3*b*e*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c
/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/3*e*(-c^2*x^2+1)^(1/2)*(a+b*arcsin
(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c/d^2/(
c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4/3*b*e*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x
))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/
2)+4/3*I*b^2*e*(-c^2*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/
c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Mathematica [A] (warning: unable to verify)

Time = 7.87 (sec) , antiderivative size = 527, normalized size of antiderivative = 1.07

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\sqrt{e-cex}\left(\frac{a^2(-1+cx)^2}{(1+cx)^2} - \frac{ab\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\sin\left(\frac{1}{2}\arcsin(cx)\right)\right)\left(\cos\left(\right.\right.}{}\right.}{}$$

input
```
Integrate[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

output
```
(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((a^2*(-1 + c*x)^2)/(1 + c*x)^2 - (a*b*(C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*
x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*
(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(
-2 + (2 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[C
os[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2])^4 - (b^2*(-1 + c*x)^2*((-I)*Pi*ArcSin[c*x] +
 (1 + I)*ArcSin[c*x]^2 - 4*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 2*(Pi + 2*Ar
cSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] + 4*Pi*Log[Cos[ArcSin[c*x]/2]] + 2
*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (4*I)*PolyLog[2, I*E^(I*ArcSin[c*x]
)] + (4*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2])^3 - (2*ArcSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[
ArcSin[c*x]/2])^2 - (2*(-4 + ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSi
n[c*x]/2] + Sin[ArcSin[c*x]/2])))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] -
 Sin[ArcSin[c*x]/2])^2)))/(3*c*d^3*(-1 + c*x))
```

Rubi [A] (verified)

Time = 1.36 (sec) , antiderivative size = 259, normalized size of antiderivative = 0.53, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(cdx+d)^{5/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{5/2}\int \frac{e^3(1-cx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^3(1-c^2x^2)^{5/2}\int \frac{(1-cx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{e^3\left(1-c^2x^2\right)^{5/2}\int \left(\frac{(a+b\arcsin(cx))^2}{(-cx-1)\sqrt{1-c^2x^2}}+\frac{2(a+b\arcsin(cx))^2}{(cx+1)^2\sqrt{1-c^2x^2}}\right)dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 2009

$$\frac{e^3\left(1-c^2x^2\right)^{5/2}\left(\frac{i(a+b\arcsin(cx))^2}{3c}-\frac{4b\log\left(1-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c}+\frac{\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin(cx))^2}{3c}-\frac{2b\csc^2\left(\frac{1}{2}\text{ar}\right.}{}\right.}{(cdx\ -}$$

input
```
Int[(Sqrt[e - c*e*x]*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

output
```
(e^3*(1 - c^2*x^2)^(5/2)*(((I/3)*(a + b*ArcSin[c*x])^2)/c - (4*b^2*Cot[Pi/
4 + ArcSin[c*x]/2])/(3*c) + ((a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/
2])/(3*c) - (2*b*(a + b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c) -
((a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]
^2)/(3*c) - (4*b*(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c) +
 (((4*I)/3)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/((d + c*d*x)^(5/2)*(e
 - c*e*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1137 vs. $2(429) = 858$.

Time = 3.93 (sec) , antiderivative size = 1138, normalized size of antiderivative = 2.31

method	result	size
default	Expression too large to display	1138
parts	Expression too large to display	1138

input
```
int((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x,method=_RETURNV
ERBOSE)
```

output
```
a^2*(-1/c/d*(-c*e*x+e)^(1/2)/(c*d*x+d)^(3/2)-e*(-1/3/c/d/e/(c*d*x+d)^(3/2)
*(-c*e*x+e)^(1/2)-1/3/c/e/d^2/(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)))+1/3*b^2*(
4+2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+4*c*x+4*I*c*x*(-c^2*x^2+1)^(1/
2)+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)+arcsin(c*x)^2+4*c^3*x^3-2*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)*c*x+4*c^2*x^2+2*I*arcsin(c*x)+3*arcsin(c*x)^2*x^2*c^2+4
*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+6*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x^
2*c^2+2*I*arcsin(c*x)*x^2*c^2+2*I*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*arcsi
n(c*x)+6*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x*c-2*I*(-c^2*x^2+1)^(1/2
)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))+2*I*polylog(2,I*(I*c*x+(-c^2*x^2
+1)^(1/2)))*(-c^2*x^2+1)^(1/2)*x^2*c^2+4*I*arcsin(c*x)*x*c+2*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))*x^3*c^3+2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2)))*(-c^2*x^2+1)^(1/2)+6*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2)))*c^2*x^2+6*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x*c-2*arc
sin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*I
*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x^3*c^3)*(-I*c*x*(-c^2*x^2
+1)^(1/2)+c^2*x^2-I*(-c^2*x^2+1)^(1/2)-2*c*x+1)*(-e*(c*x-1))^(1/2)*(d*(c*x
+1))^(1/2)/(3*c^5*x^5+3*c^4*x^4-2*c^3*x^3-2*c^2*x^2-c*x-1)/c/d^3+2/3*a*b*(
I*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x^3*c^3+3*I*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I
)*c^2*x^2-(-c^2*x^2+1)^(1/2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x^2*c^2+I*c^2*
x^2+3*c^2*x^2*arcsin(c*x)+3*I*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x*c+2*I*c*...
```

Fricas [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorith
m="fricas")
```

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^3*d^3*x^3 + 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{\sqrt{-e\,(cx-1)}(a+b\operatorname{asin}\,(cx))^2}{(d\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)**(1/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(5/2),x)
```

output
```
Integral(sqrt(-e*(c*x - 1))*(a + b*asin(c*x))**2/(d*(c*x + 1))**(5/2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{\sqrt{-cex+e}(b\arcsin\,(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorith
m="giac")
```

output
```
integrate(sqrt(-c*e*x + e)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{e-c\,e\,x}}{(d+c\,d\,x)^{5/2}}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(5/2),x)
```

output
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(1/2))/(d + c*d*x)^(5/2), x)
```

Reduce [F]

$$\int \frac{\sqrt{e-cex}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \frac{\sqrt{e}\left(\sqrt{-cx+1}\,a^2cx-\sqrt{-cx+1}\,a^2+6\sqrt{cx+1}\left(\int \frac{\sqrt{-cx+1}\,asin}{\sqrt{cx+1}\,c^2x^2+2\sqrt{cx+1}}\right.\right.}{}$$

input
```
int((-c*e*x+e)^(1/2)*(a+b*asin(c*x))^2/(c*d*x+d)^(5/2),x)
```

output
```
(sqrt(e)*(sqrt( - c*x + 1)*a**2*c*x - sqrt( - c*x + 1)*a**2 + 6*sqrt(c*x +
 1)*int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x
 + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c**2*x + 6*sqrt(c*x + 1)*int((sqrt( - c*
x + 1)*asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*
x + 1)),x)*a*b*c + 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)**2)/(sq
rt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2*c**2*
x + 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)**2)/(sqrt(c*x + 1)*c**
2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2*c))/(3*sqrt(d)*sqrt(
c*x + 1)*c*d**2*(c*x + 1))
```

3.75 $\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 740

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{16b^2d^2e\sqrt{d+cdx}\sqrt{e-cex}}{75c} - \frac{15}{64}b^2d^2ex\sqrt{d+cdx}\sqrt{e-cex} + \frac{8b^2d^2e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{225c} - \frac{1}{32}b^2d^2ex\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2) + \frac{2b^2d^2e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2}{125c} + \frac{9b^2d^2e\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} + \frac{2bd^2ex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{5\sqrt{1-c^2x^2}} - \frac{3bcd^2ex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{4bc^2d^2ex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} + \frac{2bc^4d^2ex^5\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bd^2e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}d^2ex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{1}{4}d^2ex\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2 - \frac{d^2e}{}$$

output
```
16/75*b^2*d^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-15/64*b^2*d^2*e*x*(c*d*
x+d)^(1/2)*(-c*e*x+e)^(1/2)+8/225*b^2*d^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/
2)*(-c^2*x^2+1)/c-1/32*b^2*d^2*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*
x^2+1)+2/125*b^2*d^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^2/c+9
/64*b^2*d^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*arcsin(c*x)/c/(-c^2*x^2+1)^
(1/2)+2/5*b*d^2*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c
^2*x^2+1)^(1/2)-3/8*b*c*d^2*e*x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*ar
csin(c*x))/(-c^2*x^2+1)^(1/2)-4/15*b*c^2*d^2*e*x^3*(c*d*x+d)^(1/2)*(-c*e*x
+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+2/25*b*c^4*d^2*e*x^5*(c*d*x
+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/8*b*d^2*
e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c+
3/8*d^2*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2+1/4*d^2*e
*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2-1/5*d
^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/c
+1/8*d^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2*
x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 3.84 (sec) , antiderivative size = 574, normalized size of antiderivative = 0.78

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{d^2e\Big(36000b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-108000a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\,a$$

input
```
Integrate[(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*e*(36000*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108000*a
^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 1800*b*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*ArcSin[c*x]^2*(-10*b*Cos[3*ArcSin[c*x]] - 2*b*Cos[5*ArcSin[c*x]]
+ 5*(12*a - 4*b*Sqrt[1 - c^2*x^2] + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSi
n[c*x]])) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(72000*a*b*Cos[2*ArcSin[c*x]]
+ 4000*b^2*Cos[3*ArcSin[c*x]] + 4500*a*b*Cos[4*ArcSin[c*x]] + 288*b^2*Cos[
5*ArcSin[c*x]] - 15*(-4800*b^2*Sqrt[1 - c^2*x^2] - 512*a*b*c*x*(15 - 10*c^
2*x^2 + 3*c^4*x^4) + 480*a^2*Sqrt[1 - c^2*x^2]*(8 - 25*c*x - 16*c^2*x^2 +
10*c^3*x^3 + 8*c^4*x^4) + 2400*b^2*Sin[2*ArcSin[c*x]] + 75*b^2*Sin[4*ArcSi
n[c*x]])) - 60*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(-1200*b*Cos[
2*ArcSin[c*x]] - 75*b*Cos[4*ArcSin[c*x]] - 4*(300*b*c*x - 480*a*Sqrt[1 - c
^2*x^2] + 960*a*c^2*x^2*Sqrt[1 - c^2*x^2] - 480*a*c^4*x^4*Sqrt[1 - c^2*x^2
] + 600*a*Sin[2*ArcSin[c*x]] + 50*b*Sin[3*ArcSin[c*x]] + 75*a*Sin[4*ArcSin
[c*x]] + 6*b*Sin[5*ArcSin[c*x]]))))/(288000*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.06 (sec) , antiderivative size = 374, normalized size of antiderivative = 0.51, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\int d(cx+1)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d(cdx+d)^{3/2}(e-cex)^{3/2}\int (cx+1)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d(cdx+d)^{3/2}(e-cex)^{3/2}\int \left(cx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2+(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2\right)dx}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{d(cdx+d)^{3/2}(e-cex)^{3/2}\left(\frac{2}{25}bc^4x^5(a+b\arcsin(cx))-\frac{4}{15}bc^2x^3(a+b\arcsin(cx))+\frac{1}{4}x(1-c^2x^2)^{3/2}(a+b\arcsi\right.}{}$$

input
```
Int[(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*((16*b^2*Sqrt[1 - c^2*x^2])/(75*c)
- (15*b^2*x*Sqrt[1 - c^2*x^2])/64 + (8*b^2*(1 - c^2*x^2)^(3/2))/(225*c) -
(b^2*x*(1 - c^2*x^2)^(3/2))/32 + (2*b^2*(1 - c^2*x^2)^(5/2))/(125*c) + (9*
b^2*ArcSin[c*x])/(64*c) + (2*b*x*(a + b*ArcSin[c*x]))/5 - (3*b*c*x^2*(a +
b*ArcSin[c*x]))/8 - (4*b*c^2*x^3*(a + b*ArcSin[c*x]))/15 + (2*b*c^4*x^5*(a
 + b*ArcSin[c*x]))/25 + (b*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(8*c) + (3
*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/8 + (x*(1 - c^2*x^2)^(3/2)*(a
+ b*ArcSin[c*x])^2)/4 - ((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(5*c)
+ (a + b*ArcSin[c*x])^3/(8*b*c)))/(1 - c^2*x^2)^(3/2)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.88 (sec) , antiderivative size = 2270, normalized size of antiderivative = 3.07

method	result	size
default	Expression too large to display	2270
parts	Expression too large to display	2270

input
```
int((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNV
ERBOSE)
```

output
```
-1/5*a^2/c/e*(c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)-1/4*a^2*d/c/e*(c*d*x+d)^(3/2
)*(-c*e*x+e)^(5/2)-1/4*a^2*d^2/c/e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)+1/8*a^
2*d^2/c*(-c*e*x+e)^(3/2)*(c*d*x+d)^(1/2)+3/8*a^2*d^2*e/c*(-c*e*x+e)^(1/2)*
(c*d*x+d)^(1/2)+3/8*a^2*d^3*e^2*((c*d*x+d)*(-c*e*x+e))^(1/2)/(-c*e*x+e)^(1
/2)/(c*d*x+d)^(1/2)/(c^2*d*e)^(1/2)*arctan((c^2*d*e)^(1/2)*x/(-c^2*d*e*x^2
+d*e)^(1/2))+b^2*(-1/8*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(
1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*d^2*e-1/4000*(-e*(c*x-1))^(1/2)*(d*(c*x+1
))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2
+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(10*I*arcsi
n(c*x)+25*arcsin(c*x)^2-2)*d^2*e/c/(c^2*x^2-1)-1/512*(-e*(c*x-1))^(1/2)*(d
*(c*x+1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1
)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I*arcsin(c*x)+8*
arcsin(c*x)^2-1)*d^2*e/c/(c^2*x^2-1)-1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(
1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x)
)*d^2*e/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2
*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*arcsin(c*x)
^2-1-2*I*arcsin(c*x))*d^2*e/c/(c^2*x^2-1)-1/18000*(-e*(c*x-1))^(1/2)*(d*(c
*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(330*I*arcsin(c*x)+675*a
rcsin(c*x)^2-134)*cos(4*arcsin(c*x))*d^2*e/c/(c^2*x^2-1)-1/9000*(-e*(c*x-1
))^(1/2)*(d*(c*x+1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(210*I*...
```

Fricas [F]

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorith
m="fricas")
```

output
```
integral(-(a^2*c^3*d^2*e*x^3 + a^2*c^2*d^2*e*x^2 - a^2*c*d^2*e*x - a^2*d^2
*e + (b^2*c^3*d^2*e*x^3 + b^2*c^2*d^2*e*x^2 - b^2*c*d^2*e*x - b^2*d^2*e)*a
rcsin(c*x)^2 + 2*(a*b*c^3*d^2*e*x^3 + a*b*c^2*d^2*e*x^2 - a*b*c*d^2*e*x -
a*b*d^2*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((c*d*x+d)**(5/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorith
m="giac")
```

output
```
integrate((c*d*x + d)^(5/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{5/2}\,(e-c\,e\,x)^{3/2}\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2),x)
```

output
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(3/2), x)
```

Reduce [F]

$$\int (d+cdx)^{5/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{\sqrt{e}\,\sqrt{d}\,d^2e\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2-8\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2c^4x^4-10\sqrt{cx}\right.}{}$$

input
```
int((c*d*x+d)^(5/2)*(-c*e*x+e)^(3/2)*(a+b*asin(c*x))^2,x)
```

output

```
(sqrt(e)*sqrt(d)*d**2*e*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 - 8*sqr
t(c*x + 1)*sqrt( - c*x + 1)*a**2*c**4*x**4 - 10*sqrt(c*x + 1)*sqrt( - c*x
+ 1)*a**2*c**3*x**3 + 16*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2*c**2*x**2 + 2
5*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2*c*x - 8*sqrt(c*x + 1)*sqrt( - c*x +
1)*a**2 - 80*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**3,x)*a*b*c**4
 - 80*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**2,x)*a*b*c**3 + 80*i
nt(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x,x)*a*b*c**2 + 80*int(sqrt(c*
x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*a*b*c - 40*int(sqrt(c*x + 1)*sqrt( -
c*x + 1)*asin(c*x)**2*x**3,x)*b**2*c**4 - 40*int(sqrt(c*x + 1)*sqrt( - c*x
 + 1)*asin(c*x)**2*x**2,x)*b**2*c**3 + 40*int(sqrt(c*x + 1)*sqrt( - c*x +
1)*asin(c*x)**2*x,x)*b**2*c**2 + 40*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asi
n(c*x)**2,x)*b**2*c))/(40*c)
```

3.76 $\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 374

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{15}{64}b^2dex\sqrt{d+cdx}\sqrt{e-cex}-\frac{1}{32}b^2dex\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)$$
$$+\frac{9b^2de\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}-\frac{3bcdex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$+\frac{bde\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{8c}$$
$$+\frac{3}{8}dex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2+\frac{1}{4}dex\sqrt{d+cdx}\sqrt{e-cex}\,(1-c^2x^2)\,(a+b\arcsin(cx))^2+\frac{de\sqrt{d}}{}$$

output
```
-15/64*b^2*d*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-1/32*b^2*d*e*x*(c*d*x+d)
^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)+9/64*b^2*d*e*(c*d*x+d)^(1/2)*(-c*e*x+
e)^(1/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(1/2)-3/8*b*c*d*e*x^2*(c*d*x+d)^(1/2)*
(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/8*b*d*e*(c*d*x+d)^
(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c+3/8*d*e*x*(c
*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2+1/4*d*e*x*(c*d*x+d)^(1/
2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+1/8*d*e*(c*d*x+d)^(1/
2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.77 (sec) , antiderivative size = 373, normalized size of antiderivative = 1.00

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{32b^2de\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-96a^2d^{3/2}e^{3/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx}{\sqrt{}}\right.}{}$$

input
```
Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(32*b^2*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 96*a^2*d^(3/2)
*e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(S
qrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 8*b*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*
ArcSin[c*x]^2*(12*a + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin[c*x]]) + d*e
*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(160*a^2*c*x*Sqrt[1 - c^2*x^2] - 64*a^2*c
^3*x^3*Sqrt[1 - c^2*x^2] + 64*a*b*Cos[2*ArcSin[c*x]] + 4*a*b*Cos[4*ArcSin[
c*x]] - 32*b^2*Sin[2*ArcSin[c*x]] - b^2*Sin[4*ArcSin[c*x]]) + 4*b*d*e*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(16*b*Cos[2*ArcSin[c*x]] + b*Cos[4
*ArcSin[c*x]] + 4*a*(8*Sin[2*ArcSin[c*x]] + Sin[4*ArcSin[c*x]])))/(256*c*S
qrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.13 (sec) , antiderivative size = 277, normalized size of antiderivative = 0.74, number of steps used = 11, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {5178, 5158, 5156, 5138, 262, 223, 5152, 5182, 211, 211, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{5158}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))dx+\frac{3}{4}\int\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx+\frac{1}{4}x(\right.}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{5156}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))dx+\frac{3}{4}\left(\frac{1}{2}\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx-bc\int x(a+b\arcs\right.\right.}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{5138}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))dx+\frac{3}{4}\left(-bc\left(\frac{1}{2}x^2(a+b\arcsin(cx))-\frac{1}{2}bc\int\frac{x^2}{\sqrt{1-}}\right.\right.\right.}{(1-c^2x^2}$$

$$\Big\downarrow \text{262}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))dx+\frac{3}{4}\left(-bc\left(\frac{1}{2}x^2(a+b\arcsin(cx))-\frac{1}{2}bc\left(\frac{\int\frac{}{\sqrt{1}}}{}\right.\right.\right.\right.}{(}$$

$$\Big\downarrow \text{223}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))dx+\frac{3}{4}\left(\frac{1}{2}\int\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x\sqrt{1-c^2x^2}(a\right.\right.}{(1-}$$

$$\Big\downarrow \text{5152}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))dx+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{3}{4}\left(\frac{1}{2}\right.\right.}{(1-c^2x}$$

$$\Big\downarrow \text{5182}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{1}{2}bc\left(\frac{b\int\left(1-c^2x^2\right)^{3/2}dx}{4c}-\frac{\left(1-c^2x^2\right)^2(a+b\arcsin(cx))}{4c^2}\right)+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\right.}{(1-}$$

$$\Big\downarrow \text{211}$$

$$(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{1}{2}bc\left(\frac{b\left(\frac{3}{4}\int\sqrt{1-c^2x^2}dx+\frac{1}{4}x(1-c^2x^2)^{3/2}\right)}{4c}-\frac{(1-c^2x^2)^2(a+b\arcsin(cx))}{4c^2}\right)+\frac{1}{4}x(1-c^2x^2)^{3/2}(a$$

$\downarrow$ 211

$$(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{1}{2}bc\left(\frac{b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{1}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x\sqrt{1-c^2x^2}\right)+\frac{1}{4}x(1-c^2x^2)^{3/2}\right)}{4c}-\frac{(1-c^2x^2)^2(a+b\arcsin(cx))}{4c^2}\right)+\frac{1}{4}x$$

$\downarrow$ 223

$$(cdx+d)^{3/2}(e-cex)^{3/2}\left(\frac{1}{4}x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2-\frac{1}{2}bc\left(\frac{b\left(\frac{3}{4}\left(\frac{\arcsin(cx)}{2c}+\frac{1}{2}x\sqrt{1-c^2x^2}\right)+\frac{1}{4}x(1-c^2x^2)^{3/2}\right)}{4c}-\right.\right.$$

input
```
Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*((x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin
[c*x])^2)/4 + (3*((x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 + (a + b*A
rcSin[c*x])^3/(6*b*c) - b*c*((x^2*(a + b*ArcSin[c*x]))/2 - (b*c*(-1/2*(x*S
qrt[1 - c^2*x^2])/c^2 + ArcSin[c*x]/(2*c^3)))/2)))/4 - (b*c*(-1/4*((1 - c^
2*x^2)^2*(a + b*ArcSin[c*x]))/c^2 + (b*((x*(1 - c^2*x^2)^(3/2))/4 + (3*((x
*Sqrt[1 - c^2*x^2])/2 + ArcSin[c*x]/(2*c)))/4))/(4*c)))/2))/(1 - c^2*x^2)^
(3/2)
```

Defintions of rubi rules used

rule 211
```
Int[((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[x*((a + b*x^2)^p/(2*p + 1
)), x] + Simp[2*a*(p/(2*p + 1))   Int[(a + b*x^2)^(p - 1), x], x] /; FreeQ[
{a, b}, x] && GtQ[p, 0] && (IntegerQ[4*p] || IntegerQ[6*p])
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5158
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (S
imp[2*d*(p/(2*p + 1))   Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x],
x] - Simp[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[x*(1
- c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.00 (sec) , antiderivative size = 1101, normalized size of antiderivative = 2.94

method	result	size
default	Expression too large to display	1101
parts	Expression too large to display	1101

input
```
int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNV
ERBOSE)
```

output
```
-1/4*a^2/c/e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)-1/4*a^2*d/c/e*(c*d*x+d)^(1/2
)*(-c*e*x+e)^(5/2)+1/8*a^2*d/c*(-c*e*x+e)^(3/2)*(c*d*x+d)^(1/2)+3/8*a^2*d*
e/c*(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)+3/8*a^2*d^2*e^2*((c*d*x+d)*(-c*e*x+e)
)^(1/2)/(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*e)^(1/2)*arctan((c^2*d*e)^
(1/2)*x/(-c^2*d*e*x^2+d*e)^(1/2))+b^2*(-1/8*(-e*(c*x-1))^(1/2)*(d*(c*x+1))
^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*d*e-1/512*(-e*(c*x-1
))^(1/2)*(d*(c*x+1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*
(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I*arc
sin(c*x)+8*arcsin(c*x)^2-1)*d*e/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(
c*x+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/
2)-2*c*x)*(2*arcsin(c*x)^2-1-2*I*arcsin(c*x))*d*e/c/(c^2*x^2-1)-1/512*(-e*
(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(68*
I*arcsin(c*x)+56*arcsin(c*x)^2-31)*cos(3*arcsin(c*x))*d*e/c/(c^2*x^2-1)+3/
512*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2
-1)*(20*I*arcsin(c*x)+24*arcsin(c*x)^2-11)*sin(3*arcsin(c*x))*d*e/c/(c^2*x
^2-1))+2*a*b*(-3/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2
)/c/(c^2*x^2-1)*arcsin(c*x)^2*d*e-1/256*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/
2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c
^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(I+4*arcsin(c*x))*d*e/c/(c^2*x^2
-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x...
```

Fricas [F]

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin{(cx)}+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorith
m="fricas")
```

output
```
integral(-(a^2*c^2*d*e*x^2 - a^2*d*e + (b^2*c^2*d*e*x^2 - b^2*d*e)*arcsin(
c*x)^2 + 2*(a*b*c^2*d*e*x^2 - a*b*d*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-
c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorith
m="giac")
```

output
```
integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{3/2}\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2),x)
```

output
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2), x)
```

Reduce [F]

$$\int (d+cdx)^{3/2}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{\sqrt{e}\,\sqrt{d}\,de\left(-6asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2-2\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2c^3x^3+5\sqrt{cx+1}\right.}{}$$

input
```
int((c*d*x+d)^(3/2)*(-c*e*x+e)^(3/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(e)*sqrt(d)*d*e*( - 6*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 - 2*sqrt(c*
x + 1)*sqrt( - c*x + 1)*a**2*c**3*x**3 + 5*sqrt(c*x + 1)*sqrt( - c*x + 1)*
a**2*c*x - 16*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**2,x)*a*b*c**
3 + 16*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*a*b*c - 8*int(sqrt(
c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2*x**2,x)*b**2*c**3 + 8*int(sqrt(c*x
+ 1)*sqrt( - c*x + 1)*asin(c*x)**2,x)*b**2*c))/(8*c)
```

3.77 $\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 455

$$\begin{aligned}
\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx =
&-\frac{4b^2e\sqrt{d+cdx}\sqrt{e-cex}}{9c}-\frac{1}{4}b^2ex\sqrt{d+cdx}\sqrt{e-cex}\\
&-\frac{2b^2e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c}+\frac{b^2e\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}\\
&-\frac{2bex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}\\
&-\frac{bcex^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}\\
&+\frac{2bc^2ex^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}\\
&+\frac{1}{2}ex\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2\\
&+\frac{e\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)\,(a+b\arcsin(cx))^2}{3c}\\
&+\frac{e\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}
\end{aligned}$$

output
```
-4/9*b^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-1/4*b^2*e*x*(c*d*x+d)^(1/2)*
(-c*e*x+e)^(1/2)-2/27*b^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)/
c+1/4*b^2*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(1
/2)-2/3*b*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2
+1)^(1/2)-1/2*b*c*e*x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))
/(-c^2*x^2+1)^(1/2)+2/9*b*c^2*e*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*
arcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/2*e*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(
a+b*arcsin(c*x))^2+1/3*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)*(a+
b*arcsin(c*x))^2/c+1/6*e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x)
)^3/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 2.68 (sec) , antiderivative size = 440, normalized size of antiderivative = 0.97

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{36b^2e\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-108a^2\sqrt{d}e^{3/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{e-cex}}{\sqrt{d}\sqrt{e}(-1+c^2x^2)}\right.}{}$$

input
```
Integrate[Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(36*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108*a^2*Sqrt[d]*
e^(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sq
rt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 18*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Ar
cSin[c*x]^2*(6*a + 3*b*Sqrt[1 - c^2*x^2] + b*Cos[3*ArcSin[c*x]] + 3*b*Sin[
2*ArcSin[c*x]]) + e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(54*a*b*Cos[2*ArcSin[c
*x]] - 4*b^2*Cos[3*ArcSin[c*x]] - 3*(4*(9*b^2*Sqrt[1 - c^2*x^2] - 4*a*b*c*
x*(-3 + c^2*x^2) + 3*a^2*Sqrt[1 - c^2*x^2]*(-2 - 3*c*x + 2*c^2*x^2)) + 9*b
^2*Sin[2*ArcSin[c*x]])) - 6*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x
]*(-9*b*Cos[2*ArcSin[c*x]] + 2*(9*b*c*x - 12*a*Sqrt[1 - c^2*x^2] + 12*a*c^
2*x^2*Sqrt[1 - c^2*x^2] - 9*a*Sin[2*ArcSin[c*x]] + b*Sin[3*ArcSin[c*x]])))
/(216*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 252, normalized size of antiderivative = 0.55, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{cdx+d}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\int e(1-cx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\sqrt{cdx+d}\sqrt{e-cex}\int (1-cx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{e\sqrt{cdx+d}\sqrt{e-cex}\int \left(\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-cx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$e\sqrt{cdx+d}\sqrt{e-cex}\left(\frac{2}{9}bc^2x^3(a+b\arcsin(cx))+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{3c}-\right.$$

input
```
Int[Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-4*b^2*Sqrt[1 - c^2*x^2])/(9*c) - (b^
2*x*Sqrt[1 - c^2*x^2])/4 - (2*b^2*(1 - c^2*x^2)^(3/2))/(27*c) + (b^2*ArcSi
n[c*x])/(4*c) - (2*b*x*(a + b*ArcSin[c*x]))/3 - (b*c*x^2*(a + b*ArcSin[c*x
]))/2 + (2*b*c^2*x^3*(a + b*ArcSin[c*x]))/9 + (x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x])^2)/2 + ((1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c) + (a
 + b*ArcSin[c*x])^3/(6*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.28 (sec) , antiderivative size = 1356, normalized size of antiderivative = 2.98

method	result	size
default	Expression too large to display	1356
parts	Expression too large to display	1356

input
```
int((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNV
ERBOSE)
```

output
```
-1/3*a^2/c/e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)+1/6*a^2/c*(-c*e*x+e)^(3/2)*(
c*d*x+d)^(1/2)+1/2*a^2*e/c*(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)+1/2*a^2*d*e^2*
((c*d*x+d)*(-c*e*x+e))^(1/2)/(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*e)^(1
/2)*arctan((c^2*d*e)^(1/2)*x/(-c^2*d*e*x^2+d*e)^(1/2))+b^2*(-1/6*(-e*(c*x-
1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3
*e-1/216*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c
^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*a
rcsin(c*x)^2-2)*e/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*
(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*
I*arcsin(c*x)+2*arcsin(c*x)^2-1)*e/c/(c^2*x^2-1)+1/8*(-e*(c*x-1))^(1/2)*(d
*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*
arcsin(c*x))*e/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(2*
I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*arcs
in(c*x)^2-1-2*I*arcsin(c*x))*e/c/(c^2*x^2-1)+1/54*(-e*(c*x-1))^(1/2)*(d*(c
*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(12*I*arcsin(c*x)+9*arcs
in(c*x)^2-14)*cos(2*arcsin(c*x))*e/c/(c^2*x^2-1)+1/108*(-e*(c*x-1))^(1/2)*
(d*(c*x+1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(30*I*arcsin(c*x)+9
*arcsin(c*x)^2-26)*sin(2*arcsin(c*x))*e/c/(c^2*x^2-1))+2*a*b*(-1/4*(-e*(c*
x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)
^2*e-1/72*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I...
```

Fricas [F]

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorith
m="fricas")
```

output
```
integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*
c*e*x - a*b*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F]

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \sqrt{d\left(cx+1\right)}(-e(cx-1))^{\frac{3}{2}}\left(a+b\operatorname{asin}\left(cx\right)\right)^2\,dx$$

input
```
integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2,x)
```

output
```
Integral(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}\left(b\arcsin\left(cx\right)+a\right)^2\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2,x, algorith
m="giac")
```

output
```
integrate(sqrt(c*d*x + d)*(-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,(e-c\,e\,x)^{3/2}\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(3/2),x)
```

output
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(3/2), x)
```

Reduce [F]

$$\int \sqrt{d+cdx}(e-cex)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{\sqrt{e}\,\sqrt{d}\,e\left(-6asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2-2\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2c^2x^2+3\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2}{}$$

input
```
int((c*d*x+d)^(1/2)*(-c*e*x+e)^(3/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(e)*sqrt(d)*e*( - 6*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 - 2*sqrt(c*x
+ 1)*sqrt( - c*x + 1)*a**2*c**2*x**2 + 3*sqrt(c*x + 1)*sqrt( - c*x + 1)*a*
*2*c*x + 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2 - 12*int(sqrt(c*x + 1)*sqrt
( - c*x + 1)*asin(c*x)*x,x)*a*b*c**2 + 12*int(sqrt(c*x + 1)*sqrt( - c*x +
1)*asin(c*x),x)*a*b*c - 6*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2*
x,x)*b**2*c**2 + 6*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2,x)*b**2
*c))/(6*c)
```

3.78 $\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 398

$$\begin{aligned}\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = &-\frac{4b^2e^2(1-c^2x^2)}{c\sqrt{d+cdx}\sqrt{e-cex}}+\frac{b^2e^2x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}}\\ &-\frac{b^2e^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{4be^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{\sqrt{d+cdx}\sqrt{e-cex}}\\ &+\frac{bce^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{c\sqrt{d+cdx}\sqrt{e-cex}}\\ &-\frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}}+\frac{e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

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

Mathematica [A] (verified)

Time = 6.97 (sec) , antiderivative size = 358, normalized size of antiderivative = 0.90

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \frac{4b^2e\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 12a^2\sqrt{d}e^{3/2}\sqrt{1-c^2x^2}\operatorname{arctan}}{}$$

input
```
Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

output
```
(4*b^2*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 12*a^2*Sqrt[d]*e^
(3/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt
[d]*Sqrt[e]*(-1 + c^2*x^2))] - 2*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSi
n[c*x]*(16*b*c*x + 4*a*(-4 + c*x)*Sqrt[1 - c^2*x^2] + b*Cos[2*ArcSin[c*x]]
) + 2*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(6*a + 8*b*Sqrt[1
- c^2*x^2] - b*Sin[2*ArcSin[c*x]]) + e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-4
*(8*a*b*c*x + 8*b^2*Sqrt[1 - c^2*x^2] + a^2*(-4 + c*x)*Sqrt[1 - c^2*x^2])
- 2*a*b*Cos[2*ArcSin[c*x]] + b^2*Sin[2*ArcSin[c*x]]))/(8*c*d*Sqrt[1 - c^2*
x^2])
```

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 219, normalized size of antiderivative = 0.55, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {5178, 27, 5272, 3042, 3798, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{cdx+d}}\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{e^2(1-cx)^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{e-cex}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^2\sqrt{1-c^2x^2}\int \frac{(1-cx)^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{e-cex}}$$

$\Big\downarrow$ 5272

$$\frac{e^2\sqrt{1-c^2x^2}\int \left(c-c^2x\right)^2(a+b\arcsin(cx))^2d\arcsin(cx)}{c^3\sqrt{cdx+d}\sqrt{e-cex}}$$

$\Big\downarrow$ 3042

$$\frac{e^2\sqrt{1-c^2x^2}\int (a+b\arcsin(cx))^2(c-c\sin(\arcsin(cx)))^2d\arcsin(cx)}{c^3\sqrt{cdx+d}\sqrt{e-cex}}$$

$\Big\downarrow$ 3798

$$\frac{e^2\sqrt{1-c^2x^2}\int \left(x^2(a+b\arcsin(cx))^2c^4-2x(a+b\arcsin(cx))^2c^3+(a+b\arcsin(cx))^2c^2\right)d\arcsin(cx)}{c^3\sqrt{cdx+d}\sqrt{e-cex}}$$

$\Big\downarrow$ 2009

$$\frac{e^2\sqrt{1-c^2x^2}\left(\frac{1}{2}bc^4x^2(a+b\arcsin(cx))-4bc^3x(a+b\arcsin(cx))+2c^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{c^2(a+b\arcsin}{2b}\right.}{c^3\sqrt{cdx+d}\sqrt{e}}$$

input

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

output

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

Defintions of rubi rules used

rule 27

```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009

```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3798
```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 3.97 (sec) , antiderivative size = 1361, normalized size of antiderivative = 3.42

method	result	size
default	Expression too large to display	1361
parts	Expression too large to display	1361

input
```
int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x,method=_RETURNV
ERBOSE)
```

output
```
1/2*a^2/c/d*(-c*e*x+e)^(3/2)*(c*d*x+d)^(1/2)+3/2*a^2*e/c/d*(-c*e*x+e)^(1/2
)*(c*d*x+d)^(1/2)+3/2*a^2*e^2*((c*d*x+d)*(-c*e*x+e))^(1/2)/(-c*e*x+e)^(1/2
)/(c*d*x+d)^(1/2)/(c^2*d*e)^(1/2)*arctan((c^2*d*e)^(1/2)*x/(-c^2*d*e*x^2+d
*e)^(1/2))+b^2*(-1/2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/
2)/(c*x+1)/d/c/(c*x-1)*arcsin(c*x)^3*e-1/32*(-e*(c*x-1))^(1/2)*(d*(c*x+1))
^(1/2)*(4*c^3*x^3-2*c^2*x^2-4*I*x^2*c^2*(-c^2*x^2+1)^(1/2)-3*c*x+2*I*(-c^2
*x^2+1)^(1/2)*c*x+1+I*(-c^2*x^2+1)^(1/2))*(2*I*arcsin(c*x)+2*arcsin(c*x)^2
-1)*e/(c*x+1)/d/c/(c*x-1)+1/2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-I*(-c
^2*x^2+1)^(1/2)+c*x-1)*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*e/(c*x+1)/d/c/(c*
x-1)+(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^
2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*e/(c*x+1)/d/c/(c*x-1)-1/32*(-e*(c*x
-1))^(1/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*c*x+2*c^2*x^2-I*(-c^2
*x^2+1)^(1/2)-c*x-1)*(2*arcsin(c*x)^2-1-2*I*arcsin(c*x))*e/(c*x+1)/d/c/(c*
x-1)+1/8*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)+c*x-1)
*(7*I*arcsin(c*x)+4*arcsin(c*x)^2-8)*cos(2*arcsin(c*x))*e/(c*x+1)/d/c/(c*x
-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*c*x-I-(-c^2*x^2+1)^(1/2))
*(16*I*arcsin(c*x)+6*arcsin(c*x)^2-15)*sin(2*arcsin(c*x))*e/(c*x+1)/d/c/(c
*x-1))+2*a*b*(-3/4*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)
/(c*x+1)/d/c/(c*x-1)*arcsin(c*x)^2*e-1/32*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(
1/2)*(4*c^3*x^3-2*c^2*x^2-4*I*x^2*c^2*(-c^2*x^2+1)^(1/2)-3*c*x+2*I*(-c^...
```

Fricas [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx=\int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorith
m="fricas")
```

output
```
integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*
c*e*x - a*b*e)*arcsin(c*x))*sqrt(-c*e*x + e)/sqrt(c*d*x + d), x)
```

Sympy [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(-e(cx-1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{d\,(cx+1)}}\,dx$$

input
```
integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2),x)
```

output
```
Integral((-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2/sqrt(d*(c*x + 1)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin\,(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorith
m="giac")
```

output
```
integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{3/2}}{\sqrt{d+c\,d\,x}}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(1/2),x)
```

output
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(1/2), x)
```

Reduce [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \frac{\sqrt{e}\,e\left(-6asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2-\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2cx+4\sqrt{cx+1}\right.}{}$$

input
```
int((-c*e*x+e)^(3/2)*(a+b*asin(c*x))^2/(c*d*x+d)^(1/2),x)
```

output
```
(sqrt(e)*e*( - 6*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 - sqrt(c*x + 1)*sqrt(
 - c*x + 1)*a**2*c*x + 4*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2 - 4*int((sqrt
( - c*x + 1)*asin(c*x)*x)/sqrt(c*x + 1),x)*a*b*c**2 + 4*int((sqrt( - c*x +
 1)*asin(c*x))/sqrt(c*x + 1),x)*a*b*c - 2*int((sqrt( - c*x + 1)*asin(c*x)*
*2*x)/sqrt(c*x + 1),x)*b**2*c**2 + 2*int((sqrt( - c*x + 1)*asin(c*x)**2)/s
qrt(c*x + 1),x)*b**2*c))/(2*sqrt(d)*c)
```

3.79 $\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 685

$$\begin{aligned}\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx &= \frac{2b^2e^2(1-c^2x^2)}{cd\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{2be^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{d\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4e^2(a+b\arcsin(cx))^2}{cd\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{4e^2x(a+b\arcsin(cx))^2}{d\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4ie^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{e^2(1-c^2x^2)\,(a+b\arcsin(cx))^2}{cd\sqrt{d+cdx}\sqrt{e-cex}} - \frac{e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bcd\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{16ibe^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{8be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{8ib^2e^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{8ib^2e^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{4ib^2e^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

output
```
2*b^2*e^2*(-c^2*x^2+1)/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2*b*e^2*x*(-c^
2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4*e^2*
(a+b*arcsin(c*x))^2/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+4*e^2*x*(a+b*arcs
in(c*x))^2/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4*I*e^2*(-c^2*x^2+1)^(1/2)*(
a+b*arcsin(c*x))^2/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-e^2*(-c^2*x^2+1)*(
a+b*arcsin(c*x))^2/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-e^2*(-c^2*x^2+1)^(
1/2)*(a+b*arcsin(c*x))^3/b/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-16*I*b*e^2
*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/d
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+8*b*e^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c
*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/
2)+8*I*b^2*e^2*(-c^2*x^2+1)^(1/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-8*I*b^2*e^2*(-c^2*x^2+1)^(1/2)*polyl
og(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4*
I*b^2*e^2*(-c^2*x^2+1)^(1/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d/
(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Mathematica [A] (verified)

Time = 10.90 (sec) , antiderivative size = 1086, normalized size of antiderivative = 1.59

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

output
```
(-3*a^2*e*(5 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 9*a^2*Sqrt[d]*e^(3/2)*(1 + c*x)*Sq
rt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/(Sqrt[d]*Sqrt
[e]*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - 3*a*b*e*(
1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x]/2]*(ArcSin[c*x]*
(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + ((-4
 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2
]])*Sin[ArcSin[c*x]/2]) - b^2*e*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*
((6 + 6*I)*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + I*Sin[ArcSin[c*x]/2]) + Arc
Sin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (6*I)*ArcSin[c*x]*(
Pi - (4*I)*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2]) - 12*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E^(I*ArcSin[
c*x])] - 2*Log[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])*(Co
s[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[2, I*E^(I*ArcSin[c
*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) - 6*a*b*e*(1 + c*x)*Sqrt[
d + c*d*x]*Sqrt[e - c*e*x]*(ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + Sin[ArcSin
[c*x]/2]) - (c*x + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*(Cos[Ar
cSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + ArcSin[c*x]*((2 + Sqrt[1 - c^2*x^2])*
Cos[ArcSin[c*x]/2] + (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[c*x]/2])) - b^2*e
*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]^3*(Cos[ArcSin...
```

Rubi [A] (verified)

Time = 1.28 (sec) , antiderivative size = 327, normalized size of antiderivative = 0.48, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5178, 27, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{3/2}\int \frac{e^3(1-cx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^3\left(1-c^2x^2\right)^{3/2}\int \frac{(1-cx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{ 5274}$$

$$\frac{e^3\left(1-c^2x^2\right)^{3/2}\int \left(\frac{cx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{4(1-cx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{ 2009}$$

$$e^3\left(1-c^2x^2\right)^{3/2}\left(-\frac{16ib\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c}-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c}+\frac{4x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{4(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}\right.$$

input
```
Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

output
```
(e^3*(1 - c^2*x^2)^(3/2)*(2*a*b*x + (2*b^2*Sqrt[1 - c^2*x^2])/c + 2*b^2*x*
ArcSin[c*x] - ((4*I)*(a + b*ArcSin[c*x])^2)/c - (4*(a + b*ArcSin[c*x])^2)/
(c*Sqrt[1 - c^2*x^2]) + (4*x*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/c - (a + b*ArcSin[c*x])^3/(b*c) -
((16*I)*b*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c + (8*b*(a + b*A
rcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/c + ((8*I)*b^2*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/c - ((8*I)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x])])/c - (
(4*I)*b^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/((d + c*d*x)^(3/2)*(e -
c*e*x)^(3/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Maple [A] (verified)

Time = 4.05 (sec) , antiderivative size = 564, normalized size of antiderivative = 0.82

method	result
default	$\frac{\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,(a+b\arcsin(cx))^3 e}{(cx+1)(cx-1)d^2cb} - \frac{\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}\left(c^2x^2-i\sqrt{-c^2x^2+1}\,cx-1\right)\left(2ib^2\arcsin(cx)+a\right.}{2(cx+1)(cx-1)d^2c}$

input
```
int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x,method=_RETURNV
ERBOSE)
```

output
```
(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/(c*x+1)/(c*x-1)/d^
2/c*(a+b*arcsin(c*x))^3*e/b-1/2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(c^2*
x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*(2*I*b^2*arcsin(c*x)+arcsin(c*x)^2*b^2+2*I
*a*b+2*arcsin(c*x)*a*b+a^2-2*b^2)*e/(c*x+1)/(c*x-1)/d^2/c-1/2*(-e*(c*x-1))
^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(-2*I*b^2*ar
csin(c*x)+arcsin(c*x)^2*b^2-2*I*b*a+2*arcsin(c*x)*a*b+a^2-2*b^2)*e/(c*x+1)
/(c*x-1)/d^2/c-4*e*(arcsin(c*x)^2*b^2+2*arcsin(c*x)*a*b+a^2)*(I*(-c^2*x^2+
1)^(1/2)+c*x-1)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/d^2/c/(c^2*x^2-1)+8*I
*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/(c*x+1)/(c*x-1)/d
^2/c*b*(2*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*b+arcsin(c*x)^2
*b+I*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*a-2*I*a*ln(I*c*x+(-c^2*x^2+1)^(1/2
))+2*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*a+2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^
(1/2)))*b)*e
```

Fricas [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorith
m="fricas")
```

output
```
integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*
c*e*x - a*b*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*d^2*x^2
+ 2*c*d^2*x + d^2), x)
```

Sympy [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(-e(cx-1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))^2}{(d\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2),x)
```

output
```
Integral((-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2/(d*(c*x + 1))**(3/2),
x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorith
m="giac")
```

output
```
integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{3/2}}{(d+c\,d\,x)^{3/2}}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(3/2),x)
```

output
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(3/2), x)
```

Reduce [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \frac{\sqrt{e}\,e\left(6\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2-\sqrt{-cx+1}\,a^2cx-5\sqrt{-cx+1}\right.}{}$$

input
```
int((-c*e*x+e)^(3/2)*(a+b*asin(c*x))^2/(c*d*x+d)^(3/2),x)
```

output
```
(sqrt(e)*e*(6*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 - sqrt( -
c*x + 1)*a**2*c*x - 5*sqrt( - c*x + 1)*a**2 - 2*sqrt(c*x + 1)*int((sqrt( -
 c*x + 1)*asin(c*x)*x)/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c**2 + 2
*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c*x + sqrt(
c*x + 1)),x)*a*b*c - sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)**2*x)/(
sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2*c**2 + sqrt(c*x + 1)*int((sqrt(
 - c*x + 1)*asin(c*x)**2)/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2*c))/
(sqrt(d)*sqrt(c*x + 1)*c*d)
```

3.80 $\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 568

$$\begin{aligned}
\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx &= \frac{8ie^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bcd^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{8b^2e^2\sqrt{1-c^2x^2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{8e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{4be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{2e^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{32be^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{32ib^2e^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}$$

output
```
8/3*I*e^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/c/d^2/(c*d*x+d)^(1/2)/(-c
*e*x+e)^(1/2)+1/3*e^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3/b/c/d^2/(c*d*
x+d)^(1/2)/(-c*e*x+e)^(1/2)-8/3*b^2*e^2*(-c^2*x^2+1)^(1/2)*cot(1/4*Pi+1/2*
arcsin(c*x))/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+8/3*e^2*(-c^2*x^2+1)^(
1/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))/c/d^2/(c*d*x+d)^(1/2)
/(-c*e*x+e)^(1/2)-4/3*b*e^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*csc(1/4*P
i+1/2*arcsin(c*x))^2/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/3*e^2*(-c^2*
x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*Pi+1/
2*arcsin(c*x))^2/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-32/3*b*e^2*(-c^2*x
^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2/(c*
d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+32/3*I*b^2*e^2*(-c^2*x^2+1)^(1/2)*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1438 vs. $2(568) = 1136$.

Time = 15.12 (sec) , antiderivative size = 1438, normalized size of antiderivative = 2.53

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

output
```
(Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((-4*a^2*e)/(3*d^3*(1 + c*x)^2) +
 (8*a^2*e)/(3*d^3*(1 + c*x))))/c - (a^2*e^(3/2)*ArcTan[(c*x*Sqrt[-(e*(-1 +
 c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*x)*(1 + c*x))])/(c*d^(
5/2)) - (a*b*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*
(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[ArcSin[c*x]/2]*(-8 + 6*ArcS
in[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]
]) + Cos[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*ArcSin[c*x] + 28*Log[Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 4*ArcSin[c*x] + 6*ArcSin[
c*x]^2 + Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(14 + 3*ArcSin[c*x]) - 28*Log[Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 56*Log[Cos[ArcSin[c*x]/2] + Sin[Ar
cSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(6*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*
(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (a*b*e*Sqrt[d
+ c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] -
Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] + 2*Log[Cos[ArcSi
n[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*x]/2]*(4 + 3*ArcSin[c*x] +
 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-2 + 2*ArcSin[c*x] +
 Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x
]/2]] - 2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*
Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 + c*x)*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(C
os[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - (b^2*e*(-1 + c*x)*Sqrt[d +...
```

Rubi [A] (verified)

Time = 1.57 (sec) , antiderivative size = 279, normalized size of antiderivative = 0.49, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(cdx+d)^{5/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{5/2}\int \frac{e^4(1-cx)^4(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^4\left(1-c^2x^2\right)^{5/2}\int \frac{(1-cx)^4(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{ 5274}$$

$$\frac{e^4\left(1-c^2x^2\right)^{5/2}\int \left(-\frac{4(a+b\arcsin(cx))^2}{(cx+1)\sqrt{1-c^2x^2}}+\frac{4(a+b\arcsin(cx))^2}{(cx+1)^2\sqrt{1-c^2x^2}}+\frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{e^4\left(1-c^2x^2\right)^{5/2}\left(\frac{(a+b\arcsin(cx))^3}{3bc}+\frac{8i(a+b\arcsin(cx))^2}{3c}-\frac{32b\log\left(1-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c}+\frac{8\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\text{ar}}{3c}\right.}{}$$

input
```
Int[((e - c*e*x)^(3/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

output
```
(e^4*(1 - c^2*x^2)^(5/2)*((((8*I)/3)*(a + b*ArcSin[c*x])^2)/c + (a + b*Arc
Sin[c*x])^3/(3*b*c) - (8*b^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c) + (8*(a + b*
ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(3*c) - (4*b*(a + b*ArcSin[c*x])
*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c) - (2*(a + b*ArcSin[c*x])^2*Cot[Pi/4 +
ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3*c) - (32*b*(a + b*ArcSin[c*
x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c) + (((32*I)/3)*b^2*PolyLog[2, I*E^(
I*ArcSin[c*x])])/c))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Maple [A] (verified)

Time = 3.64 (sec) , antiderivative size = 651, normalized size of antiderivative = 1.15

method	result
default	$-\frac{\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,(a+b\arcsin(cx))^3 e}{3(cx+1)d^3(cx-1)cb}+\frac{4e\left(-4iab+12\arcsin(cx)^2b^2c^2x^2-4ib^2\arcsin(cx)+24ab\,c^2x^2\arcsin(\right.}{}$

input
```
int((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x,method=_RETURNV
ERBOSE)
```

output
```
-1/3*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/(c*x+1)/d^3/(
c*x-1)/c*(a+b*arcsin(c*x))^3*e/b+4/3*e*(-4*I*a*b+12*arcsin(c*x)^2*b^2*c^2*
x^2-4*I*b^2*arcsin(c*x)+24*a*b*c^2*x^2*arcsin(c*x)-8*I*arcsin(c*x)*b^2*c*x
-4*I*a*b*c^2*x^2+15*c*arcsin(c*x)^2*b^2*x-4*(-c^2*x^2+1)^(1/2)*arcsin(c*x)
*b^2*c*x+12*a^2*c^2*x^2-10*x^2*c^2*b^2-2*I*(-c^2*x^2+1)^(1/2)*b^2*c*x+30*c
*arcsin(c*x)*a*b*x-4*(-c^2*x^2+1)^(1/2)*a*b*c*x-8*I*a*b*c*x-4*I*arcsin(c*x
)*b^2*c^2*x^2+5*arcsin(c*x)^2*b^2-2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*b^2+15*
c*x*a^2-16*x*c*b^2-2*I*(-c^2*x^2+1)^(1/2)*b^2+10*arcsin(c*x)*a*b-2*(-c^2*x
^2+1)^(1/2)*a*b+5*a^2-6*b^2)*(2*I*(-c^2*x^2+1)^(1/2)*c*x+2*c^2*x^2+2*I*(-c
^2*x^2+1)^(1/2)-c*x-1)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(12*c^5*x^5+27
*c^4*x^4+8*c^3*x^3-22*c^2*x^2-20*c*x-5)/c/d^3-16/3*I*(-c^2*x^2+1)^(1/2)*(d
*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/(c*x+1)/d^3/(c*x-1)/c*b*(2*I*arcsin(c*x
)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*b+arcsin(c*x)^2*b+2*I*a*ln(I*c*x+(-c^
2*x^2+1)^(1/2)+I)-2*I*a*ln(I*c*x+(-c^2*x^2+1)^(1/2))+2*polylog(2,I*(I*c*x+
(-c^2*x^2+1)^(1/2)))*b)*e
```

Fricas [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorith
m="fricas")
```

output
```
integral(-(a^2*c*e*x - a^2*e + (b^2*c*e*x - b^2*e)*arcsin(c*x)^2 + 2*(a*b*
c*e*x - a*b*e)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*d^3*x^3
+ 3*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(-e(cx-1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))^2}{(d\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)**(3/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(5/2),x)
```

output
```
Integral((-e*(c*x - 1))**(3/2)*(a + b*asin(c*x))**2/(d*(c*x + 1))**(5/2),
x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx=\int \frac{(-cex+e)^{\frac{3}{2}}(b\arcsin{(cx)}+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(3/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorith
m="giac")
```

output
```
integrate((-c*e*x + e)^(3/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{3/2}}{(d+c\,d\,x)^{5/2}}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(5/2),x)
```

output
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(3/2))/(d + c*d*x)^(5/2), x)
```

Reduce [F]

$$\int \frac{(e-cex)^{3/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \frac{\sqrt{e}\,e\left(-6\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2cx-6\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a$$

input
```
int((-c*e*x+e)^(3/2)*(a+b*asin(c*x))^2/(c*d*x+d)^(5/2),x)
```

output
```
(sqrt(e)*e*( - 6*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a**2*c*x - 6
*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + 8*sqrt( - c*x + 1)*a*
*2*c*x + 4*sqrt( - c*x + 1)*a**2 - 6*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*a
sin(c*x)*x)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)
),x)*a*b*c**3*x - 6*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)*x)/(sqrt
(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c**2 + 6
*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 +
 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c**2*x + 6*sqrt(c*x + 1)*int(
(sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*
x + sqrt(c*x + 1)),x)*a*b*c - 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c
*x)**2*x)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),
x)*b**2*c**3*x - 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)**2*x)/(sq
rt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2*c**2
+ 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)**2)/(sqrt(c*x + 1)*c**2*
x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2*c**2*x + 3*sqrt(c*x +
1)*int((sqrt( - c*x + 1)*asin(c*x)**2)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c
*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2*c))/(3*sqrt(d)*sqrt(c*x + 1)*c*d**2*(
c*x + 1))
```

3.81 $\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 564

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx =$$
$$-\frac{245b^2d^2e^2x\sqrt{d+cdx}\sqrt{e-cex}}{1152}-\frac{65b^2d^2e^2x\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{1728}$$
$$-\frac{1}{108}b^2d^2e^2x\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)^2+\frac{115b^2d^2e^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}}$$
$$-\frac{5bcd^2e^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}}$$
$$+\frac{5bd^2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{48c}$$
$$+\frac{bd^2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^{5/2}\,(a+b\arcsin(cx))}{18c}$$
$$+\frac{5}{16}d^2e^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2+\frac{5}{24}d^2e^2x\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+$$

output
```
-245/1152*b^2*d^2*e^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)-65/1728*b^2*d^2*e
^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)-1/108*b^2*d^2*e^2*x*(c*
d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^2+115/1152*b^2*d^2*e^2*(c*d*x+d
)^(1/2)*(-c*e*x+e)^(1/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(1/2)-5/16*b*c*d^2*e^2
*x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)
+5/48*b*d^2*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^(3/2)*(a+b*a
rcsin(c*x))/c+1/18*b*d^2*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)
^(5/2)*(a+b*arcsin(c*x))/c+5/16*d^2*e^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)
*(a+b*arcsin(c*x))^2+5/24*d^2*e^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2
*x^2+1)*(a+b*arcsin(c*x))^2+1/6*d^2*e^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)
*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2+5/48*d^2*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e
)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 3.46 (sec) , antiderivative size = 450, normalized size of antiderivative = 0.80

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{d^2e^2\left(1440b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-4320a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\operatorname{arc}\right.}{}$$

input
```
Integrate[(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*e^2*(1440*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^
2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 12*b*Sqrt[d + c*d*x]*Sqrt[e - c
*e*x]*ArcSin[c*x]*(270*b*Cos[2*ArcSin[c*x]] + 27*b*Cos[4*ArcSin[c*x]] + 2*
b*Cos[6*ArcSin[c*x]] + 540*a*Sin[2*ArcSin[c*x]] + 108*a*Sin[4*ArcSin[c*x]]
 + 12*a*Sin[6*ArcSin[c*x]]) + 72*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[
c*x]^2*(60*a + 45*b*Sin[2*ArcSin[c*x]] + 9*b*Sin[4*ArcSin[c*x]] + b*Sin[6*
ArcSin[c*x]]) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(9504*a^2*c*x*Sqrt[1 - c^2
*x^2] - 7488*a^2*c^3*x^3*Sqrt[1 - c^2*x^2] + 2304*a^2*c^5*x^5*Sqrt[1 - c^2
*x^2] + 3240*a*b*Cos[2*ArcSin[c*x]] + 324*a*b*Cos[4*ArcSin[c*x]] + 24*a*b*
Cos[6*ArcSin[c*x]] - 1620*b^2*Sin[2*ArcSin[c*x]] - 81*b^2*Sin[4*ArcSin[c*x
]] - 4*b^2*Sin[6*ArcSin[c*x]])))/(13824*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.82 (sec) , antiderivative size = 432, normalized size of antiderivative = 0.77, number of steps used = 13, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {5178, 5158, 5158, 5156, 5138, 262, 223, 5152, 5182, 211, 211, 211, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(cdx+d)^{5/2}(e-cex)^{5/2}\int \left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2dx}{(1-c^2x^2)^{5/2}}$$

$$\Big\downarrow \text{5158}$$

$$\frac{(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))dx+\frac{5}{6}\int \left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx+\right.}{(1-c^2x^2)^{5/2}}$$

$$\Big\downarrow \text{5158}$$

$$\frac{(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))dx+\frac{5}{6}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))d\right.\right.}{(1-}$$

$$\Big\downarrow \text{5156}$$

$$\frac{(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))dx+\frac{5}{6}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))d\right.\right.}{}$$

$$\Big\downarrow \text{5138}$$

$$\frac{(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))dx+\frac{5}{6}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))d\right.\right.}{}$$

$$\Big\downarrow \text{262}$$

$$(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))dx+\frac{5}{6}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))\right.\right.$$

$\downarrow$ 223

$$(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))dx+\frac{5}{6}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))d\right.\right.$$

$\downarrow$ 5152

$$(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\int x\left(1-c^2x^2\right)^2(a+b\arcsin(cx))dx+\frac{5}{6}\left(-\frac{1}{2}bc\int x\left(1-c^2x^2\right)(a+b\arcsin(cx))d\right.\right.$$

$\downarrow$ 5182

$$(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\left(\frac{b\int\left(1-c^2x^2\right)^{5/2}dx}{6c}-\frac{\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{6c^2}\right)+\frac{5}{6}\left(-\frac{1}{2}bc\left(\frac{b\int\left(1-c^2x^2\right)^{3/2}dx}{4c}-\frac{(1-c^2x\right.\right.\right.\right.$$

$\downarrow$ 211

$$(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\left(\frac{b\left(\frac{5}{6}\int\left(1-c^2x^2\right)^{3/2}dx+\frac{1}{6}x\left(1-c^2x^2\right)^{5/2}\right)}{6c}-\frac{\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{6c^2}\right)+\frac{5}{6}\left(-\frac{1}{2}bc\left(\frac{b\left(\frac{3}{4}\int\sqrt{\right.}{}\right.\right.\right.\right.$$

$\downarrow$ 211

$$(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\left(\frac{b\left(\frac{5}{6}\left(\frac{3}{4}\int\sqrt{1-c^2x^2}dx+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}\right)+\frac{1}{6}x\left(1-c^2x^2\right)^{5/2}\right)}{6c}-\frac{\left(1-c^2x^2\right)^3(a+b\arcsin(cx))}{6c^2}\right)+\frac{5}{6}\right.$$

$\downarrow$ 211

$$(cdx+d)^{5/2}(e-cex)^{5/2}\left(-\frac{1}{3}bc\left(\frac{b\left(\frac{5}{6}\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{1}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x\sqrt{1-c^2x^2}\right)+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}\right)+\frac{1}{6}x\left(1-c^2x^2\right)^{5/2}\right)}{6c}-\frac{\left(1-c^2x^2\right)^3(a+}{6c}\right.\right.$$

$\downarrow$ 223

$$(cdx+d)^{5/2}(e-cex)^{5/2}\left(\frac{1}{6}x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2-\frac{1}{3}bc\left(\frac{b\left(\frac{5}{6}\left(\frac{3}{4}\left(\frac{\arcsin(cx)}{2c}+\frac{1}{2}x\sqrt{1-c^2x^2}\right)+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}\right)}{6c}\right.\right.$$

input
```
Int[(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

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

Defintions of rubi rules used

rule 211
```
Int[((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[x*((a + b*x^2)^p/(2*p + 1
)), x] + Simp[2*a*(p/(2*p + 1))   Int[(a + b*x^2)^(p - 1), x], x] /; FreeQ[
{a, b}, x] && GtQ[p, 0] && (IntegerQ[4*p] || IntegerQ[6*p])
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5158
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (S
imp[2*d*(p/(2*p + 1))   Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x],
x] - Simp[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[x*(1
- c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.38 (sec) , antiderivative size = 1617, normalized size of antiderivative = 2.87

method	result	size
default	Expression too large to display	1617
parts	Expression too large to display	1617

input
```
int((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNV
ERBOSE)
```

output
```
-1/6*a^2/c/e*(c*d*x+d)^(5/2)*(-c*e*x+e)^(7/2)-1/6*a^2*d/c/e*(c*d*x+d)^(3/2
)*(-c*e*x+e)^(7/2)-1/8*a^2*d^2/c/e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(7/2)+1/24*a
^2*d^2/c*(-c*e*x+e)^(5/2)*(c*d*x+d)^(1/2)+5/48*a^2*d^2*e/c*(-c*e*x+e)^(3/2
)*(c*d*x+d)^(1/2)+5/16*a^2*d^2*e^2/c*(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)+5/16
*a^2*d^3*e^3*((c*d*x+d)*(-c*e*x+e))^(1/2)/(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2)
/(c^2*d*e)^(1/2)*arctan((c^2*d*e)^(1/2)*x/(-c^2*d*e*x^2+d*e)^(1/2))+b^2*(-
5/48*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)
*arcsin(c*x)^3*d^2*e^2+1/6912*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-32*I*
(-c^2*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c
^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c
*x)*(6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d^2*e^2/c/(c^2*x^2-1)+15/256*(-e*
(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3
-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*arcsin(c*x)^2-1-2*I*arcsin(c*x))*d^2*e^2/c
/(c^2*x^2-1)-1/27648*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*c^2*x^2-c*x*(
-c^2*x^2+1)^(1/2)-I)*(348*I*arcsin(c*x)+576*arcsin(c*x)^2-77)*cos(5*arcsin
(c*x))*d^2*e^2/c/(c^2*x^2-1)+5/27648*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*
(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(60*I*arcsin(c*x)+144*arcsin(c*x)^2-1
7)*sin(5*arcsin(c*x))*d^2*e^2/c/(c^2*x^2-1)-3/1024*(-e*(c*x-1))^(1/2)*(d*(
c*x+1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(44*I*arcsin(c*x)+32*ar
csin(c*x)^2-19)*cos(3*arcsin(c*x))*d^2*e^2/c/(c^2*x^2-1)+9/1024*(-e*(c*...
```

Fricas [F]

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorith
m="fricas")
```

output
```
integral((a^2*c^4*d^2*e^2*x^4 - 2*a^2*c^2*d^2*e^2*x^2 + a^2*d^2*e^2 + (b^2
*c^4*d^2*e^2*x^4 - 2*b^2*c^2*d^2*e^2*x^2 + b^2*d^2*e^2)*arcsin(c*x)^2 + 2*
(a*b*c^4*d^2*e^2*x^4 - 2*a*b*c^2*d^2*e^2*x^2 + a*b*d^2*e^2)*arcsin(c*x))*s
qrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((c*d*x+d)**(5/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx=\int (cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorith
m="giac")
```

output
```
integrate((c*d*x + d)^(5/2)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{5/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx=\int {\left(a+b\,\mathrm{asin}(c\,x)\right)}^2\,{\left(d+c\,d\,x\right)}^{5/2}\,{\left(e-c\,e\,x\right)}^{5/2}\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2),x)
```

output
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(5/2)*(e - c*e*x)^(5/2), x)
```

Reduce [F]

$$\int (d + cdx)^{5/2}(e - cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{e}\,\sqrt{d}\,d^2e^2\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2 + 8\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2c^5x^5 - 26\sqrt{ca}\right.}{}$$

input
```
int((c*d*x+d)^(5/2)*(-c*e*x+e)^(5/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(e)*sqrt(d)*d**2*e**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + 8*
sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2*c**5*x**5 - 26*sqrt(c*x + 1)*sqrt( - c
*x + 1)*a**2*c**3*x**3 + 33*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2*c*x + 96*i
nt(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**4,x)*a*b*c**5 - 192*int(sqr
t(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**2,x)*a*b*c**3 + 96*int(sqrt(c*x +
 1)*sqrt( - c*x + 1)*asin(c*x),x)*a*b*c + 48*int(sqrt(c*x + 1)*sqrt( - c*x
 + 1)*asin(c*x)**2*x**4,x)*b**2*c**5 - 96*int(sqrt(c*x + 1)*sqrt( - c*x +
1)*asin(c*x)**2*x**2,x)*b**2*c**3 + 48*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*
asin(c*x)**2,x)*b**2*c))/(48*c)
```

3.82 $\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 740

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = -\frac{16b^2de^2\sqrt{d+cdx}\sqrt{e-cex}}{75c}$$
$$-\frac{15}{64}b^2de^2x\sqrt{d+cdx}\sqrt{e-cex}-\frac{8b^2de^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{225c}$$
$$-\frac{1}{32}b^2de^2x\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)-\frac{2b^2de^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^2}{125c}$$
$$+\frac{9b^2de^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}-\frac{2bde^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{5\sqrt{1-c^2x^2}}$$
$$-\frac{3bcde^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$+\frac{4bc^2de^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}$$
$$-\frac{2bc^4de^2x^5\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}$$
$$+\frac{bde^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))}{8c}$$
$$+\frac{3}{8}de^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2+\frac{1}{4}de^2x\sqrt{d+cdx}\sqrt{e-cex}\left(1-c^2x^2\right)(a+b\arcsin(cx))^2+\frac{de^2}{}$$

output
```
-16/75*b^2*d*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-15/64*b^2*d*e^2*x*(c*d
*x+d)^(1/2)*(-c*e*x+e)^(1/2)-8/225*b^2*d*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1
/2)*(-c^2*x^2+1)/c-1/32*b^2*d*e^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2
*x^2+1)-2/125*b^2*d*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^2/c+
9/64*b^2*d*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*arcsin(c*x)/c/(-c^2*x^2+1)
^(1/2)-2/5*b*d*e^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-
c^2*x^2+1)^(1/2)-3/8*b*c*d*e^2*x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*a
rcsin(c*x))/(-c^2*x^2+1)^(1/2)+4/15*b*c^2*d*e^2*x^3*(c*d*x+d)^(1/2)*(-c*e*
x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)-2/25*b*c^4*d*e^2*x^5*(c*d*
x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/8*b*d*e
^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/c
+3/8*d*e^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^2+1/4*d*e^
2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2+1/5*
d*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/
c+1/8*d*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2
*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 3.98 (sec) , antiderivative size = 574, normalized size of antiderivative = 0.78

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{de^2\Big(36000b^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-108000a^2\sqrt{d}\sqrt{e}\sqrt{1-c^2x^2}\,a}{}$$

input
```
Integrate[(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*e^2*(36000*b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 108000*a
^2*Sqrt[d]*Sqrt[e]*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e -
c*e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] + 1800*b*Sqrt[d + c*d*x]*Sqrt[e
- c*e*x]*ArcSin[c*x]^2*(10*b*Cos[3*ArcSin[c*x]] + 2*b*Cos[5*ArcSin[c*x]] +
 5*(12*a + 4*b*Sqrt[1 - c^2*x^2] + 8*b*Sin[2*ArcSin[c*x]] + b*Sin[4*ArcSin
[c*x]])) + Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(72000*a*b*Cos[2*ArcSin[c*x]] -
 4000*b^2*Cos[3*ArcSin[c*x]] + 4500*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Cos[5
*ArcSin[c*x]] - 15*(4800*b^2*Sqrt[1 - c^2*x^2] + 512*a*b*c*x*(15 - 10*c^2*
x^2 + 3*c^4*x^4) - 480*a^2*Sqrt[1 - c^2*x^2]*(8 + 25*c*x - 16*c^2*x^2 - 10
*c^3*x^3 + 8*c^4*x^4) + 2400*b^2*Sin[2*ArcSin[c*x]] + 75*b^2*Sin[4*ArcSin[
c*x]])) + 60*b*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]*(1200*b*Cos[2*A
rcSin[c*x]] + 75*b*Cos[4*ArcSin[c*x]] + 4*(-300*b*c*x + 480*a*Sqrt[1 - c^2
*x^2] - 960*a*c^2*x^2*Sqrt[1 - c^2*x^2] + 480*a*c^4*x^4*Sqrt[1 - c^2*x^2]
+ 600*a*Sin[2*ArcSin[c*x]] - 50*b*Sin[3*ArcSin[c*x]] + 75*a*Sin[4*ArcSin[c
*x]] - 6*b*Sin[5*ArcSin[c*x]]))))/(288000*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.05 (sec) , antiderivative size = 374, normalized size of antiderivative = 0.51, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (cdx+d)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(cdx+d)^{3/2}(e-cex)^{3/2}\int e(1-cx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e(cdx+d)^{3/2}(e-cex)^{3/2}\int (1-cx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{(1-c^2x^2)^{3/2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{e(cdx+d)^{3/2}(e-cex)^{3/2}\int\left(\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2-cx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\right)dx}{\left(1-c^2x^2\right)^{3/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e(cdx+d)^{3/2}(e-cex)^{3/2}\left(-\frac{2}{25}bc^4x^5(a+b\arcsin(cx))+\frac{4}{15}bc^2x^3(a+b\arcsin(cx))+\frac{1}{4}x\left(1-c^2x^2\right)^{3/2}(a+b\operatorname{arc}\right.}{}$$

input
```
Int[(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(e*(d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)*((-16*b^2*Sqrt[1 - c^2*x^2])/(75*c)
 - (15*b^2*x*Sqrt[1 - c^2*x^2])/64 - (8*b^2*(1 - c^2*x^2)^(3/2))/(225*c) -
 (b^2*x*(1 - c^2*x^2)^(3/2))/32 - (2*b^2*(1 - c^2*x^2)^(5/2))/(125*c) + (9
*b^2*ArcSin[c*x])/(64*c) - (2*b*x*(a + b*ArcSin[c*x]))/5 - (3*b*c*x^2*(a +
 b*ArcSin[c*x]))/8 + (4*b*c^2*x^3*(a + b*ArcSin[c*x]))/15 - (2*b*c^4*x^5*(
a + b*ArcSin[c*x]))/25 + (b*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(8*c) + (
3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/8 + (x*(1 - c^2*x^2)^(3/2)*(a
 + b*ArcSin[c*x])^2)/4 + ((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(5*c)
 + (a + b*ArcSin[c*x])^3/(8*b*c)))/(1 - c^2*x^2)^(3/2)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.87 (sec) , antiderivative size = 2264, normalized size of antiderivative = 3.06

method	result	size
default	Expression too large to display	2264
parts	Expression too large to display	2264

input
```
int((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNV
ERBOSE)
```

output
```
-1/5*a^2/c/e*(c*d*x+d)^(3/2)*(-c*e*x+e)^(7/2)-3/20*a^2*d/c/e*(c*d*x+d)^(1/
2)*(-c*e*x+e)^(7/2)+1/20*a^2*d/c*(-c*e*x+e)^(5/2)*(c*d*x+d)^(1/2)+1/8*a^2*
d*e/c*(-c*e*x+e)^(3/2)*(c*d*x+d)^(1/2)+3/8*a^2*d*e^2/c*(-c*e*x+e)^(1/2)*(c
*d*x+d)^(1/2)+3/8*a^2*d^2*e^3*((c*d*x+d)*(-c*e*x+e))^(1/2)/(-c*e*x+e)^(1/2
)/(c*d*x+d)^(1/2)/(c^2*d*e)^(1/2)*arctan((c^2*d*e)^(1/2)*x/(-c^2*d*e*x^2+d
*e)^(1/2))+b^2*(-1/8*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/
2)/c/(c^2*x^2-1)*arcsin(c*x)^3*d*e^2+1/4000*(-e*(c*x-1))^(1/2)*(d*(c*x+1))
^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+2
0*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*(10*I*arcsin(
c*x)+25*arcsin(c*x)^2-2)*d*e^2/c/(c^2*x^2-1)-1/512*(-e*(c*x-1))^(1/2)*(d*(
c*x+1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^
(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I*arcsin(c*x)+8*ar
csin(c*x)^2-1)*d*e^2/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/
2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*
d*e^2/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2*x
^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(2*arcsin(c*x)^2
-1-2*I*arcsin(c*x))*d*e^2/c/(c^2*x^2-1)+1/18000*(-e*(c*x-1))^(1/2)*(d*(c*x
+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(330*I*arcsin(c*x)+675*arc
sin(c*x)^2-134)*cos(4*arcsin(c*x))*d*e^2/c/(c^2*x^2-1)+1/9000*(-e*(c*x-1))
^(1/2)*(d*(c*x+1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(210*I*ar...
```

Fricas [F]

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx=\int (cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorith
m="fricas")
```

output
```
integral((a^2*c^3*d*e^2*x^3 - a^2*c^2*d*e^2*x^2 - a^2*c*d*e^2*x + a^2*d*e^
2 + (b^2*c^3*d*e^2*x^3 - b^2*c^2*d*e^2*x^2 - b^2*c*d*e^2*x + b^2*d*e^2)*ar
csin(c*x)^2 + 2*(a*b*c^3*d*e^2*x^3 - a*b*c^2*d*e^2*x^2 - a*b*c*d*e^2*x + a
*b*d*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int (d + cdx)^{3/2}(e - cex)^{5/2}(a + b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((c*d*x+d)**(3/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int (d + cdx)^{3/2}(e - cex)^{5/2}(a + b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int (d + cdx)^{3/2}(e - cex)^{5/2}(a + b\arcsin(cx))^2\,dx = \int (cdx + d)^{\frac{3}{2}}(-cex + e)^{\frac{5}{2}}(b\arcsin(cx) + a)^2\,dx$$

input
```
integrate((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorith
m="giac")
```

output
```
integrate((c*d*x + d)^(3/2)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx=\int (a+b\,\mathrm{asin}(c\,x))^2\,(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{5/2}\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2),x)
```

output
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(3/2)*(e - c*e*x)^(5/2), x)
```

Reduce [F]

$$\int (d+cdx)^{3/2}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx=\frac{\sqrt{e}\,\sqrt{d}\,d\,e^2\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2+8\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2c^4x^4-10\sqrt{cx}\right.}{}$$

input
```
int((c*d*x+d)^(3/2)*(-c*e*x+e)^(5/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(e)*sqrt(d)*d*e**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + 8*sqr
t(c*x + 1)*sqrt( - c*x + 1)*a**2*c**4*x**4 - 10*sqrt(c*x + 1)*sqrt( - c*x
+ 1)*a**2*c**3*x**3 - 16*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2*c**2*x**2 + 2
5*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2*c*x + 8*sqrt(c*x + 1)*sqrt( - c*x +
1)*a**2 + 80*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**3,x)*a*b*c**4
 - 80*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x**2,x)*a*b*c**3 - 80*i
nt(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x,x)*a*b*c**2 + 80*int(sqrt(c*
x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*a*b*c + 40*int(sqrt(c*x + 1)*sqrt( -
c*x + 1)*asin(c*x)**2*x**3,x)*b**2*c**4 - 40*int(sqrt(c*x + 1)*sqrt( - c*x
 + 1)*asin(c*x)**2*x**2,x)*b**2*c**3 - 40*int(sqrt(c*x + 1)*sqrt( - c*x +
1)*asin(c*x)**2*x,x)*b**2*c**2 + 40*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asi
n(c*x)**2,x)*b**2*c))/(40*c)
```

3.83 $\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 32, antiderivative size = 613

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = -\frac{8b^2e^2\sqrt{d+cdx}\sqrt{e-cex}}{9c} - \frac{15}{64}b^2e^2x\sqrt{d+cdx}\sqrt{e-cex} - \frac{1}{32}b^2c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex} - \frac{4b^2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)}{27c} + \frac{15b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} - \frac{4be^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} - \frac{3bce^2x^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{4bc^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} - \frac{bc^3e^2x^4\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{3}{8}e^2x\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{1}{4}c^2e^2x^3\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^2 + \frac{2e^2\sqrt{d+cdx}\sqrt{e-cex}(1-c^2x^2)(a+b\arcsin(cx))^2}{3c} + \frac{5e^2\sqrt{d+cdx}\sqrt{e-cex}(a+b\arcsin(cx))^3}{24bc\sqrt{1-c^2x^2}}$$

output
```
-8/9*b^2*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)/c-15/64*b^2*e^2*x*(c*d*x+d)^
(1/2)*(-c*e*x+e)^(1/2)-1/32*b^2*c^2*e^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/
2)-4/27*b^2*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2*x^2+1)/c+15/64*b^2*
e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(1/2)-4/3*
b*e^2*x*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1
/2)-3/8*b*c*e^2*x^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*arcsin(c*x))/(-c
^2*x^2+1)^(1/2)+4/9*b*c^2*e^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a+b*ar
csin(c*x))/(-c^2*x^2+1)^(1/2)-1/8*b*c^3*e^2*x^4*(c*d*x+d)^(1/2)*(-c*e*x+e)
^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+3/8*e^2*x*(c*d*x+d)^(1/2)*(-c*
e*x+e)^(1/2)*(a+b*arcsin(c*x))^2+1/4*c^2*e^2*x^3*(c*d*x+d)^(1/2)*(-c*e*x+e
)^(1/2)*(a+b*arcsin(c*x))^2+2/3*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(-c^2
*x^2+1)*(a+b*arcsin(c*x))^2/c+5/24*e^2*(c*d*x+d)^(1/2)*(-c*e*x+e)^(1/2)*(a
+b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 3.01 (sec) , antiderivative size = 555, normalized size of antiderivative = 0.91

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{1440b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3 - 4320a^2\sqrt{d}e^{5/2}\sqrt{1-c^2x^2}\arctan\left(\frac{cx\sqrt{d+cdx}\sqrt{}}{\sqrt{d}\sqrt{e}(-1+}\right.}{}$$

input
```
Integrate[Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output

```
(1440*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 4320*a^2*Sqr
t[d]*e^(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]
)/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 12*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x]*ArcSin[c*x]*(576*b*c*x - 768*a*Sqrt[1 - c^2*x^2] + 768*a*c^2*x^2*Sqrt
[1 - c^2*x^2] - 144*b*Cos[2*ArcSin[c*x]] + 9*b*Cos[4*ArcSin[c*x]] - 288*a*
Sin[2*ArcSin[c*x]] + 64*b*Sin[3*ArcSin[c*x]] + 36*a*Sin[4*ArcSin[c*x]]) +
72*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(60*a + 48*b*Sqrt[1
 - c^2*x^2] + 16*b*Cos[3*ArcSin[c*x]] + 24*b*Sin[2*ArcSin[c*x]] - 3*b*Sin[
4*ArcSin[c*x]]) + e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(1728*a*b*Cos[2*ArcS
in[c*x]] - 256*b^2*Cos[3*ArcSin[c*x]] + 3*(-3072*a*b*c*x + 1024*a*b*c^3*x^
3 + 1536*a^2*Sqrt[1 - c^2*x^2] - 2304*b^2*Sqrt[1 - c^2*x^2] + 864*a^2*c*x*
Sqrt[1 - c^2*x^2] - 1536*a^2*c^2*x^2*Sqrt[1 - c^2*x^2] + 576*a^2*c^3*x^3*S
qrt[1 - c^2*x^2] - 36*a*b*Cos[4*ArcSin[c*x]] - 288*b^2*Sin[2*ArcSin[c*x]]
+ 9*b^2*Sin[4*ArcSin[c*x]])))/(6912*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.21 (sec) , antiderivative size = 334, normalized size of antiderivative = 0.54, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{cdx+d}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{cdx+d}\sqrt{e-cex}\int e^2(1-cx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^2\sqrt{cdx+d}\sqrt{e-cex}\int (1-cx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{e^2\sqrt{cdx+d}\sqrt{e-cex}\int \left(c^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-2cx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\sqrt{1-c^2x^2}(a+\right.}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$\frac{e^2\sqrt{cdx+d}\sqrt{e-cex}\left(-\frac{1}{8}bc^3x^4(a+b\arcsin(cx))+\frac{4}{9}bc^2x^3(a+b\arcsin(cx))+\frac{3}{8}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\right.}{}$$

input
```
Int[Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-8*b^2*Sqrt[1 - c^2*x^2])/(9*c) - (
15*b^2*x*Sqrt[1 - c^2*x^2])/64 - (b^2*c^2*x^3*Sqrt[1 - c^2*x^2])/32 - (4*b
^2*(1 - c^2*x^2)^(3/2))/(27*c) + (15*b^2*ArcSin[c*x])/(64*c) - (4*b*x*(a +
 b*ArcSin[c*x]))/3 - (3*b*c*x^2*(a + b*ArcSin[c*x]))/8 + (4*b*c^2*x^3*(a +
 b*ArcSin[c*x]))/9 - (b*c^3*x^4*(a + b*ArcSin[c*x]))/8 + (3*x*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x])^2)/8 + (c^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x])^2)/4 + (2*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c) + (5*(a +
 b*ArcSin[c*x])^3)/(24*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 4.90 (sec) , antiderivative size = 1810, normalized size of antiderivative = 2.95

method	result	size
default	Expression too large to display	1810
parts	Expression too large to display	1810

input
```
int((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNV
ERBOSE)
```

output
```
-1/4*a^2/c/e*(c*d*x+d)^(1/2)*(-c*e*x+e)^(7/2)+1/12*a^2/c*(-c*e*x+e)^(5/2)*
(c*d*x+d)^(1/2)+5/24*a^2*e/c*(-c*e*x+e)^(3/2)*(c*d*x+d)^(1/2)+5/8*a^2*e^2/
c*(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)+5/8*a^2*d*e^3*((c*d*x+d)*(-c*e*x+e))^(1
/2)/(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*e)^(1/2)*arctan((c^2*d*e)^(1/2
)*x/(-c^2*d*e*x^2+d*e)^(1/2))+b^2*(-5/24*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1
/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*e^2+1/512*(-e*(c*x-1))^
(1/2)*(d*(c*x+1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(4*I*arcsin
(c*x)+8*arcsin(c*x)^2-1)*e^2/c/(c^2*x^2-1)-1/108*(-e*(c*x-1))^(1/2)*(d*(c*
x+1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*
x^2+1)^(1/2)*x*c+1)*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*e^2/c/(c^2*x^2-1)+
1/4*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2
-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*e^2/c/(c^2*x^2-1)+1/16*(-e*(c*x-1))^
(1/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*
x^2+1)^(1/2)-2*c*x)*(2*arcsin(c*x)^2-1-2*I*arcsin(c*x))*e^2/c/(c^2*x^2-1)-
3/512*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/
2)-I)*(20*I*arcsin(c*x)+24*arcsin(c*x)^2-11)*cos(3*arcsin(c*x))*e^2/c/(c^2
*x^2-1)+1/512*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c
*x+c^2*x^2-1)*(68*I*arcsin(c*x)+56*arcsin(c*x)^2-31)*sin(3*arcsin(c*x))*e^
2/c/(c^2*x^2-1)+1/27*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+...
```

Fricas [F]

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorith
m="fricas")
```

output
```
integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2
*b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x
 + a*b*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e), x)
```

Sympy [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((c*d*x+d)**(1/2)*(-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{cdx+d}(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2,x, algorith
m="giac")
```

output
```
integrate(sqrt(c*d*x + d)*(-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d+c\,d\,x}\,(e-c\,e\,x)^{5/2}\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(5/2),x)
```

output
```
int((a + b*asin(c*x))^2*(d + c*d*x)^(1/2)*(e - c*e*x)^(5/2), x)
```

Reduce [F]

$$\int \sqrt{d+cdx}(e-cex)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{e}\,\sqrt{d}\,e^2\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2+6\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2c^3x^3-16\sqrt{cx+1}\,\sqrt{-cx+\dots}\right.}{}$$

input
```
int((c*d*x+d)^(1/2)*(-c*e*x+e)^(5/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(e)*sqrt(d)*e**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + 6*sqrt(
c*x + 1)*sqrt( - c*x + 1)*a**2*c**3*x**3 - 16*sqrt(c*x + 1)*sqrt( - c*x +
1)*a**2*c**2*x**2 + 9*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2*c*x + 16*sqrt(c*
x + 1)*sqrt( - c*x + 1)*a**2 + 48*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(
c*x)*x**2,x)*a*b*c**3 - 96*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)*x,
x)*a*b*c**2 + 48*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x),x)*a*b*c + 2
4*int(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2*x**2,x)*b**2*c**3 - 48*i
nt(sqrt(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2*x,x)*b**2*c**2 + 24*int(sqr
t(c*x + 1)*sqrt( - c*x + 1)*asin(c*x)**2,x)*b**2*c))/(24*c)
```

3.84 $\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 559

$$\begin{aligned}\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx &= -\frac{68b^2e^3(1-c^2x^2)}{9c\sqrt{d+cdx}\sqrt{e-cex}} \\
&+\frac{3b^2e^3x(1-c^2x^2)}{4\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b^2e^3(1-c^2x^2)^2}{27c\sqrt{d+cdx}\sqrt{e-cex}} \\
&-\frac{3b^2e^3\sqrt{1-c^2x^2}\arcsin(cx)}{4c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{22be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3\sqrt{d+cdx}\sqrt{e-cex}} \\
&+\frac{3bce^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2\sqrt{d+cdx}\sqrt{e-cex}}-\frac{2bc^2e^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9\sqrt{d+cdx}\sqrt{e-cex}} \\
&+\frac{11e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c\sqrt{d+cdx}\sqrt{e-cex}}-\frac{3e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+\frac{ce^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3\sqrt{d+cdx}\sqrt{e-cex}}+\frac{5e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

output
```
-68/9*b^2*e^3*(-c^2*x^2+1)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/4*b^2*e^3*
x*(-c^2*x^2+1)/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2/27*b^2*e^3*(-c^2*x^2+1)^
2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-3/4*b^2*e^3*(-c^2*x^2+1)^(1/2)*arcsin
(c*x)/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-22/3*b*e^3*x*(-c^2*x^2+1)^(1/2)*(
a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+3/2*b*c*e^3*x^2*(-c^2*x^
2+1)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/9*b*c^2*e^
3*x^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2
)+11/3*e^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^(
1/2)-3/2*e^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)
^(1/2)+1/3*c*e^3*x^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*
e*x+e)^(1/2)+5/6*e^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^
(1/2)/(-c*e*x+e)^(1/2)
```

Mathematica [A] (verified)

Time = 12.19 (sec) , antiderivative size = 473, normalized size of antiderivative = 0.85

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \frac{180b^2e^2\sqrt{d+cdx}\sqrt{e-cex}\arcsin(cx)^3-540a^2\sqrt{d}e^{5/2}\sqrt{1-c^2x^2}\,\mathrm{ar}}{}$$

input
```
Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

output
```
(180*b^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^3 - 540*a^2*Sqrt[
d]*e^(5/2)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])/
(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))] - 6*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x
]*ArcSin[c*x]*(264*b*c*x + 8*b*c^3*x^3 - 270*a*Sqrt[1 - c^2*x^2] + 108*a*c
*x*Sqrt[1 - c^2*x^2] + 27*b*Cos[2*ArcSin[c*x]] + 6*a*Cos[3*ArcSin[c*x]]) +
 18*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*ArcSin[c*x]^2*(30*a + 45*b*Sqrt[
1 - c^2*x^2] - b*Cos[3*ArcSin[c*x]] - 9*b*Sin[2*ArcSin[c*x]]) + e^2*Sqrt[d
 + c*d*x]*Sqrt[e - c*e*x]*(-1620*a*b*c*x + 792*a^2*Sqrt[1 - c^2*x^2] - 162
0*b^2*Sqrt[1 - c^2*x^2] - 324*a^2*c*x*Sqrt[1 - c^2*x^2] + 72*a^2*c^2*x^2*S
qrt[1 - c^2*x^2] - 162*a*b*Cos[2*ArcSin[c*x]] + 4*b^2*Cos[3*ArcSin[c*x]] +
 81*b^2*Sin[2*ArcSin[c*x]] + 12*a*b*Sin[3*ArcSin[c*x]]))/(216*c*d*Sqrt[1 -
 c^2*x^2])
```

Rubi [A] (verified)

Time = 0.92 (sec) , antiderivative size = 302, normalized size of antiderivative = 0.54, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {5178, 27, 5272, 3042, 3798, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{cdx+d}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{e^3(1-cx)^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{e-cex}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^3\sqrt{1-c^2x^2}\int \frac{(1-cx)^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{e-cex}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{e^3\sqrt{1-c^2x^2}\int \left(c-c^2x\right)^3(a+b\arcsin(cx))^2d\arcsin(cx)}{c^4\sqrt{cdx+d}\sqrt{e-cex}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{e^3\sqrt{1-c^2x^2}\int (a+b\arcsin(cx))^2(c-c\sin(\arcsin(cx)))^3d\arcsin(cx)}{c^4\sqrt{cdx+d}\sqrt{e-cex}}$$

$$\Big\downarrow \text{3798}$$

$$\frac{e^3\sqrt{1-c^2x^2}\int \left(-x^3(a+b\arcsin(cx))^2c^6+3x^2(a+b\arcsin(cx))^2c^5-3x(a+b\arcsin(cx))^2c^4+(a+b\arcsin(cx\right.}{c^4\sqrt{cdx+d}\sqrt{e-cex}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e^3\sqrt{1-c^2x^2}\left(-\frac{2}{9}bc^6x^3(a+b\arcsin(cx))+\frac{3}{2}bc^5x^2(a+b\arcsin(cx))-\frac{22}{3}bc^4x(a+b\arcsin(cx))+\frac{5c^3(a+b\arcsin(cx}{6b}\right.}{}$$

input
```
Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/Sqrt[d + c*d*x],x]
```

output
```
(e^3*Sqrt[1 - c^2*x^2]*((-68*b^2*c^3*Sqrt[1 - c^2*x^2])/9 + (3*b^2*c^4*x*S
qrt[1 - c^2*x^2])/4 + (2*b^2*c^3*(1 - c^2*x^2)^(3/2))/27 - (3*b^2*c^3*ArcS
in[c*x])/4 - (22*b*c^4*x*(a + b*ArcSin[c*x]))/3 + (3*b*c^5*x^2*(a + b*ArcS
in[c*x]))/2 - (2*b*c^6*x^3*(a + b*ArcSin[c*x]))/9 + (11*c^3*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])^2)/3 - (3*c^4*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*
x])^2)/2 + (c^5*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/3 + (5*c^3*(a
 + b*ArcSin[c*x])^3)/(6*b)))/(c^4*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3798
```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 3.83 (sec) , antiderivative size = 1820, normalized size of antiderivative = 3.26

method	result	size
default	Expression too large to display	1820
parts	Expression too large to display	1820

input
```
int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x,method=_RETURNV
ERBOSE)
```

output
```
1/3*a^2/c/d*(-c*e*x+e)^(5/2)*(c*d*x+d)^(1/2)+5/6*a^2*e/c/d*(-c*e*x+e)^(3/2
)*(c*d*x+d)^(1/2)+5/2*a^2*e^2/c/d*(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)+5/2*a^2
*e^3*((c*d*x+d)*(-c*e*x+e))^(1/2)/(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*
e)^(1/2)*arctan((c^2*d*e)^(1/2)*x/(-c^2*d*e*x^2+d*e)^(1/2))+b^2*(-5/6*(-e*
(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c*x+1)/d/c/(c*x-1)*ar
csin(c*x)^3*e^2+1/432*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-4*c^3*x^3-8*I
*(-c^2*x^2+1)^(1/2)*x^3*c^3+8*c^4*x^4+3*c*x+4*I*(-c^2*x^2+1)^(1/2)*x^2*c^2
+4*I*c*x*(-c^2*x^2+1)^(1/2)-8*c^2*x^2-I*(-c^2*x^2+1)^(1/2)+1)*(6*I*arcsin(
c*x)+9*arcsin(c*x)^2-2)*e^2/(c*x+1)/d/c/(c*x-1)+15/16*(-e*(c*x-1))^(1/2)*(
d*(c*x+1))^(1/2)*(-I*(-c^2*x^2+1)^(1/2)+c*x-1)*(arcsin(c*x)^2-2+2*I*arcsin
(c*x))*e^2/(c*x+1)/d/c/(c*x-1)+15/8*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(
I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*e^2/
(c*x+1)/d/c/(c*x-1)-3/32*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(2*I*(-c^2*x
^2+1)^(1/2)*c*x+2*c^2*x^2-I*(-c^2*x^2+1)^(1/2)-c*x-1)*(2*arcsin(c*x)^2-1-2
*I*arcsin(c*x))*e^2/(c*x+1)/d/c/(c*x-1)+1/864*(-e*(c*x-1))^(1/2)*(d*(c*x+1
))^(1/2)*(I*c*x-I-(-c^2*x^2+1)^(1/2))*(162*I*arcsin(c*x)+126*arcsin(c*x)^2
-73)*cos(3*arcsin(c*x))*e^2/(c*x+1)/d/c/(c*x-1)-1/288*(-e*(c*x-1))^(1/2)*(
d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)+c*x-1)*(46*I*arcsin(c*x)+54*arcsin(
c*x)^2-27)*sin(3*arcsin(c*x))*e^2/(c*x+1)/d/c/(c*x-1)+1/216*(-e*(c*x-1))^(
1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)+c*x-1)*(198*arcsin(c*x)^2+...
```

Fricas [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx=\int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^2}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorith
m="fricas")
```

output
```
integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2
*b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x
 + a*b*e^2)*arcsin(c*x))*sqrt(-c*e*x + e)/sqrt(c*d*x + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \text{Timed out}$$

input
```
integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(1/2),x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx = \int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}}\,dx$$

input
```
integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2),x, algorith
m="giac")
```

output
```
integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/sqrt(c*d*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{5/2}}{\sqrt{d+c\,d\,x}}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(1/2),x)
```

output
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(1/2), x)
```

Reduce [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{\sqrt{d+cdx}}\,dx=\frac{\sqrt{e}\,e^2\left(-30asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2+2\sqrt{cx+1}\,\sqrt{-cx+1}\,a^2c^2x^2-9\sqrt{cx}$$

input
```
int((-c*e*x+e)^(5/2)*(a+b*asin(c*x))^2/(c*d*x+d)^(1/2),x)
```

output
```
(sqrt(e)*e**2*( - 30*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + 2*sqrt(c*x + 1)
*sqrt( - c*x + 1)*a**2*c**2*x**2 - 9*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2*c
*x + 22*sqrt(c*x + 1)*sqrt( - c*x + 1)*a**2 + 12*int((sqrt( - c*x + 1)*asi
n(c*x)*x**2)/sqrt(c*x + 1),x)*a*b*c**3 - 24*int((sqrt( - c*x + 1)*asin(c*x
)*x)/sqrt(c*x + 1),x)*a*b*c**2 + 12*int((sqrt( - c*x + 1)*asin(c*x))/sqrt(
c*x + 1),x)*a*b*c + 6*int((sqrt( - c*x + 1)*asin(c*x)**2*x**2)/sqrt(c*x +
1),x)*b**2*c**3 - 12*int((sqrt( - c*x + 1)*asin(c*x)**2*x)/sqrt(c*x + 1),x
)*b**2*c**2 + 6*int((sqrt( - c*x + 1)*asin(c*x)**2)/sqrt(c*x + 1),x)*b**2*
c))/(6*sqrt(d)*c)
```

3.85 $\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 897

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \frac{8b^2e^3(1-c^2x^2)}{cd\sqrt{d+cdx}\sqrt{e-cex}} - \frac{b^2e^3x(1-c^2x^2)}{4d\sqrt{d+cdx}\sqrt{e-cex}} + \frac{b^2e^3\sqrt{1-c^2x^2}\arcsin(cx)}{4cd\sqrt{d+cdx}\sqrt{e-cex}} + \frac{8be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{d\sqrt{d+cdx}\sqrt{e-cex}} - \frac{bce^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2d\sqrt{d+cdx}\sqrt{e-cex}} - \frac{8e^3(a+b\arcsin(cx))^2}{cd\sqrt{d+cdx}\sqrt{e-cex}} + \frac{8e^3x(a+b\arcsin(cx))^2}{d\sqrt{d+cdx}\sqrt{e-cex}} - \frac{8ie^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d+cdx}\sqrt{e-cex}} - \frac{4e^3(1-c^2x^2)(a+b\arcsin(cx))^2}{cd\sqrt{d+cdx}\sqrt{e-cex}} + \frac{e^3x(1-c^2x^2)(a+b\arcsin(cx))^2}{2d\sqrt{d+cdx}\sqrt{e-cex}} - \frac{5e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bcd\sqrt{d+cdx}\sqrt{e-cex}} - \frac{32ibe^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}} + \frac{16be^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}} + \frac{16ib^2e^3\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}} - \frac{16ib^2e^3\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}} - \frac{8ib^2e^3\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cd\sqrt{d+cdx}\sqrt{e-cex}}$$

output
```
8*b^2*e^3*(-c^2*x^2+1)/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/4*b^2*e^3*x*
(-c^2*x^2+1)/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/4*b^2*e^3*(-c^2*x^2+1)^(
1/2)*arcsin(c*x)/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+8*b*e^3*x*(-c^2*x^2+
1)^(1/2)*(a+b*arcsin(c*x))/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/2*b*c*e^3*
x^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2
)-8*e^3*(a+b*arcsin(c*x))^2/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+8*e^3*x*(
a+b*arcsin(c*x))^2/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-8*I*e^3*(-c^2*x^2+1)
^(1/2)*(a+b*arcsin(c*x))^2/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4*e^3*(-c^
2*x^2+1)*(a+b*arcsin(c*x))^2/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/2*e^3*
x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-5/2*
e^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3/b/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e
)^(1/2)-32*I*b*e^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2
*x^2+1)^(1/2))/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+16*b*e^3*(-c^2*x^2+1)^
(1/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d/(c*d*x+d)^(
1/2)/(-c*e*x+e)^(1/2)-8*I*b^2*e^3*(-c^2*x^2+1)^(1/2)*polylog(2,-(I*c*x+(-c
^2*x^2+1)^(1/2))^2)/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-16*I*b^2*e^3*(-c^
2*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d/(c*d*x+d)^(1/2)
/(-c*e*x+e)^(1/2)+16*I*b^2*e^3*(-c^2*x^2+1)^(1/2)*polylog(2,-I*(I*c*x+(-c^
2*x^2+1)^(1/2)))/c/d/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Mathematica [A] (verified)

Time = 19.58 (sec) , antiderivative size = 1642, normalized size of antiderivative = 1.83

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

output
```
(e^2*(12*a^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(-24 - 7*c*
x + c^2*x^2)*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + 180*a^2*Sqrt[d]*S
qrt[e]*(1 + c*x)*Sqrt[1 - c^2*x^2]*ArcTan[(c*x*Sqrt[d + c*d*x]*Sqrt[e - c*
e*x])/(Sqrt[d]*Sqrt[e]*(-1 + c^2*x^2))]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c
*x]/2]) - 24*a*b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(Cos[ArcSin[c*x
]/2]*(ArcSin[c*x]*(4 + ArcSin[c*x]) - 8*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSi
n[c*x]/2]]) + ((-4 + ArcSin[c*x])*ArcSin[c*x] - 8*Log[Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]) - 8*b^2*(1 + c*x)*Sqrt[d + c*d*x
]*Sqrt[e - c*e*x]*((6 + 6*I)*ArcSin[c*x]^2*(Cos[ArcSin[c*x]/2] + I*Sin[Arc
Sin[c*x]/2]) + ArcSin[c*x]^3*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) - (
6*I)*ArcSin[c*x]*(Pi - (4*I)*Log[1 - I*E^(I*ArcSin[c*x])])*(Cos[ArcSin[c*x
]/2] + Sin[ArcSin[c*x]/2]) - 12*Pi*(2*Log[1 + E^((-I)*ArcSin[c*x])] + Log[
1 - I*E^(I*ArcSin[c*x])] - 2*Log[Cos[ArcSin[c*x]/2]] - Log[Sin[(Pi + 2*Arc
Sin[c*x])/4]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + (24*I)*PolyLog[
2, I*E^(I*ArcSin[c*x])]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])) - 96*a*
b*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(ArcSin[c*x]^2*(Cos[ArcSin[c*x
]/2] + Sin[ArcSin[c*x]/2]) - (c*x + 4*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[
c*x]/2]])*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]) + ArcSin[c*x]*((2 + Sq
rt[1 - c^2*x^2])*Cos[ArcSin[c*x]/2] + (-2 + Sqrt[1 - c^2*x^2])*Sin[ArcSin[
c*x]/2])) - 16*b^2*(1 + c*x)*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[...
```

Rubi [A] (verified)

Time = 1.48 (sec) , antiderivative size = 411, normalized size of antiderivative = 0.46, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\int \frac{e^4(1-cx)^4(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^4\left(1-c^2x^2\right)^{3/2}\int\frac{(1-cx)^4(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \textbf{5274}$$

$$\frac{e^4\left(1-c^2x^2\right)^{3/2}\int\left(-\frac{c^2x^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{4cx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{7(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{8(1-cx)(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{3/2}}\right)dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \textbf{2009}$$

$$\frac{e^4\left(1-c^2x^2\right)^{3/2}\left(-\frac{32ib\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c}+\frac{1}{2}x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{4\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c}\right.}{}$$

input
```
Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(3/2),x]
```

output
```
(e^4*(1 - c^2*x^2)^(3/2)*(8*a*b*x + (8*b^2*Sqrt[1 - c^2*x^2])/c - (b^2*x*S
qrt[1 - c^2*x^2])/4 + (b^2*ArcSin[c*x])/(4*c) + 8*b^2*x*ArcSin[c*x] - (b*c
*x^2*(a + b*ArcSin[c*x]))/2 - ((8*I)*(a + b*ArcSin[c*x])^2)/c - (8*(a + b*
ArcSin[c*x])^2)/(c*Sqrt[1 - c^2*x^2]) + (8*x*(a + b*ArcSin[c*x])^2)/Sqrt[1
 - c^2*x^2] - (4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/c + (x*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 - (5*(a + b*ArcSin[c*x])^3)/(2*b*c) - ((
32*I)*b*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c + (16*b*(a + b*Ar
cSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/c + ((16*I)*b^2*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/c - ((16*I)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x])])/c -
((8*I)*b^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/((d + c*d*x)^(3/2)*(e -
 c*e*x)^(3/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Maple [A] (verified)

Time = 3.93 (sec) , antiderivative size = 1078, normalized size of antiderivative = 1.20

method	result	size
default	Expression too large to display	1078

input
```
int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x,method=_RETURNV
ERBOSE)
```

output
```
5/2*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/(c*x+1)/(c*x-1
)/d^2/c*(a+b*arcsin(c*x))^3*e^2/b+1/32*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2
)*(4*c^3*x^3-2*c^2*x^2-4*I*x^2*c^2*(-c^2*x^2+1)^(1/2)-3*c*x+2*I*(-c^2*x^2+
1)^(1/2)*c*x+1+I*(-c^2*x^2+1)^(1/2))*(2*I*b^2*arcsin(c*x)+2*arcsin(c*x)^2*
b^2+2*I*a*b+4*arcsin(c*x)*a*b+2*a^2-b^2)*e^2/(c*x+1)/(c*x-1)/d^2/c-(-e*(c*
x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-I*(-c^2*x^2+1)^(1/2)+c*x-1)*(2*I*b^2*arcsi
n(c*x)+arcsin(c*x)^2*b^2+2*I*a*b+2*arcsin(c*x)*a*b+a^2-2*b^2)*e^2/(c*x+1)/
(c*x-1)/d^2/c-2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)
*c*x+c^2*x^2-1)*(-2*I*b^2*arcsin(c*x)+arcsin(c*x)^2*b^2-2*I*b*a+2*arcsin(c
*x)*a*b+a^2-2*b^2)*e^2/(c*x+1)/(c*x-1)/d^2/c+1/32*(-e*(c*x-1))^(1/2)*(d*(c
*x+1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*c*x+2*c^2*x^2-I*(-c^2*x^2+1)^(1/2)-c*
x-1)*(-2*I*b^2*arcsin(c*x)+2*arcsin(c*x)^2*b^2-2*I*b*a+4*arcsin(c*x)*a*b+2
*a^2-b^2)*e^2/(c*x+1)/(c*x-1)/d^2/c-8*e^2*(arcsin(c*x)^2*b^2+2*arcsin(c*x)
*a*b+a^2)*(I*(-c^2*x^2+1)^(1/2)+c*x-1)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2
)/d^2/c/(c^2*x^2-1)+16*I*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))
^(1/2)/(c*x+1)/(c*x-1)/d^2/c*b*(2*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)
^(1/2)))*b+arcsin(c*x)^2*b+2*I*a*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)-2*I*a*ln(I
*c*x+(-c^2*x^2+1)^(1/2))+2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*b)*e^2-
1/8*(I*(-c^2*x^2+1)^(1/2)+c*x-1)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(15*
I*b^2*arcsin(c*x)+8*arcsin(c*x)^2*b^2+15*I*a*b+16*arcsin(c*x)*a*b+8*a^2...
```

Fricas [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorith
m="fricas")
```

output
```
integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2
*b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x
 + a*b*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^2*d^2*x^2 + 2
*c*d^2*x + d^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \text{Timed out}$$

input
```
integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(3/2),x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx = \int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2),x, algorith
m="giac")
```

output
```
integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e-c\,e\,x)^{5/2}}{(d+c\,d\,x)^{3/2}}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(3/2),x)
```

output
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(3/2), x)
```

Reduce [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}}\,dx=\frac{\sqrt{e}\,e^2\left(30\sqrt{cx+1}\,asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2+\sqrt{-cx+1}\,a^2c^2x^2-7\sqrt{-cx}\right.}{}$$

input
```
int((-c*e*x+e)^(5/2)*(a+b*asin(c*x))^2/(c*d*x+d)^(3/2),x)
```

output
```
(sqrt(e)*e**2*(30*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + sqrt
( - c*x + 1)*a**2*c**2*x**2 - 7*sqrt( - c*x + 1)*a**2*c*x - 24*sqrt( - c*x
 + 1)*a**2 + 4*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)*x**2)/(sqrt(c
*x + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c**3 - 8*sqrt(c*x + 1)*int((sqrt( - c*
x + 1)*asin(c*x)*x)/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c**2 + 4*sq
rt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c*x + sqrt(c*x
 + 1)),x)*a*b*c + 2*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)**2*x**2)
/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2*c**3 - 4*sqrt(c*x + 1)*int((s
qrt( - c*x + 1)*asin(c*x)**2*x)/(sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**
2*c**2 + 2*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)**2)/(sqrt(c*x + 1
)*c*x + sqrt(c*x + 1)),x)*b**2*c))/(2*sqrt(d)*sqrt(c*x + 1)*c*d)
```

3.86 $\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 717

$$
\begin{aligned}
\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx &= -\frac{2b^2e^3(1-c^2x^2)}{cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{2be^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{d^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{28ie^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{e^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{cd^2\sqrt{d+cdx}\sqrt{e-cex}} + \frac{5e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bcd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{16b^2e^3\sqrt{1-c^2x^2}\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{28e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{8be^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{4e^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{112be^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{112ib^2e^3\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3cd^2\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

output
```
-2*b^2*e^3*(-c^2*x^2+1)/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2*b*e^3*x*(
-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2
8/3*I*e^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/c/d^2/(c*d*x+d)^(1/2)/(-c
*e*x+e)^(1/2)+e^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/d^2/(c*d*x+d)^(1/2)/(
-c*e*x+e)^(1/2)+5/3*e^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3/b/c/d^2/(c*
d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-16/3*b^2*e^3*(-c^2*x^2+1)^(1/2)*cot(1/4*Pi+1
/2*arcsin(c*x))/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+28/3*e^3*(-c^2*x^2+
1)^(1/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))/c/d^2/(c*d*x+d)^(
1/2)/(-c*e*x+e)^(1/2)-8/3*b*e^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*csc(1
/4*Pi+1/2*arcsin(c*x))^2/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-4/3*e^3*(-
c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*P
i+1/2*arcsin(c*x))^2/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-112/3*b*e^3*(-
c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^
2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+112/3*I*b^2*e^3*(-c^2*x^2+1)^(1/2)*poly
log(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2338 vs. $2(717) = 1434$.

Time = 22.06 (sec) , antiderivative size = 2338, normalized size of antiderivative = 3.26

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Result too large to show}$$

input
```
Integrate[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

output
```
(Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*((a^2*e^2)/d^3 - (8*a^2*e^2)/(3*d
^3*(1 + c*x)^2) + (28*a^2*e^2)/(3*d^3*(1 + c*x))))/c - (5*a^2*e^(5/2)*ArcT
an[(c*x*Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)])/(Sqrt[d]*Sqrt[e]*(-1 + c*
x)*(1 + c*x))])/(c*d^(5/2)) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqr
t[-(d*e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[Arc
Sin[c*x]/2]*(-8 + 6*ArcSin[c*x] + 9*ArcSin[c*x]^2 - 84*Log[Cos[ArcSin[c*x]
/2] + Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/2]*((14 - 3*ArcSin[c*x])*
ArcSin[c*x] + 28*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(-4 + 4
*ArcSin[c*x] + 6*ArcSin[c*x]^2 + Sqrt[1 - c^2*x^2]*(ArcSin[c*x]*(14 + 3*Ar
cSin[c*x]) - 28*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 56*Log[Cos
[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 +
 c*x)*Sqrt[(-d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]
/2])^4) - (a*b*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[-(d*e*(1 - c^2*x^2
))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])*(Cos[(3*ArcSin[c*x])/2]*(Arc
Sin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) - Cos[ArcSin[c*
x]/2]*(4 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])
 + 2*(-2 + 2*ArcSin[c*x] + Sqrt[1 - c^2*x^2]*ArcSin[c*x] - 4*Log[Cos[ArcSi
n[c*x]/2] + Sin[ArcSin[c*x]/2]] - 2*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/
2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(3*c*d^3*(-1 + c*x)*Sqrt[(-
d - c*d*x)*(e - c*e*x)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^4) - ...
```

Rubi [A] (verified)

Time = 1.54 (sec) , antiderivative size = 344, normalized size of antiderivative = 0.48, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5178, 27, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(cdx+d)^{5/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\int \frac{e^5(1-cx)^5(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^5\left(1-c^2x^2\right)^{5/2}\int \frac{(1-cx)^5(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 5274

$$\frac{e^5\left(1-c^2x^2\right)^{5/2}\int \left(-\frac{cx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{12(a+b\arcsin(cx))^2}{(cx+1)\sqrt{1-c^2x^2}}+\frac{8(a+b\arcsin(cx))^2}{(cx+1)^2\sqrt{1-c^2x^2}}+\frac{5(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 2009

$$e^5\left(1-c^2x^2\right)^{5/2}\left(\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c}+\frac{5(a+b\arcsin(cx))^3}{3bc}+\frac{28i(a+b\arcsin(cx))^2}{3c}-\frac{112b\log\left(1-ie^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c}\right.$$

input
```
Int[((e - c*e*x)^(5/2)*(a + b*ArcSin[c*x])^2)/(d + c*d*x)^(5/2),x]
```

output
```
(e^5*(1 - c^2*x^2)^(5/2)*(-2*a*b*x - (2*b^2*Sqrt[1 - c^2*x^2])/c - 2*b^2*x
*ArcSin[c*x] + (((28*I)/3)*(a + b*ArcSin[c*x])^2)/c + (Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x])^2)/c + (5*(a + b*ArcSin[c*x])^3)/(3*b*c) - (16*b^2*Cot[
Pi/4 + ArcSin[c*x]/2])/(3*c) + (28*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin
[c*x]/2])/(3*c) - (8*b*(a + b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(3
*c) - (4*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin
[c*x]/2]^2)/(3*c) - (112*b*(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])
])/(3*c) + (((112*I)/3)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x])])/c))/((d + c*d
*x)^(5/2)*(e - c*e*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

Maple [A] (verified)

Time = 4.10 (sec) , antiderivative size = 905, normalized size of antiderivative = 1.26

method	result
default	$-\frac{5\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,(a+b\arcsin(cx))^3e^2}{3(cx+1)d^3(cx-1)cb}+\frac{\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}\,\left(c^2x^2-i\sqrt{-c^2x^2+1}\,cx-1\right)\left(2ib^2\arcsin(c\right.}{2(cx+1)d^3(cx-}$

input
```
int((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x,method=_RETURNV
ERBOSE)
```

output
```
-5/3*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/(c*x+1)/d^3/(
c*x-1)/c*(a+b*arcsin(c*x))^3*e^2/b+1/2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2
)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*(2*I*b^2*arcsin(c*x)+arcsin(c*x)^2*
b^2+2*I*a*b+2*arcsin(c*x)*a*b+a^2-2*b^2)*e^2/(c*x+1)/d^3/(c*x-1)/c+1/2*(-e
*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(-2
*I*b^2*arcsin(c*x)+arcsin(c*x)^2*b^2-2*I*b*a+2*arcsin(c*x)*a*b+a^2-2*b^2)*
e^2/(c*x+1)/d^3/(c*x-1)/c+4/3*e^2*(-14*I*a*b+63*arcsin(c*x)^2*b^2*c^2*x^2-
14*I*b^2*arcsin(c*x)+126*a*b*c^2*x^2*arcsin(c*x)-28*I*arcsin(c*x)*b^2*c*x-
14*I*a*b*c^2*x^2+96*c*arcsin(c*x)^2*b^2*x-14*(-c^2*x^2+1)^(1/2)*arcsin(c*x
)*b^2*c*x+63*a^2*c^2*x^2-32*x^2*c^2*b^2-4*I*(-c^2*x^2+1)^(1/2)*b^2*c*x+192
*c*arcsin(c*x)*a*b*x-14*(-c^2*x^2+1)^(1/2)*a*b*c*x-28*I*a*b*c*x-14*I*arcsi
n(c*x)*b^2*c^2*x^2+37*arcsin(c*x)^2*b^2-10*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*
b^2+96*c*x*a^2-56*x*c*b^2-4*I*(-c^2*x^2+1)^(1/2)*b^2+74*arcsin(c*x)*a*b-10
*(-c^2*x^2+1)^(1/2)*a*b+37*a^2-24*b^2)*(7*I*(-c^2*x^2+1)^(1/2)*x*c+7*c^2*x
^2+7*I*(-c^2*x^2+1)^(1/2)-2*c*x-5)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(6
3*c^5*x^5+159*c^4*x^4+70*c^3*x^3-122*c^2*x^2-133*c*x-37)/c/d^3-56/3*I*(-c^
2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/(c*x+1)/d^3/(c*x-1)/c*
b*(2*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*b+arcsin(c*x)^2*b+I*
ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*a-2*I*a*ln(I*c*x+(-c^2*x^2+1)^(1/2))+2*
arctan(I*c*x+(-c^2*x^2+1)^(1/2))*a+2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1...
```

Fricas [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx=\int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin\left(cx\right)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorith
m="fricas")
```

output
```
integral((a^2*c^2*e^2*x^2 - 2*a^2*c*e^2*x + a^2*e^2 + (b^2*c^2*e^2*x^2 - 2
*b^2*c*e^2*x + b^2*e^2)*arcsin(c*x)^2 + 2*(a*b*c^2*e^2*x^2 - 2*a*b*c*e^2*x
 + a*b*e^2)*arcsin(c*x))*sqrt(c*d*x + d)*sqrt(-c*e*x + e)/(c^3*d^3*x^3 + 3
*c^2*d^3*x^2 + 3*c*d^3*x + d^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Timed out}$$

input
```
integrate((-c*e*x+e)**(5/2)*(a+b*asin(c*x))**2/(c*d*x+d)**(5/2),x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx = \int \frac{(-cex+e)^{\frac{5}{2}}(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((-c*e*x+e)^(5/2)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2),x, algorith
m="giac")
```

output
```
integrate((-c*e*x + e)^(5/2)*(b*arcsin(c*x) + a)^2/(c*d*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx=\int \frac{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,{\left(e-c\,e\,x\right)}^{5/2}}{{\left(d+c\,d\,x\right)}^{5/2}}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(5/2),x)
```

output
```
int(((a + b*asin(c*x))^2*(e - c*e*x)^(5/2))/(d + c*d*x)^(5/2), x)
```

Reduce [F]

$$\int \frac{(e-cex)^{5/2}(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}}\,dx=\text{Too large to display}$$

input
```
int((-c*e*x+e)^(5/2)*(a+b*asin(c*x))^2/(c*d*x+d)^(5/2),x)
```

output

```
(sqrt(e)*e**2*( - 30*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a**2*c*x
 - 30*sqrt(c*x + 1)*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + 3*sqrt( - c*x +
1)*a**2*c**2*x**2 + 34*sqrt( - c*x + 1)*a**2*c*x + 23*sqrt( - c*x + 1)*a**
2 + 6*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)*x**2)/(sqrt(c*x + 1)*c
**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c**4*x + 6*sqrt(c*x
 + 1)*int((sqrt( - c*x + 1)*asin(c*x)*x**2)/(sqrt(c*x + 1)*c**2*x**2 + 2*s
qrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c**3 - 12*sqrt(c*x + 1)*int((sqrt
( - c*x + 1)*asin(c*x)*x)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x +
 sqrt(c*x + 1)),x)*a*b*c**3*x - 12*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asi
n(c*x)*x)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),
x)*a*b*c**2 + 6*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x +
 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c**2*x + 6*sqr
t(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x))/(sqrt(c*x + 1)*c**2*x**2 + 2*s
qrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*a*b*c + 3*sqrt(c*x + 1)*int((sqrt( -
c*x + 1)*asin(c*x)**2*x**2)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x
 + sqrt(c*x + 1)),x)*b**2*c**4*x + 3*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*a
sin(c*x)**2*x**2)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*
x + 1)),x)*b**2*c**3 - 6*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)**2*
x)/(sqrt(c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*c*x + sqrt(c*x + 1)),x)*b**2
*c**3*x - 6*sqrt(c*x + 1)*int((sqrt( - c*x + 1)*asin(c*x)**2*x)/(sqrt(c...
```

3.87 $\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 55

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d+cdx}\sqrt{e-cex}}$$

output
```
1/3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(c*d*x+d)^(1/2)/(-c*e*x+e)^
(1/2)
```

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 159 vs. 2(55) = 110.

Time = 0.53 (sec) , antiderivative size = 159, normalized size of antiderivative = 2.89

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

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

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

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.062$, Rules used = {5178, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}\sqrt{e-cex}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{cdx+d}\sqrt{e-cex}}$$

$$\Big\downarrow \text{5152}$$

$$\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{cdx+d}\sqrt{e-cex}}$$

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

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

Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 196 vs. $2(47) = 94$.

Time = 0.00 (sec) , antiderivative size = 197, normalized size of antiderivative = 3.58

method	result
default	$\frac{a^2\sqrt{(cdx+d)(-cxe+e)}\,\arctan\left(\frac{\sqrt{c^2de}\,x}{\sqrt{-c^2d\,x^2e+de}}\right)}{\sqrt{-cxe+e}\,\sqrt{cdx+d}\,\sqrt{c^2de}} - \frac{b^2\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{3dec(c^2x^2-1)} - \frac{ab\sqrt{-e(cx-1)}\,\sqrt{d(cx}}{dec}$
parts	$\frac{a^2\sqrt{(cdx+d)(-cxe+e)}\,\arctan\left(\frac{\sqrt{c^2de}\,x}{\sqrt{-c^2d\,x^2e+de}}\right)}{\sqrt{-cxe+e}\,\sqrt{cdx+d}\,\sqrt{c^2de}} - \frac{b^2\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3}{3dec(c^2x^2-1)} - \frac{ab\sqrt{-e(cx-1)}\,\sqrt{d(cx}}{dec}$

input
```
int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x,method=_RETURNV
ERBOSE)
```

output
```
a^2*((c*d*x+d)*(-c*e*x+e))^(1/2)/(-c*e*x+e)^(1/2)/(c*d*x+d)^(1/2)/(c^2*d*e
)^(1/2)*arctan((c^2*d*e)^(1/2)*x/(-c^2*d*e*x^2+d*e)^(1/2))-1/3*b^2*(-e*(c*
x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/e/c/(c^2*x^2-1)*arcsin(
c*x)^3-a*b*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/e/c/(
c^2*x^2-1)*arcsin(c*x)^2
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\int \frac{(b\arcsin{(cx)}+a)^2}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorith
m="fricas")
```

output
```
integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sq
rt(-c*e*x + e)/(c^2*d*e*x^2 - d*e), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\int \frac{(a+b\operatorname{asin}{(cx)})^2}{\sqrt{d\,(cx+1)}\,\sqrt{-e\,(cx-1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*sqrt(-e*(c*x - 1))), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}\sqrt{-cex+e}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x, algorith
m="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*sqrt(-c*e*x + e)), x)
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(1/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}\sqrt{e-cex}}\,dx$$
$$= \frac{-2asin\left(\frac{\sqrt{-cx+1}}{\sqrt{2}}\right)a^2+2\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)abc+\left(\int \frac{asin(cx)^2}{\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)b^2c}{\sqrt{e}\,\sqrt{d}\,c}$$

input
```
int((a+b*asin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2),x)
```

output
```
( - 2*asin(sqrt( - c*x + 1)/sqrt(2))*a**2 + 2*int(asin(c*x)/(sqrt(c*x + 1)
*sqrt( - c*x + 1)),x)*a*b*c + int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x
+ 1)),x)*b**2*c)/(sqrt(e)*sqrt(d)*c)
```

3.88 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 455

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx &= -\frac{e(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{ex(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{ie(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{4ibe(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2be(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2ib^2e(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{2ib^2e(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{ib^2e(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\end{aligned}$$

output
```
-e*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+e*x
*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*e*(-c
^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-4*I
*b*e*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))
/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*e*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c
*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)
+2*I*b^2*e*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(
c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-2*I*b^2*e*(-c^2*x^2+1)^(3/2)*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*e*(-c^
2*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/
(-c*e*x+e)^(3/2)
```

Mathematica [A] (verified)

Time = 2.28 (sec) , antiderivative size = 217, normalized size of antiderivative = 0.48

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx =$$
$$-\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(-b^2\sqrt{1-c^2x^2}\arcsin(cx)^2\left(-i+\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)+2b\sqrt{1-c^2x^2}\arcsin(cx\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*Sqrt[e - c*e*x]),x]
```

output
```
-((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(-(b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*
(-I + Cot[(Pi + 2*ArcSin[c*x])/4])) + 2*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(-
(a*Cot[(Pi + 2*ArcSin[c*x])/4]) + 2*b*Log[1 + I/E^(I*ArcSin[c*x])]) + a*(-
a + a*c*x + 2*b*Sqrt[1 - c^2*x^2]*Log[1 + c*x]) + (4*I)*b^2*Sqrt[1 - c^2*x
^2]*PolyLog[2, (-I)/E^(I*ArcSin[c*x])]))/(c*d^2*e*(-1 + c*x)*(1 + c*x)))
```

Rubi [A] (verified)

Time = 0.89 (sec) , antiderivative size = 240, normalized size of antiderivative = 0.53, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}\sqrt{e-cex}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{3/2}\int \frac{e(1-cx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e(1-c^2x^2)^{3/2}\int \frac{(1-cx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{e(1-c^2x^2)^{3/2}\int \left(\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}-\frac{cx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e(1-c^2x^2)^{3/2}\left(-\frac{4ib\arctan(e^{i\arcsin(cx)})(a+b\arcsin(cx))}{c}+\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{(a+b\arcsin(cx))^2}{c\sqrt{1-c^2x^2}}-\frac{i(a+b\arcsin(cx))^2}{c}+\frac{2b\log(1}{}\right.}{(cdx+d)^{3/2}(e}$$

input
```
Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*Sqrt[e - c*e*x]),x]
```

output
```
(e*(1 - c^2*x^2)^(3/2)*(((-I)*(a + b*ArcSin[c*x])^2)/c - (a + b*ArcSin[c*x
])^2/(c*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] -
 ((4*I)*b*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c + (2*b*(a + b*A
rcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/c + ((2*I)*b^2*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/c - ((2*I)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x])])/c - (
I*b^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/((d + c*d*x)^(3/2)*(e - c*e*
x)^(3/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [A] (verified)

Time = 2.91 (sec) , antiderivative size = 430, normalized size of antiderivative = 0.95

method	result
default	$-\frac{a^2\sqrt{-cxe+e}}{cde\sqrt{cdx+d}}+b^2\left(-\frac{\arcsin(cx)^2\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}\,\left(i\sqrt{-c^2x^2+1}+cx-1\right)}{(cx+1)c\,d^2e(cx-1)}+\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,\left(2\right.}{}\right.$
parts	$-\frac{a^2\sqrt{-cxe+e}}{cde\sqrt{cdx+d}}+b^2\left(-\frac{\arcsin(cx)^2\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}\,\left(i\sqrt{-c^2x^2+1}+cx-1\right)}{(cx+1)c\,d^2e(cx-1)}+\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,\left(2\right.}{}\right.$

input
```
int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x,method=_RETURNV
ERBOSE)
```

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

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx=\int \frac{(b\arcsin{(cx)}+a)^2}{(cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorith
m="fricas")
```

output
```
integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sq
rt(-c*e*x + e)/(c^3*d^2*e*x^3 + c^2*d^2*e*x^2 - c*d^2*e*x - d^2*e), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}\sqrt{-e(cx-1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*sqrt(-e*(c*x - 1))), x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}\sqrt{-cex+e}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x, algorith
m="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*sqrt(-c*e*x + e)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx=\int \frac{{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}^2}{{\left(d+c\,d\,x\right)}^{3/2}\,\sqrt{e-c\,e\,x}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(1/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}\sqrt{e-cex}}\,dx=\frac{-\sqrt{-cx+1}\,a^2+2\sqrt{cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,cx+\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)abc+\sqrt{cx}}{\sqrt{e}\,\sqrt{d}\,\sqrt{cx+1}\,cd}$$

input
```
int((a+b*asin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(1/2),x)
```

output
```
( - sqrt( - c*x + 1)*a**2 + 2*sqrt(c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*s
qrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b*c + sqrt(c*x
+ 1)*int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*
sqrt( - c*x + 1)),x)*b**2*c)/(sqrt(e)*sqrt(d)*sqrt(c*x + 1)*c*d)
```

3.89 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 896

$$\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = & -\frac{2b^2e^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& + \frac{2b^2e^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2e^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& - \frac{be^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& + \frac{2be^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& - \frac{bce^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& - \frac{2e^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{e^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& + \frac{c^2e^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& + \frac{2e^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& - \frac{ie^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& - \frac{4ibe^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& + \frac{2be^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& + \frac{2ib^2e^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& - \frac{2ib^2e^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} \\
& - \frac{ib^2e^2(1-c^2x^2)^{5/2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}
\end{aligned}$$

output
```
-2/3*b^2*e^2*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b^2*e^2
*x*(-c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b^2*e^2*(-c^2*x^2+1
)^(5/2)*arcsin(c*x)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*e^2*(-c^2*x^2
+1)^(3/2)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b*e^2*x
*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3
*b*c*e^2*x^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+
e)^(5/2)-2/3*e^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*
x+e)^(5/2)+1/3*e^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*
e*x+e)^(5/2)+1/3*c^2*e^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5
/2)/(-c*e*x+e)^(5/2)+2/3*e^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d
)^(5/2)/(-c*e*x+e)^(5/2)+2/3*I*b^2*e^2*(-c^2*x^2+1)^(5/2)*polylog(2,-I*(I*
c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*e^2*(-c^
2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*
b*e^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))
^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-4/3*I*b*e^2*(-c^2*x^2+1)^(5/2)*(a+b
*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(5/2)/(-c*e*x+e
)^(5/2)-2/3*I*b^2*e^2*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(
1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*b^2*e^2*(-c^2*x^2+1)^(5/2)
*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/
2)
```

Mathematica [A] (verified)

Time = 7.18 (sec) , antiderivative size = 369, normalized size of antiderivative = 0.41

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx =$$

$$-\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(\frac{2a^2(2+cx)}{(1+cx)^2}+\frac{b^2\left(\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\left(4+\arcsin(cx)^2\left(2+\csc^2\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)\right)+2\arcsin(cx)\left(-i\arcsin(\cdots\right.}{\sqrt{1-c^2x^2}}\right.}{\cdots}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*Sqrt[e - c*e*x]),x]
```

output
```
-1/6*(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((2*a^2*(2 + c*x))/(1 + c*x)^2 + (b^
2*(Cot[(Pi + 2*ArcSin[c*x])/4]*(4 + ArcSin[c*x]^2*(2 + Csc[(Pi + 2*ArcSin[
c*x])/4]^2)) + 2*ArcSin[c*x]*((-I)*ArcSin[c*x] + Csc[(Pi + 2*ArcSin[c*x])/
4]^2 - 4*Log[1 + I/E^(I*ArcSin[c*x])]) - (8*I)*PolyLog[2, (-I)/E^(I*ArcSin
[c*x])]))/Sqrt[1 - c^2*x^2] + (2*a*b*(Cos[ArcSin[c*x]/2]*(2 + 3*ArcSin[c*x
] - 6*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[(3*ArcSin[c*x])/
2]*(ArcSin[c*x] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + 2*(1 +
 (-1 + Sqrt[1 - c^2*x^2])*ArcSin[c*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x
^2]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3)))/(c*d^3*e)
```

Rubi [A] (verified)

Time = 1.49 (sec) , antiderivative size = 465, normalized size of antiderivative = 0.52, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{5/2}\sqrt{e-cex}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{5/2}\int \frac{e^2(1-cx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^2(1-c^2x^2)^{5/2}\int \frac{(1-cx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{e^2(1-c^2x^2)^{5/2}\int \left(\frac{c^2x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}-\frac{2cx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e^2(1-c^2x^2)^{5/2}\left(-\frac{4ib\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c}-\frac{bcx^2(a+b\arcsin(cx))}{3(1-c^2x^2)}+\frac{2x(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}}+\frac{x(a+b\arcsin(cx))^2}{3(1-c^2x^2)^{3/2}}+\frac{2i}{}\right.}{}$$

input
```
Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*Sqrt[e - c*e*x]),x]
```

output
```
(e^2*(1 - c^2*x^2)^(5/2)*((-2*b^2)/(3*c*Sqrt[1 - c^2*x^2]) + (2*b^2*x)/(3*
Sqrt[1 - c^2*x^2]) - (b^2*ArcSin[c*x])/(3*c) - (b*(a + b*ArcSin[c*x]))/(3*
c*(1 - c^2*x^2)) + (2*b*x*(a + b*ArcSin[c*x]))/(3*(1 - c^2*x^2)) - (b*c*x^
2*(a + b*ArcSin[c*x]))/(3*(1 - c^2*x^2)) - ((I/3)*(a + b*ArcSin[c*x])^2)/c
 - (2*(a + b*ArcSin[c*x])^2)/(3*c*(1 - c^2*x^2)^(3/2)) + (x*(a + b*ArcSin[
c*x])^2)/(3*(1 - c^2*x^2)^(3/2)) + (c^2*x^3*(a + b*ArcSin[c*x])^2)/(3*(1 -
 c^2*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x])^2)/(3*Sqrt[1 - c^2*x^2]) - (((
4*I)/3)*b*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c + (2*b*(a + b*A
rcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c) + (((2*I)/3)*b^2*PolyLog
[2, (-I)*E^(I*ArcSin[c*x])])/c - (((2*I)/3)*b^2*PolyLog[2, I*E^(I*ArcSin[c
*x])])/c - ((I/3)*b^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/((d + c*d*x)
^(5/2)*(e - c*e*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [A] (verified)

Time = 3.14 (sec) , antiderivative size = 666, normalized size of antiderivative = 0.74

method	result
default	$a^2\left(-\frac{\sqrt{-cxe+e}}{3cde(cdx+d)^{\frac{3}{2}}}-\frac{\sqrt{-cxe+e}}{3ce\,d^2\sqrt{cdx+d}}\right)+\frac{ib^2\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,\left(-2i\arcsin(cx)^2\sqrt{-c^2x^2+1}-2i\arcsin(cx\right.}{}$
parts	$a^2\left(-\frac{\sqrt{-cxe+e}}{3cde(cdx+d)^{\frac{3}{2}}}-\frac{\sqrt{-cxe+e}}{3ce\,d^2\sqrt{cdx+d}}\right)+\frac{ib^2\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,\left(-2i\arcsin(cx)^2\sqrt{-c^2x^2+1}-2i\arcsin(cx\right.}{}$

input
```
int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x,method=_RETURNV
ERBOSE)
```

output
```
a^2*(-1/3/c/d/e/(c*d*x+d)^(3/2)*(-c*e*x+e)^(1/2)-1/3/c/e/d^2/(c*d*x+d)^(1/
2)*(-c*e*x+e)^(1/2))+1/3*I*b^2*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c
*x-1))^(1/2)*(-2*I*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)-2*I*arcsin(c*x)*c*x+ar
csin(c*x)^2*x^2*c^2+8*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x*c
+4*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x^2*c^2+4*I*arcsin(c*x)*ln(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*(-c^2*x^2+1)^(1/2)+4*I*arcsin(c*x)*ln(1-I*
(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*x^2+2*arcsin(c*x)^2*c*x-2*c^2*x^2-2*I*(-c^
2*x^2+1)^(1/2)*c*x+8*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x*c-I*arcsin(
c*x)^2*(-c^2*x^2+1)^(1/2)*x*c-2*I*arcsin(c*x)+arcsin(c*x)^2-4*c*x+4*polylo
g(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2)/d^3/e/c/(c^4*x^4+2*c^3*x^3-2*c*x-1)+2
/3*a*b*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c
*x)*c^2*x^2-2*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c^2*x^2+arcsin(c*x)*(-c^2*x^2
+1)^(1/2)*c*x+2*I*arcsin(c*x)*c*x-4*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*x*c+2*a
rcsin(c*x)*(-c^2*x^2+1)^(1/2)+I*arcsin(c*x)+c*x-2*ln(I*c*x+(-c^2*x^2+1)^(1
/2)+I)+1)/d^3/e/c/(c^4*x^4+2*c^3*x^3-2*c*x-1)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorith
m="fricas")
```

output
```
integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sq
rt(-c*e*x + e)/(c^4*d^3*e*x^4 + 2*c^3*d^3*e*x^3 - 2*c*d^3*e*x - d^3*e), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{5}{2}}\sqrt{-e(cx-1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(5/2)*sqrt(-e*(c*x - 1))), x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}\sqrt{-cex+e}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x, algorith
m="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*sqrt(-c*e*x + e)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{5/2}\,\sqrt{e-c\,e\,x}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(1/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}\sqrt{e-cex}}\,dx = \frac{-\sqrt{-cx+1}\,a^2cx-2\sqrt{-cx+1}\,a^2+6\sqrt{cx+1}\left(\int \frac{asin(c}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2+2\sqrt{cx+1}\,\sqrt{}}\right.}{}$$

input
```
int((a+b*asin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(1/2),x)
```

output
```
( - sqrt( - c*x + 1)*a**2*c*x - 2*sqrt( - c*x + 1)*a**2 + 6*sqrt(c*x + 1)*
int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*
sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b*c**2*x + 6*s
qrt(c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 + 2*s
qrt(c*x + 1)*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b
*c + 3*sqrt(c*x + 1)*int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2
*x**2 + 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x +
 1)),x)*b**2*c**2*x + 3*sqrt(c*x + 1)*int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt
( - c*x + 1)*c**2*x**2 + 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x + sqrt(c*x +
 1)*sqrt( - c*x + 1)),x)*b**2*c)/(3*sqrt(e)*sqrt(d)*sqrt(c*x + 1)*c*d**2*(
c*x + 1))
```

3.90 $\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 454

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx &= \frac{d(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{dx(1-c^2x^2)\,(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}} - \frac{id(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))^2}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{4ibd(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2bd(1-c^2x^2)^{3/2}\,(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{2ib^2d(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &+ \frac{2ib^2d(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}} \\ &- \frac{ib^2d(1-c^2x^2)^{3/2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c(d+cdx)^{3/2}(e-cex)^{3/2}}\end{aligned}$$

output
```
d*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+d*x*
(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*d*(-c^
2*x^2+1)^(3/2)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+4*I*
b*d*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/
c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*b*d*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*
x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-
2*I*b^2*d*(-c^2*x^2+1)^(3/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c
*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+2*I*b^2*d*(-c^2*x^2+1)^(3/2)*polylog(2,I*(I
*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)-I*b^2*d*(-c^2
*x^2+1)^(3/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(3/2)/(
-c*e*x+e)^(3/2)
```

Mathematica [A] (verified)

Time = 2.24 (sec) , antiderivative size = 221, normalized size of antiderivative = 0.49

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = -\frac{\sqrt{d+cdx}\sqrt{e-cex}\left(a\left(a+acx+4b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)\right)-4ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)),x]
```

output
```
-((Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(a*(a + a*c*x + 4*b*Sqrt[1 - c^2*x^2]*L
og[Cos[(Pi + 2*ArcSin[c*x])/4]]) - (4*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2,
(-I)*E^(I*ArcSin[c*x])] + b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2*(-I + Tan[(P
i + 2*ArcSin[c*x])/4]) + 2*b*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*(2*b*Log[1 + I*
E^(I*ArcSin[c*x])] + a*Tan[(Pi + 2*ArcSin[c*x])/4])))/(c*d*e^2*(-1 + c*x)*
(1 + c*x)))
```

Rubi [A] (verified)

Time = 0.91 (sec) , antiderivative size = 239, normalized size of antiderivative = 0.53, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}(e-cex)^{3/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{(1-c^2x^2)^{3/2}\int \frac{d(cx+1)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d(1-c^2x^2)^{3/2}\int \frac{(cx+1)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d(1-c^2x^2)^{3/2}\int \left(\frac{cx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}+\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{d(1-c^2x^2)^{3/2}\left(\frac{4ib\arctan(e^{i\arcsin(cx)})(a+b\arcsin(cx))}{c}+\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{(a+b\arcsin(cx))^2}{c\sqrt{1-c^2x^2}}-\frac{i(a+b\arcsin(cx))^2}{c}+\frac{2b\log(1+\ldots}{}\right.}{(cdx+d)^{3/2}(e-\ldots}$$

input
```
Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(3/2)),x]
```

output
```
(d*(1 - c^2*x^2)^(3/2)*(((-I)*(a + b*ArcSin[c*x])^2)/c + (a + b*ArcSin[c*x
])^2/(c*Sqrt[1 - c^2*x^2]) + (x*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] +
 ((4*I)*b*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c + (2*b*(a + b*A
rcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/c - ((2*I)*b^2*PolyLog[2, (-I)
*E^(I*ArcSin[c*x])])/c + ((2*I)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x])])/c - (
I*b^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/((d + c*d*x)^(3/2)*(e - c*e*
x)^(3/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [A] (verified)

Time = 3.00 (sec) , antiderivative size = 429, normalized size of antiderivative = 0.94

method	result
default	$\frac{a^2\sqrt{cdx+d}}{cde\sqrt{-cxe+e}}+b^2\left(-\frac{\arcsin(cx)^2\left(i\sqrt{-c^2x^2+1}+cx+1\right)\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}}{(cx-1)cd\,e^2(cx+1)}+\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,\left(2i\right.}{}\right.$
parts	$\frac{a^2\sqrt{cdx+d}}{cde\sqrt{-cxe+e}}+b^2\left(-\frac{\arcsin(cx)^2\left(i\sqrt{-c^2x^2+1}+cx+1\right)\sqrt{-e(cx-1)}\,\sqrt{d(cx+1)}}{(cx-1)cd\,e^2(cx+1)}+\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,\left(2i\right.}{}\right.$

input
```
int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x,method=_RETURNV
ERBOSE)
```

output
```
a^2/c/d/e/(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)+b^2*(-arcsin(c*x)^2*(I*(-c^2*x^
2+1)^(1/2)+c*x+1)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(c*x-1)/c/d/e^2/(c*
x+1)+2*I*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)*(2*I*arcs
in(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))+arcsin(c*x)^2+2*polylog(2,-I*(I
*c*x+(-c^2*x^2+1)^(1/2))))/c/d/e^2/(c^2*x^2-1))+2*a*b*(2*I*(-c^2*x^2+1)^(1
/2)*(d*(c*x+1))^(1/2)*(-e*(c*x-1))^(1/2)/c/d/e^2/(c^2*x^2-1)*arcsin(c*x)-a
rcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)+c*x+1)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/
2)/(c*x-1)/c/d/e^2/(c*x+1)-2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^
2+1)^(1/2)/c/d/e^2/(c^2*x^2-1)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorith
m="fricas")
```

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^3*d*e^2*x^3 - c^2*d*e^2*x^2 - c*d*e^2*x + d*e^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{d\,(cx+1)}\,(-e\,(cx-1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(3/2)), x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin\,(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x, algorith
m="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\sqrt{d+c\,d\,x}\,\left(e-c\,e\,x\right)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{3/2}}\,dx=\frac{-2\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,cx-\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)abc-\sqrt{-cx+1}\left(\int \frac{}{\sqrt{cx+\cdots}}\right.}{\sqrt{e}\,\sqrt{d}\,\sqrt{-cx+1}\,ce}$$

input
```
int((a+b*asin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2),x)
```

output
```
( - 2*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x -
 sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b*c - sqrt( - c*x + 1)*int(asin(c*x)
**2/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x - sqrt(c*x + 1)*sqrt( - c*x + 1)),
x)*b**2*c + sqrt(c*x + 1)*a**2)/(sqrt(e)*sqrt(d)*sqrt( - c*x + 1)*c*e)
```

3.91 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 231

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx=\frac{x(a+b\arcsin(cx))^2}{de\sqrt{d+cdx}\sqrt{e-cex}}-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cde\sqrt{d+cdx}\sqrt{e-cex}}+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cde\sqrt{d+cdx}\sqrt{e-cex}}-\frac{ib^2\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cde\sqrt{d+cdx}\sqrt{e-cex}}$$

output

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

Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 550 vs. 2(231) = 462.

Time = 0.19 (sec) , antiderivative size = 550, normalized size of antiderivative = 2.38

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \frac{a^2cx+2abcx\arcsin(cx)+2ib^2\pi\sqrt{1-c^2x^2}\arcsin(cx)+b^2cx\arcsin(cx)^2}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

output
```
(a^2*c*x + 2*a*b*c*x*ArcSin[c*x] + (2*I)*b^2*Pi*Sqrt[1 - c^2*x^2]*ArcSin[c
*x] + b^2*c*x*ArcSin[c*x]^2 - I*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 + 4*b^
2*Pi*Sqrt[1 - c^2*x^2]*Log[1 + E^((-I)*ArcSin[c*x])] + b^2*Pi*Sqrt[1 - c^2
*x^2]*Log[1 - I*E^(I*ArcSin[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*L
og[1 - I*E^(I*ArcSin[c*x])] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[1 + I*E^(I*ArcS
in[c*x])] + 2*b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x]
)] - 4*b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Cos[ArcSin[c*x]/2]] + b^2*Pi*Sqrt[1 -
c^2*x^2]*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[C
os[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 2*a*b*Sqrt[1 - c^2*x^2]*Log[Cos[
ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - b^2*Pi*Sqrt[1 - c^2*x^2]*Log[Sin[(P
i + 2*ArcSin[c*x])/4]] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, (-I)*E^(I*
ArcSin[c*x])] - (2*I)*b^2*Sqrt[1 - c^2*x^2]*PolyLog[2, I*E^(I*ArcSin[c*x])
])/(c*d*e*Sqrt[d + c*d*x]*Sqrt[e - c*e*x])
```

Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.61, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {5178, 5160, 5180, 3042, 4202, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{3/2}}\,dx$$

$$\Big\downarrow \text{ 5178}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\int\frac{(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{3/2}}dx}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{ 5160}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-2bc\int\frac{x(a+b\arcsin(cx))}{1-c^2x^2}dx\right)}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{ 5180}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\int\frac{cx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}d\arcsin(cx)}{c}\right)}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\int(a+b\arcsin(cx))\tan(\arcsin(cx))d\arcsin(cx)}{c}\right)}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{ 4202}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\int\frac{e^{2i\arcsin(cx)}(a+b\arcsin(cx))}{1+e^{2i\arcsin(cx)}}d\arcsin(cx)\right)}{c}\right)}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{ 2620}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\left(\frac{1}{2}ib\int\log\left(1+e^{2i\arcsin(cx)}\right)d\arcsin(cx)-\frac{1}{2}i\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin\right.\right.}{c}\right.}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{ 2715}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\left(\frac{1}{4}b\int e^{-2i\arcsin(cx)}\log\left(1+e^{2i\arcsin(cx)}\right)de^{2i\arcsin(cx)}-\frac{1}{2}i\log\left(1+e^{2i\arcsin(\right.\right.}{c}\right.}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

$$\Big\downarrow \text{ 2838}$$

$$\frac{\left(1-c^2x^2\right)^{3/2}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\left(-\frac{1}{2}i\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))-\frac{1}{4}b\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)\right)\right.}{c}\right.}{(cdx+d)^{3/2}(e-cex)^{3/2}}$$

input
```
Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x]
```

output
```
((1 - c^2*x^2)^(3/2)*((x*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (2*b*(
((I/2)*(a + b*ArcSin[c*x])^2)/b - (2*I)*((-1/2*I)*(a + b*ArcSin[c*x])*Log[
1 + E^((2*I)*ArcSin[c*x])] - (b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/4)))/c
))/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2))
```

Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4202
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^m*(E^(2*I*(
e + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGt
Q[m, 0]
```

rule 5160
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Simp[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[x*((a + b*ArcSin[c*x
])^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5180
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[-e^(-1)   Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x
]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 704 vs. $2(227) = 454$.

Time = 0.01 (sec) , antiderivative size = 705, normalized size of antiderivative = 3.05

method	result
default	$a^2\left(-\frac{1}{cde\sqrt{cdx+d}\,\sqrt{-cxe+e}}+\frac{\sqrt{cdx+d}}{ce\,d^2\sqrt{-cxe+e}}\right)-\frac{b^2\left(\arcsin(cx)^2+2\,\mathrm{polylog}\left(2,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)+2\,\mathrm{polylog}\left(2,i\left(icx+\right.\right.\right.}{}$
parts	$a^2\left(-\frac{1}{cde\sqrt{cdx+d}\,\sqrt{-cxe+e}}+\frac{\sqrt{cdx+d}}{ce\,d^2\sqrt{-cxe+e}}\right)-\frac{b^2\left(\arcsin(cx)^2+2\,\mathrm{polylog}\left(2,-i\left(icx+\sqrt{-c^2x^2+1}\right)\right)+2\,\mathrm{polylog}\left(2,i\left(icx+\right.\right.\right.}{}$

input
```
int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x,method=_RETURNV
ERBOSE)
```

output
```
a^2*(-1/c/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/c/e/d^2/(-c*e*x+e)^(1/2)*
(c*d*x+d)^(1/2))-b^2*(arcsin(c*x)^2+2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/
2)))+2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2*I*(-c^2*x^2+1)^(1/2)*poly
log(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x*c-2*I*(-c^2*x^2+1)^(1/2)*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x*c-2*I*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+
1)^(1/2)))*x^2*c^2-2*I*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x^2*
c^2+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x*
c+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x*c-
2*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x^2*c^2-2*polylog(2,I*(I*c*x+(-
c^2*x^2+1)^(1/2)))*x^2*c^2+2*I*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2
)))+2*I*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*arcsin(c*x))*(-I*(-c^2*x^2+1)^(
1/2)+c*x)*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/c/d^2/e^2/(c^2*x^2-1)+2*a*b
*(I*arcsin(c*x)*c^2*x^2-ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*x^2*c^2+arcsin(
c*x)*(-c^2*x^2+1)^(1/2)*c*x-I*arcsin(c*x)+ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^
2))*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d^2/e^2/(c^4
*x^4-2*c^2*x^2+1)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorith
m="fricas")
```

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{(d(cx+1))^{\frac{3}{2}}(-e(cx-1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/((d*(c*x + 1))**(3/2)*(-e*(c*x - 1))**(3/2))
, x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorith
m="maxima")
```

output
```
-b^2*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/((c^2*d*e*x^2
- d*e)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/(sqrt(d)*sqrt(e)) + 2*a*b*x*arcsi
n(c*x)/(sqrt(-c^2*d*e*x^2 + d*e)*d*e) + a^2*x/(sqrt(-c^2*d*e*x^2 + d*e)*d*
e) - a*b*sqrt(1/(d*e))*log(x^2 - 1/c^2)/(c*d*e)
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x, algorith
m="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx=\int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d+c\,d\,x\right)^{3/2}\,\left(e-c\,e\,x\right)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{3/2}}\,dx=\frac{-2\sqrt{cx+1}\,\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2-\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)ab-\sqrt{cx+}}{\sqrt{e}\,\sqrt{d}\,\sqrt{cx+1}\,\sqrt{-cx}}$$

input
```
int((a+b*asin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2),x)
```

output
```
( - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( -
c*x + 1)*c**2*x**2 - sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b - sqrt(c*x + 1
)*sqrt( - c*x + 1)*int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x
**2 - sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b**2 + a**2*x)/(sqrt(e)*sqrt(d)*s
qrt(c*x + 1)*sqrt( - c*x + 1)*d*e)
```

3.92 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 742

$$\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx &= -\frac{b^2}{3cd^2e\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{b^2x}{3d^2e\sqrt{d+cdx}\sqrt{e-cex}} - \frac{b(a+b\arcsin(cx))}{3cd^2e\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}} \\
&+ \frac{bx(a+b\arcsin(cx))}{3d^2e\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}} + \frac{2x(a+b\arcsin(cx))^2}{3d^2e\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{(a+b\arcsin(cx))^2}{3cd^2e\sqrt{d+cdx}\sqrt{e-cex}\,(1-c^2x^2)} \\
&+ \frac{x(a+b\arcsin(cx))^2}{3d^2e\sqrt{d+cdx}\sqrt{e-cex}\,(1-c^2x^2)} - \frac{2i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2e\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3cd^2e\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2e\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3cd^2e\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3cd^2e\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2e\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}$$

output
```
-1/3*b^2/c/d^2/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*b^2*x/d^2/e/(c*d*x+d
)^(1/2)/(-c*e*x+e)^(1/2)-1/3*b*(a+b*arcsin(c*x))/c/d^2/e/(c*d*x+d)^(1/2)/(
-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+1/3*b*x*(a+b*arcsin(c*x))/d^2/e/(c*d*x+
d)^(1/2)/(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2/3*x*(a+b*arcsin(c*x))^2/d^2
/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/3*(a+b*arcsin(c*x))^2/c/d^2/e/(c*d*x
+d)^(1/2)/(-c*e*x+e)^(1/2)/(-c^2*x^2+1)+1/3*x*(a+b*arcsin(c*x))^2/d^2/e/(c
*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)/(-c^2*x^2+1)-2/3*I*(-c^2*x^2+1)^(1/2)*(a+b*
arcsin(c*x))^2/c/d^2/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/3*I*b*(-c^2*x^2+
1)^(1/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/d^2/e/(c*d*x
+d)^(1/2)/(-c*e*x+e)^(1/2)+4/3*b*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1
+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d^2/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/
3*I*b^2*(-c^2*x^2+1)^(1/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2/
e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/3*I*b^2*(-c^2*x^2+1)^(1/2)*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d^2/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/3
*I*b^2*(-c^2*x^2+1)^(1/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d^2/e
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Mathematica [A] (warning: unable to verify)

Time = 9.23 (sec) , antiderivative size = 739, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x]
```

output
```
(Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(-1/4*a^2/(d^3*e^2*(-1 + c*x)) -
a^2/(6*d^3*e^2*(1 + c*x)^2) - (5*a^2)/(12*d^3*e^2*(1 + c*x))))/c + (a*b*Sq
rt[d + c*d*x]*Sqrt[e - c*e*x]*(2*ArcSin[c*x]*(-2*c*x + Cos[2*ArcSin[c*x]])
 - Sqrt[1 - c^2*x^2]*(-1 + 3*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]]
+ 5*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] + c*x*(3*Log[Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2]] + 5*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]]))))/(3*c*d^2*e*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1 - c^2*x^2)
)]*(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2) + (b^2*Sqrt[d + c*d*x]*Sqr
t[e - c*e*x]*Sqrt[1 - c^2*x^2]*((-7*I)*Pi*ArcSin[c*x] + (1 + 4*I)*ArcSin[c
*x]^2 - 16*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - 5*(Pi + 2*ArcSin[c*x])*Log[1
 - I*E^(I*ArcSin[c*x])] + 3*(Pi - 2*ArcSin[c*x])*Log[1 + I*E^(I*ArcSin[c*x
])] + 16*Pi*Log[Cos[ArcSin[c*x]/2]] - 3*Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4
]] + 5*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] + (6*I)*PolyLog[2, (-I)*E^(I*Ar
cSin[c*x])] + (10*I)*PolyLog[2, I*E^(I*ArcSin[c*x])] - (3*ArcSin[c*x]^2*Si
n[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]) - (2*ArcSin[c*
x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^3 + (Ar
cSin[c*x]*(2 + ArcSin[c*x]))/(Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2])^2 -
 ((4 + 5*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] + Sin[ArcS
in[c*x]/2])))/(6*c*d^2*e*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*e*(1 - c^
2*x^2))])
```

Rubi [A] (verified)

Time = 1.29 (sec) , antiderivative size = 386, normalized size of antiderivative = 0.52, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{5/2}(e-cex)^{3/2}}dx$$

$$\Big\downarrow \text{ 5178}$$

$$\frac{(1-c^2x^2)^{5/2}\int \frac{e(1-cx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e\left(1-c^2x^2\right)^{5/2}\int\frac{(1-cx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{e\left(1-c^2x^2\right)^{5/2}\int\left(\frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}-\frac{cx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e\left(1-c^2x^2\right)^{5/2}\left(-\frac{2ib\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c}+\frac{bx(a+b\arcsin(cx))}{3(1-c^2x^2)}-\frac{b(a+b\arcsin(cx))}{3c(1-c^2x^2)}+\frac{2x(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}}+\frac{x(a+b}{3(1-}\right.}{}$$

input
```
Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x]
```

output
```
(e*(1 - c^2*x^2)^(5/2)*(-1/3*b^2/(c*Sqrt[1 - c^2*x^2]) + (b^2*x)/(3*Sqrt[1
 - c^2*x^2]) - (b*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) + (b*x*(a + b*A
rcSin[c*x]))/(3*(1 - c^2*x^2)) - (((2*I)/3)*(a + b*ArcSin[c*x])^2)/c - (a
+ b*ArcSin[c*x])^2/(3*c*(1 - c^2*x^2)^(3/2)) + (x*(a + b*ArcSin[c*x])^2)/(
3*(1 - c^2*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x])^2)/(3*Sqrt[1 - c^2*x^2])
 - (((2*I)/3)*b*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c + (4*b*(a
 + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c) + ((I/3)*b^2*PolyL
og[2, (-I)*E^(I*ArcSin[c*x])])/c - ((I/3)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x
])])/c - (((2*I)/3)*b^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/((d + c*d*
x)^(5/2)*(e - c*e*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] && !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3172 vs. $2(685) = 1370$.

Time = 3.44 (sec) , antiderivative size = 3173, normalized size of antiderivative = 4.28

method	result	size
default	Expression too large to display	3173
parts	Expression too large to display	3173

input
```
int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x,method=_RETURNV
ERBOSE)
```

output

```
4/3*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4+9*c^3*x^3+c^2*x^2-
9*c*x-5)/d^3/e^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x-8/3*b^2*(-e*(c*x-1))^(1/
2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4+9*c^3*x^3+c^2*x^2-9*c*x-5)/d^3/e^2*c^2*arc
sin(c*x)^2*x^3-6*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4+9*c^3
*x^3+c^2*x^2-9*c*x-5)/d^3/e^2*c*arcsin(c*x)^2*x^2+5/3*b^2*(-e*(c*x-1))^(1/
2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4+9*c^3*x^3+c^2*x^2-9*c*x-5)/d^3/e^2/c*arcsi
n(c*x)*(-c^2*x^2+1)^(1/2)+10/3*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4
*c^4*x^4+9*c^3*x^3+c^2*x^2-9*c*x-5)/d^3/e^2*c*(-c^2*x^2+1)*x^2+4/3*b^2*(-e
*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4+9*c^3*x^3+c^2*x^2-9*c*x-5)/d^
3/e^2*c^2*(-c^2*x^2+1)*x^3-2/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/
(4*c^4*x^4+9*c^3*x^3+c^2*x^2-9*c*x-5)/d^3/e^2*arcsin(c*x)*x-3*I*b^2*(-e*(c
*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4+9*c^3*x^3+c^2*x^2-9*c*x-5)/d^3/e
^2*(-c^2*x^2+1)^(1/2)*x-10/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4
*c^4*x^4+9*c^3*x^3+c^2*x^2-9*c*x-5)/d^3/e^2*c*arcsin(c*x)*x^2-4/3*I*b^2*(-
e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4+9*c^3*x^3+c^2*x^2-9*c*x-5)/d
^3/e^2*c*(-c^2*x^2+1)^(1/2)*x^2-10/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^
(1/2)/(4*c^4*x^4+9*c^3*x^3+c^2*x^2-9*c*x-5)/d^3/e^2/c*arcsin(c*x)^2*(-c^2*
x^2+1)^(1/2)-2/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4+9*c
^3*x^3+c^2*x^2-9*c*x-5)/d^3/e^2/c*arcsin(c*x)*(-c^2*x^2+1)+4/3*I*b^2*(-e*(
c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^3/e^2/c/(c^2*x^2-1...
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2}{\left(cdx+d\right)^{\frac{5}{2}}\left(-cex+e\right)^{\frac{3}{2}}}\,dx$$

input

```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorith
m="fricas")
```

output

```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sqr
t(-c*e*x + e)/(c^5*d^3*e^2*x^5 + c^4*d^3*e^2*x^4 - 2*c^3*d^3*e^2*x^3 - 2*c
^2*d^3*e^2*x^2 + c*d^3*e^2*x + d^3*e^2), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(3/2),x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x, algorith
m="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*(-c*e*x + e)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d+c\,d\,x\right)^{5/2}\,\left(e-c\,e\,x\right)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{3/2}}\,dx = \frac{-6\sqrt{cx+1}\,\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^3x^3+\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2-\sqrt{cx+1}\,\sqrt{-cx+1}}\right.}{}$$

input
```
int((a+b*asin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(3/2),x)
```

output
```
( - 6*sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( -
c*x + 1)*c**3*x**3 + sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x +
 1)*sqrt( - c*x + 1)*c*x - sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b*c**2*x -
 6*sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x
 + 1)*c**3*x**3 + sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)
*sqrt( - c*x + 1)*c*x - sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b*c - 3*sqrt(
c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x + 1)
*c**3*x**3 + sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)*sqrt
( - c*x + 1)*c*x - sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b**2*c**2*x - 3*sqrt
(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x + 1
)*c**3*x**3 + sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)*sqr
t( - c*x + 1)*c*x - sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b**2*c + 2*a**2*c**
2*x**2 + 2*a**2*c*x - a**2)/(3*sqrt(e)*sqrt(d)*sqrt(c*x + 1)*sqrt( - c*x +
 1)*c*d**2*e*(c*x + 1))
```

3.93 $\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 896

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \frac{2b^2d^2(1-c^2x^2)^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2b^2d^2x(1-c^2x^2)^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{b^2d^2(1-c^2x^2)^{5/2}\arcsin(cx)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bd^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2bd^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{bcd^2x^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{d^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{c^2d^2x^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2d^2x(1-c^2x^2)^2(a+b\arcsin(cx))^2}{3(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{id^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{4ibd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2bd^2(1-c^2x^2)^{5/2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{2ib^2d^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} + \frac{2ib^2d^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}} - \frac{ib^2d^2(1-c^2x^2)^{5/2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c(d+cdx)^{5/2}(e-cex)^{5/2}}$$

output
```
2/3*b^2*d^2*(-c^2*x^2+1)^2/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*b^2*d^2*
x*(-c^2*x^2+1)^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b^2*d^2*(-c^2*x^2+1)
^(5/2)*arcsin(c*x)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*b*d^2*(-c^2*x^2+
1)^(3/2)*(a+b*arcsin(c*x))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-2/3*b*d^2*x*
(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*
b*c*d^2*x^2*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))/(c*d*x+d)^(5/2)/(-c*e*x+e
)^(5/2)+2/3*d^2*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c/(c*d*x+d)^(5/2)/(-c*e*x
+e)^(5/2)+1/3*d^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e
*x+e)^(5/2)+1/3*c^2*d^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c*d*x+d)^(5/
2)/(-c*e*x+e)^(5/2)+2/3*d^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2/(c*d*x+d)
^(5/2)/(-c*e*x+e)^(5/2)-2/3*I*b^2*d^2*(-c^2*x^2+1)^(5/2)*polylog(2,-I*(I*c
*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)-1/3*I*b^2*d^2*(
-c^2*x^2+1)^(5/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/
2)/(-c*e*x+e)^(5/2)+2/3*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*ln(1+(I
*c*x+(-c^2*x^2+1)^(1/2))^2)/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+2/3*I*b^2*d
^2*(-c^2*x^2+1)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/(c*d*x+d)^
(5/2)/(-c*e*x+e)^(5/2)-1/3*I*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))^2/c/
(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2)+4/3*I*b*d^2*(-c^2*x^2+1)^(5/2)*(a+b*arcsi
n(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2
)
```

Mathematica [A] (verified)

Time = 5.79 (sec) , antiderivative size = 388, normalized size of antiderivative = 0.43

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \frac{\sqrt{d+cdx}\sqrt{e-cex}\left(-\frac{2a^2(-2+cx)}{(-1+cx)^2}+\frac{2ab\left(\cos\left(\frac{3}{2}\arcsin(cx)\right)\left(\arcsin(cx)-2\log\left(\cos\left(\frac{1}{2}\arcsin(\right.\right.\right.\right.}{}}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)),x]
```

output
```
(Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*((-2*a^2*(-2 + c*x))/(-1 + c*x)^2 + (2*a*
b*(Cos[(3*ArcSin[c*x])/2]*(ArcSin[c*x] - 2*Log[Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2]]) + Cos[ArcSin[c*x]/2]*(-2 + 3*ArcSin[c*x] + 6*Log[Cos[ArcSin
[c*x]/2] - Sin[ArcSin[c*x]/2]]) + 2*(1 - (-1 + Sqrt[1 - c^2*x^2])*ArcSin[c
*x] - 2*(2 + Sqrt[1 - c^2*x^2])*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2
]])*Sin[ArcSin[c*x]/2]))/(Sqrt[1 - c^2*x^2]*(Cos[ArcSin[c*x]/2] - Sin[ArcS
in[c*x]/2])^3) + (b^2*((-8*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] + ArcSin[
c*x]*(8*Log[1 + I*E^(I*ArcSin[c*x])] - 2*Sec[(Pi + 2*ArcSin[c*x])/4]^2) +
4*Tan[(Pi + 2*ArcSin[c*x])/4] + ArcSin[c*x]^2*(-2*I + (2 + Sec[(Pi + 2*Arc
Sin[c*x])/4]^2)*Tan[(Pi + 2*ArcSin[c*x])/4])))/Sqrt[1 - c^2*x^2]))/(6*c*d*
e^3)
```

Rubi [A] (verified)

Time = 1.65 (sec) , antiderivative size = 465, normalized size of antiderivative = 0.52, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{cdx+d}(e-cex)^{5/2}}\,dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\int \frac{d^2(cx+1)^2(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d^2\left(1-c^2x^2\right)^{5/2}\int \frac{(cx+1)^2(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d^2\left(1-c^2x^2\right)^{5/2}\int \left(\frac{c^2x^2(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}+\frac{2cx(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}+\frac{(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}\right)dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{2009}$$

$$d^2(1-c^2x^2)^{5/2}\left(\frac{4ib\arctan(e^{i\arcsin(cx)})(a+b\arcsin(cx))}{3c}-\frac{bcx^2(a+b\arcsin(cx))}{3(1-c^2x^2)}+\frac{2x(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}}+\frac{x(a+b\arcsin(cx))^2}{3(1-c^2x^2)^{3/2}}-\frac{2bx}{}\right.$$

input
```
Int[(a + b*ArcSin[c*x])^2/(Sqrt[d + c*d*x]*(e - c*e*x)^(5/2)),x]
```

output
```
(d^2*(1 - c^2*x^2)^(5/2)*((2*b^2)/(3*c*Sqrt[1 - c^2*x^2]) + (2*b^2*x)/(3*S
qrt[1 - c^2*x^2]) - (b^2*ArcSin[c*x])/(3*c) - (b*(a + b*ArcSin[c*x]))/(3*c
*(1 - c^2*x^2)) - (2*b*x*(a + b*ArcSin[c*x]))/(3*(1 - c^2*x^2)) - (b*c*x^2
*(a + b*ArcSin[c*x]))/(3*(1 - c^2*x^2)) - ((I/3)*(a + b*ArcSin[c*x])^2)/c
+ (2*(a + b*ArcSin[c*x])^2)/(3*c*(1 - c^2*x^2)^(3/2)) + (x*(a + b*ArcSin[c
*x])^2)/(3*(1 - c^2*x^2)^(3/2)) + (c^2*x^3*(a + b*ArcSin[c*x])^2)/(3*(1 -
c^2*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x])^2)/(3*Sqrt[1 - c^2*x^2]) + (((4
*I)/3)*b*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c + (2*b*(a + b*Ar
cSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c) - (((2*I)/3)*b^2*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])])/c + (((2*I)/3)*b^2*PolyLog[2, I*E^(I*ArcSin[c*
x])])/c - ((I/3)*b^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/((d + c*d*x)^
(5/2)*(e - c*e*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
 - e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [A] (verified)

Time = 3.07 (sec) , antiderivative size = 667, normalized size of antiderivative = 0.74

method	result
default	$a^2\left(\frac{\sqrt{cdx+d}}{3cde(-cxe+e)^{\frac{3}{2}}}+\frac{\sqrt{cdx+d}}{3cd\,e^2\sqrt{-cxe+e}}\right)+\frac{ib^2\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,\left(2i\arcsin(cx)^2\sqrt{-c^2x^2+1}+4i\arcsin(cx)\right.}{}$
parts	$a^2\left(\frac{\sqrt{cdx+d}}{3cde(-cxe+e)^{\frac{3}{2}}}+\frac{\sqrt{cdx+d}}{3cd\,e^2\sqrt{-cxe+e}}\right)+\frac{ib^2\sqrt{-c^2x^2+1}\,\sqrt{d(cx+1)}\,\sqrt{-e(cx-1)}\,\left(2i\arcsin(cx)^2\sqrt{-c^2x^2+1}+4i\arcsin(cx)\right.}{}$

input
```
int((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x,method=_RETURNV
ERBOSE)
```

output
```
a^2*(1/3/c/d/e/(-c*e*x+e)^(3/2)*(c*d*x+d)^(1/2)+1/3/c/d/e^2/(-c*e*x+e)^(1/
2)*(c*d*x+d)^(1/2))+1/3*I*b^2*(-c^2*x^2+1)^(1/2)*(d*(c*x+1))^(1/2)*(-e*(c*
x-1))^(1/2)*(2*I*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)+4*I*arcsin(c*x)*ln(1+I*(
I*c*x+(-c^2*x^2+1)^(1/2)))+arcsin(c*x)^2*x^2*c^2+2*I*arcsin(c*x)*c*x+4*pol
ylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x^2*c^2-8*I*arcsin(c*x)*ln(1+I*(I*c*
x+(-c^2*x^2+1)^(1/2)))*x*c+2*I*(-c^2*x^2+1)^(1/2)-2*I*(-c^2*x^2+1)^(1/2)*c
*x-2*arcsin(c*x)^2*c*x-2*c^2*x^2+4*I*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1
)^(1/2)))*x^2*c^2-8*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*x*c-I*arcsin(
c*x)^2*(-c^2*x^2+1)^(1/2)*x*c-2*I*arcsin(c*x)+arcsin(c*x)^2+4*c*x+4*polylo
g(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))-2)/d/e^3/c/(c^4*x^4-2*c^3*x^3+2*c*x-1)+
2/3*a*b*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(
c*x)*c^2*x^2-2*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*x^2*c^2+arcsin(c*x)*(-c^2*x^
2+1)^(1/2)*c*x-2*I*arcsin(c*x)*c*x+4*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*x*c-2*
arcsin(c*x)*(-c^2*x^2+1)^(1/2)+I*arcsin(c*x)-c*x-2*ln(I*c*x+(-c^2*x^2+1)^(
1/2)-I)+1)/d/e^3/c/(c^4*x^4-2*c^3*x^3+2*c*x-1)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorith
m="fricas")
```

output
```
integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sq
rt(-c*e*x + e)/(c^4*d*e^3*x^4 - 2*c^3*d*e^3*x^3 + 2*c*d*e^3*x - d*e^3), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{d\,(cx+1)}\,(-e\,(cx-1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(c*d*x+d)**(1/2)/(-c*e*x+e)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/(sqrt(d*(c*x + 1))*(-e*(c*x - 1))**(5/2)), x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorith
m="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{cdx+d}(-cex+e)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x, algorith
m="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2/(sqrt(c*d*x + d)*(-c*e*x + e)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d+c\,d\,x}\,(e-c\,e\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(1/2)*(e - c*e*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d+cdx}(e-cex)^{5/2}}\,dx = \frac{6\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2-2\sqrt{cx+1}\,\sqrt{-cx+1}\,cx+\sqrt{cx+1}\,\sqrt{-cx+1}}dx\right)ab\,c^2x - \cdots}{\cdots}$$

input
```
int((a+b*asin(c*x))^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(5/2),x)
```

output
```
(6*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**
2 - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1))
,x)*a*b*c**2*x - 6*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c
*x + 1)*c**2*x**2 - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*s
qrt( - c*x + 1)),x)*a*b*c + 3*sqrt( - c*x + 1)*int(asin(c*x)**2/(sqrt(c*x
+ 1)*sqrt( - c*x + 1)*c**2*x**2 - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c*x + s
qrt(c*x + 1)*sqrt( - c*x + 1)),x)*b**2*c**2*x - 3*sqrt( - c*x + 1)*int(asi
n(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - 2*sqrt(c*x + 1)*sqrt
( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b**2*c + sqrt(c*x +
1)*a**2*c*x - 2*sqrt(c*x + 1)*a**2)/(3*sqrt(e)*sqrt(d)*sqrt( - c*x + 1)*c*
e**2*(c*x - 1))
```

3.94 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 742

$$
\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx &= \frac{b^2}{3cde^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{b^2x}{3de^2\sqrt{d+cdx}\sqrt{e-cex}} - \frac{b(a+b\arcsin(cx))}{3cde^2\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}} \\
&- \frac{bx(a+b\arcsin(cx))}{3de^2\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}} + \frac{2x(a+b\arcsin(cx))^2}{3de^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{(a+b\arcsin(cx))^2}{3cde^2\sqrt{d+cdx}\sqrt{e-cex}\,(1-c^2x^2)} \\
&+ \frac{x(a+b\arcsin(cx))^2}{3de^2\sqrt{d+cdx}\sqrt{e-cex}\,(1-c^2x^2)} - \frac{2i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cde^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{2ib\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3cde^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cde^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3cde^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&+ \frac{ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3cde^2\sqrt{d+cdx}\sqrt{e-cex}} \\
&- \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cde^2\sqrt{d+cdx}\sqrt{e-cex}}
\end{aligned}
$$

output
```
1/3*b^2/c/d/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*b^2*x/d/e^2/(c*d*x+d)
^(1/2)/(-c*e*x+e)^(1/2)-1/3*b*(a+b*arcsin(c*x))/c/d/e^2/(c*d*x+d)^(1/2)/(-
c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)-1/3*b*x*(a+b*arcsin(c*x))/d/e^2/(c*d*x+d
)^(1/2)/(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2/3*x*(a+b*arcsin(c*x))^2/d/e^
2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*(a+b*arcsin(c*x))^2/c/d/e^2/(c*d*x+
d)^(1/2)/(-c*e*x+e)^(1/2)/(-c^2*x^2+1)+1/3*x*(a+b*arcsin(c*x))^2/d/e^2/(c*
d*x+d)^(1/2)/(-c*e*x+e)^(1/2)/(-c^2*x^2+1)-2/3*I*(-c^2*x^2+1)^(1/2)*(a+b*a
rcsin(c*x))^2/c/d/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+2/3*I*b*(-c^2*x^2+1
)^(1/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c/d/e^2/(c*d*x+
d)^(1/2)/(-c*e*x+e)^(1/2)+4/3*b*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1+
(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/3
*I*b^2*(-c^2*x^2+1)^(1/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d/e^2
/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*I*b^2*(-c^2*x^2+1)^(1/2)*polylog(2,I
*(I*c*x+(-c^2*x^2+1)^(1/2)))/c/d/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/3*
I*b^2*(-c^2*x^2+1)^(1/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d/e^2/
(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)
```

Mathematica [A] (warning: unable to verify)

Time = 9.31 (sec) , antiderivative size = 764, normalized size of antiderivative = 1.03

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x]
```

output
```
(Sqrt[-(e*(-1 + c*x))]*Sqrt[d*(1 + c*x)]*(a^2/(6*d^2*e^3*(-1 + c*x)^2) - (
5*a^2)/(12*d^2*e^3*(-1 + c*x)) - a^2/(4*d^2*e^3*(1 + c*x))))/c - (a*b*Sqrt
[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt[1 - c^2*x^2]*(2*ArcSin[c*x]*(2*c*x + Cos[
2*ArcSin[c*x]]) + Sqrt[1 - c^2*x^2]*(-1 + 5*Log[Cos[ArcSin[c*x]/2] - Sin[A
rcSin[c*x]/2]] + 3*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]] - c*x*(5*L
og[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 3*Log[Cos[ArcSin[c*x]/2] + S
in[ArcSin[c*x]/2]]))))/(3*c*d*e^2*Sqrt[(-d - c*d*x)*(e - c*e*x)]*Sqrt[-(d*
e*(1 - c^2*x^2))]*(Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2])^3*(Cos[ArcSin[
c*x]/2] + Sin[ArcSin[c*x]/2])) - (b^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*Sqrt
[1 - c^2*x^2]*((9*I)*Pi*ArcSin[c*x] - ((-2 + ArcSin[c*x])*ArcSin[c*x])/(-1
 + c*x) + (1 - 4*I)*ArcSin[c*x]^2 + 16*Pi*Log[1 + E^((-I)*ArcSin[c*x])] +
3*(Pi + 2*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])] - 5*(Pi - 2*ArcSin[c*x
])*Log[1 + I*E^(I*ArcSin[c*x])] - 16*Pi*Log[Cos[ArcSin[c*x]/2]] + 5*Pi*Log
[-Cos[(Pi + 2*ArcSin[c*x])/4]] - 3*Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (
10*I)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (6*I)*PolyLog[2, I*E^(I*ArcSin[
c*x])] + (2*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c*x]/2] - Sin[Ar
cSin[c*x]/2])^3 + ((4 + 5*ArcSin[c*x]^2)*Sin[ArcSin[c*x]/2])/(Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2]) + (3*ArcSin[c*x]^2*Sin[ArcSin[c*x]/2])/(Cos[A
rcSin[c*x]/2] + Sin[ArcSin[c*x]/2])))/(6*c*d*e^2*Sqrt[(-d - c*d*x)*(e - c*
e*x)]*Sqrt[-(d*e*(1 - c^2*x^2))])
```

Rubi [A] (verified)

Time = 1.17 (sec) , antiderivative size = 386, normalized size of antiderivative = 0.52, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5178, 27, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{3/2}(e-cex)^{5/2}}dx$$

$$\Big\downarrow \text{5178}$$

$$\frac{\left(1-c^2x^2\right)^{5/2}\int \frac{d(cx+1)(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{d\left(1-c^2x^2\right)^{5/2}\int \frac{(cx+1)(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 5262

$$\frac{d\left(1-c^2x^2\right)^{5/2}\int \left(\frac{cx(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}+\frac{(a+b\arcsin(cx))^2}{\left(1-c^2x^2\right)^{5/2}}\right)dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 2009

$$d\left(1-c^2x^2\right)^{5/2}\left(\frac{2ib\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c}-\frac{bx(a+b\arcsin(cx))}{3(1-c^2x^2)}-\frac{b(a+b\arcsin(cx))}{3c(1-c^2x^2)}+\frac{2x(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}}+\frac{x(a+b\arcsin}{3(1-c}\right.$$

input
```
Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x]
```

output
```
(d*(1 - c^2*x^2)^(5/2)*(b^2/(3*c*Sqrt[1 - c^2*x^2]) + (b^2*x)/(3*Sqrt[1 -
c^2*x^2]) - (b*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) - (b*x*(a + b*ArcS
in[c*x]))/(3*(1 - c^2*x^2)) - (((2*I)/3)*(a + b*ArcSin[c*x])^2)/c + (a + b
*ArcSin[c*x])^2/(3*c*(1 - c^2*x^2)^(3/2)) + (x*(a + b*ArcSin[c*x])^2)/(3*(
1 - c^2*x^2)^(3/2)) + (2*x*(a + b*ArcSin[c*x])^2)/(3*Sqrt[1 - c^2*x^2]) +
(((2*I)/3)*b*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c + (4*b*(a +
b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/(3*c) - ((I/3)*b^2*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])])/c + ((I/3)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x])]
)/c - (((2*I)/3)*b^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/((d + c*d*x)^
(5/2)*(e - c*e*x)^(5/2))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3176 vs. 2(685) = 1370.

Time = 3.37 (sec) , antiderivative size = 3177, normalized size of antiderivative = 4.28

method	result	size
default	Expression too large to display	3177
parts	Expression too large to display	3177

input
```
int((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x,method=_RETURNV
ERBOSE)
```

output
```
a^2*(-1/c/d/e/(c*d*x+d)^(1/2)/(-c*e*x+e)^(3/2)+2/d*(1/3/c/d/e/(-c*e*x+e)^(
3/2)*(c*d*x+d)^(1/2)+1/3/c/d/e^2/(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2)))+2/3*I*
b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4-9*c^3*x^3+c^2*x^2+9*c*
x-5)/c/d^2/e^3*arcsin(c*x)*(-c^2*x^2+1)+6*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x
+1))^(1/2)/(4*c^4*x^4-9*c^3*x^3+c^2*x^2+9*c*x-5)/d^2/e^3*arcsin(c*x)^2*(-c
^2*x^2+1)^(1/2)*x+2/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^
4-9*c^3*x^3+c^2*x^2+9*c*x-5)/d^2/e^3*arcsin(c*x)*(-c^2*x^2+1)*x+4/3*I*b^2*
(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/e^3/c/(c^2*x^2
-1)*arcsin(c*x)^2+5/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)*(-c^2*x^2
+1)^(1/2)/d^2/e^3/c/(c^2*x^2-1)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))+4
/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4-9*c^3*x^3+c^2*x^2
+9*c*x-5)*c^4/d^2/e^3*arcsin(c*x)*x^5-8/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x
+1))^(1/2)/(4*c^4*x^4-9*c^3*x^3+c^2*x^2+9*c*x-5)*c^3/d^2/e^3*arcsin(c*x)*x
^4-2/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4-9*c^3*x^3+c^2
*x^2+9*c*x-5)*c^2/d^2/e^3*arcsin(c*x)*x^3+10/3*I*b^2*(-e*(c*x-1))^(1/2)*(d
*(c*x+1))^(1/2)/(4*c^4*x^4-9*c^3*x^3+c^2*x^2+9*c*x-5)*c/d^2/e^3*arcsin(c*x
)*x^2-4/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4-9*c^3*x^3+
c^2*x^2+9*c*x-5)*c/d^2/e^3*(-c^2*x^2+1)^(1/2)*x^2-10/3*I*b^2*(-e*(c*x-1))^
(1/2)*(d*(c*x+1))^(1/2)/(4*c^4*x^4-9*c^3*x^3+c^2*x^2+9*c*x-5)/c/d^2/e^3*ar
csin(c*x)^2*(-c^2*x^2+1)^(1/2)-5/3*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(...
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorith
m="fricas")
```

output
```
integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sq
rt(-c*e*x + e)/(c^5*d^2*e^3*x^5 - c^4*d^2*e^3*x^4 - 2*c^3*d^2*e^3*x^3 + 2*
c^2*d^2*e^3*x^2 + c*d^2*e^3*x - d^2*e^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(c*x))**2/(c*d*x+d)**(3/2)/(-c*e*x+e)**(5/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorith
m="maxima")
```

output
```
1/6*a*b*c*(2*sqrt(d)*sqrt(e)/(c^3*d^2*e^3*x - c^2*d^2*e^3) + 3*log(c*x + 1
)/(c^2*d^(3/2)*e^(5/2)) + 5*log(c*x - 1)/(c^2*d^(3/2)*e^(5/2))) - 2/3*a*b*
(1/(sqrt(-c^2*d*e*x^2 + d*e)*c^2*d*e^2*x - sqrt(-c^2*d*e*x^2 + d*e)*c*d*e^
2) - 2*x/(sqrt(-c^2*d*e*x^2 + d*e)*d*e^2))*arcsin(c*x) - 1/3*a^2*(1/(sqrt(
-c^2*d*e*x^2 + d*e)*c^2*d*e^2*x - sqrt(-c^2*d*e*x^2 + d*e)*c*d*e^2) - 2*x/
(sqrt(-c^2*d*e*x^2 + d*e)*d*e^2)) + b^2*integrate(arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))^2/((c^3*d*e^2*x^3 - c^2*d*e^2*x^2 - c*d*e^2*x + d*e^2)*
sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/(sqrt(d)*sqrt(e))
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{(cdx+d)^{\frac{3}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x, algorith
m="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(3/2)*(-c*e*x + e)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{3/2}\,(e-c\,e\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(3/2)*(e - c*e*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{3/2}(e-cex)^{5/2}}\,dx = \frac{6\sqrt{cx+1}\,\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^3x^3-\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2-\sqrt{cx+1}\,\sqrt{-cx+1}\,cx}\right.}{}$$

input
```
int((a+b*asin(c*x))^2/(c*d*x+d)^(3/2)/(-c*e*x+e)^(5/2),x)
```

output
```
(6*sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x
 + 1)*c**3*x**3 - sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)
*sqrt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b*c**2*x - 6*
sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x +
1)*c**3*x**3 - sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)*sq
rt( - c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b*c + 3*sqrt(c*x
 + 1)*sqrt( - c*x + 1)*int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c*
*3*x**3 - sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)*sqrt( -
 c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b**2*c**2*x - 3*sqrt(c*
x + 1)*sqrt( - c*x + 1)*int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c
**3*x**3 - sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 - sqrt(c*x + 1)*sqrt(
- c*x + 1)*c*x + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b**2*c + 2*a**2*c**2*x
**2 - 2*a**2*c*x - a**2)/(3*sqrt(e)*sqrt(d)*sqrt(c*x + 1)*sqrt( - c*x + 1)
*c*d*e**2*(c*x - 1))
```

3.95 $\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx$

Optimal result

Integrand size = 32, antiderivative size = 386

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx &= \frac{b^2x}{3d^2e^2\sqrt{d+cdx}\sqrt{e-cex}} \\ &- \frac{b(a+b\arcsin(cx))}{3cd^2e^2\sqrt{d+cdx}\sqrt{e-cex}\sqrt{1-c^2x^2}} + \frac{2x(a+b\arcsin(cx))^2}{3d^2e^2\sqrt{d+cdx}\sqrt{e-cex}} \\ &+ \frac{x(a+b\arcsin(cx))^2}{3d^2e^2\sqrt{d+cdx}\sqrt{e-cex}\,(1-c^2x^2)} - \frac{2i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2e^2\sqrt{d+cdx}\sqrt{e-cex}} \\ &+ \frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2e^2\sqrt{d+cdx}\sqrt{e-cex}} \\ &- \frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2e^2\sqrt{d+cdx}\sqrt{e-cex}}\end{aligned}$$

output
```
1/3*b^2*x/d^2/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-1/3*b*(a+b*arcsin(c*x))
/c/d^2/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)/(-c^2*x^2+1)^(1/2)+2/3*x*(a+b*
arcsin(c*x))^2/d^2/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)+1/3*x*(a+b*arcsin(
c*x))^2/d^2/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)/(-c^2*x^2+1)-2/3*I*(-c^2*
x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/c/d^2/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2
)+4/3*b*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2
))^2)/c/d^2/e^2/(c*d*x+d)^(1/2)/(-c*e*x+e)^(1/2)-2/3*I*b^2*(-c^2*x^2+1)^(1
/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d^2/e^2/(c*d*x+d)^(1/2)/(-c
*e*x+e)^(1/2)
```

Mathematica [A] (warning: unable to verify)

Time = 8.21 (sec) , antiderivative size = 722, normalized size of antiderivative = 1.87

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x]
```

output
```
(4*a^2*c*x*(3 - 2*c^2*x^2) + b^2*(c*x + 6*c*x*ArcSin[c*x]^2 + (4*I)*Pi*Arc
Sin[c*x]*Cos[3*ArcSin[c*x]] - (2*I)*ArcSin[c*x]^2*Cos[3*ArcSin[c*x]] + 8*P
i*Cos[3*ArcSin[c*x]]*Log[1 + E^((-I)*ArcSin[c*x])] + 2*Pi*Cos[3*ArcSin[c*x
]]*Log[1 - I*E^(I*ArcSin[c*x])] + 4*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 -
 I*E^(I*ArcSin[c*x])] - 2*Pi*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x]
)] + 4*ArcSin[c*x]*Cos[3*ArcSin[c*x]]*Log[1 + I*E^(I*ArcSin[c*x])] - 8*Pi*
Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2]] + 2*Pi*Cos[3*ArcSin[c*x]]*Log[-
Cos[(Pi + 2*ArcSin[c*x])/4]] + 2*Sqrt[1 - c^2*x^2]*((-3*I)*ArcSin[c*x]^2 +
 ArcSin[c*x]*(-2 + (6*I)*Pi + 6*Log[1 - I*E^(I*ArcSin[c*x])] + 6*Log[1 + I
*E^(I*ArcSin[c*x])]) + 3*Pi*(4*Log[1 + E^((-I)*ArcSin[c*x])] + Log[1 - I*E
^(I*ArcSin[c*x])] - Log[1 + I*E^(I*ArcSin[c*x])] - 4*Log[Cos[ArcSin[c*x]/2
]] + Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - Log[Sin[(Pi + 2*ArcSin[c*x])/4]])
) - 2*Pi*Cos[3*ArcSin[c*x]]*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (16*I)*(1 -
 c^2*x^2)^(3/2)*PolyLog[2, (-I)*E^(I*ArcSin[c*x])] - (16*I)*(1 - c^2*x^2)^
(3/2)*PolyLog[2, I*E^(I*ArcSin[c*x])] + Sin[3*ArcSin[c*x]] + 2*ArcSin[c*x]
^2*Sin[3*ArcSin[c*x]]) + 4*a*b*(Sqrt[1 - c^2*x^2]*(-1 + 2*Log[Cos[ArcSin[c
*x]/2] - Sin[ArcSin[c*x]/2]] + 2*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/
2]] + 2*Cos[2*ArcSin[c*x]]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] +
 Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])) + ArcSin[c*x]*(3*c*x + Sin
[3*ArcSin[c*x]])))/(12*d^2*e^2*Sqrt[d + c*d*x]*Sqrt[e - c*e*x]*(c - c^3...
```

Rubi [A] (verified)

Time = 1.44 (sec) , antiderivative size = 231, normalized size of antiderivative = 0.60, number of steps used = 12, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {5178, 5162, 5160, 5180, 3042, 4202, 2620, 2715, 2838, 5182, 208}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{(cdx+d)^{5/2}(e-cex)^{5/2}}dx$$

$\Big\downarrow$ 5178

$$\frac{(1-c^2x^2)^{5/2}\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 5162

$$\frac{(1-c^2x^2)^{5/2}\left(-\frac{2}{3}bc\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}dx+\frac{2}{3}\int \frac{(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx+\frac{x(a+b\arcsin(cx))^2}{3(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 5160

$$\frac{(1-c^2x^2)^{5/2}\left(-\frac{2}{3}bc\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}dx+\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-2bc\int \frac{x(a+b\arcsin(cx))}{1-c^2x^2}dx\right)+\frac{x(a+b\arcsin(cx))^2}{3(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 5180

$$\frac{(1-c^2x^2)^{5/2}\left(-\frac{2}{3}bc\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}dx+\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\int \frac{cx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}d\arcsin(cx)}{c}\right)+\frac{x(a+b\arcsin(cx))^2}{3(1-c^2x^2)^{3/2}}\right)}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 3042

$$\frac{(1-c^2x^2)^{5/2}\left(-\frac{2}{3}bc\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}dx+\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\int (a+b\arcsin(cx))\tan(\arcsin(cx))d\arcsin(cx)}{c}\right)+\frac{x(a+b\,\cdots}{3(1-\cdots}$$

$\Big\downarrow$ 4202

$$\frac{(1-c^2x^2)^{5/2}\left(\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\int \frac{e^{2i\arcsin(cx)}(a+b\arcsin(cx))}{1+e^{2i\arcsin(cx)}}d\arcsin(cx)\right)}{c}\right)-\frac{2}{3}bc\int \frac{x(a+b\arcsin\cdots}{(1-c^2x^2)\cdots}\right.}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 2620

$$\frac{(1-c^2x^2)^{5/2}\left(-\frac{2}{3}bc\int \frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}dx+\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\left(\frac{1}{2}ib\int \log\left(1+e^{2i\arcsin(cx)}\right)d\arcsin\cdots\right.\right.}{c}\right.\right.}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 2715

$$\frac{(1-c^2x^2)^{5/2}\left(-\frac{2}{3}bc\int\frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}dx+\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\left(\frac{1}{4}b\int e^{-2i\arcsin(cx)}\log\left(1+e^{2i\arcsin\right.\right.}{}}{}\right)\right)}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 2838

$$\frac{(1-c^2x^2)^{5/2}\left(-\frac{2}{3}bc\int\frac{x(a+b\arcsin(cx))}{(1-c^2x^2)^2}dx+\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\left(-\frac{1}{2}i\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcs\right.\right.}{c}\right)\right)}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 5182

$$\frac{(1-c^2x^2)^{5/2}\left(-\frac{2}{3}bc\left(\frac{a+b\arcsin(cx)}{2c^2(1-c^2x^2)}-\frac{b\int\frac{1}{(1-c^2x^2)^{3/2}}dx}{2c}\right)+\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\left(-\frac{1}{2}i\log\left(1+e^{2i\right.\right.}{}\right)\right)}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

$\Big\downarrow$ 208

$$\frac{(1-c^2x^2)^{5/2}\left(\frac{2}{3}\left(\frac{x(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}-\frac{2b\left(\frac{i(a+b\arcsin(cx))^2}{2b}-2i\left(-\frac{1}{2}i\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))-\frac{1}{4}b\operatorname{PolyLog}\left(2,-e^{2i\arcsin(c\right.\right.\right.}{c}\right)\right)}{(cdx+d)^{5/2}(e-cex)^{5/2}}$$

input
```
Int[(a + b*ArcSin[c*x])^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x]
```

output
```
((1 - c^2*x^2)^(5/2)*((x*(a + b*ArcSin[c*x])^2)/(3*(1 - c^2*x^2)^(3/2)) -
(2*b*c*(-1/2*(b*x)/(c*Sqrt[1 - c^2*x^2]) + (a + b*ArcSin[c*x])/(2*c^2*(1 -
 c^2*x^2))))/3 + (2*((x*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2] - (2*b*((
(I/2)*(a + b*ArcSin[c*x])^2)/b - (2*I)*((-1/2*I)*(a + b*ArcSin[c*x])*Log[1
 + E^((2*I)*ArcSin[c*x])] - (b*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/4)))/c)
)/3))/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2))
```

Defintions of rubi rules used

rule 208
```
Int[((a_) + (b_.)*(x_)^2)^(-3/2), x_Symbol] :> Simp[x/(a*Sqrt[a + b*x^2]),
x] /; FreeQ[{a, b}, x]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4202
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^m*(E^(2*I*(
e + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGt
Q[m, 0]
```

rule 5160
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Simp[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[x*((a + b*ArcSin[c*x
])^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

rule 5162
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_), x_
Symbol] :> Simp[(-x)*(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*d*(p + 1
))), x] + (Simp[(2*p + 3)/(2*d*(p + 1))   Int[(d + e*x^2)^(p + 1)*(a + b*Ar
cSin[c*x])^n, x], x] + Simp[b*c*(n/(2*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2
*x^2)^p]   Int[x*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x
]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && LtQ[p,
 -1] && NeQ[p, -3/2]
```

rule 5178
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(p_)*((f_)
 + (g_.)*(x_))^(q_), x_Symbol] :> Simp[(d + e*x)^q*((f + g*x)^q/(1 - c^2*x^
2)^q)   Int[(d + e*x)^(p - q)*(1 - c^2*x^2)^q*(a + b*ArcSin[c*x])^n, x], x]
 /; FreeQ[{a, b, c, d, e, f, g, n}, x] && EqQ[e*f + d*g, 0] && EqQ[c^2*d^2
- e^2, 0] && HalfIntegerQ[p, q] && GeQ[p - q, 0]
```

rule 5180
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[-e^(-1)   Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x
]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2566 vs. $2(354) = 708$.

Time = 3.64 (sec) , antiderivative size = 2567, normalized size of antiderivative = 6.65

method	result	size
default	Expression too large to display	2567
parts	Expression too large to display	2567

input
```
int((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x,method=_RETURNV
ERBOSE)
```

output
```
a^2*(-1/3/c/d/e/(c*d*x+d)^(3/2)/(-c*e*x+e)^(3/2)+1/d*(-1/c/d/e/(c*d*x+d)^(
1/2)/(-c*e*x+e)^(3/2)+2/d*(1/3/c/d/e/(-c*e*x+e)^(3/2)*(c*d*x+d)^(1/2)+1/3/
c/d/e^2/(-c*e*x+e)^(1/2)*(c*d*x+d)^(1/2))))+17/3*b^2*(-e*(c*x-1))^(1/2)*(d
*(c*x+1))^(1/2)/e^3/d^3*c^2/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x
)^2*x^3+2/3*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/e^3/d^3*c^4/(3*c^6*x^
6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x^5-4/3*b^2*(-e*(c*x-1))^(1/2)*(d*
(c*x+1))^(1/2)/e^3/d^3*c^2/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1
)*x^3+4/3*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/e^3/d^3/c/(3*c^6*x^6-10
*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-2*I*b^2*(-e*(c*x-1))
^(1/2)*(d*(c*x+1))^(1/2)/e^3/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsi
n(c*x)*x-4/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/e^3/d^3/c/(3*c^6*x
^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)^(1/2)-2*b^2*(-e*(c*x-1))^(1/2)*(d
*(c*x+1))^(1/2)/e^3/d^3*c^4/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x
)^2*x^5+14/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/e^3/d^3*c/(3*c^6*x
^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)^2*(-c^2*x^2+1)^(1/2)*x^2+4/3*I*b^2
*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/e^3/d^3*c^4/(3*c^6*x^6-10*c^4*x^4+11
*c^2*x^2-4)*arcsin(c*x)*(-c^2*x^2+1)*x^5-2*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*
x+1))^(1/2)/e^3/d^3*c^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)^2*
(-c^2*x^2+1)^(1/2)*x^4-10/3*I*b^2*(-e*(c*x-1))^(1/2)*(d*(c*x+1))^(1/2)/e^3
/d^3*c^2/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*(-c^2*x^2+1)*x...
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorith
m="fricas")
```

output
```
integral(-(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*sqrt(c*d*x + d)*sq
rt(-c*e*x + e)/(c^6*d^3*e^3*x^6 - 3*c^4*d^3*e^3*x^4 + 3*c^2*d^3*e^3*x^2 -
d^3*e^3), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx=\text{Timed out}$$

input
```
integrate((a+b*asin(c*x))**2/(c*d*x+d)**(5/2)/(-c*e*x+e)**(5/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorith
m="maxima")
```

output
```
1/3*a*b*c*(1/(c^4*d^(5/2)*e^(5/2)*x^2 - c^2*d^(5/2)*e^(5/2)) + 2*log(c*x +
 1)/(c^2*d^(5/2)*e^(5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2)*e^(5/2))) + 2/3*a*
b*(x/((-c^2*d*e*x^2 + d*e)^(3/2)*d*e) + 2*x/(sqrt(-c^2*d*e*x^2 + d*e)*d^2*
e^2))*arcsin(c*x) + 1/3*a^2*(x/((-c^2*d*e*x^2 + d*e)^(3/2)*d*e) + 2*x/(sqr
t(-c^2*d*e*x^2 + d*e)*d^2*e^2)) + b^2*integrate(arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))^2/((c^4*d^2*e^2*x^4 - 2*c^2*d^2*e^2*x^2 + d^2*e^2)*sqrt(c
*x + 1)*sqrt(-c*x + 1)), x)/(sqrt(d)*sqrt(e))
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(cdx+d)^{\frac{5}{2}}(-cex+e)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x, algorith
m="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2/((c*d*x + d)^(5/2)*(-c*e*x + e)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(d+c\,d\,x)^{5/2}\,(e-c\,e\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((d + c*d*x)^(5/2)*(e - c*e*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(d+cdx)^{5/2}(e-cex)^{5/2}}\,dx = \frac{6\sqrt{cx+1}\,\sqrt{-cx+1}\left(\int \frac{asin(cx)}{\sqrt{cx+1}\,\sqrt{-cx+1}\,c^4x^4-2\sqrt{cx+1}\,\sqrt{-cx+1}\,c^2x^2+\sqrt{cx+1}\,\sqrt{-cx+1}}\right.}{}$$

input
```
int((a+b*asin(c*x))^2/(c*d*x+d)^(5/2)/(-c*e*x+e)^(5/2),x)
```

output

```
(6*sqrt(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x
 + 1)*c**4*x**4 - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 + sqrt(c*x +
1)*sqrt( - c*x + 1)),x)*a*b*c**2*x**2 - 6*sqrt(c*x + 1)*sqrt( - c*x + 1)*i
nt(asin(c*x)/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**4*x**4 - 2*sqrt(c*x + 1)*s
qrt( - c*x + 1)*c**2*x**2 + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*a*b + 3*sqr
t(c*x + 1)*sqrt( - c*x + 1)*int(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x +
1)*c**4*x**4 - 2*sqrt(c*x + 1)*sqrt( - c*x + 1)*c**2*x**2 + sqrt(c*x + 1)*
sqrt( - c*x + 1)),x)*b**2*c**2*x**2 - 3*sqrt(c*x + 1)*sqrt( - c*x + 1)*int
(asin(c*x)**2/(sqrt(c*x + 1)*sqrt( - c*x + 1)*c**4*x**4 - 2*sqrt(c*x + 1)*
sqrt( - c*x + 1)*c**2*x**2 + sqrt(c*x + 1)*sqrt( - c*x + 1)),x)*b**2 + 2*a
**2*c**2*x**3 - 3*a**2*x)/(3*sqrt(e)*sqrt(d)*sqrt(c*x + 1)*sqrt( - c*x + 1
)*d**2*e**2*(c**2*x**2 - 1))
```

3.96 $\int \sqrt{d+ex}\sqrt{f+gx}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 27, antiderivative size = 27

$$\int \sqrt{d+ex}\sqrt{f+gx}(a+b\arcsin(cx))\,dx = \text{Int}\left(\sqrt{d+ex}\sqrt{f+gx}(a+b\arcsin(cx)),x\right)$$

output
```
Defer(Int)((e*x+d)^(1/2)*(g*x+f)^(1/2)*(a+b*arcsin(c*x)),x)
```

Mathematica [N/A]

Not integrable

Time = 13.00 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

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

input
```
Integrate[Sqrt[d + e*x]*Sqrt[f + g*x]*(a + b*ArcSin[c*x]),x]
```

output
```
Integrate[Sqrt[d + e*x]*Sqrt[f + g*x]*(a + b*ArcSin[c*x]), x]
```

Rubi [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d+ex}\sqrt{f+gx}(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5300}$$

$$\int \sqrt{d+ex}\sqrt{f+gx}(a+b\arcsin(cx))dx$$

input
```
Int[Sqrt[d + e*x]*Sqrt[f + g*x]*(a + b*ArcSin[c*x]),x]
```

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 1.76 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.85

$$\int \sqrt{ex+d}\,\sqrt{gx+f}\,(a+b\arcsin(cx))\,dx$$

input
```
int((e*x+d)^(1/2)*(g*x+f)^(1/2)*(a+b*arcsin(c*x)),x)
```

output
```
int((e*x+d)^(1/2)*(g*x+f)^(1/2)*(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.11 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.93

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

input
```
integrate((e*x+d)^(1/2)*(g*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fric
as")
```

output
```
integral(sqrt(e*x + d)*sqrt(g*x + f)*(b*arcsin(c*x) + a), x)
```

Sympy [N/A]

Not integrable

Time = 3.56 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.96

$$\int \sqrt{d+ex}\sqrt{f+gx}(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}\,(cx))\sqrt{d+ex}\sqrt{f+gx}\,dx$$

input
```
integrate((e*x+d)**(1/2)*(g*x+f)**(1/2)*(a+b*asin(c*x)),x)
```

output
```
Integral((a + b*asin(c*x))*sqrt(d + e*x)*sqrt(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \sqrt{d+ex}\sqrt{f+gx}(a+b\arcsin(cx))\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((e*x+d)^(1/2)*(g*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="maxi
ma")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

Giac [N/A]

Not integrable

Time = 0.60 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.93

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

input
```
integrate((e*x+d)^(1/2)*(g*x+f)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="giac
")
```

output
```
integrate(sqrt(e*x + d)*sqrt(g*x + f)*(b*arcsin(c*x) + a), x)
```

Mupad [N/A]

Not integrable

Time = 0.54 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.93

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

input
```
int((f + g*x)^(1/2)*(a + b*asin(c*x))*(d + e*x)^(1/2),x)
```

output
```
int((f + g*x)^(1/2)*(a + b*asin(c*x))*(d + e*x)^(1/2), x)
```

Reduce [N/A]

Not integrable

Time = 0.53 (sec) , antiderivative size = 230, normalized size of antiderivative = 8.52

$$\int \sqrt{d+ex}\sqrt{f+gx}(a+b\arcsin(cx))\,dx$$

$$= \frac{\sqrt{gx+f}\,\sqrt{ex+d}\,ade\,g^2+\sqrt{gx+f}\,\sqrt{ex+d}\,a\,e^2fg+2\sqrt{gx+f}\,\sqrt{ex+d}\,a\,e^2g^2x-\sqrt{g}\,\sqrt{e}\log\left(\frac{\sqrt{g}\,\sqrt{ex+}}{\sqrt{}}\right.}{}$$

input
```
int((e*x+d)^(1/2)*(g*x+f)^(1/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(f + g*x)*sqrt(d + e*x)*a*d*e*g**2 + sqrt(f + g*x)*sqrt(d + e*x)*a*e*
*2*f*g + 2*sqrt(f + g*x)*sqrt(d + e*x)*a*e**2*g**2*x - sqrt(g)*sqrt(e)*log
((sqrt(g)*sqrt(d + e*x) + sqrt(e)*sqrt(f + g*x))/sqrt(d*g - e*f))*a*d**2*g
**2 + 2*sqrt(g)*sqrt(e)*log((sqrt(g)*sqrt(d + e*x) + sqrt(e)*sqrt(f + g*x)
)/sqrt(d*g - e*f))*a*d*e*f*g - sqrt(g)*sqrt(e)*log((sqrt(g)*sqrt(d + e*x)
+ sqrt(e)*sqrt(f + g*x))/sqrt(d*g - e*f))*a*e**2*f**2 + 4*int(sqrt(f + g*x
)*sqrt(d + e*x)*asin(c*x),x)*b*e**2*g**2)/(4*e**2*g**2)
```

3.97 $\int \frac{\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 27

$$\int \frac{\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}}\,dx = \text{Int}\left(\frac{\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}},x\right)$$

output
```
Defer(Int)((g*x+f)^(1/2)*(a+b*arcsin(c*x))/(e*x+d)^(1/2),x)
```

Mathematica [N/A]

Not integrable

Time = 16.42 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

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

input
```
Integrate[(Sqrt[f + g*x]*(a + b*ArcSin[c*x]))/Sqrt[d + e*x],x]
```

output
```
Integrate[(Sqrt[f + g*x]*(a + b*ArcSin[c*x]))/Sqrt[d + e*x], x]
```

Rubi [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \text{5300}$$

$$\int \frac{\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}}dx$$

input
```
Int[(Sqrt[f + g*x]*(a + b*ArcSin[c*x]))/Sqrt[d + e*x],x]
```

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 1.29 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.85

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

input
```
int((g*x+f)^(1/2)*(a+b*arcsin(c*x))/(e*x+d)^(1/2),x)
```

output
```
int((g*x+f)^(1/2)*(a+b*arcsin(c*x))/(e*x+d)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.11 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.93

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

input
```
integrate((g*x+f)^(1/2)*(a+b*arcsin(c*x))/(e*x+d)^(1/2),x, algorithm="fric
as")
```

output
```
integral(sqrt(g*x + f)*(b*arcsin(c*x) + a)/sqrt(e*x + d), x)
```

Sympy [N/A]

Not integrable

Time = 3.11 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.96

$$\int \frac{\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}}\,dx=\int \frac{(a+b\,\mathrm{asin}\,(cx))\sqrt{f+gx}}{\sqrt{d+ex}}\,dx$$

input
```
integrate((g*x+f)**(1/2)*(a+b*asin(c*x))/(e*x+d)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))*sqrt(f + g*x)/sqrt(d + e*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((g*x+f)^(1/2)*(a+b*arcsin(c*x))/(e*x+d)^(1/2),x, algorithm="maxi
ma")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e*(d*g-e*f)>0)', see `assume?` f
or more de
```

Giac [N/A]

Not integrable

Time = 0.31 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.93

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

input
```
integrate((g*x+f)^(1/2)*(a+b*arcsin(c*x))/(e*x+d)^(1/2),x, algorithm="giac
")
```

output
```
integrate(sqrt(g*x + f)*(b*arcsin(c*x) + a)/sqrt(e*x + d), x)
```

Mupad [N/A]

Not integrable

Time = 5.40 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.93

$$\int \frac{\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}}\,dx=\int \frac{\sqrt{f+g\,x}\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d+e\,x}}\,dx$$

input
```
int(((f + g*x)^(1/2)*(a + b*asin(c*x)))/(d + e*x)^(1/2),x)
```

output
```
int(((f + g*x)^(1/2)*(a + b*asin(c*x)))/(d + e*x)^(1/2), x)
```

Reduce [N/A]

Not integrable

Time = 0.48 (sec) , antiderivative size = 132, normalized size of antiderivative = 4.89

$$\int \frac{\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}}\,dx$$
$$= \frac{\sqrt{gx+f}\,\sqrt{ex+d}\,aeg - \sqrt{g}\,\sqrt{e}\log\left(\frac{\sqrt{g}\,\sqrt{ex+d}+\sqrt{e}\,\sqrt{gx+f}}{\sqrt{dg-ef}}\right)adg + \sqrt{g}\,\sqrt{e}\log\left(\frac{\sqrt{g}\,\sqrt{ex+d}+\sqrt{e}\,\sqrt{gx+f}}{\sqrt{dg-ef}}\right)aef + \left(\int\right.}{e^2 g}$$

input
```
int((g*x+f)^(1/2)*(a+b*asin(c*x))/(e*x+d)^(1/2),x)
```

output
```
(sqrt(f + g*x)*sqrt(d + e*x)*a*e*g - sqrt(g)*sqrt(e)*log((sqrt(g)*sqrt(d +
 e*x) + sqrt(e)*sqrt(f + g*x))/sqrt(d*g - e*f))*a*d*g + sqrt(g)*sqrt(e)*lo
g((sqrt(g)*sqrt(d + e*x) + sqrt(e)*sqrt(f + g*x))/sqrt(d*g - e*f))*a*e*f +
 int((sqrt(f + g*x)*asin(c*x))/sqrt(d + e*x),x)*b*e**2*g)/(e**2*g)
```

3.98 $\int \frac{a+b \arcsin(cx)}{\sqrt{d+ex}\sqrt{f+gx}} \, dx$

Optimal result

Integrand size = 27, antiderivative size = 27

$$\int \frac{a+b \arcsin(cx)}{\sqrt{d+ex}\sqrt{f+gx}} \, dx = \mathrm{Int}\left(\frac{a+b \arcsin(cx)}{\sqrt{d+ex}\sqrt{f+gx}}, x\right)$$

output
```
Defer(Int)((a+b*arcsin(c*x))/(e*x+d)^(1/2)/(g*x+f)^(1/2),x)
```

Mathematica [N/A]

Not integrable

Time = 8.58 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.07

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

input
```
Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + e*x]*Sqrt[f + g*x]),x]
```

output
```
Integrate[(a + b*ArcSin[c*x])/(Sqrt[d + e*x]*Sqrt[f + g*x]), x]
```

Rubi [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

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

$$\Big\downarrow \; 5300$$

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex}\sqrt{f+gx}}dx$$

input
```
Int[(a + b*ArcSin[c*x])/(Sqrt[d + e*x]*Sqrt[f + g*x]),x]
```

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 1.02 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.85

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

input
```
int((a+b*arcsin(c*x))/(e*x+d)^(1/2)/(g*x+f)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))/(e*x+d)^(1/2)/(g*x+f)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.11 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.70

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

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(1/2)/(g*x+f)^(1/2),x, algorithm="fric
as")
```

output
```
integral(sqrt(e*x + d)*sqrt(g*x + f)*(b*arcsin(c*x) + a)/(e*g*x^2 + d*f +
(e*f + d*g)*x), x)
```

Sympy [N/A]

Not integrable

Time = 2.85 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.96

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

input
```
integrate((a+b*asin(c*x))/(e*x+d)**(1/2)/(g*x+f)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/(sqrt(d + e*x)*sqrt(f + g*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex}\sqrt{f+gx}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(1/2)/(g*x+f)^(1/2),x, algorithm="maxi
ma")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(d*g-e*f>0)', see `assume?` for m
ore detail
```

Giac [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.93

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

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(1/2)/(g*x+f)^(1/2),x, algorithm="giac
")
```

output
```
integrate((b*arcsin(c*x) + a)/(sqrt(e*x + d)*sqrt(g*x + f)), x)
```

Mupad [N/A]

Not integrable

Time = 0.47 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.93

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex}\sqrt{f+gx}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{f+g\,x}\,\sqrt{d+e\,x}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)^(1/2)*(d + e*x)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)^(1/2)*(d + e*x)^(1/2)), x)
```

Reduce [N/A]

Not integrable

Time = 4.34 (sec) , antiderivative size = 74, normalized size of antiderivative = 2.74

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d+ex}\sqrt{f+gx}}\,dx = \frac{2\sqrt{g}\,\sqrt{e}\log\left(\frac{\sqrt{g}\,\sqrt{ex+d}+\sqrt{e}\,\sqrt{gx+f}}{\sqrt{dg-ef}}\right)a+\left(\int \frac{asin(cx)}{\sqrt{gx+f}\,\sqrt{ex+d}}dx\right)beg}{eg}$$

input
```
int((a+b*asin(c*x))/(e*x+d)^(1/2)/(g*x+f)^(1/2),x)
```

output
```
(2*sqrt(g)*sqrt(e)*log((sqrt(g)*sqrt(d + e*x) + sqrt(e)*sqrt(f + g*x))/sqr
t(d*g - e*f))*a + int(asin(c*x)/(sqrt(f + g*x)*sqrt(d + e*x)),x)*b*e*g)/(e
*g)
```

3.99 $\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 258

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}\,dx = -\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{(ef-dg)\sqrt{d+ex}} + \frac{4bc\sqrt{-c(cd+e)}\sqrt{\frac{(ef-dg)(1-cx)}{(cd+e)(f+gx)}}\sqrt{-\frac{(ef-dg)(1+cx)}{(cd-e)(f+gx)}}(f+gx)\,\text{EllipticPi}\left(\frac{(cd+e)g}{e(cf+g)},\arcsin\left(\frac{\sqrt{-c(cf+g)}\sqrt{d+ex}}{\sqrt{-c(cd+e)}\sqrt{f+gx}}\right),\frac{(cd+}{(cd-}\right.}{e\sqrt{-c(cf+g)}(ef-dg)\sqrt{1-c^2x^2}}$$

output
```
-2*(g*x+f)^(1/2)*(a+b*arcsin(c*x))/(-d*g+e*f)/(e*x+d)^(1/2)+4*b*c*(-c*(c*d
+e))^(1/2)*((-d*g+e*f)*(-c*x+1)/(c*d+e)/(g*x+f))^(1/2)*(-(-d*g+e*f)*(c*x+1
)/(c*d-e)/(g*x+f))^(1/2)*(g*x+f)*EllipticPi((-c*(c*f+g))^(1/2)*(e*x+d)^(1/
2)/(-c*(c*d+e))^(1/2)/(g*x+f)^(1/2),(c*d+e)*g/e/(c*f+g),((c*d+e)*(c*f-g)/(
c*d-e)/(c*f+g))^(1/2))/e/(-c*(c*f+g))^(1/2)/(-d*g+e*f)/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (warning: unable to verify)

Time = 5.39 (sec) , antiderivative size = 396, normalized size of antiderivative = 1.53

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}\,dx = \frac{2\sqrt{f+gx}\left(a+b\arcsin(cx)-\frac{2bc(d+ex)\left(-\frac{(cd-e)e(-ef+dg)(-1+cx)\sqrt{\frac{(cd+e)(1+cx)}{c(d+ex)}}\,\text{EllipticF}\left(\cdots\right.}{d+ex}\cdots\right.}{\cdots}\cdots\right.}{\cdots}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + e*x)^(3/2)*Sqrt[f + g*x]),x]
```

output
```
(2*Sqrt[f + g*x]*(a + b*ArcSin[c*x] - (2*b*c*(d + e*x)*(-(((c*d - e)*e*(-(
e*f) + d*g)*(-1 + c*x)*Sqrt[((c*d + e)*(1 + c*x))/(c*(d + e*x))]*EllipticF
[ArcSin[Sqrt[((-(c*d) + e)*(-1 + c*x))/(c*(d + e*x))]/Sqrt[2]], (2*c*(-(e*
f) + d*g))/((c*d - e)*(c*f + g))])/(d + e*x)) - e*(c*d + e)*g*Sqrt[((-(c*d
) + e)*(-1 + c*x))/(c*(d + e*x))]*Sqrt[((-(c^2*d^2) + e^2)*(-1 + c^2*x^2))
/(c^2*(d + e*x)^2)]*EllipticPi[(-2*e)/(c*d - e), ArcSin[Sqrt[((-(c*d) + e)
*(-1 + c*x))/(c*(d + e*x))]/Sqrt[2]], (2*c*(-(e*f) + d*g))/((c*d - e)*(c*f
 + g))]))/((c*d - e)*e^2*(c*f + g)*Sqrt[((-(c*d) + e)*(-1 + c*x))/(c*(d +
e*x))]*Sqrt[((c*d + e)*(f + g*x))/((c*f + g)*(d + e*x))]*Sqrt[1 - c^2*x^2]
)))/((-(e*f) + d*g)*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 258, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {5286, 27, 726}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}dx$$

$$\Big\downarrow \text{ 5286}$$

$$-bc\int -\frac{2\sqrt{f+gx}}{(ef-dg)\sqrt{d+ex}\sqrt{1-c^2x^2}}dx-\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}(ef-dg)}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{2bc\int \frac{\sqrt{f+gx}}{\sqrt{d+ex}\sqrt{1-c^2x^2}}dx}{ef-dg}-\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}(ef-dg)}$$

$$\Big\downarrow \text{ 726}$$

$$\frac{4bc\sqrt{-c(cd+e)}(f+gx)\sqrt{\frac{(1-cx)(ef-dg)}{(cd+e)(f+gx)}}\sqrt{-\frac{(cx+1)(ef-dg)}{(cd-e)(f+gx)}}\,\text{EllipticPi}\left(\frac{(cd+e)g}{e(cf+g)},\arcsin\left(\frac{\sqrt{-c(cf+g)}\sqrt{d+ex}}{\sqrt{-c(cd+e)}\sqrt{f+gx}}\right),\frac{(cd+e)(cf}{(cd-e)(cf}\right.}{e\sqrt{1-c^2x^2}\sqrt{-c(cf+g)}(ef-dg)}$$
$$\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{\sqrt{d+ex}(ef-dg)}$$

input
```
Int[(a + b*ArcSin[c*x])/((d + e*x)^(3/2)*Sqrt[f + g*x]),x]
```

output
```
(-2*Sqrt[f + g*x]*(a + b*ArcSin[c*x]))/((e*f - d*g)*Sqrt[d + e*x]) + (4*b*
c*Sqrt[-(c*(c*d + e))]*Sqrt[((e*f - d*g)*(1 - c*x))/((c*d + e)*(f + g*x))]
*Sqrt[-(((e*f - d*g)*(1 + c*x))/((c*d - e)*(f + g*x)))]*(f + g*x)*Elliptic
Pi[((c*d + e)*g)/(e*(c*f + g)), ArcSin[(Sqrt[-(c*(c*f + g))]*Sqrt[d + e*x]
)/(Sqrt[-(c*(c*d + e))]*Sqrt[f + g*x])], ((c*d + e)*(c*f - g))/((c*d - e)*
(c*f + g))])/(e*Sqrt[-(c*(c*f + g))]*(e*f - d*g)*Sqrt[1 - c^2*x^2])
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 726
```
Int[Sqrt[(d_.) + (e_.)*(x_)]/(Sqrt[(f_.) + (g_.)*(x_)]*Sqrt[(a_) + (c_.)*(x
_)^2]), x_Symbol] :> With[{q = Rt[-4*a*c, 2]}, Simp[Sqrt[2]*Sqrt[2*c*f - g*
q]*Sqrt[-q + 2*c*x]*(d + e*x)*Sqrt[(e*f - d*g)*((q + 2*c*x)/((2*c*f - g*q)*
(d + e*x)))]*(Sqrt[(e*f - d*g)*((2*a + q*x)/((q*f - 2*a*g)*(d + e*x)))]/(g*
Sqrt[2*c*d - e*q]*Sqrt[2*a*(c/q) + c*x]*Sqrt[a + c*x^2]))*EllipticPi[e*((2*
c*f - g*q)/(g*(2*c*d - e*q))), ArcSin[Sqrt[2*c*d - e*q]*(Sqrt[f + g*x]/(Sqr
t[2*c*f - g*q]*Sqrt[d + e*x]))], (q*d - 2*a*e)*((2*c*f - g*q)/((q*f - 2*a*g
)*(2*c*d - e*q)))], x]] /; FreeQ[{a, c, d, e, f, g}, x]
```

rule 5286
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(u_), x_Symbol] :> With[{v = IntHide
[u, x]}, Simp[(a + b*ArcSin[c*x])   v, x] - Simp[b*c   Int[SimplifyIntegran
d[v/Sqrt[1 - c^2*x^2], x], x], x] /; InverseFunctionFreeQ[v, x]] /; FreeQ[{
a, b, c}, x]
```

Maple [F]

$$\int \frac{a + b \arcsin(cx)}{(ex+d)^{\frac{3}{2}} \sqrt{gx+f}} dx$$

input
```
int((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(1/2),x)
```

Fricas [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(1/2),x, algorithm="fric
as")
```

output
```
Timed out
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{(d+ex)^{\frac{3}{2}}\sqrt{f+gx}}\,dx$$

input
```
integrate((a+b*asin(c*x))/(e*x+d)**(3/2)/(g*x+f)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/((d + e*x)**(3/2)*sqrt(f + g*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(1/2),x, algorithm="maxi
ma")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e*(d*g-e*f)>0)', see `assume?` f
or more de
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}\,dx=\int \frac{b\arcsin{(cx)}+a}{(ex+d)^{\frac{3}{2}}\sqrt{gx+f}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(1/2),x, algorithm="giac
")
```

output
```
integrate((b*arcsin(c*x) + a)/((e*x + d)^(3/2)*sqrt(g*x + f)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{f+g\,x}\,(d+e\,x)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)^(1/2)*(d + e*x)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)^(1/2)*(d + e*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}\sqrt{f+gx}}\,dx=\frac{2\sqrt{g}\,\sqrt{e}\,\sqrt{ex+d}\,a+\sqrt{ex+d}\left(\int \frac{asin(cx)}{\sqrt{gx+f}\,\sqrt{ex+d}\,d+\sqrt{gx+f}\,\sqrt{ex+d}\,ex}dx\right)bdeg-\sqrt{ex}}{\sqrt{ex+d}\,e\,(dg-e}$$

input
```
int((a+b*asin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(1/2),x)
```

output
```
(2*sqrt(g)*sqrt(e)*sqrt(d + e*x)*a + sqrt(d + e*x)*int(asin(c*x)/(sqrt(f +
 g*x)*sqrt(d + e*x)*d + sqrt(f + g*x)*sqrt(d + e*x)*e*x),x)*b*d*e*g - sqrt
(d + e*x)*int(asin(c*x)/(sqrt(f + g*x)*sqrt(d + e*x)*d + sqrt(f + g*x)*sqr
t(d + e*x)*e*x),x)*b*e**2*f + 2*sqrt(f + g*x)*a*e)/(sqrt(d + e*x)*e*(d*g -
 e*f))
```

3.100 $\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 769

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx = -\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{3(ef-dg)(d+ex)^{3/2}}$$
$$+\frac{4g\sqrt{f+gx}(a+b\arcsin(cx))}{3(ef-dg)^2\sqrt{d+ex}}$$
$$-\frac{4\sqrt{2}bc^{3/2}\sqrt{-c-c^2x}\sqrt{\frac{(cd-e)(1-cx)}{c(d+ex)}}\sqrt{f+gx}\,E\left(\arcsin\left(\frac{\sqrt{-ef+dg}\sqrt{-c-c^2x}}{\sqrt{c}\sqrt{cf-g}\sqrt{d+ex}}\right)|\frac{(cd+e)(cf-g)}{2c(ef-dg)}\right)}{3\left(c^2d^2-e^2\right)\sqrt{cf-g}\sqrt{-ef+dg}\sqrt{\frac{(cd-e)(f+gx)}{(cf-g)(d+ex)}}\sqrt{1-c^2x^2}}$$
$$+\frac{2\sqrt{2}b\sqrt{c}(cf+g)\sqrt{-c-c^2x}\sqrt{\frac{(cd-e)(1-cx)}{c(d+ex)}}\sqrt{f+gx}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-ef+dg}\sqrt{-c-c^2x}}{\sqrt{c}\sqrt{cf-g}\sqrt{d+ex}}\right),\frac{(cd+e)(cf-g)}{2c(ef-dg)}\right)}{3(cd+e)\sqrt{cf-g}(-ef+dg)^{3/2}\sqrt{\frac{(cd-e)(f+gx)}{(cf-g)(d+ex)}}\sqrt{1-c^2x^2}}$$
$$-\frac{8bc\sqrt{-c(cd+e)}g\sqrt{\frac{(ef-dg)(1-cx)}{(cd+e)(f+gx)}}\sqrt{-\frac{(ef-dg)(1+cx)}{(cd-e)(f+gx)}}(f+gx)\,\text{EllipticPi}\left(\frac{(cd+e)g}{e(cf+g)},\arcsin\left(\frac{\sqrt{-c(cf+g)}\sqrt{d+ex}}{\sqrt{-c(cd+e)}\sqrt{f+gx}}\right),\frac{(c\cdots}{(c\cdots}\right.}{3e\sqrt{-c(cf+g)}(ef-dg)^2\sqrt{1-c^2x^2}}$$

output
```
-2/3*(g*x+f)^(1/2)*(a+b*arcsin(c*x))/(-d*g+e*f)/(e*x+d)^(3/2)+4/3*g*(g*x+f
)^(1/2)*(a+b*arcsin(c*x))/(-d*g+e*f)^2/(e*x+d)^(1/2)-4/3*2^(1/2)*b*c^(3/2)
*(-c^2*x-c)^(1/2)*((c*d-e)*(-c*x+1)/c/(e*x+d))^(1/2)*(g*x+f)^(1/2)*Ellipti
cE((d*g-e*f)^(1/2)*(-c^2*x-c)^(1/2)/c^(1/2)/(c*f-g)^(1/2)/(e*x+d)^(1/2),1/
2*2^(1/2)*((c*d+e)*(c*f-g)/c/(-d*g+e*f))^(1/2))/(c^2*d^2-e^2)/(c*f-g)^(1/2
)/(d*g-e*f)^(1/2)/((c*d-e)*(g*x+f)/(c*f-g)/(e*x+d))^(1/2)/(-c^2*x^2+1)^(1/
2)+2/3*2^(1/2)*b*c^(1/2)*(c*f+g)*(-c^2*x-c)^(1/2)*((c*d-e)*(-c*x+1)/c/(e*x
+d))^(1/2)*(g*x+f)^(1/2)*EllipticF((d*g-e*f)^(1/2)*(-c^2*x-c)^(1/2)/c^(1/2
)/(c*f-g)^(1/2)/(e*x+d)^(1/2),1/2*2^(1/2)*((c*d+e)*(c*f-g)/c/(-d*g+e*f))^(
1/2))/(c*d+e)/(c*f-g)^(1/2)/(d*g-e*f)^(3/2)/((c*d-e)*(g*x+f)/(c*f-g)/(e*x+
d))^(1/2)/(-c^2*x^2+1)^(1/2)-8/3*b*c*(-c*(c*d+e))^(1/2)*g*((-d*g+e*f)*(-c*
x+1)/(c*d+e)/(g*x+f))^(1/2)*(-(-d*g+e*f)*(c*x+1)/(c*d-e)/(g*x+f))^(1/2)*(g
*x+f)*EllipticPi((-c*(c*f+g))^(1/2)*(e*x+d)^(1/2)/(-c*(c*d+e))^(1/2)/(g*x+
f)^(1/2),(c*d+e)*g/e/(c*f+g),((c*d+e)*(c*f-g)/(c*d-e)/(c*f+g))^(1/2))/e/(-
c*(c*f+g))^(1/2)/(-d*g+e*f)^2/(-c^2*x^2+1)^(1/2)
```

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 1998 vs. $2(769) = 1538$.

Time = 22.48 (sec) , antiderivative size = 1998, normalized size of antiderivative = 2.60

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx = \text{Too large to display}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + e*x)^(5/2)*Sqrt[f + g*x]),x]
```

output
```
(-4*b*c*e*Sqrt[f + g*x]*Sqrt[1 - c^2*x^2])/(3*(-(c^2*d^2) + e^2)*(e*f - d*
g)*Sqrt[d + e*x]) + Sqrt[d + e*x]*Sqrt[f + g*x]*((2*a)/(3*(-(e*f) + d*g)*(
d + e*x)^2) + (4*a*g)/(3*(e*f - d*g)^2*(d + e*x))) + (2*b*Sqrt[f + g*x]*(-
(e*f) + 3*d*g + 2*e*g*x)*ArcSin[c*x])/(3*(-(e*f) + d*g)^2*(d + e*x)^(3/2))
 - (4*b*c*Sqrt[d + e*x]*Sqrt[1 - (c^2*(d + e*x)^2*(-1 + d/(d + e*x))^2)/e^
2]*((e*f - d*g)*(g + (e*f)/(d + e*x) - (d*g)/(d + e*x))*(e^2/(d + e*x)^2 -
 c^2*(-1 + d/(d + e*x))^2) + ((c^2*d^2 - e^2)*Sqrt[((c*d + e)*(g + (e*f)/(
d + e*x) - (d*g)/(d + e*x)))/(e*(c*f + g))]*(-(e^2*f^2*Sqrt[((e*f - d*g)*(
c - (c*d)/(d + e*x) + e/(d + e*x)))/(e*(c*f - g))]*(c - (c*d + e)/(d + e*x
))*Sqrt[1 - e/(c*(d + e*x)) + (c*d*(-1 + d/(d + e*x)))/e]*(e*(c*f - g)*Ell
ipticE[ArcSin[Sqrt[((c*d + e)*(g + (e*f)/(d + e*x) - (d*g)/(d + e*x)))/(e*
(c*f + g))]], ((c*d - e)*(c*f + g))/((c*d + e)*(c*f - g))] + c*(-(e*f) + d
*g)*EllipticF[ArcSin[Sqrt[((c*d + e)*(g + (e*f)/(d + e*x) - (d*g)/(d + e*x
)))/(e*(c*f + g))]], ((c*d - e)*(c*f + g))/((c*d + e)*(c*f - g))])) + 2*d*
e*f*g*Sqrt[((e*f - d*g)*(c - (c*d)/(d + e*x) + e/(d + e*x)))/(e*(c*f - g))
]*(c - (c*d + e)/(d + e*x))*Sqrt[1 - e/(c*(d + e*x)) + (c*d*(-1 + d/(d + e
*x)))/e]*(e*(c*f - g)*EllipticE[ArcSin[Sqrt[((c*d + e)*(g + (e*f)/(d + e*x
) - (d*g)/(d + e*x)))/(e*(c*f + g))]], ((c*d - e)*(c*f + g))/((c*d + e)*(c
*f - g))] + c*(-(e*f) + d*g)*EllipticF[ArcSin[Sqrt[((c*d + e)*(g + (e*f)/(
d + e*x) - (d*g)/(d + e*x)))/(e*(c*f + g))]], ((c*d - e)*(c*f + g))/((c...
```

Rubi [F]

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx$$

$$\Big\downarrow \ 5286$$

$$-bc\int -\frac{2\sqrt{f+gx}(ef-3dg-2egx)}{3(ef-dg)^2(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx+\frac{4g\sqrt{f+gx}(a+b\arcsin(cx))}{3\sqrt{d+ex}(ef-dg)^2}-\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{3(d+ex)^{3/2}(ef-dg)}$$

$$\Big\downarrow \ 27$$

$$\frac{2bc\int \frac{\sqrt{f+gx}(ef-3dg-2egx)}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx}{3(ef-dg)^2}+\frac{4g\sqrt{f+gx}(a+b\arcsin(cx))}{3\sqrt{d+ex}(ef-dg)^2}-\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{3(d+ex)^{3/2}(ef-dg)}$$

$$\Big\downarrow \text{ 2349}$$

$$\frac{2bc\left((ef-dg)\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx+\int -\frac{2g\sqrt{f+gx}}{\sqrt{d+ex}\sqrt{1-c^2x^2}}dx\right)}{3(ef-dg)^2}+\frac{4g\sqrt{f+gx}(a+b\arcsin(cx))}{3\sqrt{d+ex}(ef-dg)^2}-\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{3(d+ex)^{3/2}(ef-dg)}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{2bc\left((ef-dg)\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx-2g\int \frac{\sqrt{f+gx}}{\sqrt{d+ex}\sqrt{1-c^2x^2}}dx\right)}{3(ef-dg)^2}+\frac{4g\sqrt{f+gx}(a+b\arcsin(cx))}{3\sqrt{d+ex}(ef-dg)^2}-\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{3(d+ex)^{3/2}(ef-dg)}$$

$$\Big\downarrow \text{ 726}$$

$$\frac{2bc\left((ef-dg)\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx-\frac{4g\sqrt{-c(cd+e)}(f+gx)\sqrt{\frac{(1-cx)(ef-dg)}{(cd+e)(f+gx)}}\sqrt{-\frac{(cx+1)(ef-dg)}{(cd-e)(f+gx)}}\,\text{EllipticPi}\left(\frac{(cd+e)g}{e(cf+g)},\arcsin\left(\frac{\sqrt{-c(cf}}{\sqrt{-c(cd}}\right.\right.}{e\sqrt{1-c^2x^2}\sqrt{-c(cf+g)}}\right.}{3(ef-dg)^2}$$
$$\frac{4g\sqrt{f+gx}(a+b\arcsin(cx))}{3\sqrt{d+ex}(ef-dg)^2}-\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{3(d+ex)^{3/2}(ef-dg)}$$

$$\Big\downarrow \text{ 744}$$

$$\frac{2bc\left((ef-dg)\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx-\frac{4g\sqrt{-c(cd+e)}(f+gx)\sqrt{\frac{(1-cx)(ef-dg)}{(cd+e)(f+gx)}}\sqrt{-\frac{(cx+1)(ef-dg)}{(cd-e)(f+gx)}}\,\text{EllipticPi}\left(\frac{(cd+e)g}{e(cf+g)},\arcsin\left(\frac{\sqrt{-c(cf}}{\sqrt{-c(cd}}\right.\right.}{e\sqrt{1-c^2x^2}\sqrt{-c(cf+g)}}\right.}{3(ef-dg)^2}$$
$$\frac{4g\sqrt{f+gx}(a+b\arcsin(cx))}{3\sqrt{d+ex}(ef-dg)^2}-\frac{2\sqrt{f+gx}(a+b\arcsin(cx))}{3(d+ex)^{3/2}(ef-dg)}$$

input
```
Int[(a + b*ArcSin[c*x])/((d + e*x)^(5/2)*Sqrt[f + g*x]),x]
```

output
```
$Aborted
```

Maple [F]

$$\int \frac{a+b\arcsin\left(cx\right)}{\left(ex+d\right)^{\frac{5}{2}}\sqrt{gx+f}}dx$$

input
```
int((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(1/2),x)
```

Fricas [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(1/2),x, algorithm="fric
as")
```

output
```
Timed out
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx = \int \frac{a+b\,\mathrm{asin}\left(cx\right)}{\left(d+ex\right)^{\frac{5}{2}}\sqrt{f+gx}}\,dx$$

input
```
integrate((a+b*asin(c*x))/(e*x+d)**(5/2)/(g*x+f)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/((d + e*x)**(5/2)*sqrt(f + g*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(1/2),x, algorithm="maxi
ma")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e*(d*g-e*f)>0)', see `assume?` f
or more de
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx = \int \frac{b\arcsin(cx)+a}{(ex+d)^{\frac{5}{2}}\sqrt{gx+f}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(1/2),x, algorithm="giac
")
```

output
```
integrate((b*arcsin(c*x) + a)/((e*x + d)^(5/2)*sqrt(g*x + f)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{\sqrt{f+g\,x}\,(d+e\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)^(1/2)*(d + e*x)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)^(1/2)*(d + e*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}\sqrt{f+gx}}\,dx = \int \frac{asin(cx)\,b+a}{(ex+d)^{\frac{5}{2}}\,\sqrt{gx+f}}dx$$

input
```
int((a+b*asin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(1/2),x)
```

output
```
int((a+b*asin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(1/2),x)
```

3.101 $\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 618

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx = -\frac{2(a+b\arcsin(cx))}{(ef-dg)\sqrt{d+ex}\sqrt{f+gx}} - \frac{4g\sqrt{d+ex}(a+b\arcsin(cx))}{(ef-dg)^2\sqrt{f+gx}}$$
$$- \frac{4bc\sqrt{cf+g}(d+ex)\sqrt{-\frac{(ef-dg)^2(1-c^2x^2)}{(c^2f^2-g^2)(d+ex)^2}}\sqrt{1-\frac{(cd-e)(f+gx)}{(cf-g)(d+ex)}}\sqrt{1-\frac{(cd+e)(f+gx)}{(cf+g)(d+ex)}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{cd+e}\sqrt{f+gx}}{\sqrt{cf+g}\sqrt{d+ex}}\right)\right.}{\sqrt{cd+e}(ef-dg)^2\sqrt{1-c^2x^2}\sqrt{1-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}}}$$
$$+ \frac{8bc\sqrt{-c(cf+g)}\sqrt{-\frac{(ef-dg)(1-cx)}{(cf+g)(d+ex)}}\sqrt{\frac{(ef-dg)(1+cx)}{(cf-g)(d+ex)}}(d+ex)\,\text{EllipticPi}\left(\frac{e(cf+g)}{(cd+e)g},\arcsin\left(\frac{\sqrt{-c(cd+e)}\sqrt{f+gx}}{\sqrt{-c(cf+g)}\sqrt{d+ex}}\right),\frac{(cd-}{(cd+}\right.}{\sqrt{-c(cd+e)}(ef-dg)^2\sqrt{1-c^2x^2}}$$

output
```
(-2*a-2*b*arcsin(c*x))/(-d*g+e*f)/(e*x+d)^(1/2)/(g*x+f)^(1/2)-4*g*(e*x+d)^
(1/2)*(a+b*arcsin(c*x))/(-d*g+e*f)^2/(g*x+f)^(1/2)-4*b*c*(c*f+g)^(1/2)*(e*
x+d)*(-(-d*g+e*f)^2*(-c^2*x^2+1)/(c^2*f^2-g^2)/(e*x+d)^2)^(1/2)*(1-(c*d-e)
*(g*x+f)/(c*f-g)/(e*x+d))^(1/2)*(1-(c*d+e)*(g*x+f)/(c*f+g)/(e*x+d))^(1/2)*
EllipticF((c*d+e)^(1/2)*(g*x+f)^(1/2)/(c*f+g)^(1/2)/(e*x+d)^(1/2),((c*d-e)
*(c*f+g)/(c*d+e)/(c*f-g))^(1/2))/(c*d+e)^(1/2)/(-d*g+e*f)^2/(-c^2*x^2+1)^(
1/2)/(1-2*(c^2*d*f-e*g)*(g*x+f)/(c^2*f^2-g^2)/(e*x+d)+(c^2*d^2-e^2)*(g*x+f
)^2/(c^2*f^2-g^2)/(e*x+d)^2)^(1/2)+8*b*c*(-c*(c*f+g))^(1/2)*(-(-d*g+e*f)*(
-c*x+1)/(c*f+g)/(e*x+d))^(1/2)*((-d*g+e*f)*(c*x+1)/(c*f-g)/(e*x+d))^(1/2)*
(e*x+d)*EllipticPi((-c*(c*d+e))^(1/2)*(g*x+f)^(1/2)/(-c*(c*f+g))^(1/2)/(e*
x+d)^(1/2),e*(c*f+g)/(c*d+e)/g,((c*d-e)*(c*f+g)/(c*d+e)/(c*f-g))^(1/2))/(-
c*(c*d+e))^(1/2)/(-d*g+e*f)^2/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (warning: unable to verify)

Time = 14.27 (sec) , antiderivative size = 377, normalized size of antiderivative = 0.61

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx = \frac{2\left(-a(dg+e(f+2gx))-b(dg+e(f+2gx))\arcsin(cx)+\frac{2bc(d+ex)\sqrt{\frac{(cd+e)}{(cf+g)}}\cdots}{\cdots}\right.}{\cdots}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + e*x)^(3/2)*(f + g*x)^(3/2)),x]
```

output
```
(2*(-(a*(d*g + e*(f + 2*g*x))) - b*(d*g + e*(f + 2*g*x))*ArcSin[c*x] + (2*
b*c*(d + e*x)*Sqrt[((c*d + e)*(f + g*x))/((c*f + g)*(d + e*x))]*(((e*f - d
*g)*(-1 + c*x)*Sqrt[((c*d + e)*(1 + c*x))/(c*(d + e*x))]*EllipticF[ArcSin[
Sqrt[((-(c*d) + e)*(-1 + c*x))/(c*(d + e*x))]/Sqrt[2]], (2*c*(-(e*f) + d*g
))/((c*d - e)*(c*f + g))])/((c*d + e)*Sqrt[((-(c*d) + e)*(-1 + c*x))/(c*(d
 + e*x))]) - (2*g*(d + e*x)*Sqrt[((-(c^2*d^2) + e^2)*(-1 + c^2*x^2))/(c^2*
(d + e*x)^2)]*EllipticPi[(-2*e)/(c*d - e), ArcSin[Sqrt[((-(c*d) + e)*(-1 +
 c*x))/(c*(d + e*x))]/Sqrt[2]], (2*c*(-(e*f) + d*g))/((c*d - e)*(c*f + g))
])/(c*d - e)))/Sqrt[1 - c^2*x^2]))/((e*f - d*g)^2*Sqrt[d + e*x]*Sqrt[f + g
*x])
```

Rubi [A] (warning: unable to verify)

Time = 1.47 (sec) , antiderivative size = 798, normalized size of antiderivative = 1.29, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074, Rules used = {5282, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx$$

$$\Big\downarrow \text{5282}$$

$$-bc\int \left(-\frac{4\sqrt{d+ex}\,g}{(ef-dg)^2\sqrt{f+gx}\sqrt{1-c^2x^2}}-\frac{2}{(ef-dg)\sqrt{d+ex}\sqrt{f+gx}\sqrt{1-c^2x^2}}\right)dx-\frac{4g\sqrt{d+ex}(a+b\arcsin(cx))}{\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{\sqrt{d+ex}\sqrt{f+gx}(ef-dg)}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{4g\sqrt{d+ex}(a+b\arcsin(cx))}{(ef-dg)^2\sqrt{f+gx}}-\frac{2(a+b\arcsin(cx))}{(ef-dg)\sqrt{d+ex}\sqrt{f+gx}}-$$

$$bc\left(\frac{2\sqrt[4]{c^2f^2-g^2}(d+ex)\sqrt{-\frac{(ef-dg)^2(1-c^2x^2)}{(c^2f^2-g^2)(d+ex)^2}}\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)\sqrt{\frac{\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+1}{\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)^2}}\text{EllipticF}}{\sqrt[4]{c^2d^2-e^2}(ef-dg)^2\sqrt{1-c^2x^2}\sqrt{\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}-\frac{2(c^2df-}{(c^2f^2-}}}\right.$$

input
```
Int[(a + b*ArcSin[c*x])/((d + e*x)^(3/2)*(f + g*x)^(3/2)),x]
```

output
```
(-2*(a + b*ArcSin[c*x]))/((e*f - d*g)*Sqrt[d + e*x]*Sqrt[f + g*x]) - (4*g*
Sqrt[d + e*x]*(a + b*ArcSin[c*x]))/((e*f - d*g)^2*Sqrt[f + g*x]) - b*c*((2
*(c^2*f^2 - g^2)^(1/4)*(d + e*x)*Sqrt[-(((e*f - d*g)^2*(1 - c^2*x^2))/((c^
2*f^2 - g^2)*(d + e*x)^2))]*(1 + (Sqrt[c^2*d^2 - e^2]*(f + g*x))/(Sqrt[c^2
*f^2 - g^2]*(d + e*x)))*Sqrt[(1 - (2*(c^2*d*f - e*g)*(f + g*x))/((c^2*f^2
- g^2)*(d + e*x)) + ((c^2*d^2 - e^2)*(f + g*x)^2)/((c^2*f^2 - g^2)*(d + e*
x)^2))/(1 + (Sqrt[c^2*d^2 - e^2]*(f + g*x))/(Sqrt[c^2*f^2 - g^2]*(d + e*x)
))^2]*EllipticF[2*ArcTan[((c^2*d^2 - e^2)^(1/4)*Sqrt[f + g*x])/((c^2*f^2 -
 g^2)^(1/4)*Sqrt[d + e*x])], (1 + (c^2*d*f - e*g)/(Sqrt[c^2*d^2 - e^2]*Sqr
t[c^2*f^2 - g^2]))/2])/((c^2*d^2 - e^2)^(1/4)*(e*f - d*g)^2*Sqrt[1 - c^2*x
^2]*Sqrt[1 - (2*(c^2*d*f - e*g)*(f + g*x))/((c^2*f^2 - g^2)*(d + e*x)) + (
(c^2*d^2 - e^2)*(f + g*x)^2)/((c^2*f^2 - g^2)*(d + e*x)^2)]) - (8*Sqrt[-(c
*(c*f + g))]*Sqrt[-(((e*f - d*g)*(1 - c*x))/((c*f + g)*(d + e*x)))]*Sqrt[(
(e*f - d*g)*(1 + c*x))/((c*f - g)*(d + e*x))]*(d + e*x)*EllipticPi[(e*(c*f
 + g))/((c*d + e)*g), ArcSin[(Sqrt[-(c*(c*d + e))]*Sqrt[f + g*x])/(Sqrt[-(
c*(c*f + g))]*Sqrt[d + e*x])], ((c*d - e)*(c*f + g))/((c*d + e)*(c*f - g))
])/(Sqrt[-(c*(c*d + e))]*(e*f - d*g)^2*Sqrt[1 - c^2*x^2]))
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5282
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(m_)*((f_) + (g_
.)*(x_))^(m_), x_Symbol] :> With[{u = IntHide[(d + e*x)^m*(f + g*x)^m, x]},
 Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]   u,
 x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && ILtQ[m + 1/2, 0]
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(ex+d)^{\frac{3}{2}}(gx+f)^{\frac{3}{2}}}dx$$

input
```
int((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(3/2),x)
```

output
```
int((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(3/2),x)
```

Fricas [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx=\text{Timed out}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(3/2),x, algorithm="fric
as")
```

output
```
Timed out
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}\,(cx)}{(d+ex)^{\frac{3}{2}}\,(f+gx)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*asin(c*x))/(e*x+d)**(3/2)/(g*x+f)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))/((d + e*x)**(3/2)*(f + g*x)**(3/2)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(3/2),x, algorithm="maxi
ma")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(d*g-e*f>0)', see `assume?` for m
ore detail
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(ex+d)^{\frac{3}{2}}(gx+f)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(3/2),x, algorithm="giac
")
```

output
```
integrate((b*arcsin(c*x) + a)/((e*x + d)^(3/2)*(g*x + f)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)^{3/2}\,(d+e\,x)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)^(3/2)*(d + e*x)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)^(3/2)*(d + e*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{3/2}(f+gx)^{3/2}}\,dx = \int \frac{asin(cx)\,b+a}{(ex+d)^{\frac{3}{2}}\,(gx+f)^{\frac{3}{2}}}dx$$

input
```
int((a+b*asin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(3/2),x)
```

output
```
int((a+b*asin(c*x))/(e*x+d)^(3/2)/(g*x+f)^(3/2),x)
```

3.102 $\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx$

Optimal result

Integrand size = 27, antiderivative size = 1133

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx = \frac{2(a+b\arcsin(cx))}{(ef-dg)(d+ex)^{3/2}\sqrt{f+gx}}$$

$$-\frac{8e\sqrt{f+gx}(a+b\arcsin(cx))}{3(ef-dg)^2(d+ex)^{3/2}}+\frac{16eg\sqrt{f+gx}(a+b\arcsin(cx))}{3(ef-dg)^3\sqrt{d+ex}}$$

$$+\frac{4\sqrt{2}bc^{3/2}e\sqrt{-c-c^2x}\sqrt{\frac{(cd-e)(1-cx)}{c(d+ex)}}\sqrt{f+gx}E\left(\arcsin\left(\frac{\sqrt{-ef+dg}\sqrt{-c-c^2x}}{\sqrt{c}\sqrt{cf-g}\sqrt{d+ex}}\right)|\frac{(cd+e)(cf-g)}{2c(ef-dg)}\right)}{3\left(c^2d^2-e^2\right)\sqrt{cf-g}(-ef+dg)^{3/2}\sqrt{\frac{(cd-e)(f+gx)}{(cf-g)(d+ex)}}\sqrt{1-c^2x^2}}$$

$$-\frac{2\sqrt{2}b\sqrt{c}e(cf+g)\sqrt{-c-c^2x}\sqrt{\frac{(cd-e)(1-cx)}{c(d+ex)}}\sqrt{f+gx}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{-ef+dg}\sqrt{-c-c^2x}}{\sqrt{c}\sqrt{cf-g}\sqrt{d+ex}}\right),\frac{(cd+e)(cf-g)}{2c(ef-dg)}\right)}{3(cd+e)\sqrt{cf-g}(-ef+dg)^{5/2}\sqrt{\frac{(cd-e)(f+gx)}{(cf-g)(d+ex)}}\sqrt{1-c^2x^2}}$$

$$-\frac{4bcg\sqrt{cf+g}(d+ex)\sqrt{-\frac{(ef-dg)^2(1-c^2x^2)}{(c^2f^2-g^2)(d+ex)^2}}\sqrt{1-\frac{(cd-e)(f+gx)}{(cf-g)(d+ex)}}\sqrt{1-\frac{(cd+e)(f+gx)}{(cf+g)(d+ex)}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{cd+e}\sqrt{f+\cdots}}{\sqrt{cf+g}\sqrt{d+\cdots}}\right.\right.\cdots}{\sqrt{cd+e}(ef-dg)^3\sqrt{1-c^2x^2}\sqrt{1-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}}}$$

$$-\frac{32bc\sqrt{-c(cd+e)}g\sqrt{\frac{(ef-dg)(1-cx)}{(cd+e)(f+gx)}}\sqrt{-\frac{(ef-dg)(1+cx)}{(cd-e)(f+gx)}}(f+gx)\,\text{EllipticPi}\left(\frac{(cd+e)g}{e(cf+g)},\arcsin\left(\frac{\sqrt{-c(cf+g)}\sqrt{d+ex}}{\sqrt{-c(cd+e)}\sqrt{f+gx}}\right),\right.\cdots}{3\sqrt{-c(cf+g)}(ef-dg)^3\sqrt{1-c^2x^2}}$$

output
```
2*(a+b*arcsin(c*x))/(-d*g+e*f)/(e*x+d)^(3/2)/(g*x+f)^(1/2)-8/3*e*(g*x+f)^(
1/2)*(a+b*arcsin(c*x))/(-d*g+e*f)^2/(e*x+d)^(3/2)+16/3*e*g*(g*x+f)^(1/2)*(
a+b*arcsin(c*x))/(-d*g+e*f)^3/(e*x+d)^(1/2)+4/3*2^(1/2)*b*c^(3/2)*e*(-c^2*
x-c)^(1/2)*((c*d-e)*(-c*x+1)/c/(e*x+d))^(1/2)*(g*x+f)^(1/2)*EllipticE((d*g
-e*f)^(1/2)*(-c^2*x-c)^(1/2)/c^(1/2)/(c*f-g)^(1/2)/(e*x+d)^(1/2),1/2*2^(1/
2)*((c*d+e)*(c*f-g)/c/(-d*g+e*f))^(1/2))/(c^2*d^2-e^2)/(c*f-g)^(1/2)/(d*g-
e*f)^(3/2)/((c*d-e)*(g*x+f)/(c*f-g)/(e*x+d))^(1/2)/(-c^2*x^2+1)^(1/2)-2/3*
2^(1/2)*b*c^(1/2)*e*(c*f+g)*(-c^2*x-c)^(1/2)*((c*d-e)*(-c*x+1)/c/(e*x+d))^
(1/2)*(g*x+f)^(1/2)*EllipticF((d*g-e*f)^(1/2)*(-c^2*x-c)^(1/2)/c^(1/2)/(c*
f-g)^(1/2)/(e*x+d)^(1/2),1/2*2^(1/2)*((c*d+e)*(c*f-g)/c/(-d*g+e*f))^(1/2))
/(c*d+e)/(c*f-g)^(1/2)/(d*g-e*f)^(5/2)/((c*d-e)*(g*x+f)/(c*f-g)/(e*x+d))^(
1/2)/(-c^2*x^2+1)^(1/2)-4*b*c*g*(c*f+g)^(1/2)*(e*x+d)*(-(-d*g+e*f)^2*(-c^2
*x^2+1)/(c^2*f^2-g^2)/(e*x+d)^2)^(1/2)*(1-(c*d-e)*(g*x+f)/(c*f-g)/(e*x+d))
^(1/2)*(1-(c*d+e)*(g*x+f)/(c*f+g)/(e*x+d))^(1/2)*EllipticF((c*d+e)^(1/2)*(
g*x+f)^(1/2)/(c*f+g)^(1/2)/(e*x+d)^(1/2),((c*d-e)*(c*f+g)/(c*d+e)/(c*f-g))
^(1/2))/(c*d+e)^(1/2)/(-d*g+e*f)^3/(-c^2*x^2+1)^(1/2)/(1-2*(c^2*d*f-e*g)*(
g*x+f)/(c^2*f^2-g^2)/(e*x+d)+(c^2*d^2-e^2)*(g*x+f)^2/(c^2*f^2-g^2)/(e*x+d)
^2)^(1/2)-32/3*b*c*(-c*(c*d+e))^(1/2)*g*((-d*g+e*f)*(-c*x+1)/(c*d+e)/(g*x+
f))^(1/2)*(-(-d*g+e*f)*(c*x+1)/(c*d-e)/(g*x+f))^(1/2)*(g*x+f)*EllipticPi((
-c*(c*f+g))^(1/2)*(e*x+d)^(1/2)/(-c*(c*d+e))^(1/2)/(g*x+f)^(1/2),(c*d+e...
```

Mathematica [B] (warning: unable to verify)

Leaf count is larger than twice the leaf count of optimal. 3485 vs. $2(1133) = 2266$.

Time = 23.99 (sec) , antiderivative size = 3485, normalized size of antiderivative = 3.08

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx = \text{Result too large to show}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + e*x)^(5/2)*(f + g*x)^(3/2)),x]
```

output
```
(-4*b*c*e^2*Sqrt[f + g*x]*Sqrt[1 - c^2*x^2])/(3*(-(c^2*d^2) + e^2)*(e*f -
d*g)^2*Sqrt[d + e*x]) + Sqrt[d + e*x]*Sqrt[f + g*x]*((-2*a*e)/(3*(e*f - d*
g)^2*(d + e*x)^2) + (10*a*e*g)/(3*(e*f - d*g)^3*(d + e*x)) + (2*a*g^2)/((e
*f - d*g)^3*(f + g*x))) - (2*b*(-(e^2*f^2) + 6*d*e*f*g + 3*d^2*g^2 + 4*e^2
*f*g*x + 12*d*e*g^2*x + 8*e^2*g^2*x^2)*ArcSin[c*x])/(3*(-(e*f) + d*g)^3*(d
 + e*x)^(3/2)*Sqrt[f + g*x]) + (4*b*c*e*(((-(e*f) + d*g)*Sqrt[d + e*x]*(c^
2 + (c^2*d^2)/(d + e*x)^2 - e^2/(d + e*x)^2 - (2*c^2*d)/(d + e*x))*(g + (e
*f)/(d + e*x) - (d*g)/(d + e*x))*Sqrt[1 - (c^2*(d + e*x)^2*(-1 + d/(d + e*
x))^2)/e^2])/((e^2/(d + e*x)^2 - c^2*(-1 + d/(d + e*x))^2)*Sqrt[f + ((d +
e*x)*(g - (d*g)/(d + e*x)))/e]) + (Sqrt[c^2 + (c^2*d^2)/(d + e*x)^2 - e^2/
(d + e*x)^2 - (2*c^2*d)/(d + e*x)]*Sqrt[g + (e*f)/(d + e*x) - (d*g)/(d + e
*x)]*Sqrt[(c^2 + (c^2*d^2)/(d + e*x)^2 - e^2/(d + e*x)^2 - (2*c^2*d)/(d +
e*x))*(g + (e*f)/(d + e*x) - (d*g)/(d + e*x))]*Sqrt[1 - (c^2*(d + e*x)^2*(
-1 + d/(d + e*x))^2)/e^2]*((-8*(c*d - e)*(c*d + e)*g^2*Sqrt[d + e*x]*Sqrt[
c^2 + (c^2*d^2)/(d + e*x)^2 - e^2/(d + e*x)^2 - (2*c^2*d)/(d + e*x)])/(c^2
*Sqrt[g + (e*f)/(d + e*x) - (d*g)/(d + e*x)]) - ((c*d - e)*(c*d + e)*(-(c^
2*e^2*f^2) + 6*c^2*d*e*f*g + 4*c*e^2*f*g + 3*c^2*d^2*g^2 + 12*c*d*e*g^2 +
8*e^2*g^2)*Sqrt[c^2 + (c^2*d^2)/(d + e*x)^2 - e^2/(d + e*x)^2 - (2*c^2*d)/
(d + e*x)])/(2*c^2*e*Sqrt[d + e*x]*(c - (c*d)/(d + e*x) - e/(d + e*x))*Sqr
t[g + (e*f)/(d + e*x) - (d*g)/(d + e*x)]) + ((c*d - e)*(c*d + e)*(-(c^2...
```

Rubi [F]

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx$$

$$\Big\downarrow \text{5286}$$

$$-bc\int -\frac{2(e^2f^2-6degf-3d^2g^2-8e^2g^2x^2-4eg(ef+3dg)x)}{3(ef-dg)^3(d+ex)^{3/2}\sqrt{f+gx}\sqrt{1-c^2x^2}}dx+\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^3}+\frac{8g(a+b\arcsin(cx))}{3\sqrt{d+ex}\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}\sqrt{f+gx}(ef-dg)}$$

$$\Big\downarrow \text{27}$$

$$\frac{2bc\int \frac{e^2f^2-6degf-3d^2g^2-8e^2g^2x^2-4eg(ef+3dg)x}{(d+ex)^{3/2}\sqrt{f+gx}\sqrt{1-c^2x^2}}dx}{3(ef-dg)^3}+\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^3}+\frac{8g(a+b\arcsin(cx))}{3\sqrt{d+ex}\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}\sqrt{f+gx}(ef-dg)}$$

$\Big\downarrow$ 2349

$$\frac{2bc\left(\int \frac{-4dg^2-8exg^2-4efg}{\sqrt{d+ex}\sqrt{f+gx}\sqrt{1-c^2x^2}}dx+(ef-dg)^2\int \frac{1}{(d+ex)^{3/2}\sqrt{f+gx}\sqrt{1-c^2x^2}}dx\right)}{3(ef-dg)^3}+\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^3}+\frac{8g(a+b\arcsin(cx))}{3\sqrt{d+ex}\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}\sqrt{f+gx}(ef-dg)}$$

$\Big\downarrow$ 733

$$\frac{2bc\left(\int \frac{-4dg^2-8exg^2-4efg}{\sqrt{d+ex}\sqrt{f+gx}\sqrt{1-c^2x^2}}dx+(ef-dg)^2\left(\frac{e\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx}{ef-dg}-\frac{g\int \frac{1}{\sqrt{d+ex}\sqrt{f+gx}\sqrt{1-c^2x^2}}dx}{ef-dg}\right)\right)}{3(ef-dg)^3}+\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^3}+\frac{8g(a+b\arcsin(cx))}{3\sqrt{d+ex}\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}\sqrt{f+gx}(ef-dg)}$$

$\Big\downarrow$ 732

$$\frac{2bc\left((ef-dg)^2\left(\frac{2g(d+ex)\sqrt{-\frac{\left(1-c^2x^2\right)(ef-dg)^2}{\left(c^2f^2-g^2\right)(d+ex)^2}}\int \frac{1}{\sqrt{\frac{\left(c^2d^2-e^2\right)(f+gx)^2}{\left(c^2f^2-g^2\right)(d+ex)^2}-\frac{2\left(c^2df-eg\right)(f+gx)}{\left(c^2f^2-g^2\right)(d+ex)}+1}}d\frac{\sqrt{f+gx}}{\sqrt{d+ex}}}{\sqrt{1-c^2x^2}(ef-dg)^2}+\frac{e\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx}{ef-dg}\right)\right)}{3(ef-dg)^3}+\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^3}+\frac{8g(a+b\arcsin(cx))}{3\sqrt{d+ex}\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}\sqrt{f+gx}(ef-dg)}$$

$\Big\downarrow$ 744

$$\frac{2bc\left((ef-dg)^2\left(\frac{2g(d+ex)\sqrt{-\frac{(1-c^2x^2)(ef-dg)^2}{(c^2f^2-g^2)(d+ex)^2}}\int \frac{1}{\sqrt{\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+1}}d\frac{\sqrt{f+gx}}{\sqrt{d+ex}}}{\sqrt{1-c^2x^2}(ef-dg)^2}+\frac{e\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx}{ef-dg}\right)\right)}{3(ef-dg)^3}+\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^3}+\frac{8g(a+b\arcsin(cx))}{3\sqrt{d+ex}\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}\sqrt{f+gx}(ef-dg)}$$

$\big\downarrow$ 1416

$$\frac{2bc\left((ef-dg)^2\left(\frac{e\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx}{ef-dg}+\frac{g\sqrt[4]{c^2f^2-g^2}(d+ex)\sqrt{-\frac{(1-c^2x^2)(ef-dg)^2}{(c^2f^2-g^2)(d+ex)^2}}\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)\sqrt{\frac{\frac{(c^2d^2-e^2)(f+gx)\cdots}{(c^2f^2-g^2)(d+ex\cdots}\cdots}{\left(\frac{\sqrt{c^2d^2\cdots}}{\sqrt{c^2f^2\cdots}}\cdots\right.}}\cdots}{\sqrt{1-c^2x^2}\sqrt[4]{c^2d^2-e^2}(ef-dg)\cdots}\right.\right.}{3(ef-\cdots}+\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^3}+\frac{8g(a+b\arcsin(cx))}{3\sqrt{d+ex}\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}\sqrt{f+gx}(ef-dg)}$$

$\big\downarrow$ 2349

$$\frac{2bc\left((ef-dg)^2\left(\frac{e\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx}{ef-dg}+\frac{g\sqrt[4]{c^2f^2-g^2}(d+ex)\sqrt{-\frac{(1-c^2x^2)(ef-dg)^2}{(c^2f^2-g^2)(d+ex)^2}}\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)\sqrt{\frac{\frac{(c^2d^2-e^2)(f+gx)\cdots}{(c^2f^2-g^2)(d+ex\cdots}\cdots}{\left(\frac{\sqrt{c^2d^2\cdots}}{\sqrt{c^2f^2\cdots}}\cdots\right.}}\cdots}{\sqrt{1-c^2x^2}\sqrt[4]{c^2d^2-e^2}(ef-dg)\cdots}\right.\right.}{\cdots}+\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^3}+\frac{8g(a+b\arcsin(cx))}{3\sqrt{d+ex}\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}\sqrt{f+gx}(ef-dg)}$$

$\downarrow$ 27

$$2bc\left((ef-dg)^2\left(\frac{e\int \frac{\sqrt{f+gx}}{(d+ex)^{3/2}\sqrt{1-c^2x^2}}dx}{ef-dg}+\frac{g\sqrt[4]{c^2f^2-g^2}(d+ex)\sqrt{-\frac{(1-c^2x^2)(ef-dg)^2}{(c^2f^2-g^2)(d+ex)^2}}\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)\sqrt{\frac{\frac{(c^2d^2-e^2)(f+gx)}{(c^2f^2-g^2)(d+ex)}}{\left(\frac{\sqrt{c^2d^2}}{\sqrt{c^2f^2}}\right.}}}{\sqrt{1-c^2x^2}\sqrt[4]{c^2d^2-e^2}(ef-dg)}\right.\right.$$

$$\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^3}+\frac{8g(a+b\arcsin(cx))}{3\sqrt{d+ex}\sqrt{f+gx}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}\sqrt{f+gx}(ef-dg)}$$

$\downarrow$ 726

$$\frac{16\sqrt{d+ex}(a+b\arcsin(cx))g^2}{3(ef-dg)^3\sqrt{f+gx}}+\frac{8(a+b\arcsin(cx))g}{3(ef-dg)^2\sqrt{d+ex}\sqrt{f+gx}}-\frac{2(a+b\arcsin(cx))}{3(ef-dg)(d+ex)^{3/2}\sqrt{f+gx}}+$$

$$2bc\left(\left(\frac{g\sqrt[4]{c^2f^2-g^2}(d+ex)\sqrt{-\frac{(ef-dg)^2(1-c^2x^2)}{(c^2f^2-g^2)(d+ex)^2}}\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)\sqrt{\frac{\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+1}{\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)^2}}\,\text{EllipticF}\left(2\arctan\right.}{\sqrt[4]{c^2d^2-e^2}(ef-dg)^2\sqrt{1-c^2x^2}\sqrt{\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+}}\right.\right.$$

$\downarrow$ 732

$$\frac{16\sqrt{d+ex}(a+b\arcsin(cx))g^2}{3(ef-dg)^3\sqrt{f+gx}}+\frac{8(a+b\arcsin(cx))g}{3(ef-dg)^2\sqrt{d+ex}\sqrt{f+gx}}-\frac{2(a+b\arcsin(cx))}{3(ef-dg)(d+ex)^{3/2}\sqrt{f+gx}}+$$

$$2bc\left(\left(\frac{g\sqrt[4]{c^2f^2-g^2}(d+ex)\sqrt{-\frac{(ef-dg)^2(1-c^2x^2)}{(c^2f^2-g^2)(d+ex)^2}}\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)\sqrt{\frac{\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+1}{\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)^2}}\text{EllipticF}\left(2\arctan\right.}{\sqrt[4]{c^2d^2-e^2}(ef-dg)^2\sqrt{1-c^2x^2}\sqrt{\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+}}\right.\right.$$

$\downarrow$ 1416

$$\frac{16\sqrt{d+ex}(a+b\arcsin(cx))g^2}{3(ef-dg)^3\sqrt{f+gx}}+\frac{8(a+b\arcsin(cx))g}{3(ef-dg)^2\sqrt{d+ex}\sqrt{f+gx}}-\frac{2(a+b\arcsin(cx))}{3(ef-dg)(d+ex)^{3/2}\sqrt{f+gx}}+$$

$$2bc\left(\left(\frac{g\sqrt[4]{c^2f^2-g^2}(d+ex)\sqrt{-\frac{(ef-dg)^2(1-c^2x^2)}{(c^2f^2-g^2)(d+ex)^2}}\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)\sqrt{\frac{\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+1}{\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)^2}}\text{EllipticF}\left(2\arctan\right.}{\sqrt[4]{c^2d^2-e^2}(ef-dg)^2\sqrt{1-c^2x^2}\sqrt{\frac{(c^2d^2-e^2)(f+gx)^2}{(c^2f^2-g^2)(d+ex)^2}-\frac{2(c^2df-eg)(f+gx)}{(c^2f^2-g^2)(d+ex)}+}}\right.\right.$$

input
```
Int[(a + b*ArcSin[c*x])/((d + e*x)^(5/2)*(f + g*x)^(3/2)),x]
```

output
```
$Aborted
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(ex+d)^{\frac{5}{2}}(gx+f)^{\frac{3}{2}}}dx$$

input
```
int((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(3/2),x)
```

output
```
int((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(3/2),x)
```

Fricas [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(3/2),x, algorithm="fric
as")
```

output
```
Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(c*x))/(e*x+d)**(5/2)/(g*x+f)**(3/2),x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(3/2),x, algorithm="maxi
ma")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e*(d*g-e*f)>0)', see `assume?` f
or more de
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(ex+d)^{\frac{5}{2}}(gx+f)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(3/2),x, algorithm="giac
")
```

output
```
integrate((b*arcsin(c*x) + a)/((e*x + d)^(5/2)*(g*x + f)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)^{3/2}\,(d+e\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)^(3/2)*(d + e*x)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)^(3/2)*(d + e*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{3/2}}\,dx = \text{too large to display}$$

input
```
int((a+b*asin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(3/2),x)
```

output
```
(16*sqrt(g)*sqrt(e)*sqrt(d + e*x)*a*d*f*g + 16*sqrt(g)*sqrt(e)*sqrt(d + e*
x)*a*d*g**2*x + 16*sqrt(g)*sqrt(e)*sqrt(d + e*x)*a*e*f*g*x + 16*sqrt(g)*sq
rt(e)*sqrt(d + e*x)*a*e*g**2*x**2 + 3*sqrt(d + e*x)*int(asin(c*x)/(sqrt(f
+ g*x)*sqrt(d + e*x)*d**2*f + sqrt(f + g*x)*sqrt(d + e*x)*d**2*g*x + 2*sqr
t(f + g*x)*sqrt(d + e*x)*d*e*f*x + 2*sqrt(f + g*x)*sqrt(d + e*x)*d*e*g*x**
2 + sqrt(f + g*x)*sqrt(d + e*x)*e**2*f*x**2 + sqrt(f + g*x)*sqrt(d + e*x)*
e**2*g*x**3),x)*b*d**4*f*g**3 + 3*sqrt(d + e*x)*int(asin(c*x)/(sqrt(f + g*
x)*sqrt(d + e*x)*d**2*f + sqrt(f + g*x)*sqrt(d + e*x)*d**2*g*x + 2*sqrt(f
+ g*x)*sqrt(d + e*x)*d*e*f*x + 2*sqrt(f + g*x)*sqrt(d + e*x)*d*e*g*x**2 +
sqrt(f + g*x)*sqrt(d + e*x)*e**2*f*x**2 + sqrt(f + g*x)*sqrt(d + e*x)*e**2
*g*x**3),x)*b*d**4*g**4*x - 9*sqrt(d + e*x)*int(asin(c*x)/(sqrt(f + g*x)*s
qrt(d + e*x)*d**2*f + sqrt(f + g*x)*sqrt(d + e*x)*d**2*g*x + 2*sqrt(f + g*
x)*sqrt(d + e*x)*d*e*f*x + 2*sqrt(f + g*x)*sqrt(d + e*x)*d*e*g*x**2 + sqrt
(f + g*x)*sqrt(d + e*x)*e**2*f*x**2 + sqrt(f + g*x)*sqrt(d + e*x)*e**2*g*x
**3),x)*b*d**3*e*f**2*g**2 - 6*sqrt(d + e*x)*int(asin(c*x)/(sqrt(f + g*x)*
sqrt(d + e*x)*d**2*f + sqrt(f + g*x)*sqrt(d + e*x)*d**2*g*x + 2*sqrt(f + g
*x)*sqrt(d + e*x)*d*e*f*x + 2*sqrt(f + g*x)*sqrt(d + e*x)*d*e*g*x**2 + sqr
t(f + g*x)*sqrt(d + e*x)*e**2*f*x**2 + sqrt(f + g*x)*sqrt(d + e*x)*e**2*g*
x**3),x)*b*d**3*e*f*g**3*x + 3*sqrt(d + e*x)*int(asin(c*x)/(sqrt(f + g*x)*
sqrt(d + e*x)*d**2*f + sqrt(f + g*x)*sqrt(d + e*x)*d**2*g*x + 2*sqrt(f ...
```

3.103 $\int \frac{a+b \arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}} \, dx$

Optimal result

Integrand size = 27, antiderivative size = 1

$$\int \frac{a+b \arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}} \, dx = 0$$

output
```
0
```

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 4 vs. order 1 in optimal.

Time = 24.67 (sec) , antiderivative size = 5962, normalized size of antiderivative = 5962.00

$$\int \frac{a+b \arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}} \, dx = \text{Result too large to show}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((d + e*x)^(5/2)*(f + g*x)^(5/2)),x]
```

output
```
Result too large to show
```

Rubi [F]

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}}\,dx$$

$$\Big\downarrow \text{5282}$$

$$-bc\int \left(\frac{32e\sqrt{d+ex}g^2}{3(ef-dg)^4\sqrt{f+gx}\sqrt{1-c^2x^2}}+\frac{16\sqrt{d+ex}g^2}{3(ef-dg)^3(f+gx)^{3/2}\sqrt{1-c^2x^2}}+\frac{4g}{(ef-dg)^2\sqrt{d+ex}(f+gx)^{3/2}\sqrt{}}\right.$$
$$\frac{32eg^2\sqrt{d+ex}(a+b\arcsin(cx))}{3\sqrt{f+gx}(ef-dg)^4}+\frac{16g^2\sqrt{d+ex}(a+b\arcsin(cx))}{3(f+gx)^{3/2}(ef-dg)^3}+$$
$$\frac{4g(a+b\arcsin(cx))}{\sqrt{d+ex}(f+gx)^{3/2}(ef-dg)^2}-\frac{2(a+b\arcsin(cx))}{3(d+ex)^{3/2}(f+gx)^{3/2}(ef-dg)}$$

$$\Big\downarrow \text{2009}$$

$$\frac{32e\sqrt{d+ex}(a+b\arcsin(cx))g^2}{3(ef-dg)^4\sqrt{f+gx}}+\frac{16\sqrt{d+ex}(a+b\arcsin(cx))g^2}{3(ef-dg)^3(f+gx)^{3/2}}+$$
$$\frac{4(a+b\arcsin(cx))g}{(ef-dg)^2\sqrt{d+ex}(f+gx)^{3/2}}-\frac{2(a+b\arcsin(cx))}{3(ef-dg)(d+ex)^{3/2}(f+gx)^{3/2}}-$$
$$bc\left(\frac{4\int \frac{\sqrt{d+ex}}{(f+gx)^{3/2}\sqrt{1-c^2x^2}}dxg^2}{3(ef-dg)^3}-\frac{4e\sqrt[4]{c^2f^2-g^2}(d+ex)\sqrt{-\frac{(ef-dg)^2(1-c^2x^2)}{(c^2f^2-g^2)(d+ex)^2}}\left(\frac{\sqrt{c^2d^2-e^2}(f+gx)}{\sqrt{c^2f^2-g^2}(d+ex)}+1\right)\sqrt{\frac{\frac{\left(c^2d^2-e^2\right)(f+gx}{\left(c^2f^2-g^2\right)(d+ex}}{\left(\frac{\sqrt{c^2d^2}}{\sqrt{c^2f^2}}\right.}}}{\sqrt[4]{c^2d^2-e^2}(ef-dg)^4\sqrt{1-c^2}}\right.$$

input
```
Int[(a + b*ArcSin[c*x])/((d + e*x)^(5/2)*(f + g*x)^(5/2)),x]
```

output
```
$Aborted
```

Maple [F]

$$\int \frac{a+b\arcsin(cx)}{(ex+d)^{\frac{5}{2}}(gx+f)^{\frac{5}{2}}}dx$$

input
```
int((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(5/2),x)
```

output
```
int((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(5/2),x)
```

Fricas [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(5/2),x, algorithm="fric
as")
```

output
```
Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(c*x))/(e*x+d)**(5/2)/(g*x+f)**(5/2),x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(5/2),x, algorithm="maxi
ma")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(d*g-e*f>0)', see `assume?` for m
ore detail
```

Giac [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}}\,dx = \int \frac{b\arcsin(cx)+a}{(ex+d)^{\frac{5}{2}}(gx+f)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(5/2),x, algorithm="giac
")
```

output
```
integrate((b*arcsin(c*x) + a)/((e*x + d)^(5/2)*(g*x + f)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)^{5/2}\,(d+e\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)^(5/2)*(d + e*x)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)^(5/2)*(d + e*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^{5/2}(f+gx)^{5/2}}\,dx = \int \frac{asin(cx)\,b+a}{(ex+d)^{\frac{5}{2}}\,(gx+f)^{\frac{5}{2}}}dx$$

input
```
int((a+b*asin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(5/2),x)
```

output
```
int((a+b*asin(c*x))/(e*x+d)^(5/2)/(g*x+f)^(5/2),x)
```

3.104 $\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 646

$$\begin{aligned}
&\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx \\
&= \frac{bf^2gx\sqrt{d-c^2dx^2}}{c\sqrt{1-c^2x^2}}+\frac{2bg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}-\frac{bcf^3x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}} \\
&\quad+\frac{3bfg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}-\frac{bcf^2gx^3\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}} \\
&\quad+\frac{bg^3x^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}-\frac{3bcfg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{bcg^3x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} \\
&\quad+\frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2} \\
&\quad+\frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{f^2g(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{c^2d} \\
&\quad-\frac{g^3(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^4d}+\frac{g^3(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{5c^4d^2} \\
&\quad+\frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}+\frac{3fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}
\end{aligned}$$

output
```
b*f^2*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/15*b*g^3*x*(-c^2*d*x
^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)-1/4*b*c*f^3*x^2*(-c^2*d*x^2+d)^(1/2)/(-
c^2*x^2+1)^(1/2)+3/16*b*f*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2
)-1/3*b*c*f^2*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/45*b*g^3*x^3
*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-3/16*b*c*f*g^2*x^4*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/25*b*c*g^3*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^
2+1)^(1/2)+1/2*f^3*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))-3/8*f*g^2*x*(-
c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^2+3/4*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2
)*(a+b*arcsin(c*x))-f^2*g*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^2/d-1/3
*g^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^4/d+1/5*g^3*(-c^2*d*x^2+d)^(
5/2)*(a+b*arcsin(c*x))/c^4/d^2+1/4*f^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*
x))^2/b/c/(-c^2*x^2+1)^(1/2)+3/16*f*g^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c
*x))^2/b/c^3/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 356, normalized size of antiderivative = 0.55

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$= \frac{\sqrt{d-c^2dx^2}\left(225a^2(4c^3f^3+3cfg^2)+30ab\sqrt{1-c^2x^2}(-16g^3-c^2g(120f^2+45fgx+8g^2x^2)+6c^4x(10f\right.}{}$$

input
```
Integrate[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(225*a^2*(4*c^3*f^3 + 3*c*f*g^2) + 30*a*b*Sqrt[1 - c^
2*x^2]*(-16*g^3 - c^2*g*(120*f^2 + 45*f*g*x + 8*g^2*x^2) + 6*c^4*x*(10*f^3
 + 20*f^2*g*x + 15*f*g^2*x^2 + 4*g^3*x^3)) + b^2*c*x*(480*g^3 + 5*c^2*g*(7
20*f^2 + 135*f*g*x + 16*g^2*x^2) - 3*c^4*x*(300*f^3 + 400*f^2*g*x + 225*f*
g^2*x^2 + 48*g^3*x^3)) + 30*b*(15*a*(4*c^3*f^3 + 3*c*f*g^2) + b*Sqrt[1 - c
^2*x^2]*(-16*g^3 - c^2*g*(120*f^2 + 45*f*g*x + 8*g^2*x^2) + 6*c^4*x*(10*f^
3 + 20*f^2*g*x + 15*f*g^2*x^2 + 4*g^3*x^3)))*ArcSin[c*x] + 225*b^2*c*f*(4*
c^2*f^2 + 3*g^2)*ArcSin[c*x]^2))/(3600*b*c^4*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.07 (sec) , antiderivative size = 371, normalized size of antiderivative = 0.57, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)^3(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{d-c^2dx^2}\int \left(\sqrt{1-c^2x^2}(a+b\arcsin(cx))f^3+3gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))f^2+3g^2x^2\sqrt{1-c^2x^2}(a+b\,\mathrm{arcs}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{d-c^2dx^2}\left(\frac{3fg^2(a+b\arcsin(cx))^2}{16bc^3}+\frac{1}{2}f^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{f^2g\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{c^2}-\frac{3fg^2x\sqrt{1-c^2x^2}}{8}\right.$$

input
```
Int[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((b*f^2*g*x)/c + (2*b*g^3*x)/(15*c^3) - (b*c*f^3*x^2)
/4 + (3*b*f*g^2*x^2)/(16*c) - (b*c*f^2*g*x^3)/3 + (b*g^3*x^3)/(45*c) - (3*
b*c*f*g^2*x^4)/16 - (b*c*g^3*x^5)/25 + (f^3*x*Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x]))/2 - (3*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c^2) +
 (3*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/4 - (f^2*g*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x]))/c^2 - (g^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x]))/(3*c^4) + (g^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4) +
 (f^3*(a + b*ArcSin[c*x])^2)/(4*b*c) + (3*f*g^2*(a + b*ArcSin[c*x])^2)/(16
*b*c^3)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.12 (sec) , antiderivative size = 1396, normalized size of antiderivative = 2.16

method	result	size
default	Expression too large to display	1396
parts	Expression too large to display	1396

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-c^2*d*x^2+d)^(1/2)))+g^3*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d
/c^4*(-c^2*d*x^2+d)^(3/2))+3*f*g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/
c^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))))-f^2*g/c^2/d*(-c^2*d*x^2+d)^(3/2))+b*(-1/16*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(4*c^2
*f^2+3*g^2)+1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2
*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2
*x^2+1)^(1/2)*x*c-1)*g^3*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)+3/256*(-d*(c^2*
x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^
(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*g^2*(I+4*arcsin(c*x
))/c^3/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(
-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(36*arcsin(c*x)*
c^2*f^2+12*I*c^2*f^2+3*g^2*arcsin(c*x)+I*g^2)/c^4/(c^2*x^2-1)+1/16*(-d*(c^
2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^
(1/2)-2*c*x)*f^3*(I+2*arcsin(c*x))/c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/
2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*g*(6*arcsin(c*x)*c^2*f^2+6*I*c^2*f
^2+g^2*arcsin(c*x)+I*g^2)/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(
-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(6*arcsin(c*x)*c^2*f^2-6*I*c^2*f^2+g^2*
arcsin(c*x)-I*g^2)/c^4/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c...
```

Fricas [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral((a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 + 3
*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\int\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^3\,dx$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))*(f + g*x)**3, x)
```

Maxima [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\int\sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin\,(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a*f^3 - 1/15*a*g^3*(3
*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c^4*d)) +
3/8*a*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*
d) + sqrt(d)*arcsin(c*x)/c^3) - (-c^2*d*x^2 + d)^(3/2)*a*f^2*g/(c^2*d) + s
qrt(d)*integrate((b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*sqrt(c*
x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{d}\left(60asin(cx)\,a\,c^3f^3+45asin(cx)\,acf\,g^2+60\sqrt{-c^2x^2+1}\,a\,c^4f^3x+120\sqrt{-c^2x^2+1}\,a\,c^4f^2g\,x^2+90\sqrt{}\right.}{}$$

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*asin(c*x)),x)
```

output

```
(sqrt(d)*(60*asin(c*x)*a*c**3*f**3 + 45*asin(c*x)*a*c*f*g**2 + 60*sqrt( -
c**2*x**2 + 1)*a*c**4*f**3*x + 120*sqrt( - c**2*x**2 + 1)*a*c**4*f**2*g*x*
*2 + 90*sqrt( - c**2*x**2 + 1)*a*c**4*f*g**2*x**3 + 24*sqrt( - c**2*x**2 +
 1)*a*c**4*g**3*x**4 - 120*sqrt( - c**2*x**2 + 1)*a*c**2*f**2*g - 45*sqrt(
 - c**2*x**2 + 1)*a*c**2*f*g**2*x - 8*sqrt( - c**2*x**2 + 1)*a*c**2*g**3*x
**2 - 16*sqrt( - c**2*x**2 + 1)*a*g**3 + 120*int(sqrt( - c**2*x**2 + 1)*as
in(c*x)*x**3,x)*b*c**4*g**3 + 360*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**
2,x)*b*c**4*f*g**2 + 360*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x,x)*b*c**4*
f**2*g + 120*int(sqrt( - c**2*x**2 + 1)*asin(c*x),x)*b*c**4*f**3 + 120*a*c
**2*f**2*g + 16*a*g**3))/(120*c**4)
```

3.105 $\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 443

$$\begin{aligned}\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx &= \frac{2bfgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcf^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{bg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}\\&\quad-\frac{2bcfgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}-\frac{bcg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}\\&\quad+\frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2}\\&\quad+\frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{2fg(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^2d}\\&\quad+\frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}+\frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}\end{aligned}$$

output
```
2/3*b*f*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/4*b*c*f^2*x^2*(-c^
2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*b*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/
(-c^2*x^2+1)^(1/2)-2/9*b*c*f*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
-1/16*b*c*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/2*f^2*x*(-c^2*
d*x^2+d)^(1/2)*(a+b*arcsin(c*x))-1/8*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsi
n(c*x))/c^2+1/4*g^2*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))-2/3*f*g*(-c
^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/c^2/d+1/4*f^2*(-c^2*d*x^2+d)^(1/2)*(a+
b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)+1/16*g^2*(-c^2*d*x^2+d)^(1/2)*(a+b
*arcsin(c*x))^2/b/c^3/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.53

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$= \frac{\sqrt{d-c^2dx^2}\left(-36bcf^2x^2-9bcg^2x^4-\frac{32bfgx(-3+c^2x^2)}{c}+72f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+36g^2x^3\sqrt{1-\right.}{}$$

input
```
Integrate[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(-36*b*c*f^2*x^2 - 9*b*c*g^2*x^4 - (32*b*f*g*x*(-3 +
c^2*x^2))/c + 72*f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + 36*g^2*x^3*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (96*f*g*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x]))/c^2 + (36*f^2*(a + b*ArcSin[c*x])^2)/(b*c) + (9*g^2*(b*c^2*
x^2 - 2*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + (a + b*ArcSin[c*x])^2/
b))/c^3))/(144*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 263, normalized size of antiderivative = 0.59, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)^2(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{d-c^2dx^2}\int \left(\sqrt{1-c^2x^2}(a+b\arcsin(cx))f^2+2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))f+g^2x^2\sqrt{1-c^2x^2}(a+b\arcsin$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{g^2(a+b\arcsin(cx))^2}{16bc^3}+\frac{1}{2}f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{2fg(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c^2}-\frac{g^2x\sqrt{1-c^2x^2}(a+b}{8c^2}$$

input
```
Int[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((2*b*f*g*x)/(3*c) - (b*c*f^2*x^2)/4 + (b*g^2*x^2)/(1
6*c) - (2*b*c*f*g*x^3)/9 - (b*c*g^2*x^4)/16 + (f^2*x*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/2 - (g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c^2
) + (g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/4 - (2*f*g*(1 - c^2*x^
2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^2) + (f^2*(a + b*ArcSin[c*x])^2)/(4*b*c
) + (g^2*(a + b*ArcSin[c*x])^2)/(16*b*c^3)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.77 (sec) , antiderivative size = 973, normalized size of antiderivative = 2.20

method	result
default	$a\left(f^{2}\left(\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2\sqrt{c^{2}d}}\right)+g^{2}\left(-\frac{x\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}{4c^{2}d}+\frac{\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2\sqrt{c^{2}d}}}{4c^{2}}\right.\right.$
parts	$a\left(f^{2}\left(\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2\sqrt{c^{2}d}}\right)+g^{2}\left(-\frac{x\left(-c^{2}d\,x^{2}+d\right)^{\frac{3}{2}}}{4c^{2}d}+\frac{\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2\sqrt{c^{2}d}}}{4c^{2}}\right.\right.$

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-c^2*d*x^2+d)^(1/2)))+g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/c^2*
(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c
^2*d*x^2+d)^(1/2))))-2/3*f*g/c^2/d*(-c^2*d*x^2+d)^(3/2))+b*(-1/16*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*(4*c^2*f^2
+g^2)+1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*
x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*
g^2*(I+4*arcsin(c*x))/c^3/(c^2*x^2-1)+1/36*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x
^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*
f*g*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-
c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(I+2*ar
csin(c*x))/c/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x
^2+1)^(1/2)-1)*f*g*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1
/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*f*g*(arcsin(c*x)-I)/c^2/(c^2*x^2-
1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I
*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*f^2/c/(c^2*x^2-1)+1/36*(-d*(
c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+
1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/256*(-d
*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5-8*I*(-c^2*x^
2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*g^2*(-I+4*arc...
```

Fricas [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2
+ 2*b*f*g*x + b*f^2)*arcsin(c*x)), x)
```

Sympy [F]

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

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))*(f + g*x)**2, x)
```

Maxima [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin\,(cx)+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a*f^2 + 1/8*a*g^2*(sq
rt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*d) + sqrt(d)*ar
csin(c*x)/c^3) - 2/3*(-c^2*d*x^2 + d)^(3/2)*a*f*g/(c^2*d) + sqrt(d)*integr
ate((b*g^2*x^2 + 2*b*f*g*x + b*f^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{d}\,\left(12 asin(cx)\,a\,c^2 f^2+3 asin(cx)\,a\,g^2+12\sqrt{-c^2x^2+1}\,a\,c^3 f^2 x+16\sqrt{-c^2x^2+1}\,a\,c^3 f g\,x^2+6\sqrt{-c^2x^2}\right.}{}$$

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*asin(c*x)),x)
```

output

```
(sqrt(d)*(12*asin(c*x)*a*c**2*f**2 + 3*asin(c*x)*a*g**2 + 12*sqrt( - c**2*
x**2 + 1)*a*c**3*f**2*x + 16*sqrt( - c**2*x**2 + 1)*a*c**3*f*g*x**2 + 6*sq
rt( - c**2*x**2 + 1)*a*c**3*g**2*x**3 - 16*sqrt( - c**2*x**2 + 1)*a*c*f*g
- 3*sqrt( - c**2*x**2 + 1)*a*c*g**2*x + 24*int(sqrt( - c**2*x**2 + 1)*asin
(c*x)*x**2,x)*b*c**3*g**2 + 48*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x,x)*b
*c**3*f*g + 24*int(sqrt( - c**2*x**2 + 1)*asin(c*x),x)*b*c**3*f**2 + 16*a*
c*f*g))/(24*c**3)
```

3.106 $\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 231

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{bgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcfx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}-\frac{bcgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+\frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{g(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3c^2d}+\frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

output
```
1/3*b*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/4*b*c*f*x^2*(-c^2*d*
x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/9*b*c*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x
^2+1)^(1/2)+1/2*f*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))-1/3*g*(-c^2*d*x
^2+d)^(3/2)*(a+b*arcsin(c*x))/c^2/d+1/4*f*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin
(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.57

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(-9bcfx^2-\frac{4bgx(-3+c^2x^2)}{c}+18fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{12g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{c^2}+\right.}{36\sqrt{1-c^2x^2}}$$

input
```
Integrate[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(-9*b*c*f*x^2 - (4*b*g*x*(-3 + c^2*x^2))/c + 18*f*x*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (12*g*(1 - c^2*x^2)^(3/2)*(a + b*Ar
cSin[c*x]))/c^2 + (9*f*(a + b*ArcSin[c*x])^2)/(b*c)))/(36*Sqrt[1 - c^2*x^2
])
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.61, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{d-c^2dx^2}\int \left(f\sqrt{1-c^2x^2}(a+b\arcsin(cx))+gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c^2}+\frac{f(a+b\arcsin(cx))^2}{4bc}-\frac{1}{4}bcfx^2-\frac{1}{9}bcgx^3\right.}{\sqrt{1-c^2x^2}}$$

input
```
Int[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((b*g*x)/(3*c) - (b*c*f*x^2)/4 - (b*c*g*x^3)/9 + (f*x
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 - (g*(1 - c^2*x^2)^(3/2)*(a + b*
ArcSin[c*x]))/(3*c^2) + (f*(a + b*ArcSin[c*x])^2)/(4*b*c)))/Sqrt[1 - c^2*x
^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.89 (sec) , antiderivative size = 628, normalized size of antiderivative = 2.72

method	result
default	$\frac{afx\sqrt{-c^2dx^2+d}}{2}+\frac{afd\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{2\sqrt{c^2d}}-\frac{ag(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{4c(c^2x^2-1)}+\sqrt{\cdots}\right.$
parts	$\frac{afx\sqrt{-c^2dx^2+d}}{2}+\frac{afd\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{2\sqrt{c^2d}}-\frac{ag(-c^2dx^2+d)^{\frac{3}{2}}}{3c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{4c(c^2x^2-1)}+\sqrt{\cdots}\right.$

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE
)
```

output
```
1/2*a*f*x*(-c^2*d*x^2+d)^(1/2)+1/2*a*f*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-c^2*d*x^2+d)^(1/2))-1/3*a*g/c^2/d*(-c^2*d*x^2+d)^(3/2)+b*(-1/4*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f+1/72*(-
d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3
*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*
(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+
1)^(1/2)-2*c*x)*(I+2*arcsin(c*x))*f/c/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/
2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*g*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-
1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(arcsin(
c*x)-I)/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*f/c/(c^
2*x^2-1)+1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4
*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))/c^2/(c^2
*x^2-1))
```

Fricas [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x)), x
)
```

Sympy [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))(f+gx)\,dx$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x)),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))*(f + g*x), x)
```

Maxima [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="max
ima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a*f + sqrt(d)*integra
te((b*g*x + b*f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)), x) - 1/3*(-c^2*d*x^2 + d)^(3/2)*a*g/(c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)),x, algorithm="gia
c")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\frac{\sqrt{d}\,\left(3asin(cx)\,acf+3\sqrt{-c^2x^2+1}\,a\,c^2fx+2\sqrt{-c^2x^2+1}\,a\,c^2g\,x^2-2\sqrt{-c^2x^2+1}\,ag+6\left(\int\sqrt{-c^2x^2+\right.}{6c^2}$$

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(d)*(3*asin(c*x)*a*c*f + 3*sqrt( - c**2*x**2 + 1)*a*c**2*f*x + 2*sqrt
( - c**2*x**2 + 1)*a*c**2*g*x**2 - 2*sqrt( - c**2*x**2 + 1)*a*g + 6*int(sq
rt( - c**2*x**2 + 1)*asin(c*x)*x,x)*b*c**2*g + 6*int(sqrt( - c**2*x**2 + 1
)*asin(c*x),x)*b*c**2*f + 2*a*g))/(6*c**2)
```

3.107 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 736

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$$
$$= \frac{a\sqrt{d-c^2dx^2}}{g} - \frac{bcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} + \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g}$$
$$+ \frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}} - \frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}}$$
$$+ \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)}$$
$$- \frac{a\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{ib\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{ib\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$+ \frac{b\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$
$$- \frac{b\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}$$

output
```
a*(-c^2*d*x^2+d)^(1/2)/g-b*c*x*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+b
*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g+1/2*c*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcs
in(c*x))^2/b/g/(-c^2*x^2+1)^(1/2)-1/2*(1-c^2*f^2/g^2)*(-c^2*d*x^2+d)^(1/2)
*(a+b*arcsin(c*x))^2/b/c/(g*x+f)/(-c^2*x^2+1)^(1/2)+1/2*(-c^2*x^2+1)^(1/2)
*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(g*x+f)-a*(c^2*f^2-g^2)^(1/2
)*(-c^2*d*x^2+d)^(1/2)*arctan((c^2*f*x+g)/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)
^(1/2))/g^2/(-c^2*x^2+1)^(1/2)+I*b*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2
)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)
))/g^2/(-c^2*x^2+1)^(1/2)-I*b*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)*arc
sin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/g^
2/(-c^2*x^2+1)^(1/2)+b*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^2/(-c^2*x^2+1)
^(1/2)-b*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)*polylog(2,I*(I*c*x+(-c^2
*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/g^2/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.62 (sec) , antiderivative size = 368, normalized size of antiderivative = 0.50

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$$
$$= \frac{\sqrt{d-c^2dx^2}\Big((c^2f^2-g^2)\,(a+b\arcsin(cx))^2+c^2gx(f+gx)(a+b\arcsin(cx))^2+g^2(1-c^2x^2)\,(a+b\,\mathrm{arc}}{}$$

input
```
Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

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

Rubi [A] (verified)

Time = 2.37 (sec) , antiderivative size = 517, normalized size of antiderivative = 0.70, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {5276, 5264, 25, 5256, 25, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5264}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)}-\frac{\int -\frac{\left(gx^2c^2+2fxc^2+g\right)(a+b\arcsin(cx))^2}{(f+gx)^2}dx}{2bc}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{25}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\int \frac{\left(gx^2c^2+2fxc^2+g\right)(a+b\arcsin(cx))^2}{(f+gx)^2}dx}{2bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5256}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{-2bc\int -\frac{\left(\frac{1}{f+gx}-\frac{c^2\left(\frac{f^2}{f+gx}+gx\right)}{g^2}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^2}{f+gx}+\frac{c^2x(a+b\arcsin(cx))^2}{g}}{2bc}+\frac{(1-c^2x^2)(a+b\,\text{arcs}}{2bc(f+gx)}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{25}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{2bc\int \frac{\left(\frac{1}{f+gx}-\frac{c^2\left(\frac{f^2}{f+gx}+gx\right)}{g^2}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^2}{f+gx}+\frac{c^2x(a+b\arcsin(cx))^2}{g}}{2bc}+\frac{(1-c^2x^2)(a+b\arcsin(c}{2bc(f+gx)}\right.}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 5298

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{2bc\int \left(-\frac{b\arcsin(cx)\left(f^2c^2+g^2x^2c^2+fgxc^2-g^2\right)}{g^2(f+gx)\sqrt{1-c^2x^2}}-\frac{a\left(f^2c^2+g^2x^2c^2+fgxc^2-g^2\right)}{g^2(f+gx)\sqrt{1-c^2x^2}}\right)dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^2}{f+gx}+\frac{c^2x(a+b\arcsin(cx}{g}}{2bc}\right.}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)}+\frac{2bc\left(-\frac{a\sqrt{c^2f^2-g^2}\arctan\left(\frac{c^2fx+g}{\sqrt{1-c^2x^2}\sqrt{c^2f^2-g^2}}\right)}{g^2}+\frac{a\sqrt{1-c^2x^2}}{g}+\frac{b\sqrt{c^2f^2-g^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(}}{cf-\sqrt{c^2f^2}}\right.}{g^2}\right.}{}\right.$$

input

```
Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output

```
(Sqrt[d - c^2*d*x^2]*(((1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*b*c*(f + g*
x)) + ((c^2*x*(a + b*ArcSin[c*x])^2)/g - ((1 - (c^2*f^2)/g^2)*(a + b*ArcSi
n[c*x])^2)/(f + g*x) + 2*b*c*(-((b*c*x)/g) + (a*Sqrt[1 - c^2*x^2])/g + (b*
Sqrt[1 - c^2*x^2]*ArcSin[c*x])/g - (a*Sqrt[c^2*f^2 - g^2]*ArcTan[(g + c^2*
f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/g^2 + (I*b*Sqrt[c^2*f^2 - g
^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2]
)])/g^2 - (I*b*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x]
)*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^2 + (b*Sqrt[c^2*f^2 - g^2]*PolyLog[2,
 (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2 - (b*Sqrt[c^2*f
^2 - g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])
/g^2))/(2*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5256
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c
*n   Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[
p, 0] && EqQ[e*g - 2*d*h, 0]
```

rule 5264
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[1/(b*c*Sqrt[d]*(n + 1))
   Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[
c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e,
0] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Maple [A] (verified)

Time = 1.03 (sec) , antiderivative size = 823, normalized size of antiderivative = 1.12

method	result
default	$\frac{a\left(\sqrt{-\left(x+\frac{f}{g}\right)^{2} c^{2} d+\frac{2 c^{2} d f\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}+\frac{c^{2} d f \arctan\left(\frac{\sqrt{c^{2} d}\, x}{\sqrt{-\left(x+\frac{f}{g}\right)^{2} c^{2} d+\frac{2 c^{2} d f\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}}\right)}{g \sqrt{c^{2} d}}+\frac{d\left(c^{2} f^{2}-g^{2}\right) \ln\left(-\frac{2 d}{\cdots}\right.}{\cdots}\right.}{g}$
parts	$\frac{a\left(\sqrt{-\left(x+\frac{f}{g}\right)^{2} c^{2} d+\frac{2 c^{2} d f\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}+\frac{c^{2} d f \arctan\left(\frac{\sqrt{c^{2} d}\, x}{\sqrt{-\left(x+\frac{f}{g}\right)^{2} c^{2} d+\frac{2 c^{2} d f\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}}\right)}{g \sqrt{c^{2} d}}+\frac{d\left(c^{2} f^{2}-g^{2}\right) \ln\left(-\frac{2 d}{\cdots}\right.}{\cdots}\right.}{g}$

input
```
int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(g*x+f),x,method=_RETURNVERBOSE
)
```

output
```
a/g*((-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2)+
c^2*d*f/g/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+1/g*f)^2*c^2*d+2*c^2*d
*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^
2-g^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+1/g*f)+2*(-d*(
c^2*f^2-g^2)/g^2)^(1/2)*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f
^2-g^2)/g^2)^(1/2))/(x+1/g*f)))+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*f*c/g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*
x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*(arcsin(c*x)+I)/(c^2*x^2-1)/g+1/2*(-d*(c^2
*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*(arcsin(c*x)-I)/(c^2*x
^2-1)/g+I*(-c^2*f^2+g^2)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(
I*arcsin(c*x)*ln((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))
/(I*f*c-(-c^2*f^2+g^2)^(1/2)))-I*arcsin(c*x)*ln((I*f*c+(I*c*x+(-c^2*x^2+1)
^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*f*c+(-c^2*f^2+g^2)^(1/2)))+dilog((I*f*c
+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*f*c-(-c^2*f^2+g^2)^
(1/2)))-dilog((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I
*f*c+(-c^2*f^2+g^2)^(1/2))))/(c^2*x^2-1)/g^2)
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)}{gx+f}\,dx$$

input
```
integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(g*x + f), x)
```

Sympy [F]

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

input
```
integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/(g*x+f),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="max
ima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x), x)
```

Reduce [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$$
$$= \frac{\sqrt{d}\left(asin(cx)\,acf-2\sqrt{c^2f^2-g^2}\,atan\left(\frac{\tan\left(\frac{asin(cx)}{2}\right)cf+g}{\sqrt{c^2f^2-g^2}}\right)a+\sqrt{-c^2x^2+1}\,ag+\left(\int\frac{\sqrt{-c^2x^2+1}\,asin(cx)}{gx+f}dx\right)b\right.}{g^2}$$

input
```
int((-c^2*d*x^2+d)^(1/2)*(a+b*asin(c*x))/(g*x+f),x)
```

output
```
(sqrt(d)*(asin(c*x)*a*c*f - 2*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2
)*c*f + g)/sqrt(c**2*f**2 - g**2))*a + sqrt( - c**2*x**2 + 1)*a*g + int((s
qrt( - c**2*x**2 + 1)*asin(c*x))/(f + g*x),x)*b*g**2 - a*g))/g**2
```

3.108 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 860

$$\begin{aligned}
&\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx \\
&= -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} \\
&\quad - \frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} + \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(c^2f^2-g^2)(f+gx)^2\sqrt{1-c^2x^2}} \\
&\quad + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} \\
&\quad + \frac{ac^2f\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad - \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc\sqrt{d-c^2dx^2}\log(f+gx)}{g^2\sqrt{1-c^2x^2}} - \frac{bc^2f\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} \\
&\quad + \frac{bc^2f\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}
\end{aligned}$$

output
```
-a*(-c^2*d*x^2+d)^(1/2)/g/(g*x+f)-b*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g/(g*
x+f)-a*c^3*f^2*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g^2/(c^2*f^2-g^2)/(-c^2*x^
2+1)^(1/2)-1/2*b*c^3*f^2*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)^2/g^2/(c^2*f^2-g
^2)/(-c^2*x^2+1)^(1/2)+1/2*(c^2*f*x+g)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(
c*x))^2/b/c/(c^2*f^2-g^2)/(g*x+f)^2/(-c^2*x^2+1)^(1/2)+1/2*(-c^2*x^2+1)^(1
/2)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(g*x+f)^2+a*c^2*f*(-c^2*d
*x^2+d)^(1/2)*arctan((c^2*f*x+g)/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))/g
^2/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2)-I*b*c^2*f*(-c^2*d*x^2+d)^(1/2)*a
rcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/
g^2/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2)+I*b*c^2*f*(-c^2*d*x^2+d)^(1/2)*
arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))
/g^2/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2)+b*c*(-c^2*d*x^2+d)^(1/2)*ln(g*
x+f)/g^2/(-c^2*x^2+1)^(1/2)-b*c^2*f*(-c^2*d*x^2+d)^(1/2)*polylog(2,I*(I*c*
x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^2/(c^2*f^2-g^2)^(1/2)
/(-c^2*x^2+1)^(1/2)+b*c^2*f*(-c^2*d*x^2+d)^(1/2)*polylog(2,I*(I*c*x+(-c^2*
x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/g^2/(c^2*f^2-g^2)^(1/2)/(-c^2*x
^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 1.84 (sec) , antiderivative size = 600, normalized size of antiderivative = 0.70

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx$$

$$= \frac{\sqrt{d-c^2dx^2}\left(\frac{(c^2f^2-g^2)(a+b\arcsin(cx))^2}{g^2(f+gx)^2} - \frac{2c^2f(a+b\arcsin(cx))^2}{g^2(f+gx)} + \frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{(f+gx)^2} + \frac{4bc^3f\left(-i(a+b\arcsin(cx))\left(\log \cdots\right.\right.}{\cdots}\right.}{\cdots}$$

input
```
Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x)^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2)/(g^2*(f + g*
x)^2) - (2*c^2*f*(a + b*ArcSin[c*x])^2)/(g^2*(f + g*x)) + ((1 - c^2*x^2)*(
a + b*ArcSin[c*x])^2)/(f + g*x)^2 + (4*b*c^3*f*((-I)*(a + b*ArcSin[c*x])*(
Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 -
(I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) - b*PolyLog[2, (I*E^
(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + b*PolyLog[2, (I*E^(I*Arc
Sin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/(g^2*Sqrt[c^2*f^2 - g^2]) + (2
*b*c^2*(-((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c*f + c*g*x)) + b*Log
[f + g*x] + (c*f*(I*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(
-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sq
rt[c^2*f^2 - g^2])]) + b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^
2*f^2 - g^2])] - b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
- g^2])]))/Sqrt[c^2*f^2 - g^2]))/g^2))/(2*b*c*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 2.91 (sec) , antiderivative size = 632, normalized size of antiderivative = 0.73, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.226$, Rules used = {5276, 5264, 27, 5254, 27, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(f+gx)^2}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5264}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}-\frac{\int -\frac{2\left(fxc^2+g\right)(a+b\arcsin(cx))^2}{(f+gx)^3}dx}{2bc}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\int \frac{\left(fxc^2+g\right)(a+b\arcsin(cx))^2}{(f+gx)^3}dx}{bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \; 5254$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\frac{\left(c^2fx+g\right)^2(a+b\arcsin(cx))^2}{2\left(c^2f^2-g^2\right)(f+gx)^2}-2bc\int \frac{\left(fxc^2+g\right)^2(a+b\arcsin(cx))}{2\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}}dx}{bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \; 27$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\frac{\left(c^2fx+g\right)^2(a+b\arcsin(cx))^2}{2\left(c^2f^2-g^2\right)(f+gx)^2}-\frac{bc\int \frac{\left(fxc^2+g\right)^2(a+b\arcsin(cx))}{(f+gx)^2\sqrt{1-c^2x^2}}dx}{c^2f^2-g^2}}{bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \; 5298$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\frac{\left(c^2fx+g\right)^2(a+b\arcsin(cx))^2}{2\left(c^2f^2-g^2\right)(f+gx)^2}-\frac{bc\int \left(\frac{b\arcsin(cx)\left(fxc^2+g\right)^2}{(f+gx)^2\sqrt{1-c^2x^2}}+\frac{a\left(fxc^2+g\right)^2}{(f+gx)^2\sqrt{1-c^2x^2}}\right)dx}{c^2f^2-g^2}}{bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \; 2009$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}+\frac{\frac{\left(c^2fx+g\right)^2(a+b\arcsin(cx))^2}{2\left(c^2f^2-g^2\right)(f+gx)^2}-\frac{bc\left(\frac{ac^3f^2\arcsin(cx)}{g^2}-\frac{ac^2f\sqrt{c^2f^2-g^2}\arctan\left(\frac{c^2fx+g}{\sqrt{1-c^2x^2}\sqrt{c^2f^2-g^2}}\right)}{g^2}-\cdots\right.}{\cdots}}{\cdots}\right.}{\cdots}$$

input

```
Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x)^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(((1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*b*c*(f + g*
x)^2) + (((g + c^2*f*x)^2*(a + b*ArcSin[c*x])^2)/(2*(c^2*f^2 - g^2)*(f + g
*x)^2) - (b*c*((a*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2])/(g*(f + g*x)) + (
a*c^3*f^2*ArcSin[c*x])/g^2 + (b*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2]*ArcS
in[c*x])/(g*(f + g*x)) + (b*c^3*f^2*ArcSin[c*x]^2)/(2*g^2) - (a*c^2*f*Sqrt
[c^2*f^2 - g^2]*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2
])])/g^2 + (I*b*c^2*f*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcS
in[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2 - (I*b*c^2*f*Sqrt[c^2*f^2 -
g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2
])])/g^2 + b*c*(1 - (c^2*f^2)/g^2)*Log[f + g*x] + (b*c^2*f*Sqrt[c^2*f^2 -
g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2
- (b*c^2*f*Sqrt[c^2*f^2 - g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + S
qrt[c^2*f^2 - g^2])])/g^2))/(c^2*f^2 - g^2))/(b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5254
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_)*((f_.)
 + (g_.)*(x_))^(p_.), x_Symbol] :> With[{u = IntHide[(f + g*x)^p*(d + e*x)^
m, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c*n   Int[SimplifyInteg
rand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x], x]] /; Free
Q[{a, b, c, d, e, f, g}, x] && IGtQ[n, 0] && IGtQ[p, 0] && ILtQ[m, 0] && Lt
Q[m + p + 1, 0]
```

rule 5264
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[1/(b*c*Sqrt[d]*(n + 1))
   Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[
c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e,
0] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Maple [A] (warning: unable to verify)

Time = 1.20 (sec) , antiderivative size = 1352, normalized size of antiderivative = 1.57

method	result	size
default	Expression too large to display	1352
parts	Expression too large to display	1352

input
```
int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(g*x+f)^2,x,method=_RETURNVERBO
SE)
```

output
```
a/g^2*(1/d/(c^2*f^2-g^2)*g^2/(x+1/g*f)*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+
1/g*f)-d*(c^2*f^2-g^2)/g^2)^(3/2)-c^2*f*g/(c^2*f^2-g^2)*((-(x+1/g*f)^2*c^2
*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2)+c^2*d*f/g/(c^2*d)^(1/2
)*arctan((c^2*d)^(1/2)*x/(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*
f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((
-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+1/g*f)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2
)*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x
+1/g*f)))+2*c^2/(c^2*f^2-g^2)*g^2*(-1/4*(-2*(x+1/g*f)*c^2*d+2*c^2*d*f/g)/c
^2/d*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2)-
1/8*(4*c^2*d^2*(c^2*f^2-g^2)/g^2-4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*ar
ctan((c^2*d)^(1/2)*x/(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-
g^2)/g^2)^(1/2))))+b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x
^2-1)*arcsin(c*x)^2*c/g^2-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x
+c^2*x^2-1)*arcsin(c*x)*(c^2*f*x+g-I*(-c^2*x^2+1)^(1/2)*c*f)/(c^2*x^2-1)/g
^2/(g*x+f)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(arcsin(c*x)*ln((I*f*
c+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*f*c-(-c^2*f^2+g^2)
^(1/2)))*(-c^2*f^2+g^2)^(1/2)*c*f-arcsin(c*x)*ln((I*f*c+(I*c*x+(-c^2*x^2+1
)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*f*c+(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g
^2)^(1/2)*c*f-I*dilog((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(
1/2))/(I*f*c-(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*c*f+I*dilog((I...
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin\left(cx\right)+a)}{\left(gx+f\right)^2}\,dx$$

input
```
integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(g*x+f)^2,x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(g^2*x^2 + 2*f*g*x + f^2
), x)
```

Sympy [F]

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

input
```
integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))/(g*x+f)**2,x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/(f + g*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(g*x+f)^2,x, algorithm="m
axima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(g*x+f)^2,x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x)^2,x)
```

output
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x)^2, x)
```

Reduce [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx$$
$$= \frac{\sqrt{d}\left(-asin(cx)\,a\,c^3f^3 - asin(cx)\,a\,c^3f^2gx + asin(cx)\,acf\,g^2 + asin(cx)\,ac\,g^3x + 2\sqrt{c^2f^2-g^2}\,atan\left(\frac{\tan}{}\right.\right.}{}$$

input
```
int((-c^2*d*x^2+d)^(1/2)*(a+b*asin(c*x))/(g*x+f)^2,x)
```

output

```
(sqrt(d)*( - asin(c*x)*a*c**3*f**3 - asin(c*x)*a*c**3*f**2*g*x + asin(c*x)
*a*c*f*g**2 + asin(c*x)*a*c*g**3*x + 2*sqrt(c**2*f**2 - g**2)*atan((tan(as
in(c*x)/2)*c*f + g)/sqrt(c**2*f**2 - g**2))*a*c**2*f**2 + 2*sqrt(c**2*f**2
 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 - g**2))*a*c**2*f*
g*x - sqrt( - c**2*x**2 + 1)*a*c**2*f**2*g + sqrt( - c**2*x**2 + 1)*a*g**3
 + int((sqrt( - c**2*x**2 + 1)*asin(c*x))/(f**2 + 2*f*g*x + g**2*x**2),x)*
b*c**2*f**3*g**2 + int((sqrt( - c**2*x**2 + 1)*asin(c*x))/(f**2 + 2*f*g*x
+ g**2*x**2),x)*b*c**2*f**2*g**3*x - int((sqrt( - c**2*x**2 + 1)*asin(c*x)
)/(f**2 + 2*f*g*x + g**2*x**2),x)*b*f*g**4 - int((sqrt( - c**2*x**2 + 1)*a
sin(c*x))/(f**2 + 2*f*g*x + g**2*x**2),x)*b*g**5*x))/(g**2*(c**2*f**3 + c*
*2*f**2*g*x - f*g**2 - g**3*x))
```

3.109 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 904

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{3bdf^2gx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}$$
$$+\frac{2bdg^3x\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}-\frac{3bcdf^3x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{3bdfg^2x^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}}$$
$$-\frac{2bcdf^2gx^3\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}}+\frac{bdg^3x^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}}-\frac{7bcdfg^2x^4\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}$$
$$+\frac{3bc^3df^2gx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}-\frac{8bcdg^3x^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}}$$
$$+\frac{bc^3dfg^2x^6\sqrt{d-c^2dx^2}}{12\sqrt{1-c^2x^2}}+\frac{bc^3dg^3x^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}$$
$$+\frac{bdf^3(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}}{16c}+\frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$-\frac{3dfg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2}+\frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+\frac{1}{4}f^3x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{2}fg^2x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))-\frac{3f^2g(d-c^2dx^2)^{5/2}(a+b}{5c^2d}$$

output
```
3/5*b*d*f^2*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/35*b*d*g^3*x*(
-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)-3/16*b*c*d*f^3*x^2*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/32*b*d*f*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^
2*x^2+1)^(1/2)-2/5*b*c*d*f^2*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)
+1/105*b*d*g^3*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-7/32*b*c*d*f*
g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/25*b*c^3*d*f^2*g*x^5*(-c
^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-8/175*b*c*d*g^3*x^5*(-c^2*d*x^2+d)^(1
/2)/(-c^2*x^2+1)^(1/2)+1/12*b*c^3*d*f*g^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x
^2+1)^(1/2)+1/49*b*c^3*d*g^3*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1
/16*b*d*f^3*(-c^2*x^2+1)^(3/2)*(-c^2*d*x^2+d)^(1/2)/c+3/8*d*f^3*x*(-c^2*d*
x^2+d)^(1/2)*(a+b*arcsin(c*x))-3/16*d*f*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*ar
csin(c*x))/c^2+3/8*d*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))+1/4*
f^3*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/2*f*g^2*x^3*(-c^2*d*x^2+d)^
(3/2)*(a+b*arcsin(c*x))-3/5*f^2*g*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c
^2/d-1/5*g^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^4/d+1/7*g^3*(-c^2*d*
x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^4/d^2+3/16*d*f^3*(-c^2*d*x^2+d)^(1/2)*(a+
b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)+3/32*d*f*g^2*(-c^2*d*x^2+d)^(1/2)*
(a+b*arcsin(c*x))^2/b/c^3/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.68 (sec) , antiderivative size = 463, normalized size of antiderivative = 0.51

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\left(11025a^2cf(2c^2f^2+g^2)-210ab\sqrt{1-c^2x^2}\left(32g^3+c^2g(336f^2+105fgx-\right.\right.}{}$$

input
```
Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(11025*a^2*c*f*(2*c^2*f^2 + g^2) - 210*a*b*Sqrt[1 -
 c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6*x^3*(
35*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3 + 336*
f^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)) + b^2*c*x*(6720*g^3 + 35*c^2*g*(201
6*f^2 + 315*f*g*x + 32*g^2*x^2) - 21*c^4*x*(1750*f^3 + 2240*f^2*g*x + 1225
*f*g^2*x^2 + 256*g^3*x^3) + 2*c^6*x^3*(3675*f^3 + 7056*f^2*g*x + 4900*f*g^
2*x^2 + 1200*g^3*x^3)) - 210*b*(-105*a*c*f*(2*c^2*f^2 + g^2) + b*Sqrt[1 -
c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6*x^3*(3
5*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3 + 336*f
^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)))*ArcSin[c*x] + 11025*b^2*c*f*(2*c^2*
f^2 + g^2)*ArcSin[c*x]^2))/(117600*b*c^4*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.27 (sec) , antiderivative size = 498, normalized size of antiderivative = 0.55, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)^3(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \ 5276$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \ 5262$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))f^3+3gx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))f^2+3g^2x^2\left(1-c^2x^2\right)^{3/}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \ 2009$$

$$\frac{d\sqrt{d-c^2dx^2}\left(\frac{3fg^2(a+b\arcsin(cx))^2}{32bc^3}+\frac{1}{4}f^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{3}{8}f^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\right.}{}$$

input
```
Int[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((3*b*f^2*g*x)/(5*c) + (2*b*g^3*x)/(35*c^3) - (5*b*
c*f^3*x^2)/16 + (3*b*f*g^2*x^2)/(32*c) - (2*b*c*f^2*g*x^3)/5 + (b*g^3*x^3)
/(105*c) + (b*c^3*f^3*x^4)/16 - (7*b*c*f*g^2*x^4)/32 + (3*b*c^3*f^2*g*x^5)
/25 - (8*b*c*g^3*x^5)/175 + (b*c^3*f*g^2*x^6)/12 + (b*c^3*g^3*x^7)/49 + (3
*f^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/8 - (3*f*g^2*x*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(16*c^2) + (3*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x]))/8 + (f^3*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (f*
g^2*x^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/2 - (3*f^2*g*(1 - c^2*x^2
)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2) - (g^3*(1 - c^2*x^2)^(5/2)*(a + b*Arc
Sin[c*x]))/(5*c^4) + (g^3*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4)
 + (3*f^3*(a + b*ArcSin[c*x])^2)/(16*b*c) + (3*f*g^2*(a + b*ArcSin[c*x])^2
)/(32*b*c^3)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.61 (sec) , antiderivative size = 2074, normalized size of antiderivative = 2.29

method	result	size
default	Expression too large to display	2074
parts	Expression too large to display	2074

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d
/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^3*(-1/7*x^
2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+3*f*g^2*(-1/
6*x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(
1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^
2*d*x^2+d)^(1/2)))))-3/5*f^2*g*(-c^2*d*x^2+d)^(5/2)/c^2/d)+b*(-3/32*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(2*c^2
*f^2+g^2)*d-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7
*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^
2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g^3*(I
+7*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/768*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^
2*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x
^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*
f*g^2*(I+6*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/3200*(-d*(c^2*x^2-1))^(1/2)*(1
6*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2
*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(60*arcsin(c*x)*c^2*
f^2+12*I*c^2*f^2-5*g^2*arcsin(c*x)-I*g^2)*d/c^4/(c^2*x^2-1)-1/512*(-d*(c^2
*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(2*I*c^2*f^2+8*arc
sin(c*x)*c^2*f^2-3*I*g^2-12*g^2*arcsin(c*x))*d/c^3/(c^2*x^2-1)-3/128*(-...
```

Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}} (gx+f)^3 (b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral(-(a*c^2*d*g^3*x^5 + 3*a*c^2*d*f*g^2*x^4 - 3*a*d*f^2*g*x - a*d*f^3
 + (3*a*c^2*d*f^2*g - a*d*g^3)*x^3 + (a*c^2*d*f^3 - 3*a*d*f*g^2)*x^2 + (b*
c^2*d*g^3*x^5 + 3*b*c^2*d*f*g^2*x^4 - 3*b*d*f^2*g*x - b*d*f^3 + (3*b*c^2*d
*f^2*g - b*d*g^3)*x^3 + (b*c^2*d*f^3 - 3*b*d*f*g^2)*x^2)*arcsin(c*x))*sqrt
(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^3(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a*f^3 - 1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2
*d*x^2 + d)^(5/2)/(c^4*d))*a*g^3 + 1/16*a*f*g^2*(2*(-c^2*d*x^2 + d)^(3/2)*
x/c^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^
2 + 3*d^(3/2)*arcsin(c*x)/c^3) - 3/5*(-c^2*d*x^2 + d)^(5/2)*a*f^2*g/(c^2*d
) + sqrt(d)*integrate(-(b*c^2*d*g^3*x^5 + 3*b*c^2*d*f*g^2*x^4 - 3*b*d*f^2*
g*x - b*d*f^3 + (3*b*c^2*d*f^2*g - b*d*g^3)*x^3 + (b*c^2*d*f^3 - 3*b*d*f*g
^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{\sqrt{d}\,d\left(210 asin(cx)\,a\,c^3 f^3+105 asin(cx)\,acf\,g^2-140\sqrt{-c^2x^2+1}\,a\,c^6 f^3 x^3-336\sqrt{-c^2x^2\right.}{}$$

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(d)*d*(210*asin(c*x)*a*c**3*f**3 + 105*asin(c*x)*a*c*f*g**2 - 140*sqr
t( - c**2*x**2 + 1)*a*c**6*f**3*x**3 - 336*sqrt( - c**2*x**2 + 1)*a*c**6*f
**2*g*x**4 - 280*sqrt( - c**2*x**2 + 1)*a*c**6*f*g**2*x**5 - 80*sqrt( - c*
*2*x**2 + 1)*a*c**6*g**3*x**6 + 350*sqrt( - c**2*x**2 + 1)*a*c**4*f**3*x +
 672*sqrt( - c**2*x**2 + 1)*a*c**4*f**2*g*x**2 + 490*sqrt( - c**2*x**2 + 1
)*a*c**4*f*g**2*x**3 + 128*sqrt( - c**2*x**2 + 1)*a*c**4*g**3*x**4 - 336*s
qrt( - c**2*x**2 + 1)*a*c**2*f**2*g - 105*sqrt( - c**2*x**2 + 1)*a*c**2*f*
g**2*x - 16*sqrt( - c**2*x**2 + 1)*a*c**2*g**3*x**2 - 32*sqrt( - c**2*x**2
 + 1)*a*g**3 - 560*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**5,x)*b*c**6*g**
3 - 1680*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**4,x)*b*c**6*f*g**2 - 1680
*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*b*c**6*f**2*g + 560*int(sqrt
( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*b*c**4*g**3 - 560*int(sqrt( - c**2*x*
*2 + 1)*asin(c*x)*x**2,x)*b*c**6*f**3 + 1680*int(sqrt( - c**2*x**2 + 1)*as
in(c*x)*x**2,x)*b*c**4*f*g**2 + 1680*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*
x,x)*b*c**4*f**2*g + 560*int(sqrt( - c**2*x**2 + 1)*asin(c*x),x)*b*c**4*f*
*3 + 336*a*c**2*f**2*g + 32*a*g**3))/(560*c**4)
```

3.110 $\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 645

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{2bdfgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} - \frac{3bcdf^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{bdg^2x^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}} - \frac{4bcdfgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{2bc^3dfgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} + \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}} + \frac{bdf^2\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}}{16c} + \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} + \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{1}{4}f^2x\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) + \frac{1}{6}g^2x^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx)) - \frac{2fg\left(d-c^2dx^2\right)^{5/2}(a+b\,\mathrm{ar}}{5c^2d}$$

output
```
2/5*b*d*f*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-3/16*b*c*d*f^2*x^2
*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/32*b*d*g^2*x^2*(-c^2*d*x^2+d)^(
1/2)/c/(-c^2*x^2+1)^(1/2)-4/15*b*c*d*f*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^
2+1)^(1/2)-7/96*b*c*d*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/25
*b*c^3*d*f*g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/36*b*c^3*d*g^2*
x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*b*d*f^2*(-c^2*x^2+1)^(3/2
)*(-c^2*d*x^2+d)^(1/2)/c+3/8*d*f^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)
)-1/16*d*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^2+1/8*d*g^2*x^3*(-
c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))+1/4*f^2*x*(-c^2*d*x^2+d)^(3/2)*(a+b*a
rcsin(c*x))+1/6*g^2*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))-2/5*f*g*(-c
^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^2/d+3/16*d*f^2*(-c^2*d*x^2+d)^(1/2)*
(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)+1/32*d*g^2*(-c^2*d*x^2+d)^(1/2)
*(a+b*arcsin(c*x))^2/b/c^3/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 332, normalized size of antiderivative = 0.51

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\Big(225a^2(6c^2f^2+g^2)+b^2c^2x(450c^2f^2x(-5+c^2x^2)+192fg(15-10c^2x^2}{}$$

input
```
Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(225*a^2*(6*c^2*f^2 + g^2) + b^2*c^2*x*(450*c^2*f^2
*x*(-5 + c^2*x^2) + 192*f*g*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 25*g^2*x*(9 -
21*c^2*x^2 + 8*c^4*x^4)) - 30*a*b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1 + c^2*x^
2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*c^4*x^4
)) + 30*b*(15*a*(6*c^2*f^2 + g^2) - b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1 + c^
2*x^2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*c^4
*x^4)))*ArcSin[c*x] + 225*b^2*(6*c^2*f^2 + g^2)*ArcSin[c*x]^2))/(7200*b*c^
3*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.04 (sec) , antiderivative size = 367, normalized size of antiderivative = 0.57, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)^2(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))f^2+2gx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))f+g^2x^2\left(1-c^2x^2\right)^{3/2}(\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$d\sqrt{d-c^2dx^2}\left(\frac{g^2(a+b\arcsin(cx))^2}{32bc^3}+\frac{1}{4}f^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{3}{8}f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{2fg}{}\right.$$

input

```
Int[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output

```
(d*Sqrt[d - c^2*d*x^2]*((2*b*f*g*x)/(5*c) - (5*b*c*f^2*x^2)/16 + (b*g^2*x^
2)/(32*c) - (4*b*c*f*g*x^3)/15 + (b*c^3*f^2*x^4)/16 - (7*b*c*g^2*x^4)/96 +
 (2*b*c^3*f*g*x^5)/25 + (b*c^3*g^2*x^6)/36 + (3*f^2*x*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/8 - (g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(16*c
^2) + (g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/8 + (f^2*x*(1 - c^2*
x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (g^2*x^3*(1 - c^2*x^2)^(3/2)*(a + b*Ar
cSin[c*x]))/6 - (2*f*g*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2) +
(3*f^2*(a + b*ArcSin[c*x])^2)/(16*b*c) + (g^2*(a + b*ArcSin[c*x])^2)/(32*b
*c^3)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.03 (sec) , antiderivative size = 1535, normalized size of antiderivative = 2.38

method	result	size
default	Expression too large to display	1535
parts	Expression too large to display	1535

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d
/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^2*(-1/6*x*
(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*
x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*
x^2+d)^(1/2)))))-2/5*f*g*(-c^2*d*x^2+d)^(5/2)/c^2/d)+b*(-1/32*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*(6*c^2*f^2+g^2
)*d-1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*x^6*c^6+32*c^7
*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^
2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*g^2*(I+6*arcsin(c*x))*d/c^3/(
c^2*x^2-1)-1/400*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*
x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*
x^2+1)^(1/2)*x*c-1)*f*g*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/512*(-d*(c^2
*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(8*arcsin(c*x)*c^2*f
^2+2*I*c^2*f^2-4*g^2*arcsin(c*x)-I*g^2)*d/c^3/(c^2*x^2-1)-1/8*(-d*(c^2*x^2
-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*f*g*(arcsin(c*x)+I)*d/c^2/
(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1
)*f*g*(arcsin(c*x)-I)*d/c^2/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*
(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-16*I*c^
2*f^2+32*arcsin(c*x)*c^2*f^2-I*g^2+2*g^2*arcsin(c*x))*d/c^3/(c^2*x^2-1)...
```

Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral(-(a*c^2*d*g^2*x^4 + 2*a*c^2*d*f*g*x^3 - 2*a*d*f*g*x - a*d*f^2 + (
a*c^2*d*f^2 - a*d*g^2)*x^2 + (b*c^2*d*g^2*x^4 + 2*b*c^2*d*f*g*x^3 - 2*b*d*
f*g*x - b*d*f^2 + (b*c^2*d*f^2 - b*d*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^
2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a*f^2 + 1/48*a*g^2*(2*(-c^2*d*x^2 + d)^(3/2)*x/c^2 - 8*(-c^2
*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^2 + 3*d^(3/2)*a
rcsin(c*x)/c^3) - 2/5*(-c^2*d*x^2 + d)^(5/2)*a*f*g/(c^2*d) + sqrt(d)*integ
rate(-(b*c^2*d*g^2*x^4 + 2*b*c^2*d*f*g*x^3 - 2*b*d*f*g*x - b*d*f^2 + (b*c^
2*d*f^2 - b*d*g^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{\sqrt{d}\,d\big(90 asin(cx)\,a\,c^2f^2+15 asin(cx)\,a\,g^2-60\sqrt{-c^2x^2+1}\,a\,c^5f^2x^3-96\sqrt{-c^2x^2+1}\,c}{}$$

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(d)*d*(90*asin(c*x)*a*c**2*f**2 + 15*asin(c*x)*a*g**2 - 60*sqrt( - c*
*2*x**2 + 1)*a*c**5*f**2*x**3 - 96*sqrt( - c**2*x**2 + 1)*a*c**5*f*g*x**4
- 40*sqrt( - c**2*x**2 + 1)*a*c**5*g**2*x**5 + 150*sqrt( - c**2*x**2 + 1)*
a*c**3*f**2*x + 192*sqrt( - c**2*x**2 + 1)*a*c**3*f*g*x**2 + 70*sqrt( - c*
*2*x**2 + 1)*a*c**3*g**2*x**3 - 96*sqrt( - c**2*x**2 + 1)*a*c*f*g - 15*sqr
t( - c**2*x**2 + 1)*a*c*g**2*x - 240*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*
x**4,x)*b*c**5*g**2 - 480*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*b*c
**5*f*g - 240*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*b*c**5*f**2 + 2
40*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*b*c**3*g**2 + 480*int(sqrt
( - c**2*x**2 + 1)*asin(c*x)*x,x)*b*c**3*f*g + 240*int(sqrt( - c**2*x**2 +
 1)*asin(c*x),x)*b*c**3*f**2 + 96*a*c*f*g))/(240*c**3)
```

3.111 $\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 29, antiderivative size = 346

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\frac{bdgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}$$
$$-\frac{3bcdfx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{2bcdgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bc^3dgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}$$
$$+\frac{bdf\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}}{16c}+\frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+\frac{1}{4}fx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))-\frac{g\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{5c^2d}+\frac{3df\sqrt{d-c^2dx^2}(a+b\arcsin(cx}{16bc\sqrt{1-c^2x^2}}$$

output
```
1/5*b*d*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-3/16*b*c*d*f*x^2*(-c
^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/15*b*c*d*g*x^3*(-c^2*d*x^2+d)^(1/2)
/(-c^2*x^2+1)^(1/2)+1/25*b*c^3*d*g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(
1/2)+1/16*b*d*f*(-c^2*x^2+1)^(3/2)*(-c^2*d*x^2+d)^(1/2)/c+3/8*d*f*x*(-c^2*
d*x^2+d)^(1/2)*(a+b*arcsin(c*x))+1/4*f*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(
c*x))-1/5*g*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/c^2/d+3/16*d*f*(-c^2*d*
x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 216, normalized size of antiderivative = 0.62

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\frac{d\sqrt{d-c^2dx^2}\left(225a^2cf-30ab\sqrt{1-c^2x^2}\left(8g(-1+c^2x^2)^2+5c^2fx(-5+2c^2x^2)\right)+b^2c\right.}{}$$

input
```
Integrate[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(225*a^2*c*f - 30*a*b*Sqrt[1 - c^2*x^2]*(8*g*(-1 +
c^2*x^2)^2 + 5*c^2*f*x*(-5 + 2*c^2*x^2)) + b^2*c*x*(75*c^2*f*x*(-5 + c^2*x
^2) + 16*g*(15 - 10*c^2*x^2 + 3*c^4*x^4)) + 30*b*(15*a*c*f + b*Sqrt[1 - c^
2*x^2]*(5*c^2*f*x*(5 - 2*c^2*x^2) - 8*g*(-1 + c^2*x^2)^2))*ArcSin[c*x] + 2
25*b^2*c*f*ArcSin[c*x]^2))/(1200*b*c^2*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 193, normalized size of antiderivative = 0.56, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(f(a+b\arcsin(cx))\left(1-c^2x^2\right)^{3/2}+gx(a+b\arcsin(cx))\left(1-c^2x^2\right)^{3/2}\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{d\sqrt{d-c^2dx^2}\left(\frac{1}{4}fx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{3}{8}fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{g\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{5c^2}\right.}{\sqrt{1-c^2x^2}}$$

input
```
Int[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((b*g*x)/(5*c) - (5*b*c*f*x^2)/16 - (2*b*c*g*x^3)/1
5 + (b*c^3*f*x^4)/16 + (b*c^3*g*x^5)/25 + (3*f*x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/8 + (f*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 - (g*(1
- c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2) + (3*f*(a + b*ArcSin[c*x])^2
)/(16*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.05 (sec) , antiderivative size = 1014, normalized size of antiderivative = 2.93

method	result
default	$\frac{afx(-c^2d\,x^2+d)^{\frac{3}{2}}}{4}+\frac{3af\sqrt{-c^2d\,x^2+d}\,xd}{8}+\frac{3af\,d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{8\sqrt{c^2d}}-\frac{ag(-c^2d\,x^2+d)^{\frac{5}{2}}}{5c^2d}+b\Bigg(-\frac{3\sqrt{-d(c^2x^2-1)}\,\sqrt{\cdot}}{16c(}$
parts	$\frac{afx(-c^2d\,x^2+d)^{\frac{3}{2}}}{4}+\frac{3af\sqrt{-c^2d\,x^2+d}\,xd}{8}+\frac{3af\,d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{8\sqrt{c^2d}}-\frac{ag(-c^2d\,x^2+d)^{\frac{5}{2}}}{5c^2d}+b\Bigg(-\frac{3\sqrt{-d(c^2x^2-1)}\,\sqrt{\cdot}}{16c(}$

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE
)
```

output
```
1/4*a*f*x*(-c^2*d*x^2+d)^(3/2)+3/8*a*f*(-c^2*d*x^2+d)^(1/2)*x*d+3/8*a*f*d^
2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/5*a*g*(-c^2
*d*x^2+d)^(5/2)/c^2/d+b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c
/(c^2*x^2-1)*arcsin(c*x)^2*d*f-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28
*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2
)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2
-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^
5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(I
+4*arcsin(c*x))*d*f/c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c
*x*(-c^2*x^2+1)^(1/2)-1)*g*(arcsin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2
*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(arcsin(c*x)-I)*d/c^
2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+
2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d*f/c/(c^2*x^2-1)
+1/96*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I
*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))*d/c^2/(c^2*x^2-1
)-1/1200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(11
*I+45*arcsin(c*x))*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/600*(-d*(c^2*x^2
-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(7*I+15*arcsin(c*x))*sin
(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-
c*x*(-c^2*x^2+1)^(1/2)-I)*(17*I+28*arcsin(c*x))*cos(3*arcsin(c*x))*d*f/...
```

Fricas [F]

$$\int (f+gx) \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fri
cas")
```

output
```
integral(-(a*c^2*d*g*x^3 + a*c^2*d*f*x^2 - a*d*g*x - a*d*f + (b*c^2*d*g*x^
3 + b*c^2*d*f*x^2 - b*d*g*x - b*d*f)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx) \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int (-d(cx-1)(cx+1))^{\frac{3}{2}} (a+b\,\mathrm{asin}(cx))(f+gx)\,dx$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))*(f + g*x), x)
```

Maxima [F]

$$\int (f+gx) \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="max
ima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a*f - 1/5*(-c^2*d*x^2 + d)^(5/2)*a*g/(c^2*d) + sqrt(d)*integ
rate(-(b*c^2*d*g*x^3 + b*c^2*d*f*x^2 - b*d*g*x - b*d*f)*sqrt(c*x + 1)*sqrt
(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="gia
c")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{d}\,d\left(15asin(cx)\,acf - 10\sqrt{-c^2x^2+1}\,a\,c^4f\,x^3 - 8\sqrt{-c^2x^2+1}\,a\,c^4g\,x^4 + 25\sqrt{-c^2x^2+\dots}\right.}{}$$

input

```
int((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*asin(c*x)),x)
```

output

```
(sqrt(d)*d*(15*asin(c*x)*a*c*f - 10*sqrt( - c**2*x**2 + 1)*a*c**4*f*x**3 -
 8*sqrt( - c**2*x**2 + 1)*a*c**4*g*x**4 + 25*sqrt( - c**2*x**2 + 1)*a*c**2
*f*x + 16*sqrt( - c**2*x**2 + 1)*a*c**2*g*x**2 - 8*sqrt( - c**2*x**2 + 1)*
a*g - 40*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*b*c**4*g - 40*int(sq
rt( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*b*c**4*f + 40*int(sqrt( - c**2*x**2
 + 1)*asin(c*x)*x,x)*b*c**2*g + 40*int(sqrt( - c**2*x**2 + 1)*asin(c*x),x)
*b*c**2*f + 8*a*g))/(40*c**2)
```

3.112 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1062

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx =
-\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3}-\frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}}
+\frac{bcd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}}{g^3\sqrt{1-c^2x^2}}-\frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}}
+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}}-\frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3}
+\frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2}
+\frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{3g}+\frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}}
-\frac{cd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^3\sqrt{1-c^2x^2}}
-\frac{d(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)\sqrt{1-c^2x^2}}
-\frac{d(cf-g)(cf+g)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^2(f+gx)}
+\frac{ad(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{1-c^2x^2}}
-\frac{ibd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}
+\frac{ibd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}
-\frac{bd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}
+\frac{bd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

output
```
-a*d*(c*f-g)*(c*f+g)*(-c^2*d*x^2+d)^(1/2)/g^3-1/3*b*c*d*x*(-c^2*d*x^2+d)^(
1/2)/g/(-c^2*x^2+1)^(1/2)+b*c*d*(c*f-g)*(c*f+g)*x*(-c^2*d*x^2+d)^(1/2)/g^3
/(-c^2*x^2+1)^(1/2)-1/4*b*c^3*d*f*x^2*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1
)^(1/2)+1/9*b*c^3*d*x^3*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)-b*d*(c*f
-g)*(c*f+g)*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g^3+1/2*c^2*d*f*x*(-c^2*d*x^2
+d)^(1/2)*(a+b*arcsin(c*x))/g^2+1/3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))
/g+1/4*c*d*f*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/g^2/(-c^2*x^2+1)^(
1/2)-1/2*c*d*(c*f-g)*(c*f+g)*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/
g^3/(-c^2*x^2+1)^(1/2)-1/2*d*(c^2*f^2-g^2)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arc
sin(c*x))^2/b/c/g^4/(g*x+f)/(-c^2*x^2+1)^(1/2)-1/2*d*(c*f-g)*(c*f+g)*(-c^2
*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c/g^2/(g*x+f)+a*d
*(c^2*f^2-g^2)^(3/2)*(-c^2*d*x^2+d)^(1/2)*arctan((c^2*f*x+g)/(c^2*f^2-g^2)
^(1/2)/(-c^2*x^2+1)^(1/2))/g^4/(-c^2*x^2+1)^(1/2)-I*b*d*(c^2*f^2-g^2)^(3/2
)*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*
f-(c^2*f^2-g^2)^(1/2)))/g^4/(-c^2*x^2+1)^(1/2)+I*b*d*(c^2*f^2-g^2)^(3/2)*(
-c^2*d*x^2+d)^(1/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(
c^2*f^2-g^2)^(1/2)))/g^4/(-c^2*x^2+1)^(1/2)-b*d*(c^2*f^2-g^2)^(3/2)*(-c^2*
d*x^2+d)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)
^(1/2)))/g^4/(-c^2*x^2+1)^(1/2)+b*d*(c^2*f^2-g^2)^(3/2)*(-c^2*d*x^2+d)^(1/
2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/...
```

Mathematica [A] (verified)

Time = 0.94 (sec) , antiderivative size = 507, normalized size of antiderivative = 0.48

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \frac{d\sqrt{d-c^2dx^2}\left(-9bc^3fx^2+4bcgx(-3+c^2x^2)+18c^2fx\sqrt{1-c^2x\cdots}\right.}{}$$

input
```
Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(-9*b*c^3*f*x^2 + 4*b*c*g*x*(-3 + c^2*x^2) + 18*c^2
*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + 12*g*(1 - c^2*x^2)^(3/2)*(a +
 b*ArcSin[c*x]) + (9*c*f*(a + b*ArcSin[c*x])^2)/b + (18*(c^2*f^2 - g^2)*(-
1 + c^2*x^2)*(a + b*ArcSin[c*x])^2)/(b*c*(f + g*x)) - (18*(c^2*f^2 - g^2)*
((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2 + c^2*g*x*(f + g*x)*(a + b*ArcSin[c
*x])^2 - 2*b*c*(f + g*x)*(b*c*g*x - g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
) - I*Sqrt[c^2*f^2 - g^2]*((a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x
])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c
*f + Sqrt[c^2*f^2 - g^2])]) - I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f
- Sqrt[c^2*f^2 - g^2])] + I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sq
rt[c^2*f^2 - g^2])]))))/(b*c*g^2*(f + g*x))))/(36*g^2*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 2.89 (sec) , antiderivative size = 709, normalized size of antiderivative = 0.67, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx$$

$$\Big\downarrow \; 5276$$

$$\frac{d\sqrt{d-c^2dx^2}\int \frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \; 5266$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(-\frac{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^2}{g}+\frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^2}{g^2}+\frac{(g^2-c^2f^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{g^2(f+gx)}\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \; 2009$$

$$d\sqrt{d-c^2dx^2}\left(-\frac{(1-c^2x^2)(c^2f^2-g^2)(a+b\arcsin(cx))^2}{2bcg^2(f+gx)}-\frac{(c^2f^2-g^2)^2(a+b\arcsin(cx))^2}{2bcg^4(f+gx)}-\frac{cx(c^2f^2-g^2)(a+b\arcsin(cx))^2}{2bg^3}+\frac{c^2fx\sqrt{1-}}{}\right.$$

input
```
Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(-1/3*(b*c*x)/g + (b*c*(c^2*f^2 - g^2)*x)/g^3 - (b*
c^3*f*x^2)/(4*g^2) + (b*c^3*x^3)/(9*g) - (a*(c*f - g)*(c*f + g)*Sqrt[1 - c
^2*x^2])/g^3 - (b*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/g^3 +
 (c^2*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*g^2) + ((1 - c^2*x^2)^
(3/2)*(a + b*ArcSin[c*x]))/(3*g) + (c*f*(a + b*ArcSin[c*x])^2)/(4*b*g^2) -
 (c*(c^2*f^2 - g^2)*x*(a + b*ArcSin[c*x])^2)/(2*b*g^3) - ((c^2*f^2 - g^2)^
2*(a + b*ArcSin[c*x])^2)/(2*b*c*g^4*(f + g*x)) - ((c^2*f^2 - g^2)*(1 - c^2
*x^2)*(a + b*ArcSin[c*x])^2)/(2*b*c*g^2*(f + g*x)) + (a*(c^2*f^2 - g^2)^(3
/2)*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/g^4 - (
I*b*(c^2*f^2 - g^2)^(3/2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 - Sqrt[c^2*f^2 - g^2])])/g^4 + (I*b*(c^2*f^2 - g^2)^(3/2)*ArcSin[c*x]*Log
[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^4 - (b*(c^2*f
^2 - g^2)^(3/2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g
^2])])/g^4 + (b*(c^2*f^2 - g^2)^(3/2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(
c*f + Sqrt[c^2*f^2 - g^2])])/g^4))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5266
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [A] (verified)

Time = 1.03 (sec) , antiderivative size = 1546, normalized size of antiderivative = 1.46

method	result	size
default	Expression too large to display	1546
parts	Expression too large to display	1546

input
```
int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x,method=_RETURNVERBOSE
)
```

output
```
a/g*(1/3*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(3
/2)+c^2*d*f/g*(-1/4*(-2*(x+1/g*f)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+1/g*f)^2*c
^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2*d^2*(c^2*
f^2-g^2)/g^2-4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2)))-d*
(c^2*f^2-g^2)/g^2*((-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^
2)/g^2)^(1/2)+c^2*d*f/g/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+1/g*f)^2
*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g
^2/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+
1/g*f)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2)*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1
/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+1/g*f))))+b*(1/4*(-d*(c^2*x^2-1))^(1/
2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*f*(2*c^2*f^2-3*g^2)*c*d/g^
4-1/72*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*
x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*(I+3*arcsin(c*x))*d/(c^2*x^2-1)/g+1/
16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c
^2*x^2+1)^(1/2)-2*c*x)*(I+2*arcsin(c*x))*f*c*d/(c^2*x^2-1)/g^2-1/8*(-d*(c^
2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*(4*c^2*f^2-5*g^2)*(ar
csin(c*x)+I)*d/(c^2*x^2-1)/g^3-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^
(1/2)*c*x+c^2*x^2-1)*(4*c^2*f^2-5*g^2)*(arcsin(c*x)-I)*d/(c^2*x^2-1)/g^3+1
/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*...
```

Fricas [F]

$$\int \frac{(d - c^2dx^2)^{3/2} (a + b \arcsin(cx))}{f + gx} dx = \int \frac{(-c^2dx^2 + d)^{\frac{3}{2}} (b \arcsin(cx) + a)}{gx + f} dx$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="fri
cas")
```

output
```
integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*
d*x^2 + d)/(g*x + f), x)
```

Sympy [F]

$$\int \frac{(d - c^2dx^2)^{3/2} (a + b \arcsin(cx))}{f + gx} dx = \int \frac{(-d(cx - 1)(cx + 1))^{\frac{3}{2}} (a + b \operatorname{asin}(cx))}{f + gx} dx$$

input
```
integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/(g*x+f),x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d - c^2dx^2)^{3/2} (a + b \arcsin(cx))}{f + gx} dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="max
ima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{3/2}}{f+g\,x}\,dx$$

input
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/(f + g*x), x)
```

Reduce [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \frac{\sqrt{d}\,d\Big(-6asin(cx)\,a\,c^3f^3+9asin(cx)\,acf\,g^2+12\sqrt{c^2f^2-g^2}\,ata$$

input
```
int((-c^2*d*x^2+d)^(3/2)*(a+b*asin(c*x))/(g*x+f),x)
```

output
```
(sqrt(d)*d*( - 6*asin(c*x)*a*c**3*f**3 + 9*asin(c*x)*a*c*f*g**2 + 12*sqrt(
c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 - g**2))*
a*c**2*f**2 - 12*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sq
rt(c**2*f**2 - g**2))*a*g**2 - 6*sqrt( - c**2*x**2 + 1)*a*c**2*f**2*g + 3*
sqrt( - c**2*x**2 + 1)*a*c**2*f*g**2*x - 2*sqrt( - c**2*x**2 + 1)*a*c**2*g
**3*x**2 + 8*sqrt( - c**2*x**2 + 1)*a*g**3 - 6*int((sqrt( - c**2*x**2 + 1)
*asin(c*x)*x**2)/(f + g*x),x)*b*c**2*g**4 + 6*int((sqrt( - c**2*x**2 + 1)*
asin(c*x))/(f + g*x),x)*b*g**4 - 2*a*c**2*f**2*g))/(6*g**4)
```

3.113 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1188

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{3bd^2f^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}$$

$$+\frac{2bd^2g^3x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}-\frac{5bcd^2f^3x^2\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}+\frac{15bd^2fg^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}$$

$$-\frac{3bcd^2f^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}+\frac{bd^2g^3x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}}-\frac{59bcd^2fg^2x^4\sqrt{d-c^2dx^2}}{256\sqrt{1-c^2x^2}}$$

$$+\frac{9bc^3d^2f^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}-\frac{bcd^2g^3x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}}+\frac{17bc^3d^2fg^2x^6\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}$$

$$-\frac{3bc^5d^2f^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}+\frac{19bc^3d^2g^3x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}$$

$$-\frac{3bc^5d^2fg^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{bc^5d^2g^3x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}$$

$$+\frac{5bd^2f^3\left(1-c^2x^2\right)^{3/2}\sqrt{d-c^2dx^2}}{96c}+\frac{bd^2f^3\left(1-c^2x^2\right)^{5/2}\sqrt{d-c^2dx^2}}{36c}$$

$$+\frac{5}{16}d^2f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{15d^2fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2}+\frac{15}{64}d^2fg^2x^3\sqrt{d-c^2dx^2}($$

output
```
5/96*b*d^2*f^3*(-c^2*x^2+1)^(3/2)*(-c^2*d*x^2+d)^(1/2)/c+1/36*b*d^2*f^3*(-
c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+15/64*d^2*f*g^2*x^3*(-c^2*d*x^2+d)
^(1/2)*(a+b*arcsin(c*x))+1/6*f^3*x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))+
15/256*b*d^2*f*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-3/7*b*c*d
^2*f^2*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/24*d*f^3*x*(-c^2*d*
x^2+d)^(3/2)*(a+b*arcsin(c*x))+3/8*f*g^2*x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arc
sin(c*x))-1/7*g^3*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^4/d+1/9*g^3*(-c
^2*d*x^2+d)^(9/2)*(a+b*arcsin(c*x))/c^4/d^2+5/16*d^2*f^3*x*(-c^2*d*x^2+d)^
(1/2)*(a+b*arcsin(c*x))+5/16*d*f*g^2*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(
c*x))-3/7*f^2*g*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^2/d-5/32*b*c*d^2*
f^3*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/189*b*d^2*g^3*x^3*(-c^2*
d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/21*b*c*d^2*g^3*x^5*(-c^2*d*x^2+d)^(1
/2)/(-c^2*x^2+1)^(1/2)+19/441*b*c^3*d^2*g^3*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2
*x^2+1)^(1/2)-1/81*b*c^5*d^2*g^3*x^9*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/
2)+2/63*b*d^2*g^3*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)-15/128*d^2
*f*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^2+5/32*d^2*f^3*(-c^2*d*x
^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)+15/256*d^2*f*g^2*(-
c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c^3/(-c^2*x^2+1)^(1/2)-59/256*b*c
*d^2*f*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+9/35*b*c^3*d^2*f^2*
g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+17/96*b*c^3*d^2*f*g^2*x^6...
```

Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 587, normalized size of antiderivative = 0.49

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(99225a^2(8c^3f^3+3cfg^2)+630ab\sqrt{1-c^2x^2}(-256g^3-c^2g(3456f^2+94\right.}{}$$

input
```
Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(99225*a^2*(8*c^3*f^3 + 3*c*f*g^2) + 630*a*b*Sqrt
[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 128*g^2*x^2) + 16*
c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3) - 8*c^6*x^3*(5
46*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^4*x*(924*f^3 +
 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)) + b^2*c*x*(161280*g^3 + 105
*c^2*g*(20736*f^2 + 2835*f*g*x + 256*g^2*x^2) - 945*c^4*x*(1848*f^3 + 2304
*f^2*g*x + 1239*f*g^2*x^2 + 256*g^3*x^3) + 72*c^6*x^3*(9555*f^3 + 18144*f^
2*g*x + 12495*f*g^2*x^2 + 3040*g^3*x^3) - 20*c^8*x^5*(7056*f^3 + 15552*f^2
*g*x + 11907*f*g^2*x^2 + 3136*g^3*x^3)) + 630*b*(315*a*(8*c^3*f^3 + 3*c*f*
g^2) + b*Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 128*g
^2*x^2) + 16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3) -
 8*c^6*x^3*(546*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^4
*x*(924*f^3 + 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)))*ArcSin[c*x] +
 99225*b^2*c*f*(8*c^2*f^2 + 3*g^2)*ArcSin[c*x]^2))/(5080320*b*c^4*Sqrt[1 -
 c^2*x^2])
```

Rubi [A] (verified)

Time = 1.65 (sec) , antiderivative size = 630, normalized size of antiderivative = 0.53, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)^3(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))f^3+3gx\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))f^2+3g^2x^2\left(1-c^2x^2\right)^{5}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 2009}$$

$$d^2\sqrt{d-c^2dx^2}\left(\frac{15fg^2(a+b\arcsin(cx))^2}{256bc^3}+\frac{1}{6}f^3x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{5}{24}f^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(c\right.$$

input
```
Int[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((3*b*f^2*g*x)/(7*c) + (2*b*g^3*x)/(63*c^3) - (25
*b*c*f^3*x^2)/96 + (15*b*f*g^2*x^2)/(256*c) - (3*b*c*f^2*g*x^3)/7 + (b*g^3
*x^3)/(189*c) + (5*b*c^3*f^3*x^4)/96 - (59*b*c*f*g^2*x^4)/256 + (9*b*c^3*f
^2*g*x^5)/35 - (b*c*g^3*x^5)/21 + (17*b*c^3*f*g^2*x^6)/96 - (3*b*c^5*f^2*g
*x^7)/49 + (19*b*c^3*g^3*x^7)/441 - (3*b*c^5*f*g^2*x^8)/64 - (b*c^5*g^3*x^
9)/81 + (b*f^3*(1 - c^2*x^2)^3)/(36*c) + (5*f^3*x*Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x]))/16 - (15*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(12
8*c^2) + (15*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/64 + (5*f^3*
x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (5*f*g^2*x^3*(1 - c^2*x^2)
^(3/2)*(a + b*ArcSin[c*x]))/16 + (f^3*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[
c*x]))/6 + (3*f*g^2*x^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/8 - (3*f^
2*g*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^2) - (g^3*(1 - c^2*x^2)^
(7/2)*(a + b*ArcSin[c*x]))/(7*c^4) + (g^3*(1 - c^2*x^2)^(9/2)*(a + b*ArcSi
n[c*x]))/(9*c^4) + (5*f^3*(a + b*ArcSin[c*x])^2)/(32*b*c) + (15*f*g^2*(a +
 b*ArcSin[c*x])^2)/(256*b*c^3)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.14 (sec) , antiderivative size = 2903, normalized size of antiderivative = 2.44

method	result	size
default	Expression too large to display	2903
parts	Expression too large to display	2903

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3*(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d
*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-
c^2*d*x^2+d)^(1/2)))))+g^3*(-1/9*x^2*(-c^2*d*x^2+d)^(7/2)/c^2/d-2/63/d/c^4
*(-c^2*d*x^2+d)^(7/2))+3*f*g^2*(-1/8*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/8/c^2*
(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x
*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x
^2+d)^(1/2))))))-3/7*f^2*g*(-c^2*d*x^2+d)^(7/2)/c^2/d)+b*(-5/256*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(8*c^2*f^
2+3*g^2)*d^2+1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256
*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7
-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1
)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g^3*(I+9*arcsin(c*x))*d^2/c^
4/(c^2*x^2-1)+3/25088*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*
c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25
*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(
28*arcsin(c*x)*c^2*f^2+4*I*c^2*f^2-7*g^2*arcsin(c*x)-I*g^2)*d^2/c^4/(c^2*x
^2-1)+3/16384*(-d*(c^2*x^2-1))^(1/2)*(128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128
*c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7+160*I*(-c^2*x^2+1)^(
1/2)*x^4*c^4+272*c^5*x^5-32*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-88*c^3*x^3+I*(-c^
2*x^2+1)^(1/2)+8*c*x)*f*g^2*(-I+8*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-3/64...
```

Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^3(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral((a*c^4*d^2*g^3*x^7 + 3*a*c^4*d^2*f*g^2*x^6 + 3*a*d^2*f^2*g*x + a*
d^2*f^3 + (3*a*c^4*d^2*f^2*g - 2*a*c^2*d^2*g^3)*x^5 + (a*c^4*d^2*f^3 - 6*a
*c^2*d^2*f*g^2)*x^4 - (6*a*c^2*d^2*f^2*g - a*d^2*g^3)*x^3 - (2*a*c^2*d^2*f
^3 - 3*a*d^2*f*g^2)*x^2 + (b*c^4*d^2*g^3*x^7 + 3*b*c^4*d^2*f*g^2*x^6 + 3*b
*d^2*f^2*g*x + b*d^2*f^3 + (3*b*c^4*d^2*f^2*g - 2*b*c^2*d^2*g^3)*x^5 + (b*
c^4*d^2*f^3 - 6*b*c^2*d^2*f*g^2)*x^4 - (6*b*c^2*d^2*f^2*g - b*d^2*g^3)*x^3
 - (2*b*c^2*d^2*f^3 - 3*b*d^2*f*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d
), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (gx+f)^3 (b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a*f^3 + 1/128*(8*(-c^2*
d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*d*
x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*ar
csin(c*x)/c^3)*a*f*g^2 - 1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-
c^2*d*x^2 + d)^(7/2)/(c^4*d))*a*g^3 - 3/7*(-c^2*d*x^2 + d)^(7/2)*a*f^2*g/(
c^2*d) + sqrt(d)*integrate((b*c^4*d^2*g^3*x^7 + 3*b*c^4*d^2*f*g^2*x^6 + 3*
b*d^2*f^2*g*x + b*d^2*f^3 + (3*b*c^4*d^2*f^2*g - 2*b*c^2*d^2*g^3)*x^5 + (b
*c^4*d^2*f^3 - 6*b*c^2*d^2*f*g^2)*x^4 - (6*b*c^2*d^2*f^2*g - b*d^2*g^3)*x^
3 - (2*b*c^2*d^2*f^3 - 3*b*d^2*f*g^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^3\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(d)*d**2*(2520*asin(c*x)*a*c**3*f**3 + 945*asin(c*x)*a*c*f*g**2 + 134
4*sqrt( - c**2*x**2 + 1)*a*c**8*f**3*x**5 + 3456*sqrt( - c**2*x**2 + 1)*a*
c**8*f**2*g*x**6 + 3024*sqrt( - c**2*x**2 + 1)*a*c**8*f*g**2*x**7 + 896*sq
rt( - c**2*x**2 + 1)*a*c**8*g**3*x**8 - 4368*sqrt( - c**2*x**2 + 1)*a*c**6
*f**3*x**3 - 10368*sqrt( - c**2*x**2 + 1)*a*c**6*f**2*g*x**4 - 8568*sqrt(
- c**2*x**2 + 1)*a*c**6*f*g**2*x**5 - 2432*sqrt( - c**2*x**2 + 1)*a*c**6*g
**3*x**6 + 5544*sqrt( - c**2*x**2 + 1)*a*c**4*f**3*x + 10368*sqrt( - c**2*
x**2 + 1)*a*c**4*f**2*g*x**2 + 7434*sqrt( - c**2*x**2 + 1)*a*c**4*f*g**2*x
**3 + 1920*sqrt( - c**2*x**2 + 1)*a*c**4*g**3*x**4 - 3456*sqrt( - c**2*x**
2 + 1)*a*c**2*f**2*g - 945*sqrt( - c**2*x**2 + 1)*a*c**2*f*g**2*x - 128*sq
rt( - c**2*x**2 + 1)*a*c**2*g**3*x**2 - 256*sqrt( - c**2*x**2 + 1)*a*g**3
+ 8064*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**7,x)*b*c**8*g**3 + 24192*in
t(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**6,x)*b*c**8*f*g**2 + 24192*int(sqrt(
 - c**2*x**2 + 1)*asin(c*x)*x**5,x)*b*c**8*f**2*g - 16128*int(sqrt( - c**2
*x**2 + 1)*asin(c*x)*x**5,x)*b*c**6*g**3 + 8064*int(sqrt( - c**2*x**2 + 1)
*asin(c*x)*x**4,x)*b*c**8*f**3 - 48384*int(sqrt( - c**2*x**2 + 1)*asin(c*x
)*x**4,x)*b*c**6*f*g**2 - 48384*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,
x)*b*c**6*f**2*g + 8064*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*b*c**
4*g**3 - 16128*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*b*c**6*f**3 +
24192*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*b*c**4*f*g**2 + 2419...
```

3.114 $\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 31, antiderivative size = 871

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{2bd^2fgx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} - \frac{5bcd^2f^2x^2\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}} + \frac{5bd^2g^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}} - \frac{2bcd^2fgx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} - \frac{59bcd^2g^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}} + \frac{6bc^3d^2fgx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} + \frac{17bc^3d^2g^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}} - \frac{2bc^5d^2fgx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} - \frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} + \frac{5bd^2f^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}}{96c} + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5d^2g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} + \frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b$$

output
```
2/7*b*d^2*f*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-5/32*b*c*d^2*f^2
*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/256*b*d^2*g^2*x^2*(-c^2*d*x
^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/7*b*c*d^2*f*g*x^3*(-c^2*d*x^2+d)^(1/2)/
(-c^2*x^2+1)^(1/2)-59/768*b*c*d^2*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1
)^(1/2)+6/35*b*c^3*d^2*f*g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+17/
288*b*c^3*d^2*g^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/49*b*c^5*d
^2*f*g*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/64*b*c^5*d^2*g^2*x^8*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/96*b*d^2*f^2*(-c^2*x^2+1)^(3/2)*
(-c^2*d*x^2+d)^(1/2)/c+1/36*b*d^2*f^2*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1
/2)/c+5/16*d^2*f^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))-5/128*d^2*g^2*
x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^2+5/64*d^2*g^2*x^3*(-c^2*d*x^2+
d)^(1/2)*(a+b*arcsin(c*x))+5/24*d*f^2*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c
*x))+5/48*d*g^2*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/6*f^2*x*(-c^2
*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))+1/8*g^2*x^3*(-c^2*d*x^2+d)^(5/2)*(a+b*ar
csin(c*x))-2/7*f*g*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))/c^2/d+5/32*d^2*f
^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*x^2+1)^(1/2)+5/256*d
^2*g^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c^3/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 390, normalized size of antiderivative = 0.45

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(11025a^2(8c^2f^2+g^2)+b^2c^2x(-1960c^2f^2x(99-39c^2x^2+8c^4x^4)-4608\cdots}{}$$

input
```
Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(11025*a^2*(8*c^2*f^2 + g^2) + b^2*c^2*x*(-1960*c
^2*f^2*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) - 4608*f*g*(-35 + 35*c^2*x^2 - 21*c
^4*x^4 + 5*c^6*x^6) - 245*g^2*x*(-45 + 177*c^2*x^2 - 136*c^4*x^4 + 36*c^6*
x^6)) + 210*a*b*c*Sqrt[1 - c^2*x^2]*(768*f*g*(-1 + c^2*x^2)^3 + 56*c^2*f^2
*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*(-15 + 118*c^2*x^2 - 136*c^4*x^
4 + 48*c^6*x^6)) + 210*b*(105*a*(8*c^2*f^2 + g^2) + b*c*Sqrt[1 - c^2*x^2]*
(768*f*g*(-1 + c^2*x^2)^3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7
*g^2*x*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6)))*ArcSin[c*x] + 1102
5*b^2*(8*c^2*f^2 + g^2)*ArcSin[c*x]^2))/(564480*b*c^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.27 (sec) , antiderivative size = 481, normalized size of antiderivative = 0.55, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)^2(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(f^2(a+b\arcsin(cx))\left(1-c^2x^2\right)^{5/2}+g^2x^2(a+b\arcsin(cx))\left(1-c^2x^2\right)^{5/2}+2fgx(a+b\arcsin(\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\left(\frac{5g^2(a+b\arcsin(cx))^2}{256bc^3}+\frac{1}{6}f^2x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{5}{24}f^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)\right.}{}$$

input
```
Int[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((2*b*f*g*x)/(7*c) - (25*b*c*f^2*x^2)/96 + (5*b*g
^2*x^2)/(256*c) - (2*b*c*f*g*x^3)/7 + (5*b*c^3*f^2*x^4)/96 - (59*b*c*g^2*x
^4)/768 + (6*b*c^3*f*g*x^5)/35 + (17*b*c^3*g^2*x^6)/288 - (2*b*c^5*f*g*x^7
)/49 - (b*c^5*g^2*x^8)/64 + (b*f^2*(1 - c^2*x^2)^3)/(36*c) + (5*f^2*x*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/16 - (5*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(128*c^2) + (5*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/64 + (5*f^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (5*g^2*x^3*(
1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/48 + (f^2*x*(1 - c^2*x^2)^(5/2)*(a
 + b*ArcSin[c*x]))/6 + (g^2*x^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/8
 - (2*f*g*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^2) + (5*f^2*(a + b
*ArcSin[c*x])^2)/(32*b*c) + (5*g^2*(a + b*ArcSin[c*x])^2)/(256*b*c^3)))/Sq
rt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.56 (sec) , antiderivative size = 2090, normalized size of antiderivative = 2.40

method	result	size
default	Expression too large to display	2090
parts	Expression too large to display	2090

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2*(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d
*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-
c^2*d*x^2+d)^(1/2)))))+g^2*(-1/8*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/8/c^2*(1/6
*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c
^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d
)^(1/2))))))-2/7*f*g*(-c^2*d*x^2+d)^(7/2)/c^2/d)+b*(-5/256*(-d*(c^2*x^2-1)
)^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*(8*c^2*f^2+g^2)*d
^2-3/1024*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(22*
I*c^2*f^2+32*arcsin(c*x)*c^2*f^2+I*g^2+4*g^2*arcsin(c*x))*cos(3*arcsin(c*x
))*d^2/c^3/(c^2*x^2-1)+1/3136*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x
^6-64*I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^
5*c^5-25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*
c+1)*f*g*(I+7*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/16384*(-d*(c^2*x^2-1))^(1
/2)*(128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^9*x^9-256*I*(-c^2*x^2+1)^(1/2)
*x^6*c^6-320*c^7*x^7+160*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+272*c^5*x^5-32*I*(-c
^2*x^2+1)^(1/2)*x^2*c^2-88*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+8*c*x)*g^2*(-I+8*a
rcsin(c*x))*d^2/c^3/(c^2*x^2-1)-5/64*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x
*(-c^2*x^2+1)^(1/2)-1)*f*g*(arcsin(c*x)+I)*d^2/c^2/(c^2*x^2-1)-5/64*(-d*(c
^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*f*g*(arcsin(c*x)-I)*
d^2/c^2/(c^2*x^2-1)+1/64*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+...
```

Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^2(b\arcsin\left(cx\right)+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral((a*c^4*d^2*g^2*x^6 + 2*a*c^4*d^2*f*g*x^5 - 4*a*c^2*d^2*f*g*x^3 +
2*a*d^2*f*g*x + a*d^2*f^2 + (a*c^4*d^2*f^2 - 2*a*c^2*d^2*g^2)*x^4 - (2*a*c
^2*d^2*f^2 - a*d^2*g^2)*x^2 + (b*c^4*d^2*g^2*x^6 + 2*b*c^4*d^2*f*g*x^5 - 4
*b*c^2*d^2*f*g*x^3 + 2*b*d^2*f*g*x + b*d^2*f^2 + (b*c^4*d^2*f^2 - 2*b*c^2*
d^2*g^2)*x^4 - (2*b*c^2*d^2*f^2 - b*d^2*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx=\text{Timed out}$$

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a*f^2 + 1/384*(8*(-c^2*
d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*d*
x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*ar
csin(c*x)/c^3)*a*g^2 - 2/7*(-c^2*d*x^2 + d)^(7/2)*a*f*g/(c^2*d) + sqrt(d)*
integrate((b*c^4*d^2*g^2*x^6 + 2*b*c^4*d^2*f*g*x^5 - 4*b*c^2*d^2*f*g*x^3 +
 2*b*d^2*f*g*x + b*d^2*f^2 + (b*c^4*d^2*f^2 - 2*b*c^2*d^2*g^2)*x^4 - (2*b*
c^2*d^2*f^2 - b*d^2*g^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{\sqrt{d}\,d^2\left(840 asin(cx)\,a\,c^2f^2+105 asin(cx)\,a\,g^2+448\sqrt{-c^2x^2+1}\,a\,c^7f^2x^5+768\sqrt{-c^2x^2}\right.}{}$$

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*asin(c*x)),x)
```

output

```
(sqrt(d)*d**2*(840*asin(c*x)*a*c**2*f**2 + 105*asin(c*x)*a*g**2 + 448*sqrt
( - c**2*x**2 + 1)*a*c**7*f**2*x**5 + 768*sqrt( - c**2*x**2 + 1)*a*c**7*f*
g*x**6 + 336*sqrt( - c**2*x**2 + 1)*a*c**7*g**2*x**7 - 1456*sqrt( - c**2*x
**2 + 1)*a*c**5*f**2*x**3 - 2304*sqrt( - c**2*x**2 + 1)*a*c**5*f*g*x**4 -
952*sqrt( - c**2*x**2 + 1)*a*c**5*g**2*x**5 + 1848*sqrt( - c**2*x**2 + 1)*
a*c**3*f**2*x + 2304*sqrt( - c**2*x**2 + 1)*a*c**3*f*g*x**2 + 826*sqrt( -
c**2*x**2 + 1)*a*c**3*g**2*x**3 - 768*sqrt( - c**2*x**2 + 1)*a*c*f*g - 105
*sqrt( - c**2*x**2 + 1)*a*c*g**2*x + 2688*int(sqrt( - c**2*x**2 + 1)*asin(
c*x)*x**6,x)*b*c**7*g**2 + 5376*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**5,
x)*b*c**7*f*g + 2688*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**4,x)*b*c**7*f
**2 - 5376*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**4,x)*b*c**5*g**2 - 1075
2*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*b*c**5*f*g - 5376*int(sqrt(
 - c**2*x**2 + 1)*asin(c*x)*x**2,x)*b*c**5*f**2 + 2688*int(sqrt( - c**2*x*
*2 + 1)*asin(c*x)*x**2,x)*b*c**3*g**2 + 5376*int(sqrt( - c**2*x**2 + 1)*as
in(c*x)*x,x)*b*c**3*f*g + 2688*int(sqrt( - c**2*x**2 + 1)*asin(c*x),x)*b*c
**3*f**2 + 768*a*c*f*g))/(2688*c**3)
```

3.115 $\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin (cx)) \, dx$

Optimal result

Integrand size = 29, antiderivative size = 475

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin (cx)) \, dx = \frac{bd^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}$$
$$-\frac{5bcd^2fx^2\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}}-\frac{bcd^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}+\frac{3bc^3d^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}$$
$$-\frac{bc^5d^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}+\frac{5bd^2f(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}}{96c}+\frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}$$
$$+\frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{5}{24}dfx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))+\frac{1}{6}fx\left(d-c^2dx^2\right)^{5/2}(a+b\,\mathrm{arc}$$

output
```
1/7*b*d^2*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-5/32*b*c*d^2*f*x^2
*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/7*b*c*d^2*g*x^3*(-c^2*d*x^2+d)^
(1/2)/(-c^2*x^2+1)^(1/2)+3/35*b*c^3*d^2*g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x
^2+1)^(1/2)-1/49*b*c^5*d^2*g*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5
/96*b*d^2*f*(-c^2*x^2+1)^(3/2)*(-c^2*d*x^2+d)^(1/2)/c+1/36*b*d^2*f*(-c^2*x
^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+5/16*d^2*f*x*(-c^2*d*x^2+d)^(1/2)*(a+b*
arcsin(c*x))+5/24*d*f*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))+1/6*f*x*(-c
^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))-1/7*g*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin
(c*x))/c^2/d+5/32*d^2*f*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2
*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 251, normalized size of antiderivative = 0.53

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\frac{d^2\sqrt{d-c^2dx^2}\left(11025a^2cf+210ab\sqrt{1-c^2x^2}\left(48g(-1+c^2x^2)^3+7c^2fx(33-26c^2x^2+\right.\right.}{}$$

input
```
Integrate[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(11025*a^2*c*f + 210*a*b*Sqrt[1 - c^2*x^2]*(48*g*
(-1 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)) + b^2*c*x*(-24
5*c^2*f*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) - 288*g*(-35 + 35*c^2*x^2 - 21*c^4
*x^4 + 5*c^6*x^6)) + 210*b*(105*a*c*f + b*Sqrt[1 - c^2*x^2]*(48*g*(-1 + c^
2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x] + 11025*b
^2*c*f*ArcSin[c*x]^2))/(70560*b*c^2*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 256, normalized size of antiderivative = 0.54, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(f(a+b\arcsin(cx))\left(1-c^2x^2\right)^{5/2}+gx(a+b\arcsin(cx))\left(1-c^2x^2\right)^{5/2}\right)dx}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$d^2\sqrt{d-c^2dx^2}\left(\frac{1}{6}fx\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{5}{24}fx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{5}{16}fx\sqrt{1-c^2x^2}(a\right.$$

input

```
Int[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output

```
(d^2*Sqrt[d - c^2*d*x^2]*((b*g*x)/(7*c) - (25*b*c*f*x^2)/96 - (b*c*g*x^3)/
7 + (5*b*c^3*f*x^4)/96 + (3*b*c^3*g*x^5)/35 - (b*c^5*g*x^7)/49 + (b*f*(1 -
 c^2*x^2)^3)/(36*c) + (5*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/16 + (
5*f*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (f*x*(1 - c^2*x^2)^(5/
2)*(a + b*ArcSin[c*x]))/6 - (g*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7
*c^2) + (5*f*(a + b*ArcSin[c*x])^2)/(32*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009

```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.30 (sec) , antiderivative size = 1423, normalized size of antiderivative = 3.00

method	result	size
default	Expression too large to display	1423
parts	Expression too large to display	1423

input

```
int((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE
)
```

output

```
1/6*a*f*x*(-c^2*d*x^2+d)^(5/2)+5/24*a*f*(-c^2*d*x^2+d)^(3/2)*x*d+5/16*a*f*
(-c^2*d*x^2+d)^(1/2)*x*d^2+5/16*a*f*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)
*x/(-c^2*d*x^2+d)^(1/2))-1/7*a*g*(-c^2*d*x^2+d)^(7/2)/c^2/d+b*(-5/32*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*d^2*f+1/6
272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+
1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^
2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(I+7*arcsin(c*x))*d
^2/c^2/(c^2*x^2-1)+1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)
*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*
x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*f*(I+6*arcsin(
c*x))*d^2/c/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*
x^2+1)^(1/2)-1)*g*(arcsin(c*x)+I)*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(arcsin(c*x)-I)*d^2/c^2/(c
^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*
c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-I+2*arcsin(c*x))*d^2*f/c/(c^2*x^2-1)
+1/128*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*
I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))*d^2/c^2/(c^2*x^
2-1)-1/7840*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*
(11*I+70*arcsin(c*x))*cos(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-3/15680*(-d*(
c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(9*I+35*arcsin...
```

Fricas [F]

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fri
cas")
```

output
```
integral((a*c^4*d^2*g*x^5 + a*c^4*d^2*f*x^4 - 2*a*c^2*d^2*g*x^3 - 2*a*c^2*
d^2*f*x^2 + a*d^2*g*x + a*d^2*f + (b*c^4*d^2*g*x^5 + b*c^4*d^2*f*x^4 - 2*b
*c^2*d^2*g*x^3 - 2*b*c^2*d^2*f*x^2 + b*d^2*g*x + b*d^2*f)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="max
ima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a*f - 1/7*(-c^2*d*x^2 +
 d)^(7/2)*a*g/(c^2*d) + sqrt(d)*integrate((b*c^4*d^2*g*x^5 + b*c^4*d^2*f*x
^4 - 2*b*c^2*d^2*g*x^3 - 2*b*c^2*d^2*f*x^2 + b*d^2*g*x + b*d^2*f)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="gia
c")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \frac{\sqrt{d}\,d^2\left(105asin(cx)\,acf+56\sqrt{-c^2x^2+1}\,a\,c^6f\,x^5+48\sqrt{-c^2x^2+1}\,a\,c^6g\,x^6-182\sqrt{-c^2 \cdots}\right.}{\cdots}$$

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*asin(c*x)),x)
```

output
```
(sqrt(d)*d**2*(105*asin(c*x)*a*c*f + 56*sqrt( - c**2*x**2 + 1)*a*c**6*f*x*
*5 + 48*sqrt( - c**2*x**2 + 1)*a*c**6*g*x**6 - 182*sqrt( - c**2*x**2 + 1)*
a*c**4*f*x**3 - 144*sqrt( - c**2*x**2 + 1)*a*c**4*g*x**4 + 231*sqrt( - c**
2*x**2 + 1)*a*c**2*f*x + 144*sqrt( - c**2*x**2 + 1)*a*c**2*g*x**2 - 48*sqr
t( - c**2*x**2 + 1)*a*g + 336*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**5,x)
*b*c**6*g + 336*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**4,x)*b*c**6*f - 67
2*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*b*c**4*g - 672*int(sqrt( -
c**2*x**2 + 1)*asin(c*x)*x**2,x)*b*c**4*f + 336*int(sqrt( - c**2*x**2 + 1)
*asin(c*x)*x,x)*b*c**2*g + 336*int(sqrt( - c**2*x**2 + 1)*asin(c*x),x)*b*c
**2*f + 48*a*g))/(336*c**2)
```

3.116 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1609

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Too large to display}$$

output
```
b*d^2*(c^2*f^2-g^2)^2*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g^5-1/3*d*(-c^2*d*x
^2+d)^(3/2)*(a+b*arcsin(c*x))/g+1/16*b*c^5*d^2*f*x^4*(-c^2*d*x^2+d)^(1/2)/
g^2/(-c^2*x^2+1)^(1/2)-1/2*c^2*d^2*f*(c^2*f^2-2*g^2)*x*(-c^2*d*x^2+d)^(1/2
)*(a+b*arcsin(c*x))/g^4-1/16*c*d^2*f*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)
)^2/b/g^2/(-c^2*x^2+1)^(1/2)-b*c*d^2*(c^2*f^2-g^2)^2*x*(-c^2*d*x^2+d)^(1/2
)/g^5/(-c^2*x^2+1)^(1/2)+1/5*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/g+1/3*
b*c*d^2*(c^2*f^2-2*g^2)*x*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)-1/16
*b*c^3*d^2*f*x^2*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-1/9*b*c^3*d^2
*(c^2*f^2-2*g^2)*x^3*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)-1/3*d*(c^
2*f^2-2*g^2)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/g^3+a*d^2*(c^2*f^2-g^2
)^2*(-c^2*d*x^2+d)^(1/2)/g^5+1/4*b*c^3*d^2*f*(c^2*f^2-2*g^2)*x^2*(-c^2*d*x
^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-1/4*c*d^2*f*(c^2*f^2-2*g^2)*(-c^2*d*x^2
+d)^(1/2)*(a+b*arcsin(c*x))^2/b/g^4/(-c^2*x^2+1)^(1/2)+1/2*c*d^2*(c^2*f^2-
g^2)^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/g^5/(-c^2*x^2+1)^(1/2)
+1/2*d^2*(c^2*f^2-g^2)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c/g^6/
(g*x+f)/(-c^2*x^2+1)^(1/2)+1/2*d^2*(c^2*f^2-g^2)^2*(-c^2*x^2+1)^(1/2)*(-c^
2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/b/c/g^4/(g*x+f)-I*b*d^2*(c^2*f^2-g^2)
^(5/2)*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f+(c^2*f^2-g^2)^(1/2)))/g^6/(-c^2*x^2+1)^(1/2)+I*b*d^2*(c^2*f^2-g^2)^
(5/2)*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)...
```

Mathematica [A] (verified)

Time = 1.69 (sec) , antiderivative size = 787, normalized size of antiderivative = 0.49

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx =$$

$$-\frac{d^2\sqrt{d-c^2dx^2}\left(-900bc^3f(c^2f^2-2g^2)\,x^2-225bc^5fg^2x^4+144bc^5g^3x^5+400bcg(c^2f^2-2g^2)\,x(-3+c^2x\right.}{}$$

input
```
Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
-1/3600*(d^2*Sqrt[d - c^2*d*x^2]*(-900*b*c^3*f*(c^2*f^2 - 2*g^2)*x^2 - 225
*b*c^5*f*g^2*x^4 + 144*b*c^5*g^3*x^5 + 400*b*c*g*(c^2*f^2 - 2*g^2)*x*(-3 +
 c^2*x^2) + 1800*c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]) + 900*c^4*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - 720*c^4
*g^3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + 1200*g*(c^2*f^2 - 2*g^2)*
(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]) + (900*c*f*(c^2*f^2 - 2*g^2)*(a +
b*ArcSin[c*x])^2)/b + (1800*(-(c^2*f^2) + g^2)^2*(-1 + c^2*x^2)*(a + b*Arc
Sin[c*x])^2)/(b*c*(f + g*x)) - 80*g^3*(6*b*c*x + b*c^3*x^3 - 6*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x]) - 3*c^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
])) + 225*c*f*g^2*(b*c^2*x^2 - 2*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
 + (a + b*ArcSin[c*x])^2/b) - (1800*(-(c^2*f^2) + g^2)^2*(c^2*g*x*(a + b*A
rcSin[c*x])^2 + ((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2)/(f + g*x) - 2*b*c*
(b*c*g*x - g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - I*Sqrt[c^2*f^2 - g^2]
*((a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*
f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])
]) - I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] +
 I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/(
b*c*g^2)))/(g^4*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 3.17 (sec) , antiderivative size = 1019, normalized size of antiderivative = 0.63, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \frac{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5266}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int\left(\frac{x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^4}{g}-\frac{fx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^4}{g^2}-\frac{f(c^2f^2-2g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^2}{g^4}+\frac{(c^2}{}\right.}{\sqrt{1-c^2x^2}}$$

$\Big\downarrow$ 2009

$$\frac{d^2\sqrt{d-c^2dx^2}\left(-\frac{bx^5c^5}{25g}+\frac{bfx^4c^5}{16g^2}-\frac{fx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^4}{4g^2}-\frac{b(c^2f^2-2g^2)x^3c^3}{9g^3}+\frac{bx^3c^3}{45g}+\frac{bf(c^2f^2-2g^2)x^2c^3}{4g^4}-\frac{bfx^2c^3}{16g^2}\right.}{}$$

input
```
Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((2*b*c*x)/(15*g) + (b*c*(c^2*f^2 - 2*g^2)*x)/(3*
g^3) - (b*c*(c^2*f^2 - g^2)^2*x)/g^5 - (b*c^3*f*x^2)/(16*g^2) + (b*c^3*f*(
c^2*f^2 - 2*g^2)*x^2)/(4*g^4) + (b*c^3*x^3)/(45*g) - (b*c^3*(c^2*f^2 - 2*g
^2)*x^3)/(9*g^3) + (b*c^5*f*x^4)/(16*g^2) - (b*c^5*x^5)/(25*g) + (a*(c^2*f
^2 - g^2)^2*Sqrt[1 - c^2*x^2])/g^5 + (b*(c^2*f^2 - g^2)^2*Sqrt[1 - c^2*x^2
]*ArcSin[c*x])/g^5 + (c^2*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*g^
2) - (c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*
g^4) - (c^4*f*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4*g^2) - ((1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*g) - ((c^2*f^2 - 2*g^2)*(1 - c^2*x^2
)^(3/2)*(a + b*ArcSin[c*x]))/(3*g^3) + ((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[
c*x]))/(5*g) - (c*f*(a + b*ArcSin[c*x])^2)/(16*b*g^2) - (c*f*(c^2*f^2 - 2*
g^2)*(a + b*ArcSin[c*x])^2)/(4*b*g^4) + (c*(c^2*f^2 - g^2)^2*x*(a + b*ArcS
in[c*x])^2)/(2*b*g^5) + ((c^2*f^2 - g^2)^3*(a + b*ArcSin[c*x])^2)/(2*b*c*g
^6*(f + g*x)) + ((c^2*f^2 - g^2)^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2
*b*c*g^4*(f + g*x)) - (a*(c^2*f^2 - g^2)^(5/2)*ArcTan[(g + c^2*f*x)/(Sqrt[
c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/g^6 + (I*b*(c^2*f^2 - g^2)^(5/2)*ArcSi
n[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^6 -
 (I*b*(c^2*f^2 - g^2)^(5/2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c
*f + Sqrt[c^2*f^2 - g^2])])/g^6 + (b*(c^2*f^2 - g^2)^(5/2)*PolyLog[2, (I*E
^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^6 - (b*(c^2*f^2 - g...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5266
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [A] (warning: unable to verify)

Time = 1.33 (sec) , antiderivative size = 2580, normalized size of antiderivative = 1.60

method	result	size
default	Expression too large to display	2580
parts	Expression too large to display	2580

input
```
int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x,method=_RETURNVERBOSE
)
```

output
```
a/g*(1/5*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(5
/2)+c^2*d*f/g*(-1/8*(-2*(x+1/g*f)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+1/g*f)^2*c
^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(3/2)-3/16*(4*c^2*d^2*(c^2
*f^2-g^2)/g^2-4*c^4*d^2*f^2/g^2)/c^2/d*(-1/4*(-2*(x+1/g*f)*c^2*d+2*c^2*d*f
/g)/c^2/d*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(
1/2)-1/8*(4*c^2*d^2*(c^2*f^2-g^2)/g^2-4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/
2)*arctan((c^2*d)^(1/2)*x/(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2
*f^2-g^2)/g^2)^(1/2))))-d*(c^2*f^2-g^2)/g^2*(1/3*(-(x+1/g*f)^2*c^2*d+2*c^2
*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(3/2)+c^2*d*f/g*(-1/4*(-2*(x+1/g*f)*
c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*
f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2*d^2*(c^2*f^2-g^2)/g^2-4*c^4*d^2*f^2/g^2)/c^
2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(
x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2)))-d*(c^2*f^2-g^2)/g^2*((-(x+1/g*f)^2*c
^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2)+c^2*d*f/g/(c^2*d)^(1
/2)*arctan((c^2*d)^(1/2)*x/(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^
2*f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln
((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+1/g*f)+2*(-d*(c^2*f^2-g^2)/g^2)^(1
/2)*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2))/
(x+1/g*f)))))+b*(-1/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-
1)*arcsin(c*x)^2*f*(8*c^4*f^4-20*c^2*f^2*g^2+15*g^4)*d^2*c/g^6+1/800*(-...
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{gx+f}\,dx$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="fri
cas")
```

output
```
integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c
^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(g*x + f), x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\,\mathrm{asin}\,(cx))}{f+gx}\,dx$$

input
```
integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/(g*x+f),x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="max
ima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{5/2}}{f+g\,x}\,dx$$

input
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/(f + g*x), x)
```

Reduce [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \frac{\sqrt{d}\,d^2\Big(120asin(cx)\,a\,c^5f^5-300asin(cx)\,a\,c^3f^3g^2+225asin(cx)}{}$$

input
```
int((-c^2*d*x^2+d)^(5/2)*(a+b*asin(c*x))/(g*x+f),x)
```

output

```
(sqrt(d)*d**2*(120*asin(c*x)*a*c**5*f**5 - 300*asin(c*x)*a*c**3*f**3*g**2
+ 225*asin(c*x)*a*c*f*g**4 - 240*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x
)/2)*c*f + g)/sqrt(c**2*f**2 - g**2))*a*c**4*f**4 + 480*sqrt(c**2*f**2 - g
**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 - g**2))*a*c**2*f**2*g
**2 - 240*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2
*f**2 - g**2))*a*g**4 + 120*sqrt( - c**2*x**2 + 1)*a*c**4*f**4*g - 60*sqrt
( - c**2*x**2 + 1)*a*c**4*f**3*g**2*x + 40*sqrt( - c**2*x**2 + 1)*a*c**4*f
**2*g**3*x**2 - 30*sqrt( - c**2*x**2 + 1)*a*c**4*f*g**4*x**3 + 24*sqrt( -
c**2*x**2 + 1)*a*c**4*g**5*x**4 - 280*sqrt( - c**2*x**2 + 1)*a*c**2*f**2*g
**3 + 135*sqrt( - c**2*x**2 + 1)*a*c**2*f*g**4*x - 88*sqrt( - c**2*x**2 +
1)*a*c**2*g**5*x**2 + 184*sqrt( - c**2*x**2 + 1)*a*g**5 + 120*int((sqrt( -
 c**2*x**2 + 1)*asin(c*x)*x**4)/(f + g*x),x)*b*c**4*g**6 - 240*int((sqrt(
- c**2*x**2 + 1)*asin(c*x)*x**2)/(f + g*x),x)*b*c**2*g**6 + 120*int((sqrt(
 - c**2*x**2 + 1)*asin(c*x))/(f + g*x),x)*b*g**6 + 72*a*c**4*f**4*g - 136*
a*c**2*f**2*g**3 + 40*a*g**5))/(120*g**6)
```

3.117 $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 422

$$\begin{aligned}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx &= \frac{3bf^2gx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2bg^3x\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}} \\ &+\frac{3bfg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}+\frac{bg^3x^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}} \\ &-\frac{3f^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2d} \\ &-\frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4d} \\ &-\frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^2d} \\ &-\frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2d} \\ &+\frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} \\ &+\frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
3*b*f^2*g*x*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+2/3*b*g^3*x*(-c^2*x^
2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+3/4*b*f*g^2*x^2*(-c^2*x^2+1)^(1/2)/c/(
-c^2*d*x^2+d)^(1/2)+1/9*b*g^3*x^3*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2
)-3*f^2*g*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^2/d-2/3*g^3*(-c^2*d*x^2
+d)^(1/2)*(a+b*arcsin(c*x))/c^4/d-3/2*f*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*ar
csin(c*x))/c^2/d-1/3*g^3*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^2/d+
1/2*f^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*d*x^2+d)^(1/2)+3/
4*f*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/b/c^3/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.82 (sec) , antiderivative size = 343, normalized size of antiderivative = 0.81

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{-18bc\sqrt{d}f(2c^2f^2+3g^2)(-1+c^2x^2)\arcsin(cx)^2-36acf(2c^2f^2+3g^2)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{c}{\sqrt{}}\right.}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(-18*b*c*Sqrt[d]*f*(2*c^2*f^2 + 3*g^2)*(-1 + c^2*x^2)*ArcSin[c*x]^2 - 36*a
*c*f*(2*c^2*f^2 + 3*g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x
*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] - Sqrt[d]*g*(-1 + c^2*x^2)
*(8*b*c*x*(6*g^2 + c^2*(27*f^2 + g^2*x^2)) - 12*a*Sqrt[1 - c^2*x^2]*(4*g^2
 + c^2*(18*f^2 + 9*f*g*x + 2*g^2*x^2)) - 27*b*c*f*g*Cos[2*ArcSin[c*x]]) +
6*b*Sqrt[d]*g*(-1 + c^2*x^2)*ArcSin[c*x]*(4*Sqrt[1 - c^2*x^2]*(2*g^2 + c^2
*(9*f^2 + g^2*x^2)) + 9*c*f*g*Sin[2*ArcSin[c*x]]))/(72*c^4*Sqrt[d]*Sqrt[1
- c^2*x^2]*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 0.87 (sec) , antiderivative size = 262, normalized size of antiderivative = 0.62, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$

$$\Big\downarrow \; 5276$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 5262$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(a+b\arcsin(cx))f^3}{\sqrt{1-c^2x^2}}+\frac{3gx(a+b\arcsin(cx))f^2}{\sqrt{1-c^2x^2}}+\frac{3g^2x^2(a+b\arcsin(cx))f}{\sqrt{1-c^2x^2}}+\frac{g^3x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 2009$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{3fg^2(a+b\arcsin(cx))^2}{4bc^3}-\frac{3f^2g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}-\frac{3fg^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^2}-\frac{g^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx}{3c^2}\right.}{\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*((3*b*f^2*g*x)/c + (2*b*g^3*x)/(3*c^3) + (3*b*f*g^2*x^2
)/(4*c) + (b*g^3*x^3)/(9*c) - (3*f^2*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/c^2 - (2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^4) - (3*f*g^2
*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c^2) - (g^3*x^2*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(3*c^2) + (f^3*(a + b*ArcSin[c*x])^2)/(2*b*c) +
(3*f*g^2*(a + b*ArcSin[c*x])^2)/(4*b*c^3)))/Sqrt[d - c^2*d*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.86 (sec) , antiderivative size = 856, normalized size of antiderivative = 2.03

method	result
default	$a\left(\frac{f^{3}\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{\sqrt{c^{2}d}}+g^{3}\left(-\frac{x^{2}\sqrt{-c^{2}d\,x^{2}+d}}{3c^{2}d}-\frac{2\sqrt{-c^{2}d\,x^{2}+d}}{3d\,c^{4}}\right)+3f\,g^{2}\left(-\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2c^{2}d}+\frac{\arctan\left(\frac{\sqrt{c^{2}}}{\sqrt{-c^{2}d}}\right.}{2c^{2}\sqrt{c^{2}d}}\right.\right.$
parts	$a\left(\frac{f^{3}\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{\sqrt{c^{2}d}}+g^{3}\left(-\frac{x^{2}\sqrt{-c^{2}d\,x^{2}+d}}{3c^{2}d}-\frac{2\sqrt{-c^{2}d\,x^{2}+d}}{3d\,c^{4}}\right)+3f\,g^{2}\left(-\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2c^{2}d}+\frac{\arctan\left(\frac{\sqrt{c^{2}}}{\sqrt{-c^{2}d}}\right.}{2c^{2}\sqrt{c^{2}d}}\right.\right.$

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^3*(-1/
3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(
-1/2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/
2)*x/(-c^2*d*x^2+d)^(1/2)))-3*f^2*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*f*
(2*c^2*f^2+3*g^2)+1/144*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*c*
x+2*c^2*x^2-1)*g^3*(I+3*arcsin(c*x))/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1)
)^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*g*(4*arcsin(c*x)*c^2*f^2+4*I*
c^2*f^2+g^2*arcsin(c*x)+I*g^2)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2
)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(4*arcsin(c*x)*c^2*f^2-4*I*c^2*f^
2+g^2*arcsin(c*x)-I*g^2)/c^4/d/(c^2*x^2-1)+1/144*(-d*(c^2*x^2-1))^(1/2)*(2
*I*(-c^2*x^2+1)^(1/2)*c*x+2*c^2*x^2-1)*g^3*(-I+3*arcsin(c*x))/c^4/d/(c^2*x
^2-1)+3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*f*g
^2+3/8*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*f*g^2*arcsin(c*x)*x-1/24*(
-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*g^3*cos(4*arcsin(c*x))
+1/72*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*g^3*sin(4*arcsin(c*x))+3/16
*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2*cos(3*arcsin(c*x))+3/8*(-d
*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2*arcsin(c*x)*sin(3*arcsin(c*x))
)
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-(a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 +
3*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^
2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
-1/3*a*g^3*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c^4
*d)) - 3/2*a*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt
(d))) + 1/2*b*f^3*arcsin(c*x)^2/(c*sqrt(d)) + 3*b*f^2*g*x/(c*sqrt(d)) + a*
f^3*arcsin(c*x)/(c*sqrt(d)) - 3*sqrt(-c^2*d*x^2 + d)*b*f^2*g*arcsin(c*x)/(
c^2*d) - 3*sqrt(-c^2*d*x^2 + d)*a*f^2*g/(c^2*d) - sqrt(d)*integrate((b*g^3
*x^3 + 3*b*f*g^2*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))/(c^2*d*x^2 - d), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{3asin(cx)^2\,b\,c^3f^3 - 18\sqrt{-c^2x^2+1}\,asin(cx)\,b\,c^2f^2g + 6asin(cx)\,a\,c^3f^3 + 9asin(cx)\,acf\,g^2 - 18\sqrt{-c^2x^2}\cdots}{\cdots}$$

input
```
int((g*x+f)^3*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

output

```
(3*asin(c*x)**2*b*c**3*f**3 - 18*sqrt( - c**2*x**2 + 1)*asin(c*x)*b*c**2*f
**2*g + 6*asin(c*x)*a*c**3*f**3 + 9*asin(c*x)*a*c*f*g**2 - 18*sqrt( - c**2
*x**2 + 1)*a*c**2*f**2*g - 9*sqrt( - c**2*x**2 + 1)*a*c**2*f*g**2*x - 2*sq
rt( - c**2*x**2 + 1)*a*c**2*g**3*x**2 - 4*sqrt( - c**2*x**2 + 1)*a*g**3 +
6*int((asin(c*x)*x**3)/sqrt( - c**2*x**2 + 1),x)*b*c**4*g**3 + 18*int((asi
n(c*x)*x**2)/sqrt( - c**2*x**2 + 1),x)*b*c**4*f*g**2 + 18*b*c**3*f**2*g*x)
/(6*sqrt(d)*c**4)
```

3.118 $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 256

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{2bfgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{bg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} - \frac{2fg\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2d} - \frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2c^2d} + \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} + \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}$$

output
```
2*b*f*g*x*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/4*b*g^2*x^2*(-c^2*x^
2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)-2*f*g*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c
*x))/c^2/d-1/2*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^2/d+1/2*f^2*
(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^2*d*x^2+d)^(1/2)+1/4*g^2*(-
c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/b/c^3/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.04

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{-2b\sqrt{d}(2c^2f^2+g^2)\left(-1+c^2x^2\right)\arcsin(cx)^2-4a(2c^2f^2+g^2)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(-2*b*Sqrt[d]*(2*c^2*f^2 + g^2)*(-1 + c^2*x^2)*ArcSin[c*x]^2 - 4*a*(2*c^2*
f^2 + g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*
d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + Sqrt[d]*g*(-1 + c^2*x^2)*(4*c*(-4*b*c*
f*x + a*(4*f + g*x)*Sqrt[1 - c^2*x^2]) + b*g*Cos[2*ArcSin[c*x]]) + 2*b*Sqr
t[d]*g*(-1 + c^2*x^2)*ArcSin[c*x]*(8*c*f*Sqrt[1 - c^2*x^2] + g*Sin[2*ArcSi
n[c*x]]))/(8*c^3*Sqrt[d]*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 0.76 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.63, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$
$$\Big\downarrow \text{5276}$$
$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$
$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{1-c^2x^2}\int\left(\frac{(a+b\arcsin(cx))f^2}{\sqrt{1-c^2x^2}}+\frac{2gx(a+b\arcsin(cx))f}{\sqrt{1-c^2x^2}}+\frac{g^2x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{g^2(a+b\arcsin(cx))^2}{4bc^3}-\frac{2fg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}-\frac{g^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^2}+\frac{f^2(a+b\arcsin(cx))^2}{2bc}+\frac{2bfgx}{c}+\frac{b}{}\right.}{\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

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

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.68 (sec) , antiderivative size = 505, normalized size of antiderivative = 1.97

method	result
default	$a\left(\frac{f^{2}\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{\sqrt{c^{2}d}}+g^{2}\left(-\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2c^{2}d}+\frac{\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2c^{2}\sqrt{c^{2}d}}\right)-\frac{2fg\sqrt{-c^{2}d\,x^{2}+d}}{c^{2}d}\right)+b\left(-\frac{\sqrt{-d(c}}{}\right.$
parts	$a\left(\frac{f^{2}\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{\sqrt{c^{2}d}}+g^{2}\left(-\frac{x\sqrt{-c^{2}d\,x^{2}+d}}{2c^{2}d}+\frac{\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{2c^{2}\sqrt{c^{2}d}}\right)-\frac{2fg\sqrt{-c^{2}d\,x^{2}+d}}{c^{2}d}\right)+b\left(-\frac{\sqrt{-d(c}}{}\right.$

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^2*(-1/
2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*
x/(-c^2*d*x^2+d)^(1/2)))-2*f*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*(2*c^2*
f^2+g^2)-(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*f*g*(
arcsin(c*x)+I)/c^2/d/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1
/2)*c*x+c^2*x^2-1)*f*g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1)+1/16*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*g^2+1/8*(-d*(c^2*x^2-1))^(
1/2)/c^2/d/(c^2*x^2-1)*arcsin(c*x)*g^2*x+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d
/(c^2*x^2-1)*g^2*cos(3*arcsin(c*x))+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*
x^2-1)*arcsin(c*x)*g^2*sin(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2
 + 2*b*f*g*x + b*f^2)*arcsin(c*x))/(c^2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
-1/2*a*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d))) +
1/2*b*f^2*arcsin(c*x)^2/(c*sqrt(d)) + b*g^2*integrate(x^2*arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 2*
b*f*g*x/(c*sqrt(d)) + a*f^2*arcsin(c*x)/(c*sqrt(d)) - 2*sqrt(-c^2*d*x^2 +
d)*b*f*g*arcsin(c*x)/(c^2*d) - 2*sqrt(-c^2*d*x^2 + d)*a*f*g/(c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{asin(cx)^2\,b\,c^2f^2 - 4\sqrt{-c^2x^2+1}\,asin(cx)\,bcfg + 2asin(cx)\,a\,c^2f^2 + asin(cx)\,a\,g^2 - 4\sqrt{-c^2x^2+1}\,acfg -}{2\sqrt{d}\,c^3}$$

input
```
int((g*x+f)^2*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
(asin(c*x)**2*b*c**2*f**2 - 4*sqrt( - c**2*x**2 + 1)*asin(c*x)*b*c*f*g + 2
*asin(c*x)*a*c**2*f**2 + asin(c*x)*a*g**2 - 4*sqrt( - c**2*x**2 + 1)*a*c*f
*g - sqrt( - c**2*x**2 + 1)*a*c*g**2*x + 2*int((asin(c*x)*x**2)/sqrt( - c*
*2*x**2 + 1),x)*b*c**3*g**2 + 4*a*c*f*g + 4*b*c**2*f*g*x)/(2*sqrt(d)*c**3)
```

3.119 $\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 119

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{bgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}} - \frac{g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2d} + \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}$$

output
```
b*g*x*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)-g*(-c^2*d*x^2+d)^(1/2)*(a+
b*arcsin(c*x))/c^2/d+1/2*f*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/b/c/(-c^
2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.45

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{2\sqrt{d}g\left(-a+ac^2x^2+bcx\sqrt{1-c^2x^2}\right)+2b\sqrt{d}g(-1+c^2x^2)\arcsin(cx)+bc\sqrt{d}f\sqrt{1-c^2x^2}\arcsin(cx)^2-2}{2c^2\sqrt{d}\sqrt{d-c^2dx^2}}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

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

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.73, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{gx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}+\frac{f(a+b\arcsin(cx))^2}{2bc}+\frac{bgx}{c}\right)}{\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*((b*g*x)/c - (g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
c^2 + (f*(a + b*ArcSin[c*x])^2)/(2*b*c)))/Sqrt[d - c^2*d*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.73 (sec) , antiderivative size = 247, normalized size of antiderivative = 2.08

method	result
default	$\frac{af\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}-\frac{ag\sqrt{-c^2d\,x^2+d}}{c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{2cd(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-i\sqrt{-}\right.}{2c^2d(}\right.$
parts	$\frac{af\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}-\frac{ag\sqrt{-c^2d\,x^2+d}}{c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{2cd(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-i\sqrt{-}\right.}{2c^2d(}\right.$

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
a*f/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-a*g/c^2/d*(
-c^2*d*x^2+d)^(1/2)+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/
(c^2*x^2-1)*arcsin(c*x)^2*f-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^
2*x^2+1)^(1/2)-1)*g*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(arcsin(c*x)-I)/c^2/d/(c^2*x
^2-1))
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)(b\arcsin{(cx)}+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fri
cas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(
c^2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.76

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{bf\arcsin(cx)^2}{2c\sqrt{d}} + \frac{bgx}{c\sqrt{d}} + \frac{af\arcsin(cx)}{c\sqrt{d}} - \frac{\sqrt{-c^2dx^2+d}bg\arcsin(cx)}{c^2d} - \frac{\sqrt{-c^2dx^2+d}ag}{c^2d}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="max
ima")
```

output
```
1/2*b*f*arcsin(c*x)^2/(c*sqrt(d)) + b*g*x/(c*sqrt(d)) + a*f*arcsin(c*x)/(c
*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b*g*arcsin(c*x)/(c^2*d) - sqrt(-c^2*d*x^2
 + d)*a*g/(c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="gia
c")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.59

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{d}\left(asin(cx)^2 bcf - 2\sqrt{-c^2x^2+1}\,asin(cx)\,bg + 2asin(cx)\,acf - 2\sqrt{-c^2x^2+1}\,ag + 2bcgx\right)}{2c^2d}$$

input
```
int((g*x+f)*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
(sqrt(d)*(asin(c*x)**2*b*c*f - 2*sqrt( - c**2*x**2 + 1)*asin(c*x)*b*g + 2*
asin(c*x)*a*c*f - 2*sqrt( - c**2*x**2 + 1)*a*g + 2*b*c*g*x))/(2*c**2*d)
```

3.120 $\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 380

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

output
```
-I*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f-(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+I*(-
c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*
f+(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)-b*(-c^2*x
^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1
/2)))/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+b*(-c^2*x^2+1)^(1/2)*polylo
g(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2
)^(1/2)/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.61

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)\right)-b\,\mathrm{PolyLog}\left(2,-\right.\right.}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])
*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 + Sqrt[c^2*f^2 - g^2])]) - b*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f
) + Sqrt[c^2*f^2 - g^2])] + b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sq
rt[c^2*f^2 - g^2])]))/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 1.14 (sec) , antiderivative size = 288, normalized size of antiderivative = 0.76, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.290$, Rules used = {5276, 5272, 3042, 3804, 2694, 27, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}(f+gx)}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{cf+cgx}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$\downarrow$ 3042

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$\downarrow$ 3804

$$\frac{2\sqrt{1-c^2x^2}\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2ce^{i\arcsin(cx)}f-ie^{2i\arcsin(cx)}g+ig}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$\downarrow$ 2694

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}}$$

$\downarrow$ 27

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}}$$

$\downarrow$ 2620

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{b\int \log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(ca}}{cf-\sqrt{c^2f^2-}}\right.}{g}\right.}{2\sqrt{}}\right.}{\sqrt{d-c^2dx^2}}$$

$\downarrow$ 2715

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}}{g}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{ib\int e^{-i\arcsin(cx)}\,\mathrm{lo}}{}\right.}{}\right.}{\sqrt{d-c^2dx^2}}$$

$\downarrow$ 2838

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{ib\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}-\cdots\right.}{2\sqrt{c^2f^2-g^2}}\cdots\right.}{\sqrt{d-c^2dx^2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(2*Sqrt[1 - c^2*x^2]*(((-1/2*I)*g*(((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*Ar
cSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*Ar
cSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g))/Sqrt[c^2*f^2 - g^2] + ((I/
2)*g*(((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2
*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2
*f^2 - g^2])])/g))/Sqrt[c^2*f^2 - g^2]))/Sqrt[d - c^2*d*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [A] (verified)

Time = 0.85 (sec) , antiderivative size = 508, normalized size of antiderivative = 1.34

method	result
default	$-\frac{a\ln\left(\frac{-\frac{2d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}}{x+\frac{f}{g}}\right)}{g\sqrt{-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}}-\frac{ib\sqrt{-c^{2}f^{2}+g^{2}}\,\sqrt{-d(c^{2}\cdots}}{\cdots}$
parts	$-\frac{a\ln\left(\frac{-\frac{2d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}}{x+\frac{f}{g}}\right)}{g\sqrt{-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}}-\frac{ib\sqrt{-c^{2}f^{2}+g^{2}}\,\sqrt{-d(c^{2}\cdots}}{\cdots}$

input
```
int((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
-a/g/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(
x+1/g*f)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2)*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x
+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+1/g*f))-I*b*(-c^2*f^2+g^2)^(1/2)*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln((I*f*c+(I*c*x+(-
c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*f*c-(-c^2*f^2+g^2)^(1/2)))-I*
arcsin(c*x)*ln((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(
I*f*c+(-c^2*f^2+g^2)^(1/2)))+dilog((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c
^2*f^2+g^2)^(1/2))/(I*f*c-(-c^2*f^2+g^2)^(1/2)))-dilog((I*f*c+(I*c*x+(-c^2
*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*f*c+(-c^2*f^2+g^2)^(1/2))))/d/(c
^2*x^2-1)/(c^2*f^2-g^2)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="fri
cas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*g*x^3 + c^2*d*f*
x^2 - d*g*x - d*f), x)
```

Sympy [F]

$$\int \frac{a + b \arcsin(cx)}{(f + gx)\sqrt{d - c^2 dx^2}}\, dx = \int \frac{a + b \operatorname{asin}(cx)}{\sqrt{-d\,(cx - 1)\,(cx + 1)}\,(f + gx)}\, dx$$

input
```
integrate((a+b*asin(c*x))/(g*x+f)/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)), x)
```

Maxima [F]

$$\int \frac{a + b \arcsin(cx)}{(f + gx)\sqrt{d - c^2 dx^2}}\, dx = \int \frac{b \arcsin(cx) + a}{\sqrt{-c^2 dx^2 + d}(gx + f)}\, dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="max
ima")
```

output
```
integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*(g*x + f)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(cx)}{(f + gx)\sqrt{d - c^2 dx^2}}\, dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(1/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \frac{2\sqrt{c^2f^2-g^2}\,atan\left(\frac{\tan\left(\frac{asin(cx)}{2}\right)cf+g}{\sqrt{c^2f^2-g^2}}\right)a+\left(\int \frac{asin(cx)}{\sqrt{-c^2x^2+1}\,f+\sqrt{-c^2x^2+1}\,gx}dx\right)b\,c^2f^2-\left(\int \frac{asin(cx)}{\sqrt{-c^2x^2+1}\,f+\sqrt{-c^2x^2+1}\,gx}\right.}{\sqrt{d}\,(c^2f^2-g^2)}$$

input
```
int((a+b*asin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
(2*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 -
 g**2))*a + int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f + sqrt( - c**2*x**2 +
1)*g*x),x)*b*c**2*f**2 - int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f + sqrt( -
 c**2*x**2 + 1)*g*x),x)*b*g**2)/(sqrt(d)*(c**2*f**2 - g**2))
```

3.121 $\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 500

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \frac{g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{d(c^2f^2-g^2)(f+gx)} - \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} - \frac{bc\sqrt{1-c^2x^2}\log(f+gx)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{bc^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{bc^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

output
```
g*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/d/(c^2*f^2-g^2)/(g*x+f)-I*c^2*f*(
-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c
*f-(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+I*c^2*f*
(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(
c*f+(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-b*c*(-c
^2*x^2+1)^(1/2)*ln(g*x+f)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)-b*c^2*f*(-c^2
*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^
(1/2)))/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+b*c^2*f*(-c^2*x^2+1)^(1/2
)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/(c^2
*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 295, normalized size of antiderivative = 0.59

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \frac{c\sqrt{1-c^2x^2}\left(\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}-b\log(f+gx)+\frac{cf\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-\log\left(1-\frac{ie^{i\arcsin(cx)}}{cf+\sqrt{c^2f^2}}\right.\right.\right.}{\sqrt{}}\right.}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(c*Sqrt[1 - c^2*x^2]*((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c*f + c*g
*x) - b*Log[f + g*x] + (c*f*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*Arc
Sin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x]
)*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) - b*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*
g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] + b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/
(c*f + Sqrt[c^2*f^2 - g^2])]))/Sqrt[c^2*f^2 - g^2]))/((c^2*f^2 - g^2)*Sqrt
[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 1.47 (sec) , antiderivative size = 384, normalized size of antiderivative = 0.77, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.419$, Rules used = {5276, 5272, 3042, 3805, 3042, 3147, 16, 3804, 2694, 27, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}(f+gx)^2}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{c\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(cf+cgx)^2}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{c\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(cf+g\sin(\arcsin(cx)))^2}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3805}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{cf\int \frac{a+b\arcsin(cx)}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}-\frac{bg\int \frac{\sqrt{1-c^2x^2}}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{cf\int \frac{a+b\arcsin(cx)}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}-\frac{bg\int \frac{\cos(\arcsin(cx))}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3147}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{cf\int \frac{a+b\arcsin(cx)}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}-\frac{b\int \frac{1}{cf+cgx}d(cgx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 16$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{cf\int\frac{a+b\arcsin(cx)}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}-\frac{b\log(cf+cgx)}{c^2f^2-g^2}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 3804$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2ce^{i\arcsin(cx)}f-ie^{2i\arcsin(cx)}g+ig}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}-\frac{b\log(cf+cgx)}{c^2f^2-g^2}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 2694$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}-\frac{ig\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}\right)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b a}{(c^2f^2-g^2)(cf}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 27$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}\right)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(c}{(c^2f^2-g^2)(cf+cgx)}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 2620$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{b\int\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(}}{cf-\sqrt{c^2f^2}}\right.}{g}\right.}{}\right.}{c^2f^2-g^2}\right.}{\sqrt{d-c^2dx^2}}$$

$\big\downarrow$ 2715

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}}{g}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{ib\int e^{-i\arcsin(cx)}}{}\right.}{}\right.}{c^2f^2-g^2}\right.}{\sqrt{d-c^2dx}}$$

$\big\downarrow$ 2838

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{ib\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}-\right.}{2\sqrt{c^2f^2-g^2}}\right.}{c^2f^2-g^2}\right.}{\sqrt{d-c^2dx^2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(c*Sqrt[1 - c^2*x^2]*((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/((c^2*f^2
- g^2)*(c*f + c*g*x)) - (b*Log[c*f + c*g*x])/(c^2*f^2 - g^2) + (2*c*f*(((-
1/2*I)*g*(((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt
[c^2*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt
[c^2*f^2 - g^2])])/g))/Sqrt[c^2*f^2 - g^2] + ((I/2)*g*(((a + b*ArcSin[c*x]
)*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (I*b*P
olyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g))/Sqrt[c
^2*f^2 - g^2]))/(c^2*f^2 - g^2)))/Sqrt[d - c^2*d*x^2]
```

Defintions of rubi rules used

rule 16
```
Int[(c_.)/((a_.) + (b_.)*(x_)), x_Symbol] :> Simp[c*(Log[RemoveContent[a +
b*x, x]]/b), x] /; FreeQ[{a, b, c}, x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3147
```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Simp[1/(b^p*f)   Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)
/2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
 - 1)/2] && NeQ[a^2 - b^2, 0]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 3805
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Simp[a/(a^2 - b^2)   Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x]
, x] - Simp[b*d*(m/(f*(a^2 - b^2)))   Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(
a + b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 -
b^2, 0] && IGtQ[m, 0]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [A] (verified)

Time = 0.90 (sec) , antiderivative size = 931, normalized size of antiderivative = 1.86

method	result
default	$\frac{a\sqrt{-\left(x+\frac{f}{g}\right)^{2} c^{2} d+\frac{2 c^{2} d f\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}}{d\left(c^{2} f^{2}-g^{2}\right)\left(x+\frac{f}{g}\right)}-\frac{a c^{2} f \ln\left(\frac{-\frac{2 d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}+\frac{2 c^{2} d f\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}\sqrt{-\left(x+\frac{f}{g}\right)^{2} c^{2} d+\frac{2 c^{2} d \cdots}{\cdots}}}{x+\frac{f}{g}}\right.\cdots}{g\left(c^{2} f^{2}-g^{2}\right)\sqrt{-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}\cdots}$
parts	$\frac{a\sqrt{-\left(x+\frac{f}{g}\right)^{2} c^{2} d+\frac{2 c^{2} d f\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}}{d\left(c^{2} f^{2}-g^{2}\right)\left(x+\frac{f}{g}\right)}-\frac{a c^{2} f \ln\left(\frac{-\frac{2 d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}+\frac{2 c^{2} d f\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}\sqrt{-\left(x+\frac{f}{g}\right)^{2} c^{2} d+\frac{2 c^{2} d \cdots}{\cdots}}}{x+\frac{f}{g}}\right.\cdots}{g\left(c^{2} f^{2}-g^{2}\right)\sqrt{-\frac{d\left(c^{2} f^{2}-g^{2}\right)}{g^{2}}}\cdots}$

input
```
int((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a/d/(c^2*f^2-g^2)/(x+1/g*f)*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c
^2*f^2-g^2)/g^2)^(1/2)-a/g*c^2*f/(c^2*f^2-g^2)/(-d*(c^2*f^2-g^2)/g^2)^(1/2
)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+1/g*f)+2*(-d*(c^2*f^2-g^2)/g^2
)^(1/2)*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2)/g^2)^(1/
2))/(x+1/g*f))+b*((-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2
-1)*arcsin(c*x)*(c^2*f*x+g-I*(-c^2*x^2+1)^(1/2)*c*f)/d/(c^2*x^2-1)/(c^2*f^
2-g^2)/(g*x+f)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d/(c^2*x^2-1)/(c^
2*f^2-g^2)^2*(arcsin(c*x)*ln((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2
+g^2)^(1/2))/(I*f*c-(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*c*f-arcsin
(c*x)*ln((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*f*c+
(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*c*f-2*ln(I*c*x+(-c^2*x^2+1)^(1
/2))*c^2*f^2-I*dilog((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1
/2))/(I*f*c-(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*c*f+I*dilog((I*f*c
+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*f*c+(-c^2*f^2+g^2)^
(1/2)))*(-c^2*f^2+g^2)^(1/2)*c*f+ln(2*I*(I*c*x+(-c^2*x^2+1)^(1/2))*f*c+g*(
I*c*x+(-c^2*x^2+1)^(1/2))^2-g)*c^2*f^2+2*ln(I*c*x+(-c^2*x^2+1)^(1/2))*g^2-
ln(2*I*(I*c*x+(-c^2*x^2+1)^(1/2))*f*c+g*(I*c*x+(-c^2*x^2+1)^(1/2))^2-g)*g^
2)*c)
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx=\int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*g^2*x^4 + 2*c^2*
d*f*g*x^3 - 2*d*f*g*x - d*f^2 + (c^2*d*f^2 - d*g^2)*x^2), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\operatorname{asin}(cx)}{\sqrt{-d(cx-1)(cx+1)}(f+gx)^2}\,dx$$

input
```
integrate((a+b*asin(c*x))/(g*x+f)**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)**2), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*(g*x + f)^2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{2\sqrt{c^2f^2-g^2}\,atan\left(\frac{\tan\left(\frac{asin(cx)}{2}\right)cf+g}{\sqrt{c^2f^2-g^2}}\right)a\,c^2f^2+2\sqrt{c^2f^2-g^2}\,atan\left(\frac{\tan\left(\frac{asin(cx)}{2}\right)cf+g}{\sqrt{c^2f^2-g^2}}\right)a\,c^2fgx+\sqrt{-c^2x^2+1}}{}$$

input
```
int((a+b*asin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
(2*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 -
 g**2))*a*c**2*f**2 + 2*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f
+ g)/sqrt(c**2*f**2 - g**2))*a*c**2*f*g*x + sqrt( - c**2*x**2 + 1)*a*c**2*
f**2*g - sqrt( - c**2*x**2 + 1)*a*g**3 + int(asin(c*x)/(sqrt( - c**2*x**2
+ 1)*f**2 + 2*sqrt( - c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x
**2),x)*b*c**4*f**5 + int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f**2 + 2*sqrt(
 - c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x**2),x)*b*c**4*f**4
*g*x - 2*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f**2 + 2*sqrt( - c**2*x**2
+ 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x**2),x)*b*c**2*f**3*g**2 - 2*int
(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f**2 + 2*sqrt( - c**2*x**2 + 1)*f*g*x +
 sqrt( - c**2*x**2 + 1)*g**2*x**2),x)*b*c**2*f**2*g**3*x + int(asin(c*x)/(
sqrt( - c**2*x**2 + 1)*f**2 + 2*sqrt( - c**2*x**2 + 1)*f*g*x + sqrt( - c**
2*x**2 + 1)*g**2*x**2),x)*b*f*g**4 + int(asin(c*x)/(sqrt( - c**2*x**2 + 1)
*f**2 + 2*sqrt( - c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x**2)
,x)*b*g**5*x)/(sqrt(d)*(c**4*f**5 + c**4*f**4*g*x - 2*c**2*f**3*g**2 - 2*c
**2*f**2*g**3*x + f*g**4 + g**5*x))
```

3.122 $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 305

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = -\frac{bg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} + \frac{\left(g(3c^2f^2+g^2)+c^2f(c^2f^2+3g^2)\,x\right)(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} + \frac{g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^4d^2} - \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b(cf+g)^3\sqrt{1-c^2x^2}\log(1-cx)}{2c^4d\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^3\sqrt{1-c^2x^2}\log(1+cx)}{2c^4d\sqrt{d-c^2dx^2}}$$

output

```
-b*g^3*x*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)+(g*(3*c^2*f^2+g^2)+
c^2*f*(c^2*f^2+3*g^2)*x)*(a+b*arcsin(c*x))/c^4/d/(-c^2*d*x^2+d)^(1/2)+g^3*
(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^4/d^2-3/2*f*g^2*(-c^2*x^2+1)^(1/2
)*(a+b*arcsin(c*x))^2/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f+g)^3*(-c^2*x
^2+1)^(1/2)*ln(-c*x+1)/c^4/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f-g)^3*(-c^2*x^
2+1)^(1/2)*ln(c*x+1)/c^4/d/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.70 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.61

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-2bcg^3x+2g^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{3cfg^2(a+b\arcsi}{b}\right.}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-2*b*c*g^3*x + 2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x]) - (3*c*f*g^2*(a + b*ArcSin[c*x])^2)/b + (c*f - g)^3*(-((a + b*ArcSin[
c*x])*Cot[(Pi + 2*ArcSin[c*x])/4]) + b*Log[1 + c*x]) + (c*f + g)^3*(2*b*Lo
g[Cos[(Pi + 2*ArcSin[c*x])/4]] + (a + b*ArcSin[c*x])*Tan[(Pi + 2*ArcSin[c*
x])/4])))/(2*c^4*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 213, normalized size of antiderivative = 0.70, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(-\frac{x(a+b\arcsin(cx))g^3}{c^2\sqrt{1-c^2x^2}}-\frac{3f(a+b\arcsin(cx))g^2}{c^2\sqrt{1-c^2x^2}}+\frac{(c^2f^3+3g^2f+g(3c^2f^2+g^2)x)(a+b\arcsin(cx))}{c^2(1-c^2x^2)^{3/2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{3fg^2(a+b\arcsin(cx))^2}{2bc^3}+\frac{(c^2fx(c^2f^2+3g^2)+g(3c^2f^2+g^2))(a+b\arcsin(cx))}{c^4\sqrt{1-c^2x^2}}+\frac{g^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^4}-\frac{bg\text{arctan}}{}\right.}{d\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-((b*g^3*x)/c^3) + ((g*(3*c^2*f^2 + g^2) + c^2*f*(c^2*
f^2 + 3*g^2)*x)*(a + b*ArcSin[c*x]))/(c^4*Sqrt[1 - c^2*x^2]) + (g^3*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^4 - (3*f*g^2*(a + b*ArcSin[c*x])^2)/(2*
b*c^3) - (b*g*(3*c^2*f^2 + g^2)*ArcTanh[c*x])/c^4 + (b*f*(c^2*f^2 + 3*g^2)
*Log[1 - c^2*x^2])/(2*c^3)))/(d*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.29 (sec) , antiderivative size = 724, normalized size of antiderivative = 2.37

method	result
default	$a\left(\frac{f^3x}{d\sqrt{-c^2d\,x^2+d}}+g^3\left(-\frac{x^2}{c^2d\sqrt{-c^2d\,x^2+d}}+\frac{2}{d\,c^4\sqrt{-c^2d\,x^2+d}}\right)+3f\,g^2\left(\frac{x}{c^2d\sqrt{-c^2d\,x^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^2d\sqrt{c^2d}}\right.\right.$
parts	$a\left(\frac{f^3x}{d\sqrt{-c^2d\,x^2+d}}+g^3\left(-\frac{x^2}{c^2d\sqrt{-c^2d\,x^2+d}}+\frac{2}{d\,c^4\sqrt{-c^2d\,x^2+d}}\right)+3f\,g^2\left(\frac{x}{c^2d\sqrt{-c^2d\,x^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^2d\sqrt{c^2d}}\right.\right.$

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3*x/d/(-c^2*d*x^2+d)^(1/2)+g^3*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d/c
^4/(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d/(c^
2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+3*f^2*g/c^2/d/(-c
^2*d*x^2+d)^(1/2))+b*(3/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^
2/(c^2*x^2-1)*arcsin(c*x)^2*f*g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*
x*(-c^2*x^2+1)^(1/2)-1)*g^3*(arcsin(c*x)+I)/c^4/d^2/(c^2*x^2-1)+1/2*(-d*(c
^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g^3*(arcsin(c*x)-I)/
c^4/d^2/(c^2*x^2-1)+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c^3/d^2/
(c^2*x^2-1)*f*(c^2*f^2+3*g^2)*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)/c^4/d^2/(
c^2*x^2-1)*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c^3*f^3+c^4*f^3*x+3*I*(-c^2*x
^2+1)^(1/2)*c*f*g^2+3*c^2*f*g^2*x+3*f^2*g*c^2+g^3)-(-d*(c^2*x^2-1))^(1/2)*
(-c^2*x^2+1)^(1/2)/c^4/d^2/(c^2*x^2-1)*(c^3*f^3+3*c^2*f^2*g+3*c*f*g^2+g^3)
*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*
(c^3*f^3-3*c^2*f^2*g+3*c*f*g^2-g^3)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)/c^4/d^2
/(c^2*x^2-1))
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="f
ricas")
```

output
```
integral((a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 + 3
*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^4
*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(a+b\operatorname{asin}(cx))(f+gx)^3}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(3/2), x
)
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="m
axima")
```

output
```
-a*g^3*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 + d)*c^4*d))
 + 3*a*f*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2)))
+ b*f^3*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*f^3*x/(sqrt(-c^2*d*x^2
+ d)*d) - 1/2*b*f^3*log(x^2 - 1/c^2)/(c*d^(3/2)) + 3*a*f^2*g/(sqrt(-c^2*d*
x^2 + d)*c^2*d) - integrate((b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt
(-c*x + 1)), x)/sqrt(d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{-3\sqrt{-c^2x^2+1}\,asin(cx)^2\,bcf\,g^2-6\sqrt{-c^2x^2+1}\,asin(cx)\,acf\,g^2-2\sqrt{}}{}$$

input
```
int((g*x+f)^3*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

output
```
( - 3*sqrt( - c**2*x**2 + 1)*asin(c*x)**2*b*c*f*g**2 - 6*sqrt( - c**2*x**2
 + 1)*asin(c*x)*a*c*f*g**2 - 2*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt(
 - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*b*c**4*f**3 - 6*s
qrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sq
rt( - c**2*x**2 + 1)),x)*b*c**2*f*g**2 - 2*sqrt( - c**2*x**2 + 1)*int((asi
n(c*x)*x**3)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x
)*b*c**4*g**3 - 6*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt( - c**2*x
**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*b*c**4*f**2*g + 2*a*c**4*f
**3*x + 6*a*c**2*f**2*g + 6*a*c**2*f*g**2*x - 2*a*c**2*g**3*x**2 + 4*a*g**
3)/(2*sqrt(d)*sqrt( - c**2*x**2 + 1)*c**4*d)
```

3.123 $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 213

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\frac{(2fg+(c^2f^2+g^2)\,x)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}}-\frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}}+\frac{b(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{2c^3d\sqrt{d-c^2dx^2}}+\frac{b(cf-g)^2\sqrt{1-c^2x^2}\log(1+cx)}{2c^3d\sqrt{d-c^2dx^2}}$$

output

```
(2*f*g+(c^2*f^2+g^2)*x)*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/2*g
^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2
*b*(c*f+g)^2*(-c^2*x^2+1)^(1/2)*ln(-c*x+1)/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2*
b*(c*f-g)^2*(-c^2*x^2+1)^(1/2)*ln(c*x+1)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.47 (sec) , antiderivative size = 147, normalized size of antiderivative = 0.69

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-\frac{g^2(a+b\arcsin(cx))^2}{b}+(-cf+g)^2\left(-((a+b\arcsin(cx))\cot(\right.\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-((g^2*(a + b*ArcSin[c*x])^2)/b) + (-(c*f) + g)^2*(-((
a + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*x])/4]) + b*Log[1 + c*x]) + (c*f +
 g)^2*(2*b*Log[Cos[(Pi + 2*ArcSin[c*x])/4]] + (a + b*ArcSin[c*x])*Tan[(Pi
+ 2*ArcSin[c*x])/4])))/(2*c^3*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.67, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(f^2c^2+2fgxc^2+g^2)(a+b\arcsin(cx))}{c^2(1-c^2x^2)^{3/2}}-\frac{g^2(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{g^2(a+b\arcsin(cx))^2}{2bc^3}+\frac{(x(c^2f^2+g^2)+2fg)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{2bfg\text{arctanh}(cx)}{c^2}+\frac{b(c^2f^2+g^2)\log(1-c^2x^2)}{2c^3}\right)}{d\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((2*f*g + (c^2*f^2 + g^2)*x)*(a + b*ArcSin[c*x]))/(c^2
*Sqrt[1 - c^2*x^2]) - (g^2*(a + b*ArcSin[c*x])^2)/(2*b*c^3) - (2*b*f*g*Arc
Tanh[c*x])/c^2 + (b*(c^2*f^2 + g^2)*Log[1 - c^2*x^2])/(2*c^3)))/(d*Sqrt[d
- c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] && !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.04 (sec) , antiderivative size = 488, normalized size of antiderivative = 2.29

method	result
default	$a\left(\frac{f^{2}x}{d\sqrt{-c^{2}d\,x^{2}+d}}+g^{2}\left(\frac{x}{c^{2}d\sqrt{-c^{2}d\,x^{2}+d}}-\frac{\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{c^{2}d\sqrt{c^{2}d}}\right)+\frac{2fg}{c^{2}d\sqrt{-c^{2}d\,x^{2}+d}}\right)+b\left(\frac{\sqrt{-d(c^{2}x^{2}-1)}\,\sqrt{-c^{2}x}}{2c^{3}d^{2}(c^{2}}\right.$
parts	$a\left(\frac{f^{2}x}{d\sqrt{-c^{2}d\,x^{2}+d}}+g^{2}\left(\frac{x}{c^{2}d\sqrt{-c^{2}d\,x^{2}+d}}-\frac{\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-c^{2}d\,x^{2}+d}}\right)}{c^{2}d\sqrt{c^{2}d}}\right)+\frac{2fg}{c^{2}d\sqrt{-c^{2}d\,x^{2}+d}}\right)+b\left(\frac{\sqrt{-d(c^{2}x^{2}-1)}\,\sqrt{-c^{2}x}}{2c^{3}d^{2}(c^{2}}\right.$

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2*x/d/(-c^2*d*x^2+d)^(1/2)+g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d/
(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+2*f*g/c^2/d/(-
c^2*d*x^2+d)^(1/2))+b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d
^2/(c^2*x^2-1)*arcsin(c*x)^2*g^2+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(
1/2)/c^3/d^2/(c^2*x^2-1)*(c^2*f^2+g^2)*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)*
(I*(-c^2*x^2+1)^(1/2)+c*x)*arcsin(c*x)*(c^2*f^2+g^2-2*I*(-c^2*x^2+1)^(1/2)
*c*f*g+2*c^2*f*g*x)/c^3/d^2/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/c^3/d^2/(c^2*x^2-1)*(c^2*f^2+2*c*f*g+g^2)*ln(I*c*x+(-c^2*x^2+1)^(1
/2)-I)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(c^2*x^2-1)*(c^2*
f^2-2*c*f*g+g^2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I))
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2
+ 2*b*f*g*x + b*f^2)*arcsin(c*x))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^2}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x
)
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="m
axima")
```

output
```
a*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) + b*f^2
*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*f^2*x/(sqrt(-c^2*d*x^2 + d)*d)
 + sqrt(d)*integrate((b*g^2*x^2 + 2*b*f*g*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 +
d^2), x) - 1/2*b*f^2*log(x^2 - 1/c^2)/(c*d^(3/2)) + 2*a*f*g/(sqrt(-c^2*d*x
^2 + d)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{-\sqrt{-c^2x^2+1}\,asin(cx)^2\,b\,g^2-2\sqrt{-c^2x^2+1}\,asin(cx)\,a\,g^2-2\sqrt{-c^2x^2}}{}$$

input
```
int((g*x+f)^2*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

output
```
( - sqrt( - c**2*x**2 + 1)*asin(c*x)**2*b*g**2 - 2*sqrt( - c**2*x**2 + 1)*
asin(c*x)*a*g**2 - 2*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x*
*2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*b*c**3*f**2 - 2*sqrt( - c**
2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2
*x**2 + 1)),x)*b*c*g**2 - 4*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt
( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*b*c**3*f*g + 2*a
*c**3*f**2*x + 4*a*c*f*g + 2*a*c*g**2*x)/(2*sqrt(d)*sqrt( - c**2*x**2 + 1)
*c**3*d)
```

3.124 $\int \frac{(f+gx)(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 144

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\left(g+c^2fx\right)(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{b(cf+g)\sqrt{1-c^2x^2}\log(1-cx)}{2c^2d\sqrt{d-c^2dx^2}} + \frac{b(cf-g)\sqrt{1-c^2x^2}\log(1+cx)}{2c^2d\sqrt{d-c^2dx^2}}$$

output
```
(c^2*f*x+g)*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f+g)*(-c
^2*x^2+1)^(1/2)*ln(-c*x+1)/c^2/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f-g)*(-c^2*
x^2+1)^(1/2)*ln(c*x+1)/c^2/d/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 126, normalized size of antiderivative = 0.88

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left((cf-g)\left(-\left((a+b\arcsin(cx))\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)+\right.\right.}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((c*f - g)*(-((a + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*
x])/4]) + b*Log[1 + c*x]) + (c*f + g)*(2*b*Log[Cos[(Pi + 2*ArcSin[c*x])/4]
] + (a + b*ArcSin[c*x])*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^2*d*Sqrt[d - c
^2*d*x^2])
```

Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.69, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {5276, 5260, 27, 452, 219, 240}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{ 5260}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-bc\int \frac{fxc^2+g}{c^2(1-c^2x^2)}dx\right)}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{b\int \frac{fxc^2+g}{1-c^2x^2}dx}{c}\right)}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{ 452}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{b\left(c^2f\int \frac{x}{1-c^2x^2}dx+g\int \frac{1}{1-c^2x^2}dx\right)}{c}\right)}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{ 219}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{b\left(c^2f\int\frac{x}{1-c^2x^2}dx+\frac{g\operatorname{arctanh}(cx)}{c}\right)}{c}\right)}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 240$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{b\left(\frac{g\operatorname{arctanh}(cx)}{c}-\frac{1}{2}f\log(1-c^2x^2)\right)}{c}\right)}{d\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((g + c^2*f*x)*(a + b*ArcSin[c*x]))/(c^2*Sqrt[1 - c^2*
x^2]) - (b*((g*ArcTanh[c*x])/c - (f*Log[1 - c^2*x^2])/2))/c))/(d*Sqrt[d -
c^2*d*x^2])
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 240
```
Int[(x_)/((a_) + (b_.)*(x_)^2), x_Symbol] :> Simp[Log[RemoveContent[a + b*x
^2, x]]/(2*b), x] /; FreeQ[{a, b}, x]
```

rule 452
```
Int[((c_) + (d_.)*(x_))/((a_) + (b_.)*(x_)^2), x_Symbol] :> Simp[c   Int[1/
(a + b*x^2), x], x] + Simp[d   Int[x/(a + b*x^2), x], x] /; FreeQ[{a, b, c,
 d}, x] && NeQ[b*c^2 + a*d^2, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.48 (sec) , antiderivative size = 305, normalized size of antiderivative = 2.12

method	result
default	$a\left(\frac{fx}{d\sqrt{-c^2d\,x^2+d}}+\frac{g}{c^2d\sqrt{-c^2d\,x^2+d}}\right)+b\left(\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,f\arcsin(cx)}{c\,d^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)\left(i\sqrt{-c^2\right.}}{d^2c^2(c^2x^2-1)}\right.$
parts	$a\left(\frac{fx}{d\sqrt{-c^2d\,x^2+d}}+\frac{g}{c^2d\sqrt{-c^2d\,x^2+d}}\right)+b\left(\frac{2i\sqrt{-c^2x^2+1}\,\sqrt{-d(c^2x^2-1)}\,f\arcsin(cx)}{c\,d^2(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)\left(i\sqrt{-c^2\right.}}{d^2c^2(c^2x^2-1)}\right.$

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE
)
```

output
```
a*(f*x/d/(-c^2*d*x^2+d)^(1/2)+g/c^2/d/(-c^2*d*x^2+d)^(1/2))+b*(2*I*(-c^2*x
^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/c/d^2/(c^2*x^2-1)*f*arcsin(c*x)-(-d*(c^
2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c*f+
c^2*f*x+g)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(c*f-g)*ln(I*c*x+(-c^
2*x^2+1)^(1/2)+I)/d^2/c^2/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^
(1/2)/d^2/c^2/(c^2*x^2-1)*(c*f+g)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(c
^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx)}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="max
ima")
```

output
```
b*f*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*f*x/(sqrt(-c^2*d*x^2 + d)*d
) - 1/2*b*f*log(x^2 - 1/c^2)/(c*d^(3/2)) + (sqrt(c*x + 1)*sqrt(-c*x + 1)*c
^3*d^2*integrate(x^2/(c^4*d^2*x^4 - c^2*d^2*x^2 + (c^2*d^2*x^2 - d^2)*e^(l
og(c*x + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))*b*g/(sqrt(c*x + 1)*sqrt(-c*x + 1)*c^2*d^(3/2)) + a*g/(sqrt(-c^2*d*x^
2 + d)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{-\sqrt{-c^2x^2+1}\left(\int \frac{asin(cx)}{\sqrt{-c^2x^2+1}\,c^2x^2-\sqrt{-c^2x^2+1}}dx\right)b\,c^2f-\sqrt{-c^2x^2+1}\left(\int \frac{}{\sqrt{-}}\right.}{\sqrt{d}\,\sqrt{-c^2x^2+1}\,c^2d}$$

input
```
int((g*x+f)*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(3/2),x)
```

output
```
( - sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*x**2
 - sqrt( - c**2*x**2 + 1)),x)*b*c**2*f - sqrt( - c**2*x**2 + 1)*int((asin(
c*x)*x)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*b*c
**2*g + a*c**2*f*x + a*g)/(sqrt(d)*sqrt( - c**2*x**2 + 1)*c**2*d)
```

3.125 $\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 654

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = -\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} - \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf+g)\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf-g)\sqrt{d-c^2dx^2}} + \frac{bg^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} - \frac{bg^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} + \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}$$

output
```
-1/2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*cot(1/4*Pi+1/2*arcsin(c*x))/d/(c
*f-g)/(-c^2*d*x^2+d)^(1/2)+I*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1
-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/d/(c^2*f^2-g^2)
^(3/2)/(-c^2*d*x^2+d)^(1/2)-I*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(
1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/d/(c^2*f^2-g^2
)^(3/2)/(-c^2*d*x^2+d)^(1/2)+b*(-c^2*x^2+1)^(1/2)*ln(cos(1/4*Pi+1/2*arcsin
(c*x)))/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)+b*(-c^2*x^2+1)^(1/2)*ln(sin(1/4*Pi+
1/2*arcsin(c*x)))/d/(c*f-g)/(-c^2*d*x^2+d)^(1/2)+b*g^2*(-c^2*x^2+1)^(1/2)*
polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/d/(c^2
*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-b*g^2*(-c^2*x^2+1)^(1/2)*polylog(2,I*
(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/d/(c^2*f^2-g^2)^(3
/2)/(-c^2*d*x^2+d)^(1/2)+1/2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*tan(1/4*
Pi+1/2*arcsin(c*x))/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (warning: unable to verify)

Time = 1.29 (sec) , antiderivative size = 351, normalized size of antiderivative = 0.54

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{-\left((a+b\arcsin(cx))\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)+b\log(1+cx)}{cf-g}+\frac{2g^2\left(i(a+b\arcsin(cx\right.}{}\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-((a + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*x])/4]) +
b*Log[1 + c*x])/(c*f - g) + (2*g^2*(I*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I
*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[
c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) + b*PolyLog[2, (I*E^(I*ArcSin[c*x])
*g)/(c*f - Sqrt[c^2*f^2 - g^2])] - b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c
*f + Sqrt[c^2*f^2 - g^2])]))/((c*f - g)*(c*f + g)*Sqrt[c^2*f^2 - g^2]) + (
2*b*Log[Cos[(Pi + 2*ArcSin[c*x])/4]] + (a + b*ArcSin[c*x])*Tan[(Pi + 2*Arc
Sin[c*x])/4])/(c*f + g)))/(2*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 1.45 (sec) , antiderivative size = 431, normalized size of antiderivative = 0.66, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^{3/2}(f+gx)}\,dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)\left(1-c^2x^2\right)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{ 5274}$$

$$\frac{\sqrt{1-c^2x^2}\int\left(\frac{(a+b\arcsin(cx))g^2}{(g-cf)(cf+g)(f+gx)\sqrt{1-c^2x^2}}-\frac{c(a+b\arcsin(cx))}{2(cf+g)(cx-1)\sqrt{1-c^2x^2}}+\frac{c(a+b\arcsin(cx))}{2(cf-g)(cx+1)\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{ 2009}$$

$$\sqrt{1-c^2x^2}\left(\frac{ig^2(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}}-\frac{ig^2(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{(c^2f^2-g^2)^{3/2}}+\frac{\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\operatorname{arcs}}{2(cf+g)}\right.$$

input
```
Int[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-1/2*((a + b*ArcSin[c*x])*Cot[Pi/4 + ArcSin[c*x]/2])/(
c*f - g) + (I*g^2*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 - Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) - (I*g^2*(a + b*ArcSin[c*x
])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*f^2
- g^2)^(3/2) + (b*Log[Cos[Pi/4 + ArcSin[c*x]/2]])/(c*f + g) + (b*Log[Sin[P
i/4 + ArcSin[c*x]/2]])/(c*f - g) + (b*g^2*PolyLog[2, (I*E^(I*ArcSin[c*x])*
g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) - (b*g^2*PolyLog[2,
 (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/
2) + ((a + b*ArcSin[c*x])*Tan[Pi/4 + ArcSin[c*x]/2])/(2*(c*f + g))))/(d*Sq
rt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [A] (verified)

Time = 2.25 (sec) , antiderivative size = 1101, normalized size of antiderivative = 1.68

method	result	size
default	Expression too large to display	1101
parts	Expression too large to display	1101

input
```
int((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE
)
```

output
```
-a*g/d/(c^2*f^2-g^2)/(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-
g^2)/g^2)^(1/2)+a*f/(c^2*f^2-g^2)/d/(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g
*f)-d*(c^2*f^2-g^2)/g^2)^(1/2)*x*c^2+a*g/d/(c^2*f^2-g^2)/(-d*(c^2*f^2-g^2)
/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+1/g*f)+2*(-d*(c^2*f^
2-g^2)/g^2)^(1/2)*(-(x+1/g*f)^2*c^2*d+2*c^2*d*f/g*(x+1/g*f)-d*(c^2*f^2-g^2
)/g^2)^(1/2))/(x+1/g*f))+b*(-(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*(I*(-c^2*x
^2+1)^(1/2)*c*f+c^2*f*x-g)/d^2/(c^2*x^2-1)/(c^2*f^2-g^2)-(-d*(c^2*x^2-1))^
(1/2)*(-c^2*x^2+1)^(1/2)*(-2*ln(I*c*x+(-c^2*x^2+1)^(1/2))*c^3*f^3+ln(I*c*x
+(-c^2*x^2+1)^(1/2)+I)*c^3*f^3+ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*c^3*f^3+ln(I
*c*x+(-c^2*x^2+1)^(1/2)+I)*c^2*f^2*g-ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*c^2*f^
2*g+arcsin(c*x)*ln((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2
))/(I*f*c-(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*g^2-arcsin(c*x)*ln((
I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*f*c+(-c^2*f^2+
g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*g^2+2*ln(I*c*x+(-c^2*x^2+1)^(1/2))*c*f*g
^2-I*dilog((I*f*c+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*f*
c-(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*g^2+I*dilog((I*f*c+(I*c*x+(-
c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*f*c+(-c^2*f^2+g^2)^(1/2)))*(-
c^2*f^2+g^2)^(1/2)*g^2-ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c*f*g^2-ln(I*c*x+(-c
^2*x^2+1)^(1/2)-I)*c*f*g^2-ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*g^3+ln(I*c*x+(-c
^2*x^2+1)^(1/2)-I)*g^3)/d^2/(c^2*x^2-1)/(c^2*f^2-g^2)/(c*f+g)/(c*f-g))
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*g*x^5 + c^4*d^2
*f*x^4 - 2*c^2*d^2*g*x^3 - 2*c^2*d^2*f*x^2 + d^2*g*x + d^2*f), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}\left(cx\right)}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{3}{2}}\left(f+gx\right)}\,dx$$

input
```
integrate((a+b*asin(c*x))/(g*x+f)/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))/((-d*(c*x - 1)*(c*x + 1))**(3/2)*(f + g*x)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="max
ima")
```

output
```
integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*(g*x + f)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)\,\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(3/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{-2\sqrt{c^2f^2-g^2}\,\sqrt{-c^2x^2+1}\,atan\left(\frac{\tan\left(\frac{asin(cx)}{2}\right)cf+g}{\sqrt{c^2f^2-g^2}}\right)a\,g^2-\sqrt{-c^2x^2+1}\left(\int\right.}{}$$

input
```
int((a+b*asin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x)
```

output
```
( - 2*sqrt(c**2*f**2 - g**2)*sqrt( - c**2*x**2 + 1)*atan((tan(asin(c*x)/2)
*c*f + g)/sqrt(c**2*f**2 - g**2))*a*g**2 - sqrt( - c**2*x**2 + 1)*int(asin
(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*f*x**2 + sqrt( - c**2*x**2 + 1)*c**2*g*
x**3 - sqrt( - c**2*x**2 + 1)*f - sqrt( - c**2*x**2 + 1)*g*x),x)*b*c**4*f*
*4 + 2*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*f
*x**2 + sqrt( - c**2*x**2 + 1)*c**2*g*x**3 - sqrt( - c**2*x**2 + 1)*f - sq
rt( - c**2*x**2 + 1)*g*x),x)*b*c**2*f**2*g**2 - sqrt( - c**2*x**2 + 1)*int
(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*f*x**2 + sqrt( - c**2*x**2 + 1)*c*
*2*g*x**3 - sqrt( - c**2*x**2 + 1)*f - sqrt( - c**2*x**2 + 1)*g*x),x)*b*g*
*4 + sqrt( - c**2*x**2 + 1)*a*c**2*f**2*g - sqrt( - c**2*x**2 + 1)*a*g**3
+ a*c**4*f**3*x - a*c**2*f**2*g - a*c**2*f*g**2*x + a*g**3)/(sqrt(d)*sqrt(
 - c**2*x**2 + 1)*d*(c**4*f**4 - 2*c**2*f**2*g**2 + g**4))
```

3.126 $\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 570

$$\begin{aligned}
\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx &= -\frac{b(c^4f^4+6c^2f^2g^2+g^4)}{6c^5d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&- \frac{2bfg(c^2f^2+g^2)\,x}{3c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bg^4\sqrt{1-c^2x^2}\arcsin(cx)^2}{2c^5d^2\sqrt{d-c^2dx^2}} \\
&- \frac{4fg^3(a+b\arcsin(cx))}{c^4d^2\sqrt{d-c^2dx^2}} + \frac{2(c^4f^4-3c^2f^2g^2-2g^4)\,x(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{4fg(c^2f^2+g^2)\,(a+b\arcsin(cx))}{3c^4d^2\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}} + \frac{(c^4f^4+6c^2f^2g^2+g^4)\,x(a+b\arcsin(cx))}{3c^4d^2\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}} \\
&+ \frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}} \\
&- \frac{2bfg(c^2f^2-5g^2)\,\sqrt{1-c^2x^2}\,\mathrm{arctanh}(cx)}{3c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{b(c^4f^4-3c^2f^2g^2-2g^4)\,\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3c^5d^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

output
```
-1/6*b*(c^4*f^4+6*c^2*f^2*g^2+g^4)/c^5/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+
d)^(1/2)-2/3*b*f*g*(c^2*f^2+g^2)*x/c^3/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+
d)^(1/2)-1/2*b*g^4*(-c^2*x^2+1)^(1/2)*arcsin(c*x)^2/c^5/d^2/(-c^2*d*x^2+d)
^(1/2)-4*f*g^3*(a+b*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+2/3*(c^4*f^4
-3*c^2*f^2*g^2-2*g^4)*x*(a+b*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+4/3
*f*g*(c^2*f^2+g^2)*(a+b*arcsin(c*x))/c^4/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(
1/2)+1/3*(c^4*f^4+6*c^2*f^2*g^2+g^4)*x*(a+b*arcsin(c*x))/c^4/d^2/(-c^2*x^2
+1)/(-c^2*d*x^2+d)^(1/2)+g^4*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*(a+b*arcsin(c*
x))/c^5/d^2/(-c^2*d*x^2+d)^(1/2)-2/3*b*f*g*(c^2*f^2-5*g^2)*(-c^2*x^2+1)^(1
/2)*arctanh(c*x)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c^4*f^4-3*c^2*f^2*g^2
-2*g^4)*(-c^2*x^2+1)^(1/2)*ln(-c^2*x^2+1)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 2.06 (sec) , antiderivative size = 868, normalized size of antiderivative = 1.52

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[((f + g*x)^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
Sqrt[-(d*(-1 + c^2*x^2))]*((4*a*c^2*f^3*g + 4*a*f*g^3 + a*c^4*f^4*x + 6*a*
c^2*f^2*g^2*x + a*g^4*x)/(3*c^4*d^3*(-1 + c^2*x^2)^2) - (2*a*(-6*f*g^3 + c
^4*f^4*x - 3*c^2*f^2*g^2*x - 2*g^4*x))/(3*c^4*d^3*(-1 + c^2*x^2)) - (a*g^
4*ArcTan[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/(c^5*d
^(5/2)) + (b*f^2*g^2*(-2*c*x*ArcSin[c*x] + (-1 + (2*c*x*ArcSin[c*x])/Sqrt[
1 - c^2*x^2])/Sqrt[1 - c^2*x^2] - 2*Sqrt[1 - c^2*x^2]*Log[Sqrt[1 - c^2*x^2
]]))/(c^3*d^2*Sqrt[d*(1 - c^2*x^2)]) + (b*f^4*(4*c*x*ArcSin[c*x] + (-1 + (
2*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2])/Sqrt[1 - c^2*x^2] + 4*Sqrt[1 - c^2*x
^2]*Log[Sqrt[1 - c^2*x^2]]))/(6*c*d^2*Sqrt[d*(1 - c^2*x^2)]) + (b*f^3*g*(8
*ArcSin[c*x] + 3*Sqrt[1 - c^2*x^2]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]] - Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[3*ArcSin[c*x]
]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]]) - 2*Sin[2*ArcSin[c*x]]))/(6*c^2*d*(d*(1 - c^2*x^2))^
(3/2)) - (b*f*g^3*(4*ArcSin[c*x] + 12*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 5*C
os[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 15*Sqrt[1
 - c^2*x^2]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 5*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]
/2] + Sin[ArcSin[c*x]/2]] + 2*Sin[2*ArcSin[c*x]]))/(6*c^4*d*(d*(1 - c^2*x^
2))^(3/2)) + (b*g^4*(Sqrt[1 - c^2*x^2]*(3*ArcSin[c*x]^2 - 8*Log[Sqrt[1 - c
^2*x^2]]) - (1 + (2*ArcSin[c*x]*Sin[3*ArcSin[c*x]])/Sqrt[1 - c^2*x^2])/...
```

Rubi [A] (verified)

Time = 0.93 (sec) , antiderivative size = 452, normalized size of antiderivative = 0.79, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5260}$$

$$\sqrt{1-c^2x^2}\left(-bc\int\left(\frac{\arcsin(cx)g^4}{c^5\sqrt{1-c^2x^2}}+\frac{f(2c^2f^2-5g^2)g}{3c^4}+\frac{(f+gx)(2f(c^2f^2-2g^2)xc^2+g(c^2f^2-3g^2))}{3c^4(1-c^2x^2)}+\frac{(fxc^2+g)(f+gx)^3}{3c^2(1-c^2x^2)^2}\right)dx+\frac{g^4\text{ arc}}{}\right.$$

$$\Big\downarrow \text{ 2009}$$

$$\sqrt{1-c^2x^2}\left(\frac{g^4\arcsin(cx)(a+b\arcsin(cx))}{c^5}+\frac{(f+gx)^3(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{fg\sqrt{1-c^2x^2}(2c^2f^2-5g^2)(a+b\arcsin(cx))}{3c^4}+\frac{(f+gx)(}{}\right.$$

input
```
Int[((f + g*x)^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((g + c^2*f*x)*(f + g*x)^3*(a + b*ArcSin[c*x]))/(3*c^2
*(1 - c^2*x^2)^(3/2)) + ((f + g*x)*(g*(c^2*f^2 - 3*g^2) + 2*c^2*f*(c^2*f^2
 - 2*g^2)*x)*(a + b*ArcSin[c*x]))/(3*c^4*Sqrt[1 - c^2*x^2]) + (f*g*(2*c^2*
f^2 - 5*g^2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^4) + (g^4*ArcSin[
c*x]*(a + b*ArcSin[c*x]))/c^5 - b*c*((f*g^3*x)/(3*c^4) + (f*g*(2*c^2*f^2 -
 5*g^2)*x)/(3*c^4) - (2*f*g*(c^2*f^2 - 2*g^2)*x)/(3*c^4) + (c*f + g)^4/(12
*c^6*(1 - c*x)) + (c*f - g)^4/(12*c^6*(1 + c*x)) + (g^4*ArcSin[c*x]^2)/(2*
c^6) + (f*g*(3*c^2*f^2 - 7*g^2)*ArcTanh[c*x])/(3*c^5) + (g*(c*f + g)^3*Log
[1 - c*x])/(6*c^6) - ((c*f - g)^3*g*Log[1 + c*x])/(6*c^6) - ((2*c^4*f^4 -
3*c^2*f^2*g^2 - 3*g^4)*Log[1 - c^2*x^2])/(6*c^6))))/(d^2*Sqrt[d - c^2*d*x^
2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.97 (sec) , antiderivative size = 6743, normalized size of antiderivative = 11.83

method	result	size
default	Expression too large to display	6743
parts	Expression too large to display	6743

input
```
int((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBO
SE)
```

output
```
result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)^4(b\arcsin{(cx)}+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="f
ricas")
```

output
```
integral(-(a*g^4*x^4 + 4*a*f*g^3*x^3 + 6*a*f^2*g^2*x^2 + 4*a*f^3*g*x + a*f
^4 + (b*g^4*x^4 + 4*b*f*g^3*x^3 + 6*b*f^2*g^2*x^2 + 4*b*f^3*g*x + b*f^4)*a
rcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*
x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^4}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**4/(-d*(c*x - 1)*(c*x + 1))**(5/2), x
)
```

Maxima [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^4(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="m
axima")
```

output
```
1/6*b*c*f^4*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/
2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f^4*(2*x/(sqrt(-c^2*d*x^2 + d)
*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*(x*(3*x^2/((-c^2*d
*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) - x/(sqrt(-c^2*
d*x^2 + d)*c^4*d^2) + 3*arcsin(c*x)/(c^5*d^(5/2)))*a*g^4 + 1/3*a*f^4*(2*x/
(sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + 4/3*a*f*g^3*(
3*x^2/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) -
 2*a*f^2*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)
*c^2*d)) - sqrt(d)*integrate((b*g^4*x^4 + 4*b*f*g^3*x^3 + 6*b*f^2*g^2*x^2
+ 4*b*f^3*g*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x) + 4/3
*a*f^3*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^4\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
int((g*x+f)^4*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

output
```
(3*sqrt( - c**2*x**2 + 1)*asin(c*x)*a*c**2*g**4*x**2 - 3*sqrt( - c**2*x**2
 + 1)*asin(c*x)*a*g**4 + 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c
**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**
2*x**2 + 1)),x)*b*c**7*f**4*x**2 - 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/
(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + s
qrt( - c**2*x**2 + 1)),x)*b*c**5*f**4 + 3*sqrt( - c**2*x**2 + 1)*int((asin
(c*x)*x**4)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c
**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**7*g**4*x**2 - 3*sqrt( - c**2*x*
*2 + 1)*int((asin(c*x)*x**4)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( -
 c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**5*g**4 + 12*sq
rt( - c**2*x**2 + 1)*int((asin(c*x)*x**3)/(sqrt( - c**2*x**2 + 1)*c**4*x**
4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**7
*f*g**3*x**2 - 12*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x**3)/(sqrt( - c**
2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*
x**2 + 1)),x)*b*c**5*f*g**3 + 18*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x**
2)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2
+ sqrt( - c**2*x**2 + 1)),x)*b*c**7*f**2*g**2*x**2 - 18*sqrt( - c**2*x**2
+ 1)*int((asin(c*x)*x**2)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c*
*2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**5*f**2*g**2 + 12*
sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt( - c**2*x**2 + 1)*c**4*x...
```

3.127 $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 330

$$\begin{aligned}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx &= -\frac{b(f+gx)^3}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\ &\quad -\frac{bg^3x\sqrt{1-c^2x^2}}{6c^3d^2\sqrt{d-c^2dx^2}}+\frac{2(cf-g)(cf+g)\left(g+c^2fx\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} \\ &\quad +\frac{\left(g+c^2fx\right)(f+gx)^2(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} \\ &\quad +\frac{b(4cf-5g)(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{12c^4d^2\sqrt{d-c^2dx^2}} \\ &\quad +\frac{b(cf-g)^2(4cf+5g)\sqrt{1-c^2x^2}\log(1+cx)}{12c^4d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
-1/6*b*(g*x+f)^3/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/6*b*g^3*x
*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)+2/3*(c*f-g)*(c*f+g)*(c^2*
f*x+g)*(a+b*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*(c^2*f*x+g)*(g*x
+f)^2*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)+1/12*b*(
4*c*f-5*g)*(c*f+g)^2*(-c^2*x^2+1)^(1/2)*ln(-c*x+1)/c^4/d^2/(-c^2*d*x^2+d)^
(1/2)+1/12*b*(c*f-g)^2*(4*c*f+5*g)*(-c^2*x^2+1)^(1/2)*ln(c*x+1)/c^4/d^2/(-
c^2*d*x^2+d)^(1/2)
```

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.80 (sec) , antiderivative size = 366, normalized size of antiderivative = 1.11

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{d-c^2dx^2}\Big(ibcg(3c^2f^2-5g^2)\left(1-c^2x^2\right)^{3/2}\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c^2}\right.\right.}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(I*b*c*g*(3*c^2*f^2 - 5*g^2)*(1 - c^2*x^2)^(3/2)*Elli
pticF[I*ArcSinh[Sqrt[-c^2]*x], 1] - Sqrt[-c^2]*(-6*a*c^2*f^2*g + 4*a*g^3 -
 6*a*c^4*f^3*x - 6*a*c^2*g^3*x^2 + 4*a*c^6*f^3*x^3 - 6*a*c^4*f*g^2*x^3 + b
*c^3*f^3*Sqrt[1 - c^2*x^2] + 3*b*c*f*g^2*Sqrt[1 - c^2*x^2] + 3*b*c^3*f^2*g
*x*Sqrt[1 - c^2*x^2] + b*c*g^3*x*Sqrt[1 - c^2*x^2] + 2*b*(2*g^3 + 2*c^6*f^
3*x^3 - 3*c^2*g*(f^2 + g^2*x^2) - 3*c^4*f*x*(f^2 + g^2*x^2))*ArcSin[c*x] -
 b*c*f*(2*c^2*f^2 - 3*g^2)*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2]))/(6*c^4
*Sqrt[-c^2]*d^3*(-1 + c^2*x^2)^2)
```

Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 277, normalized size of antiderivative = 0.84, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{\sqrt{1-c^2x^2}\left(-bc\int\left(\frac{(fxc^2+g)(f+gx)^2}{3c^2(1-c^2x^2)^2}+\frac{2(cf-g)(cf+g)(fxc^2+g)}{3c^4(1-c^2x^2)}\right)dx+\frac{(f+gx)^2(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{2(cf-g)(cf+g)(c^2f}{3c^4\sqrt{}}\right.}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(f+gx)^2(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{2(cf-g)(cf+g)(c^2fx+g)(a+b\arcsin(cx))}{3c^4\sqrt{1-c^2x^2}}-bc\left(\frac{2g\text{arctanh}(cx)(cf+g)(cf-g)}{3c^5}+\frac{(}{12}\right.\right.}{d^2\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((g + c^2*f*x)*(f + g*x)^2*(a + b*ArcSin[c*x]))/(3*c^2
*(1 - c^2*x^2)^(3/2)) + (2*(c*f - g)*(c*f + g)*(g + c^2*f*x)*(a + b*ArcSin
[c*x]))/(3*c^4*Sqrt[1 - c^2*x^2]) - b*c*((c*f + g)^3/(12*c^5*(1 - c*x)) +
(c*f - g)^3/(12*c^5*(1 + c*x)) + (2*(c*f - g)*g*(c*f + g)*ArcTanh[c*x])/(3
*c^5) + (g*(c*f + g)^2*Log[1 - c*x])/(12*c^5) - ((c*f - g)^2*g*Log[1 + c*x
])/(12*c^5) - (f*(c*f - g)*(c*f + g)*Log[1 - c^2*x^2])/(3*c^4))))/(d^2*Sqr
t[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.44 (sec) , antiderivative size = 5114, normalized size of antiderivative = 15.50

method	result	size
default	Expression too large to display	5114
parts	Expression too large to display	5114

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBO
SE)
```

output
```
result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)^3(b\arcsin{(cx)}+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="f
ricas")
```

output
```
integral(-(a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 +
3*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^
6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^3}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(5/2), x
)
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="m
axima")
```

output
```
1/6*b*c*f^3*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/
2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f^3*(2*x/(sqrt(-c^2*d*x^2 + d)
*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*f^3*(2*x/(sqrt(-
c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + 1/3*a*g^3*(3*x^2/((-
c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) - a*f*g^2*
(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) + in
tegrate((b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt
(-c*x + 1)), x)/sqrt(d) + a*f^2*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
int((g*x+f)^3*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

output
```
(3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4
- 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**6*f
**3*x**2 - 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*
c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x
)*b*c**4*f**3 + 3*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x**3)/(sqrt( - c**
2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*
x**2 + 1)),x)*b*c**6*g**3*x**2 - 3*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x
**3)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**
2 + sqrt( - c**2*x**2 + 1)),x)*b*c**4*g**3 + 9*sqrt( - c**2*x**2 + 1)*int(
(asin(c*x)*x**2)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 +
 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**6*f*g**2*x**2 - 9*sqrt( -
c**2*x**2 + 1)*int((asin(c*x)*x**2)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*
sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**4*f*g**
2 + 9*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt( - c**2*x**2 + 1)*c**
4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b
*c**6*f**2*g*x**2 - 9*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt( - c*
*2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2
*x**2 + 1)),x)*b*c**4*f**2*g - 3*sqrt( - c**2*x**2 + 1)*a*c**4*f**2*g*x**2
 + 3*sqrt( - c**2*x**2 + 1)*a*c**2*f**2*g + 2*sqrt( - c**2*x**2 + 1)*a*c**
2*g**3*x**2 - 2*sqrt( - c**2*x**2 + 1)*a*g**3 + 2*a*c**6*f**3*x**3 - 3*...
```

3.128 $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 259

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{b(f+gx)^2}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2f(g+c^2fx)\,(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{x(f+gx)^2(a+b\arcsin(cx))}{3d^2\,(1-c^2x^2)\sqrt{d-c^2dx^2}} + \frac{b(2cf-g)(cf+g)\sqrt{d-c^2dx^2}\log(1-cx)}{6c^3d^3\sqrt{1-c^2x^2}} + \frac{b(cf-g)(2cf+g)\sqrt{d-c^2dx^2}\log(1+cx)}{6c^3d^3\sqrt{1-c^2x^2}}$$

output
```
-1/6*b*(g*x+f)^2/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2/3*f*(c^2*
f*x+g)*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*x*(g*x+f)^2*(a+b
*arcsin(c*x))/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)+1/6*b*(2*c*f-g)*(c*f+g
)*(-c^2*d*x^2+d)^(1/2)*ln(-c*x+1)/c^3/d^3/(-c^2*x^2+1)^(1/2)+1/6*b*(c*f-g)
*(2*c*f+g)*(-c^2*d*x^2+d)^(1/2)*ln(c*x+1)/c^3/d^3/(-c^2*x^2+1)^(1/2)
```

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.62 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.10

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{c\sqrt{d-c^2dx^2}\left(2ibc^2fg(1-c^2x^2)^{3/2}\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c^2}x\right),1\right)-\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(c*Sqrt[d - c^2*d*x^2]*((2*I)*b*c^2*f*g*(1 - c^2*x^2)^(3/2)*EllipticF[I*Ar
cSinh[Sqrt[-c^2]*x], 1] - Sqrt[-c^2]*(-4*a*c*f*g - 6*a*c^3*f^2*x + 4*a*c^5
*f^2*x^3 - 2*a*c^3*g^2*x^3 + b*c^2*f^2*Sqrt[1 - c^2*x^2] + b*g^2*Sqrt[1 -
c^2*x^2] + 2*b*c^2*f*g*x*Sqrt[1 - c^2*x^2] + 2*b*c*(-2*f*g - c^2*g^2*x^3 +
 c^2*f^2*x*(-3 + 2*c^2*x^2))*ArcSin[c*x] - b*(2*c^2*f^2 - g^2)*(1 - c^2*x^
2)^(3/2)*Log[-1 + c^2*x^2])))/(6*(-c^2)^(5/2)*d^3*(-1 + c^2*x^2)^2)
```

Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.74, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{\sqrt{1-c^2x^2}\left(-bc\int\left(\frac{x(f+gx)^2}{3(1-c^2x^2)^2}+\frac{2f(fxc^2+g)}{3c^2(1-c^2x^2)}\right)dx+\frac{x(f+gx)^2(a+b\arcsin(cx))}{3(1-c^2x^2)^{3/2}}+\frac{2f(c^2fx+g)(a+b\arcsin(cx))}{3c^2\sqrt{1-c^2x^2}}\right)}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{x(f+gx)^2(a+b\arcsin(cx))}{3(1-c^2x^2)^{3/2}}+\frac{2f(c^2fx+g)(a+b\arcsin(cx))}{3c^2\sqrt{1-c^2x^2}}-bc\left(\frac{fg\operatorname{arctanh}(cx)}{3c^3}-\frac{f^2\log(1-c^2x^2)}{3c^2}+\frac{(f+gx)^2}{6c^2(1-c^2x^2)}+g\right.\right.}{d^2\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((x*(f + g*x)^2*(a + b*ArcSin[c*x]))/(3*(1 - c^2*x^2)^(
3/2)) + (2*f*(g + c^2*f*x)*(a + b*ArcSin[c*x]))/(3*c^2*Sqrt[1 - c^2*x^2])
- b*c*((f + g*x)^2/(6*c^2*(1 - c^2*x^2)) + (f*g*ArcTanh[c*x])/(3*c^3) - (f
^2*Log[1 - c^2*x^2])/(3*c^2) + (g^2*Log[1 - c^2*x^2])/(6*c^4))))/(d^2*Sqrt
[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.21 (sec) , antiderivative size = 3783, normalized size of antiderivative = 14.61

method	result	size
default	Expression too large to display	3783
parts	Expression too large to display	3783

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2*(1/3*x/d/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2))+g^2*(
1/2*x/c^2/d/(-c^2*d*x^2+d)^(3/2)-1/2/c^2*(1/3*x/d/(-c^2*d*x^2+d)^(3/2)+2/3
/d^2*x/(-c^2*d*x^2+d)^(1/2)))+2/3*f*g/c^2/d/(-c^2*d*x^2+d)^(3/2))-8/3*b*(-
d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*
x)*(-c^2*x^2+1)*x^4*f*g+14/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*
c^4*x^4+11*c^2*x^2-4)*c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^2*f^2-7/3*I*b*(-d
*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcsin(c*x)*
(-c^2*x^2+1)^(1/2)*x^2*g^2+4/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-1
0*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^6*f*g-2*I*b*(-d*(c^2*x^2-1))^(1
/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^3*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)*x^4*f^2-10/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*
c^2*x^2-4)*c^2*(-c^2*x^2+1)*x^4*f*g+I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*
x^6-10*c^4*x^4+11*c^2*x^2-4)*c*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4*g^2-4*b*
(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)
*x*f^2-22/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-
4)*arcsin(c*x)*x^3*g^2+2/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*
x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*f^2+2/3*b*(-d*(c^2*x^2-1))^(1/2)/d^
3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^3*(-c^2*x^2+1)^(1/2)*g^2-I*b*(-d*(
c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x*f^2+8/3*I*b*(-
d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x^3*g^2+2*...
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2
 + 2*b*f*g*x + b*f^2)*arcsin(c*x))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^
3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^2}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x
)
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="m
axima")
```

output
```
1/6*b*c*f^2*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/
2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f^2*(2*x/(sqrt(-c^2*d*x^2 + d)
*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*f^2*(2*x/(sqrt(-
c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) - 1/3*a*g^2*(x/(sqrt(-
c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) - sqrt(d)*inte
grate((b*g^2*x^2 + 2*b*f*g*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 -
 d^3), x) + 2/3*a*f*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{3\sqrt{-c^2x^2+1}\left(\int \frac{asin(cx)}{\sqrt{-c^2x^2+1}\,c^4x^4-2\sqrt{-c^2x^2+1}\,c^2x^2+\sqrt{-c^2x^2+1}}dx\right)b\,c^4f^2x^2-3}{}$$

input
```
int((g*x+f)^2*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

output
```
(3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4
- 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**4*f
**2*x**2 - 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*
c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x
)*b*c**2*f**2 + 3*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x**2)/(sqrt( - c**
2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*
x**2 + 1)),x)*b*c**4*g**2*x**2 - 3*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x
**2)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**
2 + sqrt( - c**2*x**2 + 1)),x)*b*c**2*g**2 + 6*sqrt( - c**2*x**2 + 1)*int(
(asin(c*x)*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)
*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**4*f*g*x**2 - 6*sqrt( - c**2*x
**2 + 1)*int((asin(c*x)*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c
**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**2*f*g - 2*sqrt(
- c**2*x**2 + 1)*a*c**2*f*g*x**2 + 2*sqrt( - c**2*x**2 + 1)*a*f*g + 2*a*c*
*4*f**2*x**3 - 3*a*c**2*f**2*x - a*c**2*g**2*x**3 - 2*a*f*g)/(3*sqrt(d)*sq
rt( - c**2*x**2 + 1)*c**2*d**2*(c**2*x**2 - 1))
```

3.129 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 216

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{b(f+gx)}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)\,(a+b\arcsin(cx))}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{2fx(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} - \frac{bg\sqrt{1-c^2x^2}\,\text{arctanh}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}} + \frac{bf\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2\sqrt{d-c^2dx^2}}$$

output
```
-1/6*b*(g*x+f)/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/3*(c^2*f*x+
g)*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(3/2)+2/3*f*x*(a+b*arcsin(c*x))/
d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b*g*(-c^2*x^2+1)^(1/2)*arctanh(c*x)/c^2/d^2/(
-c^2*d*x^2+d)^(1/2)+1/3*b*f*(-c^2*x^2+1)^(1/2)*ln(-c^2*x^2+1)/c/d^2/(-c^2*
d*x^2+d)^(1/2)
```

Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.47 (sec) , antiderivative size = 208, normalized size of antiderivative = 0.96

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx =$$
$$-\frac{\sqrt{d-c^2dx^2}\left(ibcg(1-c^2x^2)^{3/2}\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c^2}x\right),1\right)+\sqrt{-c^2}\left(2ag+6ac^2fx-4ac^4fx^3-bcf\right.\right.}{6\left(-c^2\right)^{3/2}d^3}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
-1/6*(Sqrt[d - c^2*d*x^2]*(I*b*c*g*(1 - c^2*x^2)^(3/2)*EllipticF[I*ArcSinh
[Sqrt[-c^2]*x], 1] + Sqrt[-c^2]*(2*a*g + 6*a*c^2*f*x - 4*a*c^4*f*x^3 - b*c
*f*Sqrt[1 - c^2*x^2] - b*c*g*x*Sqrt[1 - c^2*x^2] + 2*b*(g + c^2*f*x*(3 - 2
*c^2*x^2))*ArcSin[c*x] + 2*b*c*f*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2])))/
((-c^2)^(3/2)*d^3*(-1 + c^2*x^2)^2)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.74, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {5276, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$$
$$\Big\downarrow \text{5276}$$
$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$
$$\Big\downarrow \text{5260}$$

$$\frac{\sqrt{1-c^2x^2}\left(-bc\int\left(\frac{2fx}{3(1-c^2x^2)}+\frac{fxc^2+g}{3c^2(1-c^2x^2)^2}\right)dx+\frac{(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{2fx(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}\right)}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{2fx(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}-bc\left(\frac{g\,\text{arctanh}(cx)}{6c^3}+\frac{f+gx}{6c^2(1-c^2x^2)}-\frac{f\log(1-c^2x^2)}{3c^2}\right)\right)}{d^2\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((g + c^2*f*x)*(a + b*ArcSin[c*x]))/(3*c^2*(1 - c^2*x^
2)^(3/2)) + (2*f*x*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) - b*c*((f +
g*x)/(6*c^2*(1 - c^2*x^2)) + (g*ArcTanh[c*x])/(6*c^3) - (f*Log[1 - c^2*x^2
])/(3*c^2))))/(d^2*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] && !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.78 (sec) , antiderivative size = 2237, normalized size of antiderivative = 10.36

method	result	size
default	Expression too large to display	2237
parts	Expression too large to display	2237

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE
)
```

output
```
a*(f*(1/3*x/d/(-c^2*d*x^2+d)^(3/2)+2/3/d^2*x/(-c^2*d*x^2+d)^(1/2))+1/3*g/c
^2/d/(-c^2*d*x^2+d)^(3/2))+4/3*I*b*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/
2)/c/d^3/(c^2*x^2-1)*f*arcsin(c*x)-4/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6
*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*(-c^2*x^2+1)*x^4*g+2/3*I*b*(
-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^
2+1)*x^6*g+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2
*x^2-4)*c^4*(-c^2*x^2+1)*x^5*f-5/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x
^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*x^4*g-5/3*I*b*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2+1)*x^3*f-8/3
*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*f-2*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-1
0*c^4*x^4+11*c^2*x^2-4)*c^3*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*x^4*f+14/3*I*b*
(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)*x^2*f-4/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10
*c^4*x^4+11*c^2*x^2-4)/c^2*arcsin(c*x)*(-c^2*x^2+1)*g+2/3*b*(-d*(c^2*x^2-1
))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*x*g-
2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*arc
sin(c*x)*x^5*f+4*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2
*x^2-4)*c^2*arcsin(c*x)*x^4*g+17/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6
-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^3*f-2/3*b*(-d*(c^2*x^2-1))^...
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fri
cas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(
c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx)}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="max
ima")
```

output
```
1/6*b*c*f*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2)
) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2
) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*f*(2*x/(sqrt(-c^2*d*
x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + b*g*integrate(x*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt
(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 1/3*a*g/((-c^2*d*x^2 + d)^(3/2)*c^
2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{3\sqrt{-c^2x^2+1}\left(\int \frac{asin(cx)}{\sqrt{-c^2x^2+1}\,c^4x^4-2\sqrt{-c^2x^2+1}\,c^2x^2+\sqrt{-c^2x^2+1}}dx\right)b\,c^4f\,x^2-3\sqrt{}}{}$$

input
```
int((g*x+f)*(a+b*asin(c*x))/(-c^2*d*x^2+d)^(5/2),x)
```

output
```
(3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4
- 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b*c**4*f
*x**2 - 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**
4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b
*c**2*f + 3*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt( - c**2*x**2 +
1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)
),x)*b*c**4*g*x**2 - 3*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt( - c
**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**
2*x**2 + 1)),x)*b*c**2*g + 2*a*c**4*f*x**3 - 3*a*c**2*f*x - a*g)/(3*sqrt(d
)*sqrt( - c**2*x**2 + 1)*c**2*d**2*(c**2*x**2 - 1))
```

3.130 $\int \frac{a+b \arcsin(cx)}{(f+gx)(d-c^2dx^2)^{5/2}} \, dx$

Optimal result

Integrand size = 31, antiderivative size = 1300

$$\int \frac{a+b \arcsin(cx)}{(f+gx)(d-c^2dx^2)^{5/2}} \, dx = \text{Too large to display}$$

output
```
-1/4*(c*f-2*g)*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*cot(1/4*Pi+1/2*arcsin(
c*x))/d^2/(c*f-g)^2/(-c^2*d*x^2+d)^(1/2)-1/12*(-c^2*x^2+1)^(1/2)*(a+b*arcs
in(c*x))*cot(1/4*Pi+1/2*arcsin(c*x))/d^2/(c*f-g)/(-c^2*d*x^2+d)^(1/2)-1/24
*b*(-c^2*x^2+1)^(1/2)*csc(1/4*Pi+1/2*arcsin(c*x))^2/d^2/(c*f-g)/(-c^2*d*x^
2+d)^(1/2)-1/24*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*cot(1/4*Pi+1/2*arcsin
(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/d^2/(c*f-g)/(-c^2*d*x^2+d)^(1/2)-I*g^
4*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g
/(c*f-(c^2*f^2-g^2)^(1/2)))/d^2/(c*f-g)^2/(c*f+g)^2/(c^2*f^2-g^2)^(1/2)/(-
c^2*d*x^2+d)^(1/2)+I*g^4*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*
x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/d^2/(c*f-g)^2/(c*f+g)^2
/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/6*b*(-c^2*x^2+1)^(1/2)*ln(cos(
1/4*Pi+1/2*arcsin(c*x)))/d^2/(c*f+g)/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f+2*g)*
(-c^2*x^2+1)^(1/2)*ln(cos(1/4*Pi+1/2*arcsin(c*x)))/d^2/(c*f+g)^2/(-c^2*d*x
^2+d)^(1/2)+1/2*b*(c*f-2*g)*(-c^2*x^2+1)^(1/2)*ln(sin(1/4*Pi+1/2*arcsin(c*
x)))/d^2/(c*f-g)^2/(-c^2*d*x^2+d)^(1/2)+1/6*b*(-c^2*x^2+1)^(1/2)*ln(sin(1/
4*Pi+1/2*arcsin(c*x)))/d^2/(c*f-g)/(-c^2*d*x^2+d)^(1/2)-b*g^4*(-c^2*x^2+1)
^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))
/d^2/(c*f-g)^2/(c*f+g)^2/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+b*g^4*(-
c^2*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^
2)^(1/2)))/d^2/(c*f-g)^2/(c*f+g)^2/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(...
```

Mathematica [A] (warning: unable to verify)

Time = 12.70 (sec) , antiderivative size = 2078, normalized size of antiderivative = 1.60

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \text{Result too large to show}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(5/2)),x]
```

output
```
Sqrt[-(d*(-1 + c^2*x^2))]*((a*g - a*c^2*f*x)/(3*d^3*(-(c^2*f^2) + g^2)*(-1
 + c^2*x^2)^2) + (-3*a*g^3 - 2*a*c^4*f^3*x + 5*a*c^2*f*g^2*x)/(3*d^3*(-(c^
2*f^2) + g^2)^2*(-1 + c^2*x^2))) + (a*g^4*Log[f + g*x])/(d^(5/2)*(-(c*f) +
 g)^2*(c*f + g)^2*Sqrt[-(c^2*f^2) + g^2]) - (a*g^4*Log[d*g + c^2*d*f*x + S
qrt[d]*Sqrt[-(c^2*f^2) + g^2]*Sqrt[-(d*(-1 + c^2*x^2))]]])/(d^(5/2)*(-(c*f)
 + g)^2*(c*f + g)^2*Sqrt[-(c^2*f^2) + g^2]) + (b*((g*(-(c^2*f^2) + 7*g^2)*
(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/(6*(-(c^2*f^2) + g^2)^2*(d*(1 - c^2*x^2))
^(3/2)) + ((4*c*f + 7*g)*(1 - c^2*x^2)^(3/2)*Log[Cos[ArcSin[c*x]/2] - Sin[
ArcSin[c*x]/2]])/(6*(c*f + g)^2*(d*(1 - c^2*x^2))^(3/2)) + ((4*c*f - 7*g)*
(1 - c^2*x^2)^(3/2)*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])/(6*(c*f
- g)^2*(d*(1 - c^2*x^2))^(3/2)) + (g^4*(1 - c^2*x^2)^(3/2)*((Pi*ArcTan[(g
+ c*f*Tan[ArcSin[c*x]/2])/Sqrt[c^2*f^2 - g^2]])/Sqrt[c^2*f^2 - g^2] + (2*(
Pi/2 - ArcSin[c*x])*ArcTanh[((c*f + g)*Cot[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-
(c^2*f^2) + g^2]] - 2*ArcCos[-((c*f)/g)]*ArcTanh[((-(c*f) + g)*Tan[(Pi/2 -
 ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]] + (ArcCos[-((c*f)/g)] - (2*I)*(A
rcTanh[((c*f + g)*Cot[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]] - A
rcTanh[((-(c*f) + g)*Tan[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]])
)*Log[Sqrt[-(c^2*f^2) + g^2]/(Sqrt[2]*E^((I/2)*(Pi/2 - ArcSin[c*x]))*Sqrt[
g]*Sqrt[c*f + c*g*x])] + (ArcCos[-((c*f)/g)] + (2*I)*(ArcTanh[((c*f + g)*C
ot[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]] - ArcTanh[((-(c*f) ...
```

Rubi [A] (verified)

Time = 2.24 (sec) , antiderivative size = 821, normalized size of antiderivative = 0.63, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{5/2}(f+gx)}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int\left(\frac{(a+b\arcsin(cx))g^4}{(g-cf)^2(cf+g)^2(f+gx)\sqrt{1-c^2x^2}}-\frac{c(cf+2g)(a+b\arcsin(cx))}{4(cf+g)^2(cx-1)\sqrt{1-c^2x^2}}+\frac{c(cf-2g)(a+b\arcsin(cx))}{4(cf-g)^2(cx+1)\sqrt{1-c^2x^2}}+\frac{c(a+b\arcsin(cx))}{4(cf+g)(cx-1)^2\sqrt{1-c^2x^2}}\right.}{d^2\sqrt{d-c^2dx^2}}$$

$\downarrow$ 2009

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{i(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)g^4}{(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}}+\frac{i(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)g^4}{(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}}-\frac{b\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right.}{(cf-g)^2(cf+g)^2\sqrt{c^2f^2-\right.}}{}$$

input
```
Int[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(5/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-1/4*((c*f - 2*g)*(a + b*ArcSin[c*x])*Cot[Pi/4 + ArcSi
n[c*x]/2])/(c*f - g)^2 - ((a + b*ArcSin[c*x])*Cot[Pi/4 + ArcSin[c*x]/2])/(
12*(c*f - g)) - (b*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(24*(c*f - g)) - ((a + b*A
rcSin[c*x])*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(24*(c*
f - g)) - (I*g^4*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
- Sqrt[c^2*f^2 - g^2])])/((c*f - g)^2*(c*f + g)^2*Sqrt[c^2*f^2 - g^2]) + (
I*g^4*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*
f^2 - g^2])])/((c*f - g)^2*(c*f + g)^2*Sqrt[c^2*f^2 - g^2]) + (b*Log[Cos[P
i/4 + ArcSin[c*x]/2]])/(6*(c*f + g)) + (b*(c*f + 2*g)*Log[Cos[Pi/4 + ArcSi
n[c*x]/2]])/(2*(c*f + g)^2) + (b*(c*f - 2*g)*Log[Sin[Pi/4 + ArcSin[c*x]/2]
])/(2*(c*f - g)^2) + (b*Log[Sin[Pi/4 + ArcSin[c*x]/2]])/(6*(c*f - g)) - (b
*g^4*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/((c*
f - g)^2*(c*f + g)^2*Sqrt[c^2*f^2 - g^2]) + (b*g^4*PolyLog[2, (I*E^(I*ArcS
in[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/((c*f - g)^2*(c*f + g)^2*Sqrt[c^
2*f^2 - g^2]) - (b*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(24*(c*f + g)) + ((a + b*A
rcSin[c*x])*Tan[Pi/4 + ArcSin[c*x]/2])/(12*(c*f + g)) + ((c*f + 2*g)*(a +
b*ArcSin[c*x])*Tan[Pi/4 + ArcSin[c*x]/2])/(4*(c*f + g)^2) + ((a + b*ArcSin
[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/2])/(24*(c*f + g
))))/(d^2*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 8598 vs. 2(1166) = 2332.

Time = 2.13 (sec) , antiderivative size = 8599, normalized size of antiderivative = 6.61

method	result	size
default	Expression too large to display	8599
parts	Expression too large to display	8599

input
```
int((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE
)
```

output
```
result too large to display
```

Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x, algorithm="fri
cas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*g*x^7 + c^6*d^
3*f*x^6 - 3*c^4*d^3*g*x^5 - 3*c^4*d^3*f*x^4 + 3*c^2*d^3*g*x^3 + 3*c^2*d^3*
f*x^2 - d^3*g*x - d^3*f), x)
```

Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{a+b\operatorname{asin}\left(cx\right)}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(f+gx\right)}\,dx$$

input
```
integrate((a+b*asin(c*x))/(g*x+f)/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))/((-d*(c*x - 1)*(c*x + 1))**(5/2)*(f + g*x)), x)
```

Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x, algorithm="max
ima")
```

output
```
integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*(g*x + f)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)\,\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(5/2)), x)
```

Reduce [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \text{Too large to display}$$

input
```
int((a+b*asin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x)
```

output

```
(6*sqrt(c**2*f**2 - g**2)*sqrt( - c**2*x**2 + 1)*atan((tan(asin(c*x)/2)*c*
f + g)/sqrt(c**2*f**2 - g**2))*a*c**2*g**4*x**2 - 6*sqrt(c**2*f**2 - g**2)
*sqrt( - c**2*x**2 + 1)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 - g
**2))*a*g**4 + 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 +
 1)*c**4*f*x**4 + sqrt( - c**2*x**2 + 1)*c**4*g*x**5 - 2*sqrt( - c**2*x**2
 + 1)*c**2*f*x**2 - 2*sqrt( - c**2*x**2 + 1)*c**2*g*x**3 + sqrt( - c**2*x*
*2 + 1)*f + sqrt( - c**2*x**2 + 1)*g*x),x)*b*c**8*f**6*x**2 - 3*sqrt( - c*
*2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**4*f*x**4 + sqrt( - c
**2*x**2 + 1)*c**4*g*x**5 - 2*sqrt( - c**2*x**2 + 1)*c**2*f*x**2 - 2*sqrt(
 - c**2*x**2 + 1)*c**2*g*x**3 + sqrt( - c**2*x**2 + 1)*f + sqrt( - c**2*x*
*2 + 1)*g*x),x)*b*c**6*f**6 - 9*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt
( - c**2*x**2 + 1)*c**4*f*x**4 + sqrt( - c**2*x**2 + 1)*c**4*g*x**5 - 2*sq
rt( - c**2*x**2 + 1)*c**2*f*x**2 - 2*sqrt( - c**2*x**2 + 1)*c**2*g*x**3 +
sqrt( - c**2*x**2 + 1)*f + sqrt( - c**2*x**2 + 1)*g*x),x)*b*c**6*f**4*g**2
*x**2 + 9*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**
4*f*x**4 + sqrt( - c**2*x**2 + 1)*c**4*g*x**5 - 2*sqrt( - c**2*x**2 + 1)*c
**2*f*x**2 - 2*sqrt( - c**2*x**2 + 1)*c**2*g*x**3 + sqrt( - c**2*x**2 + 1)
*f + sqrt( - c**2*x**2 + 1)*g*x),x)*b*c**4*f**4*g**2 + 9*sqrt( - c**2*x**2
 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**4*f*x**4 + sqrt( - c**2*x**
2 + 1)*c**4*g*x**5 - 2*sqrt( - c**2*x**2 + 1)*c**2*f*x**2 - 2*sqrt( - c...
```

3.131 $\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1084

$$\begin{aligned}
&\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx \\
&= \frac{4b^2f^2g\sqrt{d-c^2dx^2}}{3c^2}+\frac{52b^2g^3\sqrt{d-c^2dx^2}}{225c^4}-\frac{1}{4}b^2f^3x\sqrt{d-c^2dx^2} \\
&+\frac{3b^2fg^2x\sqrt{d-c^2dx^2}}{64c^2}-\frac{3}{32}b^2fg^2x^3\sqrt{d-c^2dx^2}+\frac{2b^2f^2g(d-c^2dx^2)^{3/2}}{9c^2d} \\
&+\frac{26b^2g^3(d-c^2dx^2)^{3/2}}{675c^4d}-\frac{2b^2g^3(d-c^2dx^2)^{5/2}}{125c^4d^2}+\frac{b^2f^3\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} \\
&-\frac{3b^2fg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{2bf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}} \\
&+\frac{4bg^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15c^3\sqrt{1-c^2x^2}}-\frac{bcf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&+\frac{3bfg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}}-\frac{2bcf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&+\frac{2bg^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}}-\frac{3bcfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&-\frac{2bcg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} \\
&+\frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2}-\frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\operatorname{arc}}{15c^2}
\end{aligned}$$

output
```
3/64*b^2*f*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2-3/8*f*g^2*x*(-c^2*d*x^2+d)^(1/2)
*(a+b*arcsin(c*x))^2/c^2+1/4*b^2*f^3*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/c/(-
c^2*x^2+1)^(1/2)+1/6*f^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(-c^
2*x^2+1)^(1/2)+3/8*b*f*g^2*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(-
c^2*x^2+1)^(1/2)-2/3*b*c*f^2*g*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/
(-c^2*x^2+1)^(1/2)+2/9*b^2*f^2*g*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/8*f*g^2*(-c^
2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^3/b/c^3/(-c^2*x^2+1)^(1/2)-3/64*b^2*f*g
^2*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/c^3/(-c^2*x^2+1)^(1/2)+4/15*b*g^3*x*(-
c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^3/(-c^2*x^2+1)^(1/2)-1/2*b*c*f^3*x^
2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+2/45*b*g^3*x^3
*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*x^2+1)^(1/2)-2/25*b*c*g^3*
x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+26/675*b^2*g
^3*(-c^2*d*x^2+d)^(3/2)/c^4/d-2/125*b^2*g^3*(-c^2*d*x^2+d)^(5/2)/c^4/d^2+5
2/225*b^2*g^3*(-c^2*d*x^2+d)^(1/2)/c^4-1/4*b^2*f^3*x*(-c^2*d*x^2+d)^(1/2)-
2/15*g^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/c^4+1/2*f^3*x*(-c^2*d*x^
2+d)^(1/2)*(a+b*arcsin(c*x))^2+1/5*g^3*x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsi
n(c*x))^2-f^2*g*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/c^2/d-3/8*b*c*f*g
^2*x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+2*b*f^2*g
*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*x^2+1)^(1/2)+4/3*b^2*f^2
*g*(-c^2*d*x^2+d)^(1/2)/c^2-3/32*b^2*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2)-1/1...
```

Mathematica [A] (verified)

Time = 0.66 (sec) , antiderivative size = 708, normalized size of antiderivative = 0.65

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$

$$=\frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}f^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{3}{4}fg^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{1}{5}g^3x^4\sqrt{1-c^2}\right.}{}$$

input
```
Integrate[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((f^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 +
(3*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/4 + (g^3*x^4*Sqrt[1
- c^2*x^2]*(a + b*ArcSin[c*x])^2)/5 - (f^2*g*(1 - c^2*x^2)^(3/2)*(a + b*Ar
cSin[c*x])^2)/c^2 + (f^3*(a + b*ArcSin[c*x])^3)/(6*b*c) - (2*b*g^3*(15*a*c
^5*x^5 + b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4) + 15*b*c^5*x^5*Ar
cSin[c*x]))/(375*c^4) - (2*b*f^2*g*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3
*a*c*x*(-3 + c^2*x^2) + 3*b*c*x*(-3 + c^2*x^2)*ArcSin[c*x]))/(9*c^2) - (b*
f^3*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x])
)/(4*c) - (3*b*f*g^2*(8*a*c^4*x^4 + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2
) + b*(-3 + 8*c^4*x^4)*ArcSin[c*x]))/(64*c^3) + (g^3*(-9*a^2*Sqrt[1 - c^2*
x^2]*(2 + c^2*x^2) + 6*a*b*c*x*(6 + c^2*x^2) + 2*b^2*Sqrt[1 - c^2*x^2]*(20
 + c^2*x^2) + 6*b*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x*(6 + c^2*x
^2))*ArcSin[c*x] - 9*b^2*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]^2))/(
135*c^4) - (f*g^2*(6*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (2*(a +
 b*ArcSin[c*x])^3)/b - 3*b*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 +
2*c^2*x^2)*ArcSin[c*x])))/(16*c^3)))/Sqrt[1 - c^2*x^2]
```

Rubi [A] (verified)

Time = 1.90 (sec) , antiderivative size = 750, normalized size of antiderivative = 0.69, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)^3(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{d-c^2dx^2}\int \left(\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2f^3+3gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2f^2+3g^2x^2\sqrt{1-c^2x^2}(a+b\,\mathrm{a}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{d-c^2dx^2}\left(\frac{fg^2(a+b\arcsin(cx))^3}{8bc^3}+\frac{1}{2}f^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{f^2g\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{c^2}-\frac{3fg^2x\sqrt{1-c^2x^2}}{}\right.$$

input
```
Int[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((4*a*b*g^3*x)/(15*c^3) + (4*b^2*f^2*g*Sqrt[1 - c^2*x
^2])/(3*c^2) + (52*b^2*g^3*Sqrt[1 - c^2*x^2])/(225*c^4) - (b^2*f^3*x*Sqrt[
1 - c^2*x^2])/4 + (3*b^2*f*g^2*x*Sqrt[1 - c^2*x^2])/(64*c^2) - (3*b^2*f*g^
2*x^3*Sqrt[1 - c^2*x^2])/32 + (2*b^2*f^2*g*(1 - c^2*x^2)^(3/2))/(9*c^2) +
(26*b^2*g^3*(1 - c^2*x^2)^(3/2))/(675*c^4) - (2*b^2*g^3*(1 - c^2*x^2)^(5/2
))/(125*c^4) + (b^2*f^3*ArcSin[c*x])/(4*c) - (3*b^2*f*g^2*ArcSin[c*x])/(64
*c^3) + (4*b^2*g^3*x*ArcSin[c*x])/(15*c^3) + (2*b*f^2*g*x*(a + b*ArcSin[c*
x]))/c - (b*c*f^3*x^2*(a + b*ArcSin[c*x]))/2 + (3*b*f*g^2*x^2*(a + b*ArcSi
n[c*x]))/(8*c) - (2*b*c*f^2*g*x^3*(a + b*ArcSin[c*x]))/3 + (2*b*g^3*x^3*(a
 + b*ArcSin[c*x]))/(45*c) - (3*b*c*f*g^2*x^4*(a + b*ArcSin[c*x]))/8 - (2*b
*c*g^3*x^5*(a + b*ArcSin[c*x]))/25 - (2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x])^2)/(15*c^4) + (f^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 -
(3*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) - (g^3*x^2*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^2) + (3*f*g^2*x^3*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x])^2)/4 + (g^3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x])^2)/5 - (f^2*g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/c^2 + (f^3*
(a + b*ArcSin[c*x])^3)/(6*b*c) + (f*g^2*(a + b*ArcSin[c*x])^3)/(8*b*c^3)))
/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.08 (sec) , antiderivative size = 2728, normalized size of antiderivative = 2.52

method	result	size
default	Expression too large to display	2728
parts	Expression too large to display	2728

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^3*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1
/2)*x/(-c^2*d*x^2+d)^(1/2)))+g^3*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15
/d/c^4*(-c^2*d*x^2+d)^(3/2))+3*f*g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/
4/c^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)
*x/(-c^2*d*x^2+d)^(1/2))))-f^2*g/c^2/d*(-c^2*d*x^2+d)^(3/2))+b^2*(-1/24*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*f*(4
*c^2*f^2+3*g^2)+1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*
(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*
(-c^2*x^2+1)^(1/2)*x*c-1)*g^3*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(c
^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*
c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c
*x)*f*g^2*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1)+1/864*(-d*(c
^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(
-c^2*x^2+1)^(1/2)*x*c+1)*g*(72*I*arcsin(c*x)*c^2*f^2+108*arcsin(c*x)^2*c^2
*f^2+6*I*arcsin(c*x)*g^2+9*arcsin(c*x)^2*g^2-24*c^2*f^2-2*g^2)/c^4/(c^2*x^
2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^
3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^3*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c
^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)
*g*(12*I*arcsin(c*x)*c^2*f^2+6*arcsin(c*x)^2*c^2*f^2+2*I*arcsin(c*x)*g^2+a
rcsin(c*x)^2*g^2-12*c^2*f^2-2*g^2)/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1)...
```

Fricas [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral((a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*g
^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*b
*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)^3\;dx$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2*(f + g*x)**3, x
)
```

Maxima [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin\,(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2*f^3 - 1/15*a^2*g^
3*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c^4*d)
) + 3/8*a^2*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x
/(c^2*d) + sqrt(d)*arcsin(c*x)/c^3) - (-c^2*d*x^2 + d)^(3/2)*a^2*f^2*g/(c^
2*d) + sqrt(d)*integrate(((b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x +
 b^2*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^3*x^3 +
3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{d}\,\left(60asin(cx)\,a^2c^3f^3+45asin(cx)\,a^2cf\,g^2+60\sqrt{-c^2x^2+1}\,a^2c^4f^3x+120\sqrt{-c^2x^2+1}\,a^2c^4f^2g\,x^2+9\right.}{}$$

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(1/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(d)*(60*asin(c*x)*a**2*c**3*f**3 + 45*asin(c*x)*a**2*c*f*g**2 + 60*sq
rt( - c**2*x**2 + 1)*a**2*c**4*f**3*x + 120*sqrt( - c**2*x**2 + 1)*a**2*c*
*4*f**2*g*x**2 + 90*sqrt( - c**2*x**2 + 1)*a**2*c**4*f*g**2*x**3 + 24*sqrt
( - c**2*x**2 + 1)*a**2*c**4*g**3*x**4 - 120*sqrt( - c**2*x**2 + 1)*a**2*c
**2*f**2*g - 45*sqrt( - c**2*x**2 + 1)*a**2*c**2*f*g**2*x - 8*sqrt( - c**2
*x**2 + 1)*a**2*c**2*g**3*x**2 - 16*sqrt( - c**2*x**2 + 1)*a**2*g**3 + 240
*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*a*b*c**4*g**3 + 720*int(sqrt
( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*a*b*c**4*f*g**2 + 720*int(sqrt( - c**
2*x**2 + 1)*asin(c*x)*x,x)*a*b*c**4*f**2*g + 240*int(sqrt( - c**2*x**2 + 1
)*asin(c*x),x)*a*b*c**4*f**3 + 120*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2
*x**3,x)*b**2*c**4*g**3 + 360*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x**2
,x)*b**2*c**4*f*g**2 + 360*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x,x)*b*
*2*c**4*f**2*g + 120*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2,x)*b**2*c**4*
f**3 + 120*a**2*c**2*f**2*g + 16*a**2*g**3))/(120*c**4)
```

3.132 $\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 33, antiderivative size = 723

$$\begin{aligned}
&\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx\\
&=\frac{8b^2fg\sqrt{d-c^2dx^2}}{9c^2}-\frac{1}{4}b^2f^2x\sqrt{d-c^2dx^2}+\frac{b^2g^2x\sqrt{d-c^2dx^2}}{64c^2}\\
&-\frac{1}{32}b^2g^2x^3\sqrt{d-c^2dx^2}+\frac{4b^2fg(d-c^2dx^2)^{3/2}}{27c^2d}+\frac{b^2f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}}\\
&-\frac{b^2g^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{4bfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}\\
&-\frac{bcf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}+\frac{bg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}}\\
&-\frac{4bcfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}-\frac{bcg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}\\
&+\frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2}\\
&+\frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{2fg(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3c^2d}\\
&+\frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}
\end{aligned}$$

output
```
8/9*b^2*f*g*(-c^2*d*x^2+d)^(1/2)/c^2-1/4*b^2*f^2*x*(-c^2*d*x^2+d)^(1/2)+1/
64*b^2*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2-1/32*b^2*g^2*x^3*(-c^2*d*x^2+d)^(1/2
)+4/27*b^2*f*g*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4*b^2*f^2*(-c^2*d*x^2+d)^(1/2)
*arcsin(c*x)/c/(-c^2*x^2+1)^(1/2)-1/64*b^2*g^2*(-c^2*d*x^2+d)^(1/2)*arcsin
(c*x)/c^3/(-c^2*x^2+1)^(1/2)+4/3*b*f*g*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(
c*x))/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*f^2*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsi
n(c*x))/(-c^2*x^2+1)^(1/2)+1/8*b*g^2*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(
c*x))/c/(-c^2*x^2+1)^(1/2)-4/9*b*c*f*g*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsi
n(c*x))/(-c^2*x^2+1)^(1/2)-1/8*b*c*g^2*x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsi
n(c*x))/(-c^2*x^2+1)^(1/2)+1/2*f^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x)
)^2-1/8*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/c^2+1/4*g^2*x^3*(-c
^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2-2/3*f*g*(-c^2*d*x^2+d)^(3/2)*(a+b*ar
csin(c*x))^2/c^2/d+1/6*f^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(-
c^2*x^2+1)^(1/2)+1/24*g^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^3/b/c^3/(
-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 441, normalized size of antiderivative = 0.61

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{1}{4}g^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{2fg(1-c^2x^2)^{3/2}(a+}{3c^2}\right.}{}$$

input
```
Integrate[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 +
(g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/4 - (2*f*g*(1 - c^2*x^2)
^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c^2) + (f^2*(a + b*ArcSin[c*x])^3)/(6*b*c
) - (4*b*f*g*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x*(-3 + c^2*x^2)
+ 3*b*c*x*(-3 + c^2*x^2)*ArcSin[c*x]))/(27*c^2) - (b*f^2*(c*x*(2*a*c*x + b
*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x]))/(4*c) - (b*g^2*(8*a
*c^4*x^4 + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) + b*(-3 + 8*c^4*x^4)*Ar
cSin[c*x]))/(64*c^3) - (g^2*(6*b*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^2 - 2*(a + b*ArcSin[c*x])^3 - 3*b^2*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2])
+ b*(-1 + 2*c^2*x^2)*ArcSin[c*x])))/(48*b*c^3)))/Sqrt[1 - c^2*x^2]
```

Rubi [A] (verified)

Time = 1.25 (sec) , antiderivative size = 477, normalized size of antiderivative = 0.66, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)^2(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 5262}$$

$$\frac{\sqrt{d-c^2dx^2}\int \left(f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+g^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+2fgx\sqrt{1-c^2x^2}(a+b\arcs\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 2009}$$

$$\sqrt{d-c^2dx^2}\left(\frac{g^2(a+b\arcsin(cx))^3}{24bc^3}+\frac{1}{2}f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{2fg\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{3c^2}-\frac{g^2x\sqrt{1-c^2x^2}(a}{8c}\right.$$

input
```
Int[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((8*b^2*f*g*Sqrt[1 - c^2*x^2])/(9*c^2) - (b^2*f^2*x*S
qrt[1 - c^2*x^2])/4 + (b^2*g^2*x*Sqrt[1 - c^2*x^2])/(64*c^2) - (b^2*g^2*x^
3*Sqrt[1 - c^2*x^2])/32 + (4*b^2*f*g*(1 - c^2*x^2)^(3/2))/(27*c^2) + (b^2*
f^2*ArcSin[c*x])/(4*c) - (b^2*g^2*ArcSin[c*x])/(64*c^3) + (4*b*f*g*x*(a +
b*ArcSin[c*x]))/(3*c) - (b*c*f^2*x^2*(a + b*ArcSin[c*x]))/2 + (b*g^2*x^2*(
a + b*ArcSin[c*x]))/(8*c) - (4*b*c*f*g*x^3*(a + b*ArcSin[c*x]))/9 - (b*c*g
^2*x^4*(a + b*ArcSin[c*x]))/8 + (f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
])^2)/2 - (g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (g^2*x
^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/4 - (2*f*g*(1 - c^2*x^2)^(3/2)
*(a + b*ArcSin[c*x])^2)/(3*c^2) + (f^2*(a + b*ArcSin[c*x])^3)/(6*b*c) + (g
^2*(a + b*ArcSin[c*x])^3)/(24*b*c^3)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.78 (sec) , antiderivative size = 1852, normalized size of antiderivative = 2.56

method	result	size
default	Expression too large to display	1852
parts	Expression too large to display	1852

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1
/2)*x/(-c^2*d*x^2+d)^(1/2)))+g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/c^
2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(
-c^2*d*x^2+d)^(1/2))))-2/3*f*g/c^2/d*(-c^2*d*x^2+d)^(3/2))+b^2*(-1/24*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*(4*c^2
*f^2+g^2)+1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*
c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c
*x)*g^2*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1)+1/108*(-d*(c^2
*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-c
^2*x^2+1)^(1/2)*x*c+1)*f*g*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^
2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^
3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c
^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*
f*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsi
n(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(2*arcsin(c*x)^2-1-2*I
*arcsin(c*x))/c/(c^2*x^2-1)+1/108*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^
2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-6*I
*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1)+1/512*(-d*(c^2*x^2-1))^...
```

Fricas [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral((a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin
(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-d\,(cx-1)\,(cx+1)}(a+b\operatorname{asin}{(cx)})^2\,(f+gx)^2\,dx$$

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2*(f + g*x)**2, x
)
```

Maxima [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin{(cx)}+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2*f^2 + 1/8*a^2*g^2
*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*d) + sqrt(d
)*arcsin(c*x)/c^3) - 2/3*(-c^2*d*x^2 + d)^(3/2)*a^2*f*g/(c^2*d) + sqrt(d)*
integrate(((b^2*g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{\sqrt{d}\left(12asin(cx)\,a^2c^2f^2+3asin(cx)\,a^2g^2+12\sqrt{-c^2x^2+1}\,a^2c^3f^2x+16\sqrt{-c^2x^2+1}\,a^2c^3fg\,x^2+6\sqrt{-c^2x^2}\right.}{}$$

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(1/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(d)*(12*asin(c*x)*a**2*c**2*f**2 + 3*asin(c*x)*a**2*g**2 + 12*sqrt( -
 c**2*x**2 + 1)*a**2*c**3*f**2*x + 16*sqrt( - c**2*x**2 + 1)*a**2*c**3*f*g
*x**2 + 6*sqrt( - c**2*x**2 + 1)*a**2*c**3*g**2*x**3 - 16*sqrt( - c**2*x**
2 + 1)*a**2*c*f*g - 3*sqrt( - c**2*x**2 + 1)*a**2*c*g**2*x + 48*int(sqrt(
- c**2*x**2 + 1)*asin(c*x)*x**2,x)*a*b*c**3*g**2 + 96*int(sqrt( - c**2*x**
2 + 1)*asin(c*x)*x,x)*a*b*c**3*f*g + 48*int(sqrt( - c**2*x**2 + 1)*asin(c*
x),x)*a*b*c**3*f**2 + 24*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x**2,x)*b
**2*c**3*g**2 + 48*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x,x)*b**2*c**3*
f*g + 24*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2,x)*b**2*c**3*f**2 + 16*a*
*2*c*f*g))/(24*c**3)
```

3.133 $\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 31, antiderivative size = 382

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \frac{4b^2g\sqrt{d-c^2dx^2}}{9c^2} - \frac{1}{4}b^2fx\sqrt{d-c^2dx^2} + \frac{2b^2g(d-c^2dx^2)^{3/2}}{27c^2d} + \frac{b^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} + \frac{2bgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} - \frac{bcfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} - \frac{2bcgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}} + \frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{g(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{3c^2d} + \frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}$$

output
```
4/9*b^2*g*(-c^2*d*x^2+d)^(1/2)/c^2-1/4*b^2*f*x*(-c^2*d*x^2+d)^(1/2)+2/27*b
^2*g*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4*b^2*f*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)
/c/(-c^2*x^2+1)^(1/2)+2/3*b*g*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(
-c^2*x^2+1)^(1/2)-1/2*b*c*f*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c
^2*x^2+1)^(1/2)-2/9*b*c*g*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2
*x^2+1)^(1/2)+1/2*f*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2-1/3*g*(-c^2
*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/c^2/d+1/6*f*(-c^2*d*x^2+d)^(1/2)*(a+b*
arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 225, normalized size of antiderivative = 0.59

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(54fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{36g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c^2}+\frac{18f(a+b\arcsin(cx))^3}{bc}-\frac{8bg\left(b\sqrt{\ldots}\right.}{\ldots}\right.}{108\sqrt{1-c^2\ldots}}$$

input
```
Integrate[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(54*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (36
*g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/c^2 + (18*f*(a + b*ArcSin[c*
x])^3)/(b*c) - (8*b*g*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x*(-3 +
c^2*x^2) + 3*b*c*x*(-3 + c^2*x^2)*ArcSin[c*x]))/c^2 - (27*b*f*(c*x*(2*a*c*
x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x]))/c))/(108*Sqrt[
1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 256, normalized size of antiderivative = 0.67, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)(a+b\arcsin(cx))^2\,dx$$
$$\Big\downarrow \; 5276$$
$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$
$$\Big\downarrow \; 5262$$
$$\frac{\sqrt{d-c^2dx^2}\int \left(f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{3c^2}-\frac{1}{2}bcfx^2(a+b\arcsin(cx))+\frac{f(a+b\text{a}}{}\right.}{}$$

input
```
Int[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((4*b^2*g*Sqrt[1 - c^2*x^2])/(9*c^2) - (b^2*f*x*Sqrt[
1 - c^2*x^2])/4 + (2*b^2*g*(1 - c^2*x^2)^(3/2))/(27*c^2) + (b^2*f*ArcSin[c
*x])/(4*c) + (2*b*g*x*(a + b*ArcSin[c*x]))/(3*c) - (b*c*f*x^2*(a + b*ArcSi
n[c*x]))/2 - (2*b*c*g*x^3*(a + b*ArcSin[c*x]))/9 + (f*x*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])^2)/2 - (g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(
3*c^2) + (f*(a + b*ArcSin[c*x])^3)/(6*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] && !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.65 (sec) , antiderivative size = 1236, normalized size of antiderivative = 3.24

method	result	size
default	Expression too large to display	1236
parts	Expression too large to display	1236

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBO
SE)
```

output
```
1/2*a^2*f*x*(-c^2*d*x^2+d)^(1/2)+1/2*a^2*f*d/(c^2*d)^(1/2)*arctan((c^2*d)^
(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/3*a^2*g/c^2/d*(-c^2*d*x^2+d)^(3/2)+b^2*(-1
/6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*f
+1/216*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*
x^3*c^3+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2
)/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2
*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(2*I*arcsin(c*x)+2*arcsin(c*x
)^2-1)/c/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1
)^(1/2)-1)*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/(c^2*x^2-1)-1/8*(-d*(c^
2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*
I*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+
1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(2*arcsin(c*x)^2-
1-2*I*arcsin(c*x))/c/(c^2*x^2-1)+1/216*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3
*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-
6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1))+2*a*b*(-1/4*(-d*(c^2*x
^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f+1/72*(-d*(c^
2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+3*I*(-
c^2*x^2+1)^(1/2)*x*c+1)*g*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*
x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1
/2)-2*c*x)*(I+2*arcsin(c*x))*f/c/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)...
```

Fricas [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(
c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x)), x)
```

Sympy [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))^2(f+gx)\,dx$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2,x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2*(f + g*x), x)
```

Maxima [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="m
axima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2*f - 1/3*(-c^2*d*x
^2 + d)^(3/2)*a^2*g/(c^2*d) + sqrt(d)*integrate(((b^2*g*x + b^2*f)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g*x + a*b*f)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2,x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$= \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{\sqrt{d}\,\left(3asin(cx)\,a^2cf+3\sqrt{-c^2x^2+1}\,a^2c^2fx+2\sqrt{-c^2x^2+1}\,a^2c^2g\,x^2-2\sqrt{-c^2x^2+1}\,a^2g+12\left(\int\sqrt{-c^2x\right.\right.}{}$$

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(1/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(d)*(3*asin(c*x)*a**2*c*f + 3*sqrt( - c**2*x**2 + 1)*a**2*c**2*f*x +
2*sqrt( - c**2*x**2 + 1)*a**2*c**2*g*x**2 - 2*sqrt( - c**2*x**2 + 1)*a**2*
g + 12*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x,x)*a*b*c**2*g + 12*int(sqrt(
 - c**2*x**2 + 1)*asin(c*x),x)*a*b*c**2*f + 6*int(sqrt( - c**2*x**2 + 1)*a
sin(c*x)**2*x,x)*b**2*c**2*g + 6*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2,x
)*b**2*c**2*f + 2*a**2*g))/(6*c**2)
```

3.134 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1442

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Too large to display}$$

output
```
a^2*(-c^2*d*x^2+d)^(1/2)/g-2*b^2*(-c^2*d*x^2+d)^(1/2)/g-2*a*b*c*x*(-c^2*d*
x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+2*a*b*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g
-2*b^2*c*x*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g/(-c^2*x^2+1)^(1/2)+b^2*(-c^2
*d*x^2+d)^(1/2)*arcsin(c*x)^2/g+1/3*c*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c
*x))^3/b/g/(-c^2*x^2+1)^(1/2)-1/3*(1-c^2*f^2/g^2)*(-c^2*d*x^2+d)^(1/2)*(a+
b*arcsin(c*x))^3/b/c/(g*x+f)/(-c^2*x^2+1)^(1/2)+1/3*(-c^2*x^2+1)^(1/2)*(-c
^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(g*x+f)-a^2*(c^2*f^2-g^2)^(1/2)*
(-c^2*d*x^2+d)^(1/2)*arctan((c^2*f*x+g)/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(
1/2))/g^2/(-c^2*x^2+1)^(1/2)+2*I*b^2*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1
/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^
2/(-c^2*x^2+1)^(1/2)-I*b^2*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)*arcsin
(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/g^2
/(-c^2*x^2+1)^(1/2)+I*b^2*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)*arcsin(
c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^2/
(-c^2*x^2+1)^(1/2)+2*I*a*b*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)*arcsin
(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^2/(
-c^2*x^2+1)^(1/2)+2*a*b*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)*polylog(2
,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^2/(-c^2*x^2+1
)^(1/2)+2*b^2*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^2/(-c^2*...
```

Mathematica [A] (verified)

Time = 0.86 (sec) , antiderivative size = 516, normalized size of antiderivative = 0.36

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$$
$$= \frac{\sqrt{d-c^2dx^2}\Big((c^2f^2-g^2)\,(a+b\arcsin(cx))^3+c^2gx(f+gx)(a+b\arcsin(cx))^3+g^2(1-c^2x^2)\,(a+b\,\mathrm{arc}}{}$$

input
```
Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^3 + c^2*g*x*(f +
 g*x)*(a + b*ArcSin[c*x])^3 + g^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^3 + 3*
b*c*(f + g*x)*(g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*g*(a*c*x +
b*Sqrt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]) + I*Sqrt[c^2*f^2 - g^2]*((a + b*A
rcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2
])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^
2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x
])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2
, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + 2*b^2*PolyLog[3,
(I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] - 2*b^2*PolyLog[3, (I
*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/(3*b*c*g^2*(f + g*x
)*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 3.58 (sec) , antiderivative size = 1018, normalized size of antiderivative = 0.71, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.212$, Rules used = {5276, 5264, 25, 5256, 25, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 5264}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^3}{3bc(f+gx)}-\frac{\int -\frac{\left(gx^2c^2+2fxc^2+g\right)(a+b\arcsin(cx))^3}{(f+gx)^2}dx}{3bc}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 25}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\int \frac{\left(gx^2c^2+2fxc^2+g\right)(a+b\arcsin(cx))^3}{(f+gx)^2}dx}{3bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^3}{3bc(f+gx)}\right)}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 5256

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{-3bc\int -\frac{\left(\frac{1}{f+gx}-\frac{c^2\left(\frac{f^2}{f+gx}+gx\right)}{g^2}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^3}{f+gx}+\frac{c^2x(a+b\arcsin(cx))^3}{g}}{3bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^3}{3bc(f+gx)}\right)}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 25

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{3bc\int \frac{\left(\frac{1}{f+gx}-\frac{c^2\left(\frac{f^2}{f+gx}+gx\right)}{g^2}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^3}{f+gx}+\frac{c^2x(a+b\arcsin(cx))^3}{g}}{3bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^3}{3bc(f+gx)}\right)}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 5298

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{3bc\int \left(-\frac{\left(f^2c^2+g^2x^2c^2+fgxc^2-g^2\right)a^2}{g^2(f+gx)\sqrt{1-c^2x^2}}-\frac{2b\left(f^2c^2+g^2x^2c^2+fgxc^2-g^2\right)\arcsin(cx)a}{g^2(f+gx)\sqrt{1-c^2x^2}}-\frac{b^2\left(f^2c^2+g^2x^2c^2+fgxc^2-g^2\right)\arcsin(cx)^2}{g^2(f+gx)\sqrt{1-c^2x^2}}\right)dx-\cdots}{3bc}\right)}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^3}{3bc(f+gx)}+\frac{\frac{c^2x(a+b\arcsin(cx))^3}{g}-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^3}{f+gx}+3bc\left(-\frac{\sqrt{c^2f^2-g^2}\arctan\left(\frac{fxc^2+g}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\cdots\right)}{g^2}\cdots\right.}{\cdots}\right.$$

input
```
Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(((1 - c^2*x^2)*(a + b*ArcSin[c*x])^3)/(3*b*c*(f + g*
x)) + ((c^2*x*(a + b*ArcSin[c*x])^3)/g - ((1 - (c^2*f^2)/g^2)*(a + b*ArcSi
n[c*x])^3)/(f + g*x) + 3*b*c*((-2*a*b*c*x)/g + (a^2*Sqrt[1 - c^2*x^2])/g -
 (2*b^2*Sqrt[1 - c^2*x^2])/g - (2*b^2*c*x*ArcSin[c*x])/g + (2*a*b*Sqrt[1 -
 c^2*x^2]*ArcSin[c*x])/g + (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/g - (a^2*
Sqrt[c^2*f^2 - g^2]*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2
*x^2])])/g^2 + ((2*I)*a*b*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*
ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2 + (I*b^2*Sqrt[c^2*f^2 -
g^2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g
^2])])/g^2 - ((2*I)*a*b*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*Ar
cSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^2 - (I*b^2*Sqrt[c^2*f^2 - g^
2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2
])])/g^2 + (2*a*b*Sqrt[c^2*f^2 - g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(
c*f - Sqrt[c^2*f^2 - g^2])])/g^2 + (2*b^2*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*
PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2 - (2*
a*b*Sqrt[c^2*f^2 - g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2
*f^2 - g^2])])/g^2 - (2*b^2*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*PolyLog[2, (I*
E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^2 + ((2*I)*b^2*Sqrt[c
^2*f^2 - g^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2
])])/g^2 - ((2*I)*b^2*Sqrt[c^2*f^2 - g^2]*PolyLog[3, (I*E^(I*ArcSin[c*x...
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5256
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c
*n   Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[
p, 0] && EqQ[e*g - 2*d*h, 0]
```

rule 5264
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[1/(b*c*Sqrt[d]*(n + 1))
   Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[
c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e,
0] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Maple [F]

$$\int \frac{\sqrt{-c^{2} d \,x^{2}+d}\, \left(a +b \arcsin \left(c x \right)\right)^{2}}{g x +f}d x$$

input
```
int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

output
```
int((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^2}{gx+f}\,dx$$

input
```
integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(g*x + f), x)
```

Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx=\int \frac{\sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))^2}{f+gx}\,dx$$

input
```
integrate((-c**2*d*x**2+d)**(1/2)*(a+b*asin(c*x))**2/(g*x+f),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/(f + g*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="m
axima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/(f + g*x), x)
```

Reduce [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$$
$$=\frac{\sqrt{d}\left(asin(cx)\,a^2cf-2\sqrt{c^2f^2-g^2}\,atan\left(\frac{\tan\left(\frac{asin(cx)}{2}\right)cf+g}{\sqrt{c^2f^2-g^2}}\right)a^2+\sqrt{-c^2x^2+1}\,a^2g+2\left(\int\frac{\sqrt{-c^2x^2+1}\,asin(cx)}{gx+f}d\right.\right.}{g^2}$$

input
```
int((-c^2*d*x^2+d)^(1/2)*(a+b*asin(c*x))^2/(g*x+f),x)
```

output
```
(sqrt(d)*(asin(c*x)*a**2*c*f - 2*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x
)/2)*c*f + g)/sqrt(c**2*f**2 - g**2))*a**2 + sqrt( - c**2*x**2 + 1)*a**2*g
 + 2*int((sqrt( - c**2*x**2 + 1)*asin(c*x))/(f + g*x),x)*a*b*g**2 + int((s
qrt( - c**2*x**2 + 1)*asin(c*x)**2)/(f + g*x),x)*b**2*g**2 - a**2*g))/g**2
```

3.135 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1538

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

output
```
-1/35*d*g^3*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/c^2+3/8*d*f*g^2*x
^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2-43/576*b^2*d*f*g^2*x^3*(-c^2*d
*x^2+d)^(1/2)+16/25*b^2*d*f^2*g*(-c^2*d*x^2+d)^(1/2)/c^2-3/5*f^2*g*(-c^2*d
*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/c^2/d+6/125*b^2*f^2*g*(-c^2*d*x^2+d)^(5/
2)/c^2/d-7/384*b^2*d*f*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2+1/36*b^2*c^2*d*f*g^2
*x^5*(-c^2*d*x^2+d)^(1/2)+1/8*b*d*f^3*(-c^2*x^2+1)^(3/2)*(-c^2*d*x^2+d)^(1
/2)*(a+b*arcsin(c*x))/c+8/75*b^2*f^2*g*(-c^2*d*x^2+d)^(3/2)/c^2+38/6125*b^
2*g^3*(-c^2*d*x^2+d)^(5/2)/c^4/d-2/343*b^2*g^3*(-c^2*d*x^2+d)^(7/2)/c^4/d^
2+1/2*f*g^2*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+2/105*b*d*g^3*x^3
*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*x^2+1)^(1/2)-16/175*b*c*d*
g^3*x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+2/49*b*c
^3*d*g^3*x^7*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/1
6*d*f*g^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^3/b/c^3/(-c^2*x^2+1)^(1/2
)+6/5*b*d*f^2*g*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*x^2+1)^(1
/2)+3/16*b*d*f*g^2*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*x^2+
1)^(1/2)-4/5*b*c*d*f^2*g*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*
x^2+1)^(1/2)-7/16*b*c*d*f*g^2*x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(
-c^2*x^2+1)^(1/2)+6/25*b*c^3*d*f^2*g*x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(
c*x))/(-c^2*x^2+1)^(1/2)+1/6*b*c^3*d*f*g^2*x^6*(-c^2*d*x^2+d)^(1/2)*(a+b*a
rcsin(c*x))/(-c^2*x^2+1)^(1/2)-3/16*d*f*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b...
```

Mathematica [A] (verified)

Time = 1.35 (sec) , antiderivative size = 872, normalized size of antiderivative = 0.57

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a +b\arcsin(cx))^2\,dx = \frac{d\sqrt{d-c^2dx^2}\big(3087000a^3cf(2c^2f^2+g^2)-88200a^2b\sqrt{1-c^2x^2}(32g^3+c^2g(336f^2+10}{}$$

input
```
Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(3087000*a^3*c*f*(2*c^2*f^2 + g^2) - 88200*a^2*b*Sq
rt[1 - c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6
*x^3*(35*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3
+ 336*f^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)) + 840*a*b^2*c*x*(6720*g^3 + 3
5*c^2*g*(2016*f^2 + 315*f*g*x + 32*g^2*x^2) - 21*c^4*x*(1750*f^3 + 2240*f^
2*g*x + 1225*f*g^2*x^2 + 256*g^3*x^3) + 2*c^6*x^3*(3675*f^3 + 7056*f^2*g*x
 + 4900*f*g^2*x^2 + 1200*g^3*x^3)) + b^3*Sqrt[1 - c^2*x^2]*(4785152*g^3 +
c^2*g*(39250176*f^2 - 900375*f*g*x - 429824*g^2*x^2) + 4*c^6*x^3*(385875*f
^3 + 592704*f^2*g*x + 343000*f*g^2*x^2 + 72000*g^3*x^3) - 2*c^4*x*(6559875
*f^3 + 5005056*f^2*g*x + 1843625*f*g^2*x^2 + 278784*g^3*x^3)) + 105*b*(882
00*a^2*c*f*(2*c^2*f^2 + g^2) - 1680*a*b*Sqrt[1 - c^2*x^2]*(32*g^3 + c^2*g*
(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6*x^3*(35*f^3 + 84*f^2*g*x + 70*f
*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3 + 336*f^2*g*x + 245*f*g^2*x^2 +
64*g^3*x^3)) + b^2*c*(35*g^2*(245*f + 1536*g*x) + 70*c^2*(1785*f^3 + 8064*
f^2*g*x + 1260*f*g^2*x^2 + 128*g^3*x^3) - 168*c^4*x^2*(1750*f^3 + 2240*f^2
*g*x + 1225*f*g^2*x^2 + 256*g^3*x^3) + 16*c^6*x^4*(3675*f^3 + 7056*f^2*g*x
 + 4900*f*g^2*x^2 + 1200*g^3*x^3)))*ArcSin[c*x] - 88200*b^2*(-105*a*c*f*(2
*c^2*f^2 + g^2) + b*Sqrt[1 - c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x
 + 16*g^2*x^2) + 4*c^6*x^3*(35*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^
3) - 2*c^4*x*(175*f^3 + 336*f^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3))*Arc...
```

Rubi [A] (verified)

Time = 2.48 (sec) , antiderivative size = 1066, normalized size of antiderivative = 0.69, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)^3(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d\sqrt{d-c^2dx^2}\int\left(\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2f^3+3gx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2f^2+3g^2x^2\left(1-c^2x^2\right)\right.}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$\frac{d\sqrt{d-c^2dx^2}\left(\frac{2}{49}bc^3g^3(a+b\arcsin(cx))x^7+\frac{1}{6}bc^3fg^2(a+b\arcsin(cx))x^6-\frac{16}{175}bcg^3(a+b\arcsin(cx))x^5+\frac{6}{25}bc^3\right.}{}$$

input
```
Int[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((4*a*b*g^3*x)/(35*c^3) + (16*b^2*f^2*g*Sqrt[1 - c^
2*x^2])/(25*c^2) + (304*b^2*g^3*Sqrt[1 - c^2*x^2])/(3675*c^4) - (15*b^2*f^
3*x*Sqrt[1 - c^2*x^2])/64 - (7*b^2*f*g^2*x*Sqrt[1 - c^2*x^2])/(384*c^2) -
(43*b^2*f*g^2*x^3*Sqrt[1 - c^2*x^2])/576 + (b^2*c^2*f*g^2*x^5*Sqrt[1 - c^2
*x^2])/36 + (8*b^2*f^2*g*(1 - c^2*x^2)^(3/2))/(75*c^2) + (152*b^2*g^3*(1 -
 c^2*x^2)^(3/2))/(11025*c^4) - (b^2*f^3*x*(1 - c^2*x^2)^(3/2))/32 + (6*b^2
*f^2*g*(1 - c^2*x^2)^(5/2))/(125*c^2) + (38*b^2*g^3*(1 - c^2*x^2)^(5/2))/(
6125*c^4) - (2*b^2*g^3*(1 - c^2*x^2)^(7/2))/(343*c^4) + (9*b^2*f^3*ArcSin[
c*x])/(64*c) + (7*b^2*f*g^2*ArcSin[c*x])/(384*c^3) + (4*b^2*g^3*x*ArcSin[c
*x])/(35*c^3) + (6*b*f^2*g*x*(a + b*ArcSin[c*x]))/(5*c) - (3*b*c*f^3*x^2*(
a + b*ArcSin[c*x]))/8 + (3*b*f*g^2*x^2*(a + b*ArcSin[c*x]))/(16*c) - (4*b*
c*f^2*g*x^3*(a + b*ArcSin[c*x]))/5 + (2*b*g^3*x^3*(a + b*ArcSin[c*x]))/(10
5*c) - (7*b*c*f*g^2*x^4*(a + b*ArcSin[c*x]))/16 + (6*b*c^3*f^2*g*x^5*(a +
b*ArcSin[c*x]))/25 - (16*b*c*g^3*x^5*(a + b*ArcSin[c*x]))/175 + (b*c^3*f*g
^2*x^6*(a + b*ArcSin[c*x]))/6 + (2*b*c^3*g^3*x^7*(a + b*ArcSin[c*x]))/49 +
 (b*f^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(8*c) - (2*g^3*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])^2)/(35*c^4) + (3*f^3*x*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x])^2)/8 - (3*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(16*
c^2) - (g^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^2) + (3*f*g
^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/8 + (3*g^3*x^4*Sqrt[1 -...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.51 (sec) , antiderivative size = 4176, normalized size of antiderivative = 2.72

method	result	size
default	Expression too large to display	4176
parts	Expression too large to display	4176

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^3*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2
*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^3*(-1/7*
x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+3*f*g^2*(-
1/6*x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d
*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-
c^2*d*x^2+d)^(1/2)))))-3/5*f^2*g*(-c^2*d*x^2+d)^(5/2)/c^2/d)+b^2*(-1/16*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*f*(2
*c^2*f^2+g^2)*d-1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*
I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-
25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g
^3*(14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-1/2304*(-d*(c^2
*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2
+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*
(-c^2*x^2+1)^(1/2)-6*c*x)*f*g^2*(6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d/c^3
/(c^2*x^2-1)-1/16000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-
c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-
c^2*x^2+1)^(1/2)*x*c-1)*g*(120*I*arcsin(c*x)*c^2*f^2+300*arcsin(c*x)^2*c^2
*f^2-10*I*arcsin(c*x)*g^2-25*arcsin(c*x)^2*g^2-24*c^2*f^2+2*g^2)*d/c^4/(c^
2*x^2-1)-1/1024*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*
c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+...
```

Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a + b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}} (gx+f)^3 (b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral(-(a^2*c^2*d*g^3*x^5 + 3*a^2*c^2*d*f*g^2*x^4 - 3*a^2*d*f^2*g*x - a
^2*d*f^3 + (3*a^2*c^2*d*f^2*g - a^2*d*g^3)*x^3 + (a^2*c^2*d*f^3 - 3*a^2*d*
f*g^2)*x^2 + (b^2*c^2*d*g^3*x^5 + 3*b^2*c^2*d*f*g^2*x^4 - 3*b^2*d*f^2*g*x
- b^2*d*f^3 + (3*b^2*c^2*d*f^2*g - b^2*d*g^3)*x^3 + (b^2*c^2*d*f^3 - 3*b^2
*d*f*g^2)*x^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d*g^3*x^5 + 3*a*b*c^2*d*f*g^2*x^
4 - 3*a*b*d*f^2*g*x - a*b*d*f^3 + (3*a*b*c^2*d*f^2*g - a*b*d*g^3)*x^3 + (a
*b*c^2*d*f^3 - 3*a*b*d*f*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f + gx)^3 \left(d - c^2dx^2\right)^{3/2} (a + b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f + gx)^3 \left(d - c^2dx^2\right)^{3/2} (a + b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2 + d\right)^{\frac{3}{2}}(gx + f)^3(b\arcsin(cx) + a)^2\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a^2*f^3 - 1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c
^2*d*x^2 + d)^(5/2)/(c^4*d))*a^2*g^3 + 1/16*a^2*f*g^2*(2*(-c^2*d*x^2 + d)^
(3/2)*x/c^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*
d*x/c^2 + 3*d^(3/2)*arcsin(c*x)/c^3) - 3/5*(-c^2*d*x^2 + d)^(5/2)*a^2*f^2*
g/(c^2*d) + sqrt(d)*integrate(-((b^2*c^2*d*g^3*x^5 + 3*b^2*c^2*d*f*g^2*x^4
 - 3*b^2*d*f^2*g*x - b^2*d*f^3 + (3*b^2*c^2*d*f^2*g - b^2*d*g^3)*x^3 + (b^
2*c^2*d*f^3 - 3*b^2*d*f*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))^2 + 2*(a*b*c^2*d*g^3*x^5 + 3*a*b*c^2*d*f*g^2*x^4 - 3*a*b*d*f^2*g*x - a*
b*d*f^3 + (3*a*b*c^2*d*f^2*g - a*b*d*g^3)*x^3 + (a*b*c^2*d*f^3 - 3*a*b*d*f
*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(
-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(d)*d*(210*asin(c*x)*a**2*c**3*f**3 + 105*asin(c*x)*a**2*c*f*g**2 - 1
40*sqrt( - c**2*x**2 + 1)*a**2*c**6*f**3*x**3 - 336*sqrt( - c**2*x**2 + 1)
*a**2*c**6*f**2*g*x**4 - 280*sqrt( - c**2*x**2 + 1)*a**2*c**6*f*g**2*x**5
- 80*sqrt( - c**2*x**2 + 1)*a**2*c**6*g**3*x**6 + 350*sqrt( - c**2*x**2 +
1)*a**2*c**4*f**3*x + 672*sqrt( - c**2*x**2 + 1)*a**2*c**4*f**2*g*x**2 + 4
90*sqrt( - c**2*x**2 + 1)*a**2*c**4*f*g**2*x**3 + 128*sqrt( - c**2*x**2 +
1)*a**2*c**4*g**3*x**4 - 336*sqrt( - c**2*x**2 + 1)*a**2*c**2*f**2*g - 105
*sqrt( - c**2*x**2 + 1)*a**2*c**2*f*g**2*x - 16*sqrt( - c**2*x**2 + 1)*a**
2*c**2*g**3*x**2 - 32*sqrt( - c**2*x**2 + 1)*a**2*g**3 - 1120*int(sqrt( -
c**2*x**2 + 1)*asin(c*x)*x**5,x)*a*b*c**6*g**3 - 3360*int(sqrt( - c**2*x**
2 + 1)*asin(c*x)*x**4,x)*a*b*c**6*f*g**2 - 3360*int(sqrt( - c**2*x**2 + 1)
*asin(c*x)*x**3,x)*a*b*c**6*f**2*g + 1120*int(sqrt( - c**2*x**2 + 1)*asin(
c*x)*x**3,x)*a*b*c**4*g**3 - 1120*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**
2,x)*a*b*c**6*f**3 + 3360*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*a*b
*c**4*f*g**2 + 3360*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x,x)*a*b*c**4*f**
2*g + 1120*int(sqrt( - c**2*x**2 + 1)*asin(c*x),x)*a*b*c**4*f**3 - 560*int
(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x**5,x)*b**2*c**6*g**3 - 1680*int(sqr
t( - c**2*x**2 + 1)*asin(c*x)**2*x**4,x)*b**2*c**6*f*g**2 - 1680*int(sqrt(
 - c**2*x**2 + 1)*asin(c*x)**2*x**3,x)*b**2*c**6*f**2*g + 560*int(sqrt( -
c**2*x**2 + 1)*asin(c*x)**2*x**3,x)*b**2*c**4*g**3 - 560*int(sqrt( - c*...
```

3.136 $\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 33, antiderivative size = 1044

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \frac{32b^2dfg\sqrt{d-c^2dx^2}}{75c^2}$$
$$-\frac{15}{64}b^2df^2x\sqrt{d-c^2dx^2}-\frac{7b^2dg^2x\sqrt{d-c^2dx^2}}{1152c^2}-\frac{43b^2dg^2x^3\sqrt{d-c^2dx^2}}{1728}$$
$$+\frac{1}{108}b^2c^2dg^2x^5\sqrt{d-c^2dx^2}+\frac{16b^2fg(d-c^2dx^2)^{3/2}}{225c^2}$$
$$-\frac{1}{32}b^2f^2x\left(d-c^2dx^2\right)^{3/2}+\frac{4b^2fg(d-c^2dx^2)^{5/2}}{125c^2d}+\frac{9b^2df^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}$$
$$+\frac{7b^2dg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c^3\sqrt{1-c^2x^2}}+\frac{4bdfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}$$
$$-\frac{3bcdf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}+\frac{bdg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}}$$
$$-\frac{8bcdfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}-\frac{7bcdg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}}$$
$$+\frac{4bc^3dfgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}+\frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}}$$
$$+\frac{bdf^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}$$
$$+\frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2}+\frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\,\mathrm{arcsi}$$

output
```
-1/16*d*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/c^2+32/75*b^2*d*f*g
*(-c^2*d*x^2+d)^(1/2)/c^2-7/1152*b^2*d*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2+1/10
8*b^2*c^2*d*g^2*x^5*(-c^2*d*x^2+d)^(1/2)+4/125*b^2*f*g*(-c^2*d*x^2+d)^(5/2
)/c^2/d-2/5*f*g*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/c^2/d+16/225*b^2*
f*g*(-c^2*d*x^2+d)^(3/2)/c^2-3/8*b*c*d*f^2*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*a
rcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/16*b*d*g^2*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*
arcsin(c*x))/c/(-c^2*x^2+1)^(1/2)-7/48*b*c*d*g^2*x^4*(-c^2*d*x^2+d)^(1/2)*
(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/18*b*c^3*d*g^2*x^6*(-c^2*d*x^2+d)^(
1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/8*b*d*f^2*(-c^2*x^2+1)^(3/2)*(
-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c+1/8*d*f^2*(-c^2*d*x^2+d)^(1/2)*(a+
b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(1/2)+1/48*d*g^2*(-c^2*d*x^2+d)^(1/2)*(a
+b*arcsin(c*x))^3/b/c^3/(-c^2*x^2+1)^(1/2)+9/64*b^2*d*f^2*(-c^2*d*x^2+d)^(
1/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(1/2)+7/1152*b^2*d*g^2*(-c^2*d*x^2+d)^(1/2
)*arcsin(c*x)/c^3/(-c^2*x^2+1)^(1/2)+1/4*f^2*x*(-c^2*d*x^2+d)^(3/2)*(a+b*a
rcsin(c*x))^2+1/6*g^2*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-1/32*b^
2*f^2*x*(-c^2*d*x^2+d)^(3/2)-15/64*b^2*d*f^2*x*(-c^2*d*x^2+d)^(1/2)-43/172
8*b^2*d*g^2*x^3*(-c^2*d*x^2+d)^(1/2)+3/8*d*f^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b
*arcsin(c*x))^2+1/8*d*g^2*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2-8/1
5*b*c*d*f*g*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+
4/25*b*c^3*d*f*g*x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1...
```

Mathematica [A] (verified)

Time = 0.60 (sec) , antiderivative size = 616, normalized size of antiderivative = 0.59

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \frac{d\sqrt{d-c^2dx^2}\Big(9000a^3(6c^2f^2+g^2)+120ab^2c^2x(450c^2f^2x(-5+c^2x^2)+192fg(15-1}{}$$

input
```
Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(9000*a^3*(6*c^2*f^2 + g^2) + 120*a*b^2*c^2*x*(450*
c^2*f^2*x*(-5 + c^2*x^2) + 192*f*g*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 25*g^2*
x*(9 - 21*c^2*x^2 + 8*c^4*x^4)) - 1800*a^2*b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(
-1 + c^2*x^2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2
+ 8*c^4*x^4)) + b^3*c*Sqrt[1 - c^2*x^2]*(6750*c^2*f^2*x*(-17 + 2*c^2*x^2)
+ 1536*f*g*(149 - 38*c^2*x^2 + 9*c^4*x^4) + 125*g^2*x*(-21 - 86*c^2*x^2 +
32*c^4*x^4)) + 15*b*(1800*a^2*(6*c^2*f^2 + g^2) + b^2*(175*g^2 + 90*c^2*(8
5*f^2 + 256*f*g*x + 20*g^2*x^2) - 120*c^4*x^2*(150*f^2 + 128*f*g*x + 35*g^
2*x^2) + 16*c^6*x^4*(225*f^2 + 288*f*g*x + 100*g^2*x^2)) - 240*a*b*c*Sqrt[
1 - c^2*x^2]*(96*f*g*(-1 + c^2*x^2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*
g^2*x*(3 - 14*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x] + 1800*b^2*(15*a*(6*c^2*f
^2 + g^2) - b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1 + c^2*x^2)^2 + 30*c^2*f^2*x*
(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x]^2 +
9000*b^3*(6*c^2*f^2 + g^2)*ArcSin[c*x]^3))/(432000*b*c^3*Sqrt[1 - c^2*x^2]
)
```

Rubi [A] (verified)

Time = 1.72 (sec) , antiderivative size = 699, normalized size of antiderivative = 0.67, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)^2(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(f^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2+g^2x^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2+2fgx\left(1-c^2x^2\right)^{3/}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$d\sqrt{d-c^2dx^2}\left(\frac{4}{25}bc^3fgx^5(a+b\arcsin(cx))+\frac{1}{18}bc^3g^2x^6(a+b\arcsin(cx))+\frac{g^2(a+b\arcsin(cx))^3}{48bc^3}+\frac{1}{4}f^2x(1-c^2x^2)^{3/}\right.$$

input
```
Int[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((32*b^2*f*g*Sqrt[1 - c^2*x^2])/(75*c^2) - (15*b^2*
f^2*x*Sqrt[1 - c^2*x^2])/64 - (7*b^2*g^2*x*Sqrt[1 - c^2*x^2])/(1152*c^2) -
 (43*b^2*g^2*x^3*Sqrt[1 - c^2*x^2])/1728 + (b^2*c^2*g^2*x^5*Sqrt[1 - c^2*x
^2])/108 + (16*b^2*f*g*(1 - c^2*x^2)^(3/2))/(225*c^2) - (b^2*f^2*x*(1 - c^
2*x^2)^(3/2))/32 + (4*b^2*f*g*(1 - c^2*x^2)^(5/2))/(125*c^2) + (9*b^2*f^2*
ArcSin[c*x])/(64*c) + (7*b^2*g^2*ArcSin[c*x])/(1152*c^3) + (4*b*f*g*x*(a +
 b*ArcSin[c*x]))/(5*c) - (3*b*c*f^2*x^2*(a + b*ArcSin[c*x]))/8 + (b*g^2*x^
2*(a + b*ArcSin[c*x]))/(16*c) - (8*b*c*f*g*x^3*(a + b*ArcSin[c*x]))/15 - (
7*b*c*g^2*x^4*(a + b*ArcSin[c*x]))/48 + (4*b*c^3*f*g*x^5*(a + b*ArcSin[c*x
]))/25 + (b*c^3*g^2*x^6*(a + b*ArcSin[c*x]))/18 + (b*f^2*(1 - c^2*x^2)^2*(
a + b*ArcSin[c*x]))/(8*c) + (3*f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^2)/8 - (g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(16*c^2) + (g^2*x^
3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/8 + (f^2*x*(1 - c^2*x^2)^(3/2)*
(a + b*ArcSin[c*x])^2)/4 + (g^2*x^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]
)^2)/6 - (2*f*g*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(5*c^2) + (f^2*
(a + b*ArcSin[c*x])^3)/(8*b*c) + (g^2*(a + b*ArcSin[c*x])^3)/(48*b*c^3)))/
Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.11 (sec) , antiderivative size = 3032, normalized size of antiderivative = 2.90

method	result	size
default	Expression too large to display	3032
parts	Expression too large to display	3032

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2
*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^2*(-1/6*
x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/
2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*
d*x^2+d)^(1/2)))))-2/5*f*g*(-c^2*d*x^2+d)^(5/2)/c^2/d)+b^2*(-1/48*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*(6*c^2*f^2
+g^2)*d-1/6912*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*x^6*c^6+32
*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*g^2*(6*I*arcsin(c*x)+18*a
rcsin(c*x)^2-1)*d/c^3/(c^2*x^2-1)-1/2000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^
6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^
(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(10*I*arcsin(c*x)+25*arcsi
n(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/1024*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^
2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(
-c^2*x^2+1)^(1/2)+4*c*x)*(8*I*arcsin(c*x)*c^2*f^2+16*arcsin(c*x)^2*c^2*f^2
-4*I*arcsin(c*x)*g^2-8*arcsin(c*x)^2*g^2-2*c^2*f^2+g^2)*d/c^3/(c^2*x^2-1)-
1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*f*g*(arcsi
n(c*x)^2-2+2*I*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(
I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*
d/c^2/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*...
```

Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral(-(a^2*c^2*d*g^2*x^4 + 2*a^2*c^2*d*f*g*x^3 - 2*a^2*d*f*g*x - a^2*d
*f^2 + (a^2*c^2*d*f^2 - a^2*d*g^2)*x^2 + (b^2*c^2*d*g^2*x^4 + 2*b^2*c^2*d*
f*g*x^3 - 2*b^2*d*f*g*x - b^2*d*f^2 + (b^2*c^2*d*f^2 - b^2*d*g^2)*x^2)*arc
sin(c*x)^2 + 2*(a*b*c^2*d*g^2*x^4 + 2*a*b*c^2*d*f*g*x^3 - 2*a*b*d*f*g*x -
a*b*d*f^2 + (a*b*c^2*d*f^2 - a*b*d*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2
+ d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a^2*f^2 + 1/48*a^2*g^2*(2*(-c^2*d*x^2 + d)^(3/2)*x/c^2 - 8*(
-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^2 + 3*d^(3/
2)*arcsin(c*x)/c^3) - 2/5*(-c^2*d*x^2 + d)^(5/2)*a^2*f*g/(c^2*d) + sqrt(d)
*integrate(-((b^2*c^2*d*g^2*x^4 + 2*b^2*c^2*d*f*g*x^3 - 2*b^2*d*f*g*x - b^
2*d*f^2 + (b^2*c^2*d*f^2 - b^2*d*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2 + 2*(a*b*c^2*d*g^2*x^4 + 2*a*b*c^2*d*f*g*x^3 - 2*a*b*d*f*g*x
 - a*b*d*f^2 + (a*b*c^2*d*f^2 - a*b*d*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \frac{\sqrt{d}\,d\big(90asin(cx)\,a^2c^2f^2+15asin(cx)\,a^2g^2-60\sqrt{-c^2x^2+1}\,a^2c^5f^2x^3-96\sqrt{-c^2x^2+}}{}$$

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(d)*d*(90*asin(c*x)*a**2*c**2*f**2 + 15*asin(c*x)*a**2*g**2 - 60*sqrt
( - c**2*x**2 + 1)*a**2*c**5*f**2*x**3 - 96*sqrt( - c**2*x**2 + 1)*a**2*c*
*5*f*g*x**4 - 40*sqrt( - c**2*x**2 + 1)*a**2*c**5*g**2*x**5 + 150*sqrt( -
c**2*x**2 + 1)*a**2*c**3*f**2*x + 192*sqrt( - c**2*x**2 + 1)*a**2*c**3*f*g
*x**2 + 70*sqrt( - c**2*x**2 + 1)*a**2*c**3*g**2*x**3 - 96*sqrt( - c**2*x*
*2 + 1)*a**2*c*f*g - 15*sqrt( - c**2*x**2 + 1)*a**2*c*g**2*x - 480*int(sqr
t( - c**2*x**2 + 1)*asin(c*x)*x**4,x)*a*b*c**5*g**2 - 960*int(sqrt( - c**2
*x**2 + 1)*asin(c*x)*x**3,x)*a*b*c**5*f*g - 480*int(sqrt( - c**2*x**2 + 1)
*asin(c*x)*x**2,x)*a*b*c**5*f**2 + 480*int(sqrt( - c**2*x**2 + 1)*asin(c*x
)*x**2,x)*a*b*c**3*g**2 + 960*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x,x)*a*
b*c**3*f*g + 480*int(sqrt( - c**2*x**2 + 1)*asin(c*x),x)*a*b*c**3*f**2 - 2
40*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x**4,x)*b**2*c**5*g**2 - 480*in
t(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x**3,x)*b**2*c**5*f*g - 240*int(sqrt
( - c**2*x**2 + 1)*asin(c*x)**2*x**2,x)*b**2*c**5*f**2 + 240*int(sqrt( - c
**2*x**2 + 1)*asin(c*x)**2*x**2,x)*b**2*c**3*g**2 + 480*int(sqrt( - c**2*x
**2 + 1)*asin(c*x)**2*x,x)*b**2*c**3*f*g + 240*int(sqrt( - c**2*x**2 + 1)*
asin(c*x)**2,x)*b**2*c**3*f**2 + 96*a**2*c*f*g))/(240*c**3)
```

3.137 $\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 31, antiderivative size = 568

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{16b^2dg\sqrt{d-c^2dx^2}}{75c^2}$$
$$-\frac{15}{64}b^2dfx\sqrt{d-c^2dx^2}+\frac{8b^2g(d-c^2dx^2)^{3/2}}{225c^2}$$
$$-\frac{1}{32}b^2fx\left(d-c^2dx^2\right)^{3/2}+\frac{2b^2g(d-c^2dx^2)^{5/2}}{125c^2d}+\frac{9b^2df\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}$$
$$+\frac{2bdgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{3bcdfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$-\frac{4bcdgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}}+\frac{2bc^3dgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}$$
$$+\frac{bdf(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}$$
$$+\frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{4}fx\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2-\frac{g(d-c^2dx^2)^{5/2}(a+b\arcsin(}{5c^2d}$$

output
```
16/75*b^2*d*g*(-c^2*d*x^2+d)^(1/2)/c^2-15/64*b^2*d*f*x*(-c^2*d*x^2+d)^(1/2
)+8/225*b^2*g*(-c^2*d*x^2+d)^(3/2)/c^2-1/32*b^2*f*x*(-c^2*d*x^2+d)^(3/2)+2
/125*b^2*g*(-c^2*d*x^2+d)^(5/2)/c^2/d+9/64*b^2*d*f*(-c^2*d*x^2+d)^(1/2)*ar
csin(c*x)/c/(-c^2*x^2+1)^(1/2)+2/5*b*d*g*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsi
n(c*x))/c/(-c^2*x^2+1)^(1/2)-3/8*b*c*d*f*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arc
sin(c*x))/(-c^2*x^2+1)^(1/2)-4/15*b*c*d*g*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*ar
csin(c*x))/(-c^2*x^2+1)^(1/2)+2/25*b*c^3*d*g*x^5*(-c^2*d*x^2+d)^(1/2)*(a+b
*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+1/8*b*d*f*(-c^2*x^2+1)^(3/2)*(-c^2*d*x^2+
d)^(1/2)*(a+b*arcsin(c*x))/c+3/8*d*f*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*
x))^2+1/4*f*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2-1/5*g*(-c^2*d*x^2+d
)^(5/2)*(a+b*arcsin(c*x))^2/c^2/d+1/8*d*f*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin
(c*x))^3/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 395, normalized size of antiderivative = 0.70

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{d\sqrt{d-c^2dx^2}\Big(9000a^3cf-1800a^2b\sqrt{1-c^2x^2}\Big(8g(-1+c^2x^2)^2+5c^2fx(-5+2c^2x^2)\Big)$$

input
```
Integrate[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(9000*a^3*c*f - 1800*a^2*b*Sqrt[1 - c^2*x^2]*(8*g*(
-1 + c^2*x^2)^2 + 5*c^2*f*x*(-5 + 2*c^2*x^2)) + 120*a*b^2*c*x*(75*c^2*f*x*
(-5 + c^2*x^2) + 16*g*(15 - 10*c^2*x^2 + 3*c^4*x^4)) + b^3*Sqrt[1 - c^2*x^
2]*(1125*c^2*f*x*(-17 + 2*c^2*x^2) + 128*g*(149 - 38*c^2*x^2 + 9*c^4*x^4))
 + 15*b*(1800*a^2*c*f - 240*a*b*Sqrt[1 - c^2*x^2]*(8*g*(-1 + c^2*x^2)^2 +
5*c^2*f*x*(-5 + 2*c^2*x^2)) + b^2*c*(128*g*x*(15 - 10*c^2*x^2 + 3*c^4*x^4)
 + 75*f*(17 - 40*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x] + 1800*b^2*(15*a*c*f +
 b*Sqrt[1 - c^2*x^2]*(5*c^2*f*x*(5 - 2*c^2*x^2) - 8*g*(-1 + c^2*x^2)^2))*A
rcSin[c*x]^2 + 9000*b^3*c*f*ArcSin[c*x]^3))/(72000*b*c^2*Sqrt[1 - c^2*x^2]
)
```

Rubi [A] (verified)

Time = 0.96 (sec) , antiderivative size = 384, normalized size of antiderivative = 0.68, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 5262}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(f\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2+gx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 2009}$$

$$d\sqrt{d-c^2dx^2}\left(\frac{2}{25}bc^3gx^5(a+b\arcsin(cx))+\frac{1}{4}fx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{3}{8}fx\sqrt{1-c^2x^2}(a+b\arcsin(\right.$$

input
```
Int[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((16*b^2*g*Sqrt[1 - c^2*x^2])/(75*c^2) - (15*b^2*f*
x*Sqrt[1 - c^2*x^2])/64 + (8*b^2*g*(1 - c^2*x^2)^(3/2))/(225*c^2) - (b^2*f
*x*(1 - c^2*x^2)^(3/2))/32 + (2*b^2*g*(1 - c^2*x^2)^(5/2))/(125*c^2) + (9*
b^2*f*ArcSin[c*x])/(64*c) + (2*b*g*x*(a + b*ArcSin[c*x]))/(5*c) - (3*b*c*f
*x^2*(a + b*ArcSin[c*x]))/8 - (4*b*c*g*x^3*(a + b*ArcSin[c*x]))/15 + (2*b*
c^3*g*x^5*(a + b*ArcSin[c*x]))/25 + (b*f*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x
]))/(8*c) + (3*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/8 + (f*x*(1 -
c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 - (g*(1 - c^2*x^2)^(5/2)*(a + b*Ar
cSin[c*x])^2)/(5*c^2) + (f*(a + b*ArcSin[c*x])^3)/(8*b*c)))/Sqrt[1 - c^2*x
^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.98 (sec) , antiderivative size = 2021, normalized size of antiderivative = 3.56

method	result	size
default	Expression too large to display	2021
parts	Expression too large to display	2021

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBO
SE)
```

output
```
1/4*a^2*f*x*(-c^2*d*x^2+d)^(3/2)+3/8*a^2*f*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a^
2*f*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/5*a^2
*g*(-c^2*d*x^2+d)^(5/2)/c^2/d+b^2*(-1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*f*d-1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*
c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(10*I*arcsin(c*x)+25*a
rcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2
*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-
I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)*d/c/(c^2
*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*g
*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*I*arcsin(
c*x))*d/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(2*arcsin(c*x)^2-1-2*I*a
rcsin(c*x))*d/c/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^
2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-6*I*a
rcsin(c*x)+9*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/18000*(-d*(c^2*x^2-1))^(
1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(330*I*arcsin(c*x)+675*arcsin(
c*x)^2-134)*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/9000*(-d*(c^2*x^2-1))^(
1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(210*I*arcsin(c*x)+225*arcs...
```

Fricas [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="f
ricas")
```

output
```
integral(-(a^2*c^2*d*g*x^3 + a^2*c^2*d*f*x^2 - a^2*d*g*x - a^2*d*f + (b^2*
c^2*d*g*x^3 + b^2*c^2*d*f*x^2 - b^2*d*g*x - b^2*d*f)*arcsin(c*x)^2 + 2*(a*
b*c^2*d*g*x^3 + a*b*c^2*d*f*x^2 - a*b*d*g*x - a*b*d*f)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d), x)
```

Sympy [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \left(-d(cx-1)\,(cx+1)\right)^{\frac{3}{2}}\,(a+b\operatorname{asin}(cx))^2\,(f+gx)\,dx$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2*(f + g*x), x
)
```

Maxima [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="m
axima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a^2*f - 1/5*(-c^2*d*x^2 + d)^(5/2)*a^2*g/(c^2*d) + sqrt(d)*i
ntegrate(-((b^2*c^2*d*g*x^3 + b^2*c^2*d*f*x^2 - b^2*d*g*x - b^2*d*f)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*g*x^3 + a*b*c^2*d*f
*x^2 - a*b*d*g*x - a*b*d*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sq
rt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{\sqrt{d}\,d\left(15asin(cx)\,a^2cf-10\sqrt{-c^2x^2+1}\,a^2c^4f\,x^3-8\sqrt{-c^2x^2+1}\,a^2c^4g\,x^4+25\sqrt{-c^2x\right.}{}$$

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(d)*d*(15*asin(c*x)*a**2*c*f - 10*sqrt( - c**2*x**2 + 1)*a**2*c**4*f*
x**3 - 8*sqrt( - c**2*x**2 + 1)*a**2*c**4*g*x**4 + 25*sqrt( - c**2*x**2 +
1)*a**2*c**2*f*x + 16*sqrt( - c**2*x**2 + 1)*a**2*c**2*g*x**2 - 8*sqrt( -
c**2*x**2 + 1)*a**2*g - 80*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*a*
b*c**4*g - 80*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*a*b*c**4*f + 80
*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x,x)*a*b*c**2*g + 80*int(sqrt( - c**
2*x**2 + 1)*asin(c*x),x)*a*b*c**2*f - 40*int(sqrt( - c**2*x**2 + 1)*asin(c
*x)**2*x**3,x)*b**2*c**4*g - 40*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x*
*2,x)*b**2*c**4*f + 40*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x,x)*b**2*c
**2*g + 40*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2,x)*b**2*c**2*f + 8*a**2
*g))/(40*c**2)
```

3.138 $\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1970

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Too large to display}$$

output
```
2*b^2*d*(c*f-g)*(c*f+g)*(-c^2*d*x^2+d)^(1/2)/g^3-a^2*d*(c*f-g)*(c*f+g)*(-c
^2*d*x^2+d)^(1/2)/g^3-2*b^2*d*(c^2*f^2-g^2)^(3/2)*(-c^2*d*x^2+d)^(1/2)*arc
sin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)
))/g^4/(-c^2*x^2+1)^(1/2)-2*I*b^2*d*(c^2*f^2-g^2)^(3/2)*(-c^2*d*x^2+d)^(1/
2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^4
/(-c^2*x^2+1)^(1/2)+2*a*b*d*(c^2*f^2-g^2)^(3/2)*(-c^2*d*x^2+d)^(1/2)*polyl
og(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/g^4/(-c^2*x
^2+1)^(1/2)-2*a*b*d*(c^2*f^2-g^2)^(3/2)*(-c^2*d*x^2+d)^(1/2)*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^4/(-c^2*x^2+1)^(1
/2)-2*a*b*d*(c*f-g)*(c*f+g)*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g^3+1/4*b^2*c
*d*f*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g^2/(-c^2*x^2+1)^(1/2)-2/3*b*c*d*x*(
-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/g/(-c^2*x^2+1)^(1/2)+2/9*b*c^3*d*x^3
*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/g/(-c^2*x^2+1)^(1/2)+2*I*b^2*d*(c^
2*f^2-g^2)^(3/2)*(-c^2*d*x^2+d)^(1/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2
))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/g^4/(-c^2*x^2+1)^(1/2)+2*a*b*c*d*(c*f-g)*(
c*f+g)*x*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)+2*b^2*c*d*(c*f-g)*(c*
f+g)*x*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g^3/(-c^2*x^2+1)^(1/2)-1/3*c*d*(c*
f-g)*(c*f+g)*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^3/b/g^3/(-c^2*x^2+1)
^(1/2)-1/3*d*(c*f-g)*(c*f+g)*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)*(a+b*
arcsin(c*x))^3/b/c/g^2/(g*x+f)-2*I*a*b*d*(c^2*f^2-g^2)^(3/2)*(-c^2*d*x^...
```

Mathematica [A] (verified)

Time = 1.55 (sec) , antiderivative size = 740, normalized size of antiderivative = 0.38

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \frac{d\sqrt{d-c^2dx^2}\left(54c^2fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+36g(1-c\right.}{}$$

input
```
Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(54*c^2*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2
 + 36*g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2 + (18*c*f*(a + b*ArcSin[
c*x])^3)/b + (36*(c^2*f^2 - g^2)*(-1 + c^2*x^2)*(a + b*ArcSin[c*x])^3)/(b*
c*(f + g*x)) - 27*b*c*f*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c
^2*x^2)*ArcSin[c*x]) - 8*b*g*(b*Sqrt[1 - c^2*x^2]*(7 - c^2*x^2) + 9*c*x*(a
 + b*ArcSin[c*x]) - 3*c^3*x^3*(a + b*ArcSin[c*x])) - (36*(c^2*f^2 - g^2)*(
(c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^3 + c^2*g*x*(f + g*x)*(a + b*ArcSin[c*
x])^3 + 3*b*c*(f + g*x)*(g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*g
*(a*c*x + b*Sqrt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]) + I*Sqrt[c^2*f^2 - g^2]
*((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2
*f^2 - g^2])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*
ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*(a + b*ArcSin[c*x])
*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + 2*b^2*P
olyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] - 2*b^2*Pol
yLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/(b*c*g^2*
(f + g*x)))/(108*g^2*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 4.07 (sec) , antiderivative size = 1369, normalized size of antiderivative = 0.69, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \frac{(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5266}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(-\frac{c^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g}+\frac{(g^2-c^2f^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g^2(f+gx)}+\frac{c^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g^2}\right)dx}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$d\sqrt{d-c^2dx^2}\left(\frac{2bx^3(a+b\arcsin(cx))c^3}{9g}-\frac{bfx^2(a+b\arcsin(cx))c^3}{2g^2}+\frac{fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^2}{2g^2}-\frac{b^2fx\sqrt{1-c^2x^2}c^2}{4g^2}-\frac{(c^2f^2-g^2)}{}\right.$$

input
```
Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((2*a*b*c*(c^2*f^2 - g^2)*x)/g^3 - (4*b^2*Sqrt[1 -
c^2*x^2])/(9*g) - (a^2*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2])/g^3 + (2*b^2
*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2])/g^3 - (b^2*c^2*f*x*Sqrt[1 - c^2*x^
2])/(4*g^2) - (2*b^2*(1 - c^2*x^2)^(3/2))/(27*g) + (b^2*c*f*ArcSin[c*x])/(
4*g^2) + (2*b^2*c*(c^2*f^2 - g^2)*x*ArcSin[c*x])/g^3 - (2*a*b*(c*f - g)*(c
*f + g)*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/g^3 - (b^2*(c*f - g)*(c*f + g)*Sqrt
[1 - c^2*x^2]*ArcSin[c*x]^2)/g^3 - (2*b*c*x*(a + b*ArcSin[c*x]))/(3*g) - (
b*c^3*f*x^2*(a + b*ArcSin[c*x]))/(2*g^2) + (2*b*c^3*x^3*(a + b*ArcSin[c*x]
))/(9*g) + (c^2*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*g^2) + ((1
 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*g) + (c*f*(a + b*ArcSin[c*x])^
3)/(6*b*g^2) - (c*(c^2*f^2 - g^2)*x*(a + b*ArcSin[c*x])^3)/(3*b*g^3) - ((c
^2*f^2 - g^2)^2*(a + b*ArcSin[c*x])^3)/(3*b*c*g^4*(f + g*x)) - ((c^2*f^2 -
 g^2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^3)/(3*b*c*g^2*(f + g*x)) + (a^2*(c
^2*f^2 - g^2)^(3/2)*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2
*x^2])])/g^4 - ((2*I)*a*b*(c^2*f^2 - g^2)^(3/2)*ArcSin[c*x]*Log[1 - (I*E^(
I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^4 - (I*b^2*(c^2*f^2 - g^
2)^(3/2)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2
 - g^2])])/g^4 + ((2*I)*a*b*(c^2*f^2 - g^2)^(3/2)*ArcSin[c*x]*Log[1 - (I*E
^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^4 + (I*b^2*(c^2*f^2 -
g^2)^(3/2)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5266
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] && !GtQ[d, 0]
```

Maple [F]

$$\int \frac{(-c^2d\,x^2+d)^{\frac{3}{2}}\,(a+b\arcsin{(cx)})^2}{gx+f}dx$$

input
```
int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

output
```
int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{f+gx}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin{(cx)}+a)^2}{gx+f}\,dx$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="f
ricas")
```

output
```
integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
 2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(g*x + f), x)
```

Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{f+gx}\,dx=\int \frac{(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))^2}{f+gx}\,dx$$

input
```
integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/(g*x+f),x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/(f + g*x), x
)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}\,(a+b\arcsin(cx))^2}{f+gx}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="m
axima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{f+g\,x}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/(f + g*x), x)
```

Reduce [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \frac{\sqrt{d}\,d\Big(-6asin(cx)\,a^2c^3f^3+9asin(cx)\,a^2cf\,g^2+12\sqrt{c^2f^2-g^2}\,a}{}$$

input
```
int((-c^2*d*x^2+d)^(3/2)*(a+b*asin(c*x))^2/(g*x+f),x)
```

output
```
(sqrt(d)*d*( - 6*asin(c*x)*a**2*c**3*f**3 + 9*asin(c*x)*a**2*c*f*g**2 + 12
*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 - g
**2))*a**2*c**2*f**2 - 12*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*
f + g)/sqrt(c**2*f**2 - g**2))*a**2*g**2 - 6*sqrt( - c**2*x**2 + 1)*a**2*c
**2*f**2*g + 3*sqrt( - c**2*x**2 + 1)*a**2*c**2*f*g**2*x - 2*sqrt( - c**2*
x**2 + 1)*a**2*c**2*g**3*x**2 + 8*sqrt( - c**2*x**2 + 1)*a**2*g**3 - 12*in
t((sqrt( - c**2*x**2 + 1)*asin(c*x)*x**2)/(f + g*x),x)*a*b*c**2*g**4 + 12*
int((sqrt( - c**2*x**2 + 1)*asin(c*x))/(f + g*x),x)*a*b*g**4 - 6*int((sqrt
( - c**2*x**2 + 1)*asin(c*x)**2*x**2)/(f + g*x),x)*b**2*c**2*g**4 + 6*int(
(sqrt( - c**2*x**2 + 1)*asin(c*x)**2)/(f + g*x),x)*b**2*g**4 - 2*a**2*c**2
*f**2*g))/(6*g**4)
```

3.139 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 33, antiderivative size = 2037

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

output
```
-1/63*d^2*g^3*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/c^2+359/12288*b
^2*d^2*f*g^2*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/c^3/(-c^2*x^2+1)^(1/2)+15/64
*d^2*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2-1079/18432*b^2*d^2
*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2)+96/245*b^2*d^2*f^2*g*(-c^2*d*x^2+d)^(1/2)/
c^2+16/245*b^2*d*f^2*g*(-c^2*d*x^2+d)^(3/2)/c^2+5/16*d*f*g^2*x^3*(-c^2*d*x
^2+d)^(3/2)*(a+b*arcsin(c*x))^2+80/11907*b^2*d*g^3*(-c^2*d*x^2+d)^(3/2)/c^
4-65/1728*b^2*d*f^3*x*(-c^2*d*x^2+d)^(3/2)+36/1225*b^2*f^2*g*(-c^2*d*x^2+d
)^(5/2)/c^2+50/27783*b^2*g^3*(-c^2*d*x^2+d)^(7/2)/c^4/d-2/729*b^2*g^3*(-c^
2*d*x^2+d)^(9/2)/c^4/d^2+5/24*d*f^3*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x
))^2+5/63*d*g^3*x^4*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+3/8*f*g^2*x^3
*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2-3/7*f^2*g*(-c^2*d*x^2+d)^(7/2)*(
a+b*arcsin(c*x))^2/c^2/d+6/343*b^2*f^2*g*(-c^2*d*x^2+d)^(7/2)/c^2/d+4/63*b
*d^2*g^3*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c^3/(-c^2*x^2+1)^(1/2)-5
/16*b*c*d^2*f^3*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1
/2)+2/189*b*d^2*g^3*x^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*x^2
+1)^(1/2)-2/21*b*c*d^2*g^3*x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^
2*x^2+1)^(1/2)+38/441*b*c^3*d^2*g^3*x^7*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c
*x))/(-c^2*x^2+1)^(1/2)-2/81*b*c^5*d^2*g^3*x^9*(-c^2*d*x^2+d)^(1/2)*(a+b*a
rcsin(c*x))/(-c^2*x^2+1)^(1/2)+5/128*d^2*f*g^2*(-c^2*d*x^2+d)^(1/2)*(a+b*a
rcsin(c*x))^3/b/c^3/(-c^2*x^2+1)^(1/2)-359/12288*b^2*d^2*f*g^2*x*(-c^2*...
```

Mathematica [A] (verified)

Time = 1.07 (sec) , antiderivative size = 1114, normalized size of antiderivative = 0.55

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

input
```
Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(333396000*a^3*(8*c^3*f^3 + 3*c*f*g^2) + 3175200*
a^2*b*Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 128*g^2*
x^2) + 16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3) - 8*
c^6*x^3*(546*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^4*x*
(924*f^3 + 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)) - 10080*a*b^2*c*x
*(-161280*g^3 - 105*c^2*g*(20736*f^2 + 2835*f*g*x + 256*g^2*x^2) + 945*c^4
*x*(1848*f^3 + 2304*f^2*g*x + 1239*f*g^2*x^2 + 256*g^3*x^3) - 72*c^6*x^3*(
9555*f^3 + 18144*f^2*g*x + 12495*f*g^2*x^2 + 3040*g^3*x^3) + 20*c^8*x^5*(7
056*f^3 + 15552*f^2*g*x + 11907*f*g^2*x^2 + 3136*g^3*x^3)) - b^3*Sqrt[1 -
c^2*x^2]*(-1257472000*g^3 + c^2*g*(-12905422848*f^2 + 748057275*f*g*x + 18
4115200*g^2*x^2) + 400*c^8*x^5*(592704*f^3 + 1119744*f^2*g*x + 750141*f*g^
2*x^2 + 175616*g^3*x^3) - 8*c^6*x^3*(179663400*f^3 + 262020096*f^2*g*x + 1
45166175*f*g^2*x^2 + 29363200*g^3*x^3) + 6*c^4*x*(1107615600*f^3 + 7534632
96*f^2*g*x + 249815475*f*g^2*x^2 + 34304000*g^3*x^3)) + 315*b*(3175200*a^2
*(8*c^3*f^3 + 3*c*f*g^2) + 20160*a*b*Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(
3456*f^2 + 945*f*g*x + 128*g^2*x^2) + 16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 1
89*f*g^2*x^2 + 56*g^3*x^3) - 8*c^6*x^3*(546*f^3 + 1296*f^2*g*x + 1071*f*g^
2*x^2 + 304*g^3*x^3) + 6*c^4*x*(924*f^3 + 1728*f^2*g*x + 1239*f*g^2*x^2 +
320*g^3*x^3)) + b^2*c*(315*g^2*(7539*f + 16384*g*x) - 30240*c^4*x^2*(1848*
f^3 + 2304*f^2*g*x + 1239*f*g^2*x^2 + 256*g^3*x^3) + 3360*c^2*(6279*f^3...
```

Rubi [A] (verified)

Time = 3.52 (sec) , antiderivative size = 1379, normalized size of antiderivative = 0.68, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)^3(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \; 5276$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \; 5262$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int\left(\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2f^3+3gx\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2f^2+3g^2x^2\left(1-c^2x^2\right.\right.}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$\frac{d^2\sqrt{d-c^2dx^2}\left(-\frac{2}{81}bc^5g^3(a+b\arcsin(cx))x^9-\frac{3}{32}bc^5fg^2(a+b\arcsin(cx))x^8+\frac{38}{441}bc^3g^3(a+b\arcsin(cx))x^7-\right.}{}$$

input
```
Int[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((4*a*b*g^3*x)/(63*c^3) + (96*b^2*f^2*g*Sqrt[1 -
c^2*x^2])/(245*c^2) + (160*b^2*g^3*Sqrt[1 - c^2*x^2])/(3969*c^4) - (245*b^
2*f^3*x*Sqrt[1 - c^2*x^2])/1152 - (359*b^2*f*g^2*x*Sqrt[1 - c^2*x^2])/(122
88*c^2) - (1079*b^2*f*g^2*x^3*Sqrt[1 - c^2*x^2])/18432 + (209*b^2*c^2*f*g^
2*x^5*Sqrt[1 - c^2*x^2])/4608 - (3*b^2*c^4*f*g^2*x^7*Sqrt[1 - c^2*x^2])/25
6 + (16*b^2*f^2*g*(1 - c^2*x^2)^(3/2))/(245*c^2) + (80*b^2*g^3*(1 - c^2*x^
2)^(3/2))/(11907*c^4) - (65*b^2*f^3*x*(1 - c^2*x^2)^(3/2))/1728 + (36*b^2*
f^2*g*(1 - c^2*x^2)^(5/2))/(1225*c^2) + (4*b^2*g^3*(1 - c^2*x^2)^(5/2))/(1
323*c^4) - (b^2*f^3*x*(1 - c^2*x^2)^(5/2))/108 + (6*b^2*f^2*g*(1 - c^2*x^2
)^(7/2))/(343*c^2) + (50*b^2*g^3*(1 - c^2*x^2)^(7/2))/(27783*c^4) - (2*b^2
*g^3*(1 - c^2*x^2)^(9/2))/(729*c^4) + (115*b^2*f^3*ArcSin[c*x])/(1152*c) +
 (359*b^2*f*g^2*ArcSin[c*x])/(12288*c^3) + (4*b^2*g^3*x*ArcSin[c*x])/(63*c
^3) + (6*b*f^2*g*x*(a + b*ArcSin[c*x]))/(7*c) - (5*b*c*f^3*x^2*(a + b*ArcS
in[c*x]))/16 + (15*b*f*g^2*x^2*(a + b*ArcSin[c*x]))/(128*c) - (6*b*c*f^2*g
*x^3*(a + b*ArcSin[c*x]))/7 + (2*b*g^3*x^3*(a + b*ArcSin[c*x]))/(189*c) -
(59*b*c*f*g^2*x^4*(a + b*ArcSin[c*x]))/128 + (18*b*c^3*f^2*g*x^5*(a + b*Ar
cSin[c*x]))/35 - (2*b*c*g^3*x^5*(a + b*ArcSin[c*x]))/21 + (17*b*c^3*f*g^2*
x^6*(a + b*ArcSin[c*x]))/48 - (6*b*c^5*f^2*g*x^7*(a + b*ArcSin[c*x]))/49 +
 (38*b*c^3*g^3*x^7*(a + b*ArcSin[c*x]))/441 - (3*b*c^5*f*g^2*x^8*(a + b*Ar
cSin[c*x]))/32 - (2*b*c^5*g^3*x^9*(a + b*ArcSin[c*x]))/81 + (5*b*f^3*(1...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.09 (sec) , antiderivative size = 5977, normalized size of antiderivative = 2.93

method	result	size
default	Expression too large to display	5977
parts	Expression too large to display	5977

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
result too large to display
```

Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (gx+f)^3 (b\arcsin(cx)+a)^2 \, dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral((a^2*c^4*d^2*g^3*x^7 + 3*a^2*c^4*d^2*f*g^2*x^6 + 3*a^2*d^2*f^2*g*
x + a^2*d^2*f^3 + (3*a^2*c^4*d^2*f^2*g - 2*a^2*c^2*d^2*g^3)*x^5 + (a^2*c^4
*d^2*f^3 - 6*a^2*c^2*d^2*f*g^2)*x^4 - (6*a^2*c^2*d^2*f^2*g - a^2*d^2*g^3)*
x^3 - (2*a^2*c^2*d^2*f^3 - 3*a^2*d^2*f*g^2)*x^2 + (b^2*c^4*d^2*g^3*x^7 + 3
*b^2*c^4*d^2*f*g^2*x^6 + 3*b^2*d^2*f^2*g*x + b^2*d^2*f^3 + (3*b^2*c^4*d^2*
f^2*g - 2*b^2*c^2*d^2*g^3)*x^5 + (b^2*c^4*d^2*f^3 - 6*b^2*c^2*d^2*f*g^2)*x
^4 - (6*b^2*c^2*d^2*f^2*g - b^2*d^2*g^3)*x^3 - (2*b^2*c^2*d^2*f^3 - 3*b^2*
d^2*f*g^2)*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*g^3*x^7 + 3*a*b*c^4*d^2*f*g
^2*x^6 + 3*a*b*d^2*f^2*g*x + a*b*d^2*f^3 + (3*a*b*c^4*d^2*f^2*g - 2*a*b*c^
2*d^2*g^3)*x^5 + (a*b*c^4*d^2*f^3 - 6*a*b*c^2*d^2*f*g^2)*x^4 - (6*a*b*c^2*
d^2*f^2*g - a*b*d^2*g^3)*x^3 - (2*a*b*c^2*d^2*f^3 - 3*a*b*d^2*f*g^2)*x^2)*
arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Timed out}$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (gx+f)^3 (b\arcsin(cx)+a)^2 \, dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2*f^3 + 1/128*(8*(-c^
2*d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*
d*x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*
arcsin(c*x)/c^3)*a^2*f*g^2 - 1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) +
2*(-c^2*d*x^2 + d)^(7/2)/(c^4*d))*a^2*g^3 - 3/7*(-c^2*d*x^2 + d)^(7/2)*a^2
*f^2*g/(c^2*d) + sqrt(d)*integrate(((b^2*c^4*d^2*g^3*x^7 + 3*b^2*c^4*d^2*f
*g^2*x^6 + 3*b^2*d^2*f^2*g*x + b^2*d^2*f^3 + (3*b^2*c^4*d^2*f^2*g - 2*b^2*
c^2*d^2*g^3)*x^5 + (b^2*c^4*d^2*f^3 - 6*b^2*c^2*d^2*f*g^2)*x^4 - (6*b^2*c^
2*d^2*f^2*g - b^2*d^2*g^3)*x^3 - (2*b^2*c^2*d^2*f^3 - 3*b^2*d^2*f*g^2)*x^2
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*g^3*x^7 +
3*a*b*c^4*d^2*f*g^2*x^6 + 3*a*b*d^2*f^2*g*x + a*b*d^2*f^3 + (3*a*b*c^4*d^2
*f^2*g - 2*a*b*c^2*d^2*g^3)*x^5 + (a*b*c^4*d^2*f^3 - 6*a*b*c^2*d^2*f*g^2)*
x^4 - (6*a*b*c^2*d^2*f^2*g - a*b*d^2*g^3)*x^3 - (2*a*b*c^2*d^2*f^3 - 3*a*b
*d^2*f*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)
*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\int (f+g\,x)^3\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int (f+gx)^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\text{Too large to display}$$

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(d)*d**2*(2520*asin(c*x)*a**2*c**3*f**3 + 945*asin(c*x)*a**2*c*f*g**2
 + 1344*sqrt( - c**2*x**2 + 1)*a**2*c**8*f**3*x**5 + 3456*sqrt( - c**2*x**
2 + 1)*a**2*c**8*f**2*g*x**6 + 3024*sqrt( - c**2*x**2 + 1)*a**2*c**8*f*g**
2*x**7 + 896*sqrt( - c**2*x**2 + 1)*a**2*c**8*g**3*x**8 - 4368*sqrt( - c**
2*x**2 + 1)*a**2*c**6*f**3*x**3 - 10368*sqrt( - c**2*x**2 + 1)*a**2*c**6*f
**2*g*x**4 - 8568*sqrt( - c**2*x**2 + 1)*a**2*c**6*f*g**2*x**5 - 2432*sqrt
( - c**2*x**2 + 1)*a**2*c**6*g**3*x**6 + 5544*sqrt( - c**2*x**2 + 1)*a**2*
c**4*f**3*x + 10368*sqrt( - c**2*x**2 + 1)*a**2*c**4*f**2*g*x**2 + 7434*sq
rt( - c**2*x**2 + 1)*a**2*c**4*f*g**2*x**3 + 1920*sqrt( - c**2*x**2 + 1)*a
**2*c**4*g**3*x**4 - 3456*sqrt( - c**2*x**2 + 1)*a**2*c**2*f**2*g - 945*sq
rt( - c**2*x**2 + 1)*a**2*c**2*f*g**2*x - 128*sqrt( - c**2*x**2 + 1)*a**2*
c**2*g**3*x**2 - 256*sqrt( - c**2*x**2 + 1)*a**2*g**3 + 16128*int(sqrt( -
c**2*x**2 + 1)*asin(c*x)*x**7,x)*a*b*c**8*g**3 + 48384*int(sqrt( - c**2*x*
*2 + 1)*asin(c*x)*x**6,x)*a*b*c**8*f*g**2 + 48384*int(sqrt( - c**2*x**2 +
1)*asin(c*x)*x**5,x)*a*b*c**8*f**2*g - 32256*int(sqrt( - c**2*x**2 + 1)*as
in(c*x)*x**5,x)*a*b*c**6*g**3 + 16128*int(sqrt( - c**2*x**2 + 1)*asin(c*x)
*x**4,x)*a*b*c**8*f**3 - 96768*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**4,x
)*a*b*c**6*f*g**2 - 96768*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*a*b
*c**6*f**2*g + 16128*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x)*a*b*c**4
*g**3 - 32256*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*a*b*c**6*f**...
```

3.140 $\int (f+gx)^2 (d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 33, antiderivative size = 1401

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

output
```
32/735*b^2*d*f*g*(-c^2*d*x^2+d)^(3/2)/c^2+4/343*b^2*f*g*(-c^2*d*x^2+d)^(7/
2)/c^2/d-2/7*f*g*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))^2/c^2/d+64/245*b^2
*d^2*f*g*(-c^2*d*x^2+d)^(1/2)/c^2-359/36864*b^2*d^2*g^2*x*(-c^2*d*x^2+d)^(
1/2)/c^2+209/13824*b^2*c^2*d^2*g^2*x^5*(-c^2*d*x^2+d)^(1/2)-1/256*b^2*c^4*
d^2*g^2*x^7*(-c^2*d*x^2+d)^(1/2)-5/128*d^2*g^2*x*(-c^2*d*x^2+d)^(1/2)*(a+b
*arcsin(c*x))^2/c^2-65/1728*b^2*d*f^2*x*(-c^2*d*x^2+d)^(3/2)+24/1225*b^2*f
*g*(-c^2*d*x^2+d)^(5/2)/c^2+5/24*d*f^2*x*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(
c*x))^2+5/48*d*g^2*x^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2+17/144*b*c
^3*d^2*g^2*x^6*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)-1
/32*b*c^5*d^2*g^2*x^8*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^
(1/2)-5/16*b*c*d^2*f^2*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^
2+1)^(1/2)+5/128*b*d^2*g^2*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(-
c^2*x^2+1)^(1/2)-59/384*b*c*d^2*g^2*x^4*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c
*x))/(-c^2*x^2+1)^(1/2)+115/1152*b^2*d^2*f^2*(-c^2*d*x^2+d)^(1/2)*arcsin(c
*x)/c/(-c^2*x^2+1)^(1/2)+359/36864*b^2*d^2*g^2*(-c^2*d*x^2+d)^(1/2)*arcsin
(c*x)/c^3/(-c^2*x^2+1)^(1/2)+5/48*d^2*f^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin
(c*x))^3/b/c/(-c^2*x^2+1)^(1/2)+5/384*d^2*g^2*(-c^2*d*x^2+d)^(1/2)*(a+b*ar
csin(c*x))^3/b/c^3/(-c^2*x^2+1)^(1/2)+5/48*b*d^2*f^2*(-c^2*x^2+1)^(3/2)*(-
c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c+1/18*b*d^2*f^2*(-c^2*x^2+1)^(5/2)*(
-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c+1/6*f^2*x*(-c^2*d*x^2+d)^(5/2)*...
```

Mathematica [A] (verified)

Time = 0.78 (sec) , antiderivative size = 742, normalized size of antiderivative = 0.53

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(12348000a^3(8c^2f^2+g^2)-3360ab^2c^2x(1960c^2f^2x(99-39c^2x^2+8c^4x\cdots}{\cdots}$$

input
```
Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(12348000*a^3*(8*c^2*f^2 + g^2) - 3360*a*b^2*c^2*
x*(1960*c^2*f^2*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) + 4608*f*g*(-35 + 35*c^2*x
^2 - 21*c^4*x^4 + 5*c^6*x^6) + 245*g^2*x*(-45 + 177*c^2*x^2 - 136*c^4*x^4
+ 36*c^6*x^6)) + 352800*a^2*b*c*Sqrt[1 - c^2*x^2]*(768*f*g*(-1 + c^2*x^2)^
3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*(-15 + 118*c^2*x^
2 - 136*c^4*x^4 + 48*c^6*x^6)) - b^3*c*Sqrt[1 - c^2*x^2]*(274400*c^2*f^2*x
*(897 - 194*c^2*x^2 + 32*c^4*x^4) + 147456*f*g*(-2161 + 757*c^2*x^2 - 351*
c^4*x^4 + 75*c^6*x^6) + 8575*g^2*x*(1077 + 2158*c^2*x^2 - 1672*c^4*x^4 + 4
32*c^6*x^6)) + 105*b*(352800*a^2*(8*c^2*f^2 + g^2) + b^2*(87955*g^2 + 1120
*c^2*(2093*f^2 + 4608*f*g*x + 315*g^2*x^2) - 3360*c^4*x^2*(1848*f^2 + 1536
*f*g*x + 413*g^2*x^2) - 640*c^8*x^6*(784*f^2 + 1152*f*g*x + 441*g^2*x^2) +
 1792*c^6*x^4*(1365*f^2 + 1728*f*g*x + 595*g^2*x^2)) + 6720*a*b*c*Sqrt[1 -
 c^2*x^2]*(768*f*g*(-1 + c^2*x^2)^3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^
4*x^4) + 7*g^2*x*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6)))*ArcSin[c
*x] + 352800*b^2*(105*a*(8*c^2*f^2 + g^2) + b*c*Sqrt[1 - c^2*x^2]*(768*f*g
*(-1 + c^2*x^2)^3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*(
-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6)))*ArcSin[c*x]^2 + 12348000*b
^3*(8*c^2*f^2 + g^2)*ArcSin[c*x]^3))/(948326400*b*c^3*Sqrt[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 2.30 (sec) , antiderivative size = 922, normalized size of antiderivative = 0.66, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)^2(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(f^2(a+b\arcsin(cx))^2\left(1-c^2x^2\right)^{5/2}+g^2x^2(a+b\arcsin(cx))^2\left(1-c^2x^2\right)^{5/2}+2fgx(a+b\arcsi\right.}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$d^2\sqrt{d-c^2dx^2}\left(-\frac{1}{32}bc^5g^2(a+b\arcsin(cx))x^8-\frac{4}{49}bc^5fg(a+b\arcsin(cx))x^7-\frac{1}{256}b^2c^4g^2\sqrt{1-c^2x^2}x^7+\frac{17}{144}bc^3g^2\right.$$

input
```
Int[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((64*b^2*f*g*Sqrt[1 - c^2*x^2])/(245*c^2) - (245*
b^2*f^2*x*Sqrt[1 - c^2*x^2])/1152 - (359*b^2*g^2*x*Sqrt[1 - c^2*x^2])/(368
64*c^2) - (1079*b^2*g^2*x^3*Sqrt[1 - c^2*x^2])/55296 + (209*b^2*c^2*g^2*x^
5*Sqrt[1 - c^2*x^2])/13824 - (b^2*c^4*g^2*x^7*Sqrt[1 - c^2*x^2])/256 + (32
*b^2*f*g*(1 - c^2*x^2)^(3/2))/(735*c^2) - (65*b^2*f^2*x*(1 - c^2*x^2)^(3/2
))/1728 + (24*b^2*f*g*(1 - c^2*x^2)^(5/2))/(1225*c^2) - (b^2*f^2*x*(1 - c^
2*x^2)^(5/2))/108 + (4*b^2*f*g*(1 - c^2*x^2)^(7/2))/(343*c^2) + (115*b^2*f
^2*ArcSin[c*x])/(1152*c) + (359*b^2*g^2*ArcSin[c*x])/(36864*c^3) + (4*b*f*
g*x*(a + b*ArcSin[c*x]))/(7*c) - (5*b*c*f^2*x^2*(a + b*ArcSin[c*x]))/16 +
(5*b*g^2*x^2*(a + b*ArcSin[c*x]))/(128*c) - (4*b*c*f*g*x^3*(a + b*ArcSin[c
*x]))/7 - (59*b*c*g^2*x^4*(a + b*ArcSin[c*x]))/384 + (12*b*c^3*f*g*x^5*(a
+ b*ArcSin[c*x]))/35 + (17*b*c^3*g^2*x^6*(a + b*ArcSin[c*x]))/144 - (4*b*c
^5*f*g*x^7*(a + b*ArcSin[c*x]))/49 - (b*c^5*g^2*x^8*(a + b*ArcSin[c*x]))/3
2 + (5*b*f^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(48*c) + (b*f^2*(1 - c^2
*x^2)^3*(a + b*ArcSin[c*x]))/(18*c) + (5*f^2*x*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x])^2)/16 - (5*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(128*
c^2) + (5*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/64 + (5*f^2*x*(
1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/24 + (5*g^2*x^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x])^2)/48 + (f^2*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c
*x])^2)/6 + (g^2*x^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/8 - (2*...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.71 (sec) , antiderivative size = 4170, normalized size of antiderivative = 2.98

method	result	size
default	Expression too large to display	4170
parts	Expression too large to display	4170

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2*(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4
*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/
(-c^2*d*x^2+d)^(1/2)))))+g^2*(-1/8*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/8/c^2*(1
/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(
-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2
+d)^(1/2))))))-2/7*f*g*(-c^2*d*x^2+d)^(7/2)/c^2/d)+b^2*(-5/384*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*(8*c^2*f^2+g^
2)*d^2+1/21952*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7
*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^
2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*f*g*(14*I*
arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-1/55296*(-d*(c^2*x^2-1
))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(696*I*arcsin(c*x)*c^2*f^2+1
152*arcsin(c*x)^2*c^2*f^2-156*I*arcsin(c*x)*g^2-72*arcsin(c*x)^2*g^2-154*c
^2*f^2+19*g^2)*cos(5*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-3/2048*(-d*(c^2*x^2-
1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(88*I*arcsin(c*x)*c^2*f^2+6
4*arcsin(c*x)^2*c^2*f^2+4*I*arcsin(c*x)*g^2+8*arcsin(c*x)^2*g^2-38*c^2*f^2
-3*g^2)*cos(3*arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-3/274400*(-d*(c^2*x^2-1))^(
1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*g*(630*I*arcsin(c*x)+1225*arcs
in(c*x)^2-106)*sin(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/64*(-d*(c^2*x^2-1)
)^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*f*g*(arcsin(c*x)^2-2+2*I*a...
```

Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a + b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (gx+f)^2 (b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral((a^2*c^4*d^2*g^2*x^6 + 2*a^2*c^4*d^2*f*g*x^5 - 4*a^2*c^2*d^2*f*g*
x^3 + 2*a^2*d^2*f*g*x + a^2*d^2*f^2 + (a^2*c^4*d^2*f^2 - 2*a^2*c^2*d^2*g^2
)*x^4 - (2*a^2*c^2*d^2*f^2 - a^2*d^2*g^2)*x^2 + (b^2*c^4*d^2*g^2*x^6 + 2*b
^2*c^4*d^2*f*g*x^5 - 4*b^2*c^2*d^2*f*g*x^3 + 2*b^2*d^2*f*g*x + b^2*d^2*f^2
 + (b^2*c^4*d^2*f^2 - 2*b^2*c^2*d^2*g^2)*x^4 - (2*b^2*c^2*d^2*f^2 - b^2*d^
2*g^2)*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*g^2*x^6 + 2*a*b*c^4*d^2*f*g*x^5
 - 4*a*b*c^2*d^2*f*g*x^3 + 2*a*b*d^2*f*g*x + a*b*d^2*f^2 + (a*b*c^4*d^2*f^
2 - 2*a*b*c^2*d^2*g^2)*x^4 - (2*a*b*c^2*d^2*f^2 - a*b*d^2*g^2)*x^2)*arcsin
(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2*f^2 + 1/384*(8*(-c^
2*d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*
d*x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*
arcsin(c*x)/c^3)*a^2*g^2 - 2/7*(-c^2*d*x^2 + d)^(7/2)*a^2*f*g/(c^2*d) + sq
rt(d)*integrate(((b^2*c^4*d^2*g^2*x^6 + 2*b^2*c^4*d^2*f*g*x^5 - 4*b^2*c^2*
d^2*f*g*x^3 + 2*b^2*d^2*f*g*x + b^2*d^2*f^2 + (b^2*c^4*d^2*f^2 - 2*b^2*c^2
*d^2*g^2)*x^4 - (2*b^2*c^2*d^2*f^2 - b^2*d^2*g^2)*x^2)*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*g^2*x^6 + 2*a*b*c^4*d^2*f*g*x^5
 - 4*a*b*c^2*d^2*f*g*x^3 + 2*a*b*d^2*f*g*x + a*b*d^2*f^2 + (a*b*c^4*d^2*f^
2 - 2*a*b*c^2*d^2*g^2)*x^4 - (2*a*b*c^2*d^2*f^2 - a*b*d^2*g^2)*x^2)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^2\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(d)*d**2*(840*asin(c*x)*a**2*c**2*f**2 + 105*asin(c*x)*a**2*g**2 + 44
8*sqrt( - c**2*x**2 + 1)*a**2*c**7*f**2*x**5 + 768*sqrt( - c**2*x**2 + 1)*
a**2*c**7*f*g*x**6 + 336*sqrt( - c**2*x**2 + 1)*a**2*c**7*g**2*x**7 - 1456
*sqrt( - c**2*x**2 + 1)*a**2*c**5*f**2*x**3 - 2304*sqrt( - c**2*x**2 + 1)*
a**2*c**5*f*g*x**4 - 952*sqrt( - c**2*x**2 + 1)*a**2*c**5*g**2*x**5 + 1848
*sqrt( - c**2*x**2 + 1)*a**2*c**3*f**2*x + 2304*sqrt( - c**2*x**2 + 1)*a**
2*c**3*f*g*x**2 + 826*sqrt( - c**2*x**2 + 1)*a**2*c**3*g**2*x**3 - 768*sqr
t( - c**2*x**2 + 1)*a**2*c*f*g - 105*sqrt( - c**2*x**2 + 1)*a**2*c*g**2*x
 + 5376*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**6,x)*a*b*c**7*g**2 + 10752*
int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**5,x)*a*b*c**7*f*g + 5376*int(sqrt(
 - c**2*x**2 + 1)*asin(c*x)*x**4,x)*a*b*c**7*f**2 - 10752*int(sqrt( - c**2
*x**2 + 1)*asin(c*x)*x**4,x)*a*b*c**5*g**2 - 21504*int(sqrt( - c**2*x**2 +
 1)*asin(c*x)*x**3,x)*a*b*c**5*f*g - 10752*int(sqrt( - c**2*x**2 + 1)*asin
(c*x)*x**2,x)*a*b*c**5*f**2 + 5376*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x*
*2,x)*a*b*c**3*g**2 + 10752*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x,x)*a*b*
c**3*f*g + 5376*int(sqrt( - c**2*x**2 + 1)*asin(c*x),x)*a*b*c**3*f**2 + 26
88*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x**6,x)*b**2*c**7*g**2 + 5376*i
nt(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x**5,x)*b**2*c**7*f*g + 2688*int(sq
rt( - c**2*x**2 + 1)*asin(c*x)**2*x**4,x)*b**2*c**7*f**2 - 5376*int(sqrt(
- c**2*x**2 + 1)*asin(c*x)**2*x**4,x)*b**2*c**5*g**2 - 10752*int(sqrt( ...
```

3.141 $\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 31, antiderivative size = 773

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\frac{32b^2d^2g\sqrt{d-c^2dx^2}}{245c^2}$$
$$-\frac{245b^2d^2fx\sqrt{d-c^2dx^2}}{1152}+\frac{16b^2dg(d-c^2dx^2)^{3/2}}{735c^2}$$
$$-\frac{65b^2dfx(d-c^2dx^2)^{3/2}}{1728}+\frac{12b^2g(d-c^2dx^2)^{5/2}}{1225c^2}$$
$$-\frac{1}{108}b^2fx\left(d-c^2dx^2\right)^{5/2}+\frac{2b^2g(d-c^2dx^2)^{7/2}}{343c^2d}+\frac{115b^2d^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}}+\frac{2bd^2gx\sqrt{d-c^2dx^2}(a+b}{7c\sqrt{1-c^2x^2}}$$

output
```
32/245*b^2*d^2*g*(-c^2*d*x^2+d)^(1/2)/c^2-245/1152*b^2*d^2*f*x*(-c^2*d*x^2
+d)^(1/2)+16/735*b^2*d*g*(-c^2*d*x^2+d)^(3/2)/c^2-65/1728*b^2*d*f*x*(-c^2*
d*x^2+d)^(3/2)+12/1225*b^2*g*(-c^2*d*x^2+d)^(5/2)/c^2-1/108*b^2*f*x*(-c^2*
d*x^2+d)^(5/2)+2/343*b^2*g*(-c^2*d*x^2+d)^(7/2)/c^2/d+115/1152*b^2*d^2*f*(
-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/c/(-c^2*x^2+1)^(1/2)+2/7*b*d^2*g*x*(-c^2*d
*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*x^2+1)^(1/2)-5/16*b*c*d^2*f*x^2*(-
c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)-2/7*b*c*d^2*g*x^3*
(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+6/35*b*c^3*d^2*g
*x^5*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)-2/49*b*c^5*
d^2*g*x^7*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2)+5/48*b
*d^2*f*(-c^2*x^2+1)^(3/2)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c+1/18*b*
d^2*f*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))/c+5/16*d^2
*f*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2+5/24*d*f*x*(-c^2*d*x^2+d)^(3
/2)*(a+b*arcsin(c*x))^2+1/6*f*x*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2-1
/7*g*(-c^2*d*x^2+d)^(7/2)*(a+b*arcsin(c*x))^2/c^2/d+5/48*d^2*f*(-c^2*d*x^2
+d)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2*x^2+1)^(1/2)
```

Mathematica [A] (verified)

Time = 0.51 (sec) , antiderivative size = 470, normalized size of antiderivative = 0.61

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(3087000a^3cf+88200a^2b\sqrt{1-c^2x^2}\Big(48g(-1+c^2x^2)^3+7c^2fx(33-26\cdots$$

input
```
Integrate[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(3087000*a^3*c*f + 88200*a^2*b*Sqrt[1 - c^2*x^2]*
(48*g*(-1 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)) - 840*a*
b^2*c*x*(245*c^2*f*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) + 288*g*(-35 + 35*c^2*x
^2 - 21*c^4*x^4 + 5*c^6*x^6)) + b^3*Sqrt[1 - c^2*x^2]*(-8575*c^2*f*x*(897
- 194*c^2*x^2 + 32*c^4*x^4) - 2304*g*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 +
75*c^6*x^6)) + 105*b*(88200*a^2*c*f + 1680*a*b*Sqrt[1 - c^2*x^2]*(48*g*(-1
 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)) + b^2*c*(-2304*g*
x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) - 245*f*(-299 + 792*c^2*x^2
- 312*c^4*x^4 + 64*c^6*x^6)))*ArcSin[c*x] + 88200*b^2*(105*a*c*f + b*Sqrt[
1 - c^2*x^2]*(48*g*(-1 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x
^4)))*ArcSin[c*x]^2 + 3087000*b^3*c*f*ArcSin[c*x]^3))/(29635200*b*c^2*Sqrt
[1 - c^2*x^2])
```

Rubi [A] (verified)

Time = 1.21 (sec) , antiderivative size = 513, normalized size of antiderivative = 0.66, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(f(a+b\arcsin(cx))^2\left(1-c^2x^2\right)^{5/2}+gx(a+b\arcsin(cx))^2\left(1-c^2x^2\right)^{5/2}\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$d^2\sqrt{d-c^2dx^2}\left(-\frac{2}{49}bc^5gx^7(a+b\arcsin(cx))+\frac{6}{35}bc^3gx^5(a+b\arcsin(cx))+\frac{1}{6}fx\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))\right.$$

input
```
Int[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((32*b^2*g*Sqrt[1 - c^2*x^2])/(245*c^2) - (245*b^
2*f*x*Sqrt[1 - c^2*x^2])/1152 + (16*b^2*g*(1 - c^2*x^2)^(3/2))/(735*c^2) -
 (65*b^2*f*x*(1 - c^2*x^2)^(3/2))/1728 + (12*b^2*g*(1 - c^2*x^2)^(5/2))/(1
225*c^2) - (b^2*f*x*(1 - c^2*x^2)^(5/2))/108 + (2*b^2*g*(1 - c^2*x^2)^(7/2
))/(343*c^2) + (115*b^2*f*ArcSin[c*x])/(1152*c) + (2*b*g*x*(a + b*ArcSin[c
*x]))/(7*c) - (5*b*c*f*x^2*(a + b*ArcSin[c*x]))/16 - (2*b*c*g*x^3*(a + b*A
rcSin[c*x]))/7 + (6*b*c^3*g*x^5*(a + b*ArcSin[c*x]))/35 - (2*b*c^5*g*x^7*(
a + b*ArcSin[c*x]))/49 + (5*b*f*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(48*c
) + (b*f*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(18*c) + (5*f*x*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x])^2)/16 + (5*f*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin
[c*x])^2)/24 + (f*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/6 - (g*(1 -
 c^2*x^2)^(7/2)*(a + b*ArcSin[c*x])^2)/(7*c^2) + (5*f*(a + b*ArcSin[c*x])^
3)/(48*b*c)))/Sqrt[1 - c^2*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.23 (sec) , antiderivative size = 2852, normalized size of antiderivative = 3.69

method	result	size
default	Expression too large to display	2852
parts	Expression too large to display	2852

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBO
SE)
```

output
```
1/6*a^2*f*x*(-c^2*d*x^2+d)^(5/2)+5/24*a^2*f*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*
a^2*f*d^2*x*(-c^2*d*x^2+d)^(1/2)+5/16*a^2*f*d^3/(c^2*d)^(1/2)*arctan((c^2*
d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/7*a^2*g*(-c^2*d*x^2+d)^(7/2)/c^2/d+b^2*
(-5/48*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)
^3*f*d^2+1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x
^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*
x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(14*I*
arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)+1/6912*(-d*(c^2*x^2-1)
)^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*x^6*c^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/
2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x
^2+1)^(1/2)-6*c*x)*f*(6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d^2/c/(c^2*x^2-1
)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*g*(arc
sin(c*x)^2-2+2*I*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(
1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*I*arcsin(c*
x))*d^2/c^2/(c^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1
/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(2*arcsin(c*x)^2-1-2*I
*arcsin(c*x))*d^2/c/(c^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*
(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-6
*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-1/137200*(-d*(c^2*x^
2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(385*I*arcsin(c*x)+1...
```

Fricas [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="f
ricas")
```

output
```
integral((a^2*c^4*d^2*g*x^5 + a^2*c^4*d^2*f*x^4 - 2*a^2*c^2*d^2*g*x^3 - 2*
a^2*c^2*d^2*f*x^2 + a^2*d^2*g*x + a^2*d^2*f + (b^2*c^4*d^2*g*x^5 + b^2*c^4
*d^2*f*x^4 - 2*b^2*c^2*d^2*g*x^3 - 2*b^2*c^2*d^2*f*x^2 + b^2*d^2*g*x + b^2
*d^2*f)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*g*x^5 + a*b*c^4*d^2*f*x^4 - 2*a*b*c
^2*d^2*g*x^3 - 2*a*b*c^2*d^2*f*x^2 + a*b*d^2*g*x + a*b*d^2*f)*arcsin(c*x))
*sqrt(-c^2*d*x^2 + d), x)
```

Sympy [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

Maxima [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="m
axima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2*f - 1/7*(-c^2*d*x^2
 + d)^(7/2)*a^2*g/(c^2*d) + sqrt(d)*integrate(((b^2*c^4*d^2*g*x^5 + b^2*c^
4*d^2*f*x^4 - 2*b^2*c^2*d^2*g*x^3 - 2*b^2*c^2*d^2*f*x^2 + b^2*d^2*g*x + b^
2*d^2*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*g*x
^5 + a*b*c^4*d^2*f*x^4 - 2*a*b*c^2*d^2*g*x^3 - 2*a*b*c^2*d^2*f*x^2 + a*b*d
^2*g*x + a*b*d^2*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x +
 1)*sqrt(-c*x + 1), x)
```

Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \frac{\sqrt{d}\,d^2\left(105 asin(cx)\,a^2cf+56\sqrt{-c^2x^2+1}\,a^2c^6f\,x^5+48\sqrt{-c^2x^2+1}\,a^2c^6g\,x^6-182\sqrt{-}\right.}{}$$

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*asin(c*x))^2,x)
```

output
```
(sqrt(d)*d**2*(105*asin(c*x)*a**2*c*f + 56*sqrt( - c**2*x**2 + 1)*a**2*c**
6*f*x**5 + 48*sqrt( - c**2*x**2 + 1)*a**2*c**6*g*x**6 - 182*sqrt( - c**2*x
**2 + 1)*a**2*c**4*f*x**3 - 144*sqrt( - c**2*x**2 + 1)*a**2*c**4*g*x**4 +
231*sqrt( - c**2*x**2 + 1)*a**2*c**2*f*x + 144*sqrt( - c**2*x**2 + 1)*a**2
*c**2*g*x**2 - 48*sqrt( - c**2*x**2 + 1)*a**2*g + 672*int(sqrt( - c**2*x**
2 + 1)*asin(c*x)*x**5,x)*a*b*c**6*g + 672*int(sqrt( - c**2*x**2 + 1)*asin(
c*x)*x**4,x)*a*b*c**6*f - 1344*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**3,x
)*a*b*c**4*g - 1344*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x**2,x)*a*b*c**4*
f + 672*int(sqrt( - c**2*x**2 + 1)*asin(c*x)*x,x)*a*b*c**2*g + 672*int(sqr
t( - c**2*x**2 + 1)*asin(c*x),x)*a*b*c**2*f + 336*int(sqrt( - c**2*x**2 +
1)*asin(c*x)**2*x**5,x)*b**2*c**6*g + 336*int(sqrt( - c**2*x**2 + 1)*asin(
c*x)**2*x**4,x)*b**2*c**6*f - 672*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*
x**3,x)*b**2*c**4*g - 672*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x**2,x)*
b**2*c**4*f + 336*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x,x)*b**2*c**2*g
 + 336*int(sqrt( - c**2*x**2 + 1)*asin(c*x)**2,x)*b**2*c**2*f + 48*a**2*g)
)/(336*c**2)
```

3.142 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 2897

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Too large to display}$$

output
```
2*a*b*d^2*(c^2*f^2-g^2)^2*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)/g^5+1/8*c^2*d^2
*f*x*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/g^2-1/64*b^2*c^2*d^2*f*x*(-c
^2*d*x^2+d)^(1/2)/g^2+1/32*b^2*c^4*d^2*f*x^3*(-c^2*d*x^2+d)^(1/2)/g^2-a^2*
d^2*(c^2*f^2-g^2)^(5/2)*(-c^2*d*x^2+d)^(1/2)*arctan((c^2*f*x+g)/(c^2*f^2-g
^2)^(1/2)/(-c^2*x^2+1)^(1/2))/g^6/(-c^2*x^2+1)^(1/2)+1/64*b^2*c*d^2*f*(-c^
2*d*x^2+d)^(1/2)*arcsin(c*x)/g^2/(-c^2*x^2+1)^(1/2)+1/4*b^2*c^2*d^2*f*(c^2
*f^2-2*g^2)*x*(-c^2*d*x^2+d)^(1/2)/g^4-2*I*b^2*d^2*(c^2*f^2-g^2)^(5/2)*(-c
^2*d*x^2+d)^(1/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g
^2)^(1/2)))/g^6/(-c^2*x^2+1)^(1/2)+2*I*b^2*d^2*(c^2*f^2-g^2)^(5/2)*(-c^2*d
*x^2+d)^(1/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^
(1/2)))/g^6/(-c^2*x^2+1)^(1/2)+1/2*b*c^3*d^2*f*(c^2*f^2-2*g^2)*x^2*(-c^2*d
*x^2+d)^(1/2)*(a+b*arcsin(c*x))/g^4/(-c^2*x^2+1)^(1/2)-2*I*a*b*d^2*(c^2*f^
2-g^2)^(5/2)*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/g^6/(-c^2*x^2+1)^(1/2)+2*I*a*b*d^2*(c^2
*f^2-g^2)^(5/2)*(-c^2*d*x^2+d)^(1/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/g^6/(-c^2*x^2+1)^(1/2)-1/15*c^2*d^2*
x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/g+1/5*c^4*d^2*x^4*(-c^2*d*x^2
+d)^(1/2)*(a+b*arcsin(c*x))^2/g+b^2*d^2*(c^2*f^2-g^2)^2*(-c^2*d*x^2+d)^(1/
2)*arcsin(c*x)^2/g^5+52/225*b^2*d^2*(-c^2*d*x^2+d)^(1/2)/g-2/15*d^2*(-c^2*
d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/g-1/3*d*(c^2*f^2-2*g^2)*(-c^2*d*x^2+...
```

Mathematica [A] (warning: unable to verify)

Time = 3.05 (sec) , antiderivative size = 1275, normalized size of antiderivative = 0.44

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Too large to display}$$

input
```
Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(-1/2*(c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2)/g^4 - (c^4*f*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x])^2)/(4*g^2) + (c^4*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(5*g)
 - ((c^2*f^2 - 2*g^2)*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*g^3) -
 (c*f*(c^2*f^2 - 2*g^2)*(a + b*ArcSin[c*x])^3)/(6*b*g^4) - ((-(c^2*f^2) +
g^2)^2*(-1 + c^2*x^2)*(a + b*ArcSin[c*x])^3)/(3*b*c*g^4*(f + g*x)) + (b*c*
f*(c^2*f^2 - 2*g^2)*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x
^2)*ArcSin[c*x]))/(4*g^4) + (2*b*(c^2*f^2 - 2*g^2)*(b*Sqrt[1 - c^2*x^2]*(7
 - c^2*x^2) + 9*c*x*(a + b*ArcSin[c*x]) - 3*c^3*x^3*(a + b*ArcSin[c*x])))/
(27*g^3) + (b*c*f*(b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) - 3*b*ArcSin[c*
x] + 8*c^4*x^4*(a + b*ArcSin[c*x])))/(64*g^2) - (2*b*(b*Sqrt[1 - c^2*x^2]*
(8 + 4*c^2*x^2 + 3*c^4*x^4) + 15*c^5*x^5*(a + b*ArcSin[c*x])))/(375*g) + (
c*f*(6*b*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*(a + b*ArcSin[c*x
])^3 - 3*b^2*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*Arc
Sin[c*x])))/(48*b*g^2) - (9*c^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^
2 - 2*b*(b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + 3*c^3*x^3*(a + b*ArcSin[c*x])
) + 18*(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*(a*c*x + b*Sqrt[1 -
c^2*x^2] + b*c*x*ArcSin[c*x])))/(135*g) + ((-(c^2*f^2) + g^2)^2*((c^2*f^2
- g^2)*(a + b*ArcSin[c*x])^3 + c^2*g*x*(f + g*x)*(a + b*ArcSin[c*x])^3 + 3
*b*c*(f + g*x)*(g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*g*(a*c*...
```

Rubi [A] (verified)

Time = 4.97 (sec) , antiderivative size = 1986, normalized size of antiderivative = 0.69, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \frac{(1-c^2x^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5266}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int\left(\frac{x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^4}{g}-\frac{fx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^4}{g^2}-\frac{f(c^2f^2-2g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^2}{g^4}+\right.}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$d^2\sqrt{d-c^2dx^2}\left(-\frac{2bx^5(a+b\arcsin(cx))c^5}{25g}+\frac{bfx^4(a+b\arcsin(cx))c^5}{8g^2}+\frac{x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^4}{5g}-\frac{fx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx)}{4g^2}\right.$$

input
```
Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((4*a*b*c*x)/(15*g) - (2*a*b*c*(c^2*f^2 - g^2)^2*
x)/g^5 + (52*b^2*Sqrt[1 - c^2*x^2])/(225*g) + (4*b^2*(c^2*f^2 - 2*g^2)*Sqr
t[1 - c^2*x^2])/(9*g^3) + (a^2*(c^2*f^2 - g^2)^2*Sqrt[1 - c^2*x^2])/g^5 -
(2*b^2*(c^2*f^2 - g^2)^2*Sqrt[1 - c^2*x^2])/g^5 - (b^2*c^2*f*x*Sqrt[1 - c^
2*x^2])/(64*g^2) + (b^2*c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2])/(4*g^
4) + (b^2*c^4*f*x^3*Sqrt[1 - c^2*x^2])/(32*g^2) + (26*b^2*(1 - c^2*x^2)^(3
/2))/(675*g) + (2*b^2*(c^2*f^2 - 2*g^2)*(1 - c^2*x^2)^(3/2))/(27*g^3) - (2
*b^2*(1 - c^2*x^2)^(5/2))/(125*g) + (b^2*c*f*ArcSin[c*x])/(64*g^2) - (b^2*
c*f*(c^2*f^2 - 2*g^2)*ArcSin[c*x])/(4*g^4) + (4*b^2*c*x*ArcSin[c*x])/(15*g
) - (2*b^2*c*(c^2*f^2 - g^2)^2*x*ArcSin[c*x])/g^5 + (2*a*b*(c^2*f^2 - g^2)
^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/g^5 + (b^2*(c^2*f^2 - g^2)^2*Sqrt[1 - c^
2*x^2]*ArcSin[c*x]^2)/g^5 + (2*b*c*(c^2*f^2 - 2*g^2)*x*(a + b*ArcSin[c*x])
)/(3*g^3) - (b*c^3*f*x^2*(a + b*ArcSin[c*x]))/(8*g^2) + (b*c^3*f*(c^2*f^2
- 2*g^2)*x^2*(a + b*ArcSin[c*x]))/(2*g^4) + (2*b*c^3*x^3*(a + b*ArcSin[c*x
]))/(45*g) - (2*b*c^3*(c^2*f^2 - 2*g^2)*x^3*(a + b*ArcSin[c*x]))/(9*g^3) +
 (b*c^5*f*x^4*(a + b*ArcSin[c*x]))/(8*g^2) - (2*b*c^5*x^5*(a + b*ArcSin[c*
x]))/(25*g) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(15*g) + (c^2*f*
x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(8*g^2) - (c^2*f*(c^2*f^2 - 2*g
^2)*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*g^4) - (c^2*x^2*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x])^2)/(15*g) - (c^4*f*x^3*Sqrt[1 - c^2*x^2]*...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5266
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] && !GtQ[d, 0]
```

Maple [F]

$$\int \frac{(-c^2 d\,x^2+d)^{\frac{5}{2}} (a+b\arcsin{(cx)})^2}{gx+f}dx$$

input
```
int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

output
```
int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin{(cx)}+a)^2}{gx+f}\,dx$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="f
ricas")
```

output
```
integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b
*c^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(g*x + f), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Timed out}$$

input
```
integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/(g*x+f),x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="m
axima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{5/2}}{f+g\,x}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/(f + g*x), x)
```

Reduce [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \frac{\sqrt{d}\,d^2\Big(120 asin(cx)\,a^2c^5f^5 - 300 asin(cx)\,a^2c^3f^3g^2 + 225 asin(c$$

input
```
int((-c^2*d*x^2+d)^(5/2)*(a+b*asin(c*x))^2/(g*x+f),x)
```

output
```
(sqrt(d)*d**2*(120*asin(c*x)*a**2*c**5*f**5 - 300*asin(c*x)*a**2*c**3*f**3
*g**2 + 225*asin(c*x)*a**2*c*f*g**4 - 240*sqrt(c**2*f**2 - g**2)*atan((tan
(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 - g**2))*a**2*c**4*f**4 + 480*sqrt(c
**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 - g**2))*a
**2*c**2*f**2*g**2 - 240*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f
 + g)/sqrt(c**2*f**2 - g**2))*a**2*g**4 + 120*sqrt( - c**2*x**2 + 1)*a**2*
c**4*f**4*g - 60*sqrt( - c**2*x**2 + 1)*a**2*c**4*f**3*g**2*x + 40*sqrt( -
 c**2*x**2 + 1)*a**2*c**4*f**2*g**3*x**2 - 30*sqrt( - c**2*x**2 + 1)*a**2*
c**4*f*g**4*x**3 + 24*sqrt( - c**2*x**2 + 1)*a**2*c**4*g**5*x**4 - 280*sqr
t( - c**2*x**2 + 1)*a**2*c**2*f**2*g**3 + 135*sqrt( - c**2*x**2 + 1)*a**2*
c**2*f*g**4*x - 88*sqrt( - c**2*x**2 + 1)*a**2*c**2*g**5*x**2 + 184*sqrt(
- c**2*x**2 + 1)*a**2*g**5 + 240*int((sqrt( - c**2*x**2 + 1)*asin(c*x)*x**
4)/(f + g*x),x)*a*b*c**4*g**6 - 480*int((sqrt( - c**2*x**2 + 1)*asin(c*x)*
x**2)/(f + g*x),x)*a*b*c**2*g**6 + 240*int((sqrt( - c**2*x**2 + 1)*asin(c*
x))/(f + g*x),x)*a*b*g**6 + 120*int((sqrt( - c**2*x**2 + 1)*asin(c*x)**2*x
**4)/(f + g*x),x)*b**2*c**4*g**6 - 240*int((sqrt( - c**2*x**2 + 1)*asin(c*
x)**2*x**2)/(f + g*x),x)*b**2*c**2*g**6 + 120*int((sqrt( - c**2*x**2 + 1)*
asin(c*x)**2)/(f + g*x),x)*b**2*g**6 + 72*a**2*c**4*f**4*g - 136*a**2*c**2
*f**2*g**3 + 40*a**2*g**5))/(120*g**6)
```

3.143 $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 634

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{6b^2f^2g\sqrt{d-c^2dx^2}}{c^2d}+\frac{14b^2g^3\sqrt{d-c^2dx^2}}{9c^4d} + \frac{3b^2fg^2x\sqrt{d-c^2dx^2}}{4c^2d}-\frac{2b^2g^3(d-c^2dx^2)^{3/2}}{27c^4d^2} - \frac{3b^2fg^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} + \frac{6bf^2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} + \frac{4bg^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3\sqrt{d-c^2dx^2}} + \frac{3bfg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} + \frac{2bg^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{3f^2g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2d} - \frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^4d} - \frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^2d} - \frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2d} + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^3\sqrt{d-c^2dx^2}}$$

output
```
6*b^2*f^2*g*(-c^2*d*x^2+d)^(1/2)/c^2/d+14/9*b^2*g^3*(-c^2*d*x^2+d)^(1/2)/c
^4/d+3/4*b^2*f*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2/d-2/27*b^2*g^3*(-c^2*d*x^2+d
)^(3/2)/c^4/d^2-3/4*b^2*f*g^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)/c^3/(-c^2*d*x
^2+d)^(1/2)+6*b*f^2*g*x*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*d*x^2
+d)^(1/2)+4/3*b*g^3*x*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c^3/(-c^2*d*x^2
+d)^(1/2)+3/2*b*f*g^2*x^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*d*x
^2+d)^(1/2)+2/9*b*g^3*x^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*d*x
^2+d)^(1/2)-3*f^2*g*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/c^2/d-2/3*g^3
*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/c^4/d-3/2*f*g^2*x*(-c^2*d*x^2+d)
^(1/2)*(a+b*arcsin(c*x))^2/c^2/d-1/3*g^3*x^2*(-c^2*d*x^2+d)^(1/2)*(a+b*arc
sin(c*x))^2/c^2/d+1/3*f^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2
*d*x^2+d)^(1/2)+1/2*f*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3/b/c^3/(-c
^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 1.25 (sec) , antiderivative size = 582, normalized size of antiderivative = 0.92

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{-36a^2d(1-c^2x^2)^{3/2}\left(4g^3+c^2g(18f^2+9fgx+2g^2x^2)\right)-216abc^3df^3(-1+c^2x^2)\arcsin(cx)^2-72b^2c^3d}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(-36*a^2*d*(1 - c^2*x^2)^(3/2)*(4*g^3 + c^2*g*(18*f^2 + 9*f*g*x + 2*g^2*x^
2)) - 216*a*b*c^3*d*f^3*(-1 + c^2*x^2)*ArcSin[c*x]^2 - 72*b^2*c^3*d*f^3*(-
1 + c^2*x^2)*ArcSin[c*x]^3 - 1296*a*b*c^2*d*f^2*g*(-1 + c^2*x^2)*(c*x - Sq
rt[1 - c^2*x^2]*ArcSin[c*x]) - 48*a*b*d*g^3*(-1 + c^2*x^2)*(6*c*x + c^3*x^
3 - 3*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]) + 648*b^2*c^2*d*f^2*g*(
1 - c^2*x^2)*(2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2))
 - 108*a^2*c*Sqrt[d]*f*(2*c^2*f^2 + 3*g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d
*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 162*a*b
*c*d*f*g^2*(-1 + c^2*x^2)*(-2*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 2*ArcSi
n[c*x]*Sin[2*ArcSin[c*x]]) + 27*b^2*c*d*f*g^2*(1 - c^2*x^2)*(4*ArcSin[c*x]
^3 - 6*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + (3 - 6*ArcSin[c*x]^2)*Sin[2*ArcSin
[c*x]]) - 2*b^2*d*g^3*(1 - c^2*x^2)*(81*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x
]^2) - (-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] + 6*ArcSin[c*x]*(-27*c*x
+ Sin[3*ArcSin[c*x]])))/(216*c^4*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 0.92 (sec) , antiderivative size = 417, normalized size of antiderivative = 0.66, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {5276, 5272, 3042, 3798, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{\sqrt{1-c^2x^2}\int (cf+cgx)^3(a+b\arcsin(cx))^2d\arcsin(cx)}{c^4\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\sqrt{1-c^2x^2}\int (a+b\arcsin(cx))^2(cf+g\sin(\arcsin(cx)))^3d\arcsin(cx)}{c^4\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 3798$$

$$\frac{\sqrt{1-c^2x^2}\int\left(f^3(a+b\arcsin(cx))^2c^3+g^3x^3(a+b\arcsin(cx))^2c^3+3fg^2x^2(a+b\arcsin(cx))^2c^3+3f^2gx(a+b\,a\right.}{c^4\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 2009$$

$$\sqrt{1-c^2x^2}\left(\frac{c^3f^3(a+b\arcsin(cx))^3}{3b}+6bc^3f^2gx(a+b\arcsin(cx))+\frac{3}{2}bc^3fg^2x^2(a+b\arcsin(cx))+\frac{2}{9}bc^3g^3x^3(a+b\,\mathrm{arc}\right.$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*(6*b^2*c^2*f^2*g*Sqrt[1 - c^2*x^2] + (14*b^2*g^3*Sqrt[1
 - c^2*x^2])/9 + (3*b^2*c^2*f*g^2*x*Sqrt[1 - c^2*x^2])/4 - (2*b^2*g^3*(1 -
 c^2*x^2)^(3/2))/27 - (3*b^2*c*f*g^2*ArcSin[c*x])/4 + 6*b*c^3*f^2*g*x*(a +
 b*ArcSin[c*x]) + (4*b*c*g^3*x*(a + b*ArcSin[c*x]))/3 + (3*b*c^3*f*g^2*x^2
*(a + b*ArcSin[c*x]))/2 + (2*b*c^3*g^3*x^3*(a + b*ArcSin[c*x]))/9 - 3*c^2*
f^2*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (2*g^3*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x])^2)/3 - (3*c^2*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x])^2)/2 - (c^2*g^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/3 + (c^3
*f^3*(a + b*ArcSin[c*x])^3)/(3*b) + (c*f*g^2*(a + b*ArcSin[c*x])^3)/(2*b))
)/(c^4*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3798
```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.99 (sec) , antiderivative size = 1636, normalized size of antiderivative = 2.58

method	result	size
default	Expression too large to display	1636
parts	Expression too large to display	1636

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^3*(-
1/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+3*f*g^2
*(-1/2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(
1/2)*x/(-c^2*d*x^2+d)^(1/2)))-3*f^2*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b^2*(-1/
6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^
3*f*(2*c^2*f^2+3*g^2)+1/432*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2
)*c*x+2*c^2*x^2-1)*g^3*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/d/(c^2*x^2-
1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*g*(8*I*
arcsin(c*x)*c^2*f^2+4*arcsin(c*x)^2*c^2*f^2+2*I*arcsin(c*x)*g^2+arcsin(c*x
)^2*g^2-8*c^2*f^2-2*g^2)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(
-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(4*arcsin(c*x)^2*c^2*f^2-8*I*arcsin(c*x
)*c^2*f^2+arcsin(c*x)^2*g^2-2*I*arcsin(c*x)*g^2-8*c^2*f^2-2*g^2)/c^4/d/(c^
2*x^2-1)+1/432*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*c*x+2*c^2*x^
2-1)*g^3*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1)+3/8*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2*arcsin(c*x)+3/
16*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*f*g^2*(2*arcsin(c*x)^2-1)*x-1/
216*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*g^3*(9*arcsin(c*x)^2-2)*cos(4
*arcsin(c*x))+1/36*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*g^
3*sin(4*arcsin(c*x))+3/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2*ar
csin(c*x)*cos(3*arcsin(c*x))+3/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2...
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^3(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral(-(a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*
g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*
b*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"maxima")
```

output
```
-1/3*a^2*g^3*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c
^4*d)) - 3/2*a^2*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*
sqrt(d))) + a*b*f^3*arcsin(c*x)^2/(c*sqrt(d)) + 6*a*b*f^2*g*x/(c*sqrt(d))
+ a^2*f^3*arcsin(c*x)/(c*sqrt(d)) - 6*sqrt(-c^2*d*x^2 + d)*a*b*f^2*g*arcsi
n(c*x)/(c^2*d) - 3*sqrt(-c^2*d*x^2 + d)*a^2*f^2*g/(c^2*d) - sqrt(d)*integr
ate(((b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^3*x^3 + 3*a*b*f*g^2*x^2)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*
d*x^2 - d), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{2asin(cx)^3\,b^2c^3f^3 - 18\sqrt{-c^2x^2+1}\,asin(cx)^2\,b^2c^2f^2g + 6asin(cx)^2\,ab\,c^3f^3 - 36\sqrt{-c^2x^2+1}\,asin(cx)\,ab\,c}{}$$

input
```
int((g*x+f)^3*(a+b*asin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

output

```
(2*asin(c*x)**3*b**2*c**3*f**3 - 18*sqrt( - c**2*x**2 + 1)*asin(c*x)**2*b*
*2*c**2*f**2*g + 6*asin(c*x)**2*a*b*c**3*f**3 - 36*sqrt( - c**2*x**2 + 1)*
asin(c*x)*a*b*c**2*f**2*g + 6*asin(c*x)*a**2*c**3*f**3 + 9*asin(c*x)*a**2*
c*f*g**2 + 36*asin(c*x)*b**2*c**3*f**2*g*x - 18*sqrt( - c**2*x**2 + 1)*a**
2*c**2*f**2*g - 9*sqrt( - c**2*x**2 + 1)*a**2*c**2*f*g**2*x - 2*sqrt( - c*
*2*x**2 + 1)*a**2*c**2*g**3*x**2 - 4*sqrt( - c**2*x**2 + 1)*a**2*g**3 + 36
*sqrt( - c**2*x**2 + 1)*b**2*c**2*f**2*g + 12*int((asin(c*x)*x**3)/sqrt( -
 c**2*x**2 + 1),x)*a*b*c**4*g**3 + 36*int((asin(c*x)*x**2)/sqrt( - c**2*x*
*2 + 1),x)*a*b*c**4*f*g**2 + 6*int((asin(c*x)**2*x**3)/sqrt( - c**2*x**2 +
 1),x)*b**2*c**4*g**3 + 18*int((asin(c*x)**2*x**2)/sqrt( - c**2*x**2 + 1),
x)*b**2*c**4*f*g**2 + 36*a*b*c**3*f**2*g*x)/(6*sqrt(d)*c**4)
```

3.144 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 382

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{4b^2fg\sqrt{d-c^2dx^2}}{c^2d}+\frac{b^2g^2x\sqrt{d-c^2dx^2}}{4c^2d} - \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} + \frac{4bfgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} + \frac{bg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} - \frac{2fg\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2d} - \frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2c^2d} + \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}}$$

output
```
4*b^2*f*g*(-c^2*d*x^2+d)^(1/2)/c^2/d+1/4*b^2*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^
2/d-1/4*b^2*g^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)/c^3/(-c^2*d*x^2+d)^(1/2)+4*
b*f*g*x*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*d*x^2+d)^(1/2)+1/2*b*
g^2*x^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c/(-c^2*d*x^2+d)^(1/2)-2*f*g*
(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/c^2/d-1/2*g^2*x*(-c^2*d*x^2+d)^(1
/2)*(a+b*arcsin(c*x))^2/c^2/d+1/3*f^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))
^3/b/c/(-c^2*d*x^2+d)^(1/2)+1/6*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3
/b/c^3/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 1.08 (sec) , antiderivative size = 400, normalized size of antiderivative = 1.05

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{-4b^2\sqrt{d}(2c^2f^2+g^2)\left(-1+c^2x^2\right)\arcsin(cx)^3-12a^2(2c^2f^2+g^2)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2}}{\sqrt{d}(-1+c}\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(-4*b^2*Sqrt[d]*(2*c^2*f^2 + g^2)*(-1 + c^2*x^2)*ArcSin[c*x]^3 - 12*a^2*(2
*c^2*f^2 + g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d -
 c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 6*b*Sqrt[d]*g*(-1 + c^2*x^2)*ArcS
in[c*x]*(16*c*f*(-(b*c*x) + a*Sqrt[1 - c^2*x^2]) + b*g*Cos[2*ArcSin[c*x]]
+ 2*a*g*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d]*g*(-1 + c^2*x^2)*(4*c*(-8*a*b*c*f*
x - 8*b^2*f*Sqrt[1 - c^2*x^2] + a^2*(4*f + g*x)*Sqrt[1 - c^2*x^2]) + 2*a*b
*g*Cos[2*ArcSin[c*x]] - b^2*g*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d]*(-1 + c^2*
x^2)*ArcSin[c*x]^2*(-2*a*(2*c^2*f^2 + g^2) + 8*b*c*f*g*Sqrt[1 - c^2*x^2] +
 b*g^2*Sin[2*ArcSin[c*x]]))/(24*c^3*Sqrt[d]*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2
*d*x^2])
```

Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 240, normalized size of antiderivative = 0.63, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {5276, 5272, 3042, 3798, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{\sqrt{1-c^2x^2}\int (cf+cgx)^2(a+b\arcsin(cx))^2d\arcsin(cx)}{c^3\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\sqrt{1-c^2x^2}\int (a+b\arcsin(cx))^2(cf+g\sin(\arcsin(cx)))^2d\arcsin(cx)}{c^3\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3798}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(c^2f^2(a+b\arcsin(cx))^2+c^2g^2x^2(a+b\arcsin(cx))^2+2c^2fgx(a+b\arcsin(cx))^2\right)d\arcsin(cx)}{c^3\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{1-c^2x^2}\left(\frac{c^2f^2(a+b\arcsin(cx))^3}{3b}-2cfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+4bc^2fgx(a+b\arcsin(cx))-\frac{1}{2}cg^2x\sqrt{1-c^2\right.$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*(4*b^2*c*f*g*Sqrt[1 - c^2*x^2] + (b^2*c*g^2*x*Sqrt[1 -
c^2*x^2])/4 - (b^2*g^2*ArcSin[c*x])/4 + 4*b*c^2*f*g*x*(a + b*ArcSin[c*x])
+ (b*c^2*g^2*x^2*(a + b*ArcSin[c*x]))/2 - 2*c*f*g*Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x])^2 - (c*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 + (c
^2*f^2*(a + b*ArcSin[c*x])^3)/(3*b) + (g^2*(a + b*ArcSin[c*x])^3)/(6*b)))/
(c^3*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3798
```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.71 (sec) , antiderivative size = 928, normalized size of antiderivative = 2.43

method	result
default	$a^2\left(\frac{f^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right)-\frac{2fg\sqrt{-c^2d\,x^2+d}}{c^2d}\right)+b^2\left(-\frac{\sqrt{-c}}{}\right.$
parts	$a^2\left(\frac{f^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right)-\frac{2fg\sqrt{-c^2d\,x^2+d}}{c^2d}\right)+b^2\left(-\frac{\sqrt{-c}}{}\right.$

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^2*(-
1/2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-c^2*d*x^2+d)^(1/2)))-2*f*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b^2*(-1/6*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^3*(2*
c^2*f^2+g^2)-(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*f
*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1
/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsin(c
*x))/c^2/d/(c^2*x^2-1)+1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d
/(c^2*x^2-1)*arcsin(c*x)*g^2+1/16*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)
*g^2*(2*arcsin(c*x)^2-1)*x+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*g^
2*arcsin(c*x)*cos(3*arcsin(c*x))+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^
2-1)*g^2*(2*arcsin(c*x)^2-1)*sin(3*arcsin(c*x)))+2*a*b*(-1/4*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*(2*c^2*f^2+g^
2)-(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*f*g*(arcsin
(c*x)+I)/c^2/d/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*
x+c^2*x^2-1)*f*g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(
1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*g^2+1/8*(-d*(c^2*x^2-1))^(1/2)/c
^2/d/(c^2*x^2-1)*arcsin(c*x)*g^2*x+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*
x^2-1)*g^2*cos(3*arcsin(c*x))+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)
*arcsin(c*x)*g^2*sin(3*arcsin(c*x)))
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral(-(a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*
x + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsi
n(c*x))*sqrt(-c^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"maxima")
```

output
```
-1/2*a^2*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d)))
+ a*b*f^2*arcsin(c*x)^2/(c*sqrt(d)) + 4*a*b*f*g*x/(c*sqrt(d)) + a^2*f^2*ar
csin(c*x)/(c*sqrt(d)) - 4*sqrt(-c^2*d*x^2 + d)*a*b*f*g*arcsin(c*x)/(c^2*d)
 - 2*sqrt(-c^2*d*x^2 + d)*a^2*f*g/(c^2*d) - sqrt(d)*integrate((2*a*b*g^2*x
^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)*sqrt(c*x + 1)*sq
rt(-c*x + 1)/(c^2*d*x^2 - d), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{2asin(cx)^3\,b^2c^2f^2 - 12\sqrt{-c^2x^2+1}\,asin(cx)^2\,b^2cfg + 6asin(cx)^2\,ab\,c^2f^2 - 24\sqrt{-c^2x^2+1}\,asin(cx)\,abcf}{}$$

input
```
int((g*x+f)^2*(a+b*asin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
(2*asin(c*x)**3*b**2*c**2*f**2 - 12*sqrt( - c**2*x**2 + 1)*asin(c*x)**2*b*
*2*c*f*g + 6*asin(c*x)**2*a*b*c**2*f**2 - 24*sqrt( - c**2*x**2 + 1)*asin(c
*x)*a*b*c*f*g + 6*asin(c*x)*a**2*c**2*f**2 + 3*asin(c*x)*a**2*g**2 + 24*as
in(c*x)*b**2*c**2*f*g*x - 12*sqrt( - c**2*x**2 + 1)*a**2*c*f*g - 3*sqrt( -
 c**2*x**2 + 1)*a**2*c*g**2*x + 24*sqrt( - c**2*x**2 + 1)*b**2*c*f*g + 12*
int((asin(c*x)*x**2)/sqrt( - c**2*x**2 + 1),x)*a*b*c**3*g**2 + 6*int((asin
(c*x)**2*x**2)/sqrt( - c**2*x**2 + 1),x)*b**2*c**3*g**2 + 12*a**2*c*f*g +
24*a*b*c**2*f*g*x)/(6*sqrt(d)*c**3)
```

3.145 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 157

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{2b^2g\sqrt{d-c^2dx^2}}{c^2d} + \frac{2bgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} - \frac{g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2d} + \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}$$

output
```
2*b^2*g*(-c^2*d*x^2+d)^(1/2)/c^2/d+2*b*g*x*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(
c*x))/c/(-c^2*d*x^2+d)^(1/2)-g*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/c^
2/d+1/3*f*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3/b/c/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.75

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c} + \frac{f(a+b\arcsin(cx))^3}{3b} + \frac{2bg\left(acx+b\sqrt{1-c^2x^2}+bcx\arcsin(cx)\right)}{c}\right)}{c\sqrt{d-c^2dx^2}}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/c) + (f*
(a + b*ArcSin[c*x])^3)/(3*b) + (2*b*g*(a*c*x + b*Sqrt[1 - c^2*x^2] + b*c*x
*ArcSin[c*x]))/c))/(c*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.82, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{gx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^2}+\frac{f(a+b\arcsin(cx))^3}{3bc}+\frac{2abgx}{c}+\frac{2b^2gx\arcsin(cx)}{c}+\frac{2b^2g\sqrt{1-c^2x^2}}{c^2}\right)}{\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*((2*a*b*g*x)/c + (2*b^2*g*Sqrt[1 - c^2*x^2])/c^2 + (2*b
^2*g*x*ArcSin[c*x])/c - (g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/c^2 +
(f*(a + b*ArcSin[c*x])^3)/(3*b*c)))/Sqrt[d - c^2*d*x^2]
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.74 (sec) , antiderivative size = 460, normalized size of antiderivative = 2.93

method	result
default	$\frac{a^2 f \arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d\, x^2+d}}\right)}{\sqrt{c^2 d}}-\frac{a^2 g \sqrt{-c^2 d\, x^2+d}}{c^2 d}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3 f}{3cd(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-i\right.}{}\right.$
parts	$\frac{a^2 f \arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d\, x^2+d}}\right)}{\sqrt{c^2 d}}-\frac{a^2 g \sqrt{-c^2 d\, x^2+d}}{c^2 d}+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3 f}{3cd(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-i\right.}{}\right.$

input
```
int((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a^2*f/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-a^2*g/c^2
/d*(-c^2*d*x^2+d)^(1/2)+b^2*(-1/3*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/c/d/(c^2*x^2-1)*arcsin(c*x)^3*f-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*
x*(-c^2*x^2+1)^(1/2)-1)*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/d/(c^2*x^2
-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g*(arc
sin(c*x)^2-2-2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1))+2*a*b*(-1/2*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^2*f-1/2*(-d*(c^2*
x^2-1))^(1/2)*(c^2*x^2-I*c*x*(-c^2*x^2+1)^(1/2)-1)*g*(arcsin(c*x)+I)/c^2/d
/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-
1)*g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1))
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin
(c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x))/(c^2*d*x^2 - d), x)
```

Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

Maxima [A] (verification not implemented)

Time = 0.16 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.17

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{b^2f\arcsin{(cx)}^3}{3\,c\sqrt{d}} + 2\,b^2g\left(\frac{x\arcsin{(cx)}}{c\sqrt{d}} + \frac{\sqrt{-c^2x^2+1}}{c^2\sqrt{d}}\right) + \frac{abf\arcsin{(cx)}^2}{c\sqrt{d}} + \frac{2\,abgx}{c\sqrt{d}} + \frac{a^2f\arcsin{(cx)}}{c\sqrt{d}} - \frac{\sqrt{-c^2dx^2+d}b^2g\arcsin{(cx)}^2}{c^2d} - \frac{2\sqrt{-c^2dx^2+d}abg\arcsin{(cx)}}{c^2d} - \frac{\sqrt{-c^2dx^2+d}a^2g}{c^2d}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
1/3*b^2*f*arcsin(c*x)^3/(c*sqrt(d)) + 2*b^2*g*(x*arcsin(c*x)/(c*sqrt(d)) +
 sqrt(-c^2*x^2 + 1)/(c^2*sqrt(d))) + a*b*f*arcsin(c*x)^2/(c*sqrt(d)) + 2*a
*b*g*x/(c*sqrt(d)) + a^2*f*arcsin(c*x)/(c*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*
b^2*g*arcsin(c*x)^2/(c^2*d) - 2*sqrt(-c^2*d*x^2 + d)*a*b*g*arcsin(c*x)/(c^
2*d) - sqrt(-c^2*d*x^2 + d)*a^2*g/(c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 142, normalized size of antiderivative = 0.90

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$
$$=\frac{\sqrt{d}\left(asin(cx)^3 b^2cf-3\sqrt{-c^2x^2+1}\,asin(cx)^2 b^2g+3asin(cx)^2 abcf-6\sqrt{-c^2x^2+1}\,asin(cx)\,abg+3asi}{3c^2d}$$

input
```
int((g*x+f)*(a+b*asin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
(sqrt(d)*(asin(c*x)**3*b**2*c*f - 3*sqrt( - c**2*x**2 + 1)*asin(c*x)**2*b*
*2*g + 3*asin(c*x)**2*a*b*c*f - 6*sqrt( - c**2*x**2 + 1)*asin(c*x)*a*b*g +
 3*asin(c*x)*a**2*c*f + 6*asin(c*x)*b**2*c*g*x - 3*sqrt( - c**2*x**2 + 1)*
a**2*g + 6*sqrt( - c**2*x**2 + 1)*b**2*g + 6*a*b*c*g*x))/(3*c**2*d)
```

3.146 $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 589

$$
\begin{aligned}
\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = &-\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&-\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&-\frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} \\
&+\frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}
\end{aligned}
$$

output
```
-I*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)
)*g/(c*f-(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+I*
(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g
/(c*f+(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*b*(
-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))
*g/(c*f-(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2*b
*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2
))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2
*I*b^2*(-c^2*x^2+1)^(1/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c
^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*(-c^2
*x^2+1)^(1/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^
(1/2)))/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 357, normalized size of antiderivative = 0.61

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx =$$
$$-\frac{i\sqrt{1-c^2x^2}\left((a+b\arcsin(cx))^2\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

output
```
((-I)*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x]
)*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^
(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*
x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I
)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2
*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f
^2 - g^2])] - 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])]))/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 1.71 (sec) , antiderivative size = 402, normalized size of antiderivative = 0.68, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.303, Rules used = {5276, 5272, 3042, 3804, 2694, 27, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}(f+gx)}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{cf+cgx}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3804}$$

$$\frac{2\sqrt{1-c^2x^2}\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2ce^{i\arcsin(cx)}f-ie^{2i\arcsin(cx)}g+ig}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2694}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2\left(cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2\left(cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2620}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\int(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\cdots}{\cdots}\right.}{\cdots}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3011}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-ib\int\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\,a\cdots\right.}{g}\right.}{2\sqrt{c^2f^2-g^2}}\cdots\right.}{\cdots}$$

$$\Big\downarrow \text{2720}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}\cdots}{cf+\sqrt{\cdots}}\right.\right.}{g}\right.}{2\sqrt{c^2f^2-g^2}}\cdots\right.}{\cdots}$$

$$\Big\downarrow \text{7143}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}\cdots\right.}{\sqrt{d-c^2dx\cdots}}$$

input
```
Int[(a + b*ArcSin[c*x])^2/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(2*Sqrt[1 - c^2*x^2]*(((-1/2*I)*g*(((a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*
ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g - (2*b*(I*(a + b*ArcSin[c*
x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] - b*Po
lyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]))/g))/Sqrt[c
^2*f^2 - g^2] + ((I/2)*g*(((a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*
x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (2*b*(I*(a + b*ArcSin[c*x])*PolyL
og[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - b*PolyLog[3,
(I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/g))/Sqrt[c^2*f^2 -
g^2]))/Sqrt[d - c^2*d*x^2]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(gx+f)\sqrt{-c^2d\,x^2+d}}dx$$

input
```
int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2)/(c^2*d*g*x^3 + c^2*d*f*x^2 - d*g*x - d*f), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{\sqrt{-d(cx-1)(cx+1)}(f+gx)}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(g*x+f)/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*(g*x + f)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(1/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{2\sqrt{c^2f^2-g^2}\,atan\left(\frac{\tan\left(\frac{asin(cx)}{2}\right)cf+g}{\sqrt{c^2f^2-g^2}}\right)a^2+2\left(\int \frac{asin(cx)}{\sqrt{-c^2x^2+1}\,f+\sqrt{-c^2x^2+1}\,gx}dx\right)ab\,c^2f^2-2\left(\int \frac{asin(cx)}{\sqrt{-c^2x^2+1}\,f+\sqrt{-c^2x^{2}}}\right.}{\sqrt{d}\,(c^2f^2-g^2}$$

input

```
int((a+b*asin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x)
```

output

```
(2*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 -
 g**2))*a**2 + 2*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f + sqrt( - c**2*x*
*2 + 1)*g*x),x)*a*b*c**2*f**2 - 2*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f
+ sqrt( - c**2*x**2 + 1)*g*x),x)*a*b*g**2 + int(asin(c*x)**2/(sqrt( - c**2
*x**2 + 1)*f + sqrt( - c**2*x**2 + 1)*g*x),x)*b**2*c**2*f**2 - int(asin(c*
x)**2/(sqrt( - c**2*x**2 + 1)*f + sqrt( - c**2*x**2 + 1)*g*x),x)*b**2*g**2
)/(sqrt(d)*(c**2*f**2 - g**2))
```

3.147 $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1106

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{g\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{d(c^2f^2-g^2)(f+gx)}$$
$$- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$- \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$- \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$+ \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{2ib^2c\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$- \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{2ib^2c\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$
$$+ \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$- \frac{2ib^2c^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+ \frac{2ib^2c^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

output
```
I*c*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1
/2)+g*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))^2/d/(c^2*f^2-g^2)/(g*x+f)-2*b
*c*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f-(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)-I*c^2*f*(-
c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(
c*f-(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-2*b*c*(
-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c
*f+(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)+I*c^2*f*(-c^2*
x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+
(c^2*f^2-g^2)^(1/2)))/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*c*(
-c^2*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g
^2)^(1/2)))/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)-2*b*c^2*f*(-c^2*x^2+1)^(1/2
)*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2
-g^2)^(1/2)))/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*c*(-c^2*x^2
+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2
)))/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)+2*b*c^2*f*(-c^2*x^2+1)^(1/2)*(a+b*a
rcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1
/2)))/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*c^2*f*(-c^2*x^2+1)^
(1/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/
(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*c^2*f*(-c^2*x^2+1)^(1/...
```

Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 651, normalized size of antiderivative = 0.59

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \frac{c\sqrt{1-c^2x^2}\left(i(a+b\arcsin(cx))^2+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cf+cgx}-2b(a+b\arcsin(cx))\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

output

```
(c*Sqrt[1 - c^2*x^2]*(I*(a + b*ArcSin[c*x])^2 + (g*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])^2)/(c*f + c*g*x) - 2*b*(a + b*ArcSin[c*x])*Log[1 + (I*E^(I*
ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - 2*b*(a + b*ArcSin[c*x])*
Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + (2*I)*b^2*P
olyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b^2
*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (I*c*f*
((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*
f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])
*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g
)/(c*f - Sqrt[c^2*f^2 - g^2])]))/Sqrt[c^2*f^2 - g^2] + (c*f*(2*b*(a + b*Ar
cSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]
 + I*((a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^
2*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*
f^2 - g^2])])))/Sqrt[c^2*f^2 - g^2]))/((c^2*f^2 - g^2)*Sqrt[d - c^2*d*x^2]
)
```

Rubi [A] (verified)

Time = 3.25 (sec) , antiderivative size = 721, normalized size of antiderivative = 0.65, number of steps used = 17, number of rules used = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.485$, Rules used = {5276, 5272, 3042, 3805, 3042, 3804, 2694, 27, 2620, 3011, 2720, 5030, 2620, 2715, 2838, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}(f+gx)^2}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{c\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(cf+cgx)^2}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{c\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(cf+g\sin(\arcsin(cx)))^2}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 3805$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{cf\int \frac{(a+b\arcsin(cx))^2}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 3042$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{cf\int \frac{(a+b\arcsin(cx))^2}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 3804$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{2cf\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2ce^{i\arcsin(cx)}f-ie^{2i\arcsin(cx)}g+ig}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin}{(c^2f^2-g^2)(cf+cg}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 2694$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{2cf\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2\left(cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b}{2\left(cf-ie^{i\arcsin(cx)}g\right.}}{\sqrt{c^2}}\right.}{c^2f^2-g^2}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 27$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{2cf\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2}}}{2\sqrt{c^2f^2-g^2}}\right.}{c^2f^2-g^2}\right.}{\sqrt{d-c^2dx^2}}$$

$\Big\downarrow$ 2620

$$c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\int(a+b\arcsin(cx))\log\left(1-\frac{i\ldots}{c\ldots}\right)}{g}\ldots\right)}{2\sqrt{c^2f^2-g^2}}\ldots\right)}{\ldots}\right.$$

$\Big\downarrow$ 3011

$$c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-ib\int\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\ldots\right)\ldots\right)}{g}\ldots\right)}{2\sqrt{c^2f^2-g^2}}\ldots\right)}{\ldots}\right.$$

$\Big\downarrow$ 2720

$$c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{i}{c}\cdots\right.\right.}{g}\cdots\right.}{2\sqrt{c^2f^2-g^2}\cdots}\cdots}{\cdots}\cdots\right.$$

$\downarrow$ 5030

$$c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{i}{c}\cdots\right.\right.}{g}\cdots\right.}{2\sqrt{c^2f^2-g^2}\cdots}\cdots}{\cdots}\cdots\right.$$

$\downarrow$ 2620

$$c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{i\cdots}{c\cdots}\right.\right.}{g}\right.}{2\sqrt{c^2f^2-g^2}}\right.}{\cdots}\right.$$

$\downarrow$ 2715

$$c\sqrt{1-c^2x^2}\left(\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(cf+cgx)}-\frac{2bg\left(-\frac{i(a+b\arcsin(cx))^2}{2bg}+\frac{\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)(a+b\arcsin(cx))}{g}+\frac{\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)(a+b\cdots}{g}\right.}{\cdots}\right.$$

$\downarrow$ 2838

$$c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{i\ldots}{c\ldots}\right.\right.}{g}\right.}{2\sqrt{c^2f^2-g^2}}\right.}{\ldots}\right.$$

$\Big\downarrow$ 7143

$$c\sqrt{1-c^2x^2}\left(-\frac{2bg\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{i(a+b\arcsin(cx))^2}{2bg}-\frac{ib\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}\ldots}{cf-\sqrt{\ldots}}\right)}{g}\ldots\right.}{c^2f^2-g^2}\right.$$

input
```
Int[(a + b*ArcSin[c*x])^2/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(c*Sqrt[1 - c^2*x^2]*((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/((c^2*f^
2 - g^2)*(c*f + c*g*x)) - (2*b*g*(((-1/2*I)*(a + b*ArcSin[c*x])^2)/(b*g) +
 ((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2
- g^2])])/g + ((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f +
Sqrt[c^2*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f -
Sqrt[c^2*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f +
Sqrt[c^2*f^2 - g^2])])/g))/(c^2*f^2 - g^2) + (2*c*f*(((-1/2*I)*g*(((a + b*
ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
])/g - (2*b*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f
 - Sqrt[c^2*f^2 - g^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqr
t[c^2*f^2 - g^2])]))/g))/Sqrt[c^2*f^2 - g^2] + ((I/2)*g*(((a + b*ArcSin[c*
x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (2
*b*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c
^2*f^2 - g^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])]))/g))/Sqrt[c^2*f^2 - g^2]))/(c^2*f^2 - g^2)))/Sqrt[d - c^2*d*x^2
]
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 3805
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Simp[a/(a^2 - b^2)   Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x]
, x] - Simp[b*d*(m/(f*(a^2 - b^2)))   Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(
a + b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 -
b^2, 0] && IGtQ[m, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(gx+f)^2\sqrt{-c^2d\,x^2+d}}dx$$

input
```
int((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2)/(c^2*d*g^2*x^4 + 2*c^2*d*f*g*x^3 - 2*d*f*g*x - d*f^2 + (c^2*d*f^2 - d*g
^2)*x^2), x)
```

Sympy [F]

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

input
```
integrate((a+b*asin(c*x))**2/(g*x+f)**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)**2),
 x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"maxima")
```

output
```
integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*(g*x + f)^2), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

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

input
```
int((a + b*asin(c*x))^2/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \text{Too large to display}$$

input
```
int((a+b*asin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
(2*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c*f + g)/sqrt(c**2*f**2 -
 g**2))*a**2*c**2*f**2 + 2*sqrt(c**2*f**2 - g**2)*atan((tan(asin(c*x)/2)*c
*f + g)/sqrt(c**2*f**2 - g**2))*a**2*c**2*f*g*x + sqrt( - c**2*x**2 + 1)*a
**2*c**2*f**2*g - sqrt( - c**2*x**2 + 1)*a**2*g**3 + 2*int(asin(c*x)/(sqrt
( - c**2*x**2 + 1)*f**2 + 2*sqrt( - c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x*
*2 + 1)*g**2*x**2),x)*a*b*c**4*f**5 + 2*int(asin(c*x)/(sqrt( - c**2*x**2 +
 1)*f**2 + 2*sqrt( - c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x*
*2),x)*a*b*c**4*f**4*g*x - 4*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f**2 +
2*sqrt( - c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x**2),x)*a*b*
c**2*f**3*g**2 - 4*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f**2 + 2*sqrt( -
c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x**2),x)*a*b*c**2*f**2*
g**3*x + 2*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*f**2 + 2*sqrt( - c**2*x**
2 + 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x**2),x)*a*b*f*g**4 + 2*int(asi
n(c*x)/(sqrt( - c**2*x**2 + 1)*f**2 + 2*sqrt( - c**2*x**2 + 1)*f*g*x + sqr
t( - c**2*x**2 + 1)*g**2*x**2),x)*a*b*g**5*x + int(asin(c*x)**2/(sqrt( - c
**2*x**2 + 1)*f**2 + 2*sqrt( - c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x**2 +
1)*g**2*x**2),x)*b**2*c**4*f**5 + int(asin(c*x)**2/(sqrt( - c**2*x**2 + 1)
*f**2 + 2*sqrt( - c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x**2)
,x)*b**2*c**4*f**4*g*x - 2*int(asin(c*x)**2/(sqrt( - c**2*x**2 + 1)*f**2 +
 2*sqrt( - c**2*x**2 + 1)*f*g*x + sqrt( - c**2*x**2 + 1)*g**2*x**2),x)*...
```

3.148 $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 677

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = -\frac{2b^2g^3\sqrt{d-c^2dx^2}}{c^4d^2} - \frac{2bg^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3d\sqrt{d-c^2dx^2}} + \frac{g(3c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} + \frac{f\left(f^2+\frac{3g^2}{c^2}\right)x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{if(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} + \frac{g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^4d^2} - \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}} + \frac{4ibg(3c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{2bf(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} - \frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} + \frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} - \frac{ib^2f(c^2f^2+3g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}$$

output
```
-2*b^2*g^3*(-c^2*d*x^2+d)^(1/2)/c^4/d^2-2*b*g^3*x*(-c^2*x^2+1)^(1/2)*(a+b*
arcsin(c*x))/c^3/d/(-c^2*d*x^2+d)^(1/2)+g*(3*c^2*f^2+g^2)*(a+b*arcsin(c*x)
)^2/c^4/d/(-c^2*d*x^2+d)^(1/2)+f*(f^2+3*g^2/c^2)*x*(a+b*arcsin(c*x))^2/d/(
-c^2*d*x^2+d)^(1/2)-I*f*(c^2*f^2+3*g^2)*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x
))^2/c^3/d/(-c^2*d*x^2+d)^(1/2)+g^3*(-c^2*d*x^2+d)^(1/2)*(a+b*arcsin(c*x))
^2/c^4/d^2-f*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^3/b/c^3/d/(-c^2*d*x^
2+d)^(1/2)+4*I*b*g*(3*c^2*f^2+g^2)*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ar
ctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*b*f*(c^2*f^2+3
*g^2)*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))
^2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*g*(3*c^2*f^2+g^2)*(-c^2*x^2+1)^(1/2
)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*I*
b^2*g*(3*c^2*f^2+g^2)*(-c^2*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(
1/2)))/c^4/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*f*(c^2*f^2+3*g^2)*(-c^2*x^2+1)^(1/
2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 2.12 (sec) , antiderivative size = 325, normalized size of antiderivative = 0.48

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\Big(2g^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{2cfg^2(a+b\arcsin(cx))^3}{b}-4}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (2*c*f
*g^2*(a + b*ArcSin[c*x])^3)/b - 4*b*g^3*(a*c*x + b*Sqrt[1 - c^2*x^2] + b*c
*x*ArcSin[c*x]) + (c*f - g)^3*(-((a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[
c*x])/4]) + I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/
E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])) - (c*f +
g)^3*(I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*A
rcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]) - (a + b*ArcSin[
c*x])^2*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^4*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 1.43 (sec) , antiderivative size = 447, normalized size of antiderivative = 0.66, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(-\frac{x(a+b\arcsin(cx))^2g^3}{c^2\sqrt{1-c^2x^2}}-\frac{3f(a+b\arcsin(cx))^2g^2}{c^2\sqrt{1-c^2x^2}}+\frac{(c^2f^3+3g^2f+g(3c^2f^2+g^2)x)(a+b\arcsin(cx))^2}{c^2(1-c^2x^2)^{3/2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{4ibg(3c^2f^2+g^2)\arctan(e^{i\arcsin(cx)})(a+b\arcsin(cx))}{c^4}-\frac{fg^2(a+b\arcsin(cx))^3}{bc^3}+\frac{fx\left(\frac{3g^2}{c^2}+f^2\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{g(3c^2f^2\ldots}{\ldots}\right.}{\ldots}$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-2*a*b*g^3*x)/c^3 - (2*b^2*g^3*Sqrt[1 - c^2*x^2])/c^4
 - (2*b^2*g^3*x*ArcSin[c*x])/c^3 - (I*f*(c^2*f^2 + 3*g^2)*(a + b*ArcSin[c*
x])^2)/c^3 + (g*(3*c^2*f^2 + g^2)*(a + b*ArcSin[c*x])^2)/(c^4*Sqrt[1 - c^2
*x^2]) + (f*(f^2 + (3*g^2)/c^2)*x*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2]
 + (g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/c^4 - (f*g^2*(a + b*ArcSi
n[c*x])^3)/(b*c^3) + ((4*I)*b*g*(3*c^2*f^2 + g^2)*(a + b*ArcSin[c*x])*ArcT
an[E^(I*ArcSin[c*x])])/c^4 + (2*b*f*(c^2*f^2 + 3*g^2)*(a + b*ArcSin[c*x])*
Log[1 + E^((2*I)*ArcSin[c*x])])/c^3 - ((2*I)*b^2*g*(3*c^2*f^2 + g^2)*PolyL
og[2, (-I)*E^(I*ArcSin[c*x])])/c^4 + ((2*I)*b^2*g*(3*c^2*f^2 + g^2)*PolyLo
g[2, I*E^(I*ArcSin[c*x])])/c^4 - (I*b^2*f*(c^2*f^2 + 3*g^2)*PolyLog[2, -E^
((2*I)*ArcSin[c*x])])/c^3))/(d*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1527 vs. $2(674) = 1348$.

Time = 1.54 (sec) , antiderivative size = 1528, normalized size of antiderivative = 2.26

method	result	size
default	Expression too large to display	1528
parts	Expression too large to display	1528

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^3*x/d/(-c^2*d*x^2+d)^(1/2)+g^3*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d
/c^4/(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d/(
c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+3*f^2*g/c^2/d/(
-c^2*d*x^2+d)^(1/2))+b^2*((-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^
2/(c^2*x^2-1)*arcsin(c*x)^3*f*g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*c*
x*(-c^2*x^2+1)^(1/2)-1)*g^3*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^4/d^2/(c^2
*x^2-1)+1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*c*x+c^2*x^2-1)*g^
3*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/c^4/d^2/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(
1/2)/c^4/d^2/(c^2*x^2-1)*arcsin(c*x)^2*(I*(-c^2*x^2+1)^(1/2)*c^3*f^3+c^4*f
^3*x+3*I*(-c^2*x^2+1)^(1/2)*c*f*g^2+3*c^2*f*g^2*x+3*f^2*g*c^2+g^3)+(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(2*I*arcsin(c*x)^2*c^3*f^3+I*polylog(2,
-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^3*f^3-2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2
+1)^(1/2))^2)*c^3*f^3+6*I*arcsin(c*x)^2*c*f*g^2+6*I*dilog(1+I*(I*c*x+(-c^2
*x^2+1)^(1/2)))*c^2*f^2*g-6*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*f^
2*g-6*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*f^2*g+6*arcsin(c*
x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*f^2*g+3*I*polylog(2,-(I*c*x+(-c^
2*x^2+1)^(1/2))^2)*c*f*g^2-6*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2
)*c*f*g^2+2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g^3-2*I*dilog(1-I*(I*c
*x+(-c^2*x^2+1)^(1/2)))*g^3-2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)
))*g^3+2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g^3)/c^4/d^2/(c...
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"fricas")
```

output
```
integral((a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*g
^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*b
*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)^3}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(3/2)
, x)
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin\,(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"maxima")
```

output
```
-a^2*g^3*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 + d)*c^4*d
)) + 3*a^2*f*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2
))) + 2*a*b*f^3*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a^2*f^3*x/(sqrt(-
c^2*d*x^2 + d)*d) - a*b*f^3*log(x^2 - 1/c^2)/(c*d^(3/2)) + 3*a^2*f^2*g/(sq
rt(-c^2*d*x^2 + d)*c^2*d) - sqrt(d)*integrate(((b^2*g^3*x^3 + 3*b^2*f*g^2*
x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^
2 + 2*(a*b*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))/((c^2*d^2*x^2 - d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1))
, x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{-\sqrt{-c^2x^2+1}\,asin(cx)^3\,b^2cf\,g^2 - 3\sqrt{-c^2x^2+1}\,asin(cx)^2\,abcf\,g^2 - 3}{}$$

input
```
int((g*x+f)^3*(a+b*asin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

output

```
( - sqrt( - c**2*x**2 + 1)*asin(c*x)**3*b**2*c*f*g**2 - 3*sqrt( - c**2*x**
2 + 1)*asin(c*x)**2*a*b*c*f*g**2 - 3*sqrt( - c**2*x**2 + 1)*asin(c*x)*a**2
*c*f*g**2 - 2*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)
*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*a*b*c**4*f**3 - 6*sqrt( - c**2*x**
2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2
 + 1)),x)*a*b*c**2*f*g**2 - sqrt( - c**2*x**2 + 1)*int(asin(c*x)**2/(sqrt(
 - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*b**2*c**4*f**3 -
3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)**2/(sqrt( - c**2*x**2 + 1)*c**2*x**
2 - sqrt( - c**2*x**2 + 1)),x)*b**2*c**2*f*g**2 - 2*sqrt( - c**2*x**2 + 1)
*int((asin(c*x)*x**3)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**
2 + 1)),x)*a*b*c**4*g**3 - 6*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqr
t( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*a*b*c**4*f**2*g
 - sqrt( - c**2*x**2 + 1)*int((asin(c*x)**2*x**3)/(sqrt( - c**2*x**2 + 1)*
c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*b**2*c**4*g**3 - 3*sqrt( - c**2*x**
2 + 1)*int((asin(c*x)**2*x)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c*
*2*x**2 + 1)),x)*b**2*c**4*f**2*g + a**2*c**4*f**3*x + 3*a**2*c**2*f**2*g
+ 3*a**2*c**2*f*g**2*x - a**2*c**2*g**3*x**2 + 2*a**2*g**3)/(sqrt(d)*sqrt(
 - c**2*x**2 + 1)*c**4*d)
```

3.149 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 513

$$\begin{aligned}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{(c^2f^2+g^2)\,x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} \\ &- \frac{i(c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} \\ &- \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} \\ &+ \frac{8ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{2b(c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} \\ &- \frac{4ib^2fg\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{4ib^2fg\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &- \frac{ib^2(c^2f^2+g^2)\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
2*f*g*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+(c^2*f^2+g^2)*x*(a+b*
arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*(c^2*f^2+g^2)*(-c^2*x^2+1)^(1/
2)*(a+b*arcsin(c*x))^2/c^3/d/(-c^2*d*x^2+d)^(1/2)-1/3*g^2*(-c^2*x^2+1)^(1/
2)*(a+b*arcsin(c*x))^3/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+8*I*b*f*g*(-c^2*x^2+1)
^(1/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^2/d/(-c^2*d*x^
2+d)^(1/2)+2*b*(c^2*f^2+g^2)*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))^2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-4*I*b^2*f*g*(-c^2*x^
2+1)^(1/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^2/d/(-c^2*d*x^2+d)^(
1/2)+4*I*b^2*f*g*(-c^2*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))
)/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*(c^2*f^2+g^2)*(-c^2*x^2+1)^(1/2)*polylo
g(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 1.37 (sec) , antiderivative size = 259, normalized size of antiderivative = 0.50

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-\frac{2g^2(a+b\arcsin(cx))^3}{b}+3(-cf+g)^2\left(-(a+b\arcsin(cx))^2\,\mathrm{co}\right.\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-2*g^2*(a + b*ArcSin[c*x])^3)/b + 3*(-(c*f) + g)^2*(-
((a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[c*x])/4]) + I*((a + b*ArcSin[c*x
])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/E^(I*ArcSin[c*x])]) + 4*b^2*Poly
Log[2, (-I)/E^(I*ArcSin[c*x])])) - 3*(c*f + g)^2*(I*((a + b*ArcSin[c*x])*(
a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])]) - (a + b*ArcSin[c*x])^2*Tan[(Pi + 2*ArcSin[c*x
])/4])))/(6*c^3*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 1.26 (sec) , antiderivative size = 314, normalized size of antiderivative = 0.61, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(f^2c^2+2fgxc^2+g^2)(a+b\arcsin(cx))^2}{c^2(1-c^2x^2)^{3/2}}-\frac{g^2(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{8ibfg\arctan(e^{i\arcsin(cx)})(a+b\arcsin(cx))}{c^2}-\frac{g^2(a+b\arcsin(cx))^3}{3bc^3}+\frac{x(c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}+\frac{2fg(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}\right.}{}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((-I)*(c^2*f^2 + g^2)*(a + b*ArcSin[c*x])^2)/c^3 + (2*
f*g*(a + b*ArcSin[c*x])^2)/(c^2*Sqrt[1 - c^2*x^2]) + ((c^2*f^2 + g^2)*x*(a
 + b*ArcSin[c*x])^2)/(c^2*Sqrt[1 - c^2*x^2]) - (g^2*(a + b*ArcSin[c*x])^3)
/(3*b*c^3) + ((8*I)*b*f*g*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c
^2 + (2*b*(c^2*f^2 + g^2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x]
)])/c^3 - ((4*I)*b^2*f*g*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c^2 + ((4*I)*
b^2*f*g*PolyLog[2, I*E^(I*ArcSin[c*x])])/c^2 - (I*b^2*(c^2*f^2 + g^2)*Poly
Log[2, -E^((2*I)*ArcSin[c*x])])/c^3))/(d*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [A] (verified)

Time = 0.96 (sec) , antiderivative size = 974, normalized size of antiderivative = 1.90

method	result
default	$a^2\left(\frac{f^2x}{d\sqrt{-c^2d\,x^2+d}}+g^2\left(\frac{x}{c^2d\sqrt{-c^2d\,x^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)+\frac{2fg}{c^2d\sqrt{-c^2d\,x^2+d}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-}}{3c^3d^2(}\right.$
parts	$a^2\left(\frac{f^2x}{d\sqrt{-c^2d\,x^2+d}}+g^2\left(\frac{x}{c^2d\sqrt{-c^2d\,x^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)+\frac{2fg}{c^2d\sqrt{-c^2d\,x^2+d}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-}}{3c^3d^2(}\right.$

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2*x/d/(-c^2*d*x^2+d)^(1/2)+g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/
d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+2*f*g/c^2/d/
(-c^2*d*x^2+d)^(1/2))+b^2*(1/3*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c
^3/d^2/(c^2*x^2-1)*arcsin(c*x)^3*g^2-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1
)^(1/2)+c*x)*arcsin(c*x)^2*(c^2*f^2+g^2-2*I*(-c^2*x^2+1)^(1/2)*c*f*g+2*c^2
*f*g*x)/c^3/d^2/(c^2*x^2-1)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(2*I
*arcsin(c*x)^2*c^2*f^2+I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^2*f^2-
2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^2*f^2+2*I*g^2*arcsin(c*
x)^2-4*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c*f*g+4*I*dilog(1+I*(I*c*x+
(-c^2*x^2+1)^(1/2)))*c*f*g-4*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2))
)*c*f*g+4*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c*f*g+I*polylog(2
,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*g^2-2*arcsin(c*x)*ln(1+(I*c*x+(-c^2*x^2+1)
^(1/2))^2)*g^2)/c^3/d^2/(c^2*x^2-1))+2*a*b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c
^2*x^2+1)^(1/2)/c^3/d^2/(c^2*x^2-1)*arcsin(c*x)^2*g^2+2*I*(-c^2*x^2+1)^(1/
2)*(-d*(c^2*x^2-1))^(1/2)/c^3/d^2/(c^2*x^2-1)*(c^2*f^2+g^2)*arcsin(c*x)-(-
d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)+c*x)*arcsin(c*x)*(c^2*f^2+g^2-2
*I*(-c^2*x^2+1)^(1/2)*c*f*g+2*c^2*f*g*x)/c^3/d^2/(c^2*x^2-1)-(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(c^2*x^2-1)*(c^2*f^2+2*c*f*g+g^2)*ln(
I*c*x+(-c^2*x^2+1)^(1/2)-I)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/
d^2/(c^2*x^2-1)*(c^2*f^2-2*c*f*g+g^2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I))
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(gx+f)^2(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"fricas")
```

output
```
integral((a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin
(c*x))*sqrt(-c^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)^2}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(3/2)
, x)
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"maxima")
```

output
```
a^2*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) + 2*a
*b*f^2*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a^2*f^2*x/(sqrt(-c^2*d*x^2
 + d)*d) - a*b*f^2*log(x^2 - 1/c^2)/(c*d^(3/2)) - sqrt(d)*integrate(((b^2*
g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))/((c^2*d^2*x^2 - d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 2*a^2*f*g/(
sqrt(-c^2*d*x^2 + d)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{-\sqrt{-c^2x^2+1}\,asin(cx)^3\,b^2g^2-3\sqrt{-c^2x^2+1}\,asin(cx)^2\,ab\,g^2-3\sqrt{-c}}{}$$

input
```
int((g*x+f)^2*(a+b*asin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

output
```
( - sqrt( - c**2*x**2 + 1)*asin(c*x)**3*b**2*g**2 - 3*sqrt( - c**2*x**2 +
1)*asin(c*x)**2*a*b*g**2 - 3*sqrt( - c**2*x**2 + 1)*asin(c*x)*a**2*g**2 -
6*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 -
 sqrt( - c**2*x**2 + 1)),x)*a*b*c**3*f**2 - 6*sqrt( - c**2*x**2 + 1)*int(a
sin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*a*
b*c*g**2 - 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)**2/(sqrt( - c**2*x**2 +
1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*b**2*c**3*f**2 - 3*sqrt( - c**2*
x**2 + 1)*int(asin(c*x)**2/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**
2*x**2 + 1)),x)*b**2*c*g**2 - 12*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/
(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*a*b*c**3*f*
g - 6*sqrt( - c**2*x**2 + 1)*int((asin(c*x)**2*x)/(sqrt( - c**2*x**2 + 1)*
c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*b**2*c**3*f*g + 3*a**2*c**3*f**2*x
+ 6*a**2*c*f*g + 3*a**2*c*g**2*x)/(3*sqrt(d)*sqrt( - c**2*x**2 + 1)*c**3*d
)
```

3.150 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 410

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} \\ &+ \frac{4ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{2bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} \\ &- \frac{2ib^2g\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{2ib^2g\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &- \frac{ib^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
g*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+f*x*(a+b*arcsin(c*x))^2/d
/(-c^2*d*x^2+d)^(1/2)-I*f*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/c/d/(-c^2
*d*x^2+d)^(1/2)+4*I*b*g*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*arctan(I*c*x+
(-c^2*x^2+1)^(1/2))/c^2/d/(-c^2*d*x^2+d)^(1/2)+2*b*f*(-c^2*x^2+1)^(1/2)*(a
+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d/(-c^2*d*x^2+d)^(1/2
)-2*I*b^2*g*(-c^2*x^2+1)^(1/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^
2/d/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*g*(-c^2*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(
-c^2*x^2+1)^(1/2)))/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*f*(-c^2*x^2+1)^(1/2)*
polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d/(-c^2*d*x^2+d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.58

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left((cf-g)\left(-(a+b\arcsin(cx))^2\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)+\right.\right.}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((c*f - g)*(-((a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[
c*x])/4]) + I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/
E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])) - (c*f +
g)*(I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*Arc
Sin[c*x])]) + 4*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]) - (a + b*ArcSin[c*
x])^2*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^2*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 0.98 (sec) , antiderivative size = 243, normalized size of antiderivative = 0.59, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$$

$\Big\downarrow$ 5276

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$\Big\downarrow$ 5262

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}+\frac{gx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$\Big\downarrow$ 2009

$$\frac{\sqrt{1-c^2x^2}\left(\frac{4ibg\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^2}+\frac{fx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{g(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}-\frac{if(a+b\arcsin(cx))^2}{c}+\frac{2bf\log(1+}{}\right.}{d\sqrt{d-c}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((-I)*f*(a + b*ArcSin[c*x])^2)/c + (g*(a + b*ArcSin[c*
x])^2)/(c^2*Sqrt[1 - c^2*x^2]) + (f*x*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*
x^2] + ((4*I)*b*g*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c^2 + (2*
b*f*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/c - ((2*I)*b^2*g*P
olyLog[2, (-I)*E^(I*ArcSin[c*x])])/c^2 + ((2*I)*b^2*g*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/c^2 - (I*b^2*f*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/(d*Sqr
t[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [A] (verified)

Time = 0.96 (sec) , antiderivative size = 612, normalized size of antiderivative = 1.49

method	result
default	$a^2\left(\frac{fx}{d\sqrt{-c^2d\,x^2+d}}+\frac{g}{c^2d\sqrt{-c^2d\,x^2+d}}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2\left(i\sqrt{-c^2x^2+1}\,cf+c^2fx+g\right)}{d^2c^2(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}}{}\right.$
parts	$a^2\left(\frac{fx}{d\sqrt{-c^2d\,x^2+d}}+\frac{g}{c^2d\sqrt{-c^2d\,x^2+d}}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2\left(i\sqrt{-c^2x^2+1}\,cf+c^2fx+g\right)}{d^2c^2(c^2x^2-1)}+\frac{\sqrt{-d(c^2x^2-1)}}{}\right.$

input
```
int((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBO
SE)
```

output
```
a^2*(f*x/d/(-c^2*d*x^2+d)^(1/2)+g/c^2/d/(-c^2*d*x^2+d)^(1/2))+b^2*(-(-d*(c
^2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)*arcsin(c*x)^2*(I*(-c^2*x^2+1)^(1/2)*c
*f+c^2*f*x+g)+(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(2*I*arcsin(c*x)^2
*c*f+I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c*f-2*arcsin(c*x)*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))^2)*c*f-2*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g
+2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g-2*arcsin(c*x)*ln(1+I*(I*c*x+(
-c^2*x^2+1)^(1/2)))*g+2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g)/
d^2/c^2/(c^2*x^2-1))+2*a*b*(2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/
c/d^2/(c^2*x^2-1)*f*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)
*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c*f+c^2*f*x+g)-(-d*(c^2*x^2-1))^(1/2)*(
-c^2*x^2+1)^(1/2)*(c*f-g)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)/d^2/c^2/(c^2*x^2-
1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^2/(c^2*x^2-1)*(c*f+g)*l
n(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(
c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d
^2), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}{(cx)})^2\,(f+gx)}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(3/2), x
)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="m
axima")
```

output
```
2*a*b*f*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a^2*f*x/(sqrt(-c^2*d*x^2
+ d)*d) - sqrt(d)*integrate((2*a*b*g*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)) + (b^2*g*x + b^2*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/
((c^2*d^2*x^2 - d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) - a*b*f*log(x^2 - 1
/c^2)/(c*d^(3/2)) + a^2*g/(sqrt(-c^2*d*x^2 + d)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{-2\sqrt{-c^2x^2+1}\left(\int \frac{asin(cx)}{\sqrt{-c^2x^2+1}\,c^2x^2-\sqrt{-c^2x^2+1}}dx\right)ab\,c^2f-\sqrt{-c^2x^2+1}\left(\int\right.}{}$$

input
```
int((g*x+f)*(a+b*asin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x)
```

output
```
( - 2*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*x*
*2 - sqrt( - c**2*x**2 + 1)),x)*a*b*c**2*f - sqrt( - c**2*x**2 + 1)*int(as
in(c*x)**2/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*
b**2*c**2*f - 2*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt( - c**2*x**
2 + 1)*c**2*x**2 - sqrt( - c**2*x**2 + 1)),x)*a*b*c**2*g - sqrt( - c**2*x*
*2 + 1)*int((asin(c*x)**2*x)/(sqrt( - c**2*x**2 + 1)*c**2*x**2 - sqrt( - c
**2*x**2 + 1)),x)*b**2*c**2*g + a**2*c**2*f*x + a**2*g)/(sqrt(d)*sqrt( - c
**2*x**2 + 1)*c**2*d)
```

3.151 $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1137

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \text{Too large to display}$$

output
```
-1/2*I*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/d/(c*f-g)/(-c^2*d*x^2+d)^(1/
2)+1/2*I*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/d/(c*f+g)/(-c^2*d*x^2+d)^(
1/2)-1/2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x)
)/d/(c*f-g)/(-c^2*d*x^2+d)^(1/2)+2*b*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*
ln(1-I/(I*c*x+(-c^2*x^2+1)^(1/2)))/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)+2*b*(-c^
2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d/(c*f
-g)/(-c^2*d*x^2+d)^(1/2)+I*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*ln(1
-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/d/(c^2*f^2-g^2)
^(3/2)/(-c^2*d*x^2+d)^(1/2)-I*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*l
n(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/d/(c^2*f^2-g
^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*(-c^2*x^2+1)^(1/2)*polylog(2,I/(I*c
*x+(-c^2*x^2+1)^(1/2)))/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*(-c^2*x^2+1
)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/d/(c*f-g)/(-c^2*d*x^2+d)^(
1/2)+2*b*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2
*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/d/(c^2*f^2-g^2)^(3/2)/(-c^2*d*
x^2+d)^(1/2)-2*b*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*polylog(2,I*(I*c
*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/d/(c^2*f^2-g^2)^(3/2)/
(-c^2*d*x^2+d)^(1/2)+2*I*b^2*g^2*(-c^2*x^2+1)^(1/2)*polylog(3,I*(I*c*x+(-c
^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/d/(c^2*f^2-g^2)^(3/2)/(-c^2*
d*x^2+d)^(1/2)-2*I*b^2*g^2*(-c^2*x^2+1)^(1/2)*polylog(3,I*(I*c*x+(-c^2*...
```

Mathematica [A] (warning: unable to verify)

Time = 3.24 (sec) , antiderivative size = 597, normalized size of antiderivative = 0.53

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{-((a+b\arcsin(cx))(-ia+a\cot(\frac{1}{4}(\pi+2\arcsin(cx)))+b\arcsin(cx)(-i+\cot(\frac{1}{4}(\pi+2 \cdots}{cf-g}\right.}{\cdots}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-((a + b*ArcSin[c*x])*((-I)*a + a*Cot[(Pi + 2*ArcSin[
c*x])/4] + b*ArcSin[c*x]*(-I + Cot[(Pi + 2*ArcSin[c*x])/4]) - 4*b*Log[1 +
I/E^(I*ArcSin[c*x])])) + (4*I)*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])/(c*
f - g) + ((2*I)*g^2*((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)
/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*A
rcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*
PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*
(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 -
 g^2])] - 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g
^2])]))/((c*f - g)*(c*f + g)*Sqrt[c^2*f^2 - g^2]) + ((-4*I)*b^2*PolyLog[2,
 (-I)*E^(I*ArcSin[c*x])] + (a + b*ArcSin[c*x])*((-I)*a + 4*b*Log[1 + I*E^(
I*ArcSin[c*x])] + a*Tan[(Pi + 2*ArcSin[c*x])/4] + b*ArcSin[c*x]*(-I + Tan[
(Pi + 2*ArcSin[c*x])/4]))/(c*f + g)))/(2*d*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 2.68 (sec) , antiderivative size = 722, normalized size of antiderivative = 0.64, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}(f+gx)}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(-\frac{c(a+b\arcsin(cx))^2}{2(cf+g)(cx-1)\sqrt{1-c^2x^2}}+\frac{c(a+b\arcsin(cx))^2}{2(cf-g)(cx+1)\sqrt{1-c^2x^2}}+\frac{g^2(a+b\arcsin(cx))^2}{(g-cf)(cf+g)(f+gx)\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{1-c^2x^2}\left(\frac{2bg^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}}-\frac{2bg^2(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}}+\frac{ig^2(a+b\arcsin(cx)}{(c^2}\right.$$

input
```
Int[(a + b*ArcSin[c*x])^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((-1/2*I)*(a + b*ArcSin[c*x])^2)/(c*f - g) + ((I/2)*(a
 + b*ArcSin[c*x])^2)/(c*f + g) - ((a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[
c*x]/2])/(2*(c*f - g)) + (2*b*(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*
x])])/(c*f + g) + (2*b*(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(
c*f - g) + (I*g^2*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c
*f - Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) - (I*g^2*(a + b*ArcSin[c
*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*
f^2 - g^2)^(3/2) + ((2*I)*b^2*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*f + g) -
 ((2*I)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*f - g) + (2*b*g^2*(a + b*A
rcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
])/(c^2*f^2 - g^2)^(3/2) - (2*b*g^2*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I
*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) + ((2
*I)*b^2*g^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
])/(c^2*f^2 - g^2)^(3/2) - ((2*I)*b^2*g^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*
g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) + ((a + b*ArcSin[c*
x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(2*(c*f + g))))/(d*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(gx+f)(-c^2d\,x^2+d)^{\frac{3}{2}}}dx$$

input
```
int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x)
```

output
```
int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^4*d^2*g*x^5 + c^4*d^2*f*x^4 - 2*c^2*d^2*g*x^3 - 2*c^2*d^2*f*x^2 + d^2
*g*x + d^2*f), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}(f+gx)}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(g*x+f)/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/((-d*(c*x - 1)*(c*x + 1))**(3/2)*(f + g*x)),
 x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="m
axima")
```

output
```
integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*(g*x + f)), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(f+g\,x)\,\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{-2\sqrt{c^2f^2-g^2}\,\sqrt{-c^2x^2+1}\,atan\left(\frac{\tan\left(\frac{asin(cx)}{2}\right)cf+g}{\sqrt{c^2f^2-g^2}}\right)a^2g^2-2\sqrt{-c^2x^2+1}\,(}{}$$

input
```
int((a+b*asin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x)
```

output
```
( - 2*sqrt(c**2*f**2 - g**2)*sqrt( - c**2*x**2 + 1)*atan((tan(asin(c*x)/2)
*c*f + g)/sqrt(c**2*f**2 - g**2))*a**2*g**2 - 2*sqrt( - c**2*x**2 + 1)*int
(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*f*x**2 + sqrt( - c**2*x**2 + 1)*c*
*2*g*x**3 - sqrt( - c**2*x**2 + 1)*f - sqrt( - c**2*x**2 + 1)*g*x),x)*a*b*
c**4*f**4 + 4*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)
*c**2*f*x**2 + sqrt( - c**2*x**2 + 1)*c**2*g*x**3 - sqrt( - c**2*x**2 + 1)
*f - sqrt( - c**2*x**2 + 1)*g*x),x)*a*b*c**2*f**2*g**2 - 2*sqrt( - c**2*x*
*2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**2*f*x**2 + sqrt( - c**2*x
**2 + 1)*c**2*g*x**3 - sqrt( - c**2*x**2 + 1)*f - sqrt( - c**2*x**2 + 1)*g
*x),x)*a*b*g**4 - sqrt( - c**2*x**2 + 1)*int(asin(c*x)**2/(sqrt( - c**2*x*
*2 + 1)*c**2*f*x**2 + sqrt( - c**2*x**2 + 1)*c**2*g*x**3 - sqrt( - c**2*x*
*2 + 1)*f - sqrt( - c**2*x**2 + 1)*g*x),x)*b**2*c**4*f**4 + 2*sqrt( - c**2
*x**2 + 1)*int(asin(c*x)**2/(sqrt( - c**2*x**2 + 1)*c**2*f*x**2 + sqrt( -
c**2*x**2 + 1)*c**2*g*x**3 - sqrt( - c**2*x**2 + 1)*f - sqrt( - c**2*x**2
+ 1)*g*x),x)*b**2*c**2*f**2*g**2 - sqrt( - c**2*x**2 + 1)*int(asin(c*x)**2
/(sqrt( - c**2*x**2 + 1)*c**2*f*x**2 + sqrt( - c**2*x**2 + 1)*c**2*g*x**3
- sqrt( - c**2*x**2 + 1)*f - sqrt( - c**2*x**2 + 1)*g*x),x)*b**2*g**4 + sq
rt( - c**2*x**2 + 1)*a**2*c**2*f**2*g - sqrt( - c**2*x**2 + 1)*a**2*g**3 +
 a**2*c**4*f**3*x - a**2*c**2*f**2*g - a**2*c**2*f*g**2*x + a**2*g**3)/(sq
rt(d)*sqrt( - c**2*x**2 + 1)*d*(c**4*f**4 - 2*c**2*f**2*g**2 + g**4))
```

3.152 $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 1589

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Too large to display}$$

output
```
1/12*I*(c*f+g)^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^
2+d)^(1/2)-1/3*I*b^2*(c*f-g)^3*(-c^2*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2
*x^2+1)^(1/2)))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*I*(c*f-g)^3*(-c^2*x^2+1)
^(1/2)*(a+b*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2*(c*f+g)^
3*(-c^2*x^2+1)^(1/2)*polylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))/c^4/d^2/(-c^2
*d*x^2+d)^(1/2)-1/6*b^2*(c*f-g)^3*(-c^2*x^2+1)^(1/2)*cot(1/4*Pi+1/2*arcsin
(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*(c*f-g)^3*(-c^2*x^2+1)^(1/2)*(a+b
*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1
/4*(c*f-g)^2*(c*f+2*g)*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1
/2*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*b*(c*f-g)^3*(-c^2*x^2+1)
^(1/2)*(a+b*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^2
+d)^(1/2)-1/24*(c*f-g)^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2*cot(1/4*Pi
+1/2*arcsin(c*x))*csc(1/4*Pi+1/2*arcsin(c*x))^2/c^4/d^2/(-c^2*d*x^2+d)^(1/
2)+b*(c*f-2*g)*(c*f+g)^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I/(I*c*
x+(-c^2*x^2+1)^(1/2)))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f+g)^3*(-c^2*
x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I/(I*c*x+(-c^2*x^2+1)^(1/2)))/c^4/d^2/
(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f-g)^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*
ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+b*(c*f-g)^
2*(c*f+2*g)*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2)))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+I*b^2*(c*f-2*g)*(c*f+g)^2*(-c^2*...
```

Mathematica [A] (verified)

Time = 6.15 (sec) , antiderivative size = 715, normalized size of antiderivative = 0.45

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((c*f - g)^2*(c*f + 2*g)*(I*b*((a + b*ArcSin[c*x])^2/b
 - 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))] - b*Po
lyLog[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi
/4 - ArcSin[c*x]/2]))/(4*c^4) - ((c*f - g)^3*(2*b*(a + b*ArcSin[c*x])*Sec[
Pi/4 - ArcSin[c*x]/2]^2 + 4*b^2*Tan[Pi/4 - ArcSin[c*x]/2] + (a + b*ArcSin[
c*x])^2*Sec[Pi/4 - ArcSin[c*x]/2]^2*Tan[Pi/4 - ArcSin[c*x]/2] - 2*(I*b*((a
 + b*ArcSin[c*x])^2/b - 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*
ArcSin[c*x]))] - b*PolyLog[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*
ArcSin[c*x])^2*Tan[Pi/4 - ArcSin[c*x]/2])))/(24*c^4) - ((c*f - 2*g)*(c*f +
 g)^2*(I*b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^(
(I/2)*(Pi + 2*ArcSin[c*x]))] + b*PolyLog[2, -E^((I/2)*(Pi + 2*ArcSin[c*x])
)])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2]))/(4*c^4) - ((c*f +
 g)^3*(2*b*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2 - 4*b^2*Tan[Pi/
4 + ArcSin[c*x]/2] - (a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan
[Pi/4 + ArcSin[c*x]/2] + 2*(I*b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a + b*Arc
Sin[c*x])*Log[1 + E^((I/2)*(Pi + 2*ArcSin[c*x]))] + b*PolyLog[2, -E^((I/2)
*(Pi + 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2
])))/(24*c^4)))/(d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 2.51 (sec) , antiderivative size = 918, normalized size of antiderivative = 0.58, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int\left(\frac{(a+b\arcsin(cx))^2(cf-g)^3}{4c^3(cx+1)^2\sqrt{1-c^2x^2}}+\frac{(cf+2g)(a+b\arcsin(cx))^2(cf-g)^2}{4c^3(cx+1)\sqrt{1-c^2x^2}}-\frac{(cf-2g)(cf+g)^2(a+b\arcsin(cx))^2}{4c^3(cx-1)\sqrt{1-c^2x^2}}+\frac{(cf+g)^3(a+b\arcs}{4c^3(cx-1)^2\sqrt{1}}\right.}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{i(a+b\arcsin(cx))^2(cf-g)^3}{12c^4}-\frac{b(a+b\arcsin(cx))\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(cf-g)^3}{12c^4}-\frac{(a+b\arcsin(cx))^2\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\csc}{24c^4}\right.}{}$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((-1/12*I)*(c*f - g)^3*(a + b*ArcSin[c*x])^2)/c^4 + ((
I/4)*(c*f - 2*g)*(c*f + g)^2*(a + b*ArcSin[c*x])^2)/c^4 + ((I/12)*(c*f + g
)^3*(a + b*ArcSin[c*x])^2)/c^4 - ((I/4)*(c*f - g)^2*(c*f + 2*g)*(a + b*Arc
Sin[c*x])^2)/c^4 - (b^2*(c*f - g)^3*Cot[Pi/4 + ArcSin[c*x]/2])/(6*c^4) - (
(c*f - g)^3*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(12*c^4) - ((
c*f - g)^2*(c*f + 2*g)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(4
*c^4) - (b*(c*f - g)^3*(a + b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(1
2*c^4) - ((c*f - g)^3*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[
Pi/4 + ArcSin[c*x]/2]^2)/(24*c^4) + (b*(c*f - 2*g)*(c*f + g)^2*(a + b*ArcS
in[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/c^4 + (b*(c*f + g)^3*(a + b*ArcSin[
c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c^4) + (b*(c*f - g)^3*(a + b*ArcSin
[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c^4) + (b*(c*f - g)^2*(c*f + 2*g)*
(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/c^4 + (I*b^2*(c*f - 2*g)
*(c*f + g)^2*PolyLog[2, I/E^(I*ArcSin[c*x])])/c^4 + ((I/3)*b^2*(c*f + g)^3
*PolyLog[2, I/E^(I*ArcSin[c*x])])/c^4 - ((I/3)*b^2*(c*f - g)^3*PolyLog[2,
I*E^(I*ArcSin[c*x])])/c^4 - (I*b^2*(c*f - g)^2*(c*f + 2*g)*PolyLog[2, I*E^
(I*ArcSin[c*x])])/c^4 - (b*(c*f + g)^3*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcS
in[c*x]/2]^2)/(12*c^4) + (b^2*(c*f + g)^3*Tan[Pi/4 + ArcSin[c*x]/2])/(6*c^
4) + ((c*f - 2*g)*(c*f + g)^2*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]
/2])/(4*c^4) + ((c*f + g)^3*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 13139 vs. $2(1473) = 2946$.

Time = 1.66 (sec) , antiderivative size = 13140, normalized size of antiderivative = 8.27

method	result	size
default	Expression too large to display	13140
parts	Expression too large to display	13140

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"fricas")
```

output
```
integral(-(a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*
g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*
b*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2\,(f+gx)^3}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(5/2)
, x)
```

Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"maxima")
```

output
```
1/3*a*b*c*f^3*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(
5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*f^3*(2*x/(sqrt(-c^2*d*x^2
+ d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*f^3*(2*x/(
sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + 1/3*a^2*g^3*(3
*x^2/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) -
a^2*f*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^
2*d)) + sqrt(d)*integrate(((b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x
+ b^2*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^3*x^3 +
 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)))/((c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
 + a^2*f^2*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{too large to display}$$

input
```
int((g*x+f)^3*(a+b*asin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

output
```
(6*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4
- 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**6
*f**3*x**2 - 6*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1
)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1))
,x)*a*b*c**4*f**3 + 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)**2/(sqrt( - c**
2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*
x**2 + 1)),x)*b**2*c**6*f**3*x**2 - 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)
**2/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2
 + sqrt( - c**2*x**2 + 1)),x)*b**2*c**4*f**3 + 6*sqrt( - c**2*x**2 + 1)*in
t((asin(c*x)*x**3)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2
 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**6*g**3*x**2 - 6*sqrt(
- c**2*x**2 + 1)*int((asin(c*x)*x**3)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 -
2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**4*g
**3 + 18*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x**2)/(sqrt( - c**2*x**2 +
1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)
),x)*a*b*c**6*f*g**2*x**2 - 18*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x**2)
/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 +
sqrt( - c**2*x**2 + 1)),x)*a*b*c**4*f*g**2 + 18*sqrt( - c**2*x**2 + 1)*int
((asin(c*x)*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1
)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**6*f**2*g*x**2 - 18*sqrt...
```

3.153 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 989

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{2b^2fg}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{b^2f^2x}{3d^2\sqrt{d-c^2dx^2}} + \frac{b^2g^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{2bfgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bg^2x^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fg(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}} + \frac{f^2x(a+b\arcsin(cx))^2}{3d\,(d-c^2dx^2)^{3/2}} + \frac{g^2x^3(a+b\arcsin(cx))^2}{3d\,(d-c^2dx^2)^{3/2}} + \frac{2f^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} - \frac{2if^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}} + \frac{4ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{4bf^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} - \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{2ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{2ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{2ib^2f^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} + \frac{ib^2g^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}$$

output
```
2/3*b^2*f*g/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b^2*f^2*x/d^2/(-c^2*d*x^2+d)^
(1/2)+1/3*b^2*g^2*x/c^2/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b^2*g^2*(-c^2*x^2+1)^
(1/2)*arcsin(c*x)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*b*f^2*(a+b*arcsin(c*x))
/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2/3*b*f*g*x*(a+b*arcsin(c*x
))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/3*b*g^2*x^2*(a+b*arcsin
(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2/3*f*g*(a+b*arcsin(c
*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*f^2*x*(a+b*arcsin(c*x))^2/d/(-c^2*d*
x^2+d)^(3/2)+1/3*g^2*x^3*(a+b*arcsin(c*x))^2/d/(-c^2*d*x^2+d)^(3/2)+2/3*f^
2*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)-2/3*I*b^2*f^2*(-c^2*x^2+1
)^(1/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d^2/(-c^2*d*x^2+d)^(1/2
)-2/3*I*b^2*f*g*(-c^2*x^2+1)^(1/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)-2/3*I*f^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*
x))^2/c/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*b*f^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(
c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d^2/(-c^2*d*x^2+d)^(1/2)-2/3*b*
g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2
)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*
x))^2/c^3/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*I*b*f*g*(-c^2*x^2+1)^(1/2)*(a+b*arc
sin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+2/
3*I*b^2*f*g*(-c^2*x^2+1)^(1/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))/c^2
/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2*g^2*(-c^2*x^2+1)^(1/2)*polylog(2,-(...
```

Mathematica [A] (verified)

Time = 4.99 (sec) , antiderivative size = 618, normalized size of antiderivative = 0.62

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx =$$
$$-\frac{\sqrt{1-c^2x^2}\left(-6(c^2f^2-g^2)\left(-(a+b\arcsin(cx))^2\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)+i\left((a+b\arcsin(cx))\left(a+b\,\mathrm{a}\right.\right.\right.\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
-1/24*(Sqrt[1 - c^2*x^2]*(-6*(c^2*f^2 - g^2)*(-((a + b*ArcSin[c*x])^2*Cot[
(Pi + 2*ArcSin[c*x])/4]) + I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] - (4*
I)*b*Log[1 + I/E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x
])])) + (-(c*f) + g)^2*(4*b^2*Cot[(Pi + 2*ArcSin[c*x])/4] + 2*(a + b*ArcSi
n[c*x])^2*Cot[(Pi + 2*ArcSin[c*x])/4] + 2*b*(a + b*ArcSin[c*x])*Csc[(Pi +
2*ArcSin[c*x])/4]^2 + (a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[c*x])/4]*Cs
c[(Pi + 2*ArcSin[c*x])/4]^2 - (2*I)*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x
] - (4*I)*b*Log[1 + I/E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*Arc
Sin[c*x])])) + 6*(c^2*f^2 - g^2)*(I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x
] + (4*I)*b*Log[1 + I*E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)*E^(I*Arc
Sin[c*x])]) - (a + b*ArcSin[c*x])^2*Tan[(Pi + 2*ArcSin[c*x])/4]) + (c*f +
g)^2*((2*I)*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^
(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]) + 2*b*(a + b
*ArcSin[c*x])*Sec[(Pi + 2*ArcSin[c*x])/4]^2 - 4*b^2*Tan[(Pi + 2*ArcSin[c*x
])/4] - 2*(a + b*ArcSin[c*x])^2*Tan[(Pi + 2*ArcSin[c*x])/4] - (a + b*ArcSi
n[c*x])^2*Sec[(Pi + 2*ArcSin[c*x])/4]^2*Tan[(Pi + 2*ArcSin[c*x])/4])))/(c^
3*d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 1.74 (sec) , antiderivative size = 614, normalized size of antiderivative = 0.62, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{g^2x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{2fgx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{4ibfg\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^2}+\frac{ig^2(a+b\arcsin(cx))^2}{3c^3}-\frac{2bg^2\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^3}+\frac{2f^2x(a+b}{3\sqrt{1}}\right.}{}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((2*b^2*f*g)/(3*c^2*Sqrt[1 - c^2*x^2]) + (b^2*f^2*x)/(3
*Sqrt[1 - c^2*x^2]) + (b^2*g^2*x)/(3*c^2*Sqrt[1 - c^2*x^2]) - (b^2*g^2*Arc
Sin[c*x])/(3*c^3) - (b*f^2*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) - (2*b
*f*g*x*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) - (b*g^2*x^2*(a + b*ArcSin
[c*x]))/(3*c*(1 - c^2*x^2)) - (((2*I)/3)*f^2*(a + b*ArcSin[c*x])^2)/c + ((
I/3)*g^2*(a + b*ArcSin[c*x])^2)/c^3 + (2*f*g*(a + b*ArcSin[c*x])^2)/(3*c^2
*(1 - c^2*x^2)^(3/2)) + (f^2*x*(a + b*ArcSin[c*x])^2)/(3*(1 - c^2*x^2)^(3/
2)) + (g^2*x^3*(a + b*ArcSin[c*x])^2)/(3*(1 - c^2*x^2)^(3/2)) + (2*f^2*x*(
a + b*ArcSin[c*x])^2)/(3*Sqrt[1 - c^2*x^2]) + (((4*I)/3)*b*f*g*(a + b*ArcS
in[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c^2 + (4*b*f^2*(a + b*ArcSin[c*x])*Log
[1 + E^((2*I)*ArcSin[c*x])])/(3*c) - (2*b*g^2*(a + b*ArcSin[c*x])*Log[1 +
E^((2*I)*ArcSin[c*x])])/(3*c^3) - (((2*I)/3)*b^2*f*g*PolyLog[2, (-I)*E^(I*
ArcSin[c*x])])/c^2 + (((2*I)/3)*b^2*f*g*PolyLog[2, I*E^(I*ArcSin[c*x])])/c
^2 - (((2*I)/3)*b^2*f^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c + ((I/3)*b^2
*g^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c^3))/(d^2*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 9719 vs. $2(938) = 1876$.

Time = 1.40 (sec) , antiderivative size = 9720, normalized size of antiderivative = 9.83

method	result	size
default	Expression too large to display	9720
parts	Expression too large to display	9720

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"fricas")
```

output
```
integral(-(a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*
x + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsi
n(c*x))*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2
- d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(a+b\operatorname{asin}(cx))^2(f+gx)^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(5/2)
, x)
```

Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"maxima")
```

output
```
1/3*a*b*c*f^2*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(
5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*f^2*(2*x/(sqrt(-c^2*d*x^2
+ d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*f^2*(2*x/(
sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) - 1/3*a^2*g^2*(x
/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) + sqrt
(d)*integrate(((b^2*g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x)*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)))/((c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3)*sqrt(c*x +
1)*sqrt(-c*x + 1)), x) + 2/3*a^2*f*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
int((g*x+f)^2*(a+b*asin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

output
```
(6*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4
- 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**4
*f**2*x**2 - 6*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1
)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1))
,x)*a*b*c**2*f**2 + 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)**2/(sqrt( - c**
2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*
x**2 + 1)),x)*b**2*c**4*f**2*x**2 - 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)
**2/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2
 + sqrt( - c**2*x**2 + 1)),x)*b**2*c**2*f**2 + 6*sqrt( - c**2*x**2 + 1)*in
t((asin(c*x)*x**2)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2
 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**4*g**2*x**2 - 6*sqrt(
- c**2*x**2 + 1)*int((asin(c*x)*x**2)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 -
2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**2*g
**2 + 12*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt( - c**2*x**2 + 1)*
c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x
)*a*b*c**4*f*g*x**2 - 12*sqrt( - c**2*x**2 + 1)*int((asin(c*x)*x)/(sqrt( -
 c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c
**2*x**2 + 1)),x)*a*b*c**2*f*g + 3*sqrt( - c**2*x**2 + 1)*int((asin(c*x)**
2*x**2)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*
x**2 + sqrt( - c**2*x**2 + 1)),x)*b**2*c**4*g**2*x**2 - 3*sqrt( - c**2*...
```

3.154 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 617

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx &= \frac{b^2g}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{b^2fx}{3d^2\sqrt{d-c^2dx^2}} \\ &- \frac{bf(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\ &+ \frac{g(a+b\arcsin(cx))^2}{3c^2d\,(d-c^2dx^2)^{3/2}}+\frac{fx(a+b\arcsin(cx))^2}{3d\,(d-c^2dx^2)^{3/2}} \\ &+ \frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}-\frac{2if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} \\ &+ \frac{2ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\ &+ \frac{4bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\ &- \frac{ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\ &+ \frac{ib^2g\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\ &- \frac{2ib^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
1/3*b^2*g/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b^2*f*x/d^2/(-c^2*d*x^2+d)^(1/2
)-1/3*b*f*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-
1/3*b*g*x*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+
1/3*g*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(3/2)+1/3*f*x*(a+b*arcsin(c
*x))^2/d/(-c^2*d*x^2+d)^(3/2)+2/3*f*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+
d)^(1/2)-2/3*I*f*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))^2/c/d^2/(-c^2*d*x^2+
d)^(1/2)+2/3*I*b*g*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2
*x^2+1)^(1/2))/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*b*f*(-c^2*x^2+1)^(1/2)*(a+
b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d^2/(-c^2*d*x^2+d)^(1/
2)-1/3*I*b^2*g*(-c^2*x^2+1)^(1/2)*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))
/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2*g*(-c^2*x^2+1)^(1/2)*polylog(2,I*(
I*c*x+(-c^2*x^2+1)^(1/2)))/c^2/d^2/(-c^2*d*x^2+d)^(1/2)-2/3*I*b^2*f*(-c^2*
x^2+1)^(1/2)*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)/c/d^2/(-c^2*d*x^2+d)
^(1/2)
```

Mathematica [A] (verified)

Time = 4.88 (sec) , antiderivative size = 591, normalized size of antiderivative = 0.96

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{5/2}}\,dx =$$
$$-\frac{\sqrt{1-c^2x^2}\left(6cf\left((a+b\arcsin(cx))^2\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)-i\left((a+b\arcsin(cx))\left(a+b\arcsin(cx)-4\right.\right.\right.\right.}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
-1/24*(Sqrt[1 - c^2*x^2]*(6*c*f*((a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[
c*x])/4] - I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/E
^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])) + (c*f - g
)*(4*b^2*Cot[(Pi + 2*ArcSin[c*x])/4] + 2*(a + b*ArcSin[c*x])^2*Cot[(Pi + 2
*ArcSin[c*x])/4] + 2*b*(a + b*ArcSin[c*x])*Csc[(Pi + 2*ArcSin[c*x])/4]^2 +
 (a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[c*x])/4]*Csc[(Pi + 2*ArcSin[c*x]
)/4]^2 - (2*I)*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I
/E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])) - 6*c*f*
((-I)*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*Arc
Sin[c*x])]) + 4*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]) + (a + b*ArcSin[c*
x])^2*Tan[(Pi + 2*ArcSin[c*x])/4]) + (c*f + g)*((2*I)*((a + b*ArcSin[c*x])
*(a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*ArcSin[c*x])]) + 4*b^2*PolyLo
g[2, (-I)*E^(I*ArcSin[c*x])]) + 2*b*(a + b*ArcSin[c*x])*Sec[(Pi + 2*ArcSin
[c*x])/4]^2 - 4*b^2*Tan[(Pi + 2*ArcSin[c*x])/4] - 2*(a + b*ArcSin[c*x])^2*
Tan[(Pi + 2*ArcSin[c*x])/4] - (a + b*ArcSin[c*x])^2*Sec[(Pi + 2*ArcSin[c*x
])/4]^2*Tan[(Pi + 2*ArcSin[c*x])/4])))/(c^2*d^2*Sqrt[d - c^2*d*x^2])
```

Rubi [A] (verified)

Time = 1.16 (sec) , antiderivative size = 398, normalized size of antiderivative = 0.65, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{gx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{1-c^2x^2}\left(\frac{2ibg\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^2}-\frac{bf(a+b\arcsin(cx))}{3c(1-c^2x^2)}+\frac{2fx(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}}+\frac{fx(a+b\arcsin(cx))^2}{3(1-c^2x^2)^{3/2}}-\frac{bgx(a+b}{3c(1-}\right.$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((b^2*g)/(3*c^2*Sqrt[1 - c^2*x^2]) + (b^2*f*x)/(3*Sqrt[
1 - c^2*x^2]) - (b*f*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) - (b*g*x*(a
+ b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) - (((2*I)/3)*f*(a + b*ArcSin[c*x])^2
)/c + (g*(a + b*ArcSin[c*x])^2)/(3*c^2*(1 - c^2*x^2)^(3/2)) + (f*x*(a + b*
ArcSin[c*x])^2)/(3*(1 - c^2*x^2)^(3/2)) + (2*f*x*(a + b*ArcSin[c*x])^2)/(3
*Sqrt[1 - c^2*x^2]) + (((2*I)/3)*b*g*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSi
n[c*x])])/c^2 + (4*b*f*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])
/(3*c) - ((I/3)*b^2*g*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c^2 + ((I/3)*b^2
*g*PolyLog[2, I*E^(I*ArcSin[c*x])])/c^2 - (((2*I)/3)*b^2*f*PolyLog[2, -E^(
(2*I)*ArcSin[c*x])])/c))/(d^2*Sqrt[d - c^2*d*x^2])
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] && !GtQ[d, 0]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5893 vs. 2(586) = 1172.

Time = 1.06 (sec) , antiderivative size = 5894, normalized size of antiderivative = 9.55

method	result	size
default	Expression too large to display	5894
parts	Expression too large to display	5894

input
```
int((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBO
SE)
```

output
```
result too large to display
```

Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin
(c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 +
3*c^2*d^3*x^2 - d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(5/2), x
)
```

Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)(b\arcsin\,(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="m
axima")
```

output
```
1/3*a*b*c*f*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/
2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*f*(2*x/(sqrt(-c^2*d*x^2 + d)
*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*f*(2*x/(sqrt(-
c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + sqrt(d)*integrate((2
*a*b*g*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*g*x + b^2*f)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/((c^4*d^3*x^4 - 2*c^2*d^3*x^2
+ d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/3*a^2*g/((-c^2*d*x^2 + d)^(3/
2)*c^2*d)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{6\sqrt{-c^2x^2+1}\left(\int \frac{asin(cx)}{\sqrt{-c^2x^2+1}\,c^4x^4-2\sqrt{-c^2x^2+1}\,c^2x^2+\sqrt{-c^2x^2+1}}dx\right)ab\,c^4f\,x^2-}{}$$

input
```
int((g*x+f)*(a+b*asin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x)
```

output
```
(6*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4
- 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**4
*f*x**2 - 6*sqrt( - c**2*x**2 + 1)*int(asin(c*x)/(sqrt( - c**2*x**2 + 1)*c
**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)
*a*b*c**2*f + 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)**2/(sqrt( - c**2*x**2
 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 +
 1)),x)*b**2*c**4*f*x**2 - 3*sqrt( - c**2*x**2 + 1)*int(asin(c*x)**2/(sqrt
( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt(
- c**2*x**2 + 1)),x)*b**2*c**2*f + 6*sqrt( - c**2*x**2 + 1)*int((asin(c*x)
*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2
 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**4*g*x**2 - 6*sqrt( - c**2*x**2 + 1)*i
nt((asin(c*x)*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( - c**2*x**2 +
 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*a*b*c**2*g + 3*sqrt( - c**2*x**
2 + 1)*int((asin(c*x)**2*x)/(sqrt( - c**2*x**2 + 1)*c**4*x**4 - 2*sqrt( -
c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b**2*c**4*g*x**2 - 3
*sqrt( - c**2*x**2 + 1)*int((asin(c*x)**2*x)/(sqrt( - c**2*x**2 + 1)*c**4*
x**4 - 2*sqrt( - c**2*x**2 + 1)*c**2*x**2 + sqrt( - c**2*x**2 + 1)),x)*b**
2*c**2*g + 2*a**2*c**4*f*x**3 - 3*a**2*c**2*f*x - a**2*g)/(3*sqrt(d)*sqrt(
 - c**2*x**2 + 1)*c**2*d**2*(c**2*x**2 - 1))
```

3.155 $\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 35

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \text{Int}\left(\frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}},x\right)$$

output
```
Defer(Int)((a+b*arcsin(c*x))^n*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Mathematica [N/A]

Not integrable

Time = 0.10 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.06

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

input
```
Integrate[((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
Integrate[((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2], x]
```

Rubi [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^n \log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

$$\Big\downarrow \ 5300$$

$$\int \frac{(a+b\arcsin(cx))^n \log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}dx$$

input
```
Int[((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 3.77 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.94

$$\int \frac{(a+b\arcsin(cx))^n \ln\left(h(gx+f)^m\right)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int((a+b*arcsin(c*x))^n*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^n*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Fricas [N/A]

Not integrable

Time = 0.12 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.34

$$\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^n\log((gx+f)^mh)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^n*log((g*x + f)^m*h)/(c^2
*x^2 - 1), x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\text{Timed out}$$

input
```
integrate((a+b*asin(c*x))**n*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Timed out
```

Maxima [N/A]

Not integrable

Time = 1.92 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^n\log((gx+f)^mh)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="maxima")
```

output
```
integrate((b*arcsin(c*x) + a)^n*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Giac [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^n\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^n*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln(h(f+g\,x)^m)\,(a+b\,\mathrm{asin}(c\,x))^n}{\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^n)/(1 - c^2*x^2)^(1/2),x)
```

output
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^n)/(1 - c^2*x^2)^(1/2), x)
```

Reduce [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.03

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\left(asin(cx)\,b+a\right)^n\log\left(\left(gx+f\right)^m h\right)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int((a+b*asin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int(((asin(c*x)*b + a)**n*log((f + g*x)**m*h))/sqrt( - c**2*x**2 + 1),x)
```

3.156 $\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 634

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$$
$$= \frac{im(a+b\arcsin(cx))^5}{20b^2c} - \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc}$$
$$- \frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{4bc} + \frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}$$
$$+ \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$+ \frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$- \frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$
$$+ \frac{6b^3m\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{6b^3m\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

output
```
1/20*I*m*(a+b*arcsin(c*x))^5/b^2/c-1/4*m*(a+b*arcsin(c*x))^4*ln(1-I*(I*c*x
+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/b/c-1/4*m*(a+b*arcsin(c*
x))^4*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/b/c+1
/4*(a+b*arcsin(c*x))^4*ln(h*(g*x+f)^m)/b/c+I*m*(a+b*arcsin(c*x))^3*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*(a+b*ar
csin(c*x))^3*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(
1/2)))/c-3*b*m*(a+b*arcsin(c*x))^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f-(c^2*f^2-g^2)^(1/2)))/c-3*b*m*(a+b*arcsin(c*x))^2*polylog(3,I*(I*c*
x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c-6*I*b^2*m*(a+b*arcsin
(c*x))*polylog(4,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))
/c-6*I*b^2*m*(a+b*arcsin(c*x))*polylog(4,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c
*f+(c^2*f^2-g^2)^(1/2)))/c+6*b^3*m*polylog(5,I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+6*b^3*m*polylog(5,I*(I*c*x+(-c^2*x^2+1)^(1/
2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c
```

Mathematica [F]

$$\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

input
```
Integrate[((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
Integrate[((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2], x]
```

Rubi [A] (verified)

Time = 2.32 (sec) , antiderivative size = 628, normalized size of antiderivative = 0.99, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.257, Rules used = {5278, 5240, 5030, 2620, 3011, 7163, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

$$\Big\downarrow \text{5278}$$

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\int\frac{(a+b\arcsin(cx))^4}{f+gx}dx}{4bc}$$

$$\Big\downarrow \text{5240}$$

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^4}{cf+cgx}d\arcsin(cx)}{4bc}$$

$$\Big\downarrow \text{5030}$$

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\left(\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^4}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)+\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^4}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)-\frac{i(a+b\arcsin(cx))^5}{5bg}\right)}{4bc}$$

$$\Big\downarrow \text{2620}$$

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\left(-\frac{4b\int(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}-\frac{4b\int(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}+\frac{(a+b\arcs\ldots}{}\right.}{4bc}$$

$$\Big\downarrow \text{3011}$$

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\int(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)\right)}{g}-\frac{4b\left(i(a+b\,\mathrm{ar}\ldots\right.}{}\right.}{}$$

$$\Big\downarrow \text{7163}$$

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\left(2ib\int(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)-i(a+b\arcsin\ldots\right.\right.}{g}\right.}{}$$

$$\Big\downarrow \text{7163}$$

$$\frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc}-\frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\left(2ib\left(ib\int\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)-i(a+b\arcsin(cx))\operatorname{PolyLog}\right.\right.\right.}{g}\right.}{}$$

$\downarrow$ 2720

$$\frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc}-\frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\left(2ib\left(b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}-i(a+b\arcsin\right.\right.\right.}{g}\right.}{}$$

$\downarrow$ 7143

$$\frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc}-\frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\left(2ib\left(b\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-i(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(}}{cf-\sqrt{c^2f^2}}\right.\right.\right.\right.}{g}\right.}{}$$

input
```
Int[((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
((a + b*ArcSin[c*x])^4*Log[h*(f + g*x)^m])/(4*b*c) - (g*m*(((-1/5*I)*(a +
b*ArcSin[c*x])^5)/(b*g) + ((a + b*ArcSin[c*x])^4*Log[1 - (I*E^(I*ArcSin[c*
x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + ((a + b*ArcSin[c*x])^4*Log[1 - (I
*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (4*b*(I*(a + b*Arc
Sin[c*x])^3*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
] - (3*I)*b*((-I)*(a + b*ArcSin[c*x])^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)
/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*((-I)*(a + b*ArcSin[c*x])*PolyLog[
4, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + b*PolyLog[5, (I*
E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]))))/g - (4*b*(I*(a + b*A
rcSin[c*x])^3*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2
])] - (3*I)*b*((-I)*(a + b*ArcSin[c*x])^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*
g)/(c*f + Sqrt[c^2*f^2 - g^2])] + (2*I)*b*((-I)*(a + b*ArcSin[c*x])*PolyLo
g[4, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + b*PolyLog[5, (
I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/g))/(4*b*c)
```

Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 5278
```
Int[(Log[(h_.)*((f_.) + (g_.)*(x_))^(m_.)]*((a_.) + ArcSin[(c_.)*(x_)]*(b_.
))^(n_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[Log[h*(f + g*x)^m]*(
(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[g*(m/(b*c*Sqr
t[d]*(n + 1)))   Int[(a + b*ArcSin[c*x])^(n + 1)/(f + g*x), x], x] /; FreeQ
[{a, b, c, d, e, f, g, h, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && IGtQ[
n, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

Maple [F]

$$\int \frac{(a+b\arcsin(cx))^3 \ln(h(gx+f)^m)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int((a+b*arcsin(c*x))^3*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^3*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^3\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="fricas")
```

output
```
integral(-(b^3*arcsin(c*x)^3 + 3*a*b^2*arcsin(c*x)^2 + 3*a^2*b*arcsin(c*x)
 + a^3)*sqrt(-c^2*x^2 + 1)*log((g*x + f)^m*h)/(c^2*x^2 - 1), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^3\log(h(f+gx)^m)}{\sqrt{-(cx-1)(cx+1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))**3*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**3*log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1
)), x)
```

Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^3\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="maxima")
```

output
```
(b^3*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^3/(sqrt(c*x +
1)*sqrt(-c*x + 1)), x)*log(h) + 3*a*b^2*c*integrate(arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))^2/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)*log(h) + 3*a^2*b
*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqr
t(-c*x + 1)), x)*log(h) + b^3*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1))^3*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 3*a*b^2
*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log((g*x + f)^m)
/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 3*a^2*b*c*integrate(arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1))
, x) + a^3*c*integrate(log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
 + a^3*arctan2(c*x, sqrt(-c^2*x^2 + 1))*log(h))/c
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^3\log((gx+f)^mh)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^3*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln\left(h\,(f+g\,x)^m\right)\,(a+b\,\mathrm{asin}(c\,x))^3}{\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^3)/(1 - c^2*x^2)^(1/2),x)
```

output
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^3)/(1 - c^2*x^2)^(1/2), x)
```

Reduce [F]

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx&=\left(\int \frac{\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}dx\right)a^3\\&\quad+3\left(\int \frac{asin(cx)\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}dx\right)a^2b\\&\quad+\left(\int \frac{asin(cx)^3\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}dx\right)b^3\\&\quad+3\left(\int \frac{asin(cx)^2\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}dx\right)a\,b^2\end{aligned}$$

input
```
int((a+b*asin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int(log((f + g*x)**m*h)/sqrt( - c**2*x**2 + 1),x)*a**3 + 3*int((asin(c*x)*
log((f + g*x)**m*h))/sqrt( - c**2*x**2 + 1),x)*a**2*b + int((asin(c*x)**3*
log((f + g*x)**m*h))/sqrt( - c**2*x**2 + 1),x)*b**3 + 3*int((asin(c*x)**2*
log((f + g*x)**m*h))/sqrt( - c**2*x**2 + 1),x)*a*b**2
```

3.157 $\int \frac{(a+b \arcsin(cx))^2 \log(h(f+gx)^m)}{\sqrt{1-c^2x^2}} dx$

Optimal result

Integrand size = 35, antiderivative size = 514

$$\begin{aligned}
&\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{im(a+b\arcsin(cx))^4}{12b^2c} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{3bc} \\
&\quad - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{3bc} + \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{3bc} \\
&\quad + \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{im(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{2bm(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{2ib^2m\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{2ib^2m\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}
\end{aligned}$$

output
```
1/12*I*m*(a+b*arcsin(c*x))^4/b^2/c-1/3*m*(a+b*arcsin(c*x))^3*ln(1-I*(I*c*x
+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/b/c-1/3*m*(a+b*arcsin(c*
x))^3*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/b/c+1
/3*(a+b*arcsin(c*x))^3*ln(h*(g*x+f)^m)/b/c+I*m*(a+b*arcsin(c*x))^2*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*(a+b*ar
csin(c*x))^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(
1/2)))/c-2*b*m*(a+b*arcsin(c*x))*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/
(c*f-(c^2*f^2-g^2)^(1/2)))/c-2*b*m*(a+b*arcsin(c*x))*polylog(3,I*(I*c*x+(-
c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c-2*I*b^2*m*polylog(4,I*(I*
c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c-2*I*b^2*m*polylog(4
,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c
```

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 7541 vs. $2(514) = 1028$.

Time = 85.06 (sec) , antiderivative size = 7541, normalized size of antiderivative = 14.67

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \text{Result too large to show}$$

input
```
Integrate[((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
Result too large to show
```

Rubi [A] (verified)

Time = 1.82 (sec) , antiderivative size = 506, normalized size of antiderivative = 0.98, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.229$, Rules used = {5278, 5240, 5030, 2620, 3011, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}dx$$

$\downarrow$ 5278

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\int \frac{(a+b\arcsin(cx))^3}{f+gx}dx}{3bc}$$

$\downarrow$ 5240

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{cf+cgx}d\arcsin(cx)}{3bc}$$

$\downarrow$ 5030

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\left(\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^3}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)+\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^3}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)-\frac{i(a+b\arcsin(cx))^4}{4bg}\right)}{3bc}$$

$\downarrow$ 2620

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\left(-\frac{3b\int (a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}-\frac{3b\int (a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}+\frac{(a+b\arcs}{}\right.}{3bc}$$

$\downarrow$ 3011

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-$$
$$gm\left(-\frac{3b\left(i(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-2ib\int (a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)\right)}{g}-\frac{3b\left(i(a+b\arc\right.}{}\right.$$

$\downarrow$ 7163

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-$$
$$gm\left(-\frac{3b\left(i(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-2ib\left(ib\int \operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)-i(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\right.\right.\right.}{g}\right.$$

$\downarrow$ 2720

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc} - \frac{gm\left(-\frac{3b\left(i(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-2ib\left(b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}-i(a+b\arcsin(cx))\right.\right.}{g}\right.}{}$$

$$\Big\downarrow \text{ 7143}$$

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc} - \frac{gm\left(-\frac{3b\left(i(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-2ib\left(b\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-i(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right.\right.\right.}{g}\right.}{}$$

input
```
Int[((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/(3*b*c) - (g*m*(((-1/4*I)*(a +
b*ArcSin[c*x])^4)/(b*g) + ((a + b*ArcSin[c*x])^3*Log[1 - (I*E^(I*ArcSin[c*
x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + ((a + b*ArcSin[c*x])^3*Log[1 - (I
*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (3*b*(I*(a + b*Arc
Sin[c*x])^2*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
] - (2*I)*b*((-I)*(a + b*ArcSin[c*x])*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(
c*f - Sqrt[c^2*f^2 - g^2])] + b*PolyLog[4, (I*E^(I*ArcSin[c*x])*g)/(c*f -
Sqrt[c^2*f^2 - g^2])])))/g - (3*b*(I*(a + b*ArcSin[c*x])^2*PolyLog[2, (I*E
^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*((-I)*(a + b*Ar
cSin[c*x])*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]
 + b*PolyLog[4, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])))/g)
)/(3*b*c)
```

Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 5278
```
Int[(Log[(h_.)*((f_.) + (g_.)*(x_))^(m_.)]*((a_.) + ArcSin[(c_.)*(x_)]*(b_.
))^(n_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[Log[h*(f + g*x)^m]*(
(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[g*(m/(b*c*Sqr
t[d]*(n + 1)))   Int[(a + b*ArcSin[c*x])^(n + 1)/(f + g*x), x], x] /; FreeQ
[{a, b, c, d, e, f, g, h, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && IGtQ[
n, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

Maple [F]

$$\int \frac{(a+b\arcsin (cx))^2 \ln (h(gx+f)^m)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int((a+b*arcsin(c*x))^2*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^2*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
*log((g*x + f)^m*h)/(c^2*x^2 - 1), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}\,dx$$

input
```
integrate((a+b*asin(c*x))**2*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1
)), x)
```

Maxima [F]

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

input
```
integrate((a+b*arcsin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="maxima")
```

output
```
(b^2*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/(sqrt(c*x +
1)*sqrt(-c*x + 1)), x)*log(h) + 2*a*b*c*integrate(arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)*log(h) + b^2*c*integ
rate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log((g*x + f)^m)/(sqrt(c
*x + 1)*sqrt(-c*x + 1)), x) + 2*a*b*c*integrate(arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a^2
*c*integrate(log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a^2*arc
tan2(c*x, sqrt(-c^2*x^2 + 1))*log(h))/c
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^2\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln(h\,(f+g\,x)^m)\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^2)/(1 - c^2*x^2)^(1/2),x)
```

output
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^2)/(1 - c^2*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\left(\int \frac{\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}dx\right)a^2+2\left(\int \frac{asin(cx)\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}dx\right)ab+\left(\int \frac{asin(cx)^2\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}dx\right)b^2$$

input
```
int((a+b*asin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output

```
int(log((f + g*x)**m*h)/sqrt( - c**2*x**2 + 1),x)*a**2 + 2*int((asin(c*x)*
log((f + g*x)**m*h))/sqrt( - c**2*x**2 + 1),x)*a*b + int((asin(c*x)**2*log
((f + g*x)**m*h))/sqrt( - c**2*x**2 + 1),x)*b**2
```

3.158 $\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 390

$$\begin{aligned}
&\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx \\
&= \frac{im(a+b\arcsin(cx))^3}{6b^2c} - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{2bc} \\
&\quad - \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{2bc} + \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc} \\
&\quad + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad + \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\
&\quad - \frac{bm\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{bm\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}
\end{aligned}$$

output
```
1/6*I*m*(a+b*arcsin(c*x))^3/b^2/c-1/2*m*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+
(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/b/c-1/2*m*(a+b*arcsin(c*x
))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/b/c+1/
2*(a+b*arcsin(c*x))^2*ln(h*(g*x+f)^m)/b/c+I*m*(a+b*arcsin(c*x))*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*(a+b*arcsi
n(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2))
)/c-b*m*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2))
)/c-b*m*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2))
)/c
```

Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2724 vs. $2(390) = 780$.

Time = 8.37 (sec) , antiderivative size = 2724, normalized size of antiderivative = 6.98

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \text{Result too large to show}$$

input
```
Integrate[((a + b*ArcSin[c*x])*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
(m*ArcSin[c*x]*(2*a + b*ArcSin[c*x])*Log[f + g*x])/(2*c) + (a*ArcSin[c*x]*
(-(m*Log[f + g*x]) + Log[h*(f + g*x)^m]))/c + (b*f*(-(m*Log[f + g*x]) + Lo
g[h*(f + g*x)^m])*((-I)*ArcSin[c*x]*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*
f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c
^2*f^2 - g^2])]) - PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^
2*f^2 - g^2])] + PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 -
g^2])]))/Sqrt[c^2*f^2 - g^2] + (a*g*m*(-1/2*(((3*I)/2)*Pi*ArcSin[c*x] - (I
/2)*ArcSin[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - Pi*Log[1 + I*E^(I
*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 2*Pi*Log[Cos
[ArcSin[c*x]/2]] + Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2,
 (-I)*E^(I*ArcSin[c*x])])/(c*(-c^(-1) - f/g)*g) + ((I/2)*Pi*ArcSin[c*x] -
(I/2)*ArcSin[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + Pi*Log[1 - I*E^
(I*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*Pi*Log[C
os[ArcSin[c*x]/2]] - Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2
, I*E^(I*ArcSin[c*x])])/(2*c*(c^(-1) - f/g)*g) + (((-1/2*I)*ArcSin[c*x]^2)
/g + (ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^
2])])/g + (ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])])/g - (I*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2
*f^2 - g^2])])/g - (I*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f
^2 - g^2])])/g)/(c^2*(-c^(-1) - f/g)*(c^(-1) - f/g))))/c - a*c*g*m*(-1/...
```

Rubi [A] (verified)

Time = 1.31 (sec) , antiderivative size = 386, normalized size of antiderivative = 0.99, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.212$, Rules used = {5278, 5240, 5030, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}dx$$

$$\Big\downarrow \text{5278}$$

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\int\frac{(a+b\arcsin(cx))^2}{f+gx}dx}{2bc}$$

$$\Big\downarrow \text{5240}$$

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cf+cgx}d\arcsin(cx)}{2bc}$$

$\downarrow$ 5030

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)+\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)-\frac{i(a+b\arcsin(cx))^3}{3bg}\right)}{2bc}$$

$\downarrow$ 2620

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(-\frac{2b\int(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}-\frac{2b\int(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}+\frac{(a+b\arcsin}{}\right.}{2bc}$$

$\downarrow$ 3011

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-ib\int\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(\right.\right.}{}\right.}{}$$

$\downarrow$ 2720

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}\right)}{g}-\frac{2b\left(i(a+b\arcsin(c\right.}{}\right.}{}$$

$\downarrow$ 7143

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-b\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}}{cf+\sqrt{c^2f^2-}}\right.\right.}{g}\right.}{}$$

input
```
Int[((a + b*ArcSin[c*x])*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/(2*b*c) - (g*m*(((-1/3*I)*(a +
b*ArcSin[c*x])^3)/(b*g) + ((a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*
x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + ((a + b*ArcSin[c*x])^2*Log[1 - (I
*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (2*b*(I*(a + b*Arc
Sin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]
- b*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]))/g -
(2*b*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt
[c^2*f^2 - g^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f
^2 - g^2])]))/g))/(2*b*c)
```

Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 5278
```
Int[(Log[(h_.)*((f_.) + (g_.)*(x_))^(m_.)]*((a_.) + ArcSin[(c_.)*(x_)]*(b_.
))^(n_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[Log[h*(f + g*x)^m]*(
(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[g*(m/(b*c*Sqr
t[d]*(n + 1)))   Int[(a + b*ArcSin[c*x])^(n + 1)/(f + g*x), x], x] /; FreeQ
[{a, b, c, d, e, f, g, h, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && IGtQ[
n, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Maple [F]

$$\int \frac{(a + b \arcsin (cx)) \ln (h(gx + f)^m)}{\sqrt{-c^2x^2 + 1}} dx$$

input
```
int((a+b*arcsin(c*x))*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Fricas [F]

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

input
```
integrate((a+b*arcsin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorit
hm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*log((g*x + f)^m*h)/(c^2*x
^2 - 1), x)
```

Sympy [F]

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(a+b\operatorname{asin}(cx))\log\left(h(f+gx)^m\right)}{\sqrt{-(cx-1)(cx+1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))*log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1)),
 x)
```

Maxima [F]

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

input
```
integrate((a+b*arcsin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorit
hm="maxima")
```

output
```
(b*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*s
qrt(-c*x + 1)), x)*log(h) + b*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1))*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a*c*integ
rate(log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a*arctan2(c*x,
sqrt(-c^2*x^2 + 1))*log(h))/c
```

Giac [F]

$$\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorit
hm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln\left(h\,(f+g\,x)^m\right)\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x)))/(1 - c^2*x^2)^(1/2),x)
```

output
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x)))/(1 - c^2*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \left(\int \frac{\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}dx\right)a + \left(\int \frac{asin(cx)\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}dx\right)b$$

input
```
int((a+b*asin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int(log((f + g*x)**m*h)/sqrt( - c**2*x**2 + 1),x)*a + int((asin(c*x)*log((
f + g*x)**m*h))/sqrt( - c**2*x**2 + 1),x)*b
```

3.159 $\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

Optimal result

Integrand size = 25, antiderivative size = 237

$$\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \frac{im\arcsin(cx)^2}{2c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{\arcsin(cx)\log(h(f+gx)^m)}{c} + \frac{im\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

output
```
1/2*I*m*arcsin(c*x)^2/c-m*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/
(c*f-(c^2*f^2-g^2)^(1/2)))/c-m*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2
))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c+arcsin(c*x)*ln(h*(g*x+f)^m)/c+I*m*polylo
g(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*polylo
g(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c
```

Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.04

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \frac{im\arcsin(cx)^2}{2c} - \frac{m\arcsin(cx)\log\left(1-\frac{ice^{i\arcsin(cx)}g}{c^2f-c\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ice^{i\arcsin(cx)}g}{c^2f+c\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} + \frac{im\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

input
```
Integrate[Log[h*(f + g*x)^m]/Sqrt[1 - c^2*x^2],x]
```

output
```
((I/2)*m*ArcSin[c*x]^2)/c - (m*ArcSin[c*x]*Log[1 - (I*c*E^(I*ArcSin[c*x])*
g)/(c^2*f - c*Sqrt[c^2*f^2 - g^2])])/c - (m*ArcSin[c*x]*Log[1 - (I*c*E^(I*
ArcSin[c*x])*g)/(c^2*f + c*Sqrt[c^2*f^2 - g^2])])/c + (ArcSin[c*x]*Log[h*(
f + g*x)^m])/c + (I*m*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f
^2 - g^2])])/c + (I*m*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f
^2 - g^2])])/c
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.280$, Rules used = {2851, 27, 5240, 5030, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

$$\Big\downarrow \text{ 2851}$$

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-gm\int\frac{\arcsin(cx)}{c(f+gx)}dx$$

$$\Big\downarrow \; 27$$

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\int\frac{\arcsin(cx)}{f+gx}dx}{c}$$

$$\Big\downarrow \; 5240$$

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\int\frac{\sqrt{1-c^2x^2}\arcsin(cx)}{cf+cgx}d\arcsin(cx)}{c}$$

$$\Big\downarrow \; 5030$$

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\left(\int\frac{e^{i\arcsin(cx)}\arcsin(cx)}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)+\int\frac{e^{i\arcsin(cx)}\arcsin(cx)}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)-\frac{i\arcsin(cx)^2}{2g}\right)}{c}$$

$$\Big\downarrow \; 2620$$

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\left(-\frac{\int\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}-\frac{\int\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}+\frac{\arcsin(cx)\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}+\frac{\arcsin(cx)\cdots}{\cdots}\cdots\right.}{c}$$

$$\Big\downarrow \; 2715$$

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\left(\frac{i\int e^{-i\arcsin(cx)}\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}}{g}+\frac{i\int e^{-i\arcsin(cx)}\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}}{g}+\frac{\arcsin(cx)\log\left(1-\frac{ige\cdots}{cf-\cdots}\right.}{g}\cdots\right.}{c}$$

$$\Big\downarrow \; 2838$$

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\left(-\frac{i\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}-\frac{i\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g}+\frac{\arcsin(cx)\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}+\frac{\arcsin(cx)\log\left(1-\frac{ige^{i\,\text{arcsi}\cdots}}{\sqrt{c^2f^2-g\cdots}}\right.}{g}\cdots\right.}{c}$$

input
```
Int[Log[h*(f + g*x)^m]/Sqrt[1 - c^2*x^2],x]
```

output
```
(ArcSin[c*x]*Log[h*(f + g*x)^m])/c - (g*m*(((-1/2*I)*ArcSin[c*x]^2)/g + (A
rcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g
 + (ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2]
)])/g - (I*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]
)/g - (I*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/
g))/c
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 2851
```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Simp[b*e*n   Int[SimplifyIntegrand[u/(d + e*x)
, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

Maple [F]

$$\int \frac{\ln \left(h(gx+f)^{m}\right)}{\sqrt{-c^{2}x^{2}+1}}dx$$

input
```
int(ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int(ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

Fricas [F]

$$\int \frac{\log \left(h(f+gx)^{m}\right)}{\sqrt{1-c^{2}x^{2}}}\,dx=\int \frac{\log \left((gx+f)^{m}h\right)}{\sqrt{-c^{2}x^{2}+1}}\,dx$$

input
```
integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*log((g*x + f)^m*h)/(c^2*x^2 - 1), x)
```

Sympy [F]

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}\,dx$$

input
```
integrate(ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Integral(log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1)), x)
```

Maxima [F]

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

output
```
integrate(log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Giac [F]

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

output
```
integrate(log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln \left(h\,{\left(f+g\,x\right)}^m\right)}{\sqrt{1-c^2\,x^2}} \,dx$$

input
```
int(log(h*(f + g*x)^m)/(1 - c^2*x^2)^(1/2),x)
```

output
```
int(log(h*(f + g*x)^m)/(1 - c^2*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int(log((f + g*x)**m*h)/sqrt( - c**2*x**2 + 1),x)
```

3.160 $\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))} dx$

Optimal result

Integrand size = 35, antiderivative size = 35

$$\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))} dx = \text{Int}\left(\frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}, x\right)$$

output
```
Defer(Int)(ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Mathematica [N/A]

Not integrable

Time = 0.21 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.06

$$\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))} dx = \int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))} dx$$

input
```
Integrate[Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

output
```
Integrate[Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

Rubi [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}dx$$

$$\Big\downarrow \ 5300$$

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}dx$$

input
```
Int[Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

output
```
$Aborted
```

Maple [N/A]

Not integrable

Time = 1.57 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.94

$$\int \frac{\ln \left(h(gx+f)^m\right)}{\sqrt{-c^2x^2+1}\,(a+b\arcsin(cx))}dx$$

input
```
int(ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

output
```
int(ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x)
```

Fricas [N/A]

Not integrable

Time = 0.09 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.63

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

input
```
integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorit
hm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*log((g*x + f)^m*h)/(a*c^2*x^2 + (b*c^2*x^2 -
b)*arcsin(c*x) - a), x)
```

Sympy [N/A]

Not integrable

Time = 8.69 (sec) , antiderivative size = 34, normalized size of antiderivative = 0.97

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx=\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}{(cx)})}\,dx$$

input
```
integrate(ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2)/(a+b*asin(c*x)),x)
```

output
```
Integral(log(h*(f + g*x)**m)/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))
), x)
```

Maxima [N/A]

Not integrable

Time = 0.89 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

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

input
```
integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorit
hm="maxima")
```

output
```
integrate(log((g*x + f)^m*h)/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Giac [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

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

input
```
integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x)),x, algorit
hm="giac")
```

output
```
integrate(log((g*x + f)^m*h)/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

Mupad [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\ln\left(h\,(f+g\,x)^m\right)}{(a+b\,\mathrm{asin}\,(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int(log(h*(f + g*x)^m)/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
```

output
```
int(log(h*(f + g*x)^m)/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

Reduce [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.31

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

input
```
int(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2)/(a+b*asin(c*x)),x)
```

output
```
int(log((f + g*x)**m*h)/(sqrt( - c**2*x**2 + 1)*asin(c*x)*b + sqrt( - c**2
*x**2 + 1)*a),x)
```

3.161 $\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 26, antiderivative size = 523

$$\begin{aligned}
&\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx \\
&= \frac{b(15c^4d^3f+3e^2(eg+3dh)+5c^2d(3e^2f+3deg+d^2h))\sqrt{1-c^2x^2}}{15c^5} \\
&+ \frac{b(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e^2f+3deg+3d^2h))\,x\sqrt{1-c^2x^2}}{96c^5} \\
&+ \frac{be(5e^2h+9c^2(e^2f+3deg+3d^2h))\,x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be^3hx^5\sqrt{1-c^2x^2}}{36c} \\
&- \frac{b(6e^2(eg+3dh)+5c^2d(3e^2f+3deg+d^2h))\left(1-c^2x^2\right)^{3/2}}{45c^5} \\
&+ \frac{be^2(eg+3dh)\left(1-c^2x^2\right)^{5/2}}{25c^5} \\
&- \frac{b(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e^2f+3deg+3d^2h))\arcsin(cx)}{96c^6} \\
&+ d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) \\
&+ \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) \\
&+ \frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx)) \\
&+ \frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^3hx^6(a+b\arcsin(cx))
\end{aligned}$$

output
```
1/15*b*(15*c^4*d^3*f+3*e^2*(3*d*h+e*g)+5*c^2*d*(d^2*h+3*d*e*g+3*e^2*f))*(-
c^2*x^2+1)^(1/2)/c^5+1/96*b*(24*c^4*d^2*(d*g+3*e*f)+5*e^3*h+9*c^2*e*(3*d^2
*h+3*d*e*g+e^2*f))*x*(-c^2*x^2+1)^(1/2)/c^5+1/144*b*e*(5*e^2*h+9*c^2*(3*d^
2*h+3*d*e*g+e^2*f))*x^3*(-c^2*x^2+1)^(1/2)/c^3+1/36*b*e^3*h*x^5*(-c^2*x^2+
1)^(1/2)/c-1/45*b*(6*e^2*(3*d*h+e*g)+5*c^2*d*(d^2*h+3*d*e*g+3*e^2*f))*(-c^
2*x^2+1)^(3/2)/c^5+1/25*b*e^2*(3*d*h+e*g)*(-c^2*x^2+1)^(5/2)/c^5-1/96*b*(2
4*c^4*d^2*(d*g+3*e*f)+5*e^3*h+9*c^2*e*(3*d^2*h+3*d*e*g+e^2*f))*arcsin(c*x)
/c^6+d^3*f*x*(a+b*arcsin(c*x))+1/2*d^2*(d*g+3*e*f)*x^2*(a+b*arcsin(c*x))+1
/3*d*(d^2*h+3*d*e*g+3*e^2*f)*x^3*(a+b*arcsin(c*x))+1/4*e*(3*d^2*h+3*d*e*g+
e^2*f)*x^4*(a+b*arcsin(c*x))+1/5*e^2*(3*d*h+e*g)*x^5*(a+b*arcsin(c*x))+1/6
*e^3*h*x^6*(a+b*arcsin(c*x))
```

Mathematica [A] (verified)

Time = 0.31 (sec) , antiderivative size = 463, normalized size of antiderivative = 0.89

$$
\begin{aligned}
&\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx \\
&= ad^3fx+\frac{1}{2}ad^2(3ef+dg)x^2+\frac{1}{3}ad\left(3e^2f+3deg+d^2h\right)x^3 \\
&\quad+\frac{1}{4}ae\left(e^2f+3deg+3d^2h\right)x^4+\frac{1}{5}ae^2(eg+3dh)x^5+\frac{1}{6}ae^3hx^6 \\
&\quad+\frac{b\sqrt{1-c^2x^2}(3e^2(256eg+768dh+125ehx)+c^2(1600d^3h+75d^2e(64g+27hx)+e^3x(675f+384gx+\cdots}{\cdots} \\
&\quad-\frac{b(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e^2f+3deg+3d^2h))\arcsin(cx)}{96c^6} \\
&\quad+\frac{1}{60}bx\left(10d^3(6f+x(3g+2hx))+15d^2ex(6f+x(4g+3hx))\right. \\
&\qquad\left.+3de^2x^2(20f+3x(5g+4hx))+e^3x^3(15f+2x(6g+5hx))\right)\arcsin(cx)
\end{aligned}
$$

input
```
Integrate[(d + e*x)^3*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
a*d^3*f*x + (a*d^2*(3*e*f + d*g)*x^2)/2 + (a*d*(3*e^2*f + 3*d*e*g + d^2*h)
*x^3)/3 + (a*e*(e^2*f + 3*d*e*g + 3*d^2*h)*x^4)/4 + (a*e^2*(e*g + 3*d*h)*x
^5)/5 + (a*e^3*h*x^6)/6 + (b*Sqrt[1 - c^2*x^2]*(3*e^2*(256*e*g + 768*d*h +
 125*e*h*x) + c^2*(1600*d^3*h + 75*d^2*e*(64*g + 27*h*x) + e^3*x*(675*f +
384*g*x + 250*h*x^2) + 3*d*e^2*(1600*f + 675*g*x + 384*h*x^2)) + 2*c^4*(10
0*d^3*(36*f + x*(9*g + 4*h*x)) + 75*d^2*e*x*(36*f + x*(16*g + 9*h*x)) + 3*
d*e^2*x^2*(400*f + 9*x*(25*g + 16*h*x)) + e^3*x^3*(225*f + 4*x*(36*g + 25*
h*x)))))/(7200*c^5) - (b*(24*c^4*d^2*(3*e*f + d*g) + 5*e^3*h + 9*c^2*e*(e^
2*f + 3*d*e*g + 3*d^2*h))*ArcSin[c*x])/(96*c^6) + (b*x*(10*d^3*(6*f + x*(3
*g + 2*h*x)) + 15*d^2*e*x*(6*f + x*(4*g + 3*h*x)) + 3*d*e^2*x^2*(20*f + 3*
x*(5*g + 4*h*x)) + e^3*x^3*(15*f + 2*x*(6*g + 5*h*x)))*ArcSin[c*x])/60
```

Rubi [A] (verified)

Time = 2.43 (sec) , antiderivative size = 556, normalized size of antiderivative = 1.06, number of steps used = 14, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$, Rules used = {5248, 27, 2340, 27, 2340, 25, 2340, 27, 2340, 25, 27, 533, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5248}$$

$$-bc\int \frac{x\left(10(6f+x(3g+2hx))d^3+15ex(6f+x(4g+3hx))d^2+3e^2x^2(20f+3x(5g+4hx))d+e^3x^3(15f+2x\right.}{60\sqrt{1-c^2x^2}} \\ d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+ \\ b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+ \\ b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{60}bc\int \frac{x\left(10(6f+x(3g+2hx))d^3+15ex(6f+x(4g+3hx))d^2+3e^2x^2(20f+3x(5g+4hx))d+e^3x^3(15f+\right.}{\sqrt{1-c^2x^2}}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\Big\downarrow$ 2340

$$-\frac{1}{60}bc\left(-\frac{\int -\frac{2x\left(36c^2e^2(eg+3dh)x^4+5e\left(9\left(3hd^2+3egd+e^2f\right)c^2+5e^2h\right)x^3+60c^2d\left(hd^2+3egd+3e^2f\right)x^2+90c^2d^2(3ef+dg)x+180c^2d^3f\right)}{\sqrt{1-c^2x^2}}dx}{6c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\Big\downarrow$ 27

$$-\frac{1}{60}bc\left(\frac{\int \frac{x\left(36c^2e^2(eg+3dh)x^4+5e\left(9\left(3hd^2+3egd+e^2f\right)c^2+5e^2h\right)x^3+60c^2d\left(hd^2+3egd+3e^2f\right)x^2+90c^2d^2(3ef+dg)x+180c^2d^3f\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{5}{}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\Big\downarrow$ 2340

$$-\frac{1}{60}bc\left(\frac{-\frac{\int -\frac{x\left(900d^3fc^4+450d^2(3ef+dg)xc^4+25e\left(9\left(3hd^2+3egd+e^2f\right)c^2+5e^2h\right)x^3c^2+12\left(25d\left(hd^2+3egd+3e^2f\right)c^2+12e^2(eg+3dh)\right)x^2c^2\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{36}{5}e}{3c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\Big\downarrow$ 25

$$-\frac{1}{60}bc\left(\frac{\frac{\int \frac{x\left(900d^3fc^4+450d^2(3ef+dg)xc^4+25e\left(9\left(3hd^2+3egd+e^2f\right)c^2+5e^2h\right)x^3c^2+12\left(25d\left(hd^2+3egd+3e^2f\right)c^2+12e^2(eg+3dh)\right)x^2c^2\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{36}{5}e^2x^4}{3c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+ b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+ b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{60}bc\left(\frac{\frac{-\frac{\int -\frac{3x\left(1200d^3fc^6+16\left(25d\left(hd^2+3egd+3e^2f\right)c^2+12e^2(eg+3dh)\right)x^2c^4+25\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}ex^3\sqrt{}}{5c^2}}{3c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+ b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+ b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\downarrow$ 27

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\int \frac{x\left(1200d^3fc^6+16\left(25d\left(hd^2+3egd+3e^2f\right)c^2+12e^2(eg+3dh)\right)x^2c^4+25\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}ex^3\sqrt{1-}}{5c^2}}{3c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+ b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+ b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(-\frac{\int -\frac{c^4x\left(16\left(225d^3fc^4+50d\left(hd^2+3egd+3e^2f\right)c^2+24e^2(eg+3dh)\right)+75\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}c^2x^2\sqrt{1-c\ldots}\right.}{4c^2}}{5c^2}}{3\ldots}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\big\downarrow$ 25

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(\frac{\int \frac{c^4x\left(16\left(225d^3fc^4+50d\left(hd^2+3egd+3e^2f\right)c^2+24e^2(eg+3dh)\right)+75\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}c^2x^2\sqrt{1-c^2x^2}\ldots\right.}{4c^2}}{5c^2}}{3c\ldots}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\big\downarrow$ 27

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(\frac{1}{3}c^2\int \frac{x\left(16\left(225d^3fc^4+50d\left(hd^2+3egd+3e^2f\right)c^2+24e^2(eg+3dh)\right)+75\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)x\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}c^2x^2\sqrt{1-c^2\ldots}\right.}{4c^2}}{5c^2}}{3c\ldots}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\big\downarrow$ 533

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{\int \frac{32\left(225d^3fc^4+50d\left(hd^2+3egd+3e^2f\right)c^2+24e^2(eg+3dh)\right)xc^2+75\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{75x\sqrt{1-c^2x^2}\left(\cdots\right.}{\cdots}\right.\right.\cdots}{4c^2}}{\cdots}\right.\cdots$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 455$$

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{75\left(24c^4d^2(dg+3ef)+9c^2e\left(3d^2h+3deg+e^2f\right)+5e^3h\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-32\sqrt{1-c^2x^2}\left(225c^4d^3f+50c^2d\left(d^2h+3deg+3e^2f\right)+24e^2(3dh+eg)\right)\cdots}{2c^2}\right.\right.\cdots}{4c^2}}{\cdots}\right.\cdots$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 223$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{\frac{75\arcsin(cx)\left(24c^4d^2(dg+3ef)+9c^2e\left(3d^2h+3deg+e^2f\right)+5e^3h\right)}{c}-32\sqrt{1-c^2x^2}\left(225c^4d^3f+50c^2d\left(d^2h+3deg+3e^2f\right)+24e^2(3dh+eg)\right)}{2c^2}-\frac{75x\sqrt{\cdots}}{\cdots}\right.\right.\cdots}{4c^2}}{\cdots}\right.\cdots$$

input
```
Int[(d + e*x)^3*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
d^3*f*x*(a + b*ArcSin[c*x]) + (d^2*(3*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/
2 + (d*(3*e^2*f + 3*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + (e*(e^2*f
+ 3*d*e*g + 3*d^2*h)*x^4*(a + b*ArcSin[c*x]))/4 + (e^2*(e*g + 3*d*h)*x^5*(
a + b*ArcSin[c*x]))/5 + (e^3*h*x^6*(a + b*ArcSin[c*x]))/6 - (b*c*((-5*e^3*
h*x^5*Sqrt[1 - c^2*x^2])/(3*c^2) + ((-36*e^2*(e*g + 3*d*h)*x^4*Sqrt[1 - c^
2*x^2])/5 + ((-25*e*(5*e^2*h + 9*c^2*(e^2*f + 3*d*e*g + 3*d^2*h))*x^3*Sqrt
[1 - c^2*x^2])/4 + (3*((-16*c^2*(12*e^2*(e*g + 3*d*h) + 25*c^2*d*(3*e^2*f
+ 3*d*e*g + d^2*h))*x^2*Sqrt[1 - c^2*x^2])/3 + (c^2*((-75*(24*c^4*d^2*(3*e
*f + d*g) + 5*e^3*h + 9*c^2*e*(e^2*f + 3*d*e*g + 3*d^2*h))*x*Sqrt[1 - c^2*
x^2])/(2*c^2) + (-32*(225*c^4*d^3*f + 24*e^2*(e*g + 3*d*h) + 50*c^2*d*(3*e
^2*f + 3*d*e*g + d^2*h))*Sqrt[1 - c^2*x^2] + (75*(24*c^4*d^2*(3*e*f + d*g)
 + 5*e^3*h + 9*c^2*e*(e^2*f + 3*d*e*g + 3*d^2*h))*ArcSin[c*x])/c)/(2*c^2))
)/3))/(4*c^2))/(5*c^2))/(3*c^2)))/60
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 609, normalized size of antiderivative = 1.16

method	result
parts	$a\left(\frac{e^3 h x^6}{6}+\frac{(3d e^2 h+e^3 g)x^5}{5}+\frac{(3d^2 eh+3d e^2 g+e^3 f)x^4}{4}+\frac{(d^3 h+3d^2 eg+3d e^2 f)x^3}{3}+\frac{(d^3 g+3d^2 ef)x^2}{2}+d^3$
derivativedivides	$\frac{a\left(\frac{e^3 h c^6 x^6}{6}+\frac{\left(3cd e^2 h+e^3 cg\right)c^5 x^5}{5}+\frac{\left(3c^2 d^2 eh+3c^2 d e^2 g+e^3 f c^2\right)c^4 x^4}{4}+\frac{\left(c^3 d^3 h+3c^3 d^2 eg+3c^3 d e^2 f\right)c^3 x^3}{3}+\frac{\left(c^4 d^3 g+3c^4 d^2 ef\right)}{2}\right.}{c^5}$
default	$\frac{a\left(\frac{e^3 h c^6 x^6}{6}+\frac{\left(3cd e^2 h+e^3 cg\right)c^5 x^5}{5}+\frac{\left(3c^2 d^2 eh+3c^2 d e^2 g+e^3 f c^2\right)c^4 x^4}{4}+\frac{\left(c^3 d^3 h+3c^3 d^2 eg+3c^3 d e^2 f\right)c^3 x^3}{3}+\frac{\left(c^4 d^3 g+3c^4 d^2 ef\right)}{2}\right.}{c^5}$
orering	Expression too large to display

input
```
int((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/6*e^3*h*x^6+1/5*(3*d*e^2*h+e^3*g)*x^5+1/4*(3*d^2*e*h+3*d*e^2*g+e^3*f)
*x^4+1/3*(d^3*h+3*d^2*e*g+3*d*e^2*f)*x^3+1/2*(d^3*g+3*d^2*e*f)*x^2+d^3*f*x
)+b/c*(1/6*c*arcsin(c*x)*e^3*h*x^6+3/5*c*arcsin(c*x)*x^5*d*e^2*h+1/5*c*arc
sin(c*x)*x^5*e^3*g+3/4*c*arcsin(c*x)*x^4*d^2*e*h+3/4*c*arcsin(c*x)*x^4*d*e
^2*g+1/4*c*arcsin(c*x)*x^4*e^3*f+1/3*c*arcsin(c*x)*x^3*d^3*h+c*arcsin(c*x)
*x^3*d^2*e*g+c*arcsin(c*x)*x^3*d*e^2*f+1/2*c*arcsin(c*x)*x^2*d^3*g+3/2*c*a
rcsin(c*x)*x^2*d^2*e*f+arcsin(c*x)*d^3*f*c*x-1/60/c^5*(30*c^4*d^2*(d*g+3*e
*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+12*c*e^2*(3*d*h+e*g)*(-1
/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x
^2+1)^(1/2))+15*c^2*e*(3*d^2*h+3*d*e*g+e^2*f)*(-1/4*c^3*x^3*(-c^2*x^2+1)^(
1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+20*c^3*d*(d^2*h+3*d*e*g+3
*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+10*e^3*h*
(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*
(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))-60*d^3*c^5*f*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 676, normalized size of antiderivative = 1.29

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{1200\,ac^6e^3hx^6 + 7200\,ac^6d^3fx + 1440\,(ac^6e^3g + 3\,ac^6de^2h)x^5 + 1800\,(ac^6e^3f + 3\,ac^6de^2g + 3\,ac^6d^2eh)x}{}$$

input
```
integrate((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/7200*(1200*a*c^6*e^3*h*x^6 + 7200*a*c^6*d^3*f*x + 1440*(a*c^6*e^3*g + 3*
a*c^6*d*e^2*h)*x^5 + 1800*(a*c^6*e^3*f + 3*a*c^6*d*e^2*g + 3*a*c^6*d^2*e*h
)*x^4 + 2400*(3*a*c^6*d*e^2*f + 3*a*c^6*d^2*e*g + a*c^6*d^3*h)*x^3 + 3600*
(3*a*c^6*d^2*e*f + a*c^6*d^3*g)*x^2 + 15*(80*b*c^6*e^3*h*x^6 + 480*b*c^6*d
^3*f*x + 96*(b*c^6*e^3*g + 3*b*c^6*d*e^2*h)*x^5 + 120*(b*c^6*e^3*f + 3*b*c
^6*d*e^2*g + 3*b*c^6*d^2*e*h)*x^4 + 160*(3*b*c^6*d*e^2*f + 3*b*c^6*d^2*e*g
 + b*c^6*d^3*h)*x^3 + 240*(3*b*c^6*d^2*e*f + b*c^6*d^3*g)*x^2 - 45*(8*b*c^
4*d^2*e + b*c^2*e^3)*f - 15*(8*b*c^4*d^3 + 9*b*c^2*d*e^2)*g - 5*(27*b*c^2*
d^2*e + 5*b*e^3)*h)*arcsin(c*x) + (200*b*c^5*e^3*h*x^5 + 288*(b*c^5*e^3*g
+ 3*b*c^5*d*e^2*h)*x^4 + 50*(9*b*c^5*e^3*f + 27*b*c^5*d*e^2*g + (27*b*c^5*
d^2*e + 5*b*c^3*e^3)*h)*x^3 + 32*(75*b*c^5*d*e^2*f + 3*(25*b*c^5*d^2*e + 4
*b*c^3*e^3)*g + (25*b*c^5*d^3 + 36*b*c^3*d*e^2)*h)*x^2 + 2400*(3*b*c^5*d^3
 + 2*b*c^3*d*e^2)*f + 192*(25*b*c^3*d^2*e + 4*b*c*e^3)*g + 64*(25*b*c^3*d^
3 + 36*b*c*d*e^2)*h + 75*(9*(8*b*c^5*d^2*e + b*c^3*e^3)*f + 3*(8*b*c^5*d^3
 + 9*b*c^3*d*e^2)*g + (27*b*c^3*d^2*e + 5*b*c*e^3)*h)*x)*sqrt(-c^2*x^2 + 1
))/c^6
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1263 vs. $2(518) = 1036$.

Time = 0.65 (sec) , antiderivative size = 1263, normalized size of antiderivative = 2.41

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)**3*(h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**3*f*x + a*d**3*g*x**2/2 + a*d**3*h*x**3/3 + 3*a*d**2*e*f*x
**2/2 + a*d**2*e*g*x**3 + 3*a*d**2*e*h*x**4/4 + a*d*e**2*f*x**3 + 3*a*d*e*
*2*g*x**4/4 + 3*a*d*e**2*h*x**5/5 + a*e**3*f*x**4/4 + a*e**3*g*x**5/5 + a*
e**3*h*x**6/6 + b*d**3*f*x*asin(c*x) + b*d**3*g*x**2*asin(c*x)/2 + b*d**3*
h*x**3*asin(c*x)/3 + 3*b*d**2*e*f*x**2*asin(c*x)/2 + b*d**2*e*g*x**3*asin(
c*x) + 3*b*d**2*e*h*x**4*asin(c*x)/4 + b*d*e**2*f*x**3*asin(c*x) + 3*b*d*e
**2*g*x**4*asin(c*x)/4 + 3*b*d*e**2*h*x**5*asin(c*x)/5 + b*e**3*f*x**4*asi
n(c*x)/4 + b*e**3*g*x**5*asin(c*x)/5 + b*e**3*h*x**6*asin(c*x)/6 + b*d**3*
f*sqrt(-c**2*x**2 + 1)/c + b*d**3*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**3*
h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + 3*b*d**2*e*f*x*sqrt(-c**2*x**2 + 1)/(4
*c) + b*d**2*e*g*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d**2*e*h*x**3*sqrt(
-c**2*x**2 + 1)/(16*c) + b*d*e**2*f*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*
d*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d*e**2*h*x**4*sqrt(-c**2*x
**2 + 1)/(25*c) + b*e**3*f*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e**3*g*x**
4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e**3*h*x**5*sqrt(-c**2*x**2 + 1)/(36*c)
- b*d**3*g*asin(c*x)/(4*c**2) - 3*b*d**2*e*f*asin(c*x)/(4*c**2) + 2*b*d**3
*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 2*b*d**2*e*g*sqrt(-c**2*x**2 + 1)/(3*c*
*3) + 9*b*d**2*e*h*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 2*b*d*e**2*f*sqrt(-c
**2*x**2 + 1)/(3*c**3) + 9*b*d*e**2*g*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 4
*b*d*e**2*h*x**2*sqrt(-c**2*x**2 + 1)/(25*c**3) + 3*b*e**3*f*x*sqrt(-c*...
```

Maxima [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 859, normalized size of antiderivative = 1.64

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/6*a*e^3*h*x^6 + 1/5*a*e^3*g*x^5 + 3/5*a*d*e^2*h*x^5 + 1/4*a*e^3*f*x^4 +
3/4*a*d*e^2*g*x^4 + 3/4*a*d^2*e*h*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 + 1/
3*a*d^3*h*x^3 + 3/2*a*d^2*e*f*x^2 + 1/2*a*d^3*g*x^2 + 3/4*(2*x^2*arcsin(c*
x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e*f + 1/3*(3*x^
3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))
*b*d*e^2*f + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*s
qrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3*f + 1/4*(2*x^2*arcsi
n(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3*g + 1/3*(3*
x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4
))*b*d^2*e*g + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3
*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e^2*g + 1/75*(15*x^5
*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^
4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^3*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqr
t(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^3*h + 3/32*(8*x^4
*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4
- 3*arcsin(c*x)/c^5)*c)*b*d^2*e*h + 1/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^
2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c
^6)*c)*b*d*e^2*h + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c
^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcs
in(c*x)/c^7)*c)*b*e^3*h + a*d^3*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 ...
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1337 vs. $2(487) = 974$.

Time = 0.16 (sec) , antiderivative size = 1337, normalized size of antiderivative = 2.56

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/6*a*e^3*h*x^6 + 1/5*a*e^3*g*x^5 + 3/5*a*d*e^2*h*x^5 + 1/4*a*e^3*f*x^4 +
3/4*a*d*e^2*g*x^4 + 3/4*a*d^2*e*h*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 + 1/
3*a*d^3*h*x^3 + b*d^3*f*x*arcsin(c*x) + a*d^3*f*x + (c^2*x^2 - 1)*b*d*e^2*
f*x*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/3*(c^2
*x^2 - 1)*b*d^3*h*x*arcsin(c*x)/c^2 + 3/4*sqrt(-c^2*x^2 + 1)*b*d^2*e*f*x/c
 + 1/4*sqrt(-c^2*x^2 + 1)*b*d^3*g*x/c + 3/2*(c^2*x^2 - 1)*b*d^2*e*f*arcsin
(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^3*g*arcsin(c*x)/c^2 + b*d*e^2*f*x*arcsin
(c*x)/c^2 + b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e^3*g*x*ar
csin(c*x)/c^4 + 1/3*b*d^3*h*x*arcsin(c*x)/c^2 + 3/5*(c^2*x^2 - 1)^2*b*d*e^
2*h*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^3*f/c - 1/16*(-c^2*x^2 + 1)
^(3/2)*b*e^3*f*x/c^3 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*g*x/c^3 - 3/16*(-
c^2*x^2 + 1)^(3/2)*b*d^2*e*h*x/c^3 + 3/2*(c^2*x^2 - 1)*a*d^2*e*f/c^2 + 1/2
*(c^2*x^2 - 1)*a*d^3*g/c^2 + 3/4*b*d^2*e*f*arcsin(c*x)/c^2 + 1/4*(c^2*x^2
- 1)^2*b*e^3*f*arcsin(c*x)/c^4 + 1/4*b*d^3*g*arcsin(c*x)/c^2 + 3/4*(c^2*x^
2 - 1)^2*b*d*e^2*g*arcsin(c*x)/c^4 + 3/4*(c^2*x^2 - 1)^2*b*d^2*e*h*arcsin(
c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e^3*g*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)
*b*d*e^2*h*x*arcsin(c*x)/c^4 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*f/c^3 - 1/
3*(-c^2*x^2 + 1)^(3/2)*b*d^2*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d^3*h/c^
3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e^3*f*x/c^3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d*e
^2*g*x/c^3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d^2*e*h*x/c^3 + 1/36*(c^2*x^2 -...
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\, dx = \int (a+b\,\mathrm{asin}(c\,x))\, (d+e\,x)^3 \left(h\,x^2+g\,x+f\right)\, dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2), x)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 1010, normalized size of antiderivative = 1.93

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx)) \, dx = \text{Too large to display}$$

input
```
int((e*x+d)^3*(h*x^2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
(7200*asin(c*x)*b*c**6*d**3*f*x + 3600*asin(c*x)*b*c**6*d**3*g*x**2 + 2400
*asin(c*x)*b*c**6*d**3*h*x**3 + 10800*asin(c*x)*b*c**6*d**2*e*f*x**2 + 720
0*asin(c*x)*b*c**6*d**2*e*g*x**3 + 5400*asin(c*x)*b*c**6*d**2*e*h*x**4 + 7
200*asin(c*x)*b*c**6*d*e**2*f*x**3 + 5400*asin(c*x)*b*c**6*d*e**2*g*x**4 +
 4320*asin(c*x)*b*c**6*d*e**2*h*x**5 + 1800*asin(c*x)*b*c**6*e**3*f*x**4 +
 1440*asin(c*x)*b*c**6*e**3*g*x**5 + 1200*asin(c*x)*b*c**6*e**3*h*x**6 - 1
800*asin(c*x)*b*c**4*d**3*g - 5400*asin(c*x)*b*c**4*d**2*e*f - 2025*asin(c
*x)*b*c**2*d**2*e*h - 2025*asin(c*x)*b*c**2*d*e**2*g - 675*asin(c*x)*b*c**
2*e**3*f - 375*asin(c*x)*b*e**3*h + 7200*sqrt( - c**2*x**2 + 1)*b*c**5*d**
3*f + 1800*sqrt( - c**2*x**2 + 1)*b*c**5*d**3*g*x + 800*sqrt( - c**2*x**2
+ 1)*b*c**5*d**3*h*x**2 + 5400*sqrt( - c**2*x**2 + 1)*b*c**5*d**2*e*f*x +
2400*sqrt( - c**2*x**2 + 1)*b*c**5*d**2*e*g*x**2 + 1350*sqrt( - c**2*x**2
+ 1)*b*c**5*d**2*e*h*x**3 + 2400*sqrt( - c**2*x**2 + 1)*b*c**5*d*e**2*f*x*
*2 + 1350*sqrt( - c**2*x**2 + 1)*b*c**5*d*e**2*g*x**3 + 864*sqrt( - c**2*x
**2 + 1)*b*c**5*d*e**2*h*x**4 + 450*sqrt( - c**2*x**2 + 1)*b*c**5*e**3*f*x
**3 + 288*sqrt( - c**2*x**2 + 1)*b*c**5*e**3*g*x**4 + 200*sqrt( - c**2*x**
2 + 1)*b*c**5*e**3*h*x**5 + 1600*sqrt( - c**2*x**2 + 1)*b*c**3*d**3*h + 48
00*sqrt( - c**2*x**2 + 1)*b*c**3*d**2*e*g + 2025*sqrt( - c**2*x**2 + 1)*b*
c**3*d**2*e*h*x + 4800*sqrt( - c**2*x**2 + 1)*b*c**3*d*e**2*f + 2025*sqrt(
 - c**2*x**2 + 1)*b*c**3*d*e**2*g*x + 1152*sqrt( - c**2*x**2 + 1)*b*c**...
```

3.162 $\int (d+ex)^2 (f+gx+hx^2) (a+b\arcsin(cx))\,dx$

Optimal result

Integrand size = 26, antiderivative size = 369

$$
\begin{aligned}
&\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx \\
&= \frac{b(15c^4d^2f+3e^2h+5c^2(e^2f+2deg+d^2h))\sqrt{1-c^2x^2}}{15c^5} \\
&\quad + \frac{b(8c^2d(2ef+dg)+3e(eg+2dh))\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{be(eg+2dh)x^3\sqrt{1-c^2x^2}}{16c} \\
&\quad - \frac{b(6e^2h+5c^2(e^2f+2deg+d^2h))\,(1-c^2x^2)^{3/2}}{45c^5} + \frac{be^2h(1-c^2x^2)^{5/2}}{25c^5} \\
&\quad - \frac{b(8c^2d(2ef+dg)+3e(eg+2dh))\arcsin(cx)}{32c^4} + d^2fx(a+b\arcsin(cx)) \\
&\quad + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx)) + \frac{1}{5}e^2hx^5(a+b\arcsin(cx))
\end{aligned}
$$

output
```
1/15*b*(15*c^4*d^2*f+3*e^2*h+5*c^2*(d^2*h+2*d*e*g+e^2*f))*(-c^2*x^2+1)^(1/
2)/c^5+1/32*b*(8*c^2*d*(d*g+2*e*f)+3*e*(2*d*h+e*g))*x*(-c^2*x^2+1)^(1/2)/c
^3+1/16*b*e*(2*d*h+e*g)*x^3*(-c^2*x^2+1)^(1/2)/c-1/45*b*(6*e^2*h+5*c^2*(d^
2*h+2*d*e*g+e^2*f))*(-c^2*x^2+1)^(3/2)/c^5+1/25*b*e^2*h*(-c^2*x^2+1)^(5/2)
/c^5-1/32*b*(8*c^2*d*(d*g+2*e*f)+3*e*(2*d*h+e*g))*arcsin(c*x)/c^4+d^2*f*x*
(a+b*arcsin(c*x))+1/2*d*(d*g+2*e*f)*x^2*(a+b*arcsin(c*x))+1/3*(d^2*h+2*d*e
*g+e^2*f)*x^3*(a+b*arcsin(c*x))+1/4*e*(2*d*h+e*g)*x^4*(a+b*arcsin(c*x))+1/
5*e^2*h*x^5*(a+b*arcsin(c*x))
```

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 307, normalized size of antiderivative = 0.83

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{120ac^5x(10d^2(6f+x(3g+2hx))+10dex(6f+x(4g+3hx))+e^2x^2(20f+3x(5g+4hx)))+b\sqrt{1-c^2}}{}$$

input
```
Integrate[(d + e*x)^2*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
(120*a*c^5*x*(10*d^2*(6*f + x*(3*g + 2*h*x)) + 10*d*e*x*(6*f + x*(4*g + 3*
h*x)) + e^2*x^2*(20*f + 3*x*(5*g + 4*h*x))) + b*Sqrt[1 - c^2*x^2]*(768*e^2
*h + c^2*(1600*d^2*h + 50*d*e*(64*g + 27*h*x) + e^2*(1600*f + 675*g*x + 38
4*h*x^2)) + 2*c^4*(100*d^2*(36*f + x*(9*g + 4*h*x)) + 50*d*e*x*(36*f + x*(
16*g + 9*h*x)) + e^2*x^2*(400*f + 9*x*(25*g + 16*h*x)))) + 15*b*c*(-120*c^
2*d*(2*e*f + d*g) - 45*e*(e*g + 2*d*h) + 8*c^4*x*(10*d^2*(6*f + x*(3*g + 2
*h*x)) + 10*d*e*x*(6*f + x*(4*g + 3*h*x)) + e^2*x^2*(20*f + 3*x*(5*g + 4*h
*x))))*ArcSin[c*x])/(7200*c^5)
```

Rubi [A] (verified)

Time = 1.42 (sec) , antiderivative size = 389, normalized size of antiderivative = 1.05, number of steps used = 13, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5248, 27, 2340, 25, 2340, 25, 2340, 25, 27, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx)) \, dx$$

$$\Big\downarrow \ 5248$$

$$-bc\int \frac{x\left(12e^2hx^4+15e(eg+2dh)x^3+20\left(hd^2+2egd+e^2f\right)x^2+30d(2ef+dg)x+60d^2f\right)}{60\sqrt{1-c^2x^2}}dx+\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \ 27$$

$$-\frac{1}{60}bc\int \frac{x\left(12e^2hx^4+15e(eg+2dh)x^3+20\left(hd^2+2egd+e^2f\right)x^2+30d(2ef+dg)x+60d^2f\right)}{\sqrt{1-c^2x^2}}dx+\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \ 2340$$

$$-\frac{1}{60}bc\left(-\frac{\int -\frac{x\left(75c^2e(eg+2dh)x^3+4\left(25\left(hd^2+2egd+e^2f\right)c^2+12e^2h\right)x^2+150c^2d(2ef+dg)x+300c^2d^2f\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{12e^2hx^4\sqrt{1-c^2x^2}}{5c^2}\right)+\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \ 25$$

$$-\frac{1}{60}bc\left(\frac{\int \frac{x(75c^2e(eg+2dh)x^3+4(25(hd^2+2egd+e^2f)c^2+12e^2h)x^2+150c^2d(2ef+dg)x+300c^2d^2f)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{12e^2hx^4\sqrt{1-c^2x^2}}{5c^2}\right)+\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(\frac{-\frac{\int -\frac{x\left(1200d^2fc^4+16\left(25\left(hd^2+2egd+e^2f\right)c^2+12e^2h\right)x^2c^2+75\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{75}{4}ex^3\sqrt{1-c^2x^2}(2dh+eg)}{5c^2}\right.$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{60}bc\left(\frac{\frac{\int \frac{x\left(1200d^2fc^4+16\left(25\left(hd^2+2egd+e^2f\right)c^2+12e^2h\right)x^2c^2+75\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{75}{4}ex^3\sqrt{1-c^2x^2}(2dh+eg)}{5c^2}-\right.$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(\frac{\frac{-\frac{\int -\frac{c^2x\left(225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2+16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2\left(d^2h+2deg+e^2f\right)+\right.}{4c^2}}{5c^2}\right.$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{\int \frac{c^2x\left(225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2+16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2\left(d^2h+2deg+e^2f\right)+12e\right.}{4c^2}}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$\downarrow$ 27

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\int \frac{x\left(225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2+16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2\left(d^2h+2deg+e^2f\right)+12e\right.}{4c^2}}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$\downarrow$ 533

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{\int \frac{c^2\left(225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)+32\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)x\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2d(dg+2ef)+3e(2dh+eg\right.\right.}{4c^2}}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$\downarrow$ 27

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\int \frac{225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)+32\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)x}{\sqrt{1-c^2x^2}}dx-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2d(dg+2ef)+3e(2dh+eg)\right)\right.}{4c^2}}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$\Big\downarrow$ 455

$$-\frac{1}{60}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{1}{2}\left(225\left(8c^2d(dg+2ef)+3e(2dh+eg)\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-\frac{32\sqrt{1-c^2x^2}\left(225c^4d^2f+50c^2\left(d^2h+2deg+e^2f\right)+24e^2h\right)}{c^2}\right)-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2d\right.}{4c^2}}{5c^2}\right.$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$\Big\downarrow$ 223

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))-\frac{1}{60}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{1}{2}\left(\frac{225\arcsin(cx)\left(8c^2d(dg+2ef)+3e(2dh+eg)\right)}{c}-\frac{32\sqrt{1-c^2x^2}\left(225c^4d^2f+50c^2\left(d^2h+2deg+e^2f\right)+24e^2h\right)}{c^2}\right)-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2d(dg+2ef)+\right.}{4c^2}}{5c^2}\right.$$

input
```
Int[(d + e*x)^2*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2
+ ((e^2*f + 2*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + (e*(e*g + 2*d*h)
*x^4*(a + b*ArcSin[c*x]))/4 + (e^2*h*x^5*(a + b*ArcSin[c*x]))/5 - (b*c*((-
12*e^2*h*x^4*Sqrt[1 - c^2*x^2])/(5*c^2) + ((-75*e*(e*g + 2*d*h)*x^3*Sqrt[1
 - c^2*x^2])/4 + ((-16*(12*e^2*h + 25*c^2*(e^2*f + 2*d*e*g + d^2*h))*x^2*S
qrt[1 - c^2*x^2])/3 + ((-225*(8*c^2*d*(2*e*f + d*g) + 3*e*(e*g + 2*d*h))*x
*Sqrt[1 - c^2*x^2])/2 + ((-32*(225*c^4*d^2*f + 24*e^2*h + 50*c^2*(e^2*f +
2*d*e*g + d^2*h))*Sqrt[1 - c^2*x^2])/c^2 + (225*(8*c^2*d*(2*e*f + d*g) + 3
*e*(e*g + 2*d*h))*ArcSin[c*x])/c)/2)/3)/(4*c^2))/(5*c^2)))/60
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 434, normalized size of antiderivative = 1.18

method	result
parts	$a\left(\frac{e^2 h\,x^5}{5}+\frac{(2deh+e^2 g)x^4}{4}+\frac{(d^2 h+2deg+e^2 f)x^3}{3}+\frac{(d^2 g+2def)x^2}{2}+d^2 f x\right)+\frac{b\left(\frac{c\arcsin(cx)e^2 h\,x^5}{5}+\frac{c\,\mathrm{ar}}{}\right.}{}$
derivativedivides	$\frac{\frac{a\left(\frac{e^2 h\,c^5 x^5}{5}+\frac{\left(2cdeh+e^2 cg\right)c^4 x^4}{4}+\frac{\left(c^2 d^2 h+2c^2 deg+e^2 f\,c^2\right)c^3 x^3}{3}+\frac{\left(c^3 d^2 g+2c^3 def\right)c^2 x^2}{2}+d^2 c^5 f x\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)e^2 h\,c^5 x^5}{5}+\right.}{}}{}$
default	$\frac{\frac{a\left(\frac{e^2 h\,c^5 x^5}{5}+\frac{\left(2cdeh+e^2 cg\right)c^4 x^4}{4}+\frac{\left(c^2 d^2 h+2c^2 deg+e^2 f\,c^2\right)c^3 x^3}{3}+\frac{\left(c^3 d^2 g+2c^3 def\right)c^2 x^2}{2}+d^2 c^5 f x\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)e^2 h\,c^5 x^5}{5}+\right.}{}}{}$
orering	Expression too large to display

input

```
int((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output

```
a*(1/5*e^2*h*x^5+1/4*(2*d*e*h+e^2*g)*x^4+1/3*(d^2*h+2*d*e*g+e^2*f)*x^3+1/2
*(d^2*g+2*d*e*f)*x^2+d^2*f*x)+b/c*(1/5*c*arcsin(c*x)*e^2*h*x^5+1/2*c*arcsi
n(c*x)*x^4*d*e*h+1/4*c*arcsin(c*x)*x^4*e^2*g+1/3*c*arcsin(c*x)*x^3*d^2*h+2
/3*c*arcsin(c*x)*x^3*d*e*g+1/3*c*arcsin(c*x)*x^3*e^2*f+1/2*c*arcsin(c*x)*x
^2*d^2*g+c*arcsin(c*x)*x^2*d*e*f+arcsin(c*x)*d^2*f*c*x-1/60/c^4*(30*c^3*d*
(d*g+2*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+15*c*e*(2*d*h+e*
g)*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(
c*x))+20*c^2*(d^2*h+2*d*e*g+e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-
c^2*x^2+1)^(1/2))+12*e^2*h*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(
-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-60*d^2*c^4*f*(-c^2*x^2+1)^(1/2)
))
```

Fricas [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.22

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{1440\,ac^5e^2hx^5 + 7200\,ac^5d^2fx + 1800\,(ac^5e^2g + 2\,ac^5deh)x^4 + 2400\,(ac^5e^2f + 2\,ac^5deg + ac^5d^2h)x^3 + 3}{}$$

input
```
integrate((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/7200*(1440*a*c^5*e^2*h*x^5 + 7200*a*c^5*d^2*f*x + 1800*(a*c^5*e^2*g + 2*
a*c^5*d*e*h)*x^4 + 2400*(a*c^5*e^2*f + 2*a*c^5*d*e*g + a*c^5*d^2*h)*x^3 +
3600*(2*a*c^5*d*e*f + a*c^5*d^2*g)*x^2 + 15*(96*b*c^5*e^2*h*x^5 + 480*b*c^
5*d^2*f*x - 240*b*c^3*d*e*f - 90*b*c*d*e*h + 120*(b*c^5*e^2*g + 2*b*c^5*d*
e*h)*x^4 + 160*(b*c^5*e^2*f + 2*b*c^5*d*e*g + b*c^5*d^2*h)*x^3 + 240*(2*b*
c^5*d*e*f + b*c^5*d^2*g)*x^2 - 15*(8*b*c^3*d^2 + 3*b*c*e^2)*g)*arcsin(c*x)
 + (288*b*c^4*e^2*h*x^4 + 3200*b*c^2*d*e*g + 450*(b*c^4*e^2*g + 2*b*c^4*d*
e*h)*x^3 + 32*(25*b*c^4*e^2*f + 50*b*c^4*d*e*g + (25*b*c^4*d^2 + 12*b*c^2*
e^2)*h)*x^2 + 800*(9*b*c^4*d^2 + 2*b*c^2*e^2)*f + 64*(25*b*c^2*d^2 + 12*b*
e^2)*h + 225*(16*b*c^4*d*e*f + 6*b*c^2*d*e*h + (8*b*c^4*d^2 + 3*b*c^2*e^2)
*g)*x)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 821 vs. 2(360) = 720.

Time = 0.47 (sec) , antiderivative size = 821, normalized size of antiderivative = 2.22

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)**2*(h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output

```
Piecewise((a*d**2*f*x + a*d**2*g*x**2/2 + a*d**2*h*x**3/3 + a*d*e*f*x**2 +
 2*a*d*e*g*x**3/3 + a*d*e*h*x**4/2 + a*e**2*f*x**3/3 + a*e**2*g*x**4/4 + a
*e**2*h*x**5/5 + b*d**2*f*x*asin(c*x) + b*d**2*g*x**2*asin(c*x)/2 + b*d**2
*h*x**3*asin(c*x)/3 + b*d*e*f*x**2*asin(c*x) + 2*b*d*e*g*x**3*asin(c*x)/3
+ b*d*e*h*x**4*asin(c*x)/2 + b*e**2*f*x**3*asin(c*x)/3 + b*e**2*g*x**4*asi
n(c*x)/4 + b*e**2*h*x**5*asin(c*x)/5 + b*d**2*f*sqrt(-c**2*x**2 + 1)/c + b
*d**2*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**2*h*x**2*sqrt(-c**2*x**2 + 1)/
(9*c) + b*d*e*f*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*b*d*e*g*x**2*sqrt(-c**2*x
**2 + 1)/(9*c) + b*d*e*h*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + b*e**2*f*x**2*s
qrt(-c**2*x**2 + 1)/(9*c) + b*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*
e**2*h*x**4*sqrt(-c**2*x**2 + 1)/(25*c) - b*d**2*g*asin(c*x)/(4*c**2) - b*
d*e*f*asin(c*x)/(2*c**2) + 2*b*d**2*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*
d*e*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d*e*h*x*sqrt(-c**2*x**2 + 1)/(16
*c**3) + 2*b*e**2*f*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e**2*g*x*sqrt(-c**
2*x**2 + 1)/(32*c**3) + 4*b*e**2*h*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) - 3
*b*d*e*h*asin(c*x)/(16*c**4) - 3*b*e**2*g*asin(c*x)/(32*c**4) + 8*b*e**2*h
*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d**2*f*x + d**2*g*x**2/2 +
 d**2*h*x**3/3 + d*e*f*x**2 + 2*d*e*g*x**3/3 + d*e*h*x**4/2 + e**2*f*x**3/
3 + e**2*g*x**4/4 + e**2*h*x**5/5), True))
```

Maxima [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 581, normalized size of antiderivative = 1.57

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$

$$= \frac{1}{5}ae^2hx^5 + \frac{1}{4}ae^2gx^4 + \frac{1}{2}adehx^4 + \frac{1}{3}ae^2fx^3 + \frac{2}{3}adegx^3 + \frac{1}{3}ad^2hx^3 + adefx^2 + \frac{1}{2}ad^2gx^2 + \frac{1}{2}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdef + \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2f + \frac{1}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2g + \frac{2}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdeg + \frac{1}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^2g + \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2h + \frac{1}{16}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bdeh + \frac{1}{75}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^2h + ad^2fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^2f}{c}$$

input
```
integrate((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/5*a*e^2*h*x^5 + 1/4*a*e^2*g*x^4 + 1/2*a*d*e*h*x^4 + 1/3*a*e^2*f*x^3 + 2/
3*a*d*e*g*x^3 + 1/3*a*d^2*h*x^3 + a*d*e*f*x^2 + 1/2*a*d^2*g*x^2 + 1/2*(2*x
^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*e*f +
 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
+ 1)/c^4))*b*e^2*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2
- arcsin(c*x)/c^3))*b*d^2*g + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 +
1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e*g + 1/32*(8*x^4*arcsin(c*x)
+ (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*
x)/c^5)*c)*b*e^2*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^
2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2*h + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt
(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c
)*b*d*e*h + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*s
qrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^2*h + a*d^2*f
*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^2*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 847 vs. $2(339) = 678$.

Time = 0.15 (sec) , antiderivative size = 847, normalized size of antiderivative = 2.30

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\, dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/5*a*e^2*h*x^5 + 1/4*a*e^2*g*x^4 + 1/2*a*d*e*h*x^4 + 1/3*a*e^2*f*x^3 + 2/
3*a*d*e*g*x^3 + 1/3*a*d^2*h*x^3 + b*d^2*f*x*arcsin(c*x) + a*d^2*f*x + 1/3*
(c^2*x^2 - 1)*b*e^2*f*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 - 1)*b*d*e*g*x*arcs
in(c*x)/c^2 + 1/3*(c^2*x^2 - 1)*b*d^2*h*x*arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*
x^2 + 1)*b*d*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d^2*g*x/c + (c^2*x^2 - 1)*
b*d*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^2*g*arcsin(c*x)/c^2 + 1/3*
b*e^2*f*x*arcsin(c*x)/c^2 + 2/3*b*d*e*g*x*arcsin(c*x)/c^2 + 1/3*b*d^2*h*x*
arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e^2*h*x*arcsin(c*x)/c^4 + sqrt(-c^
2*x^2 + 1)*b*d^2*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e^2*g*x/c^3 - 1/8*(-c^2
*x^2 + 1)^(3/2)*b*d*e*h*x/c^3 + (c^2*x^2 - 1)*a*d*e*f/c^2 + 1/2*(c^2*x^2 -
 1)*a*d^2*g/c^2 + 1/2*b*d*e*f*arcsin(c*x)/c^2 + 1/4*b*d^2*g*arcsin(c*x)/c^
2 + 1/4*(c^2*x^2 - 1)^2*b*e^2*g*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*d*
e*h*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e^2*h*x*arcsin(c*x)/c^4 - 1/9*(-
c^2*x^2 + 1)^(3/2)*b*e^2*f/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*d*e*g/c^3 - 1/
9*(-c^2*x^2 + 1)^(3/2)*b*d^2*h/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e^2*g*x/c^3
 + 5/16*sqrt(-c^2*x^2 + 1)*b*d*e*h*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e^2*g*arcsi
n(c*x)/c^4 + (c^2*x^2 - 1)*b*d*e*h*arcsin(c*x)/c^4 + 1/5*b*e^2*h*x*arcsin(
c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*e^2*f/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b*d
*e*g/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*d^2*h/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(
-c^2*x^2 + 1)*b*e^2*h/c^5 + 5/32*b*e^2*g*arcsin(c*x)/c^4 + 5/16*b*d*e*h...
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \int \left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d+e\,x\right)}^2\,\left(h\,x^2+g\,x+f\right) \,d x$$

input
```
int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2), x)
```

Reduce [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 669, normalized size of antiderivative = 1.81

$$\int (d+ex)^2 (f+gx+hx^2) (a+b\arcsin(cx))\,dx$$
$$= \frac{1600\sqrt{-c^2x^2+1}\,b\,c^2e^2f + 7200a\,c^5d^2fx + 3600a\,c^5d^2g\,x^2 + 2400a\,c^5d^2h\,x^3 + 2400a\,c^5e^2f\,x^3 + 1800a\,c^5}{}$$

input
```
int((e*x+d)^2*(h*x^2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
(7200*asin(c*x)*b*c**5*d**2*f*x + 3600*asin(c*x)*b*c**5*d**2*g*x**2 + 2400
*asin(c*x)*b*c**5*d**2*h*x**3 + 7200*asin(c*x)*b*c**5*d*e*f*x**2 + 4800*as
in(c*x)*b*c**5*d*e*g*x**3 + 3600*asin(c*x)*b*c**5*d*e*h*x**4 + 2400*asin(c
*x)*b*c**5*e**2*f*x**3 + 1800*asin(c*x)*b*c**5*e**2*g*x**4 + 1440*asin(c*x
)*b*c**5*e**2*h*x**5 - 1800*asin(c*x)*b*c**3*d**2*g - 3600*asin(c*x)*b*c**
3*d*e*f - 1350*asin(c*x)*b*c*d*e*h - 675*asin(c*x)*b*c*e**2*g + 7200*sqrt(
 - c**2*x**2 + 1)*b*c**4*d**2*f + 1800*sqrt( - c**2*x**2 + 1)*b*c**4*d**2*
g*x + 800*sqrt( - c**2*x**2 + 1)*b*c**4*d**2*h*x**2 + 3600*sqrt( - c**2*x*
*2 + 1)*b*c**4*d*e*f*x + 1600*sqrt( - c**2*x**2 + 1)*b*c**4*d*e*g*x**2 + 9
00*sqrt( - c**2*x**2 + 1)*b*c**4*d*e*h*x**3 + 800*sqrt( - c**2*x**2 + 1)*b
*c**4*e**2*f*x**2 + 450*sqrt( - c**2*x**2 + 1)*b*c**4*e**2*g*x**3 + 288*sq
rt( - c**2*x**2 + 1)*b*c**4*e**2*h*x**4 + 1600*sqrt( - c**2*x**2 + 1)*b*c*
*2*d**2*h + 3200*sqrt( - c**2*x**2 + 1)*b*c**2*d*e*g + 1350*sqrt( - c**2*x
**2 + 1)*b*c**2*d*e*h*x + 1600*sqrt( - c**2*x**2 + 1)*b*c**2*e**2*f + 675*
sqrt( - c**2*x**2 + 1)*b*c**2*e**2*g*x + 384*sqrt( - c**2*x**2 + 1)*b*c**2
*e**2*h*x**2 + 768*sqrt( - c**2*x**2 + 1)*b*e**2*h + 7200*a*c**5*d**2*f*x
+ 3600*a*c**5*d**2*g*x**2 + 2400*a*c**5*d**2*h*x**3 + 7200*a*c**5*d*e*f*x*
*2 + 4800*a*c**5*d*e*g*x**3 + 3600*a*c**5*d*e*h*x**4 + 2400*a*c**5*e**2*f*
x**3 + 1800*a*c**5*e**2*g*x**4 + 1440*a*c**5*e**2*h*x**5)/(7200*c**5)
```

3.163 $\int (d+ex) \left(f+gx+hx^2\right) (a+b \arcsin(cx)) \, dx$

Optimal result

Integrand size = 24, antiderivative size = 235

$$\begin{aligned}
&\int (d+ex) \left(f+gx+hx^2\right) (a+b\arcsin(cx)) \, dx \\
&= \frac{b(3c^2df+eg+dh)\sqrt{1-c^2x^2}}{3c^3} + \frac{b(8c^2(ef+dg)+3eh)\,x\sqrt{1-c^2x^2}}{32c^3} \\
&\quad + \frac{behx^3\sqrt{1-c^2x^2}}{16c} - \frac{b(eg+dh)\left(1-c^2x^2\right)^{3/2}}{9c^3} - \frac{b(8c^2(ef+dg)+3eh)\arcsin(cx)}{32c^4} \\
&\quad + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad + \frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) + \frac{1}{4}ehx^4(a+b\arcsin(cx))
\end{aligned}$$

output
```
1/3*b*(3*c^2*d*f+d*h+e*g)*(-c^2*x^2+1)^(1/2)/c^3+1/32*b*(8*c^2*(d*g+e*f)+3
*e*h)*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*e*h*x^3*(-c^2*x^2+1)^(1/2)/c-1/9*b*(
d*h+e*g)*(-c^2*x^2+1)^(3/2)/c^3-1/32*b*(8*c^2*(d*g+e*f)+3*e*h)*arcsin(c*x)
/c^4+d*f*x*(a+b*arcsin(c*x))+1/2*(d*g+e*f)*x^2*(a+b*arcsin(c*x))+1/3*(d*h+
e*g)*x^3*(a+b*arcsin(c*x))+1/4*e*h*x^4*(a+b*arcsin(c*x))
```

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.79

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{24ac^4x(2d(6f+x(3g+2hx))+ex(6f+x(4g+3hx)))+bc\sqrt{1-c^2x^2}(64eg+64dh+27ehx+2c^2(4d(}{}$$

input
```
Integrate[(d + e*x)*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
(24*a*c^4*x*(2*d*(6*f + x*(3*g + 2*h*x)) + e*x*(6*f + x*(4*g + 3*h*x))) +
b*c*Sqrt[1 - c^2*x^2]*(64*e*g + 64*d*h + 27*e*h*x + 2*c^2*(4*d*(36*f + 9*g
*x + 4*h*x^2) + e*x*(36*f + 16*g*x + 9*h*x^2))) + 3*b*(-24*c^2*(e*f + d*g)
 - 9*e*h + 8*c^4*x*(2*d*(6*f + 3*g*x + 2*h*x^2) + e*x*(6*f + 4*g*x + 3*h*x
^2)))*ArcSin[c*x])/(288*c^4)
```

Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.06, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {5248, 27, 2340, 25, 2340, 25, 27, 533, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \; 5248$$

$$-bc\int \frac{x\left(3ehx^3+4(eg+dh)x^2+6(ef+dg)x+12df\right)}{12\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{12}bc\int \frac{x\left(3ehx^3+4(eg+dh)x^2+6(ef+dg)x+12df\right)}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$\Big\downarrow$ 2340

$$-\frac{1}{12}bc\left(-\frac{\int -\frac{x\left(16(eg+dh)x^2c^2+48dfc^2+3\left(8(ef+dg)c^2+3eh\right)x\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$\Big\downarrow$ 25

$$-\frac{1}{12}bc\left(\frac{\int \frac{x\left(16(eg+dh)x^2c^2+48dfc^2+3\left(8(ef+dg)c^2+3eh\right)x\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$\Big\downarrow$ 2340

$$-\frac{1}{12}bc\left(\frac{-\frac{\int -\frac{c^2x\left(16\left(9dfc^2+2eg+2dh\right)+9\left(8(ef+dg)c^2+3eh\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}(dh+eg)}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$\Big\downarrow$ 25

$$-\frac{1}{12}bc\left(\frac{\frac{\int \frac{c^2x\left(16\left(9dfc^2+2eg+2dh\right)+9\left(8(ef+dg)c^2+3eh\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}(dh+eg)}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$\Big\downarrow$ 27

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\int\frac{x(16(9dfc^2+2eg+2dh)+9(8(ef+dg)c^2+3eh)x)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}x^2\sqrt{1-c^2x^2}(dh+eg)}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$\big\downarrow$ 533

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{\int\frac{32(9dfc^2+2eg+2dh)xc^2+9(8(ef+dg)c^2+3eh)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3eh}{c^2}+8dg+8ef\right)\right)-\frac{16}{3}x^2\sqrt{1-c^2x^2}(dh+e}{4c^2}\right.$$
$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$\big\downarrow$ 455

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{9(8c^2(dg+ef)+3eh)\int\frac{1}{\sqrt{1-c^2x^2}}dx-32\sqrt{1-c^2x^2}(9c^2df+2dh+2eg)}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3eh}{c^2}+8dg+8ef\right)\right)-\frac{16}{3}x^2\sqrt{1}}{4c^2}\right.$$
$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$\big\downarrow$ 223

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))-\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{9\arcsin(cx)(8c^2(dg+ef)+3eh)}{c}-32\sqrt{1-c^2x^2}(9c^2df+2dh+2eg)}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3eh}{c^2}+8dg+8ef\right)\right)-\frac{16}{3}x^2\sqrt{1-c^2x^2}}{4c^2}\right.$$

input

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

output
```
d*f*x*(a + b*ArcSin[c*x]) + ((e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + ((e*
g + d*h)*x^3*(a + b*ArcSin[c*x]))/3 + (e*h*x^4*(a + b*ArcSin[c*x]))/4 - (b
*c*((-3*e*h*x^3*Sqrt[1 - c^2*x^2])/(4*c^2) + ((-16*(e*g + d*h)*x^2*Sqrt[1
- c^2*x^2])/3 + ((-9*(8*e*f + 8*d*g + (3*e*h)/c^2)*x*Sqrt[1 - c^2*x^2])/2
+ (-32*(9*c^2*d*f + 2*e*g + 2*d*h)*Sqrt[1 - c^2*x^2] + (9*(8*c^2*(e*f + d*
g) + 3*e*h)*ArcSin[c*x])/c)/(2*c^2))/3)/(4*c^2)))/12
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.22 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.14

method	result
parts	$a\left(\frac{eh\,x^4}{4}+\frac{(dh+eg)x^3}{3}+\frac{(dg+ef)x^2}{2}+dfx\right)+\frac{b\left(\frac{c\arcsin(cx)eh\,x^4}{4}+\frac{c\arcsin(cx)x^3dh}{3}+\frac{c\arcsin(cx)x^3eg}{3}+\frac{c\arcsi\ldots}{}\right.}{\ldots}$
derivativedivides	$\frac{\frac{a\left(\frac{eh\,c^4x^4}{4}+\frac{(hcd+cge)c^3x^3}{3}+\frac{\left(c^2gd+f\,c^2e\right)c^2x^2}{2}+d\,c^4fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)eh\,c^4x^4}{4}+\frac{\arcsin(cx)c^4dh\,x^3}{3}+\frac{\arcsin(cx)c^4eg\,x^3}{3}+\ldots\right.}{\ldots}}{\ldots}$
default	$\frac{\frac{a\left(\frac{eh\,c^4x^4}{4}+\frac{(hcd+cge)c^3x^3}{3}+\frac{\left(c^2gd+f\,c^2e\right)c^2x^2}{2}+d\,c^4fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)eh\,c^4x^4}{4}+\frac{\arcsin(cx)c^4dh\,x^3}{3}+\frac{\arcsin(cx)c^4eg\,x^3}{3}+\ldots\right.}{\ldots}}{\ldots}$
orering	$\frac{(126c^4e^2h^2x^7+300c^4de\,h^2x^6+300c^4e^2gh\,x^6+160c^4d^2h^2x^5+770c^4degh\,x^5+450c^4e^2fh\,x^5+160c^4e^2g^2x^5+416c^4d^2gh\ldots}{\ldots}$

input
```
int((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/4*e*h*x^4+1/3*(d*h+e*g)*x^3+1/2*(d*g+e*f)*x^2+d*f*x)+b/c*(1/4*c*arcsi
n(c*x)*e*h*x^4+1/3*c*arcsin(c*x)*x^3*d*h+1/3*c*arcsin(c*x)*x^3*e*g+1/2*c*a
rcsin(c*x)*x^2*d*g+1/2*c*arcsin(c*x)*x^2*e*f+arcsin(c*x)*f*d*c*x-1/12/c^3*
(6*c^2*(d*g+e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+4*c*(d*h+e*
g)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+3*e*h*(-1/4*c^
3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-12*d*
c^3*f*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.04

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx = \frac{72\,ac^4ehx^4+288\,ac^4dfx+96\,(ac^4eg+ac^4dh)x^3+144\,(ac^4ef+ac^4dg)x^2+3\,(24\,bc^4ehx^4+96\,bc^4dfx-}{}$$

input
```
integrate((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/288*(72*a*c^4*e*h*x^4 + 288*a*c^4*d*f*x + 96*(a*c^4*e*g + a*c^4*d*h)*x^3
 + 144*(a*c^4*e*f + a*c^4*d*g)*x^2 + 3*(24*b*c^4*e*h*x^4 + 96*b*c^4*d*f*x
- 24*b*c^2*e*f - 24*b*c^2*d*g + 32*(b*c^4*e*g + b*c^4*d*h)*x^3 - 9*b*e*h +
 48*(b*c^4*e*f + b*c^4*d*g)*x^2)*arcsin(c*x) + (18*b*c^3*e*h*x^3 + 288*b*c
^3*d*f + 64*b*c*e*g + 64*b*c*d*h + 32*(b*c^3*e*g + b*c^3*d*h)*x^2 + 9*(8*b
*c^3*e*f + 8*b*c^3*d*g + 3*b*c*e*h)*x)*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 449 vs. 2(223) = 446.

Time = 0.35 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.91

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx = \begin{cases} adfx+\frac{adgx^2}{2}+\frac{adhx^3}{3}+\frac{aefx^2}{2}+\frac{aegx^3}{3}+\frac{aehx^4}{4}+bdfx\operatorname{asin}(cx)+\frac{bdgx^2\operatorname{asin}(cx)}{2}+\frac{bdhx^3\operatorname{asin}(cx)}{3}+\frac{befx^2\operatorname{asin}(c}{2} \\ a\left(dfx+\frac{dgx^2}{2}+\frac{dhx^3}{3}+\frac{efx^2}{2}+\frac{egx^3}{3}+\frac{ehx^4}{4}\right) \end{cases}$$

input
```
integrate((e*x+d)*(h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d*f*x + a*d*g*x**2/2 + a*d*h*x**3/3 + a*e*f*x**2/2 + a*e*g*x*
*3/3 + a*e*h*x**4/4 + b*d*f*x*asin(c*x) + b*d*g*x**2*asin(c*x)/2 + b*d*h*x
**3*asin(c*x)/3 + b*e*f*x**2*asin(c*x)/2 + b*e*g*x**3*asin(c*x)/3 + b*e*h*
x**4*asin(c*x)/4 + b*d*f*sqrt(-c**2*x**2 + 1)/c + b*d*g*x*sqrt(-c**2*x**2
+ 1)/(4*c) + b*d*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e*f*x*sqrt(-c**2*x*
*2 + 1)/(4*c) + b*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e*h*x**3*sqrt(-c
**2*x**2 + 1)/(16*c) - b*d*g*asin(c*x)/(4*c**2) - b*e*f*asin(c*x)/(4*c**2)
 + 2*b*d*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 2*b*e*g*sqrt(-c**2*x**2 + 1)/(9
*c**3) + 3*b*e*h*x*sqrt(-c**2*x**2 + 1)/(32*c**3) - 3*b*e*h*asin(c*x)/(32*
c**4), Ne(c, 0)), (a*(d*f*x + d*g*x**2/2 + d*h*x**3/3 + e*f*x**2/2 + e*g*x
**3/3 + e*h*x**4/4), True))
```

Maxima [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 334, normalized size of antiderivative = 1.42

$$
\begin{aligned}
\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx &= \frac{1}{4}\,aehx^4+\frac{1}{3}\,aegx^3+\frac{1}{3}\,adhx^3 \\
&+ \frac{1}{2}\,aefx^2+\frac{1}{2}\,adgx^2+\frac{1}{4}\left(2\,x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin(cx)}{c^3}\right)\right)bef \\
&+ \frac{1}{4}\left(2\,x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin(cx)}{c^3}\right)\right)bdg \\
&+ \frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)beg \\
&+ \frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdh \\
&+ \frac{1}{32}\left(8\,x^4\arcsin(cx)+\left(\frac{2\,\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\,\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\,\arcsin(cx)}{c^5}\right)c\right)beh \\
&+ adfx+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bdf}{c}
\end{aligned}
$$

input
```
integrate((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/4*a*e*h*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*x^3 + 1/2*a*e*f*x^2 + 1/2*a*d*g*
x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c
^3))*b*e*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin
(c*x)/c^3))*b*d*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^
2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*h + 1/32*(8*x^4*arcsin
(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arc
sin(c*x)/c^5)*c)*b*e*h + a*d*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*
b*d*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 448 vs. $2(211) = 422$.

Time = 0.14 (sec) , antiderivative size = 448, normalized size of antiderivative = 1.91

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx = \frac{1}{4}\,aehx^4+\frac{1}{3}\,aegx^3+\frac{1}{3}\,adhx^3+bdfx\arcsin(cx)+adfx+\frac{(c^2x^2-1)begx\arcsin(cx)}{3\,c^2}+\frac{(c^2x^2-1)bdhx\arcsin(cx)}{3\,c^2}+\frac{\sqrt{-c^2x^2+1}befx}{4\,c}+\frac{\sqrt{-c^2x^2+1}bdgx}{4\,c}+\frac{(c^2x^2-1)bef\arcsin(cx)}{2\,c^2}+\frac{(c^2x^2-1)bdg\arcsin(cx)}{2\,c^2}+\frac{begx\arcsin(cx)}{3\,c^2}+\frac{bdhx\arcsin(cx)}{3\,c^2}+\frac{\sqrt{-c^2x^2+1}bdf}{c}-\frac{(-c^2x^2+1)^{\frac{3}{2}}behx}{16\,c^3}+\frac{(c^2x^2-1)aef}{2\,c^2}+\frac{(c^2x^2-1)adg}{2\,c^2}+\frac{bef\arcsin(cx)}{4\,c^2}+\frac{bdg\arcsin(cx)}{4\,c^2}+\frac{(c^2x^2-1)^2beh\arcsin(cx)}{4\,c^4}-\frac{(-c^2x^2+1)^{\frac{3}{2}}beg}{9\,c^3}-\frac{(-c^2x^2+1)^{\frac{3}{2}}bdh}{9\,c^3}+\frac{5\sqrt{-c^2x^2+1}behx}{32\,c^3}+\frac{(c^2x^2-1)beh\arcsin(cx)}{2\,c^4}+\frac{\sqrt{-c^2x^2+1}beg}{3\,c^3}+\frac{\sqrt{-c^2x^2+1}bdh}{3\,c^3}+\frac{5\,beh\arcsin(cx)}{32\,c^4}$$

input
```
integrate((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/4*a*e*h*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*x^3 + b*d*f*x*arcsin(c*x) + a*d*
f*x + 1/3*(c^2*x^2 - 1)*b*e*g*x*arcsin(c*x)/c^2 + 1/3*(c^2*x^2 - 1)*b*d*h*
x*arcsin(c*x)/c^2 + 1/4*sqrt(-c^2*x^2 + 1)*b*e*f*x/c + 1/4*sqrt(-c^2*x^2 +
 1)*b*d*g*x/c + 1/2*(c^2*x^2 - 1)*b*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1
)*b*d*g*arcsin(c*x)/c^2 + 1/3*b*e*g*x*arcsin(c*x)/c^2 + 1/3*b*d*h*x*arcsin
(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e*h*x
/c^3 + 1/2*(c^2*x^2 - 1)*a*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d*g/c^2 + 1/4*b*e
*f*arcsin(c*x)/c^2 + 1/4*b*d*g*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e*h
*arcsin(c*x)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*e*g/c^3 - 1/9*(-c^2*x^2 + 1)
^(3/2)*b*d*h/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e*h*x/c^3 + 1/2*(c^2*x^2 - 1)
*b*e*h*arcsin(c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*e*g/c^3 + 1/3*sqrt(-c^2*
x^2 + 1)*b*d*h/c^3 + 5/32*b*e*h*arcsin(c*x)/c^4
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$=\int (a+b\,\mathrm{asin}(c\,x))\,(d+e\,x)\,\left(h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2), x)
```

Reduce [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 368, normalized size of antiderivative = 1.57

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$=\frac{288asin(cx)\,b\,c^4df\,x+144asin(cx)\,b\,c^4dg\,x^2+96asin(cx)\,b\,c^4dh\,x^3+144asin(cx)\,b\,c^4ef\,x^2+96asin(cx)}{}$$

input
```
int((e*x+d)*(h*x^2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
(288*asin(c*x)*b*c**4*d*f*x + 144*asin(c*x)*b*c**4*d*g*x**2 + 96*asin(c*x)
*b*c**4*d*h*x**3 + 144*asin(c*x)*b*c**4*e*f*x**2 + 96*asin(c*x)*b*c**4*e*g
*x**3 + 72*asin(c*x)*b*c**4*e*h*x**4 - 72*asin(c*x)*b*c**2*d*g - 72*asin(c
*x)*b*c**2*e*f - 27*asin(c*x)*b*e*h + 288*sqrt( - c**2*x**2 + 1)*b*c**3*d*
f + 72*sqrt( - c**2*x**2 + 1)*b*c**3*d*g*x + 32*sqrt( - c**2*x**2 + 1)*b*c
**3*d*h*x**2 + 72*sqrt( - c**2*x**2 + 1)*b*c**3*e*f*x + 32*sqrt( - c**2*x*
*2 + 1)*b*c**3*e*g*x**2 + 18*sqrt( - c**2*x**2 + 1)*b*c**3*e*h*x**3 + 64*s
qrt( - c**2*x**2 + 1)*b*c*d*h + 64*sqrt( - c**2*x**2 + 1)*b*c*e*g + 27*sqr
t( - c**2*x**2 + 1)*b*c*e*h*x + 288*a*c**4*d*f*x + 144*a*c**4*d*g*x**2 + 9
6*a*c**4*d*h*x**3 + 144*a*c**4*e*f*x**2 + 96*a*c**4*e*g*x**3 + 72*a*c**4*e
*h*x**4)/(288*c**4)
```

3.164 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 476

$$\begin{aligned}
&\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx \\
&= \frac{b(eg-dh)\sqrt{1-c^2x^2}}{ce^2}+\frac{bhx\sqrt{1-c^2x^2}}{4ce}-\frac{bh\arcsin(cx)}{4c^2e} \\
&\quad -\frac{ib(e^2f-deg+d^2h)\arcsin(cx)^2}{2e^3}+\frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} \\
&\quad +\frac{hx^2(a+b\arcsin(cx))}{2e}+\frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad +\frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad -\frac{b(e^2f-deg+d^2h)\arcsin(cx)\log(d+ex)}{e^3} \\
&\quad +\frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} \\
&\quad -\frac{ib(e^2f-deg+d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad -\frac{ib(e^2f-deg+d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}
\end{aligned}$$

output
```
b*(-d*h+e*g)*(-c^2*x^2+1)^(1/2)/c/e^2+1/4*b*h*x*(-c^2*x^2+1)^(1/2)/c/e-1/4
*b*h*arcsin(c*x)/c^2/e-1/2*I*b*(d^2*h-d*e*g+e^2*f)*arcsin(c*x)^2/e^3+(-d*h
+e*g)*x*(a+b*arcsin(c*x))/e^2+1/2*h*x^2*(a+b*arcsin(c*x))/e+b*(d^2*h-d*e*g
+e^2*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)
^(1/2)))/e^3+b*(d^2*h-d*e*g+e^2*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1
)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-b*(d^2*h-d*e*g+e^2*f)*arcsin(c*x)*
ln(e*x+d)/e^3+(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))*ln(e*x+d)/e^3-I*b*(d^2
*h-d*e*g+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2
)^(1/2)))/e^3-I*b*(d^2*h-d*e*g+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1
/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3
```

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 457, normalized size of antiderivative = 0.96

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

$$= \frac{\frac{2be(eg-dh)\sqrt{1-c^2x^2}}{c}+\frac{be^2hx\sqrt{1-c^2x^2}}{2c}-\frac{be^2h\arcsin(cx)}{2c^2}-ib(e^2f-deg+d^2h)\arcsin(cx)^2+2e(eg-dh)x(a+b\,\mathrm{a}}{}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
((2*b*e*(e*g - d*h)*Sqrt[1 - c^2*x^2])/c + (b*e^2*h*x*Sqrt[1 - c^2*x^2])/(
2*c) - (b*e^2*h*ArcSin[c*x])/(2*c^2) - I*b*(e^2*f - d*e*g + d^2*h)*ArcSin[
c*x]^2 + 2*e*(e*g - d*h)*x*(a + b*ArcSin[c*x]) + e^2*h*x^2*(a + b*ArcSin[c
*x]) + 2*b*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*
x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 2*b*(e^2*f - d*e*g + d^2*h)*ArcSin[
c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - 2*b*(e
^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[d + e*x] + 2*(e^2*f - d*e*g + d^2*h)
*(a + b*ArcSin[c*x])*Log[d + e*x] - (2*I)*b*(e^2*f - d*e*g + d^2*h)*PolyLo
g[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - (2*I)*b*(e^2*f
 - d*e*g + d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 -
 e^2])])/(2*e^3)
```

Rubi [A] (verified)

Time = 1.25 (sec) , antiderivative size = 476, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}dx$$

$$\Big\downarrow \; 5252$$

$$-bc\int \frac{ex(2(eg-dh)+ehx)+2(hd^2-egd+e^2f)\log(d+ex)}{2e^3\sqrt{1-c^2x^2}}dx+\frac{\log(d+ex)(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3}+\frac{x(eg-dh)(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e}$$

$$\Big\downarrow \; 27$$

$$-\frac{bc\int \frac{ex(2(eg-dh)+ehx)+2(hd^2-egd+e^2f)\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{2e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3}+\frac{x(eg-dh)(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e}$$

$$\Big\downarrow \; 7293$$

$$-\frac{bc\int \left(\frac{ex(2eg-2dh+ehx)}{\sqrt{1-c^2x^2}}+\frac{2(hd^2-egd+e^2f)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{2e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3}+\frac{x(eg-dh)(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e}$$

$$\Big\downarrow \; 2009$$

$$\frac{\log(d+ex)(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{e^3}+\frac{x(eg-dh)(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e}-\frac{bc\left(\frac{e^2h\arcsin(cx)}{2c^3}+\frac{2i(d^2h-deg+e^2f)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{2i(d^2h-deg+e^2f)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{2\arcsin(cx)(d^2h-}{}\right.}{}$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
((e*g - d*h)*x*(a + b*ArcSin[c*x]))/e^2 + (h*x^2*(a + b*ArcSin[c*x]))/(2*e
) + ((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x])*Log[d + e*x])/e^3 - (b*c*
((-2*e*(e*g - d*h)*Sqrt[1 - c^2*x^2])/c^2 - (e^2*h*x*Sqrt[1 - c^2*x^2])/(2
*c^2) + (e^2*h*ArcSin[c*x])/(2*c^3) + (I*(e^2*f - d*e*g + d^2*h)*ArcSin[c*
x]^2)/c - (2*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[
c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - (2*(e^2*f - d*e*g + d^2*h)*ArcSin
[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + (2
*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[d + e*x])/c + ((2*I)*(e^2*f - d*e
*g + d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])
])/c + ((2*I)*(e^2*f - d*e*g + d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(
c*d + Sqrt[c^2*d^2 - e^2])])/c))/(2*e^3)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2437 vs. $2(481) = 962$.

Time = 1.92 (sec) , antiderivative size = 2438, normalized size of antiderivative = 5.12

method	result	size
parts	Expression too large to display	2438
derivativedivides	Expression too large to display	2489
default	Expression too large to display	2489

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

output
```
I*b/e*d^2*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*
d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b/e*d^2*h*arcsin(c*x)/(c^2*d
^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*
c-(-c^2*d^2+e^2)^(1/2)))-b/e*d^2*h*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*
c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2
)))+I*b/e*d^2*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-
c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+b/e*arcsin(c*x)*x*g-1/2*
I*b*arcsin(c*x)^2/e*f-I*b*c^2/e^3*d^4*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+
(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-
I*b*c^2/e^3*d^4*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+
(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b*c^2/e*f/(c^2*d^2-e
^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c
-(-c^2*d^2+e^2)^(1/2)))*d^2-I*b*c^2/e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+
(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*
d^2+b*g*(-c^2*x^2+1)^(1/2)/c/e+1/8*b/c^2*h/e*sin(2*arcsin(c*x))+a*(1/e^2*(
1/2*e*h*x^2-d*h*x+e*g*x)+(d^2*h-d*e*g+e^2*f)/e^3*ln(e*x+d))+1/2*I*b*arcsin
(c*x)^2/e^2*d*g-1/2*I*b*arcsin(c*x)^2/e^3*d^2*h-I*b*d*g/(c^2*d^2-e^2)*dilo
g((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d
^2+e^2)^(1/2)))-I*b*d*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/
2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+b*d*g*arcsin(...
```

Fricas [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="fricas")
```

output
```
integral((a*h*x^2 + a*g*x + a*f + (b*h*x^2 + b*g*x + b*f)*arcsin(c*x))/(e*
x + d), x)
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\,\text{asin}(cx))(f+gx+hx^2)}{d+ex}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x), x)
```

Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxima")
```

output
```
a*g*(x/e - d*log(e*x + d)/e^2) + 1/2*a*h*(2*d^2*log(e*x + d)/e^3 + (e*x^2
- 2*d*x)/e^2) + a*f*log(e*x + d)/e + integrate((b*h*x^2 + b*g*x + b*f)*arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{d+e\,x}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x),x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x), x)
```

Reduce [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx$$
$$= \frac{2asin(cx)\,bc\,e^2gx + 2\sqrt{-c^2x^2+1}\,b\,e^2g - 2\left(\int \frac{asin(cx)}{ex+d}dx\right)bcd\,e^2g + 2\left(\int \frac{asin(cx)}{ex+d}dx\right)bc\,e^3f + 2\left(\int \frac{asin(cx)x}{ex+d}\right.}{}$$

input
```
int((h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

output
```
(2*asin(c*x)*b*c*e**2*g*x + 2*sqrt( - c**2*x**2 + 1)*b*e**2*g - 2*int(asin
(c*x)/(d + e*x),x)*b*c*d*e**2*g + 2*int(asin(c*x)/(d + e*x),x)*b*c*e**3*f
+ 2*int((asin(c*x)*x**2)/(d + e*x),x)*b*c*e**3*h + 2*log(d + e*x)*a*c*d**2
*h - 2*log(d + e*x)*a*c*d*e*g + 2*log(d + e*x)*a*c*e**2*f - 2*a*c*d*e*h*x
+ 2*a*c*e**2*g*x + a*c*e**2*h*x**2)/(2*c*e**3)
```

3.165 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 460

$$
\begin{aligned}
\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx
&= \frac{bh\sqrt{1-c^2x^2}}{ce^2} - \frac{ib(eg-2dh)\arcsin(cx)^2}{2e^3} \\
&+ \frac{hx(a+b\arcsin(cx))}{e^2} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)} \\
&+ \frac{bc(e^2f-deg+d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&+ \frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&+ \frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&- \frac{b(eg-2dh)\arcsin(cx)\log(d+ex)}{e^3} + \frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3} \\
&- \frac{ib(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{ib(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}
\end{aligned}
$$

output
```
b*h*(-c^2*x^2+1)^(1/2)/c/e^2-1/2*I*b*(-2*d*h+e*g)*arcsin(c*x)^2/e^3+h*x*(a
+b*arcsin(c*x))/e^2-(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)+b*c*
(d^2*h-d*e*g+e^2*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1
/2))/e^3/(c^2*d^2-e^2)^(1/2)+b*(-2*d*h+e*g)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-
c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+b*(-2*d*h+e*g)*arcsin(c*x
)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-b*(-2
*d*h+e*g)*arcsin(c*x)*ln(e*x+d)/e^3+(-2*d*h+e*g)*(a+b*arcsin(c*x))*ln(e*x+
d)/e^3-I*b*(-2*d*h+e*g)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2
*d^2-e^2)^(1/2)))/e^3-I*b*(-2*d*h+e*g)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(
1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3
```

Mathematica [A] (verified)

Time = 0.57 (sec) , antiderivative size = 432, normalized size of antiderivative = 0.94

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

$$= \frac{\frac{beh\sqrt{1-c^2x^2}}{c} - \frac{1}{2}ib(eg-2dh)\arcsin(cx)^2 + ehx(a+b\arcsin(cx)) - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{d+ex} + \frac{bc(e^2f-deg+}{}}{}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
((b*e*h*Sqrt[1 - c^2*x^2])/c - (I/2)*b*(e*g - 2*d*h)*ArcSin[c*x]^2 + e*h*x
*(a + b*ArcSin[c*x]) - ((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(d +
e*x) + (b*c*(e^2*f - d*e*g + d^2*h)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e
^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2] + b*(e*g - 2*d*h)*ArcSin[c*x]
*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + b*(e*g
- 2*d*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 -
 e^2])] - b*(e*g - 2*d*h)*ArcSin[c*x]*Log[d + e*x] + (e*g - 2*d*h)*(a + b*
ArcSin[c*x])*Log[d + e*x] - I*b*(e*g - 2*d*h)*PolyLog[2, (I*e*E^(I*ArcSin[
c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - I*b*(e*g - 2*d*h)*PolyLog[2, (I*e*E^
(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^3
```

Rubi [A] (verified)

Time = 1.26 (sec) , antiderivative size = 457, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int \frac{-\frac{hd^2-egd+e^2f}{d+ex}+ehx+(eg-2dh)\log(d+ex)}{e^3\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3(d+ex)}+\frac{(eg-2dh)\log(d+ex)(a+b\arcsin(cx))}{e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{27}$$

$$-\frac{bc\int \frac{-\frac{hd^2-egd+e^2f}{d+ex}+ehx+(eg-2dh)\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{e^3}-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3(d+ex)}+\frac{(eg-2dh)\log(d+ex)(a+b\arcsin(cx))}{e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int \left(\frac{-hd^2+egd-e^2f}{(d+ex)\sqrt{1-c^2x^2}}+\frac{(eg-2dh)\log(d+ex)}{\sqrt{1-c^2x^2}}+\frac{ehx}{\sqrt{1-c^2x^2}}\right)dx}{e^3}-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3(d+ex)}+\frac{(eg-2dh)\log(d+ex)(a+b\arcsin(cx))}{e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{e^3(d+ex)}+\frac{(eg-2dh)\log(d+ex)(a+b\arcsin(cx))}{e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}-$$

$$bc\left(\frac{i(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{i(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{\arcsin(cx)(eg-2dh)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{\text{arcs}\cdots}{\cdots}\right.$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
(h*x*(a + b*ArcSin[c*x]))/e^2 - ((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x
]))/(e^3*(d + e*x)) + ((e*g - 2*d*h)*(a + b*ArcSin[c*x])*Log[d + e*x])/e^3
 - (b*c*(-((e*h*Sqrt[1 - c^2*x^2])/c^2) + ((I/2)*(e*g - 2*d*h)*ArcSin[c*x]
^2)/c - ((e^2*f - d*e*g + d^2*h)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]
*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2] - ((e*g - 2*d*h)*ArcSin[c*x]*Log
[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - ((e*g - 2*d
*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2]
)])/c + ((e*g - 2*d*h)*ArcSin[c*x]*Log[d + e*x])/c + (I*(e*g - 2*d*h)*Poly
Log[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c + (I*(e*g -
 2*d*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c
))/e^3
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1882 vs. $2(467) = 934$.

Time = 2.83 (sec) , antiderivative size = 1883, normalized size of antiderivative = 4.09

method	result	size
parts	Expression too large to display	1883
derivativedivides	Expression too large to display	1900
default	Expression too large to display	1900

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

output
```
a*(h/e^2*x+(-2*d*h+e*g)/e^3*ln(e*x+d)-1/e^3*(d^2*h-d*e*g+e^2*f)/(e*x+d))+b
/c*(-I/e^2*c^3*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(
-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+2/e^3*c^2*d^2*h/(c^
2*d^2-e^2)^(1/2)*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*
d^2-e^2)^(1/2))-2/e^2*c^2*d*g/(c^2*d^2-e^2)^(1/2)*arctan(1/2*(2*(I*c*x+(-c
^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))+2/e*c^2*f/(c^2*d^2-e^2)^(
1/2)*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/
2))-c*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(
-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-c*g*arcsin(c*x)/(c^2*d^
2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c
+(-c^2*d^2+e^2)^(1/2)))+2*I/e^3*c^3*h*d^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*
x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2))
)+I*c*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+
e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-2*I/e*c*h*d/(c^2*d^2-e^2)*dilog(
(I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2
+e^2)^(1/2)))+I*c*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*
e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-1/2*I*c*arcsin(c*x)^
2/e^2*g-I/e^2*c^3*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*
e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-(d^2*h-d*e*g+e^2
*f)*arcsin(c*x)*c^2/e^3/(c*e*x+c*d)+1/e^2*c^3*g*arcsin(c*x)/(c^2*d^2-e^...
```

Fricas [F]

$$\int \frac{(f + gx + hx^2)(a + b\arcsin(cx))}{(d + ex)^2} dx = \int \frac{(hx^2 + gx + f)(b\arcsin(cx) + a)}{(ex + d)^2} dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fricas")
```

output
```
integral((a*h*x^2 + a*g*x + a*f + (b*h*x^2 + b*g*x + b*f)*arcsin(c*x))/(e^
2*x^2 + 2*d*e*x + d^2), x)
```

Sympy [F]

$$\int \frac{(f + gx + hx^2)(a + b\arcsin(cx))}{(d + ex)^2} dx = \int \frac{(a + b\operatorname{asin}(cx))(f + gx + hx^2)}{(d + ex)^2} dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f + gx + hx^2)(a + b\arcsin(cx))}{(d + ex)^2} dx = \text{Exception raised: ValueError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^2}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^2,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^2, x)
```

Reduce [F]

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

$$= \frac{asin(cx)\,bc\,d^2ehx + asin(cx)\,bcd\,e^2h\,x^2 + \sqrt{-c^2x^2+1}\,b\,d^2eh + \sqrt{-c^2x^2+1}\,bd\,e^2hx - \left(\int \frac{asin(cx)}{e^2x^2+2dex+d^2}\,dx\right.}{}$$

input
```
int((h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^2,x)
```

output
```
(asin(c*x)*b*c*d**2*e*h*x + asin(c*x)*b*c*d*e**2*h*x**2 + sqrt( - c**2*x**
2 + 1)*b*d**2*e*h + sqrt( - c**2*x**2 + 1)*b*d*e**2*h*x - int(asin(c*x)/(d
**2 + 2*d*e*x + e**2*x**2),x)*b*c*d**4*e*h - int(asin(c*x)/(d**2 + 2*d*e*x
 + e**2*x**2),x)*b*c*d**3*e**2*h*x + int(asin(c*x)/(d**2 + 2*d*e*x + e**2*
x**2),x)*b*c*d**2*e**3*f + int(asin(c*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b
*c*d*e**4*f*x - 2*int((asin(c*x)*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b*c*d*
*3*e**2*h + int((asin(c*x)*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b*c*d**2*e**
3*g - 2*int((asin(c*x)*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b*c*d**2*e**3*h*
x + int((asin(c*x)*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b*c*d*e**4*g*x - 2*l
og(d + e*x)*a*c*d**3*h + log(d + e*x)*a*c*d**2*e*g - 2*log(d + e*x)*a*c*d*
*2*e*h*x + log(d + e*x)*a*c*d*e**2*g*x + 2*a*c*d**2*e*h*x - a*c*d*e**2*g*x
 + a*c*d*e**2*h*x**2 + a*c*e**3*f*x)/(c*d*e**3*(d + e*x))
```

3.166 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 488

$$\begin{aligned}
&\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx \\
&= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)(d+ex)} - \frac{ibh\arcsin(cx)^2}{2e^3} \\
&\quad - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)} \\
&\quad - \frac{bc(2e^2(eg-2dh)-c^2d(e^2f+deg-3d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}} \\
&\quad + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad - \frac{bh\arcsin(cx)\log(d+ex)}{e^3} + \frac{h(a+b\arcsin(cx))\log(d+ex)}{e^3} \\
&\quad - \frac{ibh\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{ibh\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}
\end{aligned}$$

output
```
1/2*b*c*(d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)-1
/2*I*b*h*arcsin(c*x)^2/e^3-1/2*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(
e*x+d)^2-(-2*d*h+e*g)*(a+b*arcsin(c*x))/e^3/(e*x+d)-1/2*b*c*(2*e^2*(-2*d*h
+e*g)-c^2*d*(-3*d^2*h+d*e*g+e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)
/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(3/2)+b*h*arcsin(c*x)*ln(1-I*e*(I*c
*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+b*h*arcsin(c*x)*ln(1
-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-b*h*arcsin(
c*x)*ln(e*x+d)/e^3+h*(a+b*arcsin(c*x))*ln(e*x+d)/e^3-I*b*h*polylog(2,I*e*(
I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3-I*b*h*polylog(2,I
*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3
```

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 6 vs. order 4 in optimal.

Time = 4.59 (sec) , antiderivative size = 940, normalized size of antiderivative = 1.93

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = -\frac{a(e^2f-deg+d^2h)}{2e^3(d+ex)^2}+\frac{a(-eg+2dh)}{e^3(d+ex)} + \frac{bf\left(-\frac{c\sqrt{\frac{e\left(-\sqrt{\frac{1}{c^2}}+x\right)}{d+ex}}\sqrt{\frac{e\left(\sqrt{\frac{1}{c^2}}+x\right)}{d+ex}}(d+ex)\,\text{AppellF1}\left(2,\frac{1}{2},\frac{1}{2},3,\frac{d-\sqrt{\frac{1}{c^2}}e}{d+ex},\frac{d+\sqrt{\frac{1}{c^2}}e}{d+ex}\right)}{\sqrt{1-c^2x^2}}-2e\arcsin(cx)\right)}{4e^2(d+ex)^2} + \frac{ah\log(d+ex)}{e^3}+bg\left(\frac{-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}}{e^2} - \frac{d\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{2e}\right) - \frac{bh\left(-\frac{cd^2e\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}+\frac{d^2\arcsin(cx)}{(d+ex)^2}-\frac{4d\arcsin(cx)}{d+ex}+\frac{4cd\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}+\frac{ic^3d^3\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\,(ie\cdots}{\cdots}\right.\right.}{(cd-e)(cd+e)\cdots}\right.}{\cdots}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
-1/2*(a*(e^2*f - d*e*g + d^2*h))/(e^3*(d + e*x)^2) + (a*(-(e*g) + 2*d*h))/
(e^3*(d + e*x)) + (b*f*(-((c*Sqrt[(e*(-Sqrt[c^(-2)] + x))/(d + e*x)]*Sqrt[
(e*(Sqrt[c^(-2)] + x))/(d + e*x)]*(d + e*x)*AppellF1[2, 1/2, 1/2, 3, (d -
Sqrt[c^(-2)]*e)/(d + e*x), (d + Sqrt[c^(-2)]*e)/(d + e*x)])/Sqrt[1 - c^2*x
^2]) - 2*e*ArcSin[c*x]))/(4*e^2*(d + e*x)^2) + (a*h*Log[d + e*x])/e^3 + b*
g*((-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2
]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e^2 - (d*((c*Sqrt[1 - c^2*x^2]
)/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Lo
g[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]
*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*
d^2 - e^2])))/(2*e)) - (b*h*(-((c*d^2*e*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2
)*(d + e*x))) + (d^2*ArcSin[c*x])/(d + e*x)^2 - (4*d*ArcSin[c*x])/(d + e*x
) + (4*c*d*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/
Sqrt[c^2*d^2 - e^2] + (I*c^3*d^3*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I
*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))
]))/((c*d - e)*(c*d + e)*Sqrt[c^2*d^2 - e^2]) + I*(ArcSin[c*x]*(ArcSin[c*x
] + (2*I)*(Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])]
 + Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])) + 2*Poly
Log[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] + 2*PolyLog[2,
 (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])))/(2*e^3)
```

Rubi [A] (verified)

Time = 1.59 (sec) , antiderivative size = 478, normalized size of antiderivative = 0.98, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int \frac{3hd^2-e(g-4hx)d-e^2(f+2gx)+2h(d+ex)^2\log(d+ex)}{2e^3(d+ex)^2\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{2e^3(d+ex)^2}-\frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{h\log(d+ex)(a+b\arcsin(cx))}{e^3}$$

$$\Big\downarrow \text{27}$$

$$-\frac{bc\int \frac{3hd^2-e(g-4hx)d-e^2(f+2gx)+2h(d+ex)^2\log(d+ex)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{2e^3(d+ex)^2}-\frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{h\log(d+ex)(a+b\arcsin(cx))}{e^3}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int\left(\frac{3hd^2-egd-e^2f-2e(eg-2dh)x}{(d+ex)^2\sqrt{1-c^2x^2}}+\frac{2h\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{2e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{2e^3(d+ex)^2}-\frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{h\log(d+ex)(a+b\arcsin(cx))}{e^3}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{2e^3(d+ex)^2}-\frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{h\log(d+ex)(a+b\arcsin(cx))}{e^3}-$$

$$\frac{bc\left(\frac{2ih\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{2ih\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{2h\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{2h\arcsin(cx)\log\left(1-\frac{iee^{i}}{\sqrt{c^2}}\right.}{c}\right.}{}$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
-1/2*((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)^2) - ((e
*g - 2*d*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)) + (h*(a + b*ArcSin[c*x])*
Log[d + e*x])/e^3 - (b*c*(-((e*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x^2])/
((c^2*d^2 - e^2)*(d + e*x))) + (I*h*ArcSin[c*x]^2)/c + ((2*e^2*(e*g - 2*d*
h) - c^2*d*(e^2*f + d*e*g - 3*d^2*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 -
 e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2) - (2*h*ArcSin[c*x]*Log[1
- (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - (2*h*ArcSin[c*
x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + (2*h*
ArcSin[c*x]*Log[d + e*x])/c + ((2*I)*h*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/
(c*d - Sqrt[c^2*d^2 - e^2])])/c + ((2*I)*h*PolyLog[2, (I*e*E^(I*ArcSin[c*x
]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/(2*e^3)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2026 vs. $2(489) = 978$.

Time = 3.49 (sec) , antiderivative size = 2027, normalized size of antiderivative = 4.15

method	result	size
parts	Expression too large to display	2027
derivativedivides	Expression too large to display	2038
default	Expression too large to display	2038

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
a*(h/e^3*ln(e*x+d)-1/2*(d^2*h-d*e*g+e^2*f)/e^3/(e*x+d)^2-(-2*d*h+e*g)/e^3/
(e*x+d))+b/c*(1/2*I*c*arcsin(c*x)^2*h/e^3+1/2*c^2*(-I*c^3*e^4*f*x^2-I*c^3*
d^4*h+e^4*c*f*arcsin(c*x)+3*c^3*d^4*h*arcsin(c*x)+4*arcsin(c*x)*c^3*d^3*e*
h*x-2*arcsin(c*x)*c^3*d^2*e^2*g*x+I*c^3*d*e^3*g*x^2+(-c^2*x^2+1)^(1/2)*c^2
*d^2*e^2*h*x-(-c^2*x^2+1)^(1/2)*c^2*d*e^3*g*x-2*I*c^3*d^3*e*h*x+2*I*c^3*d^
2*e^2*g*x-2*I*c^3*d*e^3*f*x-I*c^3*d^2*e^2*h*x^2-e*c^3*d^3*g*arcsin(c*x)+e^
3*c*g*arcsin(c*x)*d-3*e^2*c*d^2*h*arcsin(c*x)+I*c^3*d^3*e*g+(-c^2*x^2+1)^(
1/2)*c^2*d^3*e*h-(-c^2*x^2+1)^(1/2)*c^2*d^2*e^2*g+(-c^2*x^2+1)^(1/2)*c^2*d
*e^3*f-I*c^3*d^2*e^2*f+2*arcsin(c*x)*e^4*g*c*x-e^2*c^3*d^2*f*arcsin(c*x)-4
*arcsin(c*x)*d*e^3*h*c*x+(-c^2*x^2+1)^(1/2)*c^2*e^4*f*x)/(c*e*x+c*d)^2/(c^
2*d^2-e^2)/e^3-2*c^3/(c^2*d^2-e^2)^2/e*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^
2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-
2*c^3/(c^2*d^2-e^2)^2/e*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))
*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2-I*c^5/(c^2*d^2-
e^2)^2/e^3*d^4*h*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^
(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-I*c^3/(c^2*d^2-e^2)/e^3*d^2*h*arcsin(
c*x)^2+c^5/(c^2*d^2-e^2)^2/e^3*d^4*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^
2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+c^5/(c^2
*d^2-e^2)^2/e^3*d^4*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(
-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*c/(c^2*d^2-e^2)^2*...
```

Fricas [F]

$$\int \frac{(f+gx+hx^2)\,(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\int \frac{(hx^2+gx+f)(b\arcsin{(cx)}+a)}{(ex+d)^3}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fricas")
```

output
```
integral((a*h*x^2 + a*g*x + a*f + (b*h*x^2 + b*g*x + b*f)*arcsin(c*x))/(e^
3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^3}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^3}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^3,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^3, x)
```

Reduce [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$
$$= \frac{2\left(\int \frac{asin(cx)}{e^3x^3+3d\,e^2x^2+3d^2ex+d^3}dx\right)b\,d^3e^3f+4\left(\int \frac{asin(cx)}{e^3x^3+3d\,e^2x^2+3d^2ex+d^3}dx\right)b\,d^2e^4fx+2\left(\int \frac{asin(cx)}{e^3x^3+3d\,e^2x^2+3d^2ex+d^3}d\right.}{}$$

input
```
int((h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^3,x)
```

output

```
(2*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*d**3
*e**3*f + 4*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),
x)*b*d**2*e**4*f*x + 2*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 +
e**3*x**3),x)*b*d*e**5*f*x**2 + 2*int((asin(c*x)*x**2)/(d**3 + 3*d**2*e*x
+ 3*d*e**2*x**2 + e**3*x**3),x)*b*d**3*e**3*h + 4*int((asin(c*x)*x**2)/(d*
*3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*d**2*e**4*h*x + 2*int((a
sin(c*x)*x**2)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*d*e**5
*h*x**2 + 2*int((asin(c*x)*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x*
*3),x)*b*d**3*e**3*g + 4*int((asin(c*x)*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x
**2 + e**3*x**3),x)*b*d**2*e**4*g*x + 2*int((asin(c*x)*x)/(d**3 + 3*d**2*e
*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*d*e**5*g*x**2 + 2*log(d + e*x)*a*d**3
*h + 4*log(d + e*x)*a*d**2*e*h*x + 2*log(d + e*x)*a*d*e**2*h*x**2 + a*d**3
*h - a*d*e**2*f - 2*a*d*e**2*h*x**2 + a*e**3*g*x**2)/(2*d*e**3*(d**2 + 2*d
*e*x + e**2*x**2))
```

3.167 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 349

$$\begin{aligned}
&\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx \\
&= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{6e^2(c^2d^2-e^2)(d+ex)^2} - \frac{bc(e^2(eg-2dh)-c^2(de^2f-d^3h))\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)^2(d+ex)} \\
&\quad - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{3e^3(d+ex)^3} \\
&\quad - \frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{h(a+b\arcsin(cx))}{e^3(d+ex)} \\
&\quad + \frac{bc(6e^4h+c^2e^2(e^2f-4deg-5d^2h)+c^4d^2(2e^2f+deg+2d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e^3(c^2d^2-e^2)^{5/2}}
\end{aligned}$$

output

```
1/6*b*c*(d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)^2
-1/2*b*c*(e^2*(-2*d*h+e*g)-c^2*(-d^3*h+d*e^2*f))*(-c^2*x^2+1)^(1/2)/e^2/(c
^2*d^2-e^2)^2/(e*x+d)-1/3*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d
)^3-1/2*(-2*d*h+e*g)*(a+b*arcsin(c*x))/e^3/(e*x+d)^2-h*(a+b*arcsin(c*x))/e
^3/(e*x+d)+1/6*b*c*(6*e^4*h+c^2*e^2*(-5*d^2*h-4*d*e*g+e^2*f)+c^4*d^2*(2*d^
2*h+d*e*g+2*e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1
/2))/e^3/(c^2*d^2-e^2)^(5/2)
```

Mathematica [A] (verified)

Time = 1.25 (sec) , antiderivative size = 442, normalized size of antiderivative = 1.27

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx =$$

$$-\frac{\frac{2a(e^2f-deg+d^2h)}{(d+ex)^3}+\frac{3a(eg-2dh)}{(d+ex)^2}+\frac{6ah}{d+ex}+\frac{bce\sqrt{1-c^2x^2}\left(e^2\left(-5d^2h+e^2(f+3gx)+2de(g-3hx)\right)+c^2d\left(-4de^2f+2d^3h-3e^3fx+d^2e(g\right.\right.}{(-c^2d^2+e^2)^2(d+ex)^2}}{}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
-1/6*((2*a*(e^2*f - d*e*g + d^2*h))/(d + e*x)^3 + (3*a*(e*g - 2*d*h))/(d +
 e*x)^2 + (6*a*h)/(d + e*x) + (b*c*e*Sqrt[1 - c^2*x^2]*(e^2*(-5*d^2*h + e^
2*(f + 3*g*x) + 2*d*e*(g - 3*h*x)) + c^2*d*(-4*d*e^2*f + 2*d^3*h - 3*e^3*f
*x + d^2*e*(g + 3*h*x))))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) + (b*(2*d^2*h
 + d*e*(g + 6*h*x) + e^2*(2*f + 3*x*(g + 2*h*x)))*ArcSin[c*x])/(d + e*x)^3
 - (b*c*(6*e^4*h + c^2*e^2*(e^2*f - 4*d*e*g - 5*d^2*h) + c^4*d^2*(2*e^2*f
+ d*e*g + 2*d^2*h))*Log[d + e*x])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d
^2) + e^2]) + (b*c*(6*e^4*h + c^2*e^2*(e^2*f - 4*d*e*g - 5*d^2*h) + c^4*d^
2*(2*e^2*f + d*e*g + 2*d^2*h))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sq
rt[1 - c^2*x^2]])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]))/e^3
```

Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.02, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {5252, 27, 2182, 27, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int -\frac{2hd^2+egd+6e^2hx^2+2e^2f+3e(eg+2dh)x}{6e^3(d+ex)^3\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{2hd^2+egd+6e^2hx^2+2e^2f+3e(eg+2dh)x}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{6e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\Big\downarrow \text{2182}$$

$$\frac{bc\left(\frac{\int -\frac{2\left(3ge^3+\left(\left(-5hd^2-egd+e^2f\right)c^2+6e^2h\right)xe-c^2d\left(2hd^2+egd+2e^2f\right)\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}\right)}{6e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\int \frac{3ge^3+\left(\left(-5hd^2-egd+e^2f\right)c^2+6e^2h\right)xe-c^2d\left(2hd^2+egd+2e^2f\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{6e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\Big\downarrow \text{679}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\frac{3\sqrt{1-c^2x^2}\left(e^3(eg-2dh)-c^2\left(de^3f-d^3eh\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{\left(c^4d^2\left(2d^2h+deg+2e^2f\right)+c^2e^2\left(-5d^2h-4deg+e^2f\right)+6e^4h\right)\int \frac{1}{(d+ex)\sqrt{\cdots}}}{c^2d^2-e^2}}{c^2d^2-e^2}\right)}{6e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\Big\downarrow \text{488}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\frac{\left(c^4d^2\left(2d^2h+deg+2e^2f\right)+c^2e^2\left(-5d^2h-4deg+e^2f\right)+6e^4h\right)\int\frac{1}{-c^2d^2+e^2-\frac{\left(dxc^2+e\right)^2}{1-c^2x^2}}d\frac{dxc^2+e}{\sqrt{1-c^2x^2}}}{c^2d^2-e^2}+\frac{3\sqrt{1-c^2x^2}\left(e^3(\ldots\right.}{(c^2\ldots}}{c^2d^2-e^2}\right.}{6e^3}$$
$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\Big\downarrow \; 217$$

$$-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}+$$
$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\frac{3\sqrt{1-c^2x^2}\left(e^3(eg-2dh)-c^2\left(de^3f-d^3eh\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)\left(c^4d^2\left(2d^2h+deg+2e^2f\right)+c^2e^2\left(-5d^2h-\ldots\right.\right.}{\left(c^2d^2-e^2\right)^{3/2}}}{c^2d^2-e^2}\right.}{6e^3}$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
-1/3*((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)^3) - ((e
*g - 2*d*h)*(a + b*ArcSin[c*x]))/(2*e^3*(d + e*x)^2) - (h*(a + b*ArcSin[c*
x]))/(e^3*(d + e*x)) + (b*c*((e*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x^2])
/((c^2*d^2 - e^2)*(d + e*x)^2) - ((3*(e^3*(e*g - 2*d*h) - c^2*(d*e^3*f - d
^3*e*h))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ((6*e^4*h + c^2*
e^2*(e^2*f - 4*d*e*g - 5*d^2*h) + c^4*d^2*(2*e^2*f + d*e*g + 2*d^2*h))*Arc
Tan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2
)^(3/2))/(c^2*d^2 - e^2)))/(6*e^3)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 2182
```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Qx = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
 d + e*x, x]}, Simp[e*R*(d + e*x)^(m + 1)*((a + b*x^2)^(p + 1)/((m + 1)*(b*
d^2 + a*e^2))), x] + Simp[1/((m + 1)*(b*d^2 + a*e^2))   Int[(d + e*x)^(m +
1)*(a + b*x^2)^p*ExpandToSum[(m + 1)*(b*d^2 + a*e^2)*Qx + b*d*R*(m + 1) - b
*e*R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, d, e, p}, x] && PolyQ[Pq,
 x] && NeQ[b*d^2 + a*e^2, 0] && LtQ[m, -1]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1176 vs. 2(329) = 658.

Time = 0.28 (sec) , antiderivative size = 1177, normalized size of antiderivative = 3.37

method	result	size
parts	Expression too large to display	1177
derivativedivides	Expression too large to display	1188
default	Expression too large to display	1188

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/2*(-2*d*h+e*g)/e^3/(e*x+d)^2-h/e^3/(e*x+d)-1/3*(d^2*h-d*e*g+e^2*f)/e
^3/(e*x+d)^3)+b/c*(-1/3*c^4*arcsin(c*x)/e^3/(c*e*x+c*d)^3*d^2*h+1/3*c^4*ar
csin(c*x)/e^2/(c*e*x+c*d)^3*d*g-1/3*c^4*arcsin(c*x)/e/(c*e*x+c*d)^3*f+c^3*
arcsin(c*x)/e^3/(c*e*x+c*d)^2*d*h-1/2*c^3*arcsin(c*x)/e^2/(c*e*x+c*d)^2*g-
c^2*arcsin(c*x)*h/e^3/(c*e*x+c*d)+1/6*c^2/e^3*(-6*h/e/(-(c^2*d^2-e^2)/e^2)
^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+c*d/e)+2*(-(c^2*d^2-e^2)/e^2)
^(1/2)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+
c*d/e))-3*c*(2*d*h-e*g)/e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+c*d/e)*(-(c*x+c*d/e)
^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2
*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+c*d/e)+2*(-(c^2
*d^2-e^2)/e^2)^(1/2)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2
)^(1/2))/(c*x+c*d/e)))+2*c^2*(d^2*h-d*e*g+e^2*f)/e^3*(1/2/(c^2*d^2-e^2)*e^
2/(c*x+c*d/e)^2*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/
2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+c*d/e)*(-(c*x+c*d/e)^
2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*
d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+c*d/e)+2*(-(c^2*
d^2-e^2)/e^2)^(1/2)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)
^(1/2))/(c*x+c*d/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln(
(-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+c*d/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(
c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+c*d/e))...
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1488 vs. $2(329) = 658$.

Time = 76.83 (sec) , antiderivative size = 3003, normalized size of antiderivative = 8.60

$$\int \frac{(f + gx + hx^2)(a + b\arcsin(cx))}{(d + ex)^4} dx = \text{Too large to display}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^4}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**4,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**4, x)
```

Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="maxima")
```

output
```
-1/6*(3*e*x + d)*a*g/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/3
*(3*e^2*x^2 + 3*d*e*x + d^2)*a*h/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^
3*e^3) - 1/3*a*f/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e) - 1/6*((6*b
*e^2*h*x^2 + 2*b*e^2*f + b*d*e*g + 2*b*d^2*h + 3*(b*e^2*g + 2*b*d*e*h)*x)*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 6*(e^6*x^3 + 3*d*e^5*x^2 + 3*
d^2*e^4*x + d^3*e^3)*integrate(1/6*(6*b*c*e^2*h*x^2 + 2*b*c*e^2*f + b*c*d*
e*g + 2*b*c*d^2*h + 3*(b*c*e^2*g + 2*b*c*d*e*h)*x)*e^(1/2*log(c*x + 1) + 1
/2*log(-c*x + 1))/(c^4*e^6*x^7 + 3*c^4*d*e^5*x^6 - 3*c^2*d^2*e^4*x^3 - c^2
*d^3*e^3*x^2 + (3*c^4*d^2*e^4 - c^2*e^6)*x^5 + (c^4*d^3*e^3 - 3*c^2*d*e^5)
*x^4 + (c^2*e^6*x^5 + 3*c^2*d*e^5*x^4 - 3*d^2*e^4*x - d^3*e^3 + (3*c^2*d^2
*e^4 - e^6)*x^3 + (c^2*d^3*e^3 - 3*d*e^5)*x^2)*e^(log(c*x + 1) + log(-c*x
+ 1))), x))/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^4}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^4,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^4, x)
```

Reduce [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
int((h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^4,x)
```

output
```
(6*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e
**4*x**4),x)*b*d**4*e**2*f + 18*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*
e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**3*e**3*f*x + 18*int(asin(c*
x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b
*d**2*e**4*f*x**2 + 6*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2
 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d*e**5*f*x**3 + 6*int((asin(c*x)*x**2)/(
d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**
4*e**2*h + 18*int((asin(c*x)*x**2)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 +
 4*d*e**3*x**3 + e**4*x**4),x)*b*d**3*e**3*h*x + 18*int((asin(c*x)*x**2)/(
d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**
2*e**4*h*x**2 + 6*int((asin(c*x)*x**2)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x*
*2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d*e**5*h*x**3 + 6*int((asin(c*x)*x)/(
d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**
4*e**2*g + 18*int((asin(c*x)*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*
d*e**3*x**3 + e**4*x**4),x)*b*d**3*e**3*g*x + 18*int((asin(c*x)*x)/(d**4 +
 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**2*e**4
*g*x**2 + 6*int((asin(c*x)*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*
e**3*x**3 + e**4*x**4),x)*b*d*e**5*g*x**3 - a*d**2*g - 2*a*d*e*f - 3*a*d*e
*g*x + 2*a*e**2*h*x**3)/(6*d*e**2*(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**
3*x**3))
```

3.168 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 470

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2(eg-2dh)-c^2d(5e^2f-deg-3d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc(12e^4h+c^4d^2(11e^2f+deg-d^2h)+4c^2e^2(e^2f-4deg+d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^3(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{bc^3(4e^4(eg-5dh)-c^2de^2(9e^2f-13deg-7d^2h)-2c^4d^3(3e^2f+deg+d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right.}{24e^3(c^2d^2-e^2)^{7/2}}$$

output
```
1/12*b*c*(d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)^
3-1/24*b*c*(4*e^2*(-2*d*h+e*g)-c^2*d*(-3*d^2*h-d*e*g+5*e^2*f))*(-c^2*x^2+1
)^(1/2)/e^2/(c^2*d^2-e^2)^2/(e*x+d)^2+1/24*b*c*(12*e^4*h+c^4*d^2*(-d^2*h+d
*e*g+11*e^2*f)+4*c^2*e^2*(d^2*h-4*d*e*g+e^2*f))*(-c^2*x^2+1)^(1/2)/e^2/(c^
2*d^2-e^2)^3/(e*x+d)-1/4*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)
^4-1/3*(-2*d*h+e*g)*(a+b*arcsin(c*x))/e^3/(e*x+d)^3-1/2*h*(a+b*arcsin(c*x)
)/e^3/(e*x+d)^2-1/24*b*c^3*(4*e^4*(-5*d*h+e*g)-c^2*d*e^2*(-7*d^2*h-13*d*e*
g+9*e^2*f)-2*c^4*d^3*(d^2*h+d*e*g+3*e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^
2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(7/2)
```

Mathematica [A] (verified)

Time = 1.75 (sec) , antiderivative size = 575, normalized size of antiderivative = 1.22

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx =$$

$$-\frac{\frac{6a(e^2f-deg+d^2h)}{(d+ex)^4}+\frac{8a(eg-2dh)}{(d+ex)^3}+\frac{12ah}{(d+ex)^2}+\frac{bce\sqrt{1-c^2x^2}\left(c^4d^2\left(-2d^4h+11e^4fx^2+de^3x(27f+gx)-d^3e(2g+5hx)+d^2e^2(18f+x(g-\right.\right.}{}}{}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

output
```
-1/24*((6*a*(e^2*f - d*e*g + d^2*h))/(d + e*x)^4 + (8*a*(e*g - 2*d*h))/(d
+ e*x)^3 + (12*a*h)/(d + e*x)^2 + (b*c*e*Sqrt[1 - c^2*x^2]*(c^4*d^2*(-2*d^
4*h + 11*e^4*f*x^2 + d*e^3*x*(27*f + g*x) - d^3*e*(2*g + 5*h*x) + d^2*e^2*
(18*f + x*(g - h*x))) + 2*e^4*(3*d^2*h + d*e*(g + 8*h*x) + e^2*(f + 2*x*(g
 + 3*h*x))) + c^2*e^2*(11*d^4*h + 4*e^4*f*x^2 + d*e^3*x*(3*f - 16*g*x) + d
^3*e*(-15*g + 19*h*x) + d^2*e^2*(-5*f + x*(-35*g + 4*h*x)))))/((-(c^2*d^2)
 + e^2)^3*(d + e*x)^3) + (2*b*(d^2*h + d*e*(g + 4*h*x) + e^2*(3*f + 4*g*x
+ 6*h*x^2))*ArcSin[c*x])/(d + e*x)^4 - (b*c^3*(-4*e^4*(e*g - 5*d*h) + c^2*
d*e^2*(9*e^2*f - 13*d*e*g - 7*d^2*h) + 2*c^4*d^3*(3*e^2*f + d*e*g + d^2*h)
)*Log[d + e*x])/((c*d - e)^3*(c*d + e)^3*Sqrt[-(c^2*d^2) + e^2]) + (b*c^3*
(-4*e^4*(e*g - 5*d*h) + c^2*d*e^2*(9*e^2*f - 13*d*e*g - 7*d^2*h) + 2*c^4*d
^3*(3*e^2*f + d*e*g + d^2*h))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqr
t[1 - c^2*x^2]])/((c*d - e)^3*(c*d + e)^3*Sqrt[-(c^2*d^2) + e^2]))/e^3
```

Rubi [A] (verified)

Time = 1.07 (sec) , antiderivative size = 494, normalized size of antiderivative = 1.05, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.346$, Rules used = {5252, 27, 2182, 27, 688, 25, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int -\frac{hd^2+egd+6e^2hx^2+3e^2f+4e(eg+dh)x}{12e^3(d+ex)^4\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{hd^2+egd+6e^2hx^2+3e^2f+4e(eg+dh)x}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{12e^3}-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \text{2182}$$

$$\frac{bc\left(\frac{\int -\frac{3\left(-d\left(hd^2+egd+3e^2f\right)c^2+2e^2(2eg-dh)+2e\left(\left(-2hd^2-egd+e^2f\right)c^2+3e^2h\right)x\right)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}\right)}{12e^3}-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\int \frac{-d\left(hd^2+egd+3e^2f\right)c^2+2e^2(2eg-dh)+2e\left(\left(-2hd^2-egd+e^2f\right)c^2+3e^2h\right)x}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{12e^3}-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{\int -\frac{e\left(4e^2(eg-2dh)-c^2d\left(-3hd^2-egd+5e^2f\right)\right)xc^2+2\left(d^2\left(hd^2+egd+3e^2f\right)c^4+2e^2\left(-hd^2-3egd+e^2f\right)c^2+6e^4h\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2\left(c^2d^2-e^2\right)}+ \cdots}{c^2d^2-e^2}\cdots\right.}{12e^3}$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2(eg-2dh)-c^2d\left(-3d^2h-deg+5e^2f\right)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\int \frac{e\left(4e^2(eg-2dh)-c^2d\left(-3hd^2-egd+5e^2f\right)\right)xc^2+2\left(d^2\left(hd^2+\cdots\right.\right.}{(d+ex)^2\sqrt{1-c^2\cdots}}}{2\left(c^2d^2-e^2\right)\cdots}}{c^2d^2-e^2}\cdots\right.}{12e^3}$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \; 679$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2(eg-2dh)-c^2d\left(-3d^2h-deg+5e^2f\right)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(d^2(-h)+deg+11e^2f\right)+4c^2e^2\left(d^2h-4deg+e^2\cdots\right.\right.}{\left(c^2d^2-e^2\right)(d+ex)}\cdots}{c^2d^2-\cdots}\cdots\right.}{12e^3}$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \; 488$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2(eg-2dh)-c^2d\left(-3d^2h-deg+5e^2f\right)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{c^2\left(-2c^4d^3\left(d^2h+deg+3e^2f\right)-c^2de^2\left(-7d^2h-13deg+9e^2f\right)+\cdots\right.}{c^2d^2-e^2\cdots}}{\cdots}\cdots\right.}{12e^3}$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow 217$$

$$-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}+$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2(eg-2dh)-c^2d\left(-3d^2h-deg+5e^2f\right)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(d^2(-h)+deg+11e^2f\right)+4c^2e^2\left(d^2h-4deg+e^2\right.\right.}{\left(c^2d^2-e^2\right)(d+ex)}}{}}{c^2}\right.}{12e^3}$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

output
```
-1/4*((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)^4) - ((e
*g - 2*d*h)*(a + b*ArcSin[c*x]))/(3*e^3*(d + e*x)^3) - (h*(a + b*ArcSin[c*
x]))/(2*e^3*(d + e*x)^2) + (b*c*((e*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x
^2])/((c^2*d^2 - e^2)*(d + e*x)^3) - ((e*(4*e^2*(e*g - 2*d*h) - c^2*d*(5*e
^2*f - d*e*g - 3*d^2*h))*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2
) - ((e*(12*e^4*h + c^4*d^2*(11*e^2*f + d*e*g - d^2*h) + 4*c^2*e^2*(e^2*f
- 4*d*e*g + d^2*h))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - (c^2*
(4*e^4*(e*g - 5*d*h) - c^2*d*e^2*(9*e^2*f - 13*d*e*g - 7*d^2*h) - 2*c^4*d^
3*(3*e^2*f + d*e*g + d^2*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqr
t[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2))/(2*(c^2*d^2 - e^2)))/(c^2*d^2 - e
^2)))/(12*e^3)
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 2182
```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Qx = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
 d + e*x, x]}, Simp[e*R*(d + e*x)^(m + 1)*((a + b*x^2)^(p + 1)/((m + 1)*(b*
d^2 + a*e^2))), x] + Simp[1/((m + 1)*(b*d^2 + a*e^2))   Int[(d + e*x)^(m +
1)*(a + b*x^2)^p*ExpandToSum[(m + 1)*(b*d^2 + a*e^2)*Qx + b*d*R*(m + 1) - b
*e*R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, d, e, p}, x] && PolyQ[Pq,
 x] && NeQ[b*d^2 + a*e^2, 0] && LtQ[m, -1]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1923 vs. $2(444) = 888$.

Time = 0.28 (sec) , antiderivative size = 1924, normalized size of antiderivative = 4.09

method	result	size
parts	Expression too large to display	1924
derivativedivides	Expression too large to display	1935
default	Expression too large to display	1935

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/2*h/e^3/(e*x+d)^2-1/4*(d^2*h-d*e*g+e^2*f)/e^3/(e*x+d)^4-1/3*(-2*d*h+
e*g)/e^3/(e*x+d)^3)+b/c*(-1/4*c^5*arcsin(c*x)/e^3/(c*e*x+c*d)^4*d^2*h+1/4*
c^5*arcsin(c*x)/e^2/(c*e*x+c*d)^4*d*g-1/4*c^5*arcsin(c*x)/e/(c*e*x+c*d)^4*
f+2/3*c^4*arcsin(c*x)/e^3/(c*e*x+c*d)^3*d*h-1/3*c^4*arcsin(c*x)/e^2/(c*e*x
+c*d)^3*g-1/2*c^3*arcsin(c*x)*h/e^3/(c*e*x+c*d)^2+1/12*c^3/e^3*(6*h/e^2*(1
/(c^2*d^2-e^2)*e^2/(c*x+c*d/e)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^
2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c
^2*d^2-e^2)/e^2+2*d*c/e*(c*x+c*d/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+c*
d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+c*d/e)))-4*c*(2*
d*h-e*g)/e^3*(1/2/(c^2*d^2-e^2)*e^2/(c*x+c*d/e)^2*(-(c*x+c*d/e)^2+2*d*c/e*
(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e
^2)*e^2/(c*x+c*d/e)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)
^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)
/e^2+2*d*c/e*(c*x+c*d/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+c*d/e)^2+2*d*
c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+c*d/e)))+1/2/(c^2*d^2-e^2)*
e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+c*d/e
)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^
2-e^2)/e^2)^(1/2))/(c*x+c*d/e)))+3*c^2*(d^2*h-d*e*g+e^2*f)/e^4*(1/3/(c^2*d
^2-e^2)*e^2/(c*x+c*d/e)^3*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2
)/e^2)^(1/2)+5/3*d*c*e/(c^2*d^2-e^2)*(1/2/(c^2*d^2-e^2)*e^2/(c*x+c*d/e)...
```

Fricas [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Timed out}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="fricas")
```

output
```
Timed out
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^5}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**5,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**5, x)
```

Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^5}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="maxima")
```

output
```
-1/12*(4*e*x + d)*a*g/(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x
 + d^4*e^2) - 1/12*(6*e^2*x^2 + 4*d*e*x + d^2)*a*h/(e^7*x^4 + 4*d*e^6*x^3
+ 6*d^2*e^5*x^2 + 4*d^3*e^4*x + d^4*e^3) - 1/4*a*f/(e^5*x^4 + 4*d*e^4*x^3
+ 6*d^2*e^3*x^2 + 4*d^3*e^2*x + d^4*e) - 1/12*((6*b*e^2*h*x^2 + 3*b*e^2*f
+ b*d*e*g + b*d^2*h + 4*(b*e^2*g + b*d*e*h)*x)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)) + 12*(e^7*x^4 + 4*d*e^6*x^3 + 6*d^2*e^5*x^2 + 4*d^3*e^4*x
+ d^4*e^3)*integrate(1/12*(6*b*c*e^2*h*x^2 + 3*b*c*e^2*f + b*c*d*e*g + b*c
*d^2*h + 4*(b*c*e^2*g + b*c*d*e*h)*x)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x +
 1))/(c^4*e^7*x^8 + 4*c^4*d*e^6*x^7 - 4*c^2*d^3*e^4*x^3 - c^2*d^4*e^3*x^2
+ (6*c^4*d^2*e^5 - c^2*e^7)*x^6 + 4*(c^4*d^3*e^4 - c^2*d*e^6)*x^5 + (c^4*d
^4*e^3 - 6*c^2*d^2*e^5)*x^4 + (c^2*e^7*x^6 + 4*c^2*d*e^6*x^5 - 4*d^3*e^4*x
 - d^4*e^3 + (6*c^2*d^2*e^5 - e^7)*x^4 + 4*(c^2*d^3*e^4 - d*e^6)*x^3 + (c^
2*d^4*e^3 - 6*d^2*e^5)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))/(e^7*x^
4 + 4*d*e^6*x^3 + 6*d^2*e^5*x^2 + 4*d^3*e^4*x + d^4*e^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^5}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^5,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^5, x)
```

Reduce [F]

$$\int \frac{(f + gx + hx^2)\,(a + b\arcsin(cx))}{(d + ex)^5}\,dx = \int \frac{(h\,x^2 + gx + f)\,(asin(cx)\,b + a)}{(ex + d)^5}dx$$

input
```
int((h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^5,x)
```

output
```
int((h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^5,x)
```

3.169 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 593

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{20e^2(c^2d^2-e^2)(d+ex)^4}$$
$$-\frac{bc(5e^2(eg-2dh)-c^2d(7e^2f-2deg-3d^2h))\sqrt{1-c^2x^2}}{60e^2(c^2d^2-e^2)^2(d+ex)^3}$$
$$+\frac{bc(20e^4h+c^4d^2(26e^2f-deg-4d^2h)+c^2e^2(9e^2f-34deg+19d^2h))\sqrt{1-c^2x^2}}{120e^2(c^2d^2-e^2)^3(d+ex)^2}$$
$$+\frac{bc^3(c^4d^3(10ef+dg)-4e^3(eg-5dh)+c^2de(11e^2f-18deg+d^2h))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^4(d+ex)}$$
$$-\frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{5e^3(d+ex)^5}$$
$$-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$
$$+\frac{bc^3(20e^6h+3c^4d^2e^2(24e^2f-19deg-6d^2h)+2c^6d^4(12e^2f+3deg+2d^2h)+9c^2e^4(e^2f-6deg+11d}{120e^3(c^2d^2-e^2)^{9/2}}$$

output
```
1/20*b*c*(d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)^
4-1/60*b*c*(5*e^2*(-2*d*h+e*g)-c^2*d*(-3*d^2*h-2*d*e*g+7*e^2*f))*(-c^2*x^2
+1)^(1/2)/e^2/(c^2*d^2-e^2)^2/(e*x+d)^3+1/120*b*c*(20*e^4*h+c^4*d^2*(-4*d^
2*h-d*e*g+26*e^2*f)+c^2*e^2*(19*d^2*h-34*d*e*g+9*e^2*f))*(-c^2*x^2+1)^(1/2
)/e^2/(c^2*d^2-e^2)^3/(e*x+d)^2+1/24*b*c^3*(c^4*d^3*(d*g+10*e*f)-4*e^3*(-5
*d*h+e*g)+c^2*d*e*(d^2*h-18*d*e*g+11*e^2*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2
-e^2)^4/(e*x+d)-1/5*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)^5-1/
4*(-2*d*h+e*g)*(a+b*arcsin(c*x))/e^3/(e*x+d)^4-1/3*h*(a+b*arcsin(c*x))/e^3
/(e*x+d)^3+1/120*b*c^3*(20*e^6*h+3*c^4*d^2*e^2*(-6*d^2*h-19*d*e*g+24*e^2*f
)+2*c^6*d^4*(2*d^2*h+3*d*e*g+12*e^2*f)+9*c^2*e^4*(11*d^2*h-6*d*e*g+e^2*f))
*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e
^2)^(9/2)
```

Mathematica [A] (verified)

Time = 1.64 (sec) , antiderivative size = 682, normalized size of antiderivative = 1.15

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx =$$

$$-\frac{\frac{24a(e^2f-deg+d^2h)}{(d+ex)^5}+\frac{30a(eg-2dh)}{(d+ex)^4}+\frac{40ah}{(d+ex)^3}-\frac{bce\sqrt{1-c^2x^2}\left(6(c^2d^2-e^2)^3(e^2f-deg+d^2h)-2(-c^2d^2+e^2)^2(5e^2(eg-2dh)+c^2d(-\right.}{}}{}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

output
```
-1/120*((24*a*(e^2*f - d*e*g + d^2*h))/(d + e*x)^5 + (30*a*(e*g - 2*d*h))/
(d + e*x)^4 + (40*a*h)/(d + e*x)^3 - (b*c*e*Sqrt[1 - c^2*x^2]*(6*(c^2*d^2
- e^2)^3*(e^2*f - d*e*g + d^2*h) - 2*(-(c^2*d^2) + e^2)^2*(5*e^2*(e*g - 2*
d*h) + c^2*d*(-7*e^2*f + 2*d*e*g + 3*d^2*h))*(d + e*x) - (-(c^2*d^2) + e^2
)*(20*e^4*h - c^4*d^2*(-26*e^2*f + d*e*g + 4*d^2*h) + c^2*e^2*(9*e^2*f - 3
4*d*e*g + 19*d^2*h))*(d + e*x)^2 + 5*c^2*e*(c^4*d^3*(10*e*f + d*g) - 4*e^3
*(e*g - 5*d*h) + c^2*d*e*(11*e^2*f - 18*d*e*g + d^2*h))*(d + e*x)^3))/((-(
c^2*d^2) + e^2)^4*(d + e*x)^4) + (2*b*(2*d^2*h + d*e*(3*g + 10*h*x) + e^2*
(12*f + 5*x*(3*g + 4*h*x)))*ArcSin[c*x])/(d + e*x)^5 - (b*c^3*(20*e^6*h +
2*c^6*d^4*(12*e^2*f + 3*d*e*g + 2*d^2*h) - 3*c^4*d^2*e^2*(-24*e^2*f + 19*d
*e*g + 6*d^2*h) + 9*c^2*e^4*(e^2*f - 6*d*e*g + 11*d^2*h))*Log[d + e*x])/((
-(c*d) + e)^4*(c*d + e)^4*Sqrt[-(c^2*d^2) + e^2]) + (b*c^3*(20*e^6*h + 2*c
^6*d^4*(12*e^2*f + 3*d*e*g + 2*d^2*h) - 3*c^4*d^2*e^2*(-24*e^2*f + 19*d*e*
g + 6*d^2*h) + 9*c^2*e^4*(e^2*f - 6*d*e*g + 11*d^2*h))*Log[e + c^2*d*x + S
qrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^4*(c*d + e)^4*Sqrt
[-(c^2*d^2) + e^2]))/e^3
```

Rubi [A] (verified)

Time = 1.32 (sec) , antiderivative size = 630, normalized size of antiderivative = 1.06, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.462$, Rules used = {5252, 27, 2182, 27, 688, 27, 688, 25, 27, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int -\frac{2hd^2+3egd+20e^2hx^2+12e^2f+5e(3eg+2dh)x}{60e^3(d+ex)^5\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{2hd^2+3egd+20e^2hx^2+12e^2f+5e(3eg+2dh)x}{(d+ex)^5\sqrt{1-c^2x^2}}dx}{60e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \text{2182}$$

$$\frac{bc\left(\frac{\int -\frac{4\left(-d\left(2hd^2+3egd+12e^2f\right)c^2+5e^2(3eg-2dh)+e\left(\left(-11hd^2-9egd+9e^2f\right)c^2+20e^2h\right)x\right)}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{4(c^2d^2-e^2)}+\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}\right)}{60e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\int \frac{-d\left(2hd^2+3egd+12e^2f\right)c^2+5e^2(3eg-2dh)+e\left(\left(-11hd^2-9egd+9e^2f\right)c^2+20e^2h\right)x}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{60e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{\int -\frac{3\left(d^2\left(2hd^2+3egd+12e^2f\right)c^4+e^2\left(-hd^2-24egd+9e^2f\right)c^2+2e\left(5e^2(eg-2dh)-c^2d\left(-3hd^2-2egd+7e^2f\right)\right)xc^2+20e}{(d+ex)^3\sqrt{1-c^2x^2}}}{3\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right)}{60e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\int \frac{d^2\left(2hd^2+3egd+12e^2f\right)c^4+e^2\left(-hd^2-24egd+9e^2f\right)c^2+2e}{(d+ex)^3\sqrt{}}}{c^2d^2-}}{c^2d^2-e^2}\right)}{60e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \ 688$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\int -\frac{c^2(2(-d^3(2hd^2+3egd+12e^2f)c^4-de^2(-7hd^2-28egd+\cdots}{\cdots}}{\cdots}}{\cdots}\cdots\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \ 25$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2(19d^2h-34deg\cdots}{2\left(c^2d^2-e^2\right)(d+ex)^2}\cdots}{\cdots}}{\cdots}\cdots\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \ 27$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2(19d^2h-34deg\cdots}{2\left(c^2d^2-e^2\right)(d+ex)^2}\cdots}{\cdots}}{\cdots}\cdots\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \ 679$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2\left(19d^2h-34deg\right.\right.}{2\left(c^2d^2-e^2\right)(d+ex)^2}}{}}{}\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \; 488$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2\left(19d^2h-34deg\right.\right.}{2\left(c^2d^2-e^2\right)(d+ex)^2}}{}}{}\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \; 217$$

$$-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}+$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2\left(19d^2h-34deg\right.\right.}{2\left(c^2d^2-e^2\right)(d+ex)^2}}{}}{}\right.$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

output
```
-1/5*((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)^5) - ((e
*g - 2*d*h)*(a + b*ArcSin[c*x]))/(4*e^3*(d + e*x)^4) - (h*(a + b*ArcSin[c*
x]))/(3*e^3*(d + e*x)^3) + (b*c*((3*e*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2
*x^2])/((c^2*d^2 - e^2)*(d + e*x)^4) - ((e*(5*e^2*(e*g - 2*d*h) - c^2*d*(7
*e^2*f - 2*d*e*g - 3*d^2*h))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)
^3) - ((e*(20*e^4*h + c^4*d^2*(26*e^2*f - d*e*g - 4*d^2*h) + c^2*e^2*(9*e^
2*f - 34*d*e*g + 19*d^2*h))*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x
)^2) - (c^2*((-5*e^2*(c^4*d^3*(10*e*f + d*g) - 4*e^3*(e*g - 5*d*h) + c^2*d
*e*(11*e^2*f - 18*d*e*g + d^2*h))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d +
 e*x)) - ((20*e^6*h + 3*c^4*d^2*e^2*(24*e^2*f - 19*d*e*g - 6*d^2*h) + 2*c^
6*d^4*(12*e^2*f + 3*d*e*g + 2*d^2*h) + 9*c^2*e^4*(e^2*f - 6*d*e*g + 11*d^2
*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d
^2 - e^2)^(3/2)))/(2*(c^2*d^2 - e^2)))/(c^2*d^2 - e^2))/(c^2*d^2 - e^2)))/
(60*e^3)
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 2182

```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Qx = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
 d + e*x, x]}, Simp[e*R*(d + e*x)^(m + 1)*((a + b*x^2)^(p + 1)/((m + 1)*(b*
d^2 + a*e^2))), x] + Simp[1/((m + 1)*(b*d^2 + a*e^2))   Int[(d + e*x)^(m +
1)*(a + b*x^2)^p*ExpandToSum[(m + 1)*(b*d^2 + a*e^2)*Qx + b*d*R*(m + 1) - b
*e*R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, d, e, p}, x] && PolyQ[Pq,
 x] && NeQ[b*d^2 + a*e^2, 0] && LtQ[m, -1]
```

rule 5252

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3207 vs. 2(563) = 1126.

Time = 0.28 (sec) , antiderivative size = 3208, normalized size of antiderivative = 5.41

method	result	size
parts	Expression too large to display	3208
derivativedivides	Expression too large to display	3219
default	Expression too large to display	3219

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/5*(d^2*h-d*e*g+e^2*f)/e^3/(e*x+d)^5-1/4*(-2*d*h+e*g)/e^3/(e*x+d)^4-1
/3*h/e^3/(e*x+d)^3)+b/c*(1/2*c^5*arcsin(c*x)/e^3/(c*e*x+c*d)^4*d*h-1/4*c^5
*arcsin(c*x)/e^2/(c*e*x+c*d)^4*g-1/5*c^6*arcsin(c*x)/e^3/(c*e*x+c*d)^5*d^2
*h+1/5*c^6*arcsin(c*x)/e^2/(c*e*x+c*d)^5*d*g-1/5*c^6*arcsin(c*x)/e/(c*e*x+
c*d)^5*f-1/3*c^4*arcsin(c*x)*h/e^3/(c*e*x+c*d)^3+1/60*c^4/e^3*(20*h/e^3*(1
/2/(c^2*d^2-e^2)*e^2/(c*x+c*d/e)^2*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^
2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+c*
d/e)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c
^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c
*x+c*d/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)
-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+c*d/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-
e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+c*d/e)+2*(-(c^2*d^2-
e^2)/e^2)^(1/2)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/
2))/(c*x+c*d/e)))-15*c*(2*d*h-e*g)/e^4*(1/3/(c^2*d^2-e^2)*e^2/(c*x+c*d/e)^
3*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2)+5/3*d*c*e/(
c^2*d^2-e^2)*(1/2/(c^2*d^2-e^2)*e^2/(c*x+c*d/e)^2*(-(c*x+c*d/e)^2+2*d*c/e*
(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e
^2)*e^2/(c*x+c*d/e)*(-(c*x+c*d/e)^2+2*d*c/e*(c*x+c*d/e)-(c^2*d^2-e^2)/e^2)
^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)
/e^2+2*d*c/e*(c*x+c*d/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+c*d/e)^2+2...
```

Fricas [F(-1)]

Timed out.

$$\int \frac{(f + gx + hx^2)(a + b\arcsin(cx))}{(d + ex)^6} \, dx = \text{Timed out}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="fricas")
```

output
```
Timed out
```

Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^6}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**6,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**6, x)
```

Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^6}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="maxima")
```

output
```
-1/20*(5*e*x + d)*a*g/(e^7*x^5 + 5*d*e^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4
*x^2 + 5*d^4*e^3*x + d^5*e^2) - 1/30*(10*e^2*x^2 + 5*d*e*x + d^2)*a*h/(e^8
*x^5 + 5*d*e^7*x^4 + 10*d^2*e^6*x^3 + 10*d^3*e^5*x^2 + 5*d^4*e^4*x + d^5*e
^3) - 1/5*a*f/(e^6*x^5 + 5*d*e^5*x^4 + 10*d^2*e^4*x^3 + 10*d^3*e^3*x^2 + 5
*d^4*e^2*x + d^5*e) - 1/60*((20*b*e^2*h*x^2 + 12*b*e^2*f + 3*b*d*e*g + 2*b
*d^2*h + 5*(3*b*e^2*g + 2*b*d*e*h)*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) + 60*(e^8*x^5 + 5*d*e^7*x^4 + 10*d^2*e^6*x^3 + 10*d^3*e^5*x^2 + 5*d
^4*e^4*x + d^5*e^3)*integrate(1/60*(20*b*c*e^2*h*x^2 + 12*b*c*e^2*f + 3*b*
c*d*e*g + 2*b*c*d^2*h + 5*(3*b*c*e^2*g + 2*b*c*d*e*h)*x)*e^(1/2*log(c*x +
1) + 1/2*log(-c*x + 1))/(c^4*e^8*x^9 + 5*c^4*d*e^7*x^8 - 5*c^2*d^4*e^4*x^3
 - c^2*d^5*e^3*x^2 + (10*c^4*d^2*e^6 - c^2*e^8)*x^7 + 5*(2*c^4*d^3*e^5 - c
^2*d*e^7)*x^6 + 5*(c^4*d^4*e^4 - 2*c^2*d^2*e^6)*x^5 + (c^4*d^5*e^3 - 10*c^
2*d^3*e^5)*x^4 + (c^2*e^8*x^7 + 5*c^2*d*e^7*x^6 - 5*d^4*e^4*x - d^5*e^3 +
(10*c^2*d^2*e^6 - e^8)*x^5 + 5*(2*c^2*d^3*e^5 - d*e^7)*x^4 + 5*(c^2*d^4*e^
4 - 2*d^2*e^6)*x^3 + (c^2*d^5*e^3 - 10*d^3*e^5)*x^2)*e^(log(c*x + 1) + log
(-c*x + 1))), x))/(e^8*x^5 + 5*d*e^7*x^4 + 10*d^2*e^6*x^3 + 10*d^3*e^5*x^2
 + 5*d^4*e^4*x + d^5*e^3)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{(d+e\,x)^6}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^6,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^6, x)
```

Reduce [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(h\,x^2+gx+f)\,(asin(cx)\,b+a)}{(ex+d)^6}dx$$

input
```
int((h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^6,x)
```

output
```
int((h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^6,x)
```

3.170 $\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx)) \, dx$

Optimal result

Integrand size = 31, antiderivative size = 689

$$\begin{aligned}
&\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx)) \, dx \\
&= \frac{b(105c^6d^3f+35c^4d(3e^2f+3deg+d^2h)+15e^3i+21c^2e(e^2g+3deh+3d^2i))\sqrt{1-c^2x^2}}{105c^7} \\
&+ \frac{b(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\,x\sqrt{1-c^2x^2}}{96c^5} \\
&+ \frac{b(5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\,x^3\sqrt{1-c^2x^2}}{144c^3} \\
&+ \frac{be^2(eh+3di)x^5\sqrt{1-c^2x^2}}{36c} \\
&- \frac{b(35c^4d(3e^2f+3deg+d^2h)+45e^3i+42c^2e(e^2g+3deh+3d^2i))\left(1-c^2x^2\right)^{3/2}}{315c^7} \\
&+ \frac{be(15e^2i+7c^2(e^2g+3deh+3d^2i))\left(1-c^2x^2\right)^{5/2}}{175c^7} - \frac{be^3i\left(1-c^2x^2\right)^{7/2}}{49c^7} \\
&- \frac{b(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\arcsin(cx)}{96c^6} \\
&+ d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))+
\end{aligned}$$

output
```
1/105*b*(105*c^6*d^3*f+35*c^4*d*(d^2*h+3*d*e*g+3*e^2*f)+15*e^3*i+21*c^2*e*
(3*d^2*i+3*d*e*h+e^2*g))*(-c^2*x^2+1)^(1/2)/c^7+1/96*b*(24*c^4*d^2*(d*g+3*
e*f)+5*e^2*(3*d*i+e*h)+9*c^2*(d^3*i+3*d^2*e*h+3*d*e^2*g+e^3*f))*x*(-c^2*x^
2+1)^(1/2)/c^5+1/144*b*(5*e^2*(3*d*i+e*h)+9*c^2*(d^3*i+3*d^2*e*h+3*d*e^2*g
+e^3*f))*x^3*(-c^2*x^2+1)^(1/2)/c^3+1/36*b*e^2*(3*d*i+e*h)*x^5*(-c^2*x^2+1
)^(1/2)/c-1/315*b*(35*c^4*d*(d^2*h+3*d*e*g+3*e^2*f)+45*e^3*i+42*c^2*e*(3*d
^2*i+3*d*e*h+e^2*g))*(-c^2*x^2+1)^(3/2)/c^7+1/175*b*e*(15*e^2*i+7*c^2*(3*d
^2*i+3*d*e*h+e^2*g))*(-c^2*x^2+1)^(5/2)/c^7-1/49*b*e^3*i*(-c^2*x^2+1)^(7/2
)/c^7-1/96*b*(24*c^4*d^2*(d*g+3*e*f)+5*e^2*(3*d*i+e*h)+9*c^2*(d^3*i+3*d^2*
e*h+3*d*e^2*g+e^3*f))*arcsin(c*x)/c^6+d^3*f*x*(a+b*arcsin(c*x))+1/2*d^2*(d
*g+3*e*f)*x^2*(a+b*arcsin(c*x))+1/3*d*(d^2*h+3*d*e*g+3*e^2*f)*x^3*(a+b*arc
sin(c*x))+1/4*(d^3*i+3*d^2*e*h+3*d*e^2*g+e^3*f)*x^4*(a+b*arcsin(c*x))+1/5*
e*(3*d^2*i+3*d*e*h+e^2*g)*x^5*(a+b*arcsin(c*x))+1/6*e^2*(3*d*i+e*h)*x^6*(a
+b*arcsin(c*x))+1/7*e^3*i*x^7*(a+b*arcsin(c*x))
```

Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 619, normalized size of antiderivative = 0.90

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = ad^3fx+\frac{1}{2}ad^2(3ef+dg)x^2 + \frac{1}{3}ad\left(3e^2f+3deg+d^2h\right)x^3+\frac{1}{4}a\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4 + \frac{1}{5}ae\left(e^2g+3deh+3d^2i\right)x^5+\frac{1}{6}ae^2(eh+3di)x^6+\frac{1}{7}ae^3ix^7 + \frac{b\sqrt{1-c^2x^2}(23040e^3i+3c^2e(37632d^2i+147de(256h+125ix)+e^2(12544g+5x(1225h+768ix)))+}{} - \frac{b(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\arcsin(cx)}{96c^6} + \frac{1}{420}bx\left(35d^3(12f+x(6g+x(4h+3ix)))+21d^2ex(30f+x(20g+3x(5h+4ix))) + 21de^2x^2(20f+x(15g+2x(6h+5ix))) + e^3x^3(105f+2x(42g+5x(7h+6ix)))\right)\arcsin(cx)$$

input
```
Integrate[(d + e*x)^3*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
a*d^3*f*x + (a*d^2*(3*e*f + d*g)*x^2)/2 + (a*d*(3*e^2*f + 3*d*e*g + d^2*h)
*x^3)/3 + (a*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i)*x^4)/4 + (a*e*(e^2*g
+ 3*d*e*h + 3*d^2*i)*x^5)/5 + (a*e^2*(e*h + 3*d*i)*x^6)/6 + (a*e^3*i*x^7)/
7 + (b*Sqrt[1 - c^2*x^2]*(23040*e^3*i + 3*c^2*e*(37632*d^2*i + 147*d*e*(25
6*h + 125*i*x) + e^2*(12544*g + 5*x*(1225*h + 768*i*x))) + c^4*(1225*d^3*(
64*h + 27*i*x) + 147*d^2*e*(1600*g + 675*h*x + 384*i*x^2) + 147*d*e^2*(160
0*f + x*(675*g + 384*h*x + 250*i*x^2)) + e^3*x*(33075*f + 2*x*(9408*g + 61
25*h*x + 4320*i*x^2))) + 2*c^6*(1225*d^3*(144*f + x*(36*g + x*(16*h + 9*i*
x))) + 147*d^2*e*x*(900*f + x*(400*g + 9*x*(25*h + 16*i*x))) + 147*d*e^2*x
^2*(400*f + x*(225*g + 4*x*(36*h + 25*i*x))) + e^3*x^3*(11025*f + 4*x*(176
4*g + 25*x*(49*h + 36*i*x))))))/(352800*c^7) - (b*(24*c^4*d^2*(3*e*f + d*g
) + 5*e^2*(e*h + 3*d*i) + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))*A
rcSin[c*x])/(96*c^6) + (b*x*(35*d^3*(12*f + x*(6*g + x*(4*h + 3*i*x))) + 2
1*d^2*e*x*(30*f + x*(20*g + 3*x*(5*h + 4*i*x))) + 21*d*e^2*x^2*(20*f + x*(
15*g + 2*x*(6*h + 5*i*x))) + e^3*x^3*(105*f + 2*x*(42*g + 5*x*(7*h + 6*i*x
))))*ArcSin[c*x])/420
```

Rubi [A] (verified)

Time = 4.18 (sec) , antiderivative size = 729, normalized size of antiderivative = 1.06, number of steps used = 17, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.548$, Rules used = {5248, 27, 2340, 25, 2340, 27, 2340, 25, 2340, 27, 2340, 25, 27, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^3(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)\,dx$$

$$\Big\downarrow \text{5248}$$

$$-bc\int \frac{x(35(12f+x(6g+x(4h+3ix)))d^3+21ex(30f+x(20g+3x(5h+4ix)))d^2+21e^2x^2(20f+x(15g+2x$$
$$420\sqrt{1-c^2x^2}$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+ b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+ b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+ b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{420}bc\int \frac{x\left(35(12f+x(6g+x(4h+3ix)))d^3+21ex(30f+x(20g+3x(5h+4ix)))d^2+21e^2x^2(20f+x(15g+\right.}{\sqrt{1-c^2x^2}}$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{420}bc\left(-\frac{\int -\frac{x\left(490c^2e^2(eh+3di)x^5+12e\left(49\left(3id^2+3ehd+e^2g\right)c^2+30e^2i\right)x^4+735c^2\left(id^3+3ehd^2+3e^2gd+e^3f\right)x^3+980c^2d\left(hd^2+3egd+3e^2\right.}{\sqrt{1-c^2x^2}}}{7c^2}\right.$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{420}bc\left(\frac{\int \frac{x\left(490c^2e^2(eh+3di)x^5+12e\left(49\left(3id^2+3ehd+e^2g\right)c^2+30e^2i\right)x^4+735c^2\left(id^3+3ehd^2+3e^2gd+e^3f\right)x^3+980c^2d\left(hd^2+3egd+3e^2f\right)x^2\right.}{\sqrt{1-c^2x^2}}}{7c^2}\right.$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{420}bc\left(\frac{-\frac{\int -\frac{2x\left(2940d\left(hd^2+3egd+3e^2f\right)x^2c^4+8820d^3fc^4+4410d^2(3ef+dg)xc^4+36e\left(49\left(3id^2+3ehd+e^2g\right)c^2+30e^2i\right)x^4c^2+245\left(9\left(id^3+3ehd^2+3e^2gd\right.\right.}{\sqrt{1-c^2x^2}}}{6c^2}}{7c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{420}bc\left(\frac{\frac{\int \frac{x\left(2940d\left(hd^2+3egd+3e^2f\right)x^2c^4+8820d^3fc^4+4410d^2(3ef+dg)xc^4+36e\left(49\left(3id^2+3ehd+e^2g\right)c^2+30e^2i\right)x^4c^2+245\left(9\left(id^3+3ehd^2+3e^2gd+e^3f\right)\right.}{\sqrt{1-c^2x^2}}}{3c^2}}{7c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{420}bc\left(\frac{\frac{-\frac{\int -\frac{x\left(44100d^3fc^6+22050d^2(3ef+dg)xc^6+1225\left(9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)x^3c^4+12\left(1225d\left(hd^2+3egd+3e^2f\right)c^4+588e\left(3id^2\right.\right.}{\sqrt{1-c^2x^2}}}{5c^2}}{3c^2}}{7c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{\int \frac{x\left(44100d^3fc^6+22050d^2(3ef+dg)xc^6+1225\left(9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)x^3c^4+12\left(1225d\left(hd^2+3egd+3e^2f\right)c^4+588e\left(3id^2+3e\cdots\right.\right.\right.}{\sqrt{1-c^2x^2}}}{5c^2}\cdots}{3c^2}\cdots}{7c^2}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \ 2340$$

$$-\frac{1}{420}bc\left(\frac{\frac{-\frac{\int -\frac{3x\left(58800d^3fc^8+16\left(1225d\left(hd^2+3egd+3e^2f\right)c^4+588e\left(3id^2+3ehd+e^2g\right)c^2+360e^3i\right)x^2c^4+1225\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e\cdots\right.\right.\right.}{\sqrt{1-c^2x^2}}}{4c^2}\cdots}{5c^2}\cdots}{\cdots}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \ 27$$

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{3\int \frac{x\left(58800d^3fc^8+16\left(1225d\left(hd^2+3egd+3e^2f\right)c^4+588e\left(3id^2+3ehd+e^2g\right)c^2+360e^3i\right)x^2c^4+1225\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)\cdots\right.\right.}{\sqrt{1-c^2x^2}}}{4c^2}\cdots}{5c^2}\cdots}{\cdots}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \ 2340$$

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{3\left(-\frac{\int -\frac{c^4x\left(3675\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)xc^2+16\left(11025d^3fc^6+2450d\left(hd^2+3egd+3e^2f\right)c^4+1176e\left(3id\cdots\right.\right.\right.}{\sqrt{1-c^2x^2}}}{3c^2}\cdots\right.}{4c^2}\cdots}{\cdots}}{\cdots}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{3\left(\frac{\int \frac{c^4x\left(3675\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)xc^2+16\left(11025d^3fc^6+2450d\left(hd^2+3egd+3e^2f\right)c^4+1176e\left(3id^2+3\cdots\right.\right.\right.}{\sqrt{1-c^2x^2}}}{3c^2}\cdots\right.}{4c^2}\cdots}{\cdots}}{\cdots}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{3\left(\frac{1}{3}c^2\int\frac{x\left(3675\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)xc^2+16\left(11025d^3fc^6+2450d\left(hd^2+3egd+3e^2f\right)c^4+1176e\left(3id^2\cdots\right.\right.\right.}{\sqrt{1-c^2x^2}}\cdots\right.}{\cdots}}{4c^2}\cdots}{\cdots}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$\downarrow$ 533

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{\int\frac{c^2\left(3675\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)+32\left(11025d^3fc^6+2450d\left(hd^2+3egd+3e^2f\right)c^4+1176e\left(3id^2+\cdots\right.\right.\right.}{\sqrt{1-c^2x^2}}}{2c^2}\cdots\right.\right.}{\cdots}}{\cdots}}{\cdots}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$\downarrow$ 27

$$-\frac{1}{420}bc\left(\frac{3\left(\frac{1}{3}c^2\left(\frac{1}{2}\int\frac{3675\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)+32\left(11025d^3fc^6+2450d\left(hd^2+3egd+3e^2f\right)c^4+1176e\left(3id^2+3\right.\right.}{\sqrt{1-c^2x^2}}\right.\right.}{}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 455$$

$$-\frac{1}{420}bc\left(\frac{3\left(\frac{1}{3}c^2\left(\frac{1}{2}\left(3675\left(24c^4d^2(dg+3ef)+9c^2\left(d^3i+3d^2eh+3de^2g+e^3f\right)+5e^2(3di+eh)\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-\frac{32\sqrt{1-c^2x^2}\left(11025c^6d^3f+2450c^4d\left(d^2h+3de\right.\right.}{}\right.\right.\right.}{}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 223$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))-$$

$$\frac{1}{420}bc\left(\frac{3\left(\frac{1}{3}c^2\left(\frac{1}{2}\left(\frac{3675\arcsin(cx)\left(24c^4d^2(dg+3ef)+9c^2\left(d^3i+3d^2eh+3de^2g+e^3f\right)+5e^2(3di+eh)\right)}{c}-\frac{32\sqrt{1-c^2x^2}\left(11025c^6d^3f+2450c^4d\left(d^2h+3deg+3e^2\right.\right.}{c^2}\right.\right.\right.}{}\right.$$

input
```
Int[(d + e*x)^3*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
d^3*f*x*(a + b*ArcSin[c*x]) + (d^2*(3*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/
2 + (d*(3*e^2*f + 3*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e^3*f +
3*d*e^2*g + 3*d^2*e*h + d^3*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*(e^2*g + 3*
d*e*h + 3*d^2*i)*x^5*(a + b*ArcSin[c*x]))/5 + (e^2*(e*h + 3*d*i)*x^6*(a +
b*ArcSin[c*x]))/6 + (e^3*i*x^7*(a + b*ArcSin[c*x]))/7 - (b*c*((-60*e^3*i*x
^6*Sqrt[1 - c^2*x^2])/(7*c^2) + ((-245*e^2*(e*h + 3*d*i)*x^5*Sqrt[1 - c^2*
x^2])/3 + ((-36*e*(30*e^2*i + 49*c^2*(e^2*g + 3*d*e*h + 3*d^2*i))*x^4*Sqrt
[1 - c^2*x^2])/5 + ((-1225*c^2*(5*e^2*(e*h + 3*d*i) + 9*c^2*(e^3*f + 3*d*e
^2*g + 3*d^2*e*h + d^3*i))*x^3*Sqrt[1 - c^2*x^2])/4 + (3*((-16*c^2*(1225*c
^4*d*(3*e^2*f + 3*d*e*g + d^2*h) + 360*e^3*i + 588*c^2*e*(e^2*g + 3*d*e*h
+ 3*d^2*i))*x^2*Sqrt[1 - c^2*x^2])/3 + (c^2*((-3675*(24*c^4*d^2*(3*e*f + d
*g) + 5*e^2*(e*h + 3*d*i) + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))
*x*Sqrt[1 - c^2*x^2])/2 + ((-32*(11025*c^6*d^3*f + 2450*c^4*d*(3*e^2*f + 3
*d*e*g + d^2*h) + 720*e^3*i + 1176*c^2*e*(e^2*g + 3*d*e*h + 3*d^2*i))*Sqrt
[1 - c^2*x^2])/c^2 + (3675*(24*c^4*d^2*(3*e*f + d*g) + 5*e^2*(e*h + 3*d*i)
 + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))*ArcSin[c*x])/c)/2))/3))/
(4*c^2))/(5*c^2))/(3*c^2))/(7*c^2)))/420
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.29 (sec) , antiderivative size = 802, normalized size of antiderivative = 1.16

method	result
parts	$a\left(\frac{e^3 i x^7}{7}+\frac{(3d e^2 i+e^3 h)x^6}{6}+\frac{(3d^2 e i+3d e^2 h+e^3 g)x^5}{5}+\frac{(d^3 i+3d^2 e h+3d e^2 g+e^3 f)x^4}{4}+\frac{(d^3 h+3d^2 e g+3d e^2 f}{3}\right.$
derivativedivides	$\frac{a\left(\frac{e^3 i c^7 x^7}{7}+\frac{(3cd e^2 i+e^3 ch)c^6 x^6}{6}+\frac{(3c^2 d^2 e i+3c^2 d e^2 h+e^3 c^2 g)c^5 x^5}{5}+\frac{(c^3 d^3 i+3c^3 d^2 e h+3c^3 d e^2 g+e^3 f c^3)c^4 x^4}{4}+\frac{(c^4 d^3 h+3c^4}{}\right.}{c^6}$
default	$\frac{a\left(\frac{e^3 i c^7 x^7}{7}+\frac{(3cd e^2 i+e^3 ch)c^6 x^6}{6}+\frac{(3c^2 d^2 e i+3c^2 d e^2 h+e^3 c^2 g)c^5 x^5}{5}+\frac{(c^3 d^3 i+3c^3 d^2 e h+3c^3 d e^2 g+e^3 f c^3)c^4 x^4}{4}+\frac{(c^4 d^3 h+3c^4}{}\right.}{c^6}$
orering	Expression too large to display

input
```
int((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOS
E)
```

output
```
a*(1/7*e^3*i*x^7+1/6*(3*d*e^2*i+e^3*h)*x^6+1/5*(3*d^2*e*i+3*d*e^2*h+e^3*g)
*x^5+1/4*(d^3*i+3*d^2*e*h+3*d*e^2*g+e^3*f)*x^4+1/3*(d^3*h+3*d^2*e*g+3*d*e^
2*f)*x^3+1/2*(d^3*g+3*d^2*e*f)*x^2+d^3*f*x)+b/c*(1/7*c*arcsin(c*x)*e^3*i*x
^7+1/2*c*arcsin(c*x)*x^6*d*e^2*i+1/6*c*arcsin(c*x)*e^3*h*x^6+3/5*c*arcsin(
c*x)*x^5*d^2*e*i+3/5*c*arcsin(c*x)*x^5*d*e^2*h+1/5*c*arcsin(c*x)*x^5*e^3*g
+1/4*c*arcsin(c*x)*x^4*d^3*i+3/4*c*arcsin(c*x)*x^4*d^2*e*h+3/4*c*arcsin(c*
x)*x^4*d*e^2*g+1/4*c*arcsin(c*x)*x^4*e^3*f+1/3*c*arcsin(c*x)*x^3*d^3*h+c*a
rcsin(c*x)*x^3*d^2*e*g+c*arcsin(c*x)*x^3*d*e^2*f+1/2*c*arcsin(c*x)*x^2*d^3
*g+3/2*c*arcsin(c*x)*x^2*d^2*e*f+arcsin(c*x)*d^3*f*c*x-1/420/c^6*(210*c^5*
d^2*(d*g+3*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+70*c*e^2*(3*
d*i+e*h)*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-
5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))+140*c^4*d*(d^2*h+3*d*e*g+3*e
^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+84*c^2*e*(3
*d^2*i+3*d*e*h+e^2*g)*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*
x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+105*c^3*(d^3*i+3*d^2*e*h+3*d*e^2*g+e
^3*f)*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcs
in(c*x))+60*e^3*i*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+
1)^(1/2)-8/35*c^2*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))-420*d^3
*c^6*f*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 936, normalized size of antiderivative = 1.36

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fr
icas")
```

output
```
1/352800*(50400*a*c^7*e^3*i*x^7 + 352800*a*c^7*d^3*f*x + 58800*(a*c^7*e^3*
h + 3*a*c^7*d*e^2*i)*x^6 + 70560*(a*c^7*e^3*g + 3*a*c^7*d*e^2*h + 3*a*c^7*
d^2*e*i)*x^5 + 88200*(a*c^7*e^3*f + 3*a*c^7*d*e^2*g + 3*a*c^7*d^2*e*h + a*
c^7*d^3*i)*x^4 + 117600*(3*a*c^7*d*e^2*f + 3*a*c^7*d^2*e*g + a*c^7*d^3*h)*
x^3 + 176400*(3*a*c^7*d^2*e*f + a*c^7*d^3*g)*x^2 + 105*(480*b*c^7*e^3*i*x^
7 + 3360*b*c^7*d^3*f*x + 560*(b*c^7*e^3*h + 3*b*c^7*d*e^2*i)*x^6 + 672*(b*
c^7*e^3*g + 3*b*c^7*d*e^2*h + 3*b*c^7*d^2*e*i)*x^5 + 840*(b*c^7*e^3*f + 3*
b*c^7*d*e^2*g + 3*b*c^7*d^2*e*h + b*c^7*d^3*i)*x^4 + 1120*(3*b*c^7*d*e^2*f
 + 3*b*c^7*d^2*e*g + b*c^7*d^3*h)*x^3 + 1680*(3*b*c^7*d^2*e*f + b*c^7*d^3*
g)*x^2 - 315*(8*b*c^5*d^2*e + b*c^3*e^3)*f - 105*(8*b*c^5*d^3 + 9*b*c^3*d*
e^2)*g - 35*(27*b*c^3*d^2*e + 5*b*c*e^3)*h - 105*(3*b*c^3*d^3 + 5*b*c*d*e^
2)*i)*arcsin(c*x) + (7200*b*c^6*e^3*i*x^6 + 9800*(b*c^6*e^3*h + 3*b*c^6*d*
e^2*i)*x^5 + 288*(49*b*c^6*e^3*g + 147*b*c^6*d*e^2*h + 3*(49*b*c^6*d^2*e +
 10*b*c^4*e^3)*i)*x^4 + 2450*(9*b*c^6*e^3*f + 27*b*c^6*d*e^2*g + (27*b*c^6
*d^2*e + 5*b*c^4*e^3)*h + 3*(3*b*c^6*d^3 + 5*b*c^4*d*e^2)*i)*x^3 + 32*(367
5*b*c^6*d*e^2*f + 147*(25*b*c^6*d^2*e + 4*b*c^4*e^3)*g + 49*(25*b*c^6*d^3
+ 36*b*c^4*d*e^2)*h + 36*(49*b*c^4*d^2*e + 10*b*c^2*e^3)*i)*x^2 + 117600*(
3*b*c^6*d^3 + 2*b*c^4*d*e^2)*f + 9408*(25*b*c^4*d^2*e + 4*b*c^2*e^3)*g + 3
136*(25*b*c^4*d^3 + 36*b*c^2*d*e^2)*h + 2304*(49*b*c^2*d^2*e + 10*b*e^3)*i
 + 3675*(9*(8*b*c^6*d^2*e + b*c^4*e^3)*f + 3*(8*b*c^6*d^3 + 9*b*c^4*d*e...
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1809 vs. $2(694) = 1388$.

Time = 0.89 (sec) , antiderivative size = 1809, normalized size of antiderivative = 2.63

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)**3*(i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**3*f*x + a*d**3*g*x**2/2 + a*d**3*h*x**3/3 + a*d**3*i*x**4/
4 + 3*a*d**2*e*f*x**2/2 + a*d**2*e*g*x**3 + 3*a*d**2*e*h*x**4/4 + 3*a*d**2
*e*i*x**5/5 + a*d*e**2*f*x**3 + 3*a*d*e**2*g*x**4/4 + 3*a*d*e**2*h*x**5/5
+ a*d*e**2*i*x**6/2 + a*e**3*f*x**4/4 + a*e**3*g*x**5/5 + a*e**3*h*x**6/6
+ a*e**3*i*x**7/7 + b*d**3*f*x*asin(c*x) + b*d**3*g*x**2*asin(c*x)/2 + b*d
**3*h*x**3*asin(c*x)/3 + b*d**3*i*x**4*asin(c*x)/4 + 3*b*d**2*e*f*x**2*asi
n(c*x)/2 + b*d**2*e*g*x**3*asin(c*x) + 3*b*d**2*e*h*x**4*asin(c*x)/4 + 3*b
*d**2*e*i*x**5*asin(c*x)/5 + b*d*e**2*f*x**3*asin(c*x) + 3*b*d*e**2*g*x**4
*asin(c*x)/4 + 3*b*d*e**2*h*x**5*asin(c*x)/5 + b*d*e**2*i*x**6*asin(c*x)/2
 + b*e**3*f*x**4*asin(c*x)/4 + b*e**3*g*x**5*asin(c*x)/5 + b*e**3*h*x**6*a
sin(c*x)/6 + b*e**3*i*x**7*asin(c*x)/7 + b*d**3*f*sqrt(-c**2*x**2 + 1)/c +
 b*d**3*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**3*h*x**2*sqrt(-c**2*x**2 + 1
)/(9*c) + b*d**3*i*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d**2*e*f*x*sqrt(
-c**2*x**2 + 1)/(4*c) + b*d**2*e*g*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d
**2*e*h*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d**2*e*i*x**4*sqrt(-c**2*x*
*2 + 1)/(25*c) + b*d*e**2*f*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d*e**2*g
*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d*e**2*h*x**4*sqrt(-c**2*x**2 + 1)
/(25*c) + b*d*e**2*i*x**5*sqrt(-c**2*x**2 + 1)/(12*c) + b*e**3*f*x**3*sqrt
(-c**2*x**2 + 1)/(16*c) + b*e**3*g*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e*
*3*h*x**5*sqrt(-c**2*x**2 + 1)/(36*c) + b*e**3*i*x**6*sqrt(-c**2*x**2 +...
```

Maxima [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 1231, normalized size of antiderivative = 1.79

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="ma
xima")
```

output
```
1/7*a*e^3*i*x^7 + 1/6*a*e^3*h*x^6 + 1/2*a*d*e^2*i*x^6 + 1/5*a*e^3*g*x^5 +
3/5*a*d*e^2*h*x^5 + 3/5*a*d^2*e*i*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^
4 + 3/4*a*d^2*e*h*x^4 + 1/4*a*d^3*i*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 +
1/3*a*d^3*h*x^3 + 3/2*a*d^2*e*f*x^2 + 1/2*a*d^3*g*x^2 + 3/4*(2*x^2*arcsin(
c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e*f + 1/3*(3*
x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4
))*b*d*e^2*f + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3
*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3*f + 1/4*(2*x^2*arc
sin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3*g + 1/3*(
3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c
^4))*b*d^2*e*g + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 +
 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e^2*g + 1/75*(15*x
^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/
c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^3*g + 1/9*(3*x^3*arcsin(c*x) + c*(s
qrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^3*h + 3/32*(8*x
^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^
4 - 3*arcsin(c*x)/c^5)*c)*b*d^2*e*h + 1/25*(15*x^5*arcsin(c*x) + (3*sqrt(-
c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)
/c^6)*c)*b*d*e^2*h + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5
/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15...
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2010 vs. $2(647) = 1294$.

Time = 0.18 (sec) , antiderivative size = 2010, normalized size of antiderivative = 2.92

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="gi
ac")
```

output
```
1/7*a*e^3*i*x^7 + 1/6*a*e^3*h*x^6 + 1/2*a*d*e^2*i*x^6 + 1/5*a*e^3*g*x^5 +
3/5*a*d*e^2*h*x^5 + 3/5*a*d^2*e*i*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^
4 + 3/4*a*d^2*e*h*x^4 + 1/4*a*d^3*i*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 +
1/3*a*d^3*h*x^3 + b*d^3*f*x*arcsin(c*x) + a*d^3*f*x + (c^2*x^2 - 1)*b*d*e^
2*f*x*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/3*(c
^2*x^2 - 1)*b*d^3*h*x*arcsin(c*x)/c^2 + 3/4*sqrt(-c^2*x^2 + 1)*b*d^2*e*f*x
/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d^3*g*x/c + 3/2*(c^2*x^2 - 1)*b*d^2*e*f*arcs
in(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^3*g*arcsin(c*x)/c^2 + b*d*e^2*f*x*arcs
in(c*x)/c^2 + b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e^3*g*x*
arcsin(c*x)/c^4 + 1/3*b*d^3*h*x*arcsin(c*x)/c^2 + 3/5*(c^2*x^2 - 1)^2*b*d*
e^2*h*x*arcsin(c*x)/c^4 + 3/5*(c^2*x^2 - 1)^2*b*d^2*e*i*x*arcsin(c*x)/c^4
+ sqrt(-c^2*x^2 + 1)*b*d^3*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e^3*f*x/c^3 -
 3/16*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*g*x/c^3 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d
^2*e*h*x/c^3 - 1/16*(-c^2*x^2 + 1)^(3/2)*b*d^3*i*x/c^3 + 3/2*(c^2*x^2 - 1)
*a*d^2*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d^3*g/c^2 + 3/4*b*d^2*e*f*arcsin(c*x)
/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e^3*f*arcsin(c*x)/c^4 + 1/4*b*d^3*g*arcsin(c*
x)/c^2 + 3/4*(c^2*x^2 - 1)^2*b*d*e^2*g*arcsin(c*x)/c^4 + 3/4*(c^2*x^2 - 1)
^2*b*d^2*e*h*arcsin(c*x)/c^4 + 1/4*(c^2*x^2 - 1)^2*b*d^3*i*arcsin(c*x)/c^4
 + 2/5*(c^2*x^2 - 1)*b*e^3*g*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b*d*e^2
*h*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b*d^2*e*i*x*arcsin(c*x)/c^4 + ...
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(d+e\,x)^3\,\left(i\,x^3+h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2 + i*x^3),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2 + i*x^3), x)
```

Reduce [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 1449, normalized size of antiderivative = 2.10

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input

```
int((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*asin(c*x)),x)
```

output

```
(352800*asin(c*x)*b*c**7*d**3*f*x + 176400*asin(c*x)*b*c**7*d**3*g*x**2 +
117600*asin(c*x)*b*c**7*d**3*h*x**3 + 88200*asin(c*x)*b*c**7*d**3*i*x**4 +
 529200*asin(c*x)*b*c**7*d**2*e*f*x**2 + 352800*asin(c*x)*b*c**7*d**2*e*g*
x**3 + 264600*asin(c*x)*b*c**7*d**2*e*h*x**4 + 211680*asin(c*x)*b*c**7*d**
2*e*i*x**5 + 352800*asin(c*x)*b*c**7*d*e**2*f*x**3 + 264600*asin(c*x)*b*c*
*7*d*e**2*g*x**4 + 211680*asin(c*x)*b*c**7*d*e**2*h*x**5 + 176400*asin(c*x
)*b*c**7*d*e**2*i*x**6 + 88200*asin(c*x)*b*c**7*e**3*f*x**4 + 70560*asin(c
*x)*b*c**7*e**3*g*x**5 + 58800*asin(c*x)*b*c**7*e**3*h*x**6 + 50400*asin(c
*x)*b*c**7*e**3*i*x**7 - 88200*asin(c*x)*b*c**5*d**3*g - 264600*asin(c*x)*
b*c**5*d**2*e*f - 33075*asin(c*x)*b*c**3*d**3*i - 99225*asin(c*x)*b*c**3*d
**2*e*h - 99225*asin(c*x)*b*c**3*d*e**2*g - 33075*asin(c*x)*b*c**3*e**3*f
- 55125*asin(c*x)*b*c*d*e**2*i - 18375*asin(c*x)*b*c*e**3*h + 352800*sqrt(
 - c**2*x**2 + 1)*b*c**6*d**3*f + 88200*sqrt( - c**2*x**2 + 1)*b*c**6*d**3
*g*x + 39200*sqrt( - c**2*x**2 + 1)*b*c**6*d**3*h*x**2 + 22050*sqrt( - c**
2*x**2 + 1)*b*c**6*d**3*i*x**3 + 264600*sqrt( - c**2*x**2 + 1)*b*c**6*d**2
*e*f*x + 117600*sqrt( - c**2*x**2 + 1)*b*c**6*d**2*e*g*x**2 + 66150*sqrt(
- c**2*x**2 + 1)*b*c**6*d**2*e*h*x**3 + 42336*sqrt( - c**2*x**2 + 1)*b*c**
6*d**2*e*i*x**4 + 117600*sqrt( - c**2*x**2 + 1)*b*c**6*d*e**2*f*x**2 + 661
50*sqrt( - c**2*x**2 + 1)*b*c**6*d*e**2*g*x**3 + 42336*sqrt( - c**2*x**2 +
 1)*b*c**6*d*e**2*h*x**4 + 29400*sqrt( - c**2*x**2 + 1)*b*c**6*d*e**2*i...
```

3.171 $\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin (cx)) \, dx$

Optimal result

Integrand size = 31, antiderivative size = 495

$$
\begin{aligned}
&\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin (cx)) \, dx \\
&= \frac{b\left(15c^4d^2f+5c^2\left(e^2f+2deg+d^2h\right)+3e(eh+2di)\right)\sqrt{1-c^2x^2}}{15c^5} \\
&\quad + \frac{b\left(24c^4d(2ef+dg)+5e^2i+9c^2\left(e^2g+2deh+d^2i\right)\right)x\sqrt{1-c^2x^2}}{96c^5} \\
&\quad + \frac{b\left(5e^2i+9c^2\left(e^2g+2deh+d^2i\right)\right)x^3\sqrt{1-c^2x^2}}{144c^3} + \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c} \\
&\quad - \frac{b\left(5c^2\left(e^2f+2deg+d^2h\right)+6e(eh+2di)\right)\left(1-c^2x^2\right)^{3/2}}{45c^5} \\
&\quad + \frac{be(eh+2di)\left(1-c^2x^2\right)^{5/2}}{25c^5} \\
&\quad - \frac{b\left(24c^4d(2ef+dg)+5e^2i+9c^2\left(e^2g+2deh+d^2i\right)\right)\arcsin (cx)}{96c^6} \\
&\quad + d^2fx(a+b\arcsin (cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin (cx)) \\
&\quad + \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin (cx)) + \frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin (cx)) \\
&\quad + \frac{1}{5}e(eh+2di)x^5(a+b\arcsin (cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin (cx))
\end{aligned}
$$

output
```
1/15*b*(15*c^4*d^2*f+5*c^2*(d^2*h+2*d*e*g+e^2*f)+3*e*(2*d*i+e*h))*(-c^2*x^
2+1)^(1/2)/c^5+1/96*b*(24*c^4*d*(d*g+2*e*f)+5*e^2*i+9*c^2*(d^2*i+2*d*e*h+e
^2*g))*x*(-c^2*x^2+1)^(1/2)/c^5+1/144*b*(5*e^2*i+9*c^2*(d^2*i+2*d*e*h+e^2*
g))*x^3*(-c^2*x^2+1)^(1/2)/c^3+1/36*b*e^2*i*x^5*(-c^2*x^2+1)^(1/2)/c-1/45*
b*(5*c^2*(d^2*h+2*d*e*g+e^2*f)+6*e*(2*d*i+e*h))*(-c^2*x^2+1)^(3/2)/c^5+1/2
5*b*e*(2*d*i+e*h)*(-c^2*x^2+1)^(5/2)/c^5-1/96*b*(24*c^4*d*(d*g+2*e*f)+5*e^
2*i+9*c^2*(d^2*i+2*d*e*h+e^2*g))*arcsin(c*x)/c^6+d^2*f*x*(a+b*arcsin(c*x))
+1/2*d*(d*g+2*e*f)*x^2*(a+b*arcsin(c*x))+1/3*(d^2*h+2*d*e*g+e^2*f)*x^3*(a+
b*arcsin(c*x))+1/4*(d^2*i+2*d*e*h+e^2*g)*x^4*(a+b*arcsin(c*x))+1/5*e*(2*d*
i+e*h)*x^5*(a+b*arcsin(c*x))+1/6*e^2*i*x^6*(a+b*arcsin(c*x))
```

Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 380, normalized size of antiderivative = 0.77

$$\int (d+ex)^2\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx))$$
$$+\frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx))+\frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin(cx))$$
$$+\frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$
$$+\frac{b\left(c\sqrt{1-c^2x^2}(3e(256eh+512di+125eix)+c^2(25d^2(64h+27ix)+2de(1600g+675hx+384ix^2)+\right.}{}$$

input
```
Integrate[(d + e*x)^2*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2
+ ((e^2*f + 2*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e^2*g + 2*d*e*
h + d^2*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*(e*h + 2*d*i)*x^5*(a + b*ArcSin
[c*x]))/5 + (e^2*i*x^6*(a + b*ArcSin[c*x]))/6 + (b*(c*Sqrt[1 - c^2*x^2]*(3
*e*(256*e*h + 512*d*i + 125*e*i*x) + c^2*(25*d^2*(64*h + 27*i*x) + 2*d*e*(
1600*g + 675*h*x + 384*i*x^2) + e^2*(1600*f + x*(675*g + 384*h*x + 250*i*x
^2))) + 2*c^4*(25*d^2*(144*f + x*(36*g + x*(16*h + 9*i*x))) + 2*d*e*x*(900
*f + x*(400*g + 9*x*(25*h + 16*i*x))) + e^2*x^2*(400*f + x*(225*g + 4*x*(3
6*h + 25*i*x))))) - 75*(24*c^4*d*(2*e*f + d*g) + 5*e^2*i + 9*c^2*(e^2*g +
2*d*e*h + d^2*i))*ArcSin[c*x]))/(7200*c^6)
```

Rubi [A] (verified)

Time = 2.68 (sec) , antiderivative size = 528, normalized size of antiderivative = 1.07, number of steps used = 14, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.452$, Rules used = {5248, 27, 2340, 27, 2340, 25, 2340, 27, 2340, 25, 27, 533, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^2(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)\,dx$$

$$\Big\downarrow \text{ 5248}$$

$$-bc\int \frac{x\left(5(12f+x(6g+x(4h+3ix)))d^2+2ex(30f+x(20g+3x(5h+4ix)))d+e^2x^2(20f+x(15g+2x(6h+\right.}{60\sqrt{1-c^2x^2}}$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+ d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+ b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{1}{60}bc\int \frac{x\left(5(12f+x(6g+x(4h+3ix)))d^2+2ex(30f+x(20g+3x(5h+4ix)))d+e^2x^2(20f+x(15g+2x(6\right.}{\sqrt{1-c^2x^2}}$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+ d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+ b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 2340}$$

$$-\frac{1}{60}bc\left(-\frac{\int -\frac{2x\left(36c^2e(eh+2di)x^4+5\left(9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x^3+60c^2\left(hd^2+2egd+e^2f\right)x^2+90c^2d(2ef+dg)x+180c^2d^2f\right)}{\sqrt{1-c^2x^2}}dx}{6c^2}-\frac{5e^2\right.}{}$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+ d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+ b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{1}{60}bc\left(\frac{\int \frac{x(36c^2e(eh+2di)x^4+5(9(id^2+2ehd+e^2g)c^2+5e^2i)x^3+60c^2(hd^2+2egd+e^2f)x^2+90c^2d(2ef+dg)x+180c^2d^2f)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{5e^2ix^5\sqrt{}}{3}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+$$
$$d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+$$
$$b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(\frac{-\frac{\int -\frac{x\left(900d^2fc^4+450d(2ef+dg)xc^4+25\left(9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x^3c^2+12\left(25\left(hd^2+2egd+e^2f\right)c^2+12e(eh+2di)\right)x^2c^2\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{36}{5}ex^4\sqrt{1}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+$$
$$d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+$$
$$b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{60}bc\left(\frac{\frac{\int \frac{x\left(900d^2fc^4+450d(2ef+dg)xc^4+25\left(9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x^3c^2+12\left(25\left(hd^2+2egd+e^2f\right)c^2+12e(eh+2di)\right)x^2c^2\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{36}{5}ex^4\sqrt{1-c}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+$$
$$d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+$$
$$b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(\frac{\frac{-\frac{\int -\frac{3x\left(1200d^2fc^6+16\left(25\left(hd^2+2egd+e^2f\right)c^2+12e(eh+2di)\right)x^2c^4+25\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}x^3\sqrt{1-c^2x^2}\left(\cdots\right.}{5c^2}\cdots}{3c^2}\cdots\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow 27$$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\int \frac{x\left(1200d^2fc^6+16\left(25\left(hd^2+2egd+e^2f\right)c^2+12e(eh+2di)\right)x^2c^4+25\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}x^3\sqrt{1-c^2x^2}\left(9c^2\cdots\right.}{5c^2}\cdots}{3c^2}\cdots\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow 2340$$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(-\frac{\int -\frac{c^4x\left(16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e(eh+2di)\right)+75\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}c^2x^2\sqrt{1-c^2x^2}\left(25c\cdots\right.\right.}{4c^2}\cdots}{5c^2}\cdots}{3c^2}\cdots\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow 25$$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(\frac{\int\frac{c^4x\left(16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e(eh+2di)\right)+75\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}c^2x^2\sqrt{1-c^2x^2}\left(25c^2\left(\cdots\right.\right.}{4c^2}}{5c^2}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(\frac{1}{3}c^2\int\frac{x\left(16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e(eh+2di)\right)+75\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}c^2x^2\sqrt{1-c^2x^2}\left(25c^2\cdots\right.}{4c^2}}{5c^2}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{533}$$

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{\int\frac{32\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e(eh+2di)\right)xc^2+75\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{75x\sqrt{1-c^2x^2}\left(24c^4d(d\cdots\right.}{\cdots}\right.\right.}{4c^2}}{\cdots}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{455}$$

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{75\left(24c^4d(dg+2ef)+9c^2\left(d^2i+2deh+e^2g\right)+5e^2i\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-32\sqrt{1-c^2x^2}\left(225c^4d^2f+50c^2\left(d^2h+2deg+e^2f\right)+24e(2di+eh)\right)}{2c^2}-\frac{75x\sqrt{1\cdots}}{\cdots}\cdots\right.\right.}{4c^2}\cdots}{\cdots}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+ d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+ b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{223}$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+ d^2fx(a+b\arcsin(cx))+ \frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))- \frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{\frac{75\arcsin(cx)\left(24c^4d(dg+2ef)+9c^2\left(d^2i+2deh+e^2g\right)+5e^2i\right)}{c}-32\sqrt{1-c^2x^2}\left(225c^4d^2f+50c^2\left(d^2h+2deg+e^2f\right)+24e(2di+eh)\right)}{2c^2}-\frac{75x\sqrt{1-c^2x^2}\cdots}{\cdots}\cdots\right.\right.}{4c^2}\cdots}{\cdots}\right.$$

input
```
Int[(d + e*x)^2*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2
+ ((e^2*f + 2*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e^2*g + 2*d*e*
h + d^2*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*(e*h + 2*d*i)*x^5*(a + b*ArcSin
[c*x]))/5 + (e^2*i*x^6*(a + b*ArcSin[c*x]))/6 - (b*c*((-5*e^2*i*x^5*Sqrt[1
 - c^2*x^2])/(3*c^2) + ((-36*e*(e*h + 2*d*i)*x^4*Sqrt[1 - c^2*x^2])/5 + ((
-25*(5*e^2*i + 9*c^2*(e^2*g + 2*d*e*h + d^2*i))*x^3*Sqrt[1 - c^2*x^2])/4 +
 (3*((-16*c^2*(25*c^2*(e^2*f + 2*d*e*g + d^2*h) + 12*e*(e*h + 2*d*i))*x^2*
Sqrt[1 - c^2*x^2])/3 + (c^2*((-75*(24*c^4*d*(2*e*f + d*g) + 5*e^2*i + 9*c^
2*(e^2*g + 2*d*e*h + d^2*i))*x*Sqrt[1 - c^2*x^2])/(2*c^2) + (-32*(225*c^4*
d^2*f + 50*c^2*(e^2*f + 2*d*e*g + d^2*h) + 24*e*(e*h + 2*d*i))*Sqrt[1 - c^
2*x^2] + (75*(24*c^4*d*(2*e*f + d*g) + 5*e^2*i + 9*c^2*(e^2*g + 2*d*e*h +
d^2*i))*ArcSin[c*x])/c)/(2*c^2)))/3))/(4*c^2))/(5*c^2))/(3*c^2)))/60
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 580, normalized size of antiderivative = 1.17

method	result
parts	$a\left(\frac{e^2 i\,x^6}{6}+\frac{(2dei+e^2h)x^5}{5}+\frac{(d^2i+2deh+e^2g)x^4}{4}+\frac{(d^2h+2deg+e^2f)x^3}{3}+\frac{(d^2g+2def)x^2}{2}+d^2fx\right)+\frac{b(}{}$
derivativedivides	$\frac{a\left(\frac{e^2 i\,c^6x^6}{6}+\frac{(2cdei+e^2ch)c^5x^5}{5}+\frac{(c^2d^2i+2c^2deh+e^2c^2g)c^4x^4}{4}+\frac{(c^3d^2h+2c^3deg+e^2f\,c^3)c^3x^3}{3}+\frac{(c^4d^2g+2c^4def)c^2x^2}{2}+d^2c^6\right.}{c^5}$
default	$\frac{a\left(\frac{e^2 i\,c^6x^6}{6}+\frac{(2cdei+e^2ch)c^5x^5}{5}+\frac{(c^2d^2i+2c^2deh+e^2c^2g)c^4x^4}{4}+\frac{(c^3d^2h+2c^3deg+e^2f\,c^3)c^3x^3}{3}+\frac{(c^4d^2g+2c^4def)c^2x^2}{2}+d^2c^6\right.}{c^5}$
orering	Expression too large to display

input
```
int((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOS
E)
```

output
```
a*(1/6*e^2*i*x^6+1/5*(2*d*e*i+e^2*h)*x^5+1/4*(d^2*i+2*d*e*h+e^2*g)*x^4+1/3
*(d^2*h+2*d*e*g+e^2*f)*x^3+1/2*(d^2*g+2*d*e*f)*x^2+d^2*f*x)+b/c*(1/6*c*arc
sin(c*x)*e^2*i*x^6+2/5*c*arcsin(c*x)*x^5*d*e*i+1/5*c*arcsin(c*x)*e^2*h*x^5
+1/4*c*arcsin(c*x)*x^4*d^2*i+1/2*c*arcsin(c*x)*x^4*d*e*h+1/4*c*arcsin(c*x)
*x^4*e^2*g+1/3*c*arcsin(c*x)*x^3*d^2*h+2/3*c*arcsin(c*x)*x^3*d*e*g+1/3*c*a
rcsin(c*x)*x^3*e^2*f+1/2*c*arcsin(c*x)*x^2*d^2*g+c*arcsin(c*x)*x^2*d*e*f+a
rcsin(c*x)*d^2*f*c*x-1/60/c^5*(30*c^4*d*(d*g+2*e*f)*(-1/2*c*x*(-c^2*x^2+1)
^(1/2)+1/2*arcsin(c*x))+12*c*e*(2*d*i+e*h)*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2
)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+20*c^3*(d^2*h+2
*d*e*g+e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+15*
c^2*(d^2*i+2*d*e*h+e^2*g)*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x
^2+1)^(1/2)+3/8*arcsin(c*x))+10*e^2*i*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/2
4*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))
-60*d^2*c^5*f*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 621, normalized size of antiderivative = 1.25

$$\int (d+ex)^2 (f+gx+hx^2+ix^3) (a+b\arcsin(cx))\,dx$$
$$= \frac{1200\,ac^6e^2ix^6 + 7200\,ac^6d^2fx + 1440\,(ac^6e^2h + 2\,ac^6dei)x^5 + 1800\,(ac^6e^2g + 2\,ac^6deh + ac^6d^2i)x^4 + 24}{}$$

input
```
integrate((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fr
icas")
```

output
```
1/7200*(1200*a*c^6*e^2*i*x^6 + 7200*a*c^6*d^2*f*x + 1440*(a*c^6*e^2*h + 2*
a*c^6*d*e*i)*x^5 + 1800*(a*c^6*e^2*g + 2*a*c^6*d*e*h + a*c^6*d^2*i)*x^4 +
2400*(a*c^6*e^2*f + 2*a*c^6*d*e*g + a*c^6*d^2*h)*x^3 + 3600*(2*a*c^6*d*e*f
 + a*c^6*d^2*g)*x^2 + 15*(80*b*c^6*e^2*i*x^6 + 480*b*c^6*d^2*f*x - 240*b*c
^4*d*e*f - 90*b*c^2*d*e*h + 96*(b*c^6*e^2*h + 2*b*c^6*d*e*i)*x^5 + 120*(b*
c^6*e^2*g + 2*b*c^6*d*e*h + b*c^6*d^2*i)*x^4 + 160*(b*c^6*e^2*f + 2*b*c^6*
d*e*g + b*c^6*d^2*h)*x^3 + 240*(2*b*c^6*d*e*f + b*c^6*d^2*g)*x^2 - 15*(8*b
*c^4*d^2 + 3*b*c^2*e^2)*g - 5*(9*b*c^2*d^2 + 5*b*e^2)*i)*arcsin(c*x) + (20
0*b*c^5*e^2*i*x^5 + 3200*b*c^3*d*e*g + 1536*b*c*d*e*i + 288*(b*c^5*e^2*h +
 2*b*c^5*d*e*i)*x^4 + 50*(9*b*c^5*e^2*g + 18*b*c^5*d*e*h + (9*b*c^5*d^2 +
5*b*c^3*e^2)*i)*x^3 + 32*(25*b*c^5*e^2*f + 50*b*c^5*d*e*g + 24*b*c^3*d*e*i
 + (25*b*c^5*d^2 + 12*b*c^3*e^2)*h)*x^2 + 800*(9*b*c^5*d^2 + 2*b*c^3*e^2)*
f + 64*(25*b*c^3*d^2 + 12*b*c*e^2)*h + 75*(48*b*c^5*d*e*f + 18*b*c^3*d*e*h
 + 3*(8*b*c^5*d^2 + 3*b*c^3*e^2)*g + (9*b*c^3*d^2 + 5*b*c*e^2)*i)*x)*sqrt(
-c^2*x^2 + 1))/c^6
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1197 vs. 2(488) = 976.

Time = 0.66 (sec) , antiderivative size = 1197, normalized size of antiderivative = 2.42

$$\int (d+ex)^2 (f+gx+hx^2+ix^3) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)**2*(i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**2*f*x + a*d**2*g*x**2/2 + a*d**2*h*x**3/3 + a*d**2*i*x**4/
4 + a*d*e*f*x**2 + 2*a*d*e*g*x**3/3 + a*d*e*h*x**4/2 + 2*a*d*e*i*x**5/5 +
a*e**2*f*x**3/3 + a*e**2*g*x**4/4 + a*e**2*h*x**5/5 + a*e**2*i*x**6/6 + b*
d**2*f*x*asin(c*x) + b*d**2*g*x**2*asin(c*x)/2 + b*d**2*h*x**3*asin(c*x)/3
 + b*d**2*i*x**4*asin(c*x)/4 + b*d*e*f*x**2*asin(c*x) + 2*b*d*e*g*x**3*asi
n(c*x)/3 + b*d*e*h*x**4*asin(c*x)/2 + 2*b*d*e*i*x**5*asin(c*x)/5 + b*e**2*
f*x**3*asin(c*x)/3 + b*e**2*g*x**4*asin(c*x)/4 + b*e**2*h*x**5*asin(c*x)/5
 + b*e**2*i*x**6*asin(c*x)/6 + b*d**2*f*sqrt(-c**2*x**2 + 1)/c + b*d**2*g*
x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**2*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) +
b*d**2*i*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*d*e*f*x*sqrt(-c**2*x**2 + 1)
/(2*c) + 2*b*d*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*d*e*h*x**3*sqrt(-c*
*2*x**2 + 1)/(8*c) + 2*b*d*e*i*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e**2*f
*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*
c) + b*e**2*h*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e**2*i*x**5*sqrt(-c**2*
x**2 + 1)/(36*c) - b*d**2*g*asin(c*x)/(4*c**2) - b*d*e*f*asin(c*x)/(2*c**2
) + 2*b*d**2*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d**2*i*x*sqrt(-c**2*x**
2 + 1)/(32*c**3) + 4*b*d*e*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d*e*h*x*s
qrt(-c**2*x**2 + 1)/(16*c**3) + 8*b*d*e*i*x**2*sqrt(-c**2*x**2 + 1)/(75*c*
*3) + 2*b*e**2*f*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e**2*g*x*sqrt(-c**2*x
**2 + 1)/(32*c**3) + 4*b*e**2*h*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 5...
```

Maxima [A] (verification not implemented)

Time = 0.16 (sec) , antiderivative size = 840, normalized size of antiderivative = 1.70

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="ma
xima")
```

output
```
1/6*a*e^2*i*x^6 + 1/5*a*e^2*h*x^5 + 2/5*a*d*e*i*x^5 + 1/4*a*e^2*g*x^4 + 1/
2*a*d*e*h*x^4 + 1/4*a*d^2*i*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + 1/3*
a*d^2*h*x^3 + a*d*e*f*x^2 + 1/2*a*d^2*g*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(
sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*e*f + 1/9*(3*x^3*arcsin(c
*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^2*f +
 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*
b*d^2*g + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(
-c^2*x^2 + 1)/c^4))*b*d*e*g + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 +
 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^2*g +
 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
+ 1)/c^4))*b*d^2*h + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c
^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e*h + 1/75*(15
*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^
2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^2*h + 1/32*(8*x^4*arcsin(c*x) + (
2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/
c^5)*c)*b*d^2*i + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2
 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e*i + 1
/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^
2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*e^
2*i + a*d^2*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^2*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1287 vs. $2(459) = 918$.

Time = 0.15 (sec) , antiderivative size = 1287, normalized size of antiderivative = 2.60

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="gi
ac")
```

output
```
1/6*a*e^2*i*x^6 + 1/5*a*e^2*h*x^5 + 2/5*a*d*e*i*x^5 + 1/4*a*e^2*g*x^4 + 1/
2*a*d*e*h*x^4 + 1/4*a*d^2*i*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + 1/3*
a*d^2*h*x^3 + b*d^2*f*x*arcsin(c*x) + a*d^2*f*x + 1/3*(c^2*x^2 - 1)*b*e^2*
f*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 - 1)*b*d*e*g*x*arcsin(c*x)/c^2 + 1/3*(c
^2*x^2 - 1)*b*d^2*h*x*arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b*d*e*f*x/c
 + 1/4*sqrt(-c^2*x^2 + 1)*b*d^2*g*x/c + (c^2*x^2 - 1)*b*d*e*f*arcsin(c*x)/
c^2 + 1/2*(c^2*x^2 - 1)*b*d^2*g*arcsin(c*x)/c^2 + 1/3*b*e^2*f*x*arcsin(c*x
)/c^2 + 2/3*b*d*e*g*x*arcsin(c*x)/c^2 + 1/3*b*d^2*h*x*arcsin(c*x)/c^2 + 1/
5*(c^2*x^2 - 1)^2*b*e^2*h*x*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)^2*b*d*e*i*
x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^2*f/c - 1/16*(-c^2*x^2 + 1)^(3/
2)*b*e^2*g*x/c^3 - 1/8*(-c^2*x^2 + 1)^(3/2)*b*d*e*h*x/c^3 - 1/16*(-c^2*x^2
 + 1)^(3/2)*b*d^2*i*x/c^3 + (c^2*x^2 - 1)*a*d*e*f/c^2 + 1/2*(c^2*x^2 - 1)*
a*d^2*g/c^2 + 1/2*b*d*e*f*arcsin(c*x)/c^2 + 1/4*b*d^2*g*arcsin(c*x)/c^2 +
1/4*(c^2*x^2 - 1)^2*b*e^2*g*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*d*e*h*
arcsin(c*x)/c^4 + 1/4*(c^2*x^2 - 1)^2*b*d^2*i*arcsin(c*x)/c^4 + 2/5*(c^2*x
^2 - 1)*b*e^2*h*x*arcsin(c*x)/c^4 + 4/5*(c^2*x^2 - 1)*b*d*e*i*x*arcsin(c*x
)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*e^2*f/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*
d*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d^2*h/c^3 + 5/32*sqrt(-c^2*x^2 + 1)
*b*e^2*g*x/c^3 + 5/16*sqrt(-c^2*x^2 + 1)*b*d*e*h*x/c^3 + 5/32*sqrt(-c^2*x^
2 + 1)*b*d^2*i*x/c^3 + 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^2*i*...
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx)) \, dx = \int (a+b\,\mathrm{asin}(c\,x))\,(d+e\,x)^2\,\left(i\,x^3+h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2 + i*x^3),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2 + i*x^3), x)
```

Reduce [B] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 965, normalized size of antiderivative = 1.95

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
int((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
(7200*asin(c*x)*b*c**6*d**2*f*x + 3600*asin(c*x)*b*c**6*d**2*g*x**2 + 2400
*asin(c*x)*b*c**6*d**2*h*x**3 + 1800*asin(c*x)*b*c**6*d**2*i*x**4 + 7200*a
sin(c*x)*b*c**6*d*e*f*x**2 + 4800*asin(c*x)*b*c**6*d*e*g*x**3 + 3600*asin(
c*x)*b*c**6*d*e*h*x**4 + 2880*asin(c*x)*b*c**6*d*e*i*x**5 + 2400*asin(c*x)
*b*c**6*e**2*f*x**3 + 1800*asin(c*x)*b*c**6*e**2*g*x**4 + 1440*asin(c*x)*b
*c**6*e**2*h*x**5 + 1200*asin(c*x)*b*c**6*e**2*i*x**6 - 1800*asin(c*x)*b*c
**4*d**2*g - 3600*asin(c*x)*b*c**4*d*e*f - 675*asin(c*x)*b*c**2*d**2*i - 1
350*asin(c*x)*b*c**2*d*e*h - 675*asin(c*x)*b*c**2*e**2*g - 375*asin(c*x)*b
*e**2*i + 7200*sqrt( - c**2*x**2 + 1)*b*c**5*d**2*f + 1800*sqrt( - c**2*x*
*2 + 1)*b*c**5*d**2*g*x + 800*sqrt( - c**2*x**2 + 1)*b*c**5*d**2*h*x**2 +
450*sqrt( - c**2*x**2 + 1)*b*c**5*d**2*i*x**3 + 3600*sqrt( - c**2*x**2 + 1
)*b*c**5*d*e*f*x + 1600*sqrt( - c**2*x**2 + 1)*b*c**5*d*e*g*x**2 + 900*sqr
t( - c**2*x**2 + 1)*b*c**5*d*e*h*x**3 + 576*sqrt( - c**2*x**2 + 1)*b*c**5*
d*e*i*x**4 + 800*sqrt( - c**2*x**2 + 1)*b*c**5*e**2*f*x**2 + 450*sqrt( - c
**2*x**2 + 1)*b*c**5*e**2*g*x**3 + 288*sqrt( - c**2*x**2 + 1)*b*c**5*e**2*
h*x**4 + 200*sqrt( - c**2*x**2 + 1)*b*c**5*e**2*i*x**5 + 1600*sqrt( - c**2
*x**2 + 1)*b*c**3*d**2*h + 675*sqrt( - c**2*x**2 + 1)*b*c**3*d**2*i*x + 32
00*sqrt( - c**2*x**2 + 1)*b*c**3*d*e*g + 1350*sqrt( - c**2*x**2 + 1)*b*c**
3*d*e*h*x + 768*sqrt( - c**2*x**2 + 1)*b*c**3*d*e*i*x**2 + 1600*sqrt( - c*
*2*x**2 + 1)*b*c**3*e**2*f + 675*sqrt( - c**2*x**2 + 1)*b*c**3*e**2*g*x...
```

3.172 $\int (d+ex) \left(f+gx+hx^2+ix^3\right) (a+b \arcsin (cx)) \, dx$

Optimal result

Integrand size = 29, antiderivative size = 316

$$\begin{aligned}
&\int (d+ex) \left(f+gx+hx^2+ix^3\right) (a+b\arcsin (cx)) \, dx \\
&= \frac{b(15c^4df+5c^2(eg+dh)+3ei)\sqrt{1-c^2x^2}}{15c^5} \\
&\quad + \frac{b(8c^2(ef+dg)+3(eh+di))\,x\sqrt{1-c^2x^2}}{32c^3} + \frac{b(eh+di)x^3\sqrt{1-c^2x^2}}{16c} \\
&\quad - \frac{b(5c^2(eg+dh)+6ei)\left(1-c^2x^2\right)^{3/2}}{45c^5} + \frac{bei\left(1-c^2x^2\right)^{5/2}}{25c^5} \\
&\quad - \frac{b(8c^2(ef+dg)+3(eh+di))\arcsin (cx)}{32c^4} + dfx(a+b\arcsin (cx)) \\
&\quad + \frac{1}{2}(ef+dg)x^2(a+b\arcsin (cx)) + \frac{1}{3}(eg+dh)x^3(a+b\arcsin (cx)) \\
&\quad + \frac{1}{4}(eh+di)x^4(a+b\arcsin (cx)) + \frac{1}{5}eix^5(a+b\arcsin (cx))
\end{aligned}$$

output
```
1/15*b*(15*c^4*d*f+5*c^2*(d*h+e*g)+3*e*i)*(-c^2*x^2+1)^(1/2)/c^5+1/32*b*(8
*c^2*(d*g+e*f)+3*d*i+3*e*h)*x*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*(d*i+e*h)*x^3*
(-c^2*x^2+1)^(1/2)/c-1/45*b*(5*c^2*(d*h+e*g)+6*e*i)*(-c^2*x^2+1)^(3/2)/c^5
+1/25*b*e*i*(-c^2*x^2+1)^(5/2)/c^5-1/32*b*(8*c^2*(d*g+e*f)+3*d*i+3*e*h)*ar
csin(c*x)/c^4+d*f*x*(a+b*arcsin(c*x))+1/2*(d*g+e*f)*x^2*(a+b*arcsin(c*x))+
1/3*(d*h+e*g)*x^3*(a+b*arcsin(c*x))+1/4*(d*i+e*h)*x^4*(a+b*arcsin(c*x))+1/
5*e*i*x^5*(a+b*arcsin(c*x))
```

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.80

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{120ac^5x(5d(12f+x(6g+x(4h+3ix)))+ex(30f+x(20g+3x(5h+4ix))))+b\sqrt{1-c^2x^2}(768ei+c^2}{}$$

input
```
Integrate[(d + e*x)*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
(120*a*c^5*x*(5*d*(12*f + x*(6*g + x*(4*h + 3*i*x))) + e*x*(30*f + x*(20*g
 + 3*x*(5*h + 4*i*x)))) + b*Sqrt[1 - c^2*x^2]*(768*e*i + c^2*(25*d*(64*h +
 27*i*x) + e*(1600*g + 675*h*x + 384*i*x^2)) + 2*c^4*(25*d*(144*f + x*(36*
g + x*(16*h + 9*i*x))) + e*x*(900*f + x*(400*g + 9*x*(25*h + 16*i*x))))) +
 15*b*c*(-120*c^2*(e*f + d*g) - 45*(e*h + d*i) + 8*c^4*x*(5*d*(12*f + x*(6
*g + x*(4*h + 3*i*x))) + e*x*(30*f + x*(20*g + 3*x*(5*h + 4*i*x)))))*ArcSi
n[c*x])/(7200*c^5)
```

Rubi [A] (verified)

Time = 1.40 (sec) , antiderivative size = 336, normalized size of antiderivative = 1.06, number of steps used = 13, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.448$, Rules used = {5248, 27, 2340, 25, 2340, 25, 2340, 25, 27, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)\,dx$$

$$\Big\downarrow \text{5248}$$

$$-bc\int \frac{x\left(12eix^4+15(eh+di)x^3+20(eg+dh)x^2+30(ef+dg)x+60df\right)}{60\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{60}bc\int \frac{x\left(12eix^4+15(eh+di)x^3+20(eg+dh)x^2+30(ef+dg)x+60df\right)}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(-\frac{\int -\frac{x(75c^2(eh+di)x^3+4(25(eg+dh)c^2+12ei)x^2+150c^2(ef+dg)x+300c^2df)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{12eix^4\sqrt{1-c^2x^2}}{5c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{60}bc\left(\frac{\int \frac{x(75c^2(eh+di)x^3+4(25(eg+dh)c^2+12ei)x^2+150c^2(ef+dg)x+300c^2df)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{12eix^4\sqrt{1-c^2x^2}}{5c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(\frac{-\frac{\int -\frac{x\left(1200dfc^4+16\left(25(eg+dh)c^2+12ei\right)x^2c^2+75\left(8(ef+dg)c^2+3(eh+di)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{75}{4}x^3\sqrt{1-c^2x^2}(di+eh)}{5c^2}-\frac{12eix^4\sqrt{1-}}{5c^2}\right.$$
$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{60}bc\left(\frac{\frac{\int \frac{x\left(1200dfc^4+16\left(25(eg+dh)c^2+12ei\right)x^2c^2+75\left(8(ef+dg)c^2+3(eh+di)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{75}{4}x^3\sqrt{1-c^2x^2}(di+eh)}{5c^2}-\frac{12eix^4\sqrt{1-c^2}}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\big\downarrow$ 2340

$$-\frac{1}{60}bc\left(\frac{\frac{-\frac{\int -\frac{c^2x\left(225\left(8(ef+dg)c^2+3(eh+di)\right)xc^2+16\left(225dfc^4+50(eg+dh)c^2+24ei\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2(dh+eg)+12ei\right)}{4c^2}}{5c^2}-\frac{75}{4}x^3\sqrt{1-c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\big\downarrow$ 25

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{\int \frac{c^2x\left(225\left(8(ef+dg)c^2+3(eh+di)\right)xc^2+16\left(225dfc^4+50(eg+dh)c^2+24ei\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2(dh+eg)+12ei\right)}{4c^2}}{5c^2}-\frac{75}{4}x^3\sqrt{1-c^2x^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\big\downarrow$ 27

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\int \frac{x\left(225\left(8(ef+dg)c^2+3(eh+di)\right)xc^2+16\left(225dfc^4+50(eg+dh)c^2+24ei\right)\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2(dh+eg)+12ei\right)}{4c^2}}{5c^2}-\frac{75}{4}x^3\sqrt{1-c^2x^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\big\downarrow$ 533

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{\int \frac{c^2\left(225\left(8(ef+dg)c^2+3(eh+di)\right)+32\left(225dfc^4+50(eg+dh)c^2+24ei\right)x\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2(dg+ef)+3(di+eh)\right)\right)-\frac{16}{3}x^2\sqrt{1-c^2x^2}(}{4c^2}}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+ b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\big\downarrow$ 27

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\int \frac{225\left(8(ef+dg)c^2+3(eh+di)\right)+32\left(225dfc^4+50(eg+dh)c^2+24ei\right)x}{\sqrt{1-c^2x^2}}dx-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2(dg+ef)+3(di+eh)\right)\right)-\frac{16}{3}x^2\sqrt{1-c^2x^2}(25}{4c^2}}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+ b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\big\downarrow$ 455

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\left(225\left(8c^2(dg+ef)+3(di+eh)\right)\int \frac{1}{\sqrt{1-c^2x^2}}dx-\frac{32\sqrt{1-c^2x^2}\left(225c^4df+50c^2(dh+eg)+24ei\right)}{c^2}\right)-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2(dg+ef)+3(di+eh\right.\right.}{4c^2}}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+ b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\big\downarrow$ 223

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+ b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))-$$

$$\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\left(\frac{225\arcsin(cx)\left(8c^2(dg+ef)+3(di+eh)\right)}{c}-\frac{32\sqrt{1-c^2x^2}\left(225c^4df+50c^2(dh+eg)+24ei\right)}{c^2}\right)-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2(dg+ef)+3(di+eh)\right)\right)-\frac{16}{3}x}{4c^2}}{5c^2}\right.$$

input
```
Int[(d + e*x)*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
d*f*x*(a + b*ArcSin[c*x]) + ((e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + ((e*
g + d*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e*h + d*i)*x^4*(a + b*ArcSin[c*x])
)/4 + (e*i*x^5*(a + b*ArcSin[c*x]))/5 - (b*c*((-12*e*i*x^4*Sqrt[1 - c^2*x^
2])/(5*c^2) + ((-75*(e*h + d*i)*x^3*Sqrt[1 - c^2*x^2])/4 + ((-16*(25*c^2*(
e*g + d*h) + 12*e*i)*x^2*Sqrt[1 - c^2*x^2])/3 + ((-225*(8*c^2*(e*f + d*g)
+ 3*(e*h + d*i))*x*Sqrt[1 - c^2*x^2])/2 + ((-32*(225*c^4*d*f + 50*c^2*(e*g
 + d*h) + 24*e*i)*Sqrt[1 - c^2*x^2])/c^2 + (225*(8*c^2*(e*f + d*g) + 3*(e*
h + d*i))*ArcSin[c*x])/c)/2)/3)/(4*c^2))/(5*c^2)))/60
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.17

method	result
parts	$a\left(\frac{ei\,x^5}{5}+\frac{(di+eh)x^4}{4}+\frac{(dh+eg)x^3}{3}+\frac{(dg+ef)x^2}{2}+dfx\right)+\frac{b\left(\frac{c\arcsin(cx)ei\,x^5}{5}+\frac{c\arcsin(cx)x^4di}{4}+\right.}{}$
derivativedivides	$\frac{\frac{a\left(\frac{ei\,c^5x^5}{5}+\frac{(icd+che)c^4x^4}{4}+\frac{\left(c^2hd+c^2ge\right)c^3x^3}{3}+\frac{\left(c^3gd+f\,c^3e\right)c^2x^2}{2}+d\,c^5fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)ei\,c^5x^5}{5}+\frac{\arcsin(cx)c^5di\,x^4}{4}+\right.}{}}{}$
default	$\frac{\frac{a\left(\frac{ei\,c^5x^5}{5}+\frac{(icd+che)c^4x^4}{4}+\frac{\left(c^2hd+c^2ge\right)c^3x^3}{3}+\frac{\left(c^3gd+f\,c^3e\right)c^2x^2}{2}+d\,c^5fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)ei\,c^5x^5}{5}+\frac{\arcsin(cx)c^5di\,x^4}{4}+\right.}{}}{}$
orering	Expression too large to display

input
```
int((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/5*e*i*x^5+1/4*(d*i+e*h)*x^4+1/3*(d*h+e*g)*x^3+1/2*(d*g+e*f)*x^2+d*f*x
)+b/c*(1/5*c*arcsin(c*x)*e*i*x^5+1/4*c*arcsin(c*x)*x^4*d*i+1/4*c*arcsin(c*
x)*e*h*x^4+1/3*c*arcsin(c*x)*x^3*d*h+1/3*c*arcsin(c*x)*x^3*e*g+1/2*c*arcsi
n(c*x)*x^2*d*g+1/2*c*arcsin(c*x)*x^2*e*f+arcsin(c*x)*f*d*c*x-1/60/c^4*(30*
c^3*(d*g+e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+20*c^2*(d*h+e*
g)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+15*c*(d*i+e*h)
*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*
x))+12*e*i*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2
)-8/15*(-c^2*x^2+1)^(1/2))-60*d*c^4*f*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.20 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.08

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{1440\,ac^5eix^5 + 7200\,ac^5dfx + 1800\,(ac^5eh + ac^5di)x^4 + 2400\,(ac^5eg + ac^5dh)x^3 + 3600\,(ac^5ef + ac^5dg)}{}$$

input
```
integrate((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fric
as")
```

output
```
1/7200*(1440*a*c^5*e*i*x^5 + 7200*a*c^5*d*f*x + 1800*(a*c^5*e*h + a*c^5*d*
i)*x^4 + 2400*(a*c^5*e*g + a*c^5*d*h)*x^3 + 3600*(a*c^5*e*f + a*c^5*d*g)*x
^2 + 15*(96*b*c^5*e*i*x^5 + 480*b*c^5*d*f*x - 120*b*c^3*e*f - 120*b*c^3*d*
g + 120*(b*c^5*e*h + b*c^5*d*i)*x^4 - 45*b*c*e*h - 45*b*c*d*i + 160*(b*c^5
*e*g + b*c^5*d*h)*x^3 + 240*(b*c^5*e*f + b*c^5*d*g)*x^2)*arcsin(c*x) + (28
8*b*c^4*e*i*x^4 + 7200*b*c^4*d*f + 1600*b*c^2*e*g + 1600*b*c^2*d*h + 450*(
b*c^4*e*h + b*c^4*d*i)*x^3 + 768*b*e*i + 32*(25*b*c^4*e*g + 25*b*c^4*d*h +
 12*b*c^2*e*i)*x^2 + 225*(8*b*c^4*e*f + 8*b*c^4*d*g + 3*b*c^2*e*h + 3*b*c^
2*d*i)*x)*sqrt(-c^2*x^2 + 1))/c^5
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 658 vs. $2(301) = 602$.

Time = 0.44 (sec) , antiderivative size = 658, normalized size of antiderivative = 2.08

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$=\begin{cases} adfx+\frac{adgx^2}{2}+\frac{adhx^3}{3}+\frac{adix^4}{4}+\frac{aefx^2}{2}+\frac{aegx^3}{3}+\frac{aehx^4}{4}+\frac{aeix^5}{5}+bdfx\operatorname{asin}(cx)+\frac{bdgx^2\operatorname{asin}(cx)}{2}+\frac{bdhx^3\operatorname{asin}(\cdots}{3} \\ a\left(dfx+\frac{dgx^2}{2}+\frac{dhx^3}{3}+\frac{dix^4}{4}+\frac{efx^2}{2}+\frac{egx^3}{3}+\frac{ehx^4}{4}+\frac{eix^5}{5}\right) \end{cases}$$

input
```
integrate((e*x+d)*(i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d*f*x + a*d*g*x**2/2 + a*d*h*x**3/3 + a*d*i*x**4/4 + a*e*f*x*
*2/2 + a*e*g*x**3/3 + a*e*h*x**4/4 + a*e*i*x**5/5 + b*d*f*x*asin(c*x) + b*
d*g*x**2*asin(c*x)/2 + b*d*h*x**3*asin(c*x)/3 + b*d*i*x**4*asin(c*x)/4 + b
*e*f*x**2*asin(c*x)/2 + b*e*g*x**3*asin(c*x)/3 + b*e*h*x**4*asin(c*x)/4 +
b*e*i*x**5*asin(c*x)/5 + b*d*f*sqrt(-c**2*x**2 + 1)/c + b*d*g*x*sqrt(-c**2
*x**2 + 1)/(4*c) + b*d*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*d*i*x**3*sqrt
(-c**2*x**2 + 1)/(16*c) + b*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*e*g*x**2*
sqrt(-c**2*x**2 + 1)/(9*c) + b*e*h*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e*
i*x**4*sqrt(-c**2*x**2 + 1)/(25*c) - b*d*g*asin(c*x)/(4*c**2) - b*e*f*asin
(c*x)/(4*c**2) + 2*b*d*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d*i*x*sqrt(-c
**2*x**2 + 1)/(32*c**3) + 2*b*e*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e*h*
x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 4*b*e*i*x**2*sqrt(-c**2*x**2 + 1)/(75*c
**3) - 3*b*d*i*asin(c*x)/(32*c**4) - 3*b*e*h*asin(c*x)/(32*c**4) + 8*b*e*i
*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d*f*x + d*g*x**2/2 + d*h*x
**3/3 + d*i*x**4/4 + e*f*x**2/2 + e*g*x**3/3 + e*h*x**4/4 + e*i*x**5/5), T
rue))
```

Maxima [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 490, normalized size of antiderivative = 1.55

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{5}\,aeix^5 + \frac{1}{4}\,aehx^4 + \frac{1}{4}\,adix^4 + \frac{1}{3}\,aegx^3 + \frac{1}{3}\,adhx^3 + \frac{1}{2}\,aefx^2 + \frac{1}{2}\,adgx^2$$
$$+ \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bef$$
$$+ \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdg$$
$$+ \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)beg$$
$$+ \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\,\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdh$$
$$+ \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\,\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\,\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\,\arcsin(cx)}{c^5}\right)c\right)beh$$
$$+ \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\,\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\,\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\,\arcsin(cx)}{c^5}\right)c\right)bdi$$
$$+ \frac{1}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\,\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\,\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\,\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bei$$
$$+ adfx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bdf}{c}$$

input
```
integrate((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxi
ma")
```

output
```
1/5*a*e*i*x^5 + 1/4*a*e*h*x^4 + 1/4*a*d*i*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*
x^3 + 1/2*a*e*f*x^2 + 1/2*a*d*g*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^
2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*e*f + 1/4*(2*x^2*arcsin(c*x) + c*(s
qrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*g + 1/9*(3*x^3*arcsin(c*x)
 + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e*g + 1/9*
(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/
c^4))*b*d*h + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*
sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e*h + 1/32*(8*x^4*arcsi
n(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*ar
csin(c*x)/c^5)*c)*b*d*i + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)
*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e
*i + a*d*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*f/c
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 692 vs. $2(284) = 568$.

Time = 0.14 (sec) , antiderivative size = 692, normalized size of antiderivative = 2.19

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac
")
```

output
```
1/5*a*e*i*x^5 + 1/4*a*e*h*x^4 + 1/4*a*d*i*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*
x^3 + b*d*f*x*arcsin(c*x) + a*d*f*x + 1/3*(c^2*x^2 - 1)*b*e*g*x*arcsin(c*x
)/c^2 + 1/3*(c^2*x^2 - 1)*b*d*h*x*arcsin(c*x)/c^2 + 1/4*sqrt(-c^2*x^2 + 1)
*b*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d*g*x/c + 1/2*(c^2*x^2 - 1)*b*e*f*ar
csin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d*g*arcsin(c*x)/c^2 + 1/3*b*e*g*x*arcs
in(c*x)/c^2 + 1/3*b*d*h*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e*i*x*ar
csin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e
*h*x/c^3 - 1/16*(-c^2*x^2 + 1)^(3/2)*b*d*i*x/c^3 + 1/2*(c^2*x^2 - 1)*a*e*f
/c^2 + 1/2*(c^2*x^2 - 1)*a*d*g/c^2 + 1/4*b*e*f*arcsin(c*x)/c^2 + 1/4*b*d*g
*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e*h*arcsin(c*x)/c^4 + 1/4*(c^2*x^
2 - 1)^2*b*d*i*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e*i*x*arcsin(c*x)/c^4
 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d*h/c^3
 + 5/32*sqrt(-c^2*x^2 + 1)*b*e*h*x/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*d*i*x/c
^3 + 1/2*(c^2*x^2 - 1)*b*e*h*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)*b*d*i*arc
sin(c*x)/c^4 + 1/5*b*e*i*x*arcsin(c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*e*g/
c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*d*h/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^
2 + 1)*b*e*i/c^5 + 5/32*b*e*h*arcsin(c*x)/c^4 + 5/32*b*d*i*arcsin(c*x)/c^4
 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e*i/c^5 + 1/5*sqrt(-c^2*x^2 + 1)*b*e*i/c^5
```

Mupad [F(-1)]

Timed out.

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)\,\left(i\,x^3+h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2 + i*x^3),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2 + i*x^3), x)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 539, normalized size of antiderivative = 1.71

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$=\frac{768\sqrt{-c^2x^2+1}\,bei+7200asin(cx)\,b\,c^5df\,x+3600asin(cx)\,b\,c^5dg\,x^2+2400asin(cx)\,b\,c^5dh\,x^3+1800asi}{}$$

input
```
int((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
(7200*asin(c*x)*b*c**5*d*f*x + 3600*asin(c*x)*b*c**5*d*g*x**2 + 2400*asin(
c*x)*b*c**5*d*h*x**3 + 1800*asin(c*x)*b*c**5*d*i*x**4 + 3600*asin(c*x)*b*c
**5*e*f*x**2 + 2400*asin(c*x)*b*c**5*e*g*x**3 + 1800*asin(c*x)*b*c**5*e*h*
x**4 + 1440*asin(c*x)*b*c**5*e*i*x**5 - 1800*asin(c*x)*b*c**3*d*g - 1800*a
sin(c*x)*b*c**3*e*f - 675*asin(c*x)*b*c*d*i - 675*asin(c*x)*b*c*e*h + 7200
*sqrt( - c**2*x**2 + 1)*b*c**4*d*f + 1800*sqrt( - c**2*x**2 + 1)*b*c**4*d*
g*x + 800*sqrt( - c**2*x**2 + 1)*b*c**4*d*h*x**2 + 450*sqrt( - c**2*x**2 +
 1)*b*c**4*d*i*x**3 + 1800*sqrt( - c**2*x**2 + 1)*b*c**4*e*f*x + 800*sqrt(
 - c**2*x**2 + 1)*b*c**4*e*g*x**2 + 450*sqrt( - c**2*x**2 + 1)*b*c**4*e*h*
x**3 + 288*sqrt( - c**2*x**2 + 1)*b*c**4*e*i*x**4 + 1600*sqrt( - c**2*x**2
 + 1)*b*c**2*d*h + 675*sqrt( - c**2*x**2 + 1)*b*c**2*d*i*x + 1600*sqrt( -
c**2*x**2 + 1)*b*c**2*e*g + 675*sqrt( - c**2*x**2 + 1)*b*c**2*e*h*x + 384*
sqrt( - c**2*x**2 + 1)*b*c**2*e*i*x**2 + 768*sqrt( - c**2*x**2 + 1)*b*e*i
+ 7200*a*c**5*d*f*x + 3600*a*c**5*d*g*x**2 + 2400*a*c**5*d*h*x**3 + 1800*a
*c**5*d*i*x**4 + 3600*a*c**5*e*f*x**2 + 2400*a*c**5*e*g*x**3 + 1800*a*c**5
*e*h*x**4 + 1440*a*c**5*e*i*x**5)/(7200*c**5)
```

3.173 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 639

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx$$
$$= \frac{b(2e^2i+9c^2(e^2g-deh+d^2i))\sqrt{1-c^2x^2}}{9c^3e^3}$$
$$+\frac{b(eh-di)x\sqrt{1-c^2x^2}}{4ce^2}+\frac{bix^2\sqrt{1-c^2x^2}}{9ce}-\frac{b(eh-di)\arcsin(cx)}{4c^2e^2}$$
$$-\frac{ib(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)^2}{2e^4}+\frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3}$$
$$+\frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2}+\frac{ix^3(a+b\arcsin(cx))}{3e}$$
$$+\frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$+\frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$-\frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log(d+ex)}{e^4}$$
$$+\frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$-\frac{ib(e^3f-de^2g+d^2eh-d^3i)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$-\frac{ib(e^3f-de^2g+d^2eh-d^3i)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$

output
```
1/9*b*(2*e^2*i+9*c^2*(d^2*i-d*e*h+e^2*g))*(-c^2*x^2+1)^(1/2)/c^3/e^3+1/4*b
*(-d*i+e*h)*x*(-c^2*x^2+1)^(1/2)/c/e^2+1/9*b*i*x^2*(-c^2*x^2+1)^(1/2)/c/e-
1/4*b*(-d*i+e*h)*arcsin(c*x)/c^2/e^2-1/2*I*b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f
)*arcsin(c*x)^2/e^4+(d^2*i-d*e*h+e^2*g)*x*(a+b*arcsin(c*x))/e^3+1/2*(-d*i+
e*h)*x^2*(a+b*arcsin(c*x))/e^2+1/3*i*x^3*(a+b*arcsin(c*x))/e+b*(-d^3*i+d^2
*e*h-d*e^2*g+e^3*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(
c^2*d^2-e^2)^(1/2)))/e^4+b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*arcsin(c*x)*ln(1
-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4-b*(-d^3*i+d
^2*e*h-d*e^2*g+e^3*f)*arcsin(c*x)*ln(e*x+d)/e^4+(-d^3*i+d^2*e*h-d*e^2*g+e^
3*f)*(a+b*arcsin(c*x))*ln(e*x+d)/e^4-I*b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*po
lylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4-I*b*
(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c
*d+(c^2*d^2-e^2)^(1/2)))/e^4
```

Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 610, normalized size of antiderivative = 0.95

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx$$

$$= \frac{\frac{6be(e^2g-deh+d^2i)\sqrt{1-c^2x^2}}{c}+\frac{3be^2(eh-di)x\sqrt{1-c^2x^2}}{2c}+\frac{2be^3i\sqrt{1-c^2x^2}(2+c^2x^2)}{3c^3}-\frac{3be^2(eh-di)\arcsin(cx)}{2c^2}-3ib(e^3f-de^2g+}{}$$

input
```
Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
((6*b*e*(e^2*g - d*e*h + d^2*i)*Sqrt[1 - c^2*x^2])/c + (3*b*e^2*(e*h - d*i
)*x*Sqrt[1 - c^2*x^2])/(2*c) + (2*b*e^3*i*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2))
/(3*c^3) - (3*b*e^2*(e*h - d*i)*ArcSin[c*x])/(2*c^2) - (3*I)*b*(e^3*f - d*
e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]^2 + 6*e*(e^2*g - d*e*h + d^2*i)*x*(a
+ b*ArcSin[c*x]) + 3*e^2*(e*h - d*i)*x^2*(a + b*ArcSin[c*x]) + 2*e^3*i*x^3
*(a + b*ArcSin[c*x]) + 6*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]
*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 6*b*(e^
3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]
))/(c*d + Sqrt[c^2*d^2 - e^2])] - 6*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*
ArcSin[c*x]*Log[d + e*x] + 6*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*Ar
cSin[c*x])*Log[d + e*x] - (6*I)*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*Poly
Log[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - (6*I)*b*(e^3
*f - d*e^2*g + d^2*e*h - d^3*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d +
Sqrt[c^2*d^2 - e^2])])/(6*e^4)
```

Rubi [A] (verified)

Time = 1.74 (sec) , antiderivative size = 636, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)}{d+ex}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int \frac{ex\left(6id^2-3e(2h+ix)d+e^2\left(2ix^2+3hx+6g\right)\right)+6\left(-id^3+ehd^2-e^2gd+e^3f\right)\log(d+ex)}{6e^4\sqrt{1-c^2x^2}}dx+\frac{x(a+b\arcsin(cx))\left(d^2i-deh+e^2g\right)}{e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4}+\frac{x^2(eh-di)(a+b\arcsin(cx))}{2e^2}+\frac{ix^3(a+b\arcsin(cx))}{3e}$$

$$\Big\downarrow \text{27}$$

$$-\frac{bc\int \frac{ex(6id^2-3e(2h+ix)d+e^2(2ix^2+3hx+6g))+6(-id^3+ehd^2-e^2gd+e^3f)\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{6e^4}+\frac{x(a+b\arcsin(cx))\left(d^2i-deh+e^2g\right)}{e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4}+\frac{x^2(eh-di)(a+b\arcsin(cx))}{2e^2}+\frac{ix^3(a+b\arcsin(cx))}{3e}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int \left(\frac{ex(2e^2ix^2+3e(eh-di)x+6(id^2-ehd+e^2g))}{\sqrt{1-c^2x^2}}+\frac{6(-id^3+ehd^2-e^2gd+e^3f)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{6e^4}+\frac{x(a+b\arcsin(cx))\left(d^2i-deh+e^2g\right)}{e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4}+\frac{x^2(eh-di)(a+b\arcsin(cx))}{2e^2}+\frac{ix^3(a+b\arcsin(cx))}{3e}$$

$$\Big\downarrow \text{2009}$$

$$\frac{x(a+b\arcsin(cx))\left(d^2i-deh+e^2g\right)}{e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4}+\frac{x^2(eh-di)(a+b\arcsin(cx))}{2e^2}+\frac{ix^3(a+b\arcsin(cx))}{3e}-\frac{bc\left(\frac{3e^2\arcsin(cx)(eh-di)}{2c^3}+\frac{6i\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{c}+\frac{6i\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\left(d^3(-i)+d^2eh-de^2\right.}{c}\right.}{}$$

input
```
Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
((e^2*g - d*e*h + d^2*i)*x*(a + b*ArcSin[c*x]))/e^3 + ((e*h - d*i)*x^2*(a
+ b*ArcSin[c*x]))/(2*e^2) + (i*x^3*(a + b*ArcSin[c*x]))/(3*e) + ((e^3*f -
d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x])*Log[d + e*x])/e^4 - (b*c*((
2*e*(9*d*e*h - 9*d^2*i - e^2*(9*g + (2*i)/c^2))*Sqrt[1 - c^2*x^2])/(3*c^2)
 - (3*e^2*(e*h - d*i)*x*Sqrt[1 - c^2*x^2])/(2*c^2) - (2*e^3*i*x^2*Sqrt[1 -
 c^2*x^2])/(3*c^2) + (3*e^2*(e*h - d*i)*ArcSin[c*x])/(2*c^3) + ((3*I)*(e^3
*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]^2)/c - (6*(e^3*f - d*e^2*g + d
^2*e*h - d^3*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^
2*d^2 - e^2])])/c - (6*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log
[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + (6*(e^3*f -
 d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log[d + e*x])/c + ((6*I)*(e^3*f -
d*e^2*g + d^2*e*h - d^3*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[
c^2*d^2 - e^2])])/c + ((6*I)*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*PolyLog[2
, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/(6*e^4)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3402 vs. $2(636) = 1272$.

Time = 2.26 (sec) , antiderivative size = 3403, normalized size of antiderivative = 5.33

method	result	size
parts	Expression too large to display	3403
derivativedivides	Expression too large to display	3449
default	Expression too large to display	3449

input

```
int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

output

```
I*b/e*d^2*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*
d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b/e*d^2*h*arcsin(c*x)/(c^2*d
^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*
c-(-c^2*d^2+e^2)^(1/2)))-b/e*d^2*h*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*
c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2
)))+I*b/e*d^2*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-
c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+b/e*arcsin(c*x)*x*g-1/2*
I*b*arcsin(c*x)^2/e*f-1/36*b/c^3*i/e*cos(3*arcsin(c*x))+1/4*b/c^3/e*(-c^2*
x^2+1)^(1/2)*i-I*b*c^2/e^3*d^4*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x
^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-I*b*c^2
/e^3*d^4*h/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d
^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b*c^2/e*f/(c^2*d^2-e^2)*dil
og((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*
d^2+e^2)^(1/2)))*d^2-I*b*c^2/e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x
^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+b*g
*(-c^2*x^2+1)^(1/2)/c/e+1/4*b/c^2*arcsin(c*x)/e^2*cos(2*arcsin(c*x))*d*i+b
/e^2*d^3*i*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*
e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+b/e^2*d^3*i*arcsin(c
*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1
/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I*b/e^2*d^3*i/(c^2*d^2-e^2)*dilog((I...
```

Fricas [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{d + ex}\,dx = \int \frac{(ix^3 + hx^2 + gx + f)(b\arcsin(cx) + a)}{ex + d}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="fric
as")
```

output
```
integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arcsin(c*x))/(e*x + d), x)
```

Sympy [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{d + ex}\,dx = \int \frac{(a + b\,\mathrm{asin}\,(cx))(f + gx + hx^2 + ix^3)}{d + ex}\,dx$$

input
```
integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x), x)
```

Maxima [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{d + ex}\,dx = \int \frac{(ix^3 + hx^2 + gx + f)(b\arcsin(cx) + a)}{ex + d}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxi
ma")
```

output
```
a*g*(x/e - d*log(e*x + d)/e^2) - 1/6*a*i*(6*d^3*log(e*x + d)/e^4 - (2*e^2*
x^3 - 3*d*e*x^2 + 6*d^2*x)/e^3) + 1/2*a*h*(2*d^2*log(e*x + d)/e^3 + (e*x^2
 - 2*d*x)/e^2) + a*f*log(e*x + d)/e + integrate((b*i*x^3 + b*h*x^2 + b*g*x
 + b*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac
")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(i\,x^3+h\,x^2+g\,x+f)}{d+e\,x}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x),x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x), x)
```

Reduce [F]

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{d+ex}\,dx$$
$$= \frac{6asin(cx)\,bc\,e^3gx+6\sqrt{-c^2x^2+1}\,b\,e^3g-6\left(\int \frac{asin(cx)}{ex+d}dx\right)bcd\,e^3g+6\left(\int \frac{asin(cx)}{ex+d}dx\right)bc\,e^4f+6\left(\int \frac{asin(cx)x}{ex+d}\right.}{}$$

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

output
```
(6*asin(c*x)*b*c*e**3*g*x + 6*sqrt( - c**2*x**2 + 1)*b*e**3*g - 6*int(asin
(c*x)/(d + e*x),x)*b*c*d*e**3*g + 6*int(asin(c*x)/(d + e*x),x)*b*c*e**4*f
+ 6*int((asin(c*x)*x**3)/(d + e*x),x)*b*c*e**4*i + 6*int((asin(c*x)*x**2)/
(d + e*x),x)*b*c*e**4*h - 6*log(d + e*x)*a*c*d**3*i + 6*log(d + e*x)*a*c*d
**2*e*h - 6*log(d + e*x)*a*c*d*e**2*g + 6*log(d + e*x)*a*c*e**3*f + 6*a*c*
d**2*e*i*x - 6*a*c*d*e**2*h*x - 3*a*c*d*e**2*i*x**2 + 6*a*c*e**3*g*x + 3*a
*c*e**3*h*x**2 + 2*a*c*e**3*i*x**3)/(6*c*e**4)
```

3.174 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 617

$$
\begin{aligned}
&\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^2}\,dx \\
&= \frac{b(eh-2di)\sqrt{1-c^2x^2}}{ce^3}+\frac{bix\sqrt{1-c^2x^2}}{4ce^2}-\frac{bi\arcsin(cx)}{4c^2e^2} \\
&\quad -\frac{ib(e^2g-2deh+3d^2i)\arcsin(cx)^2}{2e^4}+\frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} \\
&\quad +\frac{ix^2(a+b\arcsin(cx))}{2e^2}-\frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))}{e^4(d+ex)} \\
&\quad +\frac{bc(e^3f-de^2g+d^2eh-d^3i)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^4\sqrt{c^2d^2-e^2}} \\
&\quad +\frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad +\frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad -\frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log(d+ex)}{e^4} \\
&\quad +\frac{(e^2g-2deh+3d^2i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad -\frac{ib(e^2g-2deh+3d^2i)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad -\frac{ib(e^2g-2deh+3d^2i)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}
\end{aligned}
$$

output
```
b*(-2*d*i+e*h)*(-c^2*x^2+1)^(1/2)/c/e^3+1/4*b*i*x*(-c^2*x^2+1)^(1/2)/c/e^2
-1/4*b*i*arcsin(c*x)/c^2/e^2-1/2*I*b*(3*d^2*i-2*d*e*h+e^2*g)*arcsin(c*x)^2
/e^4+(-2*d*i+e*h)*x*(a+b*arcsin(c*x))/e^3+1/2*i*x^2*(a+b*arcsin(c*x))/e^2-
(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*(a+b*arcsin(c*x))/e^4/(e*x+d)+b*c*(-d^3*i+d
^2*e*h-d*e^2*g+e^3*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^
(1/2))/e^4/(c^2*d^2-e^2)^(1/2)+b*(3*d^2*i-2*d*e*h+e^2*g)*arcsin(c*x)*ln(1-
I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4+b*(3*d^2*i-2
*d*e*h+e^2*g)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^
2-e^2)^(1/2)))/e^4-b*(3*d^2*i-2*d*e*h+e^2*g)*arcsin(c*x)*ln(e*x+d)/e^4+(3*
d^2*i-2*d*e*h+e^2*g)*(a+b*arcsin(c*x))*ln(e*x+d)/e^4-I*b*(3*d^2*i-2*d*e*h+
e^2*g)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))
/e^4-I*b*(3*d^2*i-2*d*e*h+e^2*g)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/
(c*d+(c^2*d^2-e^2)^(1/2)))/e^4
```

Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 593, normalized size of antiderivative = 0.96

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$

$$= \frac{\frac{2be(eh-2di)\sqrt{1-c^2x^2}}{c}+\frac{be^2ix\sqrt{1-c^2x^2}}{2c}-\frac{be^2i\arcsin(cx)}{2c^2}-ib(e^2g-2deh+3d^2i)\arcsin(cx)^2+2e(eh-2di)x(a+b\ldots}{\ldots}$$

input
```
Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
((2*b*e*(e*h - 2*d*i)*Sqrt[1 - c^2*x^2])/c + (b*e^2*i*x*Sqrt[1 - c^2*x^2])
/(2*c) - (b*e^2*i*ArcSin[c*x])/(2*c^2) - I*b*(e^2*g - 2*d*e*h + 3*d^2*i)*A
rcSin[c*x]^2 + 2*e*(e*h - 2*d*i)*x*(a + b*ArcSin[c*x]) + e^2*i*x^2*(a + b*
ArcSin[c*x]) - (2*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x]))
/(d + e*x) + (2*b*c*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcTan[(e + c^2*d*
x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2] + 2*b*(e^
2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*
d) + Sqrt[c^2*d^2 - e^2])] + 2*b*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*L
og[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - 2*b*(e^2*g -
 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[d + e*x] + 2*(e^2*g - 2*d*e*h + 3*d^2*
i)*(a + b*ArcSin[c*x])*Log[d + e*x] - (2*I)*b*(e^2*g - 2*d*e*h + 3*d^2*i)*
PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - (2*I)*b*
(e^2*g - 2*d*e*h + 3*d^2*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt
[c^2*d^2 - e^2])])/(2*e^4)
```

Rubi [A] (verified)

Time = 1.96 (sec) , antiderivative size = 613, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)}{(d+ex)^2}dx$$

$$\Big\downarrow \text{ 5252}$$

$$-bc\int \frac{e^2ix^2+2e(eh-2di)x+2\left(3id^2-2ehd+e^2g\right)\log(d+ex)-\frac{2\left(-id^3+ehd^2-e^2gd+e^3f\right)}{d+ex}}{2e^4\sqrt{1-c^2x^2}}dx+\frac{\log(d+ex)(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4(d+ex)}+\frac{x(eh-2di)(a+b\arcsin(cx))}{e^3}+\frac{ix^2(a+b\arcsin(cx))}{2e^2}$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{bc\int \frac{e^2ix^2+2e(eh-2di)x+2(3id^2-2ehd+e^2g)\log(d+ex)-\frac{2(-id^3+ehd^2-e^2gd+e^3f)}{d+ex}}{\sqrt{1-c^2x^2}}dx}{2e^4}+\frac{\log(d+ex)(a+b\arcsin(cx))(3d^2i-2deh+e^2g)}{e^4}-\frac{(a+b\arcsin(cx))(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4(d+ex)}+\frac{x(eh-2di)(a+b\arcsin(cx))}{e^3}+\frac{ix^2(a+b\arcsin(cx))}{2e^2}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int \left(\frac{e^2ix^2}{\sqrt{1-c^2x^2}}+\frac{2e(eh-2di)x}{\sqrt{1-c^2x^2}}+\frac{2(3id^2-2ehd+e^2g)\log(d+ex)}{\sqrt{1-c^2x^2}}-\frac{2(-id^3+ehd^2-e^2gd+e^3f)}{(d+ex)\sqrt{1-c^2x^2}}\right)dx}{2e^4}+\frac{\log(d+ex)(a+b\arcsin(cx))(3d^2i-2deh+e^2g)}{e^4}-\frac{(a+b\arcsin(cx))(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4(d+ex)}+\frac{x(eh-2di)(a+b\arcsin(cx))}{e^3}+\frac{ix^2(a+b\arcsin(cx))}{2e^2}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\log(d+ex)(a+b\arcsin(cx))(3d^2i-2deh+e^2g)}{e^4}-\frac{(a+b\arcsin(cx))(d^3(-i)+d^2eh-de^2g+e^3f)}{e^4(d+ex)}+\frac{x(eh-2di)(a+b\arcsin(cx))}{e^3}+\frac{ix^2(a+b\arcsin(cx))}{2e^2}-$$

$$bc\left(\frac{e^2i\arcsin(cx)}{2c^3}+\frac{2i(3d^2i-2deh+e^2g)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{2i(3d^2i-2deh+e^2g)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{2\arcsin(cx)(3\right.$$

input
```
Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
((e*h - 2*d*i)*x*(a + b*ArcSin[c*x]))/e^3 + (i*x^2*(a + b*ArcSin[c*x]))/(2
*e^2) - ((e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x]))/(e^4*(d
+ e*x)) + ((e^2*g - 2*d*e*h + 3*d^2*i)*(a + b*ArcSin[c*x])*Log[d + e*x])/e
^4 - (b*c*((-2*e*(e*h - 2*d*i)*Sqrt[1 - c^2*x^2])/c^2 - (e^2*i*x*Sqrt[1 -
c^2*x^2])/(2*c^2) + (e^2*i*ArcSin[c*x])/(2*c^3) + (I*(e^2*g - 2*d*e*h + 3*
d^2*i)*ArcSin[c*x]^2)/c - (2*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcTan[(e
 + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2]
- (2*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]
))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - (2*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin
[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + (2
*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[d + e*x])/c + ((2*I)*(e^2*g -
 2*d*e*h + 3*d^2*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2
 - e^2])])/c + ((2*I)*(e^2*g - 2*d*e*h + 3*d^2*i)*PolyLog[2, (I*e*E^(I*Arc
Sin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/(2*e^4)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2872 vs. $2(616) = 1232$.

Time = 3.84 (sec) , antiderivative size = 2873, normalized size of antiderivative = 4.66

method	result	size
parts	Expression too large to display	2873
derivativedivides	Expression too large to display	2934
default	Expression too large to display	2934

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOS
E)
```

output
```
3*b*c^2/e^4*d^4*i*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^
(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+3*b*c^2/e^4*d
^4*i*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^
2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+b*c^2/e^2*g*arcsin(c*x)/(c
^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(
I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2+b*c^2/e^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln(
(I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2
+e^2)^(1/2)))*d^2-2*b*c^2/e^3*h*d^3*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I
*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/
2)))-2*b*c^2/e^3*h*d^3*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^
2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-3*I*b*c^
2/e^4*d^4*i/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*
d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-3*I*b*c^2/e^4*d^4*i/(c^2*d^2
-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d
*c-(-c^2*d^2+e^2)^(1/2)))-I*b*c^2/e^2*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+
(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*
d^2+2*I*b*c^2/e^3*h*d^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/
2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+2*I*b*c^2/e^3*h*
d^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)
^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-I*b*c^2/e^2*g/(c^2*d^2-e^2)*dilog...
```

Fricas [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^2}\,dx = \int \frac{(ix^3 + hx^2 + gx + f)(b\arcsin(cx) + a)}{(ex + d)^2}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fr
icas")
```

output
```
integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arcsin(c*x))/(e^2*x^2 + 2*d*e*x + d^2), x)
```

Sympy [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^2}\,dx = \int \frac{(a + b\operatorname{asin}(cx))(f + gx + hx^2 + ix^3)}{(d + ex)^2}\,dx$$

input
```
integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="ma
xima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="gi
ac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(i\,x^3+h\,x^2+g\,x+f\right)}{{(d+e\,x)}^2}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^2,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^2, x)
```

Reduce [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$
$$= \frac{2asin(cx)\,bc\,d^2e^2hx-2\left(\int \frac{asin(cx)}{e^2x^2+2dex+d^2}dx\right)bc\,d^3e^3hx+2\left(\int \frac{asin(cx)}{e^2x^2+2dex+d^2}dx\right)bcd\,e^5fx+2\sqrt{-c^2x^2+1}\,b\,c}{}$$

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^2,x)
```

output
```
(2*asin(c*x)*b*c*d**2*e**2*h*x + 2*asin(c*x)*b*c*d*e**3*h*x**2 + 2*sqrt( -
 c**2*x**2 + 1)*b*d**2*e**2*h + 2*sqrt( - c**2*x**2 + 1)*b*d*e**3*h*x - 2*
int(asin(c*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b*c*d**4*e**2*h - 2*int(asin
(c*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*b*c*d**3*e**3*h*x + 2*int(asin(c*x)/
(d**2 + 2*d*e*x + e**2*x**2),x)*b*c*d**2*e**4*f + 2*int(asin(c*x)/(d**2 +
2*d*e*x + e**2*x**2),x)*b*c*d*e**5*f*x + 2*int((asin(c*x)*x**3)/(d**2 + 2*
d*e*x + e**2*x**2),x)*b*c*d**2*e**4*i + 2*int((asin(c*x)*x**3)/(d**2 + 2*d
*e*x + e**2*x**2),x)*b*c*d*e**5*i*x - 4*int((asin(c*x)*x)/(d**2 + 2*d*e*x
+ e**2*x**2),x)*b*c*d**3*e**3*h + 2*int((asin(c*x)*x)/(d**2 + 2*d*e*x + e*
*2*x**2),x)*b*c*d**2*e**4*g - 4*int((asin(c*x)*x)/(d**2 + 2*d*e*x + e**2*x
**2),x)*b*c*d**2*e**4*h*x + 2*int((asin(c*x)*x)/(d**2 + 2*d*e*x + e**2*x**
2),x)*b*c*d*e**5*g*x + 6*log(d + e*x)*a*c*d**4*i - 4*log(d + e*x)*a*c*d**3
*e*h + 6*log(d + e*x)*a*c*d**3*e*i*x + 2*log(d + e*x)*a*c*d**2*e**2*g - 4*
log(d + e*x)*a*c*d**2*e**2*h*x + 2*log(d + e*x)*a*c*d*e**3*g*x - 6*a*c*d**
3*e*i*x + 4*a*c*d**2*e**2*h*x - 3*a*c*d**2*e**2*i*x**2 - 2*a*c*d*e**3*g*x
+ 2*a*c*d*e**3*h*x**2 + a*c*d*e**3*i*x**3 + 2*a*c*e**4*f*x)/(2*c*d*e**4*(d
 + e*x))
```

3.175 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1016

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$
$$= \frac{bi\sqrt{1-c^2x^2}}{ce^3} + \frac{5bcd^3i\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} - \frac{bcd^2(3eh+4di)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$+ \frac{bcd(e^2g+4deh-4d^2i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} + \frac{bc(e^3f-2de^2g+2d^3i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$- \frac{ib(eh-3di)\arcsin(cx)^2}{2e^4} + \frac{ix(a+b\arcsin(cx))}{e^3}$$
$$- \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{2e^4(d+ex)^2}$$
$$- \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{e^4(d+ex)} + \frac{5bc^3d^4i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$- \frac{bcd^2(3c^2dh+4ei)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{bcd(4e^2(eh-2di)+c^2(de^2g+4d^3i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$- \frac{bc(2e^4g-6d^2e^2i-c^2(de^3f-4d^4i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$- \frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$- \frac{ib(eh-3di)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ib(eh-3di)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$

output
```
b*i*(-c^2*x^2+1)^(1/2)/c/e^3+5/2*b*c*d^3*i*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2
-e^2)/(e*x+d)-1/2*b*c*d^2*(4*d*i+3*e*h)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^
2)/(e*x+d)+1/2*b*c*d*(-4*d^2*i+4*d*e*h+e^2*g)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*
d^2-e^2)/(e*x+d)+1/2*b*c*(2*d^3*i-2*d*e^2*g+e^3*f)*(-c^2*x^2+1)^(1/2)/e^3/
(c^2*d^2-e^2)/(e*x+d)-I*b*(-3*d*i+e*h)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(
1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4+i*x*(a+b*arcsin(c*x))/e^3-1/2*(-d^3*i
+d^2*e*h-d*e^2*g+e^3*f)*(a+b*arcsin(c*x))/e^4/(e*x+d)^2-(3*d^2*i-2*d*e*h+e
^2*g)*(a+b*arcsin(c*x))/e^4/(e*x+d)+5/2*b*c^3*d^4*i*arctan((c^2*d*x+e)/(c^
2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d^2-e^2)^(3/2)-1/2*b*c*d^2*(
3*c^2*d*h+4*e*i)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2)
)/e^3/(c^2*d^2-e^2)^(3/2)+1/2*b*c*d*(4*e^2*(-2*d*i+e*h)+c^2*(4*d^3*i+d*e^2
*g))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d
^2-e^2)^(3/2)-1/2*b*c*(2*e^4*g-6*d^2*e^2*i-c^2*(-4*d^4*i+d*e^3*f))*arctan(
(c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d^2-e^2)^(3/2
)+b*(-3*d*i+e*h)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2
*d^2-e^2)^(1/2)))/e^4+b*(-3*d*i+e*h)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2
+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4-b*(-3*d*i+e*h)*arcsin(c*x)*ln(e*
x+d)/e^4+(-3*d*i+e*h)*(a+b*arcsin(c*x))*ln(e*x+d)/e^4-I*b*(-3*d*i+e*h)*pol
ylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4-1/2*I
*b*(-3*d*i+e*h)*arcsin(c*x)^2/e^4
```

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 6 vs. order 4 in optimal.

Time = 9.97 (sec) , antiderivative size = 1556, normalized size of antiderivative = 1.53

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Too large to display}$$

input
```
Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
(a*i*x)/e^3 + (-(a*e^3*f) + a*d*e^2*g - a*d^2*e*h + a*d^3*i)/(2*e^4*(d + e
*x)^2) + (-(a*e^2*g) + 2*a*d*e*h - 3*a*d^2*i)/(e^4*(d + e*x)) + b*f*(-1/4*
(c*Sqrt[1 + (-d - Sqrt[c^(-2)]*e)/(d + e*x)]*Sqrt[1 + (-d + Sqrt[c^(-2)]*e
)/(d + e*x)]*AppellF1[2, 1/2, 1/2, 3, -((-d + Sqrt[c^(-2)]*e)/(d + e*x)),
-((-d - Sqrt[c^(-2)]*e)/(d + e*x))])/(e^2*(d + e*x)*Sqrt[1 - c^2*x^2]) - A
rcSin[c*x]/(2*e*(d + e*x)^2)) + ((a*e*h - 3*a*d*i)*Log[d + e*x])/e^4 + b*g
*((-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]
*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e^2 - (d*((c*Sqrt[1 - c^2*x^2])
/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log
[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*
Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d
^2 - e^2])))/(2*e)) + b*i*((Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x])/(c*e^3) +
 (3*d^2*(-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2
- e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2]))/e^4 - (d^3*((c*Sqrt[1 -
c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c
^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^
2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*S
qrt[c^2*d^2 - e^2])))/(2*e^3) - (3*d*(((-1/2*I)*ArcSin[c*x]^2)/e + (ArcSin
[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e + (A
rcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]...
```

Rubi [A] (verified)

Time = 2.90 (sec) , antiderivative size = 965, normalized size of antiderivative = 0.95, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)}{(d+ex)^3}\,dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int -\frac{5id^3-e(3h-4ix)d^2+e^2(g-4x(h+ix))d+e^3\left(-2ix^3+2gx+f\right)-2(eh-3di)(d+ex)^2\log(d+ex)}{2e^4(d+ex)^2\sqrt{1-c^2x^2}}$$
$$\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4(d+ex)}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{2e^4(d+ex)^2}+$$
$$\frac{(eh-3di)\log(d+ex)(a+b\arcsin(cx))}{e^4}+\frac{ix(a+b\arcsin(cx))}{e^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{5id^3-e(3h-4ix)d^2+e^2(g-4x(h+ix))d+e^3\left(-2ix^3+2gx+f\right)-2(eh-3di)(d+ex)^2\log(d+ex)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2e^4}-$$
$$\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4(d+ex)}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{2e^4(d+ex)^2}+$$
$$\frac{(eh-3di)\log(d+ex)(a+b\arcsin(cx))}{e^4}+\frac{ix(a+b\arcsin(cx))}{e^3}$$

$$\Big\downarrow \text{7293}$$

$$\frac{bc\int \left(\frac{5id^3}{(d+ex)^2\sqrt{1-c^2x^2}}+\frac{e(4ix-3h)d^2}{(d+ex)^2\sqrt{1-c^2x^2}}-\frac{e^2\left(4ix^2+4hx-g\right)d}{(d+ex)^2\sqrt{1-c^2x^2}}-\frac{e^3\left(2ix^3-2gx-f\right)}{(d+ex)^2\sqrt{1-c^2x^2}}-\frac{2(eh-3di)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{2e^4}-$$
$$\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4(d+ex)}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{2e^4(d+ex)^2}+$$
$$\frac{(eh-3di)\log(d+ex)(a+b\arcsin(cx))}{e^4}+\frac{ix(a+b\arcsin(cx))}{e^3}$$

$$\Big\downarrow \text{2009}$$

$$\frac{ix(a+b\arcsin(cx))}{e^3}+\frac{(eh-3di)\log(d+ex)(a+b\arcsin(cx))}{e^4}-$$
$$\frac{\left(3id^2-2ehd+e^2g\right)(a+b\arcsin(cx))}{e^4(d+ex)}-\frac{\left(-id^3+ehd^2-e^2gd+e^3f\right)(a+b\arcsin(cx))}{2e^4(d+ex)^2}+$$
$$bc\left(\frac{5c^2i\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^4}{\left(c^2d^2-e^2\right)^{3/2}}+\frac{5ei\sqrt{1-c^2x^2}d^3}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{e\left(3dhc^2+4ei\right)\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^2}{\left(c^2d^2-e^2\right)^{3/2}}-\frac{e(3eh+4di)\sqrt{1-c^2x^2}d^2}{\left(c^2d^2-e^2\right)(d+ex)}\right.$$

input
```
Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
(i*x*(a + b*ArcSin[c*x]))/e^3 - ((e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a +
b*ArcSin[c*x]))/(2*e^4*(d + e*x)^2) - ((e^2*g - 2*d*e*h + 3*d^2*i)*(a + b*
ArcSin[c*x]))/(e^4*(d + e*x)) + ((e*h - 3*d*i)*(a + b*ArcSin[c*x])*Log[d +
 e*x])/e^4 + (b*c*((2*e*i*Sqrt[1 - c^2*x^2])/c^2 + (5*d^3*e*i*Sqrt[1 - c^2
*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - (d^2*e*(3*e*h + 4*d*i)*Sqrt[1 - c^2*x
^2])/((c^2*d^2 - e^2)*(d + e*x)) + (d*e*(e^2*g + 4*d*e*h - 4*d^2*i)*Sqrt[1
 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) + (e*(e^3*f - 2*d*e^2*g + 2*d^3*i
)*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - (I*(e*h - 3*d*i)*ArcSin
[c*x]^2)/c + (5*c^2*d^4*i*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1
 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2) - (d^2*e*(3*c^2*d*h + 4*e*i)*ArcTan[(
e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/
2) + (d*(4*e^2*(e*h - 2*d*i) + c^2*(d*e^2*g + 4*d^3*i))*ArcTan[(e + c^2*d*
x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2) - ((2*e
^4*g - 6*d^2*e^2*i - c^2*(d*e^3*f - 4*d^4*i))*ArcTan[(e + c^2*d*x)/(Sqrt[c
^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2) + (2*(e*h - 3*d*i
)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])]
)/c + (2*(e*h - 3*d*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d +
Sqrt[c^2*d^2 - e^2])])/c - (2*(e*h - 3*d*i)*ArcSin[c*x]*Log[d + e*x])/c -
((2*I)*(e*h - 3*d*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^
2 - e^2])])/c - ((2*I)*(e*h - 3*d*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))...
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3616 vs. 2(979) = 1958.

Time = 4.13 (sec) , antiderivative size = 3617, normalized size of antiderivative = 3.56

method	result	size
parts	Expression too large to display	3617
derivativedivides	Expression too large to display	3646
default	Expression too large to display	3646

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOS
E)
```

output
```
a*(i/e^3*x-1/e^4*(3*d^2*i-2*d*e*h+e^2*g)/(e*x+d)+(-3*d*i+e*h)/e^4*ln(e*x+d
)-1/2/e^4*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)/(e*x+d)^2)+b/c*(-3/(c^2*d^2-e^2)^
2*c*i*d*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^
(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-1/2*c^2*(-2*arcsin(c*x)*e^5*g*c*x+I*c
^3*d^4*e*h+I*c^3*d^2*e^3*f+(-c^2*x^2+1)^(1/2)*c^2*d^4*e*i-(-c^2*x^2+1)^(1/
2)*c^2*d^3*e^2*h+(-c^2*x^2+1)^(1/2)*c^2*d^2*e^3*g-(-c^2*x^2+1)^(1/2)*c^2*d
*e^4*f-3*e*c^3*d^4*h*arcsin(c*x)-5*e^2*c*d^3*i*arcsin(c*x)+e^3*c^3*d^2*f*a
rcsin(c*x)+e^2*c^3*d^3*g*arcsin(c*x)+2*I*c^3*d*e^4*f*x-I*c^3*d^3*e^2*i*x^2
-I*c^3*d*e^4*g*x^2-2*I*c^3*d^4*e*i*x+2*I*c^3*d^3*e^2*h*x-2*I*c^3*d^2*e^3*g
*x+I*c^3*d^2*e^3*h*x^2+(-c^2*x^2+1)^(1/2)*c^2*d^3*e^2*i*x-(-c^2*x^2+1)^(1/
2)*c^2*d^2*e^3*h*x+(-c^2*x^2+1)^(1/2)*c^2*d*e^4*g*x+6*arcsin(c*x)*c^3*d^4*
e*i*x-4*arcsin(c*x)*c^3*d^3*e^2*h*x+2*arcsin(c*x)*c^3*d^2*e^3*g*x-I*c^3*d^
5*i-e^5*c*f*arcsin(c*x)+5*c^3*d^5*i*arcsin(c*x)+3*e^3*c*d^2*h*arcsin(c*x)-
e^4*c*g*arcsin(c*x)*d-I*c^3*d^3*e^2*g+I*c^3*e^5*f*x^2-(-c^2*x^2+1)^(1/2)*c
^2*e^5*f*x-6*arcsin(c*x)*d^2*e^3*i*c*x+4*arcsin(c*x)*d*e^4*h*c*x)/(c^2*d^2
-e^2)/(c*e*x+c*d)^2/e^4+3*I/e^4/(c^2*d^2-e^2)^2*c^5*i*d^5*dilog((I*d*c+(I*
c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2
)))-6*I/e^2/(c^2*d^2-e^2)^2*c^3*i*d^3*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/
2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+6/e^2/(c^2*d^2-e
^2)^2*c^3*i*d^3*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^...
```

Fricas [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^3}\,dx = \int \frac{(ix^3 + hx^2 + gx + f)(b\arcsin(cx) + a)}{(ex + d)^3}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fr
icas")
```

output
```
integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arcsin(c*x))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^3}\,dx = \int \frac{(a + b\operatorname{asin}(cx))(f + gx + hx^2 + ix^3)}{(d + ex)^3}\,dx$$

input
```
integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="ma
xima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="gi
ac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(i\,x^3+h\,x^2+g\,x+f\right)}{{(d+e\,x)}^3}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^3,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^3, x)
```

Reduce [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^3}\,dx = \text{Too large to display}$$

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^3,x)
```

output
```
(2*asin(c*x)*b*c*d**3*e*i*x + 4*asin(c*x)*b*c*d**2*e**2*i*x**2 + 2*asin(c*
x)*b*c*d*e**3*i*x**3 + 2*sqrt( - c**2*x**2 + 1)*b*d**3*e*i + 4*sqrt( - c**
2*x**2 + 1)*b*d**2*e**2*i*x + 2*sqrt( - c**2*x**2 + 1)*b*d*e**3*i*x**2 - 2
*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*c*d**6
*e*i - 4*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*
b*c*d**5*e**2*i*x - 2*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e
**3*x**3),x)*b*c*d**4*e**3*i*x**2 + 2*int(asin(c*x)/(d**3 + 3*d**2*e*x + 3
*d*e**2*x**2 + e**3*x**3),x)*b*c*d**3*e**4*f + 4*int(asin(c*x)/(d**3 + 3*d
**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*c*d**2*e**5*f*x + 2*int(asin(c*x
)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*c*d*e**6*f*x**2 - 6
*int((asin(c*x)*x**2)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b
*c*d**4*e**3*i + 2*int((asin(c*x)*x**2)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2
 + e**3*x**3),x)*b*c*d**3*e**4*h - 12*int((asin(c*x)*x**2)/(d**3 + 3*d**2*
e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*c*d**3*e**4*i*x + 4*int((asin(c*x)*x
**2)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*c*d**2*e**5*h*x
- 6*int((asin(c*x)*x**2)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x
)*b*c*d**2*e**5*i*x**2 + 2*int((asin(c*x)*x**2)/(d**3 + 3*d**2*e*x + 3*d*e
**2*x**2 + e**3*x**3),x)*b*c*d*e**6*h*x**2 - 6*int((asin(c*x)*x)/(d**3 + 3
*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*c*d**5*e**2*i - 12*int((asin(c
*x)*x)/(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3),x)*b*c*d**4*e**3...
```

3.176 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

Optimal result

Integrand size = 31, antiderivative size = 1278

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Too large to display}$$

output
```
1/12*b*c*(6*d^2*h-3*d*e*g+2*e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e
*x+d)^2-11/12*b*c*d^3*i*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)/(e*x+d)^2+1/1
2*b*c*d^2*(27*d*i+2*e*h)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)/(e*x+d)^2+1/
12*b*c*d*(-18*d^2*i-6*d*e*h+e^2*g)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)/(e
*x+d)^2-1/4*b*c*(2*e^2*(-4*d*h+e*g)-c^2*d*(-2*d^2*h-d*e*g+2*e^2*f))*(-c^2*
x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)^2/(e*x+d)-11/4*b*c^3*d^4*i*(-c^2*x^2+1)^(1/
2)/e^3/(c^2*d^2-e^2)^2/(e*x+d)+1/4*b*c*d^2*(18*e^2*i+c^2*d*(9*d*i+2*e*h))*
(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)^2/(e*x+d)-1/4*b*c*d*(4*e^2*(6*d*i+e*h
)-c^2*d*(6*d^2*i-2*d*e*h+e^2*g))*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)^2/(e
*x+d)-I*b*i*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1
/2)))/e^4-1/3*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*(a+b*arcsin(c*x))/e^4/(e*x+d)
^3-1/2*(3*d^2*i-2*d*e*h+e^2*g)*(a+b*arcsin(c*x))/e^4/(e*x+d)^2-(-3*d*i+e*h
)*(a+b*arcsin(c*x))/e^4/(e*x+d)+1/12*b*c*(4*c^4*d^2*f+12*e^2*h+c^2*(6*d^2*
h-9*d*e*g+2*e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1
/2))/e/(c^2*d^2-e^2)^(5/2)-11/12*b*c^3*d^3*(2*c^2*d^2+e^2)*i*arctan((c^2*d
*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d^2-e^2)^(5/2)+1/12
*b*c^3*d^2*(4*c^2*d^2*h+e*(81*d*i+2*e*h))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)
^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(5/2)+1/12*b*c*d*(2*c^4*d^2*g
-36*e^2*i+c^2*(-18*d^2*i-18*d*e*h+e^2*g))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)
^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(5/2)+b*i*arcsin(c*x)*ln(1...
```

Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 6 vs. order 4 in optimal.

Time = 7.67 (sec) , antiderivative size = 1921, normalized size of antiderivative = 1.50

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
(-(a*e^3*f) + a*d*e^2*g - a*d^2*e*h + a*d^3*i)/(3*e^4*(d + e*x)^3) + (-(a*
e^2*g) + 2*a*d*e*h - 3*a*d^2*i)/(2*e^4*(d + e*x)^2) + (-(a*e*h) + 3*a*d*i)
/(e^4*(d + e*x)) + b*f*(-1/9*(c*Sqrt[1 + (-d - Sqrt[c^(-2)]*e)/(d + e*x)]*
Sqrt[1 + (-d + Sqrt[c^(-2)]*e)/(d + e*x)]*AppellF1[3, 1/2, 1/2, 4, -((-d +
 Sqrt[c^(-2)]*e)/(d + e*x)), -((-d - Sqrt[c^(-2)]*e)/(d + e*x))])/(e^2*(d
+ e*x)^2*Sqrt[1 - c^2*x^2]) - ArcSin[c*x]/(3*e*(d + e*x)^3)) + (a*i*Log[d
+ e*x])/e^4 + b*h*((-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sq
rt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e^3 - (d*((c*S
qrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2
) - (I*c^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqr
t[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*
d + e)*Sqrt[c^2*d^2 - e^2])))/e^2 + (d^2*((Sqrt[1 - c^2*x^2]*(-(c*e^2) + c
^3*d*(4*d + 3*e*x)))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (2*ArcSin[c*x])/
(e*(d + e*x)^3) + (c^3*(2*c^2*d^2 + e^2)*Log[d + e*x])/(e*(-(c*d) + e)^2*(
c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]) - (c^3*(2*c^2*d^2 + e^2)*Log[e + c^2*d*
x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/(e*(-(c*d) + e)^2*(c*d + e)
^2*Sqrt[-(c^2*d^2) + e^2])))/(6*e^2)) + b*g*(((c*Sqrt[1 - c^2*x^2])/((c^2*
d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[4] + L
og[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1
- c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 -...
```

Rubi [A] (verified)

Time = 3.32 (sec) , antiderivative size = 1244, normalized size of antiderivative = 0.97, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)}{(d+ex)^4}\,dx$$

$$\Big\downarrow \ 5252$$

$$-bc\int \frac{11id^3-e(2h-27ix)d^2-e^2(g+6x(h-3ix))d-e^3(2f+3x(g+2hx))+6i(d+ex)^3\log(d+ex)}{6e^4(d+ex)^3\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{2e^4(d+ex)^2}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{3e^4(d+ex)^3}-\frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}+\frac{i\log(d+ex)(a+b\arcsin(cx))}{e^4}$$

$$\Big\downarrow \text{27}$$

$$-\frac{bc\int \frac{11id^3-e(2h-27ix)d^2-e^2(g+6x(h-3ix))d-e^3(2f+3x(g+2hx))+6i(d+ex)^3\log(d+ex)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{6e^4}-\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{2e^4(d+ex)^2}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{3e^4(d+ex)^3}-\frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}+\frac{i\log(d+ex)(a+b\arcsin(cx))}{e^4}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int \left(\frac{11id^3}{(d+ex)^3\sqrt{1-c^2x^2}}+\frac{e(27ix-2h)d^2}{(d+ex)^3\sqrt{1-c^2x^2}}+\frac{e^2\left(18ix^2-6hx-g\right)d}{(d+ex)^3\sqrt{1-c^2x^2}}-\frac{e^3\left(6hx^2+3gx+2f\right)}{(d+ex)^3\sqrt{1-c^2x^2}}+\frac{6i\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{6e^4}-\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{2e^4(d+ex)^2}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{3e^4(d+ex)^3}-\frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}+\frac{i\log(d+ex)(a+b\arcsin(cx))}{e^4}$$

$$\Big\downarrow \text{2009}$$

$$\frac{i\log(d+ex)(a+b\arcsin(cx))}{e^4}-\frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}-\frac{\left(3id^2-2ehd+e^2g\right)(a+b\arcsin(cx))}{2e^4(d+ex)^2}-\frac{\left(-id^3+ehd^2-e^2gd+e^3f\right)(a+b\arcsin(cx))}{3e^4(d+ex)^3}-$$
$$bc\left(\frac{33c^2ei\sqrt{1-c^2x^2}d^4}{2(c^2d^2-e^2)^2(d+ex)}+\frac{11c^2\left(2c^2d^2+e^2\right)i\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^3}{2(c^2d^2-e^2)^{5/2}}+\frac{11ei\sqrt{1-c^2x^2}d^3}{2(c^2d^2-e^2)(d+ex)^2}-\frac{c^2e\left(4c^2hd^2+e(2eh+81di)\right)\arctan\left(\right.}{2(c^2d^2-e^2)^{5/}}\right.$$

input
```
Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
-1/3*((e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x]))/(e^4*(d + e
*x)^3) - ((e^2*g - 2*d*e*h + 3*d^2*i)*(a + b*ArcSin[c*x]))/(2*e^4*(d + e*x
)^2) - ((e*h - 3*d*i)*(a + b*ArcSin[c*x]))/(e^4*(d + e*x)) + (i*(a + b*Arc
Sin[c*x])*Log[d + e*x])/e^4 - (b*c*(-1/2*(e^2*(2*e^2*f - 3*d*e*g + 6*d^2*h
)*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)^2) + (11*d^3*e*i*Sqrt[1 -
c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2) - (d^2*e*(2*e*h + 27*d*i)*Sqrt[1
 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2) - (d*e*(e^2*g - 6*d*e*h - 18*
d^2*i)*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2) + (3*e^2*(2*e^2*
(e*g - 4*d*h) - c^2*d*(2*e^2*f - d*e*g - 2*d^2*h))*Sqrt[1 - c^2*x^2])/(2*(
c^2*d^2 - e^2)^2*(d + e*x)) + (33*c^2*d^4*e*i*Sqrt[1 - c^2*x^2])/(2*(c^2*d
^2 - e^2)^2*(d + e*x)) - (3*d^2*e*(18*e^2*i + c^2*d*(2*e*h + 9*d*i))*Sqrt[
1 - c^2*x^2])/(2*(c^2*d^2 - e^2)^2*(d + e*x)) + (3*d*e*(4*e^2*(e*h + 6*d*i
) - c^2*d*(e^2*g - 2*d*e*h + 6*d^2*i))*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^
2)^2*(d + e*x)) + ((3*I)*i*ArcSin[c*x]^2)/c - (e^3*(4*c^4*d^2*f + 12*e^2*h
 + c^2*(2*e^2*f - 9*d*e*g + 6*d^2*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 -
 e^2]*Sqrt[1 - c^2*x^2])])/(2*(c^2*d^2 - e^2)^(5/2)) + (11*c^2*d^3*(2*c^2*
d^2 + e^2)*i*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])]
)/(2*(c^2*d^2 - e^2)^(5/2)) - (c^2*d^2*e*(4*c^2*d^2*h + e*(2*e*h + 81*d*i)
)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(2*(c^2*d
^2 - e^2)^(5/2)) - (d*e^2*(2*c^4*d^2*g - 36*e^2*i + c^2*(e^2*g - 18*d*e...
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3756 vs. $2(1225) = 2450$.

Time = 5.42 (sec) , antiderivative size = 3757, normalized size of antiderivative = 2.94

method	result	size
parts	Expression too large to display	3757
derivativedivides	Expression too large to display	3777
default	Expression too large to display	3777

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOS
E)
```

output
```
a*(-(-3*d*i+e*h)/e^4/(e*x+d)+i/e^4*ln(e*x+d)-1/2*(3*d^2*i-2*d*e*h+e^2*g)/e
^4/(e*x+d)^2-1/3*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)/e^4/(e*x+d)^3)+b/c*(-I/e^4
/(c^2*d^2-e^2)^3*c^7*d^6*i*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2
*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+3*I/e^2/(c^2*d^2-e^2)^3*c^5
*d^4*i*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*
d*c+(-c^2*d^2+e^2)^(1/2)))+1/e^4/(c^2*d^2-e^2)^3*c^7*d^6*i*arcsin(c*x)*ln(
(I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2
+e^2)^(1/2)))+1/e^4/(c^2*d^2-e^2)^3*c^7*d^6*i*arcsin(c*x)*ln((I*d*c+(I*c*x
+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))
-I/(c^2*d^2-e^2)^2*c*i*arcsin(c*x)^2+1/6*c^2*(3*I*c^4*e^7*g*x^3-(-c^2*x^2+
1)^(1/2)*c^3*e^7*f*x-3*(-c^2*x^2+1)^(1/2)*c^3*e^7*g*x^2-3*arcsin(c*x)*c^2*
e^7*g*x+18*arcsin(c*x)*d*e^6*i*c^2*x^2+11*c^6*d^7*i*arcsin(c*x)-2*e^7*c^2*
f*arcsin(c*x)-6*I*c^6*d^7*i+11*e^4*c^2*d^3*i*arcsin(c*x)+9*I*c^4*d^5*e^2*i
-6*I*c^4*d^4*e^3*h+3*I*c^4*d^3*e^4*g-6*arcsin(c*x)*e^7*h*c^2*x^2+5*(-c^2*x
^2+1)^(1/2)*c^5*d^6*e*i-2*(-c^2*x^2+1)^(1/2)*c^5*d^5*e^2*h-(-c^2*x^2+1)^(1
/2)*c^5*d^4*e^3*g+4*(-c^2*x^2+1)^(1/2)*c^5*d^3*e^4*f-8*(-c^2*x^2+1)^(1/2)*
c^3*d^4*e^3*i+5*(-c^2*x^2+1)^(1/2)*c^3*d^3*e^4*h-2*(-c^2*x^2+1)^(1/2)*c^3*
d^2*e^5*g-(-c^2*x^2+1)^(1/2)*c^3*d*e^6*f+3*I*c^6*d^6*e*h-3*I*c^6*d^4*e^3*f
-54*arcsin(c*x)*c^4*d^4*e^3*i*x+12*arcsin(c*x)*c^4*d^3*e^4*h*x+6*arcsin(c*
x)*c^4*d^2*e^5*g*x+27*arcsin(c*x)*c^2*d^2*e^5*i*x-6*arcsin(c*x)*c^2*d*e...
```

Fricas [F]

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fr
icas")
```

output
```
integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arcsin(c*x))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4)
, x)
```

Sympy [F]

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\operatorname{asin}(cx))\,(f+gx+hx^2+ix^3)}{(d+ex)^4}\,dx$$

input
```
integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**4,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x)**4, x)
```

Maxima [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b \arcsin(cx))}{(d + ex)^4} dx$$
$$= \int \frac{(ix^3 + hx^2 + gx + f)(b \arcsin(cx) + a)}{(ex + d)^4} dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="ma
xima")
```

output
```
1/6*a*i*((18*d*e^2*x^2 + 27*d^2*e*x + 11*d^3)/(e^7*x^3 + 3*d*e^6*x^2 + 3*d
^2*e^5*x + d^3*e^4) + 6*log(e*x + d)/e^4) - 1/6*(3*e*x + d)*a*g/(e^5*x^3 +
 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/3*(3*e^2*x^2 + 3*d*e*x + d^2)*a*
h/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3) - 1/3*a*f/(e^4*x^3 + 3*d
*e^3*x^2 + 3*d^2*e^2*x + d^3*e) + integrate((b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^4*x^4 + 4*d*e^3*x^3 + 6*
d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b \arcsin(cx))}{(d + ex)^4} dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="gi
ac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(i\,x^3+h\,x^2+g\,x+f\right)}{(d+e\,x)^4}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^4,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^4, x)
```

Reduce [F]

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*asin(c*x))/(e*x+d)^4,x)
```

output
```
(6*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e
**4*x**4),x)*b*d**4*e**4*f + 18*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*
e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**3*e**5*f*x + 18*int(asin(c*
x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b
*d**2*e**6*f*x**2 + 6*int(asin(c*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2
+ 4*d*e**3*x**3 + e**4*x**4),x)*b*d*e**7*f*x**3 + 6*int((asin(c*x)*x**3)/(
d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**
4*e**4*i + 18*int((asin(c*x)*x**3)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 +
 4*d*e**3*x**3 + e**4*x**4),x)*b*d**3*e**5*i*x + 18*int((asin(c*x)*x**3)/(
d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**
2*e**6*i*x**2 + 6*int((asin(c*x)*x**3)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x*
*2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d*e**7*i*x**3 + 6*int((asin(c*x)*x**2
)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*
d**4*e**4*h + 18*int((asin(c*x)*x**2)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**
2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d**3*e**5*h*x + 18*int((asin(c*x)*x**2
)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*
d**2*e**6*h*x**2 + 6*int((asin(c*x)*x**2)/(d**4 + 4*d**3*e*x + 6*d**2*e**2
*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*d*e**7*h*x**3 + 6*int((asin(c*x)*x
)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*x**4),x)*b*
d**4*e**4*g + 18*int((asin(c*x)*x)/(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**...
```

3.177 $\int (g+hx)^3 (d+ex+fx^2) (a+b\arcsin(cx))^2 dx$

Optimal result

Integrand size = 28, antiderivative size = 1016

$$\int (g+hx)^3\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$= -2b^2dg^3x - \frac{16b^2h^2(3fg+eh)x}{75c^4} - \frac{4b^2g(fg^2+3h(eg+dh))\,x}{9c^2}$$
$$- \frac{5b^2fh^3x^2}{96c^4} - \frac{1}{4}b^2g^2(eg+3dh)x^2 - \frac{3b^2h(3fg^2+h(3eg+dh))\,x^2}{32c^2}$$
$$- \frac{8b^2h^2(3fg+eh)x^3}{225c^2} - \frac{2}{27}b^2g\left(fg^2+3h(eg+dh)\right)x^3 - \frac{5b^2fh^3x^4}{288c^2}$$
$$- \frac{1}{32}b^2h\left(3fg^2+h(3eg+dh)\right)x^4 - \frac{2}{125}b^2h^2(3fg+eh)x^5 - \frac{1}{108}b^2fh^3x^6$$
$$+ \frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{16bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5}$$
$$+ \frac{4bg(fg^2+3h(eg+dh))\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}$$
$$+ \frac{5bfh^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{48c^5} + \frac{bg^2(eg+3dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}$$
$$+ \frac{3bh(3fg^2+h(3eg+dh))\,x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}$$
$$+ \frac{8bh^2(3fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3}$$
$$+ \frac{2bg(fg^2+3h(eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}$$
$$+ \frac{5bfh^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{72c^3}$$
$$+ \frac{bh(3fg^2+h(3eg+dh))\,x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}$$
$$+ \frac{2bh^2(3fg+eh)x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c}$$
$$+ \frac{bfh^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c} - \frac{5fh^3(a+b\arcsin(cx))^2}{96c^6}$$
$$- \frac{g^2(eg+3dh)(a+b\arcsin(cx))^2}{4c^2} - \frac{3h(3fg^2+h(3eg+dh))\,(a+b\arcsin(cx))^2}{32c^4}$$
$$+ dg^3x(a+b\arcsin(cx))^2 + \frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2$$
$$+ \frac{1}{3}g\left(fg^2+3h(eg+dh)\right)x^3(a+b\arcsin(cx))^2$$
$$+ \frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)x^4(a+b\arcsin(cx))^2$$
$$+ \frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2 + \frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2$$

output
```
d*g^3*x*(a+b*arcsin(c*x))^2-2*b^2*d*g^3*x-1/4*b^2*g^2*(3*d*h+e*g)*x^2-2/27
*b^2*g*(f*g^2+3*h*(d*h+e*g))*x^3-1/32*b^2*h*(3*f*g^2+h*(d*h+3*e*g))*x^4-2/
125*b^2*h^2*(e*h+3*f*g)*x^5-1/108*b^2*f*h^3*x^6-5/96*f*h^3*(a+b*arcsin(c*x
))^2/c^6-1/4*g^2*(3*d*h+e*g)*(a+b*arcsin(c*x))^2/c^2-3/32*h*(3*f*g^2+h*(d*
h+3*e*g))*(a+b*arcsin(c*x))^2/c^4+1/2*g^2*(3*d*h+e*g)*x^2*(a+b*arcsin(c*x)
)^2+1/3*g*(f*g^2+3*h*(d*h+e*g))*x^3*(a+b*arcsin(c*x))^2+1/4*h*(3*f*g^2+h*(
d*h+3*e*g))*x^4*(a+b*arcsin(c*x))^2+1/5*h^2*(e*h+3*f*g)*x^5*(a+b*arcsin(c*
x))^2+1/6*f*h^3*x^6*(a+b*arcsin(c*x))^2+2*b*d*g^3*(-c^2*x^2+1)^(1/2)*(a+b*
arcsin(c*x))/c+16/75*b*h^2*(e*h+3*f*g)*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x)
)/c^5+4/9*b*g*(f*g^2+3*h*(d*h+e*g))*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c
^3+1/8*b*h*(3*f*g^2+h*(d*h+3*e*g))*x^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x)
)/c+2/25*b*h^2*(e*h+3*f*g)*x^4*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+1/18
*b*f*h^3*x^5*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+5/48*b*f*h^3*x*(-c^2*x
^2+1)^(1/2)*(a+b*arcsin(c*x))/c^5+1/2*b*g^2*(3*d*h+e*g)*x*(-c^2*x^2+1)^(1/
2)*(a+b*arcsin(c*x))/c+3/16*b*h*(3*f*g^2+h*(d*h+3*e*g))*x*(-c^2*x^2+1)^(1/
2)*(a+b*arcsin(c*x))/c^3+8/75*b*h^2*(e*h+3*f*g)*x^2*(-c^2*x^2+1)^(1/2)*(a+
b*arcsin(c*x))/c^3+2/9*b*g*(f*g^2+3*h*(d*h+e*g))*x^2*(-c^2*x^2+1)^(1/2)*(a
+b*arcsin(c*x))/c+5/72*b*f*h^3*x^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c^
3-16/75*b^2*h^2*(e*h+3*f*g)*x/c^4-4/9*b^2*g*(f*g^2+3*h*(d*h+e*g))*x/c^2-5/
96*b^2*f*h^3*x^2/c^4-3/32*b^2*h*(3*f*g^2+h*(d*h+3*e*g))*x^2/c^2-8/225*b...
```

Mathematica [A] (verified)

Time = 0.60 (sec) , antiderivative size = 734, normalized size of antiderivative = 0.72

$$\int (g+hx)^3\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = dg^3x(a+b\arcsin(cx))^2$$
$$+\frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2+\frac{1}{3}g\left(fg^2+3h(eg+dh)\right)x^3(a+b\arcsin(cx))^2$$
$$+\frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)x^4(a+b\arcsin(cx))^2$$
$$+\frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2+\frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2$$
$$-\frac{2bg(fg^2+3h(eg+dh))\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(c}{27c^3}$$
$$-\frac{2bh^2(3fg+eh)\left(-15a\sqrt{1-c^2x^2}(8+4c^2x^2+3c^4x^4)+bcx(120+20c^2x^2+9c^4x^4)-15b\sqrt{1-c^2x^2}(8}{1125c^5}$$
$$-\frac{fh^3\left(45a^2-6abcx\sqrt{1-c^2x^2}(15+10c^2x^2+8c^4x^4)+b^2c^2x^2(45+15c^2x^2+8c^4x^4)-6b\left(-15a+bcx\sqrt{}\right.\right.}{864c^6}$$
$$-2bdg^3\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)$$
$$-\frac{1}{32}bh\left(3fg^2+h(3eg+dh)\right)\left(\frac{3bx^2}{c^2}+bx^4-\frac{6x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3}\right.$$
$$\left.-\frac{4x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{3(a+b\arcsin(cx))^2}{bc^4}\right)$$
$$-\frac{1}{4}bg^2(eg+3dh)\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)$$

input
```
Integrate[(g + h*x)^3*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
d*g^3*x*(a + b*ArcSin[c*x])^2 + (g^2*(e*g + 3*d*h)*x^2*(a + b*ArcSin[c*x])
^2)/2 + (g*(f*g^2 + 3*h*(e*g + d*h))*x^3*(a + b*ArcSin[c*x])^2)/3 + (h*(3*
f*g^2 + h*(3*e*g + d*h))*x^4*(a + b*ArcSin[c*x])^2)/4 + (h^2*(3*f*g + e*h)
*x^5*(a + b*ArcSin[c*x])^2)/5 + (f*h^3*x^6*(a + b*ArcSin[c*x])^2)/6 - (2*b
*g*(f*g^2 + 3*h*(e*g + d*h))*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x
*(6 + c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(27*c^3
) - (2*b*h^2*(3*f*g + e*h)*(-15*a*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4
*x^4) + b*c*x*(120 + 20*c^2*x^2 + 9*c^4*x^4) - 15*b*Sqrt[1 - c^2*x^2]*(8 +
 4*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]))/(1125*c^5) - (f*h^3*(45*a^2 - 6*a*b*
c*x*Sqrt[1 - c^2*x^2]*(15 + 10*c^2*x^2 + 8*c^4*x^4) + b^2*c^2*x^2*(45 + 15
*c^2*x^2 + 8*c^4*x^4) - 6*b*(-15*a + b*c*x*Sqrt[1 - c^2*x^2]*(15 + 10*c^2*
x^2 + 8*c^4*x^4))*ArcSin[c*x] + 45*b^2*ArcSin[c*x]^2))/(864*c^6) - 2*b*d*g
^3*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - (b*h*(3*f*g^2 + h*(
3*e*g + d*h))*((3*b*x^2)/c^2 + b*x^4 - (6*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x]))/c^3 - (4*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (3*(a + b
*ArcSin[c*x])^2)/(b*c^4)))/32 - (b*g^2*(e*g + 3*d*h)*(b*x^2 - (2*x*Sqrt[1
- c^2*x^2]*(a + b*ArcSin[c*x]))/c + (a + b*ArcSin[c*x])^2/(b*c^2)))/4
```

Rubi [A] (verified)

Time = 2.08 (sec) , antiderivative size = 1016, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {5250, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx$$

$$\Big\downarrow \text{ 5250}$$

$$\int \left(hx^3(a+b\arcsin(cx))^2 \left(h(dh+3eg)+3fg^2\right)+gx^2(a+b\arcsin(cx))^2 \left(3h(dh+eg)+fg^2\right)+g^2x(3dh+eg)\right.$$

$$\Big\downarrow \text{ 2009}$$

$$-\frac{1}{108}b^2fh^3x^6+\frac{1}{6}fh^3(a+b\arcsin(cx))^2x^6+\frac{1}{5}h^2(3fg+eh)(a+b\arcsin(cx))^2x^5-\frac{2}{125}b^2h^2(3fg+eh)x^5+\frac{bfh^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^5}{18c}-\frac{5b^2fh^3x^4}{288c^2}+\frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)(a+b\arcsin(cx))^2x^4-\frac{1}{32}b^2h\left(3fg^2+h(3eg+dh)\right)x^4+\frac{2bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^4}{25c}+\frac{1}{3}g\left(fg^2+3h(eg+dh)\right)(a+b\arcsin(cx))^2x^3-\frac{8b^2h^2(3fg+eh)x^3}{225c^2}-\frac{2}{27}b^2g\left(fg^2+3h(eg+dh)\right)x^3+\frac{5bfh^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^3}{72c^3}+\frac{bh\left(3fg^2+h(3eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^3}{8c}-\frac{5b^2fh^3x^2}{96c^4}+\frac{1}{2}g^2(eg+3dh)(a+b\arcsin(cx))^2x^2-\frac{1}{4}b^2g^2(eg+3dh)x^2-\frac{3b^2h\left(3fg^2+h(3eg+dh)\right)x^2}{32c^2}+\frac{8bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^2}{75c^3}+\frac{2bg\left(fg^2+3h(eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^2}{9c}-2b^2dg^3x+dg^3(a+b\arcsin(cx))^2x-\frac{16b^2h^2(3fg+eh)x}{75c^4}-\frac{4b^2g\left(fg^2+3h(eg+dh)\right)x}{9c^2}+\frac{5bfh^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x}{48c^5}+\frac{bg^2(eg+3dh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x}{2c}+\frac{3bh\left(3fg^2+h(3eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x}{16c^3}-\frac{5fh^3(a+b\arcsin(cx))^2}{96c^6}-\frac{g^2(eg+3dh)(a+b\arcsin(cx))^2}{4c^2}-\frac{3h\left(3fg^2+h(3eg+dh)\right)(a+b\arcsin(cx))^2}{32c^4}+\frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{16bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5}+\frac{4bg\left(fg^2+3h(eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}$$

input
```
Int[(g + h*x)^3*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
-2*b^2*d*g^3*x - (16*b^2*h^2*(3*f*g + e*h)*x)/(75*c^4) - (4*b^2*g*(f*g^2 +
 3*h*(e*g + d*h))*x)/(9*c^2) - (5*b^2*f*h^3*x^2)/(96*c^4) - (b^2*g^2*(e*g
+ 3*d*h)*x^2)/4 - (3*b^2*h*(3*f*g^2 + h*(3*e*g + d*h))*x^2)/(32*c^2) - (8*
b^2*h^2*(3*f*g + e*h)*x^3)/(225*c^2) - (2*b^2*g*(f*g^2 + 3*h*(e*g + d*h))*
x^3)/27 - (5*b^2*f*h^3*x^4)/(288*c^2) - (b^2*h*(3*f*g^2 + h*(3*e*g + d*h))
*x^4)/32 - (2*b^2*h^2*(3*f*g + e*h)*x^5)/125 - (b^2*f*h^3*x^6)/108 + (2*b*
d*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (16*b*h^2*(3*f*g + e*h)*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^5) + (4*b*g*(f*g^2 + 3*h*(e*g
+ d*h))*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c^3) + (5*b*f*h^3*x*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(48*c^5) + (b*g^2*(e*g + 3*d*h)*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c) + (3*b*h*(3*f*g^2 + h*(3*e*g + d*h
))*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(16*c^3) + (8*b*h^2*(3*f*g + e
*h)*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^3) + (2*b*g*(f*g^2 +
3*h*(e*g + d*h))*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + (5*b*f
*h^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(72*c^3) + (b*h*(3*f*g^2 +
 h*(3*e*g + d*h))*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (2*b*
h^2*(3*f*g + e*h)*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + (b*f
*h^3*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(18*c) - (5*f*h^3*(a + b*A
rcSin[c*x])^2)/(96*c^6) - (g^2*(e*g + 3*d*h)*(a + b*ArcSin[c*x])^2)/(4*c^2
) - (3*h*(3*f*g^2 + h*(3*e*g + d*h))*(a + b*ArcSin[c*x])^2)/(32*c^4) + ...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5250
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_), x_Symbol] :> Int[ExpandI
ntegrand[Px*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, n}, x] && Poly
nomialQ[Px, x]
```

Maple [A] (verified)

Time = 1.31 (sec) , antiderivative size = 1706, normalized size of antiderivative = 1.68

method	result	size
derivativedivides	Expression too large to display	1706
default	Expression too large to display	1706
parts	Expression too large to display	1903
orering	Expression too large to display	5066

input
```
int((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(a^2/c^5*(1/6*h^3*f*c^6*x^6+1/5*(c*e*h^3+3*c*f*g*h^2)*c^5*x^5+1/4*(c^2
*d*h^3+3*c^2*e*g*h^2+3*c^2*f*g^2*h)*c^4*x^4+1/3*(3*c^3*d*g*h^2+3*c^3*e*g^2
*h+c^3*f*g^3)*c^3*x^3+1/2*(3*c^4*d*g^2*h+c^4*e*g^3)*c^2*x^2+c^6*g^3*d*x)+b
^2/c^5*(c^5*d*g^3*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2
))+1/4*c^4*g^3*e*(2*arcsin(c*x)^2*c^2*x^2+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)
*c*x-arcsin(c*x)^2-c^2*x^2)+1/27*c^3*f*g^3*(9*arcsin(c*x)^2*c^3*x^3+6*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)-12*c*x)+3/4*c^4*g^2*h*d*(2*arcsin(c*x)^2*c^2*x^2+2*arcsin(c*x)*(-c^2*
x^2+1)^(1/2)*c*x-arcsin(c*x)^2-c^2*x^2)+1/9*c^3*e*g^2*h*(9*arcsin(c*x)^2*c
^3*x^3+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*c^3*x^3+12*arcsin(c*x)*(
-c^2*x^2+1)^(1/2)-12*c*x)+3/128*c^2*f*g^2*h*(32*arcsin(c*x)^2*c^4*x^4+16*a
rcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3*x^3-4*c^4*x^4+24*arcsin(c*x)*(-c^2*x^2+1
)^(1/2)*c*x-12*arcsin(c*x)^2-12*c^2*x^2-9)+1/9*c^3*d*g*h^2*(9*arcsin(c*x)^
2*c^3*x^3+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*c^3*x^3+12*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)-12*c*x)+3/128*c^2*e*g*h^2*(32*arcsin(c*x)^2*c^4*x^4+1
6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3*x^3-4*c^4*x^4+24*arcsin(c*x)*(-c^2*x^
2+1)^(1/2)*c*x-12*arcsin(c*x)^2-12*c^2*x^2-9)+1/375*c*f*g*h^2*(225*arcsin(
c*x)^2*c^5*x^5+90*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^4*x^4-18*c^5*x^5+120*ar
csin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-40*c^3*x^3+240*arcsin(c*x)*(-c^2*x^2+
1)^(1/2)-240*c*x)+1/128*h^3*d*c^2*(32*arcsin(c*x)^2*c^4*x^4+16*arcsin(c...
```

Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 1537, normalized size of antiderivative = 1.51

$$\int (g+hx)^3\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx=\text{Too large to display}$$

input
```
integrate((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

output
```
1/108000*(1000*(18*a^2 - b^2)*c^6*f*h^3*x^6 + 864*(3*(25*a^2 - 2*b^2)*c^6*
f*g*h^2 + (25*a^2 - 2*b^2)*c^6*e*h^3)*x^5 + 375*(27*(8*a^2 - b^2)*c^6*f*g^
2*h + 27*(8*a^2 - b^2)*c^6*e*g*h^2 + (9*(8*a^2 - b^2)*c^6*d - 5*b^2*c^4*f)
*h^3)*x^4 + 160*(25*(9*a^2 - 2*b^2)*c^6*f*g^3 + 75*(9*a^2 - 2*b^2)*c^6*e*g
^2*h - 24*b^2*c^4*e*h^3 + 3*(25*(9*a^2 - 2*b^2)*c^6*d - 24*b^2*c^4*f)*g*h^
2)*x^3 + 1125*(24*(2*a^2 - b^2)*c^6*e*g^3 - 27*b^2*c^4*e*g*h^2 + 9*(8*(2*a
^2 - b^2)*c^6*d - 3*b^2*c^4*f)*g^2*h - (9*b^2*c^4*d + 5*b^2*c^2*f)*h^3)*x^
2 + 225*(80*b^2*c^6*f*h^3*x^6 + 480*b^2*c^6*d*g^3*x - 120*b^2*c^4*e*g^3 -
135*b^2*c^2*e*g*h^2 + 96*(3*b^2*c^6*f*g*h^2 + b^2*c^6*e*h^3)*x^5 + 120*(3*
b^2*c^6*f*g^2*h + 3*b^2*c^6*e*g*h^2 + b^2*c^6*d*h^3)*x^4 - 45*(8*b^2*c^4*d
 + 3*b^2*c^2*f)*g^2*h - 5*(9*b^2*c^2*d + 5*b^2*f)*h^3 + 160*(b^2*c^6*f*g^3
 + 3*b^2*c^6*e*g^2*h + 3*b^2*c^6*d*g*h^2)*x^3 + 240*(b^2*c^6*e*g^3 + 3*b^2
*c^6*d*g^2*h)*x^2)*arcsin(c*x)^2 - 480*(300*b^2*c^4*e*g^2*h + 48*b^2*c^2*e
*h^3 - 25*(9*(a^2 - 2*b^2)*c^6*d - 4*b^2*c^4*f)*g^3 + 12*(25*b^2*c^4*d + 1
2*b^2*c^2*f)*g*h^2)*x + 450*(80*a*b*c^6*f*h^3*x^6 + 480*a*b*c^6*d*g^3*x -
120*a*b*c^4*e*g^3 - 135*a*b*c^2*e*g*h^2 + 96*(3*a*b*c^6*f*g*h^2 + a*b*c^6*
e*h^3)*x^5 + 120*(3*a*b*c^6*f*g^2*h + 3*a*b*c^6*e*g*h^2 + a*b*c^6*d*h^3)*x
^4 - 45*(8*a*b*c^4*d + 3*a*b*c^2*f)*g^2*h - 5*(9*a*b*c^2*d + 5*a*b*f)*h^3
+ 160*(a*b*c^6*f*g^3 + 3*a*b*c^6*e*g^2*h + 3*a*b*c^6*d*g*h^2)*x^3 + 240*(a
*b*c^6*e*g^3 + 3*a*b*c^6*d*g^2*h)*x^2)*arcsin(c*x) + 30*(200*a*b*c^5*f*...
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2992 vs. 2(1006) = 2012.

Time = 1.08 (sec) , antiderivative size = 2992, normalized size of antiderivative = 2.94

$$\int (g+hx)^3\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx=\text{Too large to display}$$

input
```
integrate((h*x+g)**3*(f*x**2+e*x+d)*(a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*d*g**3*x + 3*a**2*d*g**2*h*x**2/2 + a**2*d*g*h**2*x**3 + a
**2*d*h**3*x**4/4 + a**2*e*g**3*x**2/2 + a**2*e*g**2*h*x**3 + 3*a**2*e*g*h
**2*x**4/4 + a**2*e*h**3*x**5/5 + a**2*f*g**3*x**3/3 + 3*a**2*f*g**2*h*x**
4/4 + 3*a**2*f*g*h**2*x**5/5 + a**2*f*h**3*x**6/6 + 2*a*b*d*g**3*x*asin(c*
x) + 3*a*b*d*g**2*h*x**2*asin(c*x) + 2*a*b*d*g*h**2*x**3*asin(c*x) + a*b*d
*h**3*x**4*asin(c*x)/2 + a*b*e*g**3*x**2*asin(c*x) + 2*a*b*e*g**2*h*x**3*a
sin(c*x) + 3*a*b*e*g*h**2*x**4*asin(c*x)/2 + 2*a*b*e*h**3*x**5*asin(c*x)/5
 + 2*a*b*f*g**3*x**3*asin(c*x)/3 + 3*a*b*f*g**2*h*x**4*asin(c*x)/2 + 6*a*b
*f*g*h**2*x**5*asin(c*x)/5 + a*b*f*h**3*x**6*asin(c*x)/3 + 2*a*b*d*g**3*sq
rt(-c**2*x**2 + 1)/c + 3*a*b*d*g**2*h*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*a*b
*d*g*h**2*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + a*b*d*h**3*x**3*sqrt(-c**2*x**
2 + 1)/(8*c) + a*b*e*g**3*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*a*b*e*g**2*h*x*
*2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*a*b*e*g*h**2*x**3*sqrt(-c**2*x**2 + 1)/(
8*c) + 2*a*b*e*h**3*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 2*a*b*f*g**3*x**2*s
qrt(-c**2*x**2 + 1)/(9*c) + 3*a*b*f*g**2*h*x**3*sqrt(-c**2*x**2 + 1)/(8*c)
 + 6*a*b*f*g*h**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + a*b*f*h**3*x**5*sqrt(
-c**2*x**2 + 1)/(18*c) - 3*a*b*d*g**2*h*asin(c*x)/(2*c**2) - a*b*e*g**3*as
in(c*x)/(2*c**2) + 4*a*b*d*g*h**2*sqrt(-c**2*x**2 + 1)/(3*c**3) + 3*a*b*d*
h**3*x*sqrt(-c**2*x**2 + 1)/(16*c**3) + 4*a*b*e*g**2*h*sqrt(-c**2*x**2 + 1
)/(3*c**3) + 9*a*b*e*g*h**2*x*sqrt(-c**2*x**2 + 1)/(16*c**3) + 8*a*b*e*...
```

Maxima [F]

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \int (fx^2+ex+d)(hx+g)^3(b\arcsin{(cx)}+a)^2\,dx$$

input
```
integrate((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

output
```
1/6*a^2*f*h^3*x^6 + 3/5*a^2*f*g*h^2*x^5 + 1/5*a^2*e*h^3*x^5 + 3/4*a^2*f*g^
2*h*x^4 + 3/4*a^2*e*g*h^2*x^4 + 1/4*a^2*d*h^3*x^4 + 1/3*a^2*f*g^3*x^3 + a^
2*e*g^2*h*x^3 + a^2*d*g*h^2*x^3 + b^2*d*g^3*x*arcsin(c*x)^2 + 1/2*a^2*e*g^
3*x^2 + 3/2*a^2*d*g^2*h*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 +
1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e*g^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(
-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*f*g^3 + 3/2*(2*x^2*
arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d*g^2*h
+ 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
 + 1)/c^4))*a*b*e*g^2*h + 3/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*
x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*f*g^2*h +
 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
+ 1)/c^4))*a*b*d*g*h^2 + 3/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x
^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*e*g*h^2 +
2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2
 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*f*g*h^2 + 1/16*(8*x^4*arc
sin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*
arcsin(c*x)/c^5)*c)*a*b*d*h^3 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^
2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*
c)*a*b*e*h^3 + 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 +
 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsi...
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3444 vs. $2(932) = 1864$.

Time = 0.21 (sec) , antiderivative size = 3444, normalized size of antiderivative = 3.39

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
1/6*a^2*f*h^3*x^6 + 3/5*a^2*f*g*h^2*x^5 + 1/5*a^2*e*h^3*x^5 + 3/4*a^2*f*g^
2*h*x^4 + 3/4*a^2*e*g*h^2*x^4 + 1/4*a^2*d*h^3*x^4 + 1/3*a^2*f*g^3*x^3 + a^
2*e*g^2*h*x^3 + a^2*d*g*h^2*x^3 + b^2*d*g^3*x*arcsin(c*x)^2 + 2*a*b*d*g^3*
x*arcsin(c*x) + 1/3*(c^2*x^2 - 1)*b^2*f*g^3*x*arcsin(c*x)^2/c^2 + (c^2*x^2
 - 1)*b^2*e*g^2*h*x*arcsin(c*x)^2/c^2 + (c^2*x^2 - 1)*b^2*d*g*h^2*x*arcsin
(c*x)^2/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b^2*e*g^3*x*arcsin(c*x)/c + 3/2*sqrt(
-c^2*x^2 + 1)*b^2*d*g^2*h*x*arcsin(c*x)/c + a^2*d*g^3*x - 2*b^2*d*g^3*x +
2/3*(c^2*x^2 - 1)*a*b*f*g^3*x*arcsin(c*x)/c^2 + 2*(c^2*x^2 - 1)*a*b*e*g^2*
h*x*arcsin(c*x)/c^2 + 2*(c^2*x^2 - 1)*a*b*d*g*h^2*x*arcsin(c*x)/c^2 + 1/2*
(c^2*x^2 - 1)*b^2*e*g^3*arcsin(c*x)^2/c^2 + 3/2*(c^2*x^2 - 1)*b^2*d*g^2*h*
arcsin(c*x)^2/c^2 + 1/3*b^2*f*g^3*x*arcsin(c*x)^2/c^2 + b^2*e*g^2*h*x*arcs
in(c*x)^2/c^2 + b^2*d*g*h^2*x*arcsin(c*x)^2/c^2 + 3/5*(c^2*x^2 - 1)^2*b^2*
f*g*h^2*x*arcsin(c*x)^2/c^4 + 1/5*(c^2*x^2 - 1)^2*b^2*e*h^3*x*arcsin(c*x)^
2/c^4 + 1/2*sqrt(-c^2*x^2 + 1)*a*b*e*g^3*x/c + 3/2*sqrt(-c^2*x^2 + 1)*a*b*
d*g^2*h*x/c + 2*sqrt(-c^2*x^2 + 1)*b^2*d*g^3*arcsin(c*x)/c - 3/8*(-c^2*x^2
 + 1)^(3/2)*b^2*f*g^2*h*x*arcsin(c*x)/c^3 - 3/8*(-c^2*x^2 + 1)^(3/2)*b^2*e
*g*h^2*x*arcsin(c*x)/c^3 - 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*d*h^3*x*arcsin(c*x
)/c^3 - 2/27*(c^2*x^2 - 1)*b^2*f*g^3*x/c^2 - 2/9*(c^2*x^2 - 1)*b^2*e*g^2*h
*x/c^2 - 2/9*(c^2*x^2 - 1)*b^2*d*g*h^2*x/c^2 + (c^2*x^2 - 1)*a*b*e*g^3*arc
sin(c*x)/c^2 + 3*(c^2*x^2 - 1)*a*b*d*g^2*h*arcsin(c*x)/c^2 + 2/3*a*b*f*...
```

Mupad [F(-1)]

Timed out.

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \int (g+h\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(f\,x^2+e\,x+d\right)\,dx$$

input
```
int((g + h*x)^3*(a + b*asin(c*x))^2*(d + e*x + f*x^2),x)
```

output
```
int((g + h*x)^3*(a + b*asin(c*x))^2*(d + e*x + f*x^2), x)
```

Reduce [F]

$$\int (g+hx)^3\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx=\text{too large to display}$$

input
```
int((h*x+g)^3*(f*x^2+e*x+d)*(a+b*asin(c*x))^2,x)
```

output
```
(3600*asin(c*x)**2*b**2*c**6*d*g**3*x + 5400*asin(c*x)**2*b**2*c**6*d*g**2
*h*x**2 + 1800*asin(c*x)**2*b**2*c**6*e*g**3*x**2 - 2700*asin(c*x)**2*b**2
*c**4*d*g**2*h - 900*asin(c*x)**2*b**2*c**4*e*g**3 + 7200*sqrt( - c**2*x**
2 + 1)*asin(c*x)*b**2*c**5*d*g**3 + 5400*sqrt( - c**2*x**2 + 1)*asin(c*x)*
b**2*c**5*d*g**2*h*x + 1800*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*c**5*e*g
**3*x + 7200*asin(c*x)*a*b*c**6*d*g**3*x + 10800*asin(c*x)*a*b*c**6*d*g**2
*h*x**2 + 7200*asin(c*x)*a*b*c**6*d*g*h**2*x**3 + 1800*asin(c*x)*a*b*c**6*
d*h**3*x**4 + 3600*asin(c*x)*a*b*c**6*e*g**3*x**2 + 7200*asin(c*x)*a*b*c**
6*e*g**2*h*x**3 + 5400*asin(c*x)*a*b*c**6*e*g*h**2*x**4 + 1440*asin(c*x)*a
*b*c**6*e*h**3*x**5 + 2400*asin(c*x)*a*b*c**6*f*g**3*x**3 + 5400*asin(c*x)
*a*b*c**6*f*g**2*h*x**4 + 4320*asin(c*x)*a*b*c**6*f*g*h**2*x**5 + 1200*asi
n(c*x)*a*b*c**6*f*h**3*x**6 - 5400*asin(c*x)*a*b*c**4*d*g**2*h - 1800*asin
(c*x)*a*b*c**4*e*g**3 - 675*asin(c*x)*a*b*c**2*d*h**3 - 2025*asin(c*x)*a*b
*c**2*e*g*h**2 - 2025*asin(c*x)*a*b*c**2*f*g**2*h - 375*asin(c*x)*a*b*f*h*
*3 + 7200*sqrt( - c**2*x**2 + 1)*a*b*c**5*d*g**3 + 5400*sqrt( - c**2*x**2
+ 1)*a*b*c**5*d*g**2*h*x + 2400*sqrt( - c**2*x**2 + 1)*a*b*c**5*d*g*h**2*x
**2 + 450*sqrt( - c**2*x**2 + 1)*a*b*c**5*d*h**3*x**3 + 1800*sqrt( - c**2*
x**2 + 1)*a*b*c**5*e*g**3*x + 2400*sqrt( - c**2*x**2 + 1)*a*b*c**5*e*g**2*
h*x**2 + 1350*sqrt( - c**2*x**2 + 1)*a*b*c**5*e*g*h**2*x**3 + 288*sqrt( -
c**2*x**2 + 1)*a*b*c**5*e*h**3*x**4 + 800*sqrt( - c**2*x**2 + 1)*a*b*c*...
```

3.178 $\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx$

Optimal result

Integrand size = 28, antiderivative size = 701

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$= -2b^2dg^2x-\frac{16b^2fh^2x}{75c^4}-\frac{4b^2(fg^2+h(2eg+dh))\,x}{9c^2}$$
$$-\frac{1}{4}b^2g(eg+2dh)x^2-\frac{3b^2h(2fg+eh)x^2}{32c^2}-\frac{8b^2fh^2x^3}{225c^2}$$
$$-\frac{2}{27}b^2\left(fg^2+h(2eg+dh)\right)x^3-\frac{1}{32}b^2h(2fg+eh)x^4-\frac{2}{125}b^2fh^2x^5$$
$$+\frac{2bdg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{16bfh^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5}$$
$$+\frac{4b(fg^2+h(2eg+dh))\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}$$
$$+\frac{bg(eg+2dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}$$
$$+\frac{3bh(2fg+eh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}$$
$$+\frac{8bfh^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3}$$
$$+\frac{2b(fg^2+h(2eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}$$
$$+\frac{bh(2fg+eh)x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}$$
$$+\frac{2bfh^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c}-\frac{g(eg+2dh)(a+b\arcsin(cx))^2}{4c^2}$$
$$-\frac{3h(2fg+eh)(a+b\arcsin(cx))^2}{32c^4}+dg^2x(a+b\arcsin(cx))^2$$
$$+\frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2+\frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2$$
$$+\frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2+\frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2$$

output
```
d*g^2*x*(a+b*arcsin(c*x))^2-1/4*g*(2*d*h+e*g)*(a+b*arcsin(c*x))^2/c^2-3/32
*h*(e*h+2*f*g)*(a+b*arcsin(c*x))^2/c^4+1/2*g*(2*d*h+e*g)*x^2*(a+b*arcsin(c
*x))^2+1/4*h*(e*h+2*f*g)*x^4*(a+b*arcsin(c*x))^2+1/5*f*h^2*x^5*(a+b*arcsin
(c*x))^2-2*b^2*d*g^2*x-4/9*b^2*(f*g^2+h*(d*h+2*e*g))*x/c^2-1/4*b^2*g*(2*d*
h+e*g)*x^2-1/32*b^2*h*(e*h+2*f*g)*x^4-2/125*b^2*f*h^2*x^5+16/75*b*f*h^2*(-
c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c^5+2/9*b*(f*g^2+h*(d*h+2*e*g))*x^2*(-c
^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+2*b*d*g^2*(-c^2*x^2+1)^(1/2)*(a+b*arcs
in(c*x))/c+1/2*b*g*(2*d*h+e*g)*x*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+3/
16*b*h*(e*h+2*f*g)*x*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c^3+8/75*b*f*h^2
*x^2*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c^3+1/8*b*h*(e*h+2*f*g)*x^3*(-c^
2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c-2/27*b^2*(f*g^2+h*(d*h+2*e*g))*x^3+1/3*
(f*g^2+h*(d*h+2*e*g))*x^3*(a+b*arcsin(c*x))^2-16/75*b^2*f*h^2*x/c^4-3/32*b
^2*h*(e*h+2*f*g)*x^2/c^2-8/225*b^2*f*h^2*x^3/c^2+4/9*b*(f*g^2+h*(d*h+2*e*g
))*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c^3+2/25*b*f*h^2*x^4*(-c^2*x^2+1)^
(1/2)*(a+b*arcsin(c*x))/c
```

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 534, normalized size of antiderivative = 0.76

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = dg^2x(a+b\arcsin(cx))^2 + \frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2 + \frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2 + \frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2 + \frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2 - \frac{2b\left(fg^2+h(2eg+dh)\right)\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx\right.}{27c^3} - \frac{2bfh^2\left(-15a\sqrt{1-c^2x^2}(8+4c^2x^2+3c^4x^4)+bcx(120+20c^2x^2+9c^4x^4)-15b\sqrt{1-c^2x^2}(8+4c^2x^2+\right.}{1125c^5} - 2bdg^2\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right) - \frac{1}{32}bh(2fg+eh)\left(\frac{3bx^2}{c^2}+bx^4-\frac{6x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3} - \frac{4x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{3(a+b\arcsin(cx))^2}{bc^4}\right) - \frac{1}{4}bg(eg+2dh)\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)$$

input
```
Integrate[(g + h*x)^2*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
d*g^2*x*(a + b*ArcSin[c*x])^2 + (g*(e*g + 2*d*h)*x^2*(a + b*ArcSin[c*x])^2
)/2 + ((f*g^2 + h*(2*e*g + d*h))*x^3*(a + b*ArcSin[c*x])^2)/3 + (h*(2*f*g
+ e*h)*x^4*(a + b*ArcSin[c*x])^2)/4 + (f*h^2*x^5*(a + b*ArcSin[c*x])^2)/5
- (2*b*(f*g^2 + h*(2*e*g + d*h))*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b
*c*x*(6 + c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(27
*c^3) - (2*b*f*h^2*(-15*a*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4) +
b*c*x*(120 + 20*c^2*x^2 + 9*c^4*x^4) - 15*b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x
^2 + 3*c^4*x^4)*ArcSin[c*x]))/(1125*c^5) - 2*b*d*g^2*(b*x - (Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/c) - (b*h*(2*f*g + e*h)*((3*b*x^2)/c^2 + b*x^4 -
 (6*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^3 - (4*x^3*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x]))/c + (3*(a + b*ArcSin[c*x])^2)/(b*c^4)))/32 - (b*g*(
e*g + 2*d*h)*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (a +
 b*ArcSin[c*x])^2/(b*c^2)))/4
```

Rubi [A] (verified)

Time = 1.47 (sec) , antiderivative size = 701, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {5250, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx$$

$$\Big\downarrow \text{ 5250}$$

$$\int \left(x^2(a+b\arcsin(cx))^2 \left(h(dh+2eg)+fg^2\right)+gx(2dh+eg)(a+b\arcsin(cx))^2+dg^2(a+b\arcsin(cx))^2+hx^3\right.$$

$$\Big\downarrow \text{ 2009}$$

$$-\frac{3h(eh+2fg)(a+b\arcsin(cx))^2}{32c^4}+\frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\left(h(dh+2eg)+fg^2\right)}{9c}+\frac{bgx\sqrt{1-c^2x^2}(2dh+eg)(a+b\arcsin(cx))}{2c}-\frac{g(2dh+eg)(a+b\arcsin(cx))^2}{4c^2}+\frac{2bdg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{bhx^3\sqrt{1-c^2x^2}(eh+2fg)(a+b\arcsin(cx))}{8c}+\frac{2bfh^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c}+\frac{16bfh^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5}+\frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\left(h(dh+2eg)+fg^2\right)}{9c^3}+\frac{3bhx\sqrt{1-c^2x^2}(eh+2fg)(a+b\arcsin(cx))}{16c^3}+\frac{8bfh^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3}+\frac{1}{3}x^3(a+b\arcsin(cx))^2\left(h(dh+2eg)+fg^2\right)+\frac{1}{2}gx^2(2dh+eg)(a+b\arcsin(cx))^2+dg^2x(a+b\arcsin(cx))^2+\frac{1}{4}hx^4(eh+2fg)(a+b\arcsin(cx))^2+\frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2-\frac{16b^2fh^2x}{75c^4}-\frac{4b^2x\left(h(dh+2eg)+fg^2\right)}{9c^2}-\frac{3b^2hx^2(eh+2fg)}{32c^2}-\frac{8b^2fh^2x^3}{225c^2}-\frac{2}{27}b^2x^3\left(h(dh+2eg)+fg^2\right)-\frac{1}{4}b^2gx^2(2dh+eg)-2b^2dg^2x-\frac{1}{32}b^2hx^4(eh+2fg)-\frac{2}{125}b^2fh^2x^5$$

input
```
Int[(g + h*x)^2*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
-2*b^2*d*g^2*x - (16*b^2*f*h^2*x)/(75*c^4) - (4*b^2*(f*g^2 + h*(2*e*g + d*
h))*x)/(9*c^2) - (b^2*g*(e*g + 2*d*h)*x^2)/4 - (3*b^2*h*(2*f*g + e*h)*x^2)
/(32*c^2) - (8*b^2*f*h^2*x^3)/(225*c^2) - (2*b^2*(f*g^2 + h*(2*e*g + d*h))
*x^3)/27 - (b^2*h*(2*f*g + e*h)*x^4)/32 - (2*b^2*f*h^2*x^5)/125 + (2*b*d*g
^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (16*b*f*h^2*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x]))/(75*c^5) + (4*b*(f*g^2 + h*(2*e*g + d*h))*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c^3) + (b*g*(e*g + 2*d*h)*x*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(2*c) + (3*b*h*(2*f*g + e*h)*x*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/(16*c^3) + (8*b*f*h^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x]))/(75*c^3) + (2*b*(f*g^2 + h*(2*e*g + d*h))*x^2*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/(9*c) + (b*h*(2*f*g + e*h)*x^3*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x]))/(8*c) + (2*b*f*h^2*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]))/(25*c) - (g*(e*g + 2*d*h)*(a + b*ArcSin[c*x])^2)/(4*c^2) - (3*h*(2
*f*g + e*h)*(a + b*ArcSin[c*x])^2)/(32*c^4) + d*g^2*x*(a + b*ArcSin[c*x])^
2 + (g*(e*g + 2*d*h)*x^2*(a + b*ArcSin[c*x])^2)/2 + ((f*g^2 + h*(2*e*g + d
*h))*x^3*(a + b*ArcSin[c*x])^2)/3 + (h*(2*f*g + e*h)*x^4*(a + b*ArcSin[c*x
])^2)/4 + (f*h^2*x^5*(a + b*ArcSin[c*x])^2)/5
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5250
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_), x_Symbol] :> Int[ExpandI
ntegrand[Px*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, n}, x] && Poly
nomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.82 (sec) , antiderivative size = 1176, normalized size of antiderivative = 1.68

method	result	size
derivativedivides	Expression too large to display	1176
default	Expression too large to display	1176
parts	Expression too large to display	1263
orering	Expression too large to display	3875

input
```
int((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(a^2/c^4*(1/5*f*h^2*c^5*x^5+1/4*(c*e*h^2+2*c*f*g*h)*c^4*x^4+1/3*(c^2*d
*h^2+2*c^2*e*g*h+c^2*f*g^2)*c^3*x^3+1/2*(2*c^3*d*g*h+c^3*e*g^2)*c^2*x^2+c^
5*g^2*d*x)+b^2/c^4*(c^4*d*g^2*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2
*x^2+1)^(1/2))+1/4*c^3*g^2*e*(2*arcsin(c*x)^2*c^2*x^2+2*arcsin(c*x)*(-c^2*
x^2+1)^(1/2)*c*x-arcsin(c*x)^2-c^2*x^2)+1/27*c^2*f*g^2*(9*arcsin(c*x)^2*c^
3*x^3+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*c^3*x^3+12*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)-12*c*x)+1/2*c^3*g*h*d*(2*arcsin(c*x)^2*c^2*x^2+2*arcsin(c
*x)*(-c^2*x^2+1)^(1/2)*c*x-arcsin(c*x)^2-c^2*x^2)+2/27*c^2*e*g*h*(9*arcsin
(c*x)^2*c^3*x^3+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*c^3*x^3+12*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)+1/64*c*f*g*h*(32*arcsin(c*x)^2*c^4*x^4+
16*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3*x^3-4*c^4*x^4+24*arcsin(c*x)*(-c^2*x
^2+1)^(1/2)*c*x-12*arcsin(c*x)^2-12*c^2*x^2-9)+1/27*c^2*d*h^2*(9*arcsin(c*
x)^2*c^3*x^3+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*c^3*x^3+12*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)+1/128*c*e*h^2*(32*arcsin(c*x)^2*c^4*x^4+16
*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3*x^3-4*c^4*x^4+24*arcsin(c*x)*(-c^2*x^2
+1)^(1/2)*c*x-12*arcsin(c*x)^2-12*c^2*x^2-9)+1/1125*f*h^2*(225*arcsin(c*x)
^2*c^5*x^5+90*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^4*x^4-18*c^5*x^5+120*arcsin
(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-40*c^3*x^3+240*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)-240*c*x))+2*a*b/c^4*(1/5*arcsin(c*x)*f*h^2*c^5*x^5+1/4*arcsin(c*x)*c^
5*e*h^2*x^4+1/2*arcsin(c*x)*c^5*f*g*h*x^4+1/3*arcsin(c*x)*c^5*d*h^2*x^3...
```

Fricas [A] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 1029, normalized size of antiderivative = 1.47

$$\int (g + hx)^2 \left(d + ex + fx^2\right) (a + b \arcsin(cx))^2 \, dx = \text{Too large to display}$$

input
```
integrate((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

output
```
1/108000*(864*(25*a^2 - 2*b^2)*c^5*f*h^2*x^5 + 3375*(2*(8*a^2 - b^2)*c^5*f
*g*h + (8*a^2 - b^2)*c^5*e*h^2)*x^4 + 160*(25*(9*a^2 - 2*b^2)*c^5*f*g^2 +
50*(9*a^2 - 2*b^2)*c^5*e*g*h + (25*(9*a^2 - 2*b^2)*c^5*d - 24*b^2*c^3*f)*h
^2)*x^3 + 3375*(8*(2*a^2 - b^2)*c^5*e*g^2 - 3*b^2*c^3*e*h^2 + 2*(8*(2*a^2
- b^2)*c^5*d - 3*b^2*c^3*f)*g*h)*x^2 + 225*(96*b^2*c^5*f*h^2*x^5 + 480*b^2
*c^5*d*g^2*x - 120*b^2*c^3*e*g^2 - 45*b^2*c*e*h^2 + 120*(2*b^2*c^5*f*g*h +
 b^2*c^5*e*h^2)*x^4 + 160*(b^2*c^5*f*g^2 + 2*b^2*c^5*e*g*h + b^2*c^5*d*h^2
)*x^3 - 30*(8*b^2*c^3*d + 3*b^2*c*f)*g*h + 240*(b^2*c^5*e*g^2 + 2*b^2*c^5*
d*g*h)*x^2)*arcsin(c*x)^2 - 480*(200*b^2*c^3*e*g*h - 25*(9*(a^2 - 2*b^2)*c
^5*d - 4*b^2*c^3*f)*g^2 + 4*(25*b^2*c^3*d + 12*b^2*c*f)*h^2)*x + 450*(96*a
*b*c^5*f*h^2*x^5 + 480*a*b*c^5*d*g^2*x - 120*a*b*c^3*e*g^2 - 45*a*b*c*e*h^
2 + 120*(2*a*b*c^5*f*g*h + a*b*c^5*e*h^2)*x^4 + 160*(a*b*c^5*f*g^2 + 2*a*b
*c^5*e*g*h + a*b*c^5*d*h^2)*x^3 - 30*(8*a*b*c^3*d + 3*a*b*c*f)*g*h + 240*(
a*b*c^5*e*g^2 + 2*a*b*c^5*d*g*h)*x^2)*arcsin(c*x) + 30*(288*a*b*c^4*f*h^2*
x^4 + 3200*a*b*c^2*e*g*h + 450*(2*a*b*c^4*f*g*h + a*b*c^4*e*h^2)*x^3 + 800
*(9*a*b*c^4*d + 2*a*b*c^2*f)*g^2 + 64*(25*a*b*c^2*d + 12*a*b*f)*h^2 + 32*(
25*a*b*c^4*f*g^2 + 50*a*b*c^4*e*g*h + (25*a*b*c^4*d + 12*a*b*c^2*f)*h^2)*x
^2 + 225*(8*a*b*c^4*e*g^2 + 3*a*b*c^2*e*h^2 + 2*(8*a*b*c^4*d + 3*a*b*c^2*f
)*g*h)*x + (288*b^2*c^4*f*h^2*x^4 + 3200*b^2*c^2*e*g*h + 450*(2*b^2*c^4*f*
g*h + b^2*c^4*e*h^2)*x^3 + 800*(9*b^2*c^4*d + 2*b^2*c^2*f)*g^2 + 64*(25...
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1935 vs. $2(694) = 1388$.

Time = 0.74 (sec) , antiderivative size = 1935, normalized size of antiderivative = 2.76

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((h*x+g)**2*(f*x**2+e*x+d)*(a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*d*g**2*x + a**2*d*g*h*x**2 + a**2*d*h**2*x**3/3 + a**2*e*g
**2*x**2/2 + 2*a**2*e*g*h*x**3/3 + a**2*e*h**2*x**4/4 + a**2*f*g**2*x**3/3
 + a**2*f*g*h*x**4/2 + a**2*f*h**2*x**5/5 + 2*a*b*d*g**2*x*asin(c*x) + 2*a
*b*d*g*h*x**2*asin(c*x) + 2*a*b*d*h**2*x**3*asin(c*x)/3 + a*b*e*g**2*x**2*
asin(c*x) + 4*a*b*e*g*h*x**3*asin(c*x)/3 + a*b*e*h**2*x**4*asin(c*x)/2 + 2
*a*b*f*g**2*x**3*asin(c*x)/3 + a*b*f*g*h*x**4*asin(c*x) + 2*a*b*f*h**2*x**
5*asin(c*x)/5 + 2*a*b*d*g**2*sqrt(-c**2*x**2 + 1)/c + a*b*d*g*h*x*sqrt(-c*
*2*x**2 + 1)/c + 2*a*b*d*h**2*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + a*b*e*g**2
*x*sqrt(-c**2*x**2 + 1)/(2*c) + 4*a*b*e*g*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c
) + a*b*e*h**2*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + 2*a*b*f*g**2*x**2*sqrt(-c
**2*x**2 + 1)/(9*c) + a*b*f*g*h*x**3*sqrt(-c**2*x**2 + 1)/(4*c) + 2*a*b*f*
h**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) - a*b*d*g*h*asin(c*x)/c**2 - a*b*e*g
**2*asin(c*x)/(2*c**2) + 4*a*b*d*h**2*sqrt(-c**2*x**2 + 1)/(9*c**3) + 8*a*
b*e*g*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*a*b*e*h**2*x*sqrt(-c**2*x**2 + 1
)/(16*c**3) + 4*a*b*f*g**2*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*a*b*f*g*h*x*s
qrt(-c**2*x**2 + 1)/(8*c**3) + 8*a*b*f*h**2*x**2*sqrt(-c**2*x**2 + 1)/(75*
c**3) - 3*a*b*e*h**2*asin(c*x)/(16*c**4) - 3*a*b*f*g*h*asin(c*x)/(8*c**4)
+ 16*a*b*f*h**2*sqrt(-c**2*x**2 + 1)/(75*c**5) + b**2*d*g**2*x*asin(c*x)**
2 - 2*b**2*d*g**2*x + b**2*d*g*h*x**2*asin(c*x)**2 - b**2*d*g*h*x**2/2 + b
**2*d*h**2*x**3*asin(c*x)**2/3 - 2*b**2*d*h**2*x**3/27 + b**2*e*g**2*x*...
```

Maxima [F]

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \int (fx^2+ex+d)(hx+g)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

output
```
1/5*a^2*f*h^2*x^5 + 1/2*a^2*f*g*h*x^4 + 1/4*a^2*e*h^2*x^4 + 1/3*a^2*f*g^2*
x^3 + 2/3*a^2*e*g*h*x^3 + 1/3*a^2*d*h^2*x^3 + b^2*d*g^2*x*arcsin(c*x)^2 +
1/2*a^2*e*g^2*x^2 + a^2*d*g*h*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*
x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e*g^2 + 2/9*(3*x^3*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*f*g^2 + (2*x^
2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d*g*h
+ 4/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
 + 1)/c^4))*a*b*e*g*h + 1/8*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3
/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*f*g*h + 2/9*
(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/
c^4))*a*b*d*h^2 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2
+ 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*e*h^2 + 2/75*(15*
x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2
/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*f*h^2 - 2*b^2*d*g^2*(x - sqrt(-c^2
*x^2 + 1)*arcsin(c*x)/c) + a^2*d*g^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^
2 + 1))*a*b*d*g^2/c + 1/60*(12*b^2*f*h^2*x^5 + 15*(2*b^2*f*g*h + b^2*e*h^2
)*x^4 + 20*(b^2*f*g^2 + 2*b^2*e*g*h + b^2*d*h^2)*x^3 + 30*(b^2*e*g^2 + 2*b
^2*d*g*h)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + integrate(1/
30*(12*b^2*c*f*h^2*x^5 + 15*(2*b^2*c*f*g*h + b^2*c*e*h^2)*x^4 + 20*(b^2*c*
f*g^2 + 2*b^2*c*e*g*h + b^2*c*d*h^2)*x^3 + 30*(b^2*c*e*g^2 + 2*b^2*c*d*...
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2166 vs. $2(639) = 1278$.

Time = 0.20 (sec) , antiderivative size = 2166, normalized size of antiderivative = 3.09

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

input
```
integrate((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
1/5*a^2*f*h^2*x^5 + 1/2*a^2*f*g*h*x^4 + 1/4*a^2*e*h^2*x^4 + 1/3*a^2*f*g^2*
x^3 + 2/3*a^2*e*g*h*x^3 + 1/3*a^2*d*h^2*x^3 + b^2*d*g^2*x*arcsin(c*x)^2 +
2*a*b*d*g^2*x*arcsin(c*x) + 1/3*(c^2*x^2 - 1)*b^2*f*g^2*x*arcsin(c*x)^2/c^
2 + 2/3*(c^2*x^2 - 1)*b^2*e*g*h*x*arcsin(c*x)^2/c^2 + 1/3*(c^2*x^2 - 1)*b^
2*d*h^2*x*arcsin(c*x)^2/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b^2*e*g^2*x*arcsin(c*
x)/c + sqrt(-c^2*x^2 + 1)*b^2*d*g*h*x*arcsin(c*x)/c + a^2*d*g^2*x - 2*b^2*
d*g^2*x + 2/3*(c^2*x^2 - 1)*a*b*f*g^2*x*arcsin(c*x)/c^2 + 4/3*(c^2*x^2 - 1
)*a*b*e*g*h*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 - 1)*a*b*d*h^2*x*arcsin(c*x)/
c^2 + 1/2*(c^2*x^2 - 1)*b^2*e*g^2*arcsin(c*x)^2/c^2 + (c^2*x^2 - 1)*b^2*d*
g*h*arcsin(c*x)^2/c^2 + 1/3*b^2*f*g^2*x*arcsin(c*x)^2/c^2 + 2/3*b^2*e*g*h*
x*arcsin(c*x)^2/c^2 + 1/3*b^2*d*h^2*x*arcsin(c*x)^2/c^2 + 1/5*(c^2*x^2 - 1
)^2*b^2*f*h^2*x*arcsin(c*x)^2/c^4 + 1/2*sqrt(-c^2*x^2 + 1)*a*b*e*g^2*x/c +
 sqrt(-c^2*x^2 + 1)*a*b*d*g*h*x/c + 2*sqrt(-c^2*x^2 + 1)*b^2*d*g^2*arcsin(
c*x)/c - 1/4*(-c^2*x^2 + 1)^(3/2)*b^2*f*g*h*x*arcsin(c*x)/c^3 - 1/8*(-c^2*
x^2 + 1)^(3/2)*b^2*e*h^2*x*arcsin(c*x)/c^3 - 2/27*(c^2*x^2 - 1)*b^2*f*g^2*
x/c^2 - 4/27*(c^2*x^2 - 1)*b^2*e*g*h*x/c^2 - 2/27*(c^2*x^2 - 1)*b^2*d*h^2*
x/c^2 + (c^2*x^2 - 1)*a*b*e*g^2*arcsin(c*x)/c^2 + 2*(c^2*x^2 - 1)*a*b*d*g*
h*arcsin(c*x)/c^2 + 2/3*a*b*f*g^2*x*arcsin(c*x)/c^2 + 4/3*a*b*e*g*h*x*arcs
in(c*x)/c^2 + 2/3*a*b*d*h^2*x*arcsin(c*x)/c^2 + 2/5*(c^2*x^2 - 1)^2*a*b*f*
h^2*x*arcsin(c*x)/c^4 + 1/4*b^2*e*g^2*arcsin(c*x)^2/c^2 + 1/2*b^2*d*g*h...
```

Mupad [F(-1)]

Timed out.

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=\int (g+h\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(f\,x^2+e\,x+d\right)\,dx$$

input
```
int((g + h*x)^2*(a + b*asin(c*x))^2*(d + e*x + f*x^2),x)
```

output
```
int((g + h*x)^2*(a + b*asin(c*x))^2*(d + e*x + f*x^2), x)
```

Reduce [F]

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx=\text{Too large to display}$$

input
```
int((h*x+g)^2*(f*x^2+e*x+d)*(a+b*asin(c*x))^2,x)
```

output
```
(3600*asin(c*x)**2*b**2*c**5*d*g**2*x + 3600*asin(c*x)**2*b**2*c**5*d*g*h*
x**2 + 1800*asin(c*x)**2*b**2*c**5*e*g**2*x**2 - 1800*asin(c*x)**2*b**2*c*
*3*d*g*h - 900*asin(c*x)**2*b**2*c**3*e*g**2 + 7200*sqrt( - c**2*x**2 + 1)
*asin(c*x)*b**2*c**4*d*g**2 + 3600*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*c
**4*d*g*h*x + 1800*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*c**4*e*g**2*x + 7
200*asin(c*x)*a*b*c**5*d*g**2*x + 7200*asin(c*x)*a*b*c**5*d*g*h*x**2 + 240
0*asin(c*x)*a*b*c**5*d*h**2*x**3 + 3600*asin(c*x)*a*b*c**5*e*g**2*x**2 + 4
800*asin(c*x)*a*b*c**5*e*g*h*x**3 + 1800*asin(c*x)*a*b*c**5*e*h**2*x**4 +
2400*asin(c*x)*a*b*c**5*f*g**2*x**3 + 3600*asin(c*x)*a*b*c**5*f*g*h*x**4 +
 1440*asin(c*x)*a*b*c**5*f*h**2*x**5 - 3600*asin(c*x)*a*b*c**3*d*g*h - 180
0*asin(c*x)*a*b*c**3*e*g**2 - 675*asin(c*x)*a*b*c*e*h**2 - 1350*asin(c*x)*
a*b*c*f*g*h + 7200*sqrt( - c**2*x**2 + 1)*a*b*c**4*d*g**2 + 3600*sqrt( - c
**2*x**2 + 1)*a*b*c**4*d*g*h*x + 800*sqrt( - c**2*x**2 + 1)*a*b*c**4*d*h**
2*x**2 + 1800*sqrt( - c**2*x**2 + 1)*a*b*c**4*e*g**2*x + 1600*sqrt( - c**2
*x**2 + 1)*a*b*c**4*e*g*h*x**2 + 450*sqrt( - c**2*x**2 + 1)*a*b*c**4*e*h**
2*x**3 + 800*sqrt( - c**2*x**2 + 1)*a*b*c**4*f*g**2*x**2 + 900*sqrt( - c**
2*x**2 + 1)*a*b*c**4*f*g*h*x**3 + 288*sqrt( - c**2*x**2 + 1)*a*b*c**4*f*h*
*2*x**4 + 1600*sqrt( - c**2*x**2 + 1)*a*b*c**2*d*h**2 + 3200*sqrt( - c**2*
x**2 + 1)*a*b*c**2*e*g*h + 675*sqrt( - c**2*x**2 + 1)*a*b*c**2*e*h**2*x +
1600*sqrt( - c**2*x**2 + 1)*a*b*c**2*f*g**2 + 1350*sqrt( - c**2*x**2 + ...
```

3.179 $\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$

Optimal result

Integrand size = 26, antiderivative size = 425

$$\begin{aligned}
&\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx\\
&=-2b^2dgx-\frac{4b^2(fg+eh)x}{9c^2}-\frac{3b^2fhx^2}{32c^2}-\frac{1}{4}b^2(eg+dh)x^2-\frac{2}{27}b^2(fg+eh)x^3-\frac{1}{32}b^2fhx^4\\
&\quad+\frac{2bdg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{4b(fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}\\
&\quad+\frac{3bfhx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}+\frac{b(eg+dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}\\
&\quad+\frac{2b(fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}+\frac{bfhx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}\\
&\quad-\frac{3fh(a+b\arcsin(cx))^2}{32c^4}-\frac{(eg+dh)(a+b\arcsin(cx))^2}{4c^2}\\
&\quad+dgx(a+b\arcsin(cx))^2+\frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2\\
&\quad+\frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2
\end{aligned}$$

output
```
-2*b^2*d*g*x-4/9*b^2*(e*h+f*g)*x/c^2-3/32*b^2*f*h*x^2/c^2-1/4*b^2*(d*h+e*g
)*x^2-2/27*b^2*(e*h+f*g)*x^3-1/32*b^2*f*h*x^4+2*b*d*g*(-c^2*x^2+1)^(1/2)*(
a+b*arcsin(c*x))/c+4/9*b*(e*h+f*g)*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c^
3+3/16*b*f*h*x*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c^3+1/2*b*(d*h+e*g)*x*
(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))/c+2/9*b*(e*h+f*g)*x^2*(-c^2*x^2+1)^(1
/2)*(a+b*arcsin(c*x))/c+1/8*b*f*h*x^3*(-c^2*x^2+1)^(1/2)*(a+b*arcsin(c*x))
/c-3/32*f*h*(a+b*arcsin(c*x))^2/c^4-1/4*(d*h+e*g)*(a+b*arcsin(c*x))^2/c^2+
d*g*x*(a+b*arcsin(c*x))^2+1/2*(d*h+e*g)*x^2*(a+b*arcsin(c*x))^2+1/3*(e*h+f
*g)*x^3*(a+b*arcsin(c*x))^2+1/4*f*h*x^4*(a+b*arcsin(c*x))^2
```

Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 364, normalized size of antiderivative = 0.86

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$= dgx(a+b\arcsin(cx))^2+\frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2 + \frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2 - \frac{2b(fg+eh)\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{27c^3} - 2bdg\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right) - \frac{1}{32}bfh\left(\frac{3bx^2}{c^2}+bx^4-\frac{6x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3} - \frac{4x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{3(a+b\arcsin(cx))^2}{bc^4}\right) - \frac{1}{4}b(eg+dh)\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)$$

input
```
Integrate[(g + h*x)*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
d*g*x*(a + b*ArcSin[c*x])^2 + ((e*g + d*h)*x^2*(a + b*ArcSin[c*x])^2)/2 +
((f*g + e*h)*x^3*(a + b*ArcSin[c*x])^2)/3 + (f*h*x^4*(a + b*ArcSin[c*x])^2
)/4 - (2*b*(f*g + e*h)*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x*(6 +
c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(27*c^3) - 2*
b*d*g*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - (b*f*h*((3*b*x^2
)/c^2 + b*x^4 - (6*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^3 - (4*x^3*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (3*(a + b*ArcSin[c*x])^2)/(b*c^4
)))/32 - (b*(e*g + d*h)*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/c + (a + b*ArcSin[c*x])^2/(b*c^2)))/4
```

Rubi [A] (verified)

Time = 1.01 (sec) , antiderivative size = 425, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {5250, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5250}$$

$$\int \left(x(dh+eg)(a+b\arcsin(cx))^2+dg(a+b\arcsin(cx))^2+x^2(eh+fg)(a+b\arcsin(cx))^2+fhx^3(a+b\arcsin(\right.$$

$$\Big\downarrow \text{2009}$$

$$-\frac{3fh(a+b\arcsin(cx))^2}{32c^4}+\frac{bx\sqrt{1-c^2x^2}(dh+eg)(a+b\arcsin(cx))}{2c}-\frac{(dh+eg)(a+b\arcsin(cx))^2}{4c^2}+\frac{2bdg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{2bx^2\sqrt{1-c^2x^2}(eh+fg)(a+b\arcsin(cx))}{9c}+\frac{bfhx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}+\frac{4b\sqrt{1-c^2x^2}(eh+fg)(a+b\arcsin(cx))}{9c^3}+\frac{3bfhx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}+\frac{1}{2}x^2(dh+eg)(a+b\arcsin(cx))^2+dgx(a+b\arcsin(cx))^2+\frac{1}{3}x^3(eh+fg)(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2-\frac{4b^2x(eh+fg)}{9c^2}-\frac{3b^2fhx^2}{32c^2}-\frac{1}{4}b^2x^2(dh+eg)-2b^2dgx-\frac{2}{27}b^2x^3(eh+fg)-\frac{1}{32}b^2fhx^4$$

input
```
Int[(g + h*x)*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
-2*b^2*d*g*x - (4*b^2*(f*g + e*h)*x)/(9*c^2) - (3*b^2*f*h*x^2)/(32*c^2) -
(b^2*(e*g + d*h)*x^2)/4 - (2*b^2*(f*g + e*h)*x^3)/27 - (b^2*f*h*x^4)/32 +
(2*b*d*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (4*b*(f*g + e*h)*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c^3) + (3*b*f*h*x*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x]))/(16*c^3) + (b*(e*g + d*h)*x*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x]))/(2*c) + (2*b*(f*g + e*h)*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x]))/(9*c) + (b*f*h*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) - (
3*f*h*(a + b*ArcSin[c*x])^2)/(32*c^4) - ((e*g + d*h)*(a + b*ArcSin[c*x])^2
)/(4*c^2) + d*g*x*(a + b*ArcSin[c*x])^2 + ((e*g + d*h)*x^2*(a + b*ArcSin[c
*x])^2)/2 + ((f*g + e*h)*x^3*(a + b*ArcSin[c*x])^2)/3 + (f*h*x^4*(a + b*Ar
cSin[c*x])^2)/4
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5250
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_), x_Symbol] :> Int[ExpandI
ntegrand[Px*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, n}, x] && Poly
nomialQ[Px, x]
```

Maple [A] (verified)

Time = 0.66 (sec) , antiderivative size = 673, normalized size of antiderivative = 1.58

method	result
parts	$a^2\left(\frac{hf\,x^4}{4}+\frac{(eh+fg)x^3}{3}+\frac{(dh+eg)x^2}{2}+dgx\right)+\frac{b^2\left(\frac{fh\left(32\arcsin(cx)^2c^4x^4+16\arcsin(cx)\sqrt{-c^2x^2+1}\,c^3x^3-4c^4x\right.}{128c}\right.}{}$
derivativedivides	$\frac{a^2\left(\frac{hf\,c^4x^4}{4}+\frac{(che+gcf)c^3x^3}{3}+\frac{\left(c^2hd+c^2ge\right)c^2x^2}{2}+c^4gdx\right)}{c^3}+\frac{b^2\left(c^3dg\left(\arcsin(cx)^2cx-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{c^2ge\left(2a\right.}{}\right.}{}$
default	$\frac{a^2\left(\frac{hf\,c^4x^4}{4}+\frac{(che+gcf)c^3x^3}{3}+\frac{\left(c^2hd+c^2ge\right)c^2x^2}{2}+c^4gdx\right)}{c^3}+\frac{b^2\left(c^3dg\left(\arcsin(cx)^2cx-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{c^2ge\left(2a\right.}{}\right.}{}$
orering	Expression too large to display

input
```
int((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
a^2*(1/4*h*f*x^4+1/3*(e*h+f*g)*x^3+1/2*(d*h+e*g)*x^2+d*g*x)+b^2/c*(1/128*f
*h*(32*arcsin(c*x)^2*c^4*x^4+16*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^3*x^3-4*c
^4*x^4+24*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-12*arcsin(c*x)^2-12*c^2*x^2-9
)/c^3+1/27*f*g*(9*arcsin(c*x)^2*c^3*x^3+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c
^2*x^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)/c^2+1/27*e*h*(9
*arcsin(c*x)^2*c^3*x^3+6*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c^2*x^2-2*c^3*x^3+
12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)/c^2+1/4*e*g*(2*arcsin(c*x)^2*c^2
*x^2+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-arcsin(c*x)^2-c^2*x^2)/c+1/4*d*h
*(2*arcsin(c*x)^2*c^2*x^2+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)*c*x-arcsin(c*x)
^2-c^2*x^2)/c+d*g*(arcsin(c*x)^2*c*x-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)))+2*a*b/c*(1/4*c*arcsin(c*x)*h*f*x^4+1/3*c*arcsin(c*x)*e*h*x^3+1/3*c*arc
sin(c*x)*x^3*f*g+1/2*c*arcsin(c*x)*x^2*d*h+1/2*c*arcsin(c*x)*x^2*e*g+c*arc
sin(c*x)*x*d*g-1/12/c^3*(6*(d*h+e*g)*c^2*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*
arcsin(c*x))+4*c*(e*h+f*g)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+
1)^(1/2))+3*h*f*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2
)+3/8*arcsin(c*x))-12*c^3*g*d*(-c^2*x^2+1)^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.17 (sec) , antiderivative size = 579, normalized size of antiderivative = 1.36

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$= \frac{27\,(8\,a^2-b^2)c^4fhx^4+32\,((9\,a^2-2\,b^2)c^4fg+(9\,a^2-2\,b^2)c^4eh)x^3+27\,(8\,(2\,a^2-b^2)c^4eg+(8\,(2\,a^2-b^2)}{}$$

input
```
integrate((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
1/864*(27*(8*a^2 - b^2)*c^4*f*h*x^4 + 32*((9*a^2 - 2*b^2)*c^4*f*g + (9*a^2
 - 2*b^2)*c^4*e*h)*x^3 + 27*(8*(2*a^2 - b^2)*c^4*e*g + (8*(2*a^2 - b^2)*c^
4*d - 3*b^2*c^2*f)*h)*x^2 + 9*(24*b^2*c^4*f*h*x^4 + 96*b^2*c^4*d*g*x - 24*
b^2*c^2*e*g + 32*(b^2*c^4*f*g + b^2*c^4*e*h)*x^3 + 48*(b^2*c^4*e*g + b^2*c
^4*d*h)*x^2 - 3*(8*b^2*c^2*d + 3*b^2*f)*h)*arcsin(c*x)^2 - 96*(4*b^2*c^2*e
*h - (9*(a^2 - 2*b^2)*c^4*d - 4*b^2*c^2*f)*g)*x + 18*(24*a*b*c^4*f*h*x^4 +
 96*a*b*c^4*d*g*x - 24*a*b*c^2*e*g + 32*(a*b*c^4*f*g + a*b*c^4*e*h)*x^3 +
48*(a*b*c^4*e*g + a*b*c^4*d*h)*x^2 - 3*(8*a*b*c^2*d + 3*a*b*f)*h)*arcsin(c
*x) + 6*(18*a*b*c^3*f*h*x^3 + 64*a*b*c*e*h + 32*(a*b*c^3*f*g + a*b*c^3*e*h
)*x^2 + 32*(9*a*b*c^3*d + 2*a*b*c*f)*g + 9*(8*a*b*c^3*e*g + (8*a*b*c^3*d +
 3*a*b*c*f)*h)*x + (18*b^2*c^3*f*h*x^3 + 64*b^2*c*e*h + 32*(b^2*c^3*f*g +
b^2*c^3*e*h)*x^2 + 32*(9*b^2*c^3*d + 2*b^2*c*f)*g + 9*(8*b^2*c^3*e*g + (8*
b^2*c^3*d + 3*b^2*c*f)*h)*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1059 vs. 2(416) = 832.

Time = 0.50 (sec) , antiderivative size = 1059, normalized size of antiderivative = 2.49

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((h*x+g)*(f*x**2+e*x+d)*(a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*d*g*x + a**2*d*h*x**2/2 + a**2*e*g*x**2/2 + a**2*e*h*x**3/
3 + a**2*f*g*x**3/3 + a**2*f*h*x**4/4 + 2*a*b*d*g*x*asin(c*x) + a*b*d*h*x*
*2*asin(c*x) + a*b*e*g*x**2*asin(c*x) + 2*a*b*e*h*x**3*asin(c*x)/3 + 2*a*b
*f*g*x**3*asin(c*x)/3 + a*b*f*h*x**4*asin(c*x)/2 + 2*a*b*d*g*sqrt(-c**2*x*
*2 + 1)/c + a*b*d*h*x*sqrt(-c**2*x**2 + 1)/(2*c) + a*b*e*g*x*sqrt(-c**2*x*
*2 + 1)/(2*c) + 2*a*b*e*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + 2*a*b*f*g*x**2
*sqrt(-c**2*x**2 + 1)/(9*c) + a*b*f*h*x**3*sqrt(-c**2*x**2 + 1)/(8*c) - a*
b*d*h*asin(c*x)/(2*c**2) - a*b*e*g*asin(c*x)/(2*c**2) + 4*a*b*e*h*sqrt(-c*
*2*x**2 + 1)/(9*c**3) + 4*a*b*f*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*a*b*f*
h*x*sqrt(-c**2*x**2 + 1)/(16*c**3) - 3*a*b*f*h*asin(c*x)/(16*c**4) + b**2*
d*g*x*asin(c*x)**2 - 2*b**2*d*g*x + b**2*d*h*x**2*asin(c*x)**2/2 - b**2*d*
h*x**2/4 + b**2*e*g*x**2*asin(c*x)**2/2 - b**2*e*g*x**2/4 + b**2*e*h*x**3*
asin(c*x)**2/3 - 2*b**2*e*h*x**3/27 + b**2*f*g*x**3*asin(c*x)**2/3 - 2*b**
2*f*g*x**3/27 + b**2*f*h*x**4*asin(c*x)**2/4 - b**2*f*h*x**4/32 + 2*b**2*d
*g*sqrt(-c**2*x**2 + 1)*asin(c*x)/c + b**2*d*h*x*sqrt(-c**2*x**2 + 1)*asin
(c*x)/(2*c) + b**2*e*g*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2*c) + 2*b**2*e*h
*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c) + 2*b**2*f*g*x**2*sqrt(-c**2*x*
*2 + 1)*asin(c*x)/(9*c) + b**2*f*h*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(8*
c) - b**2*d*h*asin(c*x)**2/(4*c**2) - b**2*e*g*asin(c*x)**2/(4*c**2) - 4*b
**2*e*h*x/(9*c**2) - 4*b**2*f*g*x/(9*c**2) - 3*b**2*f*h*x**2/(32*c**2) ...
```

Maxima [F]

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \int \left(fx^2+ex+d\right)(hx+g)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
1/4*a^2*f*h*x^4 + 1/3*a^2*f*g*x^3 + 1/3*a^2*e*h*x^3 + b^2*d*g*x*arcsin(c*x
)^2 + 1/2*a^2*e*g*x^2 + 1/2*a^2*d*h*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt
(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e*g + 2/9*(3*x^3*arcsin(c*x)
+ c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*f*g + 1/2
*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*
d*h + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2
*x^2 + 1)/c^4))*a*b*e*h + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*
x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*f*h - 2*b
^2*d*g*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*g*x + 2*(c*x*arcsin(
c*x) + sqrt(-c^2*x^2 + 1))*a*b*d*g/c + 1/12*(3*b^2*f*h*x^4 + 4*(b^2*f*g +
b^2*e*h)*x^3 + 6*(b^2*e*g + b^2*d*h)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1))^2 + integrate(1/6*(3*b^2*c*f*h*x^4 + 4*(b^2*c*f*g + b^2*c*e*h)*
x^3 + 6*(b^2*c*e*g + b^2*c*d*h)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1145 vs. 2(383) = 766.

Time = 0.16 (sec) , antiderivative size = 1145, normalized size of antiderivative = 2.69

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
1/4*a^2*f*h*x^4 + 1/3*a^2*f*g*x^3 + 1/3*a^2*e*h*x^3 + b^2*d*g*x*arcsin(c*x
)^2 + 2*a*b*d*g*x*arcsin(c*x) + 1/3*(c^2*x^2 - 1)*b^2*f*g*x*arcsin(c*x)^2/
c^2 + 1/3*(c^2*x^2 - 1)*b^2*e*h*x*arcsin(c*x)^2/c^2 + 1/2*sqrt(-c^2*x^2 +
1)*b^2*e*g*x*arcsin(c*x)/c + 1/2*sqrt(-c^2*x^2 + 1)*b^2*d*h*x*arcsin(c*x)/
c + a^2*d*g*x - 2*b^2*d*g*x + 2/3*(c^2*x^2 - 1)*a*b*f*g*x*arcsin(c*x)/c^2
+ 2/3*(c^2*x^2 - 1)*a*b*e*h*x*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b^2*e*g*
arcsin(c*x)^2/c^2 + 1/2*(c^2*x^2 - 1)*b^2*d*h*arcsin(c*x)^2/c^2 + 1/3*b^2*
f*g*x*arcsin(c*x)^2/c^2 + 1/3*b^2*e*h*x*arcsin(c*x)^2/c^2 + 1/2*sqrt(-c^2*
x^2 + 1)*a*b*e*g*x/c + 1/2*sqrt(-c^2*x^2 + 1)*a*b*d*h*x/c + 2*sqrt(-c^2*x^
2 + 1)*b^2*d*g*arcsin(c*x)/c - 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*f*h*x*arcsin(c
*x)/c^3 - 2/27*(c^2*x^2 - 1)*b^2*f*g*x/c^2 - 2/27*(c^2*x^2 - 1)*b^2*e*h*x/
c^2 + (c^2*x^2 - 1)*a*b*e*g*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*a*b*d*h*arcsin
(c*x)/c^2 + 2/3*a*b*f*g*x*arcsin(c*x)/c^2 + 2/3*a*b*e*h*x*arcsin(c*x)/c^2
+ 1/4*b^2*e*g*arcsin(c*x)^2/c^2 + 1/4*b^2*d*h*arcsin(c*x)^2/c^2 + 1/4*(c^2
*x^2 - 1)^2*b^2*f*h*arcsin(c*x)^2/c^4 + 2*sqrt(-c^2*x^2 + 1)*a*b*d*g/c - 1
/8*(-c^2*x^2 + 1)^(3/2)*a*b*f*h*x/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*f*g*a
rcsin(c*x)/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*e*h*arcsin(c*x)/c^3 + 5/16*s
qrt(-c^2*x^2 + 1)*b^2*f*h*x*arcsin(c*x)/c^3 + 1/2*(c^2*x^2 - 1)*a^2*e*g/c^
2 - 1/4*(c^2*x^2 - 1)*b^2*e*g/c^2 + 1/2*(c^2*x^2 - 1)*a^2*d*h/c^2 - 1/4*(c
^2*x^2 - 1)*b^2*d*h/c^2 - 14/27*b^2*f*g*x/c^2 - 14/27*b^2*e*h*x/c^2 + 1...
```

Mupad [F(-1)]

Timed out.

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \int (g+h\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(f\,x^2+e\,x+d\right)\,dx$$

input
```
int((g + h*x)*(a + b*asin(c*x))^2*(d + e*x + f*x^2),x)
```

output
```
int((g + h*x)*(a + b*asin(c*x))^2*(d + e*x + f*x^2), x)
```

Reduce [F]

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=\frac{144\left(\int asin(cx)^2\,x^3dx\right)b^2c^4fh+72\sqrt{-c^2x^2+1}\,asin(cx)\,b^2c^3dhx-36asin(cx)^2\,b^2c^2dh-36asin(cx)^2\,b^2c}{}$$

input
```
int((h*x+g)*(f*x^2+e*x+d)*(a+b*asin(c*x))^2,x)
```

output
```
(144*asin(c*x)**2*b**2*c**4*d*g*x + 72*asin(c*x)**2*b**2*c**4*d*h*x**2 + 7
2*asin(c*x)**2*b**2*c**4*e*g*x**2 - 36*asin(c*x)**2*b**2*c**2*d*h - 36*asi
n(c*x)**2*b**2*c**2*e*g + 288*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*c**3*d
*g + 72*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*c**3*d*h*x + 72*sqrt( - c**2
*x**2 + 1)*asin(c*x)*b**2*c**3*e*g*x + 288*asin(c*x)*a*b*c**4*d*g*x + 144*
asin(c*x)*a*b*c**4*d*h*x**2 + 144*asin(c*x)*a*b*c**4*e*g*x**2 + 96*asin(c*
x)*a*b*c**4*e*h*x**3 + 96*asin(c*x)*a*b*c**4*f*g*x**3 + 72*asin(c*x)*a*b*c
**4*f*h*x**4 - 72*asin(c*x)*a*b*c**2*d*h - 72*asin(c*x)*a*b*c**2*e*g - 27*
asin(c*x)*a*b*f*h + 288*sqrt( - c**2*x**2 + 1)*a*b*c**3*d*g + 72*sqrt( - c
**2*x**2 + 1)*a*b*c**3*d*h*x + 72*sqrt( - c**2*x**2 + 1)*a*b*c**3*e*g*x +
32*sqrt( - c**2*x**2 + 1)*a*b*c**3*e*h*x**2 + 32*sqrt( - c**2*x**2 + 1)*a*
b*c**3*f*g*x**2 + 18*sqrt( - c**2*x**2 + 1)*a*b*c**3*f*h*x**3 + 64*sqrt( -
 c**2*x**2 + 1)*a*b*c*e*h + 64*sqrt( - c**2*x**2 + 1)*a*b*c*f*g + 27*sqrt(
 - c**2*x**2 + 1)*a*b*c*f*h*x + 144*int(asin(c*x)**2*x**3,x)*b**2*c**4*f*h
 + 144*int(asin(c*x)**2*x**2,x)*b**2*c**4*e*h + 144*int(asin(c*x)**2*x**2,
x)*b**2*c**4*f*g + 144*a**2*c**4*d*g*x + 72*a**2*c**4*d*h*x**2 + 72*a**2*c
**4*e*g*x**2 + 48*a**2*c**4*e*h*x**3 + 48*a**2*c**4*f*g*x**3 + 36*a**2*c**
4*f*h*x**4 - 288*b**2*c**4*d*g*x - 36*b**2*c**4*d*h*x**2 - 36*b**2*c**4*e*
g*x**2)/(144*c**4)
```

3.180 $\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$

Optimal result

Integrand size = 28, antiderivative size = 1085

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \text{Too large to display}$$

output
```
-1/2*a*b*f*arcsin(c*x)/c^2/h-2*a*b*(-e*h+f*g)*x*arcsin(c*x)/h^2-I*a*b*(d*h
^2-e*g*h+f*g^2)*arcsin(c*x)^2/h^3+2*b^2*(-e*h+f*g)*x/h^2+1/2*a^2*f*x^2/h-1
/4*b^2*f*x^2/h-2*a*b*(-e*h+f*g)*(-c^2*x^2+1)^(1/2)/c/h^2-2*b^2*(-e*h+f*g)*
(-c^2*x^2+1)^(1/2)*arcsin(c*x)/c/h^2+2*a*b*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)
*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3+2*a*b*
(d*h^2-e*g*h+f*g^2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(
c^2*g^2-h^2)^(1/2)))/h^3-2*I*a*b*(d*h^2-e*g*h+f*g^2)*polylog(2,I*(I*c*x+(-
c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3-2*I*b^2*(d*h^2-e*g*h+f*
g^2)*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^
2)^(1/2)))/h^3-2*I*b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)*polylog(2,I*(I*c*x+
(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3-2*I*a*b*(d*h^2-e*g*h+
f*g^2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))
/h^3+a^2*(d*h^2-e*g*h+f*g^2)*ln(h*x+g)/h^3-a^2*(-e*h+f*g)*x/h^2-b^2*(-e*h+
f*g)*x*arcsin(c*x)^2/h^2+a*b*f*x^2*arcsin(c*x)/h-1/4*b^2*f*arcsin(c*x)^2/c
^2/h+1/2*b^2*f*x^2*arcsin(c*x)^2/h-1/3*I*b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*
x)^3/h^3+b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^
(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3+b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x
)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+1/2
*a*b*f*x*(-c^2*x^2+1)^(1/2)/c/h+1/2*b^2*f*x*(-c^2*x^2+1)^(1/2)*arcsin(c*x)
/c/h+2*b^2*(d*h^2-e*g*h+f*g^2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h...
```

Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 556, normalized size of antiderivative = 0.51

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$$
$$= \frac{12h(-fg+eh)x(a+b\arcsin(cx))^2+6fh^2x^2(a+b\arcsin(cx))^2-\frac{4i(fg^2+h(-eg+dh))(a+b\arcsin(cx))^3}{b}+24bh}{}$$

input
```
Integrate[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x),x]
```

output
```
(12*h*(-(f*g) + e*h)*x*(a + b*ArcSin[c*x])^2 + 6*f*h^2*x^2*(a + b*ArcSin[c
*x])^2 - ((4*I)*(f*g^2 + h*(-(e*g) + d*h))*(a + b*ArcSin[c*x])^3)/b + 24*b
*h*(f*g - e*h)*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - 3*b*f*h
^2*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (a + b*ArcSin[
c*x])^2/(b*c^2)) + 12*(f*g^2 + h*(-(e*g) + d*h))*(a + b*ArcSin[c*x])^2*Log
[1 + (I*E^(I*ArcSin[c*x])*h)/(-(c*g) + Sqrt[c^2*g^2 - h^2])] + 12*(f*g^2 +
 h*(-(e*g) + d*h))*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(
c*g + Sqrt[c^2*g^2 - h^2])] - 24*b*(f*g^2 + h*(-(e*g) + d*h))*(I*(a + b*Ar
cSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])]
 - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])]) - 24
*b*(f*g^2 + h*(-(e*g) + d*h))*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*Ar
cSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c
*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]))/(12*h^3)
```

Rubi [A] (verified)

Time = 2.56 (sec) , antiderivative size = 1085, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {5258, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}dx$$

$$\Big\downarrow \text{5258}$$

$$\int \left(\frac{a^2(d+ex+fx^2)}{g+hx}+\frac{2ab\arcsin(cx)(d+ex+fx^2)}{g+hx}+\frac{b^2\arcsin(cx)^2(d+ex+fx^2)}{g+hx}\right)dx$$

$$\Big\downarrow \text{2009}$$

$$-\frac{ib^2(fg^2-ehg+dh^2)\arcsin(cx)^3}{3h^3}+\frac{b^2fx^2\arcsin(cx)^2}{2h}-\frac{iab(fg^2-ehg+dh^2)\arcsin(cx)^2}{h^3}-\frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2}+\frac{b^2(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}+\frac{b^2(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}-\frac{b^2f\arcsin(cx)^2}{4c^2h}+\frac{abfx^2\arcsin(cx)}{h}-\frac{2ab(fg-eh)x\arcsin(cx)}{h^2}+\frac{2ab(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}+\frac{2ab(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}-\frac{2ib^2(fg^2-ehg+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}-\frac{2ib^2(fg^2-ehg+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}-\frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}+\frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch}-\frac{abf\arcsin(cx)}{2c^2h}+\frac{a^2fx^2}{2h}-\frac{b^2fx^2}{4h}-\frac{a^2(fg-eh)x}{h^2}+\frac{2b^2(fg-eh)x}{h^2}+\frac{a^2(fg^2-ehg+dh^2)\log(g+hx)}{h^3}-\frac{2iab(fg^2-ehg+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{2iab(fg^2-ehg+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}+\frac{2b^2(fg^2-ehg+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}+\frac{2b^2(fg^2-ehg+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{2ab(fg-eh)\sqrt{1-c^2x^2}}{ch^2}+\frac{abfx\sqrt{1-c^2x^2}}{2ch}$$

input
```
Int[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x),x]
```

output
```
-((a^2*(f*g - e*h)*x)/h^2) + (2*b^2*(f*g - e*h)*x)/h^2 + (a^2*f*x^2)/(2*h)
 - (b^2*f*x^2)/(4*h) - (2*a*b*(f*g - e*h)*Sqrt[1 - c^2*x^2])/(c*h^2) + (a*
b*f*x*Sqrt[1 - c^2*x^2])/(2*c*h) - (a*b*f*ArcSin[c*x])/(2*c^2*h) - (2*a*b*
(f*g - e*h)*x*ArcSin[c*x])/h^2 + (a*b*f*x^2*ArcSin[c*x])/h - (2*b^2*(f*g -
 e*h)*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*h^2) + (b^2*f*x*Sqrt[1 - c^2*x^2]*
ArcSin[c*x])/(2*c*h) - (b^2*f*ArcSin[c*x]^2)/(4*c^2*h) - (I*a*b*(f*g^2 - e
*g*h + d*h^2)*ArcSin[c*x]^2)/h^3 - (b^2*(f*g - e*h)*x*ArcSin[c*x]^2)/h^2 +
 (b^2*f*x^2*ArcSin[c*x]^2)/(2*h) - ((I/3)*b^2*(f*g^2 - e*g*h + d*h^2)*ArcS
in[c*x]^3)/h^3 + (2*a*b*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(
I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 + (b^2*(f*g^2 - e*g*h
+ d*h^2)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2
 - h^2])])/h^3 + (2*a*b*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(
I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 + (b^2*(f*g^2 - e*g*h
+ d*h^2)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2
 - h^2])])/h^3 + (a^2*(f*g^2 - e*g*h + d*h^2)*Log[g + h*x])/h^3 - ((2*I)*a
*b*(f*g^2 - e*g*h + d*h^2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[
c^2*g^2 - h^2])])/h^3 - ((2*I)*b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]*Pol
yLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 - ((2*I)
*a*b*(f*g^2 - e*g*h + d*h^2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqr
t[c^2*g^2 - h^2])])/h^3 - ((2*I)*b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5258
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_)*((d_) + (e_.)*(x_))^(m_.)
, x_Symbol] :> Int[ExpandIntegrand[Px*(d + e*x)^m*(a + b*ArcSin[c*x])^n, x]
, x] /; FreeQ[{a, b, c, d, e}, x] && PolynomialQ[Px, x] && IGtQ[n, 0] && In
tegerQ[m]
```

Maple [F]

$$\int \frac{(f\,x^2+ex+d)\,(a+b\arcsin{(cx)})^2}{hx+g}dx$$

input
```
int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x)
```

output
```
int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x)
```

Fricas [F]

$$\int \frac{(d+ex+fx^2)\,(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin{(cx)}+a)^2}{hx+g}\,dx$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x, algorithm="fricas")
```

output
```
integral((a^2*f*x^2 + a^2*e*x + a^2*d + (b^2*f*x^2 + b^2*e*x + b^2*d)*arcs
in(c*x)^2 + 2*(a*b*f*x^2 + a*b*e*x + a*b*d)*arcsin(c*x))/(h*x + g), x)
```

Sympy [F]

$$\int \frac{(d+ex+fx^2)\,(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(a+b\operatorname{asin}{(cx)})^2\,(d+ex+fx^2)}{g+hx}\,dx$$

input
```
integrate((f*x**2+e*x+d)*(a+b*asin(c*x))**2/(h*x+g),x)
```

output
```
Integral((a + b*asin(c*x))**2*(d + e*x + f*x**2)/(g + h*x), x)
```

Maxima [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{hx+g}\,dx$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x, algorithm="maxima")
```

output
```
a^2*e*(x/h - g*log(h*x + g)/h^2) + 1/2*a^2*f*(2*g^2*log(h*x + g)/h^3 + (h*
x^2 - 2*g*x)/h^2) + a^2*d*log(h*x + g)/h + integrate(((b^2*f*x^2 + b^2*e*x
 + b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*f*x^2 + a*
b*e*x + a*b*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(h*x + g), x)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(f\,x^2+e\,x+d)}{g+h\,x}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x),x)
```

output
```
int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x), x)
```

Reduce [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$$
$$= \frac{2asin(cx)^2 b^2ce\,h^2x + 4\sqrt{-c^2x^2+1}\,asin(cx)\,b^2e\,h^2 + 4asin(cx)\,abce\,h^2x + 4\sqrt{-c^2x^2+1}\,abe\,h^2 + 4\Big(\int \frac{a}{}$$

input
```
int((f*x^2+e*x+d)*(a+b*asin(c*x))^2/(h*x+g),x)
```

output
```
(2*asin(c*x)**2*b**2*c*e*h**2*x + 4*sqrt( - c**2*x**2 + 1)*asin(c*x)*b**2*
e*h**2 + 4*asin(c*x)*a*b*c*e*h**2*x + 4*sqrt( - c**2*x**2 + 1)*a*b*e*h**2
+ 4*int(asin(c*x)/(g + h*x),x)*a*b*c*d*h**3 - 4*int(asin(c*x)/(g + h*x),x)
*a*b*c*e*g*h**2 + 2*int(asin(c*x)**2/(g + h*x),x)*b**2*c*d*h**3 - 2*int(as
in(c*x)**2/(g + h*x),x)*b**2*c*e*g*h**2 + 4*int((asin(c*x)*x**2)/(g + h*x)
,x)*a*b*c*f*h**3 + 2*int((asin(c*x)**2*x**2)/(g + h*x),x)*b**2*c*f*h**3 +
2*log(g + h*x)*a**2*c*d*h**2 - 2*log(g + h*x)*a**2*c*e*g*h + 2*log(g + h*x
)*a**2*c*f*g**2 + 2*a**2*c*e*h**2*x - 2*a**2*c*f*g*h*x + a**2*c*f*h**2*x**
2 - 4*b**2*c*e*h**2*x)/(2*c*h**3)
```

3.181 $\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2} dx$

Optimal result

Integrand size = 28, antiderivative size = 1323

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2} dx = \text{Too large to display}$$

output
```
2*a*b*f*x*arcsin(c*x)/h^2-2*a*b*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)/h^3/(h*x+g
)-2*b^2*(-e*h+2*f*g)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^
2-h^2)^(1/2)))/h^3-2*b^2*(-e*h+2*f*g)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2
))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+1/3*I*b^2*(-e*h+2*f*g)*arcsin(c*x)^3/h
^3+a^2*f*x/h^2-a^2*(-e*h+2*f*g)*ln(h*x+g)/h^3-a^2*(d*h^2-e*g*h+f*g^2)/h^3/
(h*x+g)+2*I*a*b*(-e*h+2*f*g)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g
+(c^2*g^2-h^2)^(1/2)))/h^3+2*I*a*b*(-e*h+2*f*g)*polylog(2,I*(I*c*x+(-c^2*x
^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+2*I*b^2*(-e*h+2*f*g)*arcsin(
c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h
^3+2*I*b^2*(-e*h+2*f*g)*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))
*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+2*b^2*c*(d*h^2-e*g*h+f*g^2)*polylog(2,I*
(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3/(c^2*g^2-h^2)^
(1/2)-2*b^2*c*(d*h^2-e*g*h+f*g^2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h
/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3/(c^2*g^2-h^2)^(1/2)+2*a*b*f*(-c^2*x^2+1)^(
1/2)/c/h^2-2*a*b*(-e*h+2*f*g)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)
)*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3-2*a*b*(-e*h+2*f*g)*arcsin(c*x)*ln(1-I*(
I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+2*b^2*f*(-c^2*x
^2+1)^(1/2)*arcsin(c*x)/c/h^2-2*b^2*f*x/h^2-b^2*(d*h^2-e*g*h+f*g^2)*arcsin
(c*x)^2/h^3/(h*x+g)+b^2*f*x*arcsin(c*x)^2/h^2+I*a*b*(-e*h+2*f*g)*arcsin(c*
x)^2/h^3-2*I*b^2*c*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*...
```

Mathematica [A] (warning: unable to verify)

Time = 0.79 (sec) , antiderivative size = 688, normalized size of antiderivative = 0.52

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

$$= \frac{3fhx(a+b\arcsin(cx))^2 - \frac{3(fg^2+h(-eg+dh))(a+b\arcsin(cx))^2}{g+hx} + \frac{i(2fg-eh)(a+b\arcsin(cx))^3}{b} - 6bfh\left(bx - \frac{\sqrt{1-c^2x^2}(a+}{c}\right.}{}$$

input
```
Integrate[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x)^2,x]
```

output
```
(3*f*h*x*(a + b*ArcSin[c*x])^2 - (3*(f*g^2 + h*(-(e*g) + d*h))*(a + b*ArcS
in[c*x])^2)/(g + h*x) + (I*(2*f*g - e*h)*(a + b*ArcSin[c*x])^3)/b - 6*b*f*
h*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - 3*(2*f*g - e*h)*(a +
 b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*h)/(-(c*g) + Sqrt[c^2*g^2 -
 h^2])] - 3*(2*f*g - e*h)*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x
])*h)/(c*g + Sqrt[c^2*g^2 - h^2])] + (6*b*c*(f*g^2 + h*(-(e*g) + d*h))*((-
I)*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*h)/(-(c*g) + Sqrt[c^2
*g^2 - h^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2]
)]) - b*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])] +
b*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]))/Sqrt[c
^2*g^2 - h^2] + 6*b*(2*f*g - e*h)*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(
I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])] - b*PolyLog[3, (I*E^(I*ArcS
in[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])]) + 6*b*(2*f*g - e*h)*(I*(a + b*Ar
cSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]
 - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]))/(3*
h^3)
```

Rubi [A] (verified)

Time = 3.09 (sec) , antiderivative size = 1323, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {5258, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}dx$$

$$\Big\downarrow \text{5258}$$

$$\int \left(\frac{a^2(d+ex+fx^2)}{(g+hx)^2}+\frac{2ab\arcsin(cx)(d+ex+fx^2)}{(g+hx)^2}+\frac{b^2\arcsin(cx)^2(d+ex+fx^2)}{(g+hx)^2}\right)dx$$

$$\Big\downarrow \text{2009}$$

$$\frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3}+\frac{iab(2fg-eh)\arcsin(cx)^2}{h^3}+\frac{b^2fx\arcsin(cx)^2}{h^2}-\frac{b^2(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}-\frac{b^2(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}-\frac{b^2(fg^2-ehg+dh^2)\arcsin(cx)^2}{h^3(g+hx)}+\frac{2abfx\arcsin(cx)}{h^2}-\frac{2ab(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}-\frac{2ib^2c(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3\sqrt{c^2g^2-h^2}}-\frac{2ab(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}+\frac{2ib^2c(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3\sqrt{c^2g^2-h^2}}+\frac{2ib^2(2fg-eh)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}+\frac{2ib^2(2fg-eh)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}+\frac{2b^2f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}-\frac{2ab(fg^2-ehg+dh^2)\arcsin(cx)}{h^3(g+hx)}+\frac{a^2fx}{h^2}-\frac{2b^2fx}{h^2}+\frac{2abc(fg^2-ehg+dh^2)\arctan\left(\frac{gxc^2+h}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}-\frac{a^2(2fg-eh)\log(g+hx)}{h^3}+\frac{2iab(2fg-eh)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{2b^2c(fg^2-ehg+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}+\frac{2iab(2fg-eh)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}+\frac{2b^2c(fg^2-ehg+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}-\frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}+\frac{2abf\sqrt{1-c^2x^2}}{ch^2}-\frac{a^2(fg^2-ehg+dh^2)}{h^3(g+hx)}$$

input
```
Int[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x)^2,x]
```

output
```
(a^2*f*x)/h^2 - (2*b^2*f*x)/h^2 - (a^2*(f*g^2 - e*g*h + d*h^2))/(h^3*(g +
h*x)) + (2*a*b*f*Sqrt[1 - c^2*x^2])/(c*h^2) + (2*a*b*f*x*ArcSin[c*x])/h^2
- (2*a*b*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x])/(h^3*(g + h*x)) + (2*b^2*f*S
qrt[1 - c^2*x^2]*ArcSin[c*x])/(c*h^2) + (I*a*b*(2*f*g - e*h)*ArcSin[c*x]^2
)/h^3 + (b^2*f*x*ArcSin[c*x]^2)/h^2 - (b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[
c*x]^2)/(h^3*(g + h*x)) + ((I/3)*b^2*(2*f*g - e*h)*ArcSin[c*x]^3)/h^3 + (2
*a*b*c*(f*g^2 - e*g*h + d*h^2)*ArcTan[(h + c^2*g*x)/(Sqrt[c^2*g^2 - h^2]*S
qrt[1 - c^2*x^2])])/(h^3*Sqrt[c^2*g^2 - h^2]) - (2*a*b*(2*f*g - e*h)*ArcSi
n[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 -
 ((2*I)*b^2*c*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c
*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/(h^3*Sqrt[c^2*g^2 - h^2]) - (b^2*(2*
f*g - e*h)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g
^2 - h^2])])/h^3 - (2*a*b*(2*f*g - e*h)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin
[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 + ((2*I)*b^2*c*(f*g^2 - e*g*h
+ d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 -
 h^2])])/(h^3*Sqrt[c^2*g^2 - h^2]) - (b^2*(2*f*g - e*h)*ArcSin[c*x]^2*Log[
1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 - (a^2*(2*f*
g - e*h)*Log[g + h*x])/h^3 + ((2*I)*a*b*(2*f*g - e*h)*PolyLog[2, (I*E^(I*A
rcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 - (2*b^2*c*(f*g^2 - e*g*h
 + d*h^2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2]...
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5258
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_)*((d_) + (e_.)*(x_))^(m_.)
, x_Symbol] :> Int[ExpandIntegrand[Px*(d + e*x)^m*(a + b*ArcSin[c*x])^n, x]
, x] /; FreeQ[{a, b, c, d, e}, x] && PolynomialQ[Px, x] && IGtQ[n, 0] && In
tegerQ[m]
```

Maple [F]

$$\int \frac{(f\,x^2+ex+d)\,(a+b\arcsin(cx))^2}{(hx+g)^2}dx$$

input
```
int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x)
```

output
```
int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x)
```

Fricas [F]

$$\int \frac{(d+ex+fx^2)\,(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{(hx+g)^2}\,dx$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x, algorithm="fricas
")
```

output
```
integral((a^2*f*x^2 + a^2*e*x + a^2*d + (b^2*f*x^2 + b^2*e*x + b^2*d)*arcs
in(c*x)^2 + 2*(a*b*f*x^2 + a*b*e*x + a*b*d)*arcsin(c*x))/(h^2*x^2 + 2*g*h*
x + g^2), x)
```

Sympy [F]

$$\int \frac{(d+ex+fx^2)\,(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(cx))^2\,(d+ex+fx^2)}{(g+hx)^2}\,dx$$

input
```
integrate((f*x**2+e*x+d)*(a+b*asin(c*x))**2/(h*x+g)**2,x)
```

output
```
Integral((a + b*asin(c*x))**2*(d + e*x + f*x**2)/(g + h*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x, algorithm="maxima
")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(h-c*g>0)', see `assume?` for mor
e details)
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(f\,x^2+e\,x+d)}{(g+h\,x)^2}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x)^2,x)
```

output
```
int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x)^2, x)
```

Reduce [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \text{Too large to display}$$

input
```
int((f*x^2+e*x+d)*(a+b*asin(c*x))^2/(h*x+g)^2,x)
```

output

```
(2*asin(c*x)*a*b*c*f*g**2*h*x + 2*asin(c*x)*a*b*c*f*g*h**2*x**2 + 2*sqrt(
- c**2*x**2 + 1)*a*b*f*g**2*h + 2*sqrt( - c**2*x**2 + 1)*a*b*f*g*h**2*x +
2*int(asin(c*x)/(g**2 + 2*g*h*x + h**2*x**2),x)*a*b*c*d*g**2*h**3 + 2*int(
asin(c*x)/(g**2 + 2*g*h*x + h**2*x**2),x)*a*b*c*d*g*h**4*x - 2*int(asin(c*
x)/(g**2 + 2*g*h*x + h**2*x**2),x)*a*b*c*f*g**4*h - 2*int(asin(c*x)/(g**2
+ 2*g*h*x + h**2*x**2),x)*a*b*c*f*g**3*h**2*x + int(asin(c*x)**2/(g**2 + 2
*g*h*x + h**2*x**2),x)*b**2*c*d*g**2*h**3 + int(asin(c*x)**2/(g**2 + 2*g*h
*x + h**2*x**2),x)*b**2*c*d*g*h**4*x + 2*int((asin(c*x)*x)/(g**2 + 2*g*h*x
 + h**2*x**2),x)*a*b*c*e*g**2*h**3 + 2*int((asin(c*x)*x)/(g**2 + 2*g*h*x +
 h**2*x**2),x)*a*b*c*e*g*h**4*x - 4*int((asin(c*x)*x)/(g**2 + 2*g*h*x + h*
*2*x**2),x)*a*b*c*f*g**3*h**2 - 4*int((asin(c*x)*x)/(g**2 + 2*g*h*x + h**2
*x**2),x)*a*b*c*f*g**2*h**3*x + int((asin(c*x)**2*x**2)/(g**2 + 2*g*h*x +
h**2*x**2),x)*b**2*c*f*g**2*h**3 + int((asin(c*x)**2*x**2)/(g**2 + 2*g*h*x
 + h**2*x**2),x)*b**2*c*f*g*h**4*x + int((asin(c*x)**2*x)/(g**2 + 2*g*h*x
+ h**2*x**2),x)*b**2*c*e*g**2*h**3 + int((asin(c*x)**2*x)/(g**2 + 2*g*h*x
+ h**2*x**2),x)*b**2*c*e*g*h**4*x + log(g + h*x)*a**2*c*e*g**2*h + log(g +
 h*x)*a**2*c*e*g*h**2*x - 2*log(g + h*x)*a**2*c*f*g**3 - 2*log(g + h*x)*a*
*2*c*f*g**2*h*x + a**2*c*d*h**3*x - a**2*c*e*g*h**2*x + 2*a**2*c*f*g**2*h*
x + a**2*c*f*g*h**2*x**2)/(c*g*h**3*(g + h*x))
```

3.182 $\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 33, antiderivative size = 520

$$\begin{aligned}
&\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx \\
&= -\frac{2b^2hx}{e}+\frac{2abh\sqrt{1-c^2x^2}}{ce}+\frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce}+\frac{hx(a+b\arcsin(cx))^2}{e} \\
&\quad-\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{2abc(e^2f-d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&\quad-\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&\quad+\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&\quad-\frac{2b^2c(e^2f-d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&\quad+\frac{2b^2c(e^2f-d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}
\end{aligned}$$

output
```
-2*b^2*h*x/e+2*a*b*h*(-c^2*x^2+1)^(1/2)/c/e+2*b^2*h*(-c^2*x^2+1)^(1/2)*arc
sin(c*x)/c/e+h*x*(a+b*arcsin(c*x))^2/e-(f-d^2*h/e^2)*(a+b*arcsin(c*x))^2/(
e*x+d)+2*a*b*c*(-d^2*h+e^2*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2
*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(1/2)-2*I*b^2*c*(-d^2*h+e^2*f)*arcsin(c*x
)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*
d^2-e^2)^(1/2)+2*I*b^2*c*(-d^2*h+e^2*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*
x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)-2*b^2*c*(
-d^2*h+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^
(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+2*b^2*c*(-d^2*h+e^2*f)*polylog(2,I*e*(I*c*
x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)
```

Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 307, normalized size of antiderivative = 0.59

$$\int \frac{(ef + 2dhx + ehx^2)(a + b\arcsin(cx))^2}{(d + ex)^2} dx = \frac{hx(a + b\arcsin(cx))^2}{e} - \frac{\left(f - \frac{d^2h}{e^2}\right)(a + b\arcsin(cx))^2}{d + ex} - \frac{2bh\left(bx - \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)}{e} + \frac{2bc(e^2f - d^2h)\left(-i(a + b\arcsin(cx))\left(\log\left(1 + \frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right) - \log\left(1 - \frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right) - b\,\mathrm{PolyLog}}{e^2\sqrt{c^2d^2 - e^2}}$$

input
```
Integrate[((e*f + 2*d*h*x + e*h*x^2)*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,x]
```

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

Rubi [A] (verified)

Time = 2.01 (sec) , antiderivative size = 507, normalized size of antiderivative = 0.98, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5256, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2\left(2dhx+ef+ehx^2\right)}{(d+ex)^2}dx$$

$$\Big\downarrow \text{5256}$$

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

$$\Big\downarrow \text{5298}$$

$$-2bc\int \left(\frac{b\arcsin(cx)\left(hd^2+ehxd+e^2hx^2-e^2f\right)}{e^2(d+ex)\sqrt{1-c^2x^2}}+\frac{a\left(hd^2+ehxd+e^2hx^2-e^2f\right)}{e^2(d+ex)\sqrt{1-c^2x^2}}\right)dx-\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{hx(a+b\arcsin(cx))^2}{e}$$

$$\Big\downarrow \text{2009}$$

$$-2bc\left(-\frac{a\left(e^2f-d^2h\right)\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}-\frac{ah\sqrt{1-c^2x^2}}{c^2e}+\frac{b\left(e^2f-d^2h\right)\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}-\ldots\right.$$
$$\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{hx(a+b\arcsin(cx))^2}{e}$$

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

output
```
(h*x*(a + b*ArcSin[c*x])^2)/e - ((f - (d^2*h)/e^2)*(a + b*ArcSin[c*x])^2)/
(d + e*x) - 2*b*c*((b*h*x)/(c*e) - (a*h*Sqrt[1 - c^2*x^2])/(c^2*e) - (b*h*
Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c^2*e) - (a*(e^2*f - d^2*h)*ArcTan[(e + c^
2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e^2*Sqrt[c^2*d^2 - e^2])
 + (I*b*(e^2*f - d^2*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d -
 Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) - (I*b*(e^2*f - d^2*h)*A
rcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(
e^2*Sqrt[c^2*d^2 - e^2]) + (b*(e^2*f - d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[
c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) - (b*(e^2*f
 - d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])
/(e^2*Sqrt[c^2*d^2 - e^2]))
```

Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5256
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c
*n   Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[
p, 0] && EqQ[e*g - 2*d*h, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1250 vs. $2(520) = 1040$.

Time = 1.43 (sec) , antiderivative size = 1251, normalized size of antiderivative = 2.41

method	result	size
parts	Expression too large to display	1251
derivativedivides	Expression too large to display	1277
default	Expression too large to display	1277

input
```
int((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x,method=_RETURNVE
RBOSE)
```

output
```
a^2*(h/e*x-(-d^2*h+e^2*f)/e^2/(e*x+d))+2*b^2*h*(-c^2*x^2+1)^(1/2)*arcsin(c
*x)/c/e+b^2*h/e*arcsin(c*x)^2*x-2*b^2*h*x/e+b^2*c*arcsin(c*x)^2/e^2/(c*e*x
+c*d)*d^2*h-b^2*c*arcsin(c*x)^2/(c*e*x+c*d)*f+2*b^2*c*(-c^2*d^2+e^2)^(1/2)
/e^2/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^
2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2*h-2*b^2*c*(-c^2*d^2+e^
2)^(1/2)/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-
(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*f-2*b^2*c*(-c^2*d^2+e^
2)^(1/2)/e^2/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2)
)*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2*h+2*b^2*c*(-c^
2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(
1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f-2*I*b^2*c*(-
c^2*d^2+e^2)^(1/2)/e^2/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2
))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*h*d^2+2*I*b^2*c*(
-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*
e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*f+2*I*b^2*c*(-c^2*d^
2+e^2)^(1/2)/e^2/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(
-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*h*d^2-2*I*b^2*c*(-c^2*d
^2+e^2)^(1/2)/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^
2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f+2*a*b/c*(arcsin(c*x)*h/e
*c*x+arcsin(c*x)*c^2/e^2/(c*e*x+c*d)*d^2*h-arcsin(c*x)*c^2/(c*e*x+c*d)*...
```

Fricas [F]

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \int \frac{(ehx^2+2\,dhx+ef)(b\arcsin(cx)+a)^2}{(ex+d)^2}\,dx$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm
="fricas")
```

output
```
integral((a^2*e*h*x^2 + 2*a^2*d*h*x + a^2*e*f + (b^2*e*h*x^2 + 2*b^2*d*h*x
 + b^2*e*f)*arcsin(c*x)^2 + 2*(a*b*e*h*x^2 + 2*a*b*d*h*x + a*b*e*f)*arcsin
(c*x))/(e^2*x^2 + 2*d*e*x + d^2), x)
```

Sympy [F]

$$\int \frac{(ef + 2dhx + ehx^2)(a + b\arcsin(cx))^2}{(d + ex)^2}\,dx = \int \frac{(a + b\,\mathrm{asin}\,(cx))^2 \cdot (2dhx + ef + ehx^2)}{(d + ex)^2}\,dx$$

input
```
integrate((e*h*x**2+2*d*h*x+e*f)*(a+b*asin(c*x))**2/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))**2*(2*d*h*x + e*f + e*h*x**2)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(ef + 2dhx + ehx^2)(a + b\arcsin(cx))^2}{(d + ex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm
="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm
="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e\,h\,x^2+2\,d\,h\,x+e\,f)}{(d+e\,x)^2}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x))/(d + e*x)^2,x)
```

output
```
int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x))/(d + e*x)^2, x)
```

Reduce [F]

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \frac{asin(cx)^2 b^2 c d^2 hx + asin(cx)^2 b^2 cdeh\,x^2 + 2\sqrt{-c^2x^2+1}\,asin(cx)\,b^2 d^2 h + 2\sqrt{-c^2x^2+1}\,asin(cx)\,b^2 dehx}{}$$

input
```
int((e*h*x^2+2*d*h*x+e*f)*(a+b*asin(c*x))^2/(e*x+d)^2,x)
```

output
```
(asin(c*x)**2*b**2*c*d**2*h*x + asin(c*x)**2*b**2*c*d*e*h*x**2 + 2*sqrt( -
 c**2*x**2 + 1)*asin(c*x)*b**2*d**2*h + 2*sqrt( - c**2*x**2 + 1)*asin(c*x)
*b**2*d*e*h*x + 2*asin(c*x)*a*b*c*d**2*h*x + 2*asin(c*x)*a*b*c*d*e*h*x**2
+ 2*sqrt( - c**2*x**2 + 1)*a*b*d**2*h + 2*sqrt( - c**2*x**2 + 1)*a*b*d*e*h
*x - 2*int(asin(c*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*a*b*c*d**4*h - 2*int(
asin(c*x)/(d**2 + 2*d*e*x + e**2*x**2),x)*a*b*c*d**3*e*h*x + 2*int(asin(c*
x)/(d**2 + 2*d*e*x + e**2*x**2),x)*a*b*c*d**2*e**2*f + 2*int(asin(c*x)/(d*
*2 + 2*d*e*x + e**2*x**2),x)*a*b*c*d*e**3*f*x - int(asin(c*x)**2/(d**2 + 2
*d*e*x + e**2*x**2),x)*b**2*c*d**4*h - int(asin(c*x)**2/(d**2 + 2*d*e*x +
e**2*x**2),x)*b**2*c*d**3*e*h*x + int(asin(c*x)**2/(d**2 + 2*d*e*x + e**2*
x**2),x)*b**2*c*d**2*e**2*f + int(asin(c*x)**2/(d**2 + 2*d*e*x + e**2*x**2
),x)*b**2*c*d*e**3*f*x + a**2*c*d*e*h*x**2 + a**2*c*e**2*f*x - 2*b**2*c*d*
*2*h*x - 2*b**2*c*d*e*h*x**2)/(c*d*e*(d + e*x))
```

3.183 $\int \frac{(ef+2dhx+ehx^2)^2(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 35, antiderivative size = 907

$$\int \frac{(ef+2dhx+ehx^2)^2 (a+b\arcsin(cx))^2}{(d+ex)^2} dx$$
$$= -\frac{4b^2h^2x}{9c^2} - \frac{2b^2h(2e^2f-d^2h)x}{e^2} - \frac{b^2dh^2x^2}{2e} - \frac{2}{27}b^2h^2x^3$$
$$+ \frac{2abh(2e^2h+9c^2(2e^2f-d^2h))\sqrt{1-c^2x^2}}{9c^3e^2} + \frac{abdh^2x\sqrt{1-c^2x^2}}{ce}$$
$$+ \frac{2abh^2x^2\sqrt{1-c^2x^2}}{9c} - \frac{abd(2c^2d^2+3e^2)h^2\arcsin(cx)}{3c^2e^3} + \frac{4b^2h^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c^3}$$
$$+ \frac{2b^2h(2e^2f-d^2h)\sqrt{1-c^2x^2}\arcsin(cx)}{ce^2} + \frac{b^2dh^2x\sqrt{1-c^2x^2}\arcsin(cx)}{ce}$$
$$+ \frac{2b^2h^2x^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c} - \frac{b^2d^3h^2\arcsin(cx)^2}{3e^3} - \frac{b^2dh^2\arcsin(cx)^2}{2c^2e}$$
$$+ \frac{2h(e^2f-d^2h)x(a+b\arcsin(cx))^2}{e^2} - \frac{(e^2f-d^2h)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}$$
$$+ \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} + \frac{2abc(e^2f-d^2h)^2\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$
$$- \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$
$$+ \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$
$$- \frac{2b^2c(e^2f-d^2h)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$
$$+ \frac{2b^2c(e^2f-d^2h)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}$$

output
```
-4/9*b^2*h^2*x/c^2-2*b^2*h*(-d^2*h+2*e^2*f)*x/e^2-1/2*b^2*d*h^2*x^2/e-2/27
*b^2*h^2*x^3+2/9*a*b*h*(2*e^2*h+9*c^2*(-d^2*h+2*e^2*f))*(-c^2*x^2+1)^(1/2)
/c^3/e^2+a*b*d*h^2*x*(-c^2*x^2+1)^(1/2)/c/e+2/9*a*b*h^2*x^2*(-c^2*x^2+1)^(
1/2)/c-1/3*a*b*d*(2*c^2*d^2+3*e^2)*h^2*arcsin(c*x)/c^2/e^3+4/9*b^2*h^2*(-c
^2*x^2+1)^(1/2)*arcsin(c*x)/c^3+2*b^2*h*(-d^2*h+2*e^2*f)*(-c^2*x^2+1)^(1/2
)*arcsin(c*x)/c/e^2+b^2*d*h^2*x*(-c^2*x^2+1)^(1/2)*arcsin(c*x)/c/e+2/9*b^2
*h^2*x^2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)/c-1/3*b^2*d^3*h^2*arcsin(c*x)^2/e^
3-1/2*b^2*d*h^2*arcsin(c*x)^2/c^2/e+2*h*(-d^2*h+e^2*f)*x*(a+b*arcsin(c*x))
^2/e^2-(-d^2*h+e^2*f)^2*(a+b*arcsin(c*x))^2/e^3/(e*x+d)+1/3*h^2*(e*x+d)^3*
(a+b*arcsin(c*x))^2/e^3+2*a*b*c*(-d^2*h+e^2*f)^2*arctan((c^2*d*x+e)/(c^2*d
^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(1/2)+2*I*b^2*c*(-d^2*
h+e^2*f)^2*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e
^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)-2*I*b^2*c*(-d^2*h+e^2*f)^2*arcsin(c*x)
*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d
^2-e^2)^(1/2)-2*b^2*c*(-d^2*h+e^2*f)^2*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(
1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)+2*b^2*c*(-d^2*h+e
^2*f)^2*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2))
)/e^3/(c^2*d^2-e^2)^(1/2)
```

Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 526, normalized size of antiderivative = 0.58

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

$$= \frac{h(2e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} + \frac{dh^2x^2(a+b\arcsin(cx))^2}{e}$$

$$+ \frac{1}{3}h^2x^3(a+b\arcsin(cx))^2 - \frac{(e^2f-d^2h)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}$$

$$- \frac{2bh^2\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{27c^3}$$

$$- \frac{2bh(2e^2f-d^2h)\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)}{e^2}$$

$$- \frac{bdh^2\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)}{2e}$$

$$+ \frac{2bc(e^2f-d^2h)^2\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)-b\,\mathrm{PolyLog}\ldots}{e^3\sqrt{c^2d^2-e^2}}$$

input
```
Integrate[((e*f + 2*d*h*x + e*h*x^2)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,
x]
```

output
```
(h*(2*e^2*f - d^2*h)*x*(a + b*ArcSin[c*x])^2)/e^2 + (d*h^2*x^2*(a + b*ArcS
in[c*x])^2)/e + (h^2*x^3*(a + b*ArcSin[c*x])^2)/3 - ((e^2*f - d^2*h)^2*(a
+ b*ArcSin[c*x])^2)/(e^3*(d + e*x)) - (2*b*h^2*(-3*a*Sqrt[1 - c^2*x^2]*(2
+ c^2*x^2) + b*c*x*(6 + c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*Arc
Sin[c*x]))/(27*c^3) - (2*b*h*(2*e^2*f - d^2*h)*(b*x - (Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x]))/c))/e^2 - (b*d*h^2*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/c + (a + b*ArcSin[c*x])^2/(b*c^2)))/(2*e) + (2*b*c*(e^2*
f - d^2*h)^2*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-
(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqr
t[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2
*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 -
 e^2])]))/(e^3*Sqrt[c^2*d^2 - e^2])
```

Rubi [A] (verified)

Time = 4.55 (sec) , antiderivative size = 888, normalized size of antiderivative = 0.98, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.114$, Rules used = {5256, 27, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2\left(2dhx+ef+ehx^2\right)^2}{(d+ex)^2}dx$$

$$\Big\downarrow \text{5256}$$

$$-2bc\int \frac{\left(h^2(d+ex)^3+6eh\left(e^2f-d^2h\right)x-\frac{3\left(e^2f-d^2h\right)^2}{d+ex}\right)(a+b\arcsin(cx))}{3e^3\sqrt{1-c^2x^2}}dx+\frac{2hx\left(e^2f-d^2h\right)(a+b\arcsin(cx))^2}{e^2}-\frac{\left(e^2f-d^2h\right)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}+\frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3}$$

$$\Big\downarrow \text{27}$$

$$-\frac{2bc\int\frac{\left(h^2(d+ex)^3+6eh(e^2f-d^2h)x-\frac{3\left(e^2f-d^2h\right)^2}{d+ex}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{3e^3}+$$
$$\frac{2hx\left(e^2f-d^2h\right)(a+b\arcsin(cx))^2}{e^2}-\frac{\left(e^2f-d^2h\right)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}+$$
$$\frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3}$$

$$\Big\downarrow \text{5298}$$

$$-\frac{2bc\int\left(\frac{b\arcsin(cx)\left(-2h^2d^4+6e^2fhd^2+4e^3h^2x^3d+2eh\left(3e^2f-d^2h\right)xd+e^4h^2x^4-3e^4f^2+6e^4fhx^2\right)}{(d+ex)\sqrt{1-c^2x^2}}+\frac{a\left(-2h^2d^4+6e^2fhd^2+4e^3h^2x^3d+2eh\right.}{(d+e}\right.}{3e^3}$$
$$\frac{2hx\left(e^2f-d^2h\right)(a+b\arcsin(cx))^2}{e^2}-\frac{\left(e^2f-d^2h\right)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}+$$
$$\frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3}$$

$$\Big\downarrow \text{2009}$$

$$\frac{h^2(a+b\arcsin(cx))^2(d+ex)^3}{3e^3}+\frac{2h\left(e^2f-d^2h\right)x(a+b\arcsin(cx))^2}{e^2}-$$
$$\frac{2bc\left(\frac{bh^2\arcsin(cx)^2d^3}{2c}+\frac{3be^2h^2x^2d}{4c}+\frac{3be^2h^2\arcsin(cx)^2d}{4c^3}+\frac{a\left(2c^2d^2+3e^2\right)h^2\arcsin(cx)d}{2c^3}-\frac{3be^2h^2x\sqrt{1-c^2x^2}\arcsin(cx)d}{2c^2}-\frac{5aeh^2(d\right.}{}}{}$$
$$\frac{\left(e^2f-d^2h\right)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}$$

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

output
```
(2*h*(e^2*f - d^2*h)*x*(a + b*ArcSin[c*x])^2)/e^2 - ((e^2*f - d^2*h)^2*(a
+ b*ArcSin[c*x])^2)/(e^3*(d + e*x)) + (h^2*(d + e*x)^3*(a + b*ArcSin[c*x])
^2)/(3*e^3) - (2*b*c*((2*b*e^3*h^2*x)/(3*c^3) + (3*b*e*h*(2*e^2*f - d^2*h)
*x)/c + (3*b*d*e^2*h^2*x^2)/(4*c) + (b*e^3*h^2*x^3)/(9*c) - (a*e*h*(4*e^2*
h + c^2*(36*e^2*f - 25*d^2*h))*Sqrt[1 - c^2*x^2])/(6*c^4) - (5*a*d*e*h^2*(
d + e*x)*Sqrt[1 - c^2*x^2])/(6*c^2) - (a*e*h^2*(d + e*x)^2*Sqrt[1 - c^2*x^
2])/(3*c^2) + (a*d*(2*c^2*d^2 + 3*e^2)*h^2*ArcSin[c*x])/(2*c^3) - (2*b*e^3
*h^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^4) - (3*b*e*h*(2*e^2*f - d^2*h)*S
qrt[1 - c^2*x^2]*ArcSin[c*x])/c^2 - (3*b*d*e^2*h^2*x*Sqrt[1 - c^2*x^2]*Arc
Sin[c*x])/(2*c^2) - (b*e^3*h^2*x^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^2)
+ (b*d^3*h^2*ArcSin[c*x]^2)/(2*c) + (3*b*d*e^2*h^2*ArcSin[c*x]^2)/(4*c^3)
- (3*a*(e^2*f - d^2*h)^2*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1
- c^2*x^2])])/Sqrt[c^2*d^2 - e^2] + ((3*I)*b*(e^2*f - d^2*h)^2*ArcSin[c*x]
*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/Sqrt[c^2*d^
2 - e^2] - ((3*I)*b*(e^2*f - d^2*h)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin
[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/Sqrt[c^2*d^2 - e^2] + (3*b*(e^2*f -
d^2*h)^2*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/
Sqrt[c^2*d^2 - e^2] - (3*b*(e^2*f - d^2*h)^2*PolyLog[2, (I*e*E^(I*ArcSin[c
*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/Sqrt[c^2*d^2 - e^2]))/(3*e^3)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5256
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c
*n   Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[
p, 0] && EqQ[e*g - 2*d*h, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2191 vs. $2(875) = 1750$.

Time = 1.98 (sec) , antiderivative size = 2192, normalized size of antiderivative = 2.42

method	result	size
parts	Expression too large to display	2192
derivativedivides	Expression too large to display	2208
default	Expression too large to display	2208

input
```
int((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x,method=_RETURN
VERBOSE)
```

output
```
a^2*(h/e^2*(1/3*e^2*h*x^3+d*e*h*x^2-d^2*h*x+2*e^2*f*x)-(d^4*h^2-2*d^2*e^2*
f*h+e^4*f^2)/e^3/(e*x+d))+b^2/c*(1/8/c*d*h^2*(2*I*arcsin(c*x)+2*arcsin(c*x
)^2-1)/e*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)-2*I*(-c^2*d^2+e^2)^(1/2)
/e^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2
)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*h^2*c^2*d^4+2*I*(-c^2*d^2+e^2)^(1/2
)/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(
1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*f^2*c^2*e+1/8*(2*I*(-c^2*x^2+1)^(1/2)*
c*x+2*c^2*x^2-1)*d*h^2*(-2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/e-(d^4*h^2-2
*d^2*e^2*f*h+e^4*f^2)*arcsin(c*x)^2*c^2/e^3/(c*e*x+c*d)-2*(-c^2*d^2+e^2)^(
1/2)/e^3/(c^2*d^2-e^2)*c^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2)
)*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^4*h^2+4*(-c^2*d^
2+e^2)^(1/2)/e/(c^2*d^2-e^2)*c^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)
^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2*f*h-2*(-
c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*e*c^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*
x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*f^2+2*
(-c^2*d^2+e^2)^(1/2)/e^3/(c^2*d^2-e^2)*c^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-
c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^
4*h^2-4*(-c^2*d^2+e^2)^(1/2)/e/(c^2*d^2-e^2)*c^2*arcsin(c*x)*ln((I*d*c+(I*
c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2
)))*d^2*f*h+2*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*e*c^2*arcsin(c*x)*ln((...
```

Fricas [F]

$$\int \frac{(ef+2dhx+ehx^2)^2(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \int \frac{{\left(ehx^2+2\,dhx+ef\right)}^2{\left(b\arcsin\left(cx\right)+a\right)}^2}{{\left(ex+d\right)}^2}\,dx$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorit
hm="fricas")
```

output
```
integral((a^2*e^2*h^2*x^4 + 4*a^2*d*e*h^2*x^3 + 4*a^2*d*e*f*h*x + a^2*e^2*
f^2 + 2*(a^2*e^2*f*h + 2*a^2*d^2*h^2)*x^2 + (b^2*e^2*h^2*x^4 + 4*b^2*d*e*h
^2*x^3 + 4*b^2*d*e*f*h*x + b^2*e^2*f^2 + 2*(b^2*e^2*f*h + 2*b^2*d^2*h^2)*x
^2)*arcsin(c*x)^2 + 2*(a*b*e^2*h^2*x^4 + 4*a*b*d*e*h^2*x^3 + 4*a*b*d*e*f*h
*x + a*b*e^2*f^2 + 2*(a*b*e^2*f*h + 2*a*b*d^2*h^2)*x^2)*arcsin(c*x))/(e^2*
x^2 + 2*d*e*x + d^2), x)
```

Sympy [F]

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b \arcsin(cx))^2}{(d + ex)^2} dx$$
$$= \int \frac{(a + b \operatorname{asin}(cx))^2 (2dhx + ef + ehx^2)^2}{(d + ex)^2} dx$$

input
```
integrate((e*h*x**2+2*d*h*x+e*f)**2*(a+b*asin(c*x))**2/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))**2*(2*d*h*x + e*f + e*h*x**2)**2/(d + e*x)**2,
x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b \arcsin(cx))^2}{(d + ex)^2} dx = \text{Exception raised: ValueError}$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorit
hm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

Giac [F(-2)]

Exception generated.

$$\int \frac{\left(ef + 2dhx + ehx^2\right)^2 (a + b\arcsin(cx))^2}{(d + ex)^2}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorit
hm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

Mupad [F(-1)]

Timed out.

$$\int \frac{\left(ef + 2dhx + ehx^2\right)^2 (a + b\arcsin(cx))^2}{(d + ex)^2}\,dx$$
$$= \int \frac{\left(a + b\,\mathrm{asin}(c\,x)\right)^2 \left(e\,h\,x^2 + 2\,d\,h\,x + e\,f\right)^2}{\left(d + e\,x\right)^2}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x)^2)/(d + e*x)^2,x)
```

output
```
int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x)^2)/(d + e*x)^2, x)
```

Reduce [F]

$$\int \frac{\left(ef + 2dhx + ehx^2\right)^2 (a + b\arcsin(cx))^2}{(d + ex)^2}\,dx$$
$$= \int \frac{\left(eh\,x^2 + 2dhx + ef\right)^2 \left(asin(cx)\,b + a\right)^2}{\left(ex + d\right)^2}dx$$

input
```
int((e*h*x^2+2*d*h*x+e*f)^2*(a+b*asin(c*x))^2/(e*x+d)^2,x)
```

output
```
int((e*h*x^2+2*d*h*x+e*f)^2*(a+b*asin(c*x))^2/(e*x+d)^2,x)
```

CHAPTER 4

Appendix

4.1 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* Nasser: April 7,2022. add second output which gives reason for the grade *)
(*                       Small rewrite of logic in main function to make it*)
(*                       match Maple's logic. No change in functionality otherwise*)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)
```

```
(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*          GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] := Module[{expnResult,expnOptimal,leafCountResult,leaf
    expnResult  = ExpnType[result];
    expnOptimal = ExpnType[optimal];
    leafCountResult = LeafCount[result];
    leafCountOptimal = LeafCount[optimal];

    (*Print["expnResult=",expnResult," expnOptimal=",expnOptimal];*)
    If[expnResult<=expnOptimal,
        If[Not[FreeQ[result,Complex]], (*result contains complex*)
            If[Not[FreeQ[optimal,Complex]], (*optimal contains complex*)
                If[leafCountResult<=2*leafCountOptimal,
                    finalresult={"A",""}
                    ,(*ELSE*)
                    finalresult={"B","Both result and optimal contain complex but leaf count
                ]
            ,(*ELSE*)
                finalresult={"C","Result contains complex when optimal does not."}
            ]
        ,(*ELSE*)(*result does not contains complex*)
            If[leafCountResult<=2*leafCountOptimal,
               finalresult={"A",""}
            ,(*ELSE*)
               finalresult={"B","Leaf count is larger than twice the leaf count of optimal.
              ]
        ]
    ,(*ELSE*) (*expnResult>expnOptimal*)
        If[FreeQ[result,Integrate] && FreeQ[result,Int],
            finalresult={"C","Result contains higher order function than in optimal. Order "
            ,
```

```
            finalresult={"F","Contains unresolved integral."}
        ]
    ];

    finalresult
]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
```

```
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
#Nasser 4/07/2022   add second output which gives reason for the grade

GradeAntiderivative := proc(result,optimal)
local leaf_count_result,
        leaf_count_optimal,
        ExpnType_result,
        ExpnType_optimal,
        debug:=false;

        leaf_count_result:=leafcount(result);
        #do NOT call ExpnType() if leaf size is too large. Recursion problem
        if leaf_count_result > 500000 then
            return "B","result has leaf size over 500,000. Avoiding possible recursion issue
        fi;

        leaf_count_optimal := leafcount(optimal);
        ExpnType_result  := ExpnType(result);
        ExpnType_optimal := ExpnType(optimal);

        if debug then
            print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
        fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
```

```
#       antiderivative
#   "A" if result can be considered optimal

    #This check below actually is not needed, since I only
    #call this grading only for passed integrals. i.e. I check
    #for "F" before calling this. But no harm of keeping it here.
    #just in case.


    if not type(result,freeof('int')) then
        return "F","Result contains unresolved integral";
    fi;


    if ExpnType_result<=ExpnType_optimal then
        if debug then
             print("ExpnType_result<=ExpnType_optimal");
        fi;
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                if debug then
                        print("both result and optimal complex");
                fi;
                if leaf_count_result<=2*leaf_count_optimal then
                     return "A"," ";
                else
                   return "B",cat("Both result and optimal contain complex but leaf count of
                                   convert(leaf_count_result,string)," vs. $2 (",
                                   convert(leaf_count_optimal,string)," ) = ",convert(2*leaf
                end if
            else #result contains complex but optimal is not
                if debug then
                        print("result contains complex but optimal is not");
                fi;
                return "C","Result contains complex when optimal does not.";
            fi;
        else # result do not contain complex
             # this assumes optimal do not as well. No check is needed here.
            if debug then
                   print("result do not contain complex, this assumes optimal do not as well
            fi;
```

```
            if leaf_count_result<=2*leaf_count_optimal then
                if debug then
                    print("leaf_count_result<=2*leaf_count_optimal");
                fi;
                return "A"," ";
            else
                if debug then
                    print("leaf_count_result>2*leaf_count_optimal");
                fi;
                return "B",cat("Leaf count of result is larger than twice the leaf count of
                                   convert(leaf_count_result,string),"$ vs. $2(",
                                   convert(leaf_count_optimal,string),")=",convert(2*leaf_co
            fi;
        fi;
    else #ExpnType(result) > ExpnType(optimal)
        if debug then
            print("ExpnType(result) > ExpnType(optimal)");
        fi;
        return "C",cat("Result contains higher order function than in optimal. Order ",
                       convert(ExpnType_result,string)," vs. order ",
                       convert(ExpnType_optimal,string),".");
    fi;

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
```

```
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
```

```
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
```

```
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
   #sympy do not have leaf count function. This is approximation
   return round(1.7*count_ops(expr))

def is_sqrt(expr):
   if isinstance(expr,Pow):
      if expr.args[1] == Rational(1,2):
         return True
      else:
         return False
   else:
      return False

def is_elementary_function(func):
   return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
         asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
         asinh,acosh,atanh,acoth,asech,acsch
      ]

def is_special_function(func):
   return func in [ erf,erfc,erfi,
          fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
          gamma,loggamma,digamma,zeta,polylog,LambertW,
          elliptic_f,elliptic_e,elliptic_pi,exp_polar
       ]
```

```
def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]

def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
            return True
        else:
            return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),Expr
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
```

```
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)  #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)  #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)  #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)  #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    #print ("Enter grade_antiderivative for sagemath")
    #print("Enter grade_antiderivative, result=",result," optimal=",optimal)

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    #print("leaf_count_result=",leaf_count_result)
    #print("leaf_count_optimal=",leaf_count_optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        grade = "F"
        grade_annotation =""
```

```
    else:
        if expnType_result <= expnType_optimal:
            if result.has(I):
                if optimal.has(I): #both result and optimal complex
                    if leaf_count_result <= 2*leaf_count_optimal:
                        grade = "A"
                        grade_annotation =""
                    else:
                        grade = "B"
                        grade_annotation ="Both result and optimal contain complex but leaf count of result is lar
                else: #result contains complex but optimal is not
                    grade = "C"
                    grade_annotation ="Result contains complex when optimal does not."
            else: # result do not contain complex, this assumes optimal do not as well
                if leaf_count_result <= 2*leaf_count_optimal:
                    grade = "A"
                    grade_annotation =""
                else:
                    grade = "B"
                    grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(
        else:
            grade = "C"
            grade_annotation ="Result contains higher order function than in optimal. Order "+str(ExpnType(


    #print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

    return grade, grade_annotation
```

SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#            Albert Rich to use with Sagemath. This is used to
#            grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#            'arctan2','floor','abs','log_integral'
#June 4, 2022  Made default grade_annotation "none" instead of "" due
#            issue later when reading the file.
#July 14, 2022. Added ellipticF. This is until they fix sagemath, then remove it.
```

```
from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    #print("Enter tree_size, expr is ",expr)

    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    #debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
```

```
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    #debug=False
    if debug:
        print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi','zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e','ellipticF',
           'elliptic_pi','exp_integral_e','log_integral',
           'weierstrassPInverse','weierstrass','weierstrassP','weierstrassZeta',
           'weierstrassPPrime','weierstrassSigma']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']    #[appellf1] can't find this in sagemath

def is_atom(expn):

    #debug=False
```

```
    if debug:
        print ("Enter is_atom, expn=",expn)

    if not hasattr(expn, 'parent'):
        return False


    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic
    try:
        if expn.parent() is SR:
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
            return expn in expn.parent().base_ring() or expn in expn.parent().gens()

        return False

    except AttributeError as error:
        print("Exception,AttributeError in  is_atom")
        print ("cought exception" , type(error).__name__ )
        return False


def expnType(expn):

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:   #isinstance(expn.args[1],Integer)
```

```
        return expnType(expn.operands()[0])    #expnType(expn.args[0])
    elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],Rational)
        if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],Rational)
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
    else:
        return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expr
  elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isins
    m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
    m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
    return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
    return max(3,expnType(expn.operands()[0]))
  elif is_special_function(expn.operator()): #is_special_function(expn.func)
    m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
    return max(4,m1)   #max(4,m1)
  elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
    m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
    return max(5,m1)   #max(5,m1)
  elif is_appell_function(expn.operator()):
    m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
    return max(6,m1)   #max(6,m1)
  elif str(expn).find("Integral") != -1: #this will never happen, since it
        #is checked before calling the grading function that is passed.
        #but kept it here.
    m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
    return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
  else:
    return 9

#main function
def grade_antiderivative(result,optimal):


  if debug:
    print ("Enter grade_antiderivative for sagemath")
    print("Enter grade_antiderivative, result=",result)
    print("Enter grade_antiderivative, optimal=",optimal)
    print("type(anti)=",type(result))
    print("type(optimal)=",type(optimal))
```

```
leaf_count_result  = tree_size(result) #leaf_count(result)
leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

#if debug: print ("leaf_count_result=", leaf_count_result, "leaf_count_optimal=",leaf_count_optimal)


expnType_result  = expnType(result)
expnType_optimal = expnType(optimal)

if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",expnType_optimal)

if expnType_result <= expnType_optimal:
    if result.has(I):
        if optimal.has(I): #both result and optimal complex
            if leaf_count_result <= 2*leaf_count_optimal:
                grade = "A"
                grade_annotation ="none"
            else:
                grade = "B"
                grade_annotation ="Both result and optimal contain complex but leaf count of result is larger
        else: #result contains complex but optimal is not
            grade = "C"
            grade_annotation ="Result contains complex when optimal does not."
    else: # result do not contain complex, this assumes optimal do not as well
        if leaf_count_result <= 2*leaf_count_optimal:
            grade = "A"
            grade_annotation ="none"
        else:
            grade = "B"
            grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(lea
else:
    grade = "C"
    grade_annotation ="Result contains higher order function than in optimal. Order "+str(expnType_re


print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

return grade, grade_annotation
```

4.2 Links to plain text integration problems used in this report for each CAS

1. Mathematica integration problems as .m file
2. Maple integration problems as .txt file
3. Sagemath integration problems as .sage file
4. Reduce integration problems as .txt file
5. Mupad integration problems as .txt file
6. Sympy integration problems as .py file