# Computer Algebra
# Independent Integration Tests

Summer 2023 edition with Rubi V 4.17.3

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

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December 9, 2023 Compiled on December 9, 2023 at 5:53am

# Contents

# CHAPTER 1

# Introduction

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

## 1.1 Listing of CAS systems tested

The following are the CAS systems tested:

1. Mathematica 13.3.1 (August 16, 2023) on windows 10.
2. Rubi 4.17.3 (Sept 25, 2023) on Mathematica 13.3.1 on windows 10
3. Maple 2023.1 (July, 12, 2023) on windows 10.
4. Maxima 5.47 (June 1, 2023) using Lisp SBCL 2.3.0 on Linux via sagemath 10.1 (Aug 20, 2023).
5. FriCAS 1.3.9 (July 8, 2023) based on sbcl 2.3.0 on Linux via sagemath 10.1 (Aug 20, 2023).
6. Giac/Xcas 1.9.0-57 (June 26, 2023) on Linux via sagemath 10.1 (Aug 20, 2023).
7. Sympy 1.12 (May 10, 2023) Using Python 3.11.3 on Linux.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 on windows 10.

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

Sympy was run directly in Python not via sagemath.

## 1.2 Results

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

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

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

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

| System | % solved | % Failed |
|---|---|---|
| Rubi | 99.37 ( 471 ) | 0.63 ( 3 ) |
| Mathematica | 98.31 ( 466 ) | 1.69 ( 8 ) |
| Maple | 79.75 ( 378 ) | 20.25 ( 96 ) |
| Giac | 53.16 ( 252 ) | 46.84 ( 222 ) |
| Fricas | 43.46 ( 206 ) | 56.54 ( 268 ) |
| Sympy | 33.97 ( 161 ) | 66.03 ( 313 ) |
| Maxima | 24.26 ( 115 ) | 75.74 ( 359 ) |
| Mupad | 18.78 ( 89 ) | 81.22 ( 385 ) |

Table 1.1: Percentage solved for each CAS

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

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

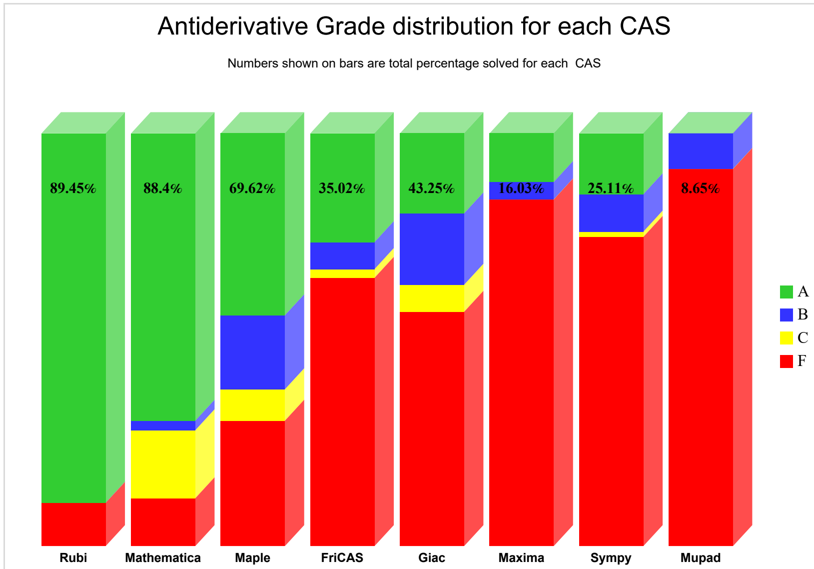
Table 1.2: Description of grading applied to integration result

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

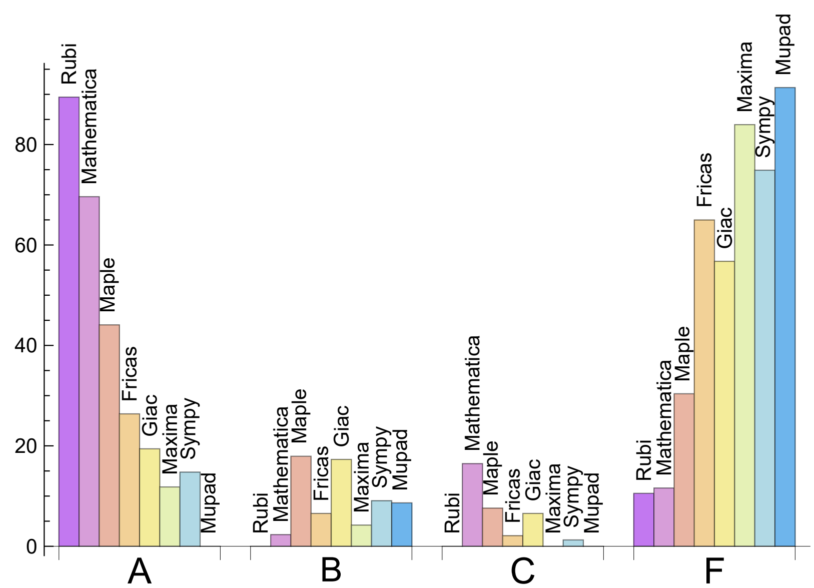
| System | % A grade | % B grade | % C grade | % F grade |
|---|---|---|---|---|
| Rubi | 89.241 | 0.000 | 0.000 | 10.759 |
| Mathematica | 69.620 | 2.321 | 16.456 | 11.603 |
| Maple | 44.093 | 17.932 | 7.595 | 30.380 |
| Fricas | 26.371 | 6.540 | 2.110 | 64.979 |
| Giac | 19.409 | 17.300 | 6.540 | 56.751 |
| Sympy | 14.768 | 9.072 | 1.266 | 74.895 |
| Maxima | 11.814 | 4.219 | 0.000 | 83.966 |
| Mupad | 0.000 | 8.650 | 0.000 | 91.350 |

Table 1.3: Antiderivative Grade distribution of each CAS

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




The figure below compares the grades of the CAS systems.




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

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

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

| System | Number failed | Percentage normal failure | Percentage time-out failure | Percentage exception failure |
|---|---|---|---|---|
| Rubi | 3 | 100.00 | 0.00 | 0.00 |
| Mathematica | 8 | 87.50 | 12.50 | 0.00 |
| Maple | 96 | 100.00 | 0.00 | 0.00 |
| Giac | 222 | 76.58 | 0.45 | 22.97 |
| Fricas | 268 | 69.78 | 0.37 | 29.85 |
| Sympy | 313 | 87.22 | 9.58 | 3.19 |
| Maxima | 359 | 72.98 | 3.06 | 23.96 |
| Mupad | 385 | 0.00 | 100.00 | 0.00 |

Table 1.4: Failure statistics for each CAS

## 1.3 Time and leaf size Performance

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

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

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

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

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

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

| System | Mean time (sec) |
|---|---|
| Mupad | 0.38 |
| Giac | 0.70 |
| Rubi | 0.71 |
| Maple | 1.13 |
| Mathematica | 1.81 |
| Fricas | 3.06 |
| Maxima | 3.09 |
| Sympy | 5.43 |

Table 1.5: Time performance for each CAS

| System | Mean size | Normalized mean | Median size | Normalized median |
|---|---|---|---|---|
| Mupad | 40.96 | 1.12 | 25.00 | 1.00 |
| Maxima | 165.24 | 3.17 | 61.00 | 1.12 |
| Mathematica | 217.32 | 1.02 | 134.00 | 0.95 |
| Rubi | 219.50 | 0.96 | 143.00 | 1.00 |
| Fricas | 242.01 | 1.70 | 81.50 | 1.19 |
| Sympy | 277.27 | 1.92 | 76.00 | 1.33 |
| Giac | 497.48 | 2.52 | 151.00 | 1.41 |
| Maple | 612.02 | 1.79 | 203.00 | 1.37 |

Table 1.6: Leaf size performance for each CAS

# 1.4 Performance based on number of rules Rubi used

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

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

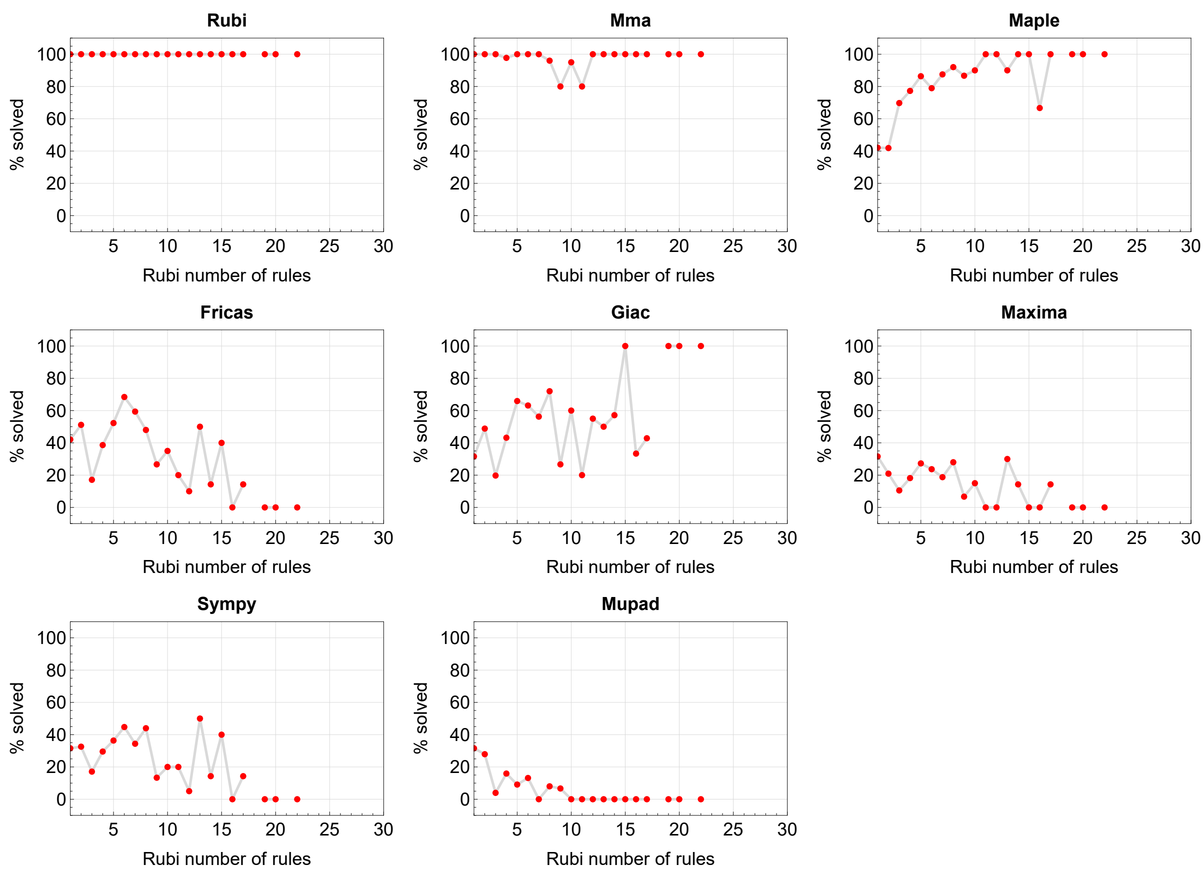



Figure 1.1: Solving statistics per number of Rubi rules used

## 1.5 Performance based on number of steps Rubi used

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

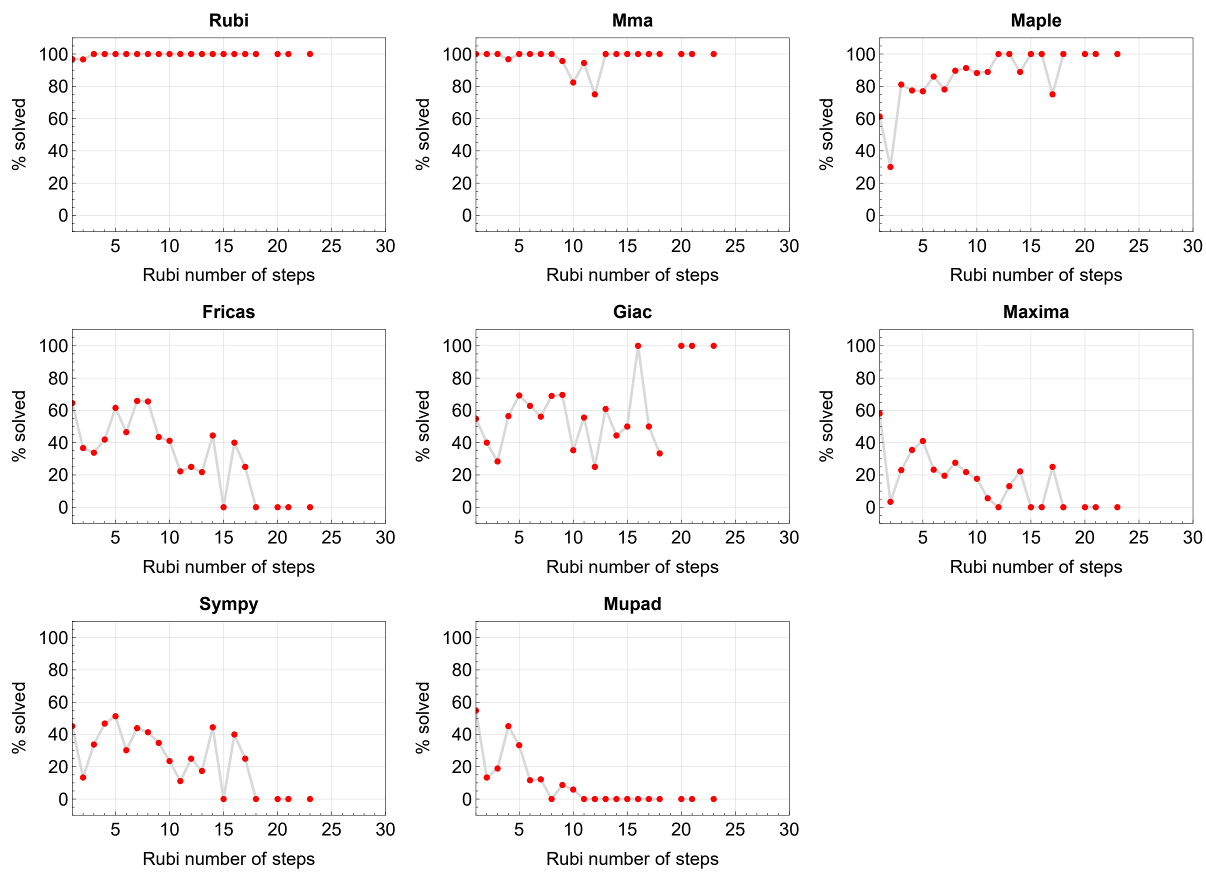



Figure 1.2: Solving statistics per number of Rubi steps used

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

## 1.6 Solved integrals histogram based on leaf size of result

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

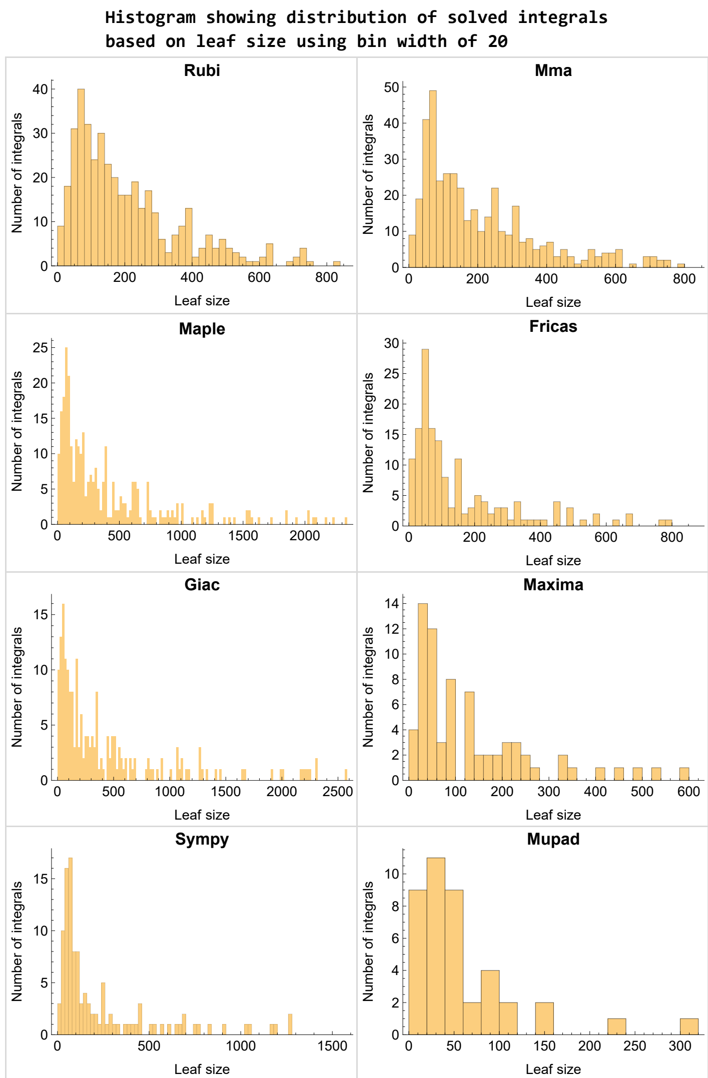



Figure 1.3: Solved integrals based on leaf size distribution

## 1.7 Solved integrals histogram based on CPU time used

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

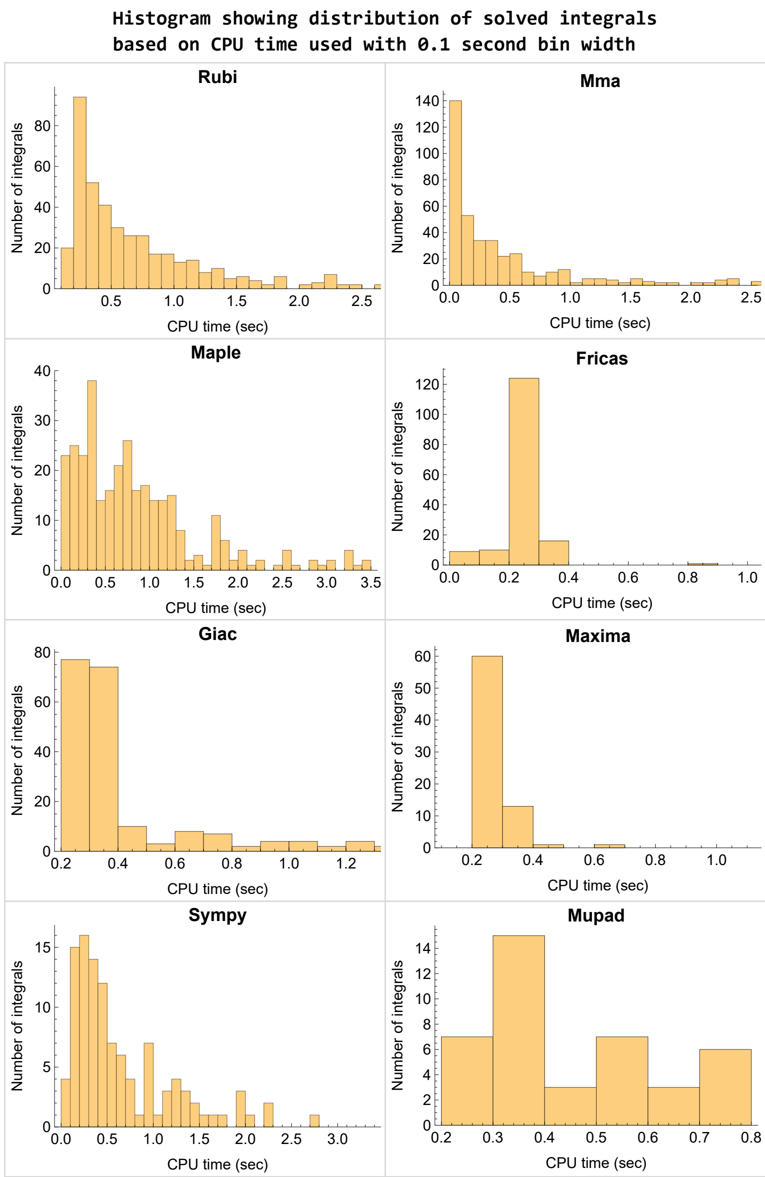



Figure 1.4: Solved integrals histogram based on CPU time used

## 1.8 Leaf size vs. CPU time used

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

The result for Fricas, Maxima and Giac is shifted more to the right than the other CAS system due to the use of sagemath to call them, which causes an initial slight delay in the timing to start the integration due to overhead of starting a new process each time.

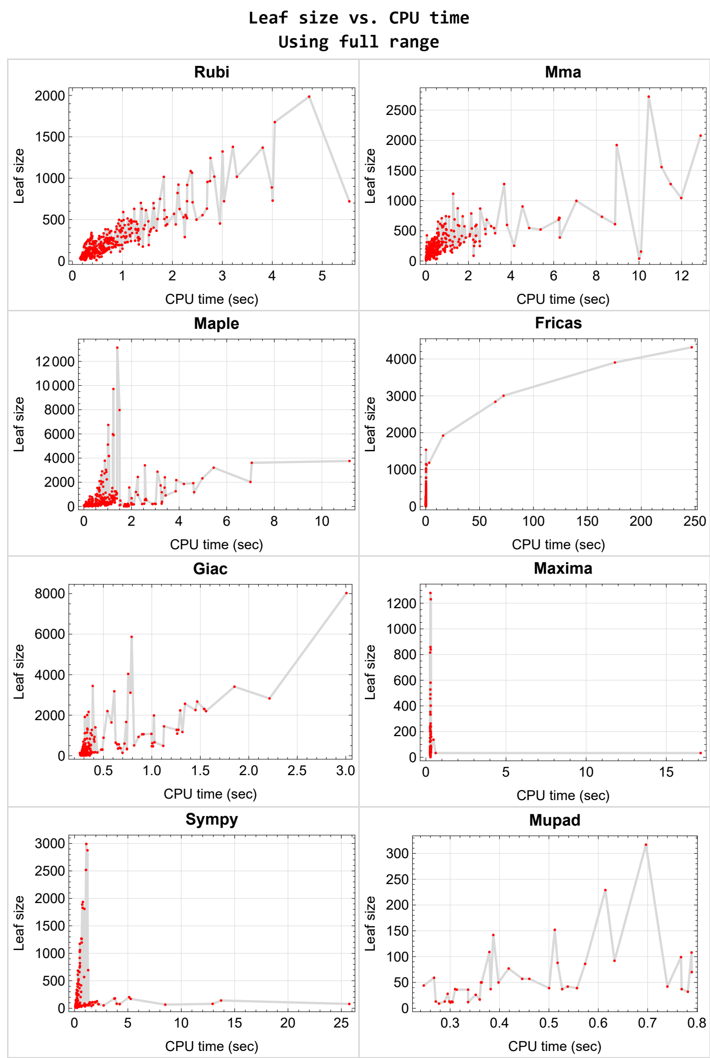



Figure 1.5: Leaf size vs. CPU time. Full range

## 1.9 list of integrals with no known antiderivative

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

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

**Rubi** {}

**Mathematica** {}

**Maple** {}

**Maxima** {}

**Fricas** {}

**Sympy** {}

**Giac** {}

**Mupad** {}

## 1.11 list of integrals solved by CAS but failed verification

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

**Rubi** {137, 139, 177, 179, 183, 185, 187, 194, 196, 197, 199, 203, 205, 211, 213, 333, 334, 399, 400, 438, 469}

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

**Maple** {35}

**Maxima** Verification phase not currently implemented.

**Fricas** Verification phase not currently implemented.

**Sympy** Verification phase not currently implemented.

**Giac** Verification phase not currently implemented.

**Mupad** Verification phase not currently implemented.

## 1.12 Timing

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

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

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

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

## 1.13 Verification

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

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

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

# 1.14 Important notes about some of the results

## 1.14.1 Important note about Maxima results

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

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

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

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

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

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

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

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

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

### 1.14.2 Important note about FriCAS result

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

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

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

### 1.14.3 Important note about finding leaf size of antiderivative

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

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

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

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

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

  except Exception as ee:
        leafCount =1
```

### 1.14.4 Important note about Mupad results

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

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

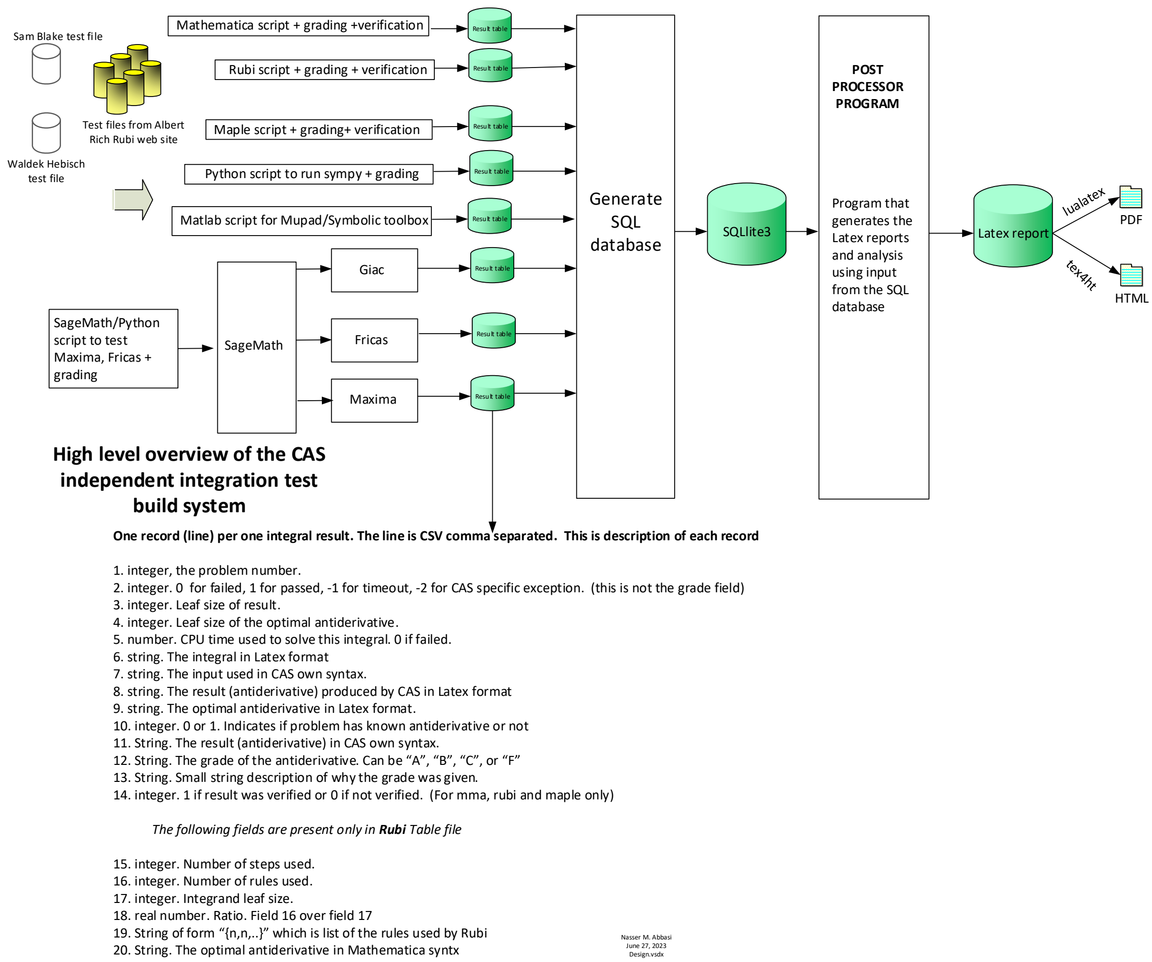
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

## 1.15 Design of the test system

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



# CHAPTER 2

## DETAILED SUMMARY TABLES OF RESULTS

## 2.1 List of integrals sorted by grade for each CAS



### 2.1.1 Rubi

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

**B grade** { }

**C grade** { }

**F normal fail** { 255, 470, 474 }

**F(-1) timedout fail** { }

**F(-2) exception fail** { }

### 2.1.2 Mma

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

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

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

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

**F(-1) timedout fail** { 300 }

**F(-2) exception fail** { }

### 2.1.3 Maple

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

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

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

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

**F(-1) timedout fail** { }

**F(-2) exception fail** { }

### 2.1.4 Fricas

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

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

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

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

**F(-1) timedout fail** { 105 }

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

### 2.1.5 Maxima

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

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

**C grade** { }

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

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

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

### 2.1.6 Giac

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

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

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

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

**F(-1) timedout fail** { 172 }

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

### 2.1.7 Mupad

**A grade** { }

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

**C grade** { }

**F normal fail** { }

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

**F(-2) exception fail** { }

### 2.1.8 Sympy

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

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

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

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

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

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

## 2.2 Detailed conclusion table per each integral for all CAS systems

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

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

| Problem 1 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 179 | 206 | 165 | 248 | 231 | 201 | 316 | 317 | 0 |
| N.S. | 1 | 1.15 | 0.92 | 1.39 | 1.29 | 1.12 | 1.77 | 1.77 | 0.00 |
| time (sec) | N/A | 0.369 | 0.108 | 0.220 | 0.266 | 0.258 | 0.310 | 0.295 | 0.000 |

| Problem 2 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 124 | 151 | 121 | 178 | 150 | 135 | 190 | 194 | 0 |
| N.S. | 1 | 1.22 | 0.98 | 1.44 | 1.21 | 1.09 | 1.53 | 1.56 | 0.00 |
| time (sec) | N/A | 0.289 | 0.077 | 0.230 | 0.267 | 0.259 | 0.237 | 0.283 | 0.000 |

| Problem 3 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 98 | 106 | 92 | 86 | 81 | 76 | 99 | 98 | 77 |
| N.S. | 1 | 1.08 | 0.94 | 0.88 | 0.83 | 0.78 | 1.01 | 1.00 | 0.79 |
| time (sec) | N/A | 0.234 | 0.028 | 0.016 | 0.268 | 0.251 | 0.172 | 0.279 | 0.419 |

| Problem 4 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 30 | 30 | 30 | 30 | 29 | 31 | 26 | 29 | 28 |
| N.S. | 1 | 1.00 | 1.00 | 1.00 | 0.97 | 1.03 | 0.87 | 0.97 | 0.93 |
| time (sec) | N/A | 0.148 | 0.008 | 0.043 | 0.266 | 0.243 | 0.069 | 0.269 | 0.295 |

| Problem 5 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 229 | 229 | 214 | 758 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.93 | 3.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.654 | 0.133 | 1.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 6 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | B | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 85 | 85 | 83 | 187 | 0 | 371 | 0 | 200 | 0 |
| N.S. | 1 | 1.00 | 0.98 | 2.20 | 0.00 | 4.36 | 0.00 | 2.35 | 0.00 |
| time (sec) | N/A | 0.227 | 0.101 | 1.010 | 0.000 | 0.280 | 0.000 | 0.313 | 0.000 |

| Problem 7 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F(-2) | B | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 135 | 134 | 207 | 295 | 0 | 673 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 1.53 | 2.19 | 0.00 | 4.99 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.269 | 0.288 | 0.326 | 0.000 | 0.354 | 0.000 | 0.000 | 0.000 |

| Problem 8 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 191 | 208 | 241 | 554 | 0 | 1125 | 0 | 0 | 0 |
| N.S. | 1 | 1.09 | 1.26 | 2.90 | 0.00 | 5.89 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.339 | 0.361 | 0.211 | 0.000 | 0.860 | 0.000 | 0.000 | 0.000 |

| Problem 9 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 374 | 393 | 355 | 541 | 0 | 446 | 743 | 816 | 0 |
| N.S. | 1 | 1.05 | 0.95 | 1.45 | 0.00 | 1.19 | 1.99 | 2.18 | 0.00 |
| time (sec) | N/A | 0.966 | 0.351 | 0.568 | 0.000 | 0.275 | 0.478 | 0.308 | 0.000 |

| Problem 10 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 242 | 266 | 249 | 374 | 0 | 290 | 454 | 487 | 0 |
| N.S. | 1 | 1.10 | 1.03 | 1.55 | 0.00 | 1.20 | 1.88 | 2.01 | 0.00 |
| time (sec) | N/A | 0.719 | 0.239 | 0.316 | 0.000 | 0.273 | 0.320 | 0.308 | 0.000 |

| Problem 11 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 142 | 164 | 154 | 189 | 0 | 156 | 233 | 244 | 0 |
| N.S. | 1 | 1.15 | 1.08 | 1.33 | 0.00 | 1.10 | 1.64 | 1.72 | 0.00 |
| time (sec) | N/A | 0.531 | 0.695 | 0.197 | 0.000 | 0.243 | 0.246 | 0.284 | 0.000 |

| Problem 12 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 47 | 51 | 47 | 72 | 72 | 65 | 82 | 75 | 142 |
| N.S. | 1 | 1.09 | 1.00 | 1.53 | 1.53 | 1.38 | 1.74 | 1.60 | 3.02 |
| time (sec) | N/A | 0.249 | 0.030 | 0.000 | 0.275 | 0.254 | 0.102 | 0.273 | 0.387 |

| Problem 13 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 347 | 343 | 332 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 0.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.053 | 0.263 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 14 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 309 | 287 | 231 | 642 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.93 | 0.75 | 2.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.972 | 0.273 | 0.780 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 15 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 401 | 386 | 315 | 966 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.96 | 0.79 | 2.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.283 | 0.826 | 1.338 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 16 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 393 | 377 | 304 | 327 | 0 | 0 | 0 | 609 | 0 |
| N.S. | 1 | 0.96 | 0.77 | 0.83 | 0.00 | 0.00 | 0.00 | 1.55 | 0.00 |
| time (sec) | N/A | 1.249 | 0.606 | 0.214 | 0.000 | 0.000 | 0.000 | 0.316 | 0.000 |

| Problem 17 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 244 | 232 | 187 | 206 | 0 | 0 | 0 | 337 | 0 |
| N.S. | 1 | 0.95 | 0.77 | 0.84 | 0.00 | 0.00 | 0.00 | 1.38 | 0.00 |
| time (sec) | N/A | 0.866 | 0.402 | 0.204 | 0.000 | 0.000 | 0.000 | 0.313 | 0.000 |

| Problem 18 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 115 | 109 | 98 | 103 | 0 | 0 | 0 | 139 | 0 |
| N.S. | 1 | 0.95 | 0.85 | 0.90 | 0.00 | 0.00 | 0.00 | 1.21 | 0.00 |
| time (sec) | N/A | 0.510 | 0.169 | 0.080 | 0.000 | 0.000 | 0.000 | 0.303 | 0.000 |

| Problem 19 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 53 | 48 | 44 | 48 | 0 | 0 | 0 | 49 | 0 |
| N.S. | 1 | 0.91 | 0.83 | 0.91 | 0.00 | 0.00 | 0.00 | 0.92 | 0.00 |
| time (sec) | N/A | 0.356 | 0.013 | 0.011 | 0.000 | 0.000 | 0.000 | 0.297 | 0.000 |

| Problem 20 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 18 | 18 | 20 | 18 | 20 | 25 | 15 | 20 | 20 |
| N.S. | 1 | 1.00 | 1.11 | 1.00 | 1.11 | 1.39 | 0.83 | 1.11 | 1.11 |
| time (sec) | N/A | 0.184 | 0.196 | 3.372 | 0.348 | 0.251 | 0.904 | 0.337 | 0.232 |

| Problem 21 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 18 | 18 | 20 | 18 | 20 | 49 | 17 | 20 | 20 |
| N.S. | 1 | 1.00 | 1.11 | 1.00 | 1.11 | 2.72 | 0.94 | 1.11 | 1.11 |
| time (sec) | N/A | 0.184 | 0.338 | 1.359 | 0.358 | 0.253 | 1.782 | 0.823 | 0.249 |

| Problem 22 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 362 | 362 | 290 | 526 | 0 | 0 | 0 | 1276 | 0 |
| N.S. | 1 | 1.00 | 0.80 | 1.45 | 0.00 | 0.00 | 0.00 | 3.52 | 0.00 |
| time (sec) | N/A | 0.784 | 1.634 | 0.355 | 0.000 | 0.000 | 0.000 | 0.381 | 0.000 |

| Problem 23 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 181 | 181 | 149 | 257 | 0 | 0 | 0 | 554 | 0 |
| N.S. | 1 | 1.00 | 0.82 | 1.42 | 0.00 | 0.00 | 0.00 | 3.06 | 0.00 |
| time (sec) | N/A | 0.487 | 0.893 | 0.154 | 0.000 | 0.000 | 0.000 | 0.359 | 0.000 |

| Problem 24 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 86 | 83 | 72 | 76 | 0 | 0 | 0 | 192 | 0 |
| N.S. | 1 | 0.97 | 0.84 | 0.88 | 0.00 | 0.00 | 0.00 | 2.23 | 0.00 |
| time (sec) | N/A | 0.546 | 0.179 | 0.014 | 0.000 | 0.000 | 0.000 | 0.311 | 0.000 |

| Problem 25 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 18 | 18 | 20 | 18 | 297 | 51 | 17 | 20 | 20 |
| N.S. | 1 | 1.00 | 1.11 | 1.00 | 16.50 | 2.83 | 0.94 | 1.11 | 1.11 |
| time (sec) | N/A | 0.182 | 10.233 | 5.662 | 1.603 | 0.245 | 1.668 | 0.398 | 0.237 |

| Problem 26 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 18 | 18 | 20 | 18 | 426 | 92 | 19 | 20 | 20 |
| N.S. | 1 | 1.00 | 1.11 | 1.00 | 23.67 | 5.11 | 1.06 | 1.11 | 1.11 |
| time (sec) | N/A | 0.184 | 12.804 | 1.961 | 2.601 | 0.249 | 6.159 | 0.965 | 0.224 |

| Problem 27 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 18 | 18 | 20 | 18 | 227 | 32 | 17 | 20 | 20 |
| N.S. | 1 | 1.00 | 1.11 | 1.00 | 12.61 | 1.78 | 0.94 | 1.11 | 1.11 |
| time (sec) | N/A | 0.416 | 11.395 | 0.236 | 1.682 | 0.264 | 14.916 | 0.420 | 0.386 |

| Problem 28 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | F | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 154 | 125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.279 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 29 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 18 | 18 | 20 | 18 | 20 | 20 | 15 | 20 | 20 |
| N.S. | 1 | 1.00 | 1.11 | 1.00 | 1.11 | 1.11 | 0.83 | 1.11 | 1.11 |
| time (sec) | N/A | 0.190 | 0.353 | 2.317 | 0.368 | 0.242 | 0.952 | 0.363 | 0.229 |

| Problem 30 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 18 | 18 | 20 | 18 | 237 | 34 | 17 | 20 | 20 |
| N.S. | 1 | 1.00 | 1.11 | 1.00 | 13.17 | 1.89 | 0.94 | 1.11 | 1.11 |
| time (sec) | N/A | 0.187 | 0.732 | 1.448 | 1.793 | 0.260 | 15.553 | 0.455 | 0.249 |

| Problem 31 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 669 | 371 | 356 | 1396 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.55 | 0.53 | 2.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.960 | 0.331 | 0.625 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 32 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 450 | 263 | 237 | 973 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.58 | 0.53 | 2.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.743 | 0.409 | 0.499 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 33 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 238 | 140 | 132 | 628 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.59 | 0.55 | 2.64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.481 | 0.178 | 0.499 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 34 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 736 | 517 | 368 | 823 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.70 | 0.50 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.214 | 0.746 | 0.647 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 35 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | No | TBD | TBD | TBD | TBD | TBD |
| size | 860 | 632 | 600 | 1352 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.73 | 0.70 | 1.57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.693 | 2.373 | 0.661 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 36 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 959 | 498 | 463 | 2074 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.52 | 0.48 | 2.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.180 | 0.831 | 0.721 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 37 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 680 | 367 | 332 | 1535 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.54 | 0.49 | 2.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.948 | 0.356 | 0.565 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 38 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 370 | 193 | 216 | 1014 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.52 | 0.58 | 2.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.547 | 0.219 | 0.557 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 39 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1073 | 709 | 507 | 1546 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.66 | 0.47 | 1.44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.337 | 1.192 | 0.643 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 40 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1281 | 630 | 587 | 2903 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.49 | 0.46 | 2.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.342 | 0.745 | 0.766 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 41 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 940 | 481 | 390 | 2090 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.51 | 0.41 | 2.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.092 | 0.523 | 0.657 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 42 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 517 | 256 | 251 | 1423 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.50 | 0.49 | 2.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.633 | 0.292 | 0.627 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 43 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1648 | 1019 | 787 | 2580 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.62 | 0.48 | 1.57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.854 | 2.131 | 0.734 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 44 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-2) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 450 | 262 | 343 | 856 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.58 | 0.76 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.791 | 1.139 | 0.546 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 45 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-2) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 270 | 162 | 266 | 505 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.60 | 0.99 | 1.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.624 | 0.661 | 0.497 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 46 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | A | F | F(-2) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 126 | 87 | 172 | 247 | 90 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.69 | 1.37 | 1.96 | 0.71 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.426 | 0.264 | 0.472 | 0.310 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 47 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 380 | 288 | 232 | 508 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.76 | 0.61 | 1.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.015 | 0.159 | 0.494 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 48 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 507 | 384 | 295 | 932 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.76 | 0.58 | 1.84 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.352 | 0.372 | 0.654 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 49 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 315 | 213 | 194 | 724 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.68 | 0.62 | 2.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.730 | 0.814 | 0.860 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 50 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 213 | 143 | 156 | 488 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.67 | 0.73 | 2.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.610 | 0.555 | 0.781 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 51 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 144 | 100 | 135 | 305 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.69 | 0.94 | 2.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.388 | 0.419 | 0.867 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 52 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 654 | 431 | 359 | 1094 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.66 | 0.55 | 1.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.402 | 1.564 | 1.388 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 53 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 528 | 452 | 868 | 6743 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.86 | 1.64 | 12.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.896 | 2.548 | 1.023 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 54 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 410 | 277 | 366 | 5114 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.68 | 0.89 | 12.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.661 | 0.946 | 1.009 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 55 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 271 | 192 | 285 | 3783 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.71 | 1.05 | 13.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.537 | 0.754 | 0.877 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 56 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 228 | 159 | 208 | 2237 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.70 | 0.91 | 9.81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.442 | 0.571 | 0.959 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 57 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | No | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1300 | 821 | 2078 | 7971 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.63 | 1.60 | 6.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.080 | 12.894 | 1.497 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 58 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1154 | 750 | 708 | 2728 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.65 | 0.61 | 2.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.740 | 0.744 | 0.865 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 59 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 737 | 477 | 441 | 1852 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.65 | 0.60 | 2.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.141 | 0.595 | 0.728 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 60 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 396 | 256 | 225 | 1236 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.65 | 0.57 | 3.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.695 | 0.176 | 0.646 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 61 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 1442 | 1018 | 516 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.71 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 3.193 | 0.967 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 62 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1685 | 1066 | 872 | 4176 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.63 | 0.52 | 2.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.413 | 1.495 | 1.046 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 63 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1108 | 699 | 616 | 3032 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.63 | 0.56 | 2.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.585 | 0.667 | 0.928 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 64 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 621 | 384 | 395 | 2021 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.62 | 0.64 | 3.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.875 | 0.418 | 0.799 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 65 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 1992 | 1369 | 740 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.69 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 3.772 | 1.730 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 66 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 2290 | 1379 | 1114 | 5977 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.60 | 0.49 | 2.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 3.236 | 1.282 | 1.215 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 67 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1533 | 922 | 742 | 4170 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.60 | 0.48 | 2.72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.150 | 0.940 | 1.055 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 68 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-1) | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 878 | 513 | 470 | 2852 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.58 | 0.54 | 3.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.121 | 0.594 | 0.941 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 69 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 2989 | 1986 | 1275 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.66 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 4.963 | 3.674 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 70 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-2) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 692 | 417 | 582 | 1636 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.60 | 0.84 | 2.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.865 | 1.565 | 0.810 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 71 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | F | F | F(-2) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 410 | 240 | 400 | 928 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.59 | 0.98 | 2.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.740 | 1.348 | 0.700 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 72 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | C | A | F | F(-2) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 171 | 128 | 118 | 460 | 184 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.75 | 0.69 | 2.69 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.557 | 0.677 | 0.639 | 0.313 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 73 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 589 | 402 | 357 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.68 | 0.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.596 | 0.294 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 74 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 1113 | 721 | 651 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.65 | 0.58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.998 | 0.573 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 75 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 738 | 447 | 325 | 1528 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.61 | 0.44 | 2.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.274 | 2.523 | 1.193 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 76 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 513 | 314 | 259 | 975 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.61 | 0.50 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.107 | 1.583 | 1.075 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 77 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 410 | 243 | 237 | 612 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.59 | 0.58 | 1.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.783 | 0.999 | 1.204 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 78 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | No | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 1137 | 722 | 597 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.64 | 0.53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.259 | 3.807 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 79 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1589 | 918 | 715 | 13140 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.58 | 0.45 | 8.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.341 | 6.256 | 1.402 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 80 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1025 | 614 | 711 | 9720 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.60 | 0.69 | 9.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.435 | 6.275 | 1.239 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 81 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 641 | 398 | 683 | 5894 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.62 | 1.07 | 9.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.941 | 6.232 | 1.248 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 82 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | F(-1) | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 35 | 35 | 37 | 33 | 35 | 47 | 0 | 35 | 35 |
| N.S. | 1 | 1.00 | 1.06 | 0.94 | 1.00 | 1.34 | 0.00 | 1.00 | 1.00 |
| time (sec) | N/A | 0.317 | 0.167 | 7.071 | 1.933 | 0.260 | 0.000 | 0.425 | 0.254 |

| Problem 83 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | F | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 634 | 628 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.081 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 84 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | F | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 514 | 506 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.655 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 85 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | No | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 390 | 386 | 2724 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 6.98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.260 | 10.459 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 86 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 237 | 238 | 246 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.704 | 0.034 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 87 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 35 | 35 | 37 | 33 | 35 | 57 | 34 | 35 | 35 |
| N.S. | 1 | 1.00 | 1.06 | 0.94 | 1.00 | 1.63 | 0.97 | 1.00 | 1.00 |
| time (sec) | N/A | 0.335 | 0.420 | 12.391 | 1.011 | 0.241 | 9.436 | 0.419 | 0.241 |

| Problem 88 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 351 | 379 | 305 | 445 | 528 | 441 | 770 | 784 | 0 |
| N.S. | 1 | 1.08 | 0.87 | 1.27 | 1.50 | 1.26 | 2.19 | 2.23 | 0.00 |
| time (sec) | N/A | 1.280 | 0.421 | 0.197 | 0.282 | 0.269 | 0.505 | 0.308 | 0.000 |

| Problem 89 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 248 | 275 | 211 | 304 | 353 | 295 | 502 | 491 | 0 |
| N.S. | 1 | 1.11 | 0.85 | 1.23 | 1.42 | 1.19 | 2.02 | 1.98 | 0.00 |
| time (sec) | N/A | 0.807 | 0.323 | 0.198 | 0.281 | 0.269 | 0.357 | 0.309 | 0.000 |

| Problem 90 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 148 | 168 | 138 | 178 | 199 | 161 | 267 | 259 | 0 |
| N.S. | 1 | 1.14 | 0.93 | 1.20 | 1.34 | 1.09 | 1.80 | 1.75 | 0.00 |
| time (sec) | N/A | 0.438 | 0.203 | 0.080 | 0.279 | 0.255 | 0.246 | 0.308 | 0.000 |

| Problem 91 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 344 | 345 | 322 | 1566 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.94 | 4.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.916 | 0.593 | 1.905 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 92 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 358 | 354 | 334 | 954 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 0.93 | 2.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.523 | 0.587 | 2.267 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 93 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | B | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 202 | 238 | 263 | 535 | 0 | 1184 | 0 | 0 | 0 |
| N.S. | 1 | 1.18 | 1.30 | 2.65 | 0.00 | 5.86 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.463 | 0.739 | 2.562 | 0.000 | 3.243 | 0.000 | 0.000 | 0.000 |

| Problem 94 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 257 | 271 | 321 | 908 | 0 | 1920 | 0 | 0 | 0 |
| N.S. | 1 | 1.05 | 1.25 | 3.53 | 0.00 | 7.47 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.531 | 0.757 | 3.434 | 0.000 | 16.148 | 0.000 | 0.000 | 0.000 |

| Problem 95 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 360 | 382 | 418 | 1550 | 0 | 2839 | 0 | 0 | 0 |
| N.S. | 1 | 1.06 | 1.16 | 4.31 | 0.00 | 7.89 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.686 | 1.069 | 3.389 | 0.000 | 64.657 | 0.000 | 0.000 | 0.000 |

| Problem 96 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 457 | 497 | 494 | 2406 | 0 | 3904 | 0 | 0 | 0 |
| N.S. | 1 | 1.09 | 1.08 | 5.26 | 0.00 | 8.54 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.906 | 1.314 | 3.401 | 0.000 | 175.625 | 0.000 | 0.000 | 0.000 |

| Problem 97 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 512 | 556 | 463 | 633 | 859 | 676 | 1263 | 1337 | 0 |
| N.S. | 1 | 1.09 | 0.90 | 1.24 | 1.68 | 1.32 | 2.47 | 2.61 | 0.00 |
| time (sec) | N/A | 2.235 | 0.527 | 0.366 | 0.287 | 0.288 | 0.670 | 0.335 | 0.000 |

| Problem 98 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 361 | 389 | 307 | 449 | 581 | 449 | 821 | 847 | 0 |
| N.S. | 1 | 1.08 | 0.85 | 1.24 | 1.61 | 1.24 | 2.27 | 2.35 | 0.00 |
| time (sec) | N/A | 1.362 | 0.519 | 0.375 | 0.291 | 0.275 | 0.506 | 0.331 | 0.000 |

| Problem 99 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 223 | 249 | 186 | 273 | 334 | 245 | 449 | 448 | 0 |
| N.S. | 1 | 1.12 | 0.83 | 1.22 | 1.50 | 1.10 | 2.01 | 2.01 | 0.00 |
| time (sec) | N/A | 0.735 | 0.298 | 0.315 | 0.292 | 0.262 | 0.341 | 0.295 | 0.000 |

| Problem 100 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 459 | 476 | 457 | 2438 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.04 | 1.00 | 5.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.169 | 0.929 | 2.265 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 101 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 460 | 457 | 432 | 1859 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 0.94 | 4.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.194 | 0.990 | 4.202 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 102 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | No | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 488 | 478 | 996 | 2027 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 2.04 | 4.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.503 | 7.064 | 6.997 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 103 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 349 | 357 | 442 | 1177 | 0 | 3003 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 1.27 | 3.37 | 0.00 | 8.60 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.753 | 2.069 | 4.631 | 0.000 | 72.257 | 0.000 | 0.000 | 0.000 |

| Problem 104 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | F | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 470 | 494 | 575 | 1924 | 0 | 4316 | 0 | 0 | 0 |
| N.S. | 1 | 1.05 | 1.22 | 4.09 | 0.00 | 9.18 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.002 | 3.062 | 4.595 | 0.000 | 246.845 | 0.000 | 0.000 | 0.000 |

| Problem 105 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F(-1) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 593 | 630 | 682 | 3208 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.06 | 1.15 | 5.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.246 | 2.856 | 5.453 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 106 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 684 | 729 | 619 | 836 | 1231 | 936 | 1809 | 2010 | 0 |
| N.S. | 1 | 1.07 | 0.90 | 1.22 | 1.80 | 1.37 | 2.64 | 2.94 | 0.00 |
| time (sec) | N/A | 3.813 | 0.919 | 0.250 | 0.307 | 0.314 | 0.928 | 0.333 | 0.000 |

| Problem 107 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 484 | 528 | 380 | 602 | 840 | 621 | 1197 | 1287 | 0 |
| N.S. | 1 | 1.09 | 0.79 | 1.24 | 1.74 | 1.28 | 2.47 | 2.66 | 0.00 |
| time (sec) | N/A | 2.225 | 0.913 | 0.251 | 0.302 | 0.294 | 0.676 | 0.337 | 0.000 |

| Problem 108 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 308 | 336 | 253 | 380 | 490 | 341 | 658 | 692 | 0 |
| N.S. | 1 | 1.09 | 0.82 | 1.23 | 1.59 | 1.11 | 2.14 | 2.25 | 0.00 |
| time (sec) | N/A | 1.191 | 0.471 | 0.088 | 0.285 | 0.285 | 0.465 | 0.294 | 0.000 |

| Problem 109 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 623 | 636 | 610 | 3401 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 0.98 | 5.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.571 | 0.872 | 2.562 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 110 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 617 | 613 | 593 | 2873 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 0.96 | 4.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.777 | 1.503 | 3.090 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 111 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | No | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1016 | 965 | 1556 | 3610 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.95 | 1.53 | 3.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.779 | 11.060 | 7.053 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 112 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F | F | F | F(-1) |
| verified | N/A | Yes | No | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1278 | 1244 | 1921 | 3757 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 1.50 | 2.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.858 | 8.955 | 11.160 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 113 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 935 | 955 | 574 | 2321 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 0.61 | 2.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.762 | 1.812 | 4.978 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 114 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 1678 | 1678 | 903 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 3.940 | 4.536 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 115 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 1016 | 1016 | 734 | 1734 | 0 | 1537 | 2992 | 3444 | 0 |
| N.S. | 1 | 1.00 | 0.72 | 1.71 | 0.00 | 1.51 | 2.94 | 3.39 | 0.00 |
| time (sec) | N/A | 1.791 | 1.089 | 3.223 | 0.000 | 0.327 | 1.105 | 0.390 | 0.000 |

| Problem 116 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 701 | 701 | 534 | 1194 | 0 | 1029 | 1935 | 2166 | 0 |
| N.S. | 1 | 1.00 | 0.76 | 1.70 | 0.00 | 1.47 | 2.76 | 3.09 | 0.00 |
| time (sec) | N/A | 1.374 | 0.551 | 2.186 | 0.000 | 0.315 | 0.781 | 0.348 | 0.000 |

| Problem 117 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 425 | 425 | 364 | 679 | 0 | 579 | 1059 | 1145 | 0 |
| N.S. | 1 | 1.00 | 0.86 | 1.60 | 0.00 | 1.36 | 2.49 | 2.69 | 0.00 |
| time (sec) | N/A | 0.916 | 0.357 | 2.003 | 0.000 | 0.290 | 0.511 | 0.331 | 0.000 |

| Problem 118 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 1067 | 1085 | 556 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.311 | 0.779 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 119 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 1323 | 1323 | 688 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.933 | 1.346 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 120 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 520 | 507 | 307 | 1251 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 0.59 | 2.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.859 | 0.517 | 3.857 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 121 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 920 | 888 | 526 | 2174 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 0.57 | 2.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 4.009 | 0.952 | 3.881 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 122 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 137 | 166 | 99 | 213 | 333 | 93 | 255 | 284 | 0 |
| N.S. | 1 | 1.21 | 0.72 | 1.55 | 2.43 | 0.68 | 1.86 | 2.07 | 0.00 |
| time (sec) | N/A | 0.341 | 0.101 | 0.068 | 0.284 | 0.258 | 0.328 | 0.299 | 0.000 |

| Problem 123 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 94 | 123 | 77 | 137 | 220 | 74 | 170 | 173 | 0 |
| N.S. | 1 | 1.31 | 0.82 | 1.46 | 2.34 | 0.79 | 1.81 | 1.84 | 0.00 |
| time (sec) | N/A | 0.297 | 0.073 | 0.045 | 0.272 | 0.253 | 0.238 | 0.292 | 0.000 |

| Problem 124 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 80 | 85 | 62 | 79 | 153 | 58 | 104 | 91 | 0 |
| N.S. | 1 | 1.06 | 0.78 | 0.99 | 1.91 | 0.72 | 1.30 | 1.14 | 0.00 |
| time (sec) | N/A | 0.258 | 0.058 | 0.053 | 0.274 | 0.261 | 0.184 | 0.289 | 0.000 |

| Problem 125 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 35 | 32 | 154 | 31 | 30 | 39 | 46 | 30 | 86 |
| N.S. | 1 | 0.91 | 4.40 | 0.89 | 0.86 | 1.11 | 1.31 | 0.86 | 2.46 |
| time (sec) | N/A | 0.186 | 0.359 | 0.040 | 0.264 | 0.265 | 0.087 | 0.274 | 0.573 |

| Problem 126 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 181 | 189 | 197 | 579 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.04 | 1.09 | 3.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.591 | 0.020 | 0.799 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 127 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | A | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 64 | 66 | 66 | 75 | 0 | 233 | 0 | 79 | 0 |
| N.S. | 1 | 1.03 | 1.03 | 1.17 | 0.00 | 3.64 | 0.00 | 1.23 | 0.00 |
| time (sec) | N/A | 0.254 | 0.064 | 0.387 | 0.000 | 0.273 | 0.000 | 0.295 | 0.000 |

| Problem 128 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 103 | 109 | 125 | 116 | 0 | 325 | 0 | 243 | 0 |
| N.S. | 1 | 1.06 | 1.21 | 1.13 | 0.00 | 3.16 | 0.00 | 2.36 | 0.00 |
| time (sec) | N/A | 0.293 | 0.330 | 0.341 | 0.000 | 0.309 | 0.000 | 0.304 | 0.000 |

| Problem 129 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 144 | 163 | 166 | 230 | 0 | 404 | 0 | 557 | 0 |
| N.S. | 1 | 1.13 | 1.15 | 1.60 | 0.00 | 2.81 | 0.00 | 3.87 | 0.00 |
| time (sec) | N/A | 0.339 | 0.338 | 0.346 | 0.000 | 0.323 | 0.000 | 0.296 | 0.000 |

| Problem 130 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-2) | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 186 | 221 | 194 | 394 | 0 | 484 | 0 | 1112 | 0 |
| N.S. | 1 | 1.19 | 1.04 | 2.12 | 0.00 | 2.60 | 0.00 | 5.98 | 0.00 |
| time (sec) | N/A | 0.399 | 0.339 | 0.333 | 0.000 | 0.344 | 0.000 | 0.369 | 0.000 |

| Problem 131 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 343 | 317 | 148 | 309 | 0 | 147 | 366 | 440 | 0 |
| N.S. | 1 | 0.92 | 0.43 | 0.90 | 0.00 | 0.43 | 1.07 | 1.28 | 0.00 |
| time (sec) | N/A | 0.708 | 0.607 | 1.039 | 0.000 | 0.253 | 0.460 | 0.288 | 0.000 |

| Problem 132 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 220 | 212 | 111 | 182 | 0 | 111 | 243 | 271 | 0 |
| N.S. | 1 | 0.96 | 0.50 | 0.83 | 0.00 | 0.50 | 1.10 | 1.23 | 0.00 |
| time (sec) | N/A | 0.565 | 0.437 | 0.684 | 0.000 | 0.250 | 0.314 | 0.280 | 0.000 |

| Problem 133 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 130 | 124 | 83 | 124 | 0 | 80 | 138 | 139 | 0 |
| N.S. | 1 | 0.95 | 0.64 | 0.95 | 0.00 | 0.62 | 1.06 | 1.07 | 0.00 |
| time (sec) | N/A | 0.450 | 0.263 | 0.391 | 0.000 | 0.255 | 0.245 | 0.293 | 0.000 |

| Problem 134 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 47 | 49 | 49 | 48 | 0 | 53 | 63 | 52 | 44 |
| N.S. | 1 | 1.04 | 1.04 | 1.02 | 0.00 | 1.13 | 1.34 | 1.11 | 0.94 |
| time (sec) | N/A | 0.267 | 0.034 | 0.316 | 0.000 | 0.257 | 0.110 | 0.276 | 0.247 |

| Problem 135 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 271 | 297 | 309 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.10 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.893 | 0.046 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 136 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 230 | 208 | 208 | 301 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.90 | 0.90 | 1.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.797 | 0.161 | 0.914 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 137 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | F | F | F | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 272 | 279 | 314 | 521 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.03 | 1.15 | 1.92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.036 | 0.149 | 1.288 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 138 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 371 | 333 | 181 | 294 | 0 | 152 | 432 | 389 | 0 |
| N.S. | 1 | 0.90 | 0.49 | 0.79 | 0.00 | 0.41 | 1.16 | 1.05 | 0.00 |
| time (sec) | N/A | 0.612 | 0.540 | 0.920 | 0.000 | 0.264 | 0.443 | 0.295 | 0.000 |

| Problem 139 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | A | A | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 211 | 199 | 135 | 185 | 0 | 108 | 248 | 203 | 0 |
| N.S. | 1 | 0.94 | 0.64 | 0.88 | 0.00 | 0.51 | 1.18 | 0.96 | 0.00 |
| time (sec) | N/A | 0.515 | 0.351 | 0.444 | 0.000 | 0.259 | 0.330 | 0.280 | 0.000 |

| Problem 140 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 82 | 77 | 74 | 71 | 0 | 66 | 109 | 78 | 59 |
| N.S. | 1 | 0.94 | 0.90 | 0.87 | 0.00 | 0.80 | 1.33 | 0.95 | 0.72 |
| time (sec) | N/A | 0.336 | 0.037 | 0.316 | 0.000 | 0.252 | 0.153 | 0.282 | 0.267 |

| Problem 141 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 365 | 397 | 424 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.09 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.143 | 0.048 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 142 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 316 | 298 | 309 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.94 | 0.98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.133 | 0.146 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 143 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 60 | 52 | 45 | 49 | 0 | 0 | 0 | 56 | 0 |
| N.S. | 1 | 0.87 | 0.75 | 0.82 | 0.00 | 0.00 | 0.00 | 0.93 | 0.00 |
| time (sec) | N/A | 0.557 | 0.371 | 0.591 | 0.000 | 0.000 | 0.000 | 0.299 | 0.000 |

| Problem 144 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 30 | 28 | 30 | 27 | 0 | 0 | 0 | 28 | 0 |
| N.S. | 1 | 0.93 | 1.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.93 | 0.00 |
| time (sec) | N/A | 0.364 | 0.189 | 0.375 | 0.000 | 0.000 | 0.000 | 0.291 | 0.000 |

| Problem 145 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 11 | 11 | 11 | 12 | 0 | 0 | 0 | 11 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 1.09 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| time (sec) | N/A | 0.241 | 0.018 | 0.207 | 0.000 | 0.000 | 0.000 | 0.279 | 0.000 |

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

| Problem 147 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 84 | 144 | 86 | 149 | 0 | 0 | 0 | 169 | 0 |
| N.S. | 1 | 1.71 | 1.02 | 1.77 | 0.00 | 0.00 | 0.00 | 2.01 | 0.00 |
| time (sec) | N/A | 0.389 | 2.239 | 0.697 | 0.000 | 0.000 | 0.000 | 0.314 | 0.000 |

| Problem 148 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 55 | 82 | 63 | 72 | 0 | 0 | 0 | 83 | 0 |
| N.S. | 1 | 1.49 | 1.15 | 1.31 | 0.00 | 0.00 | 0.00 | 1.51 | 0.00 |
| time (sec) | N/A | 0.316 | 0.395 | 0.580 | 0.000 | 0.000 | 0.000 | 0.284 | 0.000 |

| Problem 149 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 41 | 39 | 37 | 38 | 0 | 0 | 0 | 39 | 0 |
| N.S. | 1 | 0.95 | 0.90 | 0.93 | 0.00 | 0.00 | 0.00 | 0.95 | 0.00 |
| time (sec) | N/A | 0.337 | 0.126 | 0.344 | 0.000 | 0.000 | 0.000 | 0.271 | 0.000 |

| Problem 150 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 12 | 12 | 14 | 12 | 174 | 14 | 12 | 14 | 14 |
| N.S. | 1 | 1.00 | 1.17 | 1.00 | 14.50 | 1.17 | 1.00 | 1.17 | 1.17 |
| time (sec) | N/A | 0.227 | 5.406 | 11.409 | 2.514 | 0.243 | 0.406 | 0.297 | 0.225 |

| Problem 151 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 176 | 231 | 115 | 215 | 0 | 0 | 0 | 272 | 0 |
| N.S. | 1 | 1.31 | 0.65 | 1.22 | 0.00 | 0.00 | 0.00 | 1.55 | 0.00 |
| time (sec) | N/A | 0.631 | 0.608 | 0.704 | 0.000 | 0.000 | 0.000 | 0.323 | 0.000 |

| Problem 152 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 108 | 134 | 121 | 109 | 0 | 0 | 0 | 139 | 0 |
| N.S. | 1 | 1.24 | 1.12 | 1.01 | 0.00 | 0.00 | 0.00 | 1.29 | 0.00 |
| time (sec) | N/A | 0.414 | 0.219 | 0.517 | 0.000 | 0.000 | 0.000 | 0.302 | 0.000 |

| Problem 153 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 65 | 60 | 65 | 53 | 0 | 0 | 0 | 57 | 0 |
| N.S. | 1 | 0.92 | 1.00 | 0.82 | 0.00 | 0.00 | 0.00 | 0.88 | 0.00 |
| time (sec) | N/A | 0.383 | 0.038 | 0.333 | 0.000 | 0.000 | 0.000 | 0.296 | 0.000 |

| Problem 154 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 12 | 12 | 14 | 12 | 172 | 14 | 12 | 14 | 14 |
| N.S. | 1 | 1.00 | 1.17 | 1.00 | 14.33 | 1.17 | 1.00 | 1.17 | 1.17 |
| time (sec) | N/A | 0.223 | 2.869 | 9.023 | 57.493 | 0.239 | 0.480 | 0.329 | 0.227 |

| Problem 155 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 535 | 569 | 459 | 777 | 0 | 0 | 0 | 2255 | 0 |
| N.S. | 1 | 1.06 | 0.86 | 1.45 | 0.00 | 0.00 | 0.00 | 4.21 | 0.00 |
| time (sec) | N/A | 2.015 | 3.252 | 1.253 | 0.000 | 0.000 | 0.000 | 1.450 | 0.000 |

| Problem 156 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 269 | 299 | 248 | 390 | 0 | 0 | 0 | 1079 | 0 |
| N.S. | 1 | 1.11 | 0.92 | 1.45 | 0.00 | 0.00 | 0.00 | 4.01 | 0.00 |
| time (sec) | N/A | 1.002 | 2.262 | 1.113 | 0.000 | 0.000 | 0.000 | 0.996 | 0.000 |

| Problem 157 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 133 | 129 | 129 | 203 | 0 | 0 | 0 | 563 | 0 |
| N.S. | 1 | 0.97 | 0.97 | 1.53 | 0.00 | 0.00 | 0.00 | 4.23 | 0.00 |
| time (sec) | N/A | 0.680 | 0.119 | 0.753 | 0.000 | 0.000 | 0.000 | 0.660 | 0.000 |

| Problem 158 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 343 | 387 | 610 | 599 | 0 | 0 | 0 | 1987 | 0 |
| N.S. | 1 | 1.13 | 1.78 | 1.75 | 0.00 | 0.00 | 0.00 | 5.79 | 0.00 |
| time (sec) | N/A | 1.116 | 8.876 | 1.269 | 0.000 | 0.000 | 0.000 | 1.022 | 0.000 |

| Problem 159 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 175 | 165 | 311 | 304 | 0 | 0 | 0 | 1061 | 0 |
| N.S. | 1 | 0.94 | 1.78 | 1.74 | 0.00 | 0.00 | 0.00 | 6.06 | 0.00 |
| time (sec) | N/A | 0.775 | 2.293 | 0.739 | 0.000 | 0.000 | 0.000 | 0.915 | 0.000 |

| Problem 160 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 406 | 475 | 1043 | 881 | 0 | 0 | 0 | 2671 | 0 |
| N.S. | 1 | 1.17 | 2.57 | 2.17 | 0.00 | 0.00 | 0.00 | 6.58 | 0.00 |
| time (sec) | N/A | 1.246 | 11.985 | 1.141 | 0.000 | 0.000 | 0.000 | 1.468 | 0.000 |

| Problem 161 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 204 | 192 | 419 | 441 | 0 | 0 | 0 | 1279 | 0 |
| N.S. | 1 | 0.94 | 2.05 | 2.16 | 0.00 | 0.00 | 0.00 | 6.27 | 0.00 |
| time (sec) | N/A | 0.969 | 2.356 | 0.792 | 0.000 | 0.000 | 0.000 | 1.274 | 0.000 |

| Problem 162 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F(-1) | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 243 | 228 | 545 | 616 | 0 | 0 | 0 | 2308 | 0 |
| N.S. | 1 | 0.94 | 2.24 | 2.53 | 0.00 | 0.00 | 0.00 | 9.50 | 0.00 |
| time (sec) | N/A | 1.081 | 4.849 | 0.766 | 0.000 | 0.000 | 0.000 | 1.542 | 0.000 |

| Problem 163 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 440 | 433 | 319 | 384 | 0 | 0 | 0 | 646 | 0 |
| N.S. | 1 | 0.98 | 0.72 | 0.87 | 0.00 | 0.00 | 0.00 | 1.47 | 0.00 |
| time (sec) | N/A | 1.072 | 2.336 | 1.103 | 0.000 | 0.000 | 0.000 | 0.627 | 0.000 |

| Problem 164 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 211 | 209 | 218 | 179 | 0 | 0 | 0 | 306 | 0 |
| N.S. | 1 | 0.99 | 1.03 | 0.85 | 0.00 | 0.00 | 0.00 | 1.45 | 0.00 |
| time (sec) | N/A | 0.712 | 1.467 | 0.996 | 0.000 | 0.000 | 0.000 | 0.488 | 0.000 |

| Problem 165 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 105 | 106 | 131 | 94 | 0 | 0 | 0 | 167 | 0 |
| N.S. | 1 | 1.01 | 1.25 | 0.90 | 0.00 | 0.00 | 0.00 | 1.59 | 0.00 |
| time (sec) | N/A | 0.532 | 0.128 | 0.526 | 0.000 | 0.000 | 0.000 | 0.377 | 0.000 |

| Problem 166 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 287 | 274 | 251 | 321 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.95 | 0.87 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.718 | 4.142 | 1.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 167 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 144 | 144 | 185 | 170 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.28 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.713 | 0.228 | 0.719 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 168 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 384 | 362 | 388 | 725 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.94 | 1.01 | 1.89 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.980 | 6.287 | 1.158 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 169 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 179 | 177 | 238 | 370 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 1.33 | 2.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.831 | 0.638 | 0.743 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 170 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 468 | 440 | 521 | 1238 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.94 | 1.11 | 2.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.095 | 5.384 | 1.178 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 171 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 218 | 222 | 287 | 624 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 1.32 | 2.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.043 | 0.385 | 0.783 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 172 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | F(-1) | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 16 | 16 | 18 | 16 | 18 | 18 | 15 | 0 | 18 |
| N.S. | 1 | 1.00 | 1.12 | 1.00 | 1.12 | 1.12 | 0.94 | 0.00 | 1.12 |
| time (sec) | N/A | 0.250 | 0.606 | 2.491 | 1.132 | 0.267 | 18.790 | 0.000 | 0.235 |

| Problem 173 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 611 | 591 | 419 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 0.69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.000 | 0.592 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 174 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 301 | 292 | 269 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 0.89 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.616 | 0.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 175 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 147 | 150 | 129 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.378 | 0.117 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 176 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 16 | 16 | 18 | 16 | 18 | 18 | 14 | 18 | 18 |
| N.S. | 1 | 1.00 | 1.12 | 1.00 | 1.12 | 1.12 | 0.88 | 1.12 | 1.12 |
| time (sec) | N/A | 0.245 | 0.338 | 0.460 | 0.955 | 0.270 | 0.621 | 0.495 | 0.229 |

| Problem 177 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | B | B | A | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 106 | 84 | 77 | 99 | 1280 | 262 | 527 | 174 | 0 |
| N.S. | 1 | 0.79 | 0.73 | 0.93 | 12.08 | 2.47 | 4.97 | 1.64 | 0.00 |
| time (sec) | N/A | 0.277 | 0.117 | 0.263 | 0.284 | 0.288 | 0.382 | 0.293 | 0.000 |

| Problem 178 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | B | B | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 109 | 100 | 87 | 90 | 816 | 209 | 394 | 136 | 0 |
| N.S. | 1 | 0.92 | 0.80 | 0.83 | 7.49 | 1.92 | 3.61 | 1.25 | 0.00 |
| time (sec) | N/A | 0.266 | 0.084 | 0.265 | 0.269 | 0.265 | 0.288 | 0.291 | 0.000 |

| Problem 179 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | B | B | A | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 80 | 67 | 64 | 77 | 457 | 151 | 258 | 110 | 0 |
| N.S. | 1 | 0.84 | 0.80 | 0.96 | 5.71 | 1.89 | 3.22 | 1.38 | 0.00 |
| time (sec) | N/A | 0.265 | 0.055 | 0.261 | 0.276 | 0.257 | 0.181 | 0.292 | 0.000 |

| Problem 180 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | B | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 70 | 67 | 59 | 64 | 204 | 93 | 148 | 77 | 0 |
| N.S. | 1 | 0.96 | 0.84 | 0.91 | 2.91 | 1.33 | 2.11 | 1.10 | 0.00 |
| time (sec) | N/A | 0.234 | 0.076 | 0.118 | 0.265 | 0.249 | 0.126 | 0.297 | 0.000 |

| Problem 181 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 40 | 40 | 159 | 36 | 35 | 48 | 51 | 35 | 92 |
| N.S. | 1 | 1.00 | 3.98 | 0.90 | 0.88 | 1.20 | 1.28 | 0.88 | 2.30 |
| time (sec) | N/A | 0.171 | 0.377 | 0.128 | 0.258 | 0.251 | 0.091 | 0.277 | 0.633 |

| Problem 182 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 89 | 86 | 71 | 154 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 0.80 | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.436 | 0.133 | 0.578 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 183 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | B | F | B | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 51 | 44 | 45 | 56 | 0 | 101 | 0 | 108 | 0 |
| N.S. | 1 | 0.86 | 0.88 | 1.10 | 0.00 | 1.98 | 0.00 | 2.12 | 0.00 |
| time (sec) | N/A | 0.258 | 0.035 | 0.227 | 0.000 | 0.267 | 0.000 | 0.302 | 0.000 |

| Problem 184 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 61 | 56 | 49 | 62 | 120 | 102 | 0 | 231 | 0 |
| N.S. | 1 | 0.92 | 0.80 | 1.02 | 1.97 | 1.67 | 0.00 | 3.79 | 0.00 |
| time (sec) | N/A | 0.244 | 0.060 | 0.234 | 0.267 | 0.276 | 0.000 | 0.307 | 0.000 |

| Problem 185 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | B | F | B | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 88 | 73 | 77 | 78 | 0 | 209 | 0 | 388 | 0 |
| N.S. | 1 | 0.83 | 0.88 | 0.89 | 0.00 | 2.38 | 0.00 | 4.41 | 0.00 |
| time (sec) | N/A | 0.261 | 0.081 | 0.274 | 0.000 | 0.307 | 0.000 | 0.666 | 0.000 |

| Problem 186 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | B | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 94 | 87 | 63 | 84 | 263 | 193 | 0 | 447 | 0 |
| N.S. | 1 | 0.93 | 0.67 | 0.89 | 2.80 | 2.05 | 0.00 | 4.76 | 0.00 |
| time (sec) | N/A | 0.258 | 0.084 | 0.244 | 0.298 | 0.294 | 0.000 | 0.341 | 0.000 |

| Problem 187 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | B | F | B | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 121 | 102 | 65 | 100 | 0 | 321 | 0 | 598 | 0 |
| N.S. | 1 | 0.84 | 0.54 | 0.83 | 0.00 | 2.65 | 0.00 | 4.94 | 0.00 |
| time (sec) | N/A | 0.263 | 0.090 | 0.269 | 0.000 | 0.343 | 0.000 | 0.718 | 0.000 |

| Problem 188 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | B | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 203 | 177 | 164 | 194 | 0 | 567 | 1268 | 443 | 0 |
| N.S. | 1 | 0.87 | 0.81 | 0.96 | 0.00 | 2.79 | 6.25 | 2.18 | 0.00 |
| time (sec) | N/A | 0.592 | 0.402 | 1.036 | 0.000 | 0.276 | 0.637 | 0.323 | 0.000 |

| Problem 189 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | B | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 176 | 155 | 142 | 203 | 0 | 442 | 916 | 342 | 0 |
| N.S. | 1 | 0.88 | 0.81 | 1.15 | 0.00 | 2.51 | 5.20 | 1.94 | 0.00 |
| time (sec) | N/A | 0.551 | 0.202 | 0.888 | 0.000 | 0.269 | 0.486 | 0.317 | 0.000 |

| Problem 190 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | B | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 140 | 124 | 112 | 152 | 0 | 307 | 610 | 274 | 0 |
| N.S. | 1 | 0.89 | 0.80 | 1.09 | 0.00 | 2.19 | 4.36 | 1.96 | 0.00 |
| time (sec) | N/A | 0.439 | 0.201 | 0.997 | 0.000 | 0.261 | 0.307 | 0.311 | 0.000 |

| Problem 191 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | B | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 105 | 98 | 86 | 146 | 0 | 188 | 335 | 184 | 0 |
| N.S. | 1 | 0.93 | 0.82 | 1.39 | 0.00 | 1.79 | 3.19 | 1.75 | 0.00 |
| time (sec) | N/A | 0.391 | 0.077 | 0.460 | 0.000 | 0.274 | 0.205 | 0.317 | 0.000 |

| Problem 192 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | B | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 59 | 61 | 61 | 90 | 0 | 94 | 143 | 111 | 88 |
| N.S. | 1 | 1.03 | 1.03 | 1.53 | 0.00 | 1.59 | 2.42 | 1.88 | 1.49 |
| time (sec) | N/A | 0.275 | 0.099 | 0.417 | 0.000 | 0.266 | 0.123 | 0.287 | 0.518 |

| Problem 193 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 126 | 124 | 170 | 367 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 1.35 | 2.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.570 | 0.356 | 0.654 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 194 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | F | F | F | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 116 | 92 | 176 | 207 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.79 | 1.52 | 1.78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.502 | 0.829 | 0.460 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 195 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 87 | 76 | 126 | 125 | 236 | 146 | 0 | 510 | 0 |
| N.S. | 1 | 0.87 | 1.45 | 1.44 | 2.71 | 1.68 | 0.00 | 5.86 | 0.00 |
| time (sec) | N/A | 0.366 | 0.463 | 0.662 | 0.284 | 0.301 | 0.000 | 0.369 | 0.000 |

| Problem 196 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 187 | 149 | 246 | 262 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.80 | 1.32 | 1.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.682 | 2.533 | 0.987 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 197 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | B | B | B | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 338 | 340 | 307 | 383 | 0 | 996 | 2518 | 832 | 0 |
| N.S. | 1 | 1.01 | 0.91 | 1.13 | 0.00 | 2.95 | 7.45 | 2.46 | 0.00 |
| time (sec) | N/A | 1.265 | 0.942 | 3.282 | 0.000 | 0.287 | 1.074 | 0.361 | 0.000 |

| Problem 198 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | B | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 287 | 297 | 232 | 394 | 0 | 769 | 1828 | 641 | 0 |
| N.S. | 1 | 1.03 | 0.81 | 1.37 | 0.00 | 2.68 | 6.37 | 2.23 | 0.00 |
| time (sec) | N/A | 1.050 | 0.463 | 1.137 | 0.000 | 0.311 | 0.759 | 0.347 | 0.000 |

| Problem 199 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | B | B | B | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 235 | 213 | 199 | 280 | 0 | 530 | 1173 | 504 | 0 |
| N.S. | 1 | 0.91 | 0.85 | 1.19 | 0.00 | 2.26 | 4.99 | 2.14 | 0.00 |
| time (sec) | N/A | 0.751 | 0.352 | 1.049 | 0.000 | 0.280 | 0.494 | 0.355 | 0.000 |

| Problem 200 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | B | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 165 | 154 | 137 | 266 | 0 | 329 | 685 | 340 | 0 |
| N.S. | 1 | 0.93 | 0.83 | 1.61 | 0.00 | 1.99 | 4.15 | 2.06 | 0.00 |
| time (sec) | N/A | 0.588 | 0.205 | 0.638 | 0.000 | 0.272 | 0.319 | 0.340 | 0.000 |

| Problem 201 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | B | B | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 104 | 97 | 96 | 166 | 0 | 158 | 282 | 208 | 152 |
| N.S. | 1 | 0.93 | 0.92 | 1.60 | 0.00 | 1.52 | 2.71 | 2.00 | 1.46 |
| time (sec) | N/A | 0.330 | 0.079 | 0.455 | 0.000 | 0.262 | 0.187 | 0.295 | 0.512 |

| Problem 202 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 169 | 164 | 304 | 652 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 1.80 | 3.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.698 | 0.469 | 0.711 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 203 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | F | F | F | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 190 | 156 | 342 | 428 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.82 | 1.80 | 2.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.690 | 1.108 | 0.794 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 204 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-1) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 167 | 155 | 248 | 324 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.93 | 1.49 | 1.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.708 | 1.153 | 0.912 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 205 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | A | F | F | F | F | F(-1) |
| verified | N/A | No | No | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 291 | 239 | 732 | 550 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.82 | 2.52 | 1.89 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.147 | 8.262 | 1.249 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 206 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 357 | 384 | 287 | 657 | 0 | 1148 | 2876 | 1016 | 0 |
| N.S. | 1 | 1.08 | 0.80 | 1.84 | 0.00 | 3.22 | 8.06 | 2.85 | 0.00 |
| time (sec) | N/A | 1.584 | 0.463 | 1.383 | 0.000 | 0.302 | 1.212 | 0.381 | 0.000 |

| Problem 207 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | B | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 289 | 288 | 235 | 440 | 0 | 784 | 1889 | 809 | 0 |
| N.S. | 1 | 1.00 | 0.81 | 1.52 | 0.00 | 2.71 | 6.54 | 2.80 | 0.00 |
| time (sec) | N/A | 1.313 | 0.645 | 1.194 | 0.000 | 0.288 | 0.717 | 0.403 | 0.000 |

| Problem 208 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | B | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 198 | 186 | 163 | 412 | 0 | 483 | 1027 | 533 | 0 |
| N.S. | 1 | 0.94 | 0.82 | 2.08 | 0.00 | 2.44 | 5.19 | 2.69 | 0.00 |
| time (sec) | N/A | 0.824 | 0.276 | 0.885 | 0.000 | 0.282 | 0.491 | 0.372 | 0.000 |

| Problem 209 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | B | B | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 119 | 116 | 115 | 255 | 0 | 233 | 444 | 329 | 229 |
| N.S. | 1 | 0.97 | 0.97 | 2.14 | 0.00 | 1.96 | 3.73 | 2.76 | 1.92 |
| time (sec) | N/A | 0.443 | 0.159 | 0.655 | 0.000 | 0.272 | 0.264 | 0.303 | 0.614 |

| Problem 210 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | B | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 202 | 202 | 439 | 1007 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 2.17 | 4.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.826 | 0.810 | 0.814 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 211 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | B | F(-2) | F | F | F | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 270 | 228 | 575 | 721 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.84 | 2.13 | 2.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.877 | 2.324 | 0.911 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 212 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-1) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 198 | 191 | 385 | 593 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.96 | 1.94 | 2.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.890 | 1.871 | 1.068 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 213 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | A | F | F | F | F | F(-1) |
| verified | N/A | No | No | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 439 | 365 | 1274 | 1009 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.83 | 2.90 | 2.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.623 | 11.489 | 1.376 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 214 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | B | B | B | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 164 | 152 | 150 | 367 | 0 | 323 | 663 | 482 | 317 |
| N.S. | 1 | 0.93 | 0.91 | 2.24 | 0.00 | 1.97 | 4.04 | 2.94 | 1.93 |
| time (sec) | N/A | 0.527 | 0.192 | 0.658 | 0.000 | 0.258 | 0.408 | 0.297 | 0.697 |

| Problem 215 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 213 | 169 | 150 | 153 | 0 | 0 | 0 | 419 | 0 |
| N.S. | 1 | 0.79 | 0.70 | 0.72 | 0.00 | 0.00 | 0.00 | 1.97 | 0.00 |
| time (sec) | N/A | 0.553 | 0.561 | 0.282 | 0.000 | 0.000 | 0.000 | 0.350 | 0.000 |

| Problem 216 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 145 | 119 | 109 | 112 | 0 | 0 | 0 | 277 | 0 |
| N.S. | 1 | 0.82 | 0.75 | 0.77 | 0.00 | 0.00 | 0.00 | 1.91 | 0.00 |
| time (sec) | N/A | 0.458 | 0.458 | 0.303 | 0.000 | 0.000 | 0.000 | 0.334 | 0.000 |

| Problem 217 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 141 | 115 | 102 | 103 | 0 | 0 | 0 | 203 | 0 |
| N.S. | 1 | 0.82 | 0.72 | 0.73 | 0.00 | 0.00 | 0.00 | 1.44 | 0.00 |
| time (sec) | N/A | 0.428 | 0.394 | 0.320 | 0.000 | 0.000 | 0.000 | 0.332 | 0.000 |

| Problem 218 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 69 | 61 | 61 | 60 | 0 | 0 | 0 | 95 | 0 |
| N.S. | 1 | 0.88 | 0.88 | 0.87 | 0.00 | 0.00 | 0.00 | 1.38 | 0.00 |
| time (sec) | N/A | 0.490 | 0.125 | 0.213 | 0.000 | 0.000 | 0.000 | 0.322 | 0.000 |

| Problem 219 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 57 | 52 | 48 | 52 | 0 | 0 | 0 | 53 | 0 |
| N.S. | 1 | 0.91 | 0.84 | 0.91 | 0.00 | 0.00 | 0.00 | 0.93 | 0.00 |
| time (sec) | N/A | 0.411 | 0.026 | 0.263 | 0.000 | 0.000 | 0.000 | 0.334 | 0.000 |

| Problem 220 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 23 | 23 | 25 | 23 | 25 | 31 | 34 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.09 | 1.00 | 1.09 | 1.35 | 1.48 | 1.09 | 1.09 |
| time (sec) | N/A | 0.250 | 0.960 | 0.341 | 0.358 | 0.244 | 1.027 | 0.903 | 0.255 |

| Problem 221 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 258 | 210 | 283 | 396 | 0 | 0 | 0 | 1401 | 0 |
| N.S. | 1 | 0.81 | 1.10 | 1.53 | 0.00 | 0.00 | 0.00 | 5.43 | 0.00 |
| time (sec) | N/A | 0.460 | 1.613 | 0.746 | 0.000 | 0.000 | 0.000 | 0.418 | 0.000 |

| Problem 222 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 190 | 160 | 220 | 280 | 0 | 0 | 0 | 928 | 0 |
| N.S. | 1 | 0.84 | 1.16 | 1.47 | 0.00 | 0.00 | 0.00 | 4.88 | 0.00 |
| time (sec) | N/A | 0.393 | 1.344 | 0.296 | 0.000 | 0.000 | 0.000 | 0.409 | 0.000 |

| Problem 223 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 186 | 156 | 140 | 266 | 0 | 0 | 0 | 698 | 0 |
| N.S. | 1 | 0.84 | 0.75 | 1.43 | 0.00 | 0.00 | 0.00 | 3.75 | 0.00 |
| time (sec) | N/A | 0.399 | 1.231 | 0.618 | 0.000 | 0.000 | 0.000 | 0.408 | 0.000 |

| Problem 224 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 104 | 96 | 99 | 151 | 0 | 0 | 0 | 341 | 0 |
| N.S. | 1 | 0.92 | 0.95 | 1.45 | 0.00 | 0.00 | 0.00 | 3.28 | 0.00 |
| time (sec) | N/A | 0.485 | 0.517 | 0.205 | 0.000 | 0.000 | 0.000 | 0.365 | 0.000 |

| Problem 225 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 93 | 88 | 79 | 82 | 0 | 0 | 0 | 215 | 0 |
| N.S. | 1 | 0.95 | 0.85 | 0.88 | 0.00 | 0.00 | 0.00 | 2.31 | 0.00 |
| time (sec) | N/A | 0.550 | 0.303 | 0.410 | 0.000 | 0.000 | 0.000 | 0.307 | 0.000 |

| Problem 226 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 23 | 23 | 25 | 23 | 357 | 61 | 73 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.09 | 1.00 | 15.52 | 2.65 | 3.17 | 1.09 | 1.09 |
| time (sec) | N/A | 0.246 | 4.963 | 0.381 | 4.164 | 0.241 | 1.863 | 2.153 | 0.270 |

| Problem 227 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 322 | 385 | 317 | 720 | 0 | 0 | 0 | 3180 | 0 |
| N.S. | 1 | 1.20 | 0.98 | 2.24 | 0.00 | 0.00 | 0.00 | 9.88 | 0.00 |
| time (sec) | N/A | 1.082 | 1.528 | 0.871 | 0.000 | 0.000 | 0.000 | 0.613 | 0.000 |

| Problem 228 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 249 | 279 | 181 | 507 | 0 | 0 | 0 | 2201 | 0 |
| N.S. | 1 | 1.12 | 0.73 | 2.04 | 0.00 | 0.00 | 0.00 | 8.84 | 0.00 |
| time (sec) | N/A | 1.308 | 0.890 | 0.341 | 0.000 | 0.000 | 0.000 | 0.542 | 0.000 |

| Problem 229 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 248 | 267 | 219 | 476 | 0 | 0 | 0 | 1641 | 0 |
| N.S. | 1 | 1.08 | 0.88 | 1.92 | 0.00 | 0.00 | 0.00 | 6.62 | 0.00 |
| time (sec) | N/A | 1.342 | 0.904 | 0.753 | 0.000 | 0.000 | 0.000 | 0.584 | 0.000 |

| Problem 230 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 157 | 148 | 122 | 264 | 0 | 0 | 0 | 888 | 0 |
| N.S. | 1 | 0.94 | 0.78 | 1.68 | 0.00 | 0.00 | 0.00 | 5.66 | 0.00 |
| time (sec) | N/A | 0.976 | 0.481 | 0.241 | 0.000 | 0.000 | 0.000 | 0.502 | 0.000 |

| Problem 231 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 127 | 118 | 102 | 158 | 0 | 0 | 0 | 547 | 0 |
| N.S. | 1 | 0.93 | 0.80 | 1.24 | 0.00 | 0.00 | 0.00 | 4.31 | 0.00 |
| time (sec) | N/A | 0.653 | 0.410 | 0.458 | 0.000 | 0.000 | 0.000 | 0.310 | 0.000 |

| Problem 232 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 23 | 23 | 25 | 23 | 520 | 91 | 112 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.09 | 1.00 | 22.61 | 3.96 | 4.87 | 1.09 | 1.09 |
| time (sec) | N/A | 0.246 | 1.303 | 0.684 | 196.969 | 0.263 | 3.615 | 7.284 | 0.253 |

| Problem 233 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-1) | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 416 | 483 | 414 | 1138 | 0 | 0 | 0 | 5870 | 0 |
| N.S. | 1 | 1.16 | 1.00 | 2.74 | 0.00 | 0.00 | 0.00 | 14.11 | 0.00 |
| time (sec) | N/A | 0.993 | 1.687 | 0.909 | 0.000 | 0.000 | 0.000 | 0.792 | 0.000 |

| Problem 234 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-1) | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 346 | 367 | 320 | 783 | 0 | 0 | 0 | 4040 | 0 |
| N.S. | 1 | 1.06 | 0.92 | 2.26 | 0.00 | 0.00 | 0.00 | 11.68 | 0.00 |
| time (sec) | N/A | 1.305 | 1.257 | 0.332 | 0.000 | 0.000 | 0.000 | 0.756 | 0.000 |

| Problem 235 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-1) | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 337 | 360 | 264 | 753 | 0 | 0 | 0 | 3109 | 0 |
| N.S. | 1 | 1.07 | 0.78 | 2.23 | 0.00 | 0.00 | 0.00 | 9.23 | 0.00 |
| time (sec) | N/A | 1.564 | 1.260 | 0.757 | 0.000 | 0.000 | 0.000 | 0.780 | 0.000 |

| Problem 236 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-1) | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 208 | 193 | 186 | 399 | 0 | 0 | 0 | 1665 | 0 |
| N.S. | 1 | 0.93 | 0.89 | 1.92 | 0.00 | 0.00 | 0.00 | 8.00 | 0.00 |
| time (sec) | N/A | 0.956 | 0.884 | 0.221 | 0.000 | 0.000 | 0.000 | 0.736 | 0.000 |

| Problem 237 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-1) | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 164 | 162 | 134 | 270 | 0 | 0 | 0 | 1112 | 0 |
| N.S. | 1 | 0.99 | 0.82 | 1.65 | 0.00 | 0.00 | 0.00 | 6.78 | 0.00 |
| time (sec) | N/A | 0.797 | 0.448 | 0.565 | 0.000 | 0.000 | 0.000 | 0.309 | 0.000 |

| Problem 238 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | F(-1) | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 23 | 23 | 25 | 23 | 0 | 121 | 151 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.09 | 1.00 | 0.00 | 5.26 | 6.57 | 1.09 | 1.09 |
| time (sec) | N/A | 0.247 | 15.145 | 1.273 | 0.000 | 0.272 | 7.756 | 21.185 | 0.280 |

| Problem 239 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F(-1) | F | F | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 191 | 192 | 156 | 387 | 0 | 0 | 0 | 1915 | 0 |
| N.S. | 1 | 1.01 | 0.82 | 2.03 | 0.00 | 0.00 | 0.00 | 10.03 | 0.00 |
| time (sec) | N/A | 0.932 | 0.502 | 0.519 | 0.000 | 0.000 | 0.000 | 0.309 | 0.000 |

| Problem 240 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 288 | 264 | 253 | 395 | 0 | 0 | 0 | 1088 | 0 |
| N.S. | 1 | 0.92 | 0.88 | 1.37 | 0.00 | 0.00 | 0.00 | 3.78 | 0.00 |
| time (sec) | N/A | 0.783 | 0.219 | 1.141 | 0.000 | 0.000 | 0.000 | 1.262 | 0.000 |

| Problem 241 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 274 | 256 | 248 | 394 | 0 | 0 | 0 | 1169 | 0 |
| N.S. | 1 | 0.93 | 0.91 | 1.44 | 0.00 | 0.00 | 0.00 | 4.27 | 0.00 |
| time (sec) | N/A | 0.801 | 0.319 | 1.170 | 0.000 | 0.000 | 0.000 | 1.316 | 0.000 |

| Problem 242 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 156 | 148 | 138 | 203 | 0 | 0 | 0 | 488 | 0 |
| N.S. | 1 | 0.95 | 0.88 | 1.30 | 0.00 | 0.00 | 0.00 | 3.13 | 0.00 |
| time (sec) | N/A | 0.606 | 0.080 | 0.792 | 0.000 | 0.000 | 0.000 | 1.118 | 0.000 |

| Problem 243 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 133 | 129 | 129 | 203 | 0 | 0 | 0 | 563 | 0 |
| N.S. | 1 | 0.97 | 0.97 | 1.53 | 0.00 | 0.00 | 0.00 | 4.23 | 0.00 |
| time (sec) | N/A | 0.682 | 0.043 | 0.318 | 0.000 | 0.000 | 0.000 | 0.642 | 0.000 |

| Problem 244 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 25 | 0 | 20 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 1.00 | 0.00 | 0.80 | 1.00 | 1.00 |
| time (sec) | N/A | 0.275 | 0.531 | 0.597 | 0.924 | 0.000 | 0.415 | 1.357 | 0.253 |

| Problem 245 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 380 | 452 | 252 | 604 | 0 | 0 | 0 | 2237 | 0 |
| N.S. | 1 | 1.19 | 0.66 | 1.59 | 0.00 | 0.00 | 0.00 | 5.89 | 0.00 |
| time (sec) | N/A | 2.890 | 0.283 | 1.218 | 0.000 | 0.000 | 0.000 | 1.293 | 0.000 |

| Problem 246 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 361 | 441 | 268 | 600 | 0 | 0 | 0 | 2199 | 0 |
| N.S. | 1 | 1.22 | 0.74 | 1.66 | 0.00 | 0.00 | 0.00 | 6.09 | 0.00 |
| time (sec) | N/A | 2.051 | 0.322 | 1.214 | 0.000 | 0.000 | 0.000 | 1.559 | 0.000 |

| Problem 247 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 199 | 192 | 137 | 308 | 0 | 0 | 0 | 929 | 0 |
| N.S. | 1 | 0.96 | 0.69 | 1.55 | 0.00 | 0.00 | 0.00 | 4.67 | 0.00 |
| time (sec) | N/A | 1.497 | 0.088 | 0.874 | 0.000 | 0.000 | 0.000 | 0.863 | 0.000 |

| Problem 248 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 175 | 165 | 311 | 304 | 0 | 0 | 0 | 1061 | 0 |
| N.S. | 1 | 0.94 | 1.78 | 1.74 | 0.00 | 0.00 | 0.00 | 6.06 | 0.00 |
| time (sec) | N/A | 0.778 | 1.791 | 0.353 | 0.000 | 0.000 | 0.000 | 0.901 | 0.000 |

| Problem 249 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 25 | 0 | 51 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 1.00 | 0.00 | 2.04 | 1.00 | 1.00 |
| time (sec) | N/A | 0.279 | 0.317 | 0.546 | 1.104 | 0.000 | 3.309 | 0.944 | 0.247 |

| Problem 250 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 475 | 553 | 255 | 886 | 0 | 0 | 0 | 3408 | 0 |
| N.S. | 1 | 1.16 | 0.54 | 1.87 | 0.00 | 0.00 | 0.00 | 7.17 | 0.00 |
| time (sec) | N/A | 2.533 | 0.198 | 1.227 | 0.000 | 0.000 | 0.000 | 1.852 | 0.000 |

| Problem 251 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 427 | 499 | 249 | 879 | 0 | 0 | 0 | 2826 | 0 |
| N.S. | 1 | 1.17 | 0.58 | 2.06 | 0.00 | 0.00 | 0.00 | 6.62 | 0.00 |
| time (sec) | N/A | 2.462 | 0.309 | 1.239 | 0.000 | 0.000 | 0.000 | 2.214 | 0.000 |

| Problem 252 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 256 | 244 | 140 | 449 | 0 | 0 | 0 | 1449 | 0 |
| N.S. | 1 | 0.95 | 0.55 | 1.75 | 0.00 | 0.00 | 0.00 | 5.66 | 0.00 |
| time (sec) | N/A | 1.218 | 0.081 | 0.850 | 0.000 | 0.000 | 0.000 | 1.126 | 0.000 |

| Problem 253 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 204 | 192 | 419 | 441 | 0 | 0 | 0 | 1279 | 0 |
| N.S. | 1 | 0.94 | 2.05 | 2.16 | 0.00 | 0.00 | 0.00 | 6.27 | 0.00 |
| time (sec) | N/A | 0.969 | 2.348 | 0.333 | 0.000 | 0.000 | 0.000 | 1.256 | 0.000 |

| Problem 254 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 25 | 0 | 88 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 1.00 | 0.00 | 3.52 | 1.00 | 1.00 |
| time (sec) | N/A | 0.274 | 0.387 | 0.662 | 1.276 | 0.000 | 24.397 | 0.978 | 0.237 |

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

| Problem 256 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F(-1) | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 301 | 288 | 137 | 654 | 0 | 0 | 0 | 2561 | 0 |
| N.S. | 1 | 0.96 | 0.46 | 2.17 | 0.00 | 0.00 | 0.00 | 8.51 | 0.00 |
| time (sec) | N/A | 2.170 | 0.096 | 0.921 | 0.000 | 0.000 | 0.000 | 1.342 | 0.000 |

| Problem 257 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F(-1) | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 243 | 228 | 545 | 616 | 0 | 0 | 0 | 2308 | 0 |
| N.S. | 1 | 0.94 | 2.24 | 2.53 | 0.00 | 0.00 | 0.00 | 9.50 | 0.00 |
| time (sec) | N/A | 1.066 | 3.202 | 0.359 | 0.000 | 0.000 | 0.000 | 1.539 | 0.000 |

| Problem 258 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | F(-2) | F(-1) | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 25 | 0 | 0 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 |
| time (sec) | N/A | 0.272 | 0.382 | 0.697 | 2.035 | 0.000 | 0.000 | 0.979 | 0.270 |

| Problem 259 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 365 | 339 | 370 | 317 | 0 | 0 | 0 | 507 | 0 |
| N.S. | 1 | 0.93 | 1.01 | 0.87 | 0.00 | 0.00 | 0.00 | 1.39 | 0.00 |
| time (sec) | N/A | 0.724 | 0.301 | 1.290 | 0.000 | 0.000 | 0.000 | 0.817 | 0.000 |

| Problem 260 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 233 | 219 | 249 | 186 | 0 | 0 | 0 | 318 | 0 |
| N.S. | 1 | 0.94 | 1.07 | 0.80 | 0.00 | 0.00 | 0.00 | 1.36 | 0.00 |
| time (sec) | N/A | 0.558 | 0.178 | 1.145 | 0.000 | 0.000 | 0.000 | 0.743 | 0.000 |

| Problem 261 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 243 | 229 | 249 | 207 | 0 | 0 | 0 | 345 | 0 |
| N.S. | 1 | 0.94 | 1.02 | 0.85 | 0.00 | 0.00 | 0.00 | 1.42 | 0.00 |
| time (sec) | N/A | 0.561 | 0.276 | 1.092 | 0.000 | 0.000 | 0.000 | 0.743 | 0.000 |

| Problem 262 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 105 | 103 | 134 | 96 | 0 | 0 | 0 | 142 | 0 |
| N.S. | 1 | 0.98 | 1.28 | 0.91 | 0.00 | 0.00 | 0.00 | 1.35 | 0.00 |
| time (sec) | N/A | 0.628 | 0.075 | 0.679 | 0.000 | 0.000 | 0.000 | 0.698 | 0.000 |

| Problem 263 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | C | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 105 | 106 | 131 | 94 | 0 | 0 | 0 | 167 | 0 |
| N.S. | 1 | 1.01 | 1.25 | 0.90 | 0.00 | 0.00 | 0.00 | 1.59 | 0.00 |
| time (sec) | N/A | 0.517 | 0.083 | 0.125 | 0.000 | 0.000 | 0.000 | 0.386 | 0.000 |

| Problem 264 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 25 | 0 | 36 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 1.00 | 0.00 | 1.44 | 1.00 | 1.00 |
| time (sec) | N/A | 0.272 | 0.171 | 0.556 | 0.974 | 0.000 | 0.741 | 0.845 | 0.273 |

| Problem 265 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 412 | 383 | 572 | 483 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.93 | 1.39 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.656 | 0.819 | 1.531 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 266 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 270 | 263 | 300 | 329 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 1.11 | 1.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.522 | 0.361 | 1.169 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 267 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 280 | 273 | 380 | 326 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 1.36 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.525 | 0.447 | 1.303 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 268 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 144 | 141 | 168 | 169 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 1.17 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.626 | 0.174 | 0.884 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 269 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 144 | 144 | 185 | 170 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.28 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.699 | 0.163 | 0.323 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 270 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 25 | 0 | 88 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 1.00 | 0.00 | 3.52 | 1.00 | 1.00 |
| time (sec) | N/A | 0.284 | 0.193 | 0.971 | 1.129 | 0.000 | 1.971 | 2.558 | 0.289 |

| Problem 271 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 344 | 428 | 351 | 733 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.24 | 1.02 | 2.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.820 | 2.224 | 1.295 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 272 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 342 | 443 | 411 | 733 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.30 | 1.20 | 2.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.886 | 2.059 | 1.179 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 273 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 207 | 199 | 192 | 370 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.96 | 0.93 | 1.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.318 | 1.224 | 0.979 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 274 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 179 | 177 | 238 | 370 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 1.33 | 2.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.829 | 0.553 | 0.309 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 275 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 25 | 0 | 155 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 1.00 | 0.00 | 6.20 | 1.00 | 1.00 |
| time (sec) | N/A | 0.283 | 0.205 | 1.072 | 1.379 | 0.000 | 8.534 | 5.947 | 0.256 |

| Problem 276 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 442 | 529 | 445 | 1247 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.20 | 1.01 | 2.82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.886 | 2.805 | 1.339 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 277 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 441 | 539 | 538 | 1247 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.22 | 1.22 | 2.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 2.266 | 2.159 | 1.301 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 278 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 252 | 247 | 254 | 625 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 1.01 | 2.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.285 | 0.951 | 0.850 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 279 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 218 | 222 | 287 | 624 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 1.32 | 2.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 1.061 | 0.270 | 0.362 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 280 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 25 | 0 | 221 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 1.00 | 0.00 | 8.84 | 1.00 | 1.00 |
| time (sec) | N/A | 0.280 | 0.217 | 0.953 | 1.387 | 0.000 | 111.307 | 15.600 | 0.279 |

| Problem 281 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | C | F(-2) | C | F(-1) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 156 | 161 | 115 | 228 | 0 | 273 | 0 | 0 | 0 |
| N.S. | 1 | 1.03 | 0.74 | 1.46 | 0.00 | 1.75 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.315 | 0.253 | 2.974 | 0.000 | 0.122 | 0.000 | 0.000 | 0.000 |

| Problem 282 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F(-2) | C | F(-1) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 136 | 141 | 115 | 206 | 0 | 220 | 0 | 0 | 0 |
| N.S. | 1 | 1.04 | 0.85 | 1.51 | 0.00 | 1.62 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.311 | 0.191 | 2.878 | 0.000 | 0.124 | 0.000 | 0.000 | 0.000 |

| Problem 283 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | C | F(-2) | C | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 117 | 122 | 87 | 194 | 0 | 152 | 0 | 0 | 0 |
| N.S. | 1 | 1.04 | 0.74 | 1.66 | 0.00 | 1.30 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.300 | 0.057 | 2.447 | 0.000 | 0.108 | 0.000 | 0.000 | 0.000 |

| Problem 284 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F(-2) | C | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 99 | 102 | 87 | 172 | 0 | 108 | 0 | 0 | 0 |
| N.S. | 1 | 1.03 | 0.88 | 1.74 | 0.00 | 1.09 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.276 | 0.037 | 2.042 | 0.000 | 0.102 | 0.000 | 0.000 | 0.000 |

| Problem 285 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | C | F(-2) | C | F(-2) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 81 | 79 | 59 | 149 | 0 | 68 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 0.73 | 1.84 | 0.00 | 0.84 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.266 | 0.037 | 1.772 | 0.000 | 0.095 | 0.000 | 0.000 | 0.000 |

| Problem 286 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F(-2) | C | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 61 | 59 | 54 | 132 | 0 | 84 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 0.89 | 2.16 | 0.00 | 1.38 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.264 | 0.030 | 1.529 | 0.000 | 0.099 | 0.000 | 0.000 | 0.000 |

| Problem 287 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | C | F(-2) | C | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 122 | 120 | 56 | 190 | 0 | 148 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 0.46 | 1.56 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.290 | 0.038 | 1.720 | 0.000 | 0.104 | 0.000 | 0.000 | 0.000 |

| Problem 288 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F(-2) | C | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 102 | 104 | 59 | 169 | 0 | 175 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 0.58 | 1.66 | 0.00 | 1.72 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.285 | 0.043 | 2.097 | 0.000 | 0.104 | 0.000 | 0.000 | 0.000 |

| Problem 289 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | C | F(-2) | C | F(-1) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 159 | 161 | 66 | 225 | 0 | 236 | 0 | 0 | 0 |
| N.S. | 1 | 1.01 | 0.42 | 1.42 | 0.00 | 1.48 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.313 | 0.056 | 2.533 | 0.000 | 0.107 | 0.000 | 0.000 | 0.000 |

| Problem 290 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F(-2) | C | F(-1) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 139 | 145 | 66 | 203 | 0 | 263 | 0 | 0 | 0 |
| N.S. | 1 | 1.04 | 0.47 | 1.46 | 0.00 | 1.89 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.308 | 0.051 | 3.015 | 0.000 | 0.112 | 0.000 | 0.000 | 0.000 |

| Problem 291 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F(-1) | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 130 | 131 | 114 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.01 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.406 | 0.127 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 292 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F(-1) | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 130 | 131 | 106 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.01 | 0.82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.399 | 0.124 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 293 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 130 | 131 | 107 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.01 | 0.82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.412 | 0.107 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 294 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 130 | 131 | 107 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.01 | 0.82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.396 | 0.101 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 295 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F(-2) | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 128 | 127 | 107 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 0.84 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.391 | 0.089 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 296 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 126 | 125 | 104 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 0.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.396 | 0.088 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 297 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 130 | 127 | 102 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 0.78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.397 | 0.093 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 298 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 130 | 131 | 106 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.01 | 0.82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.397 | 0.092 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 299 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F(-1) | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 130 | 131 | 114 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.01 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.404 | 0.103 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 300 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | F(-1) | N/A | F(-2) | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 0 | 23 | 0 | 55 | 22 | 25 | 25 |
| N.S. | 1 | 1.00 | 0.00 | 0.92 | 0.00 | 2.20 | 0.88 | 1.00 | 1.00 |
| time (sec) | N/A | 0.401 | 0.000 | 0.428 | 0.000 | 0.254 | 70.919 | 0.933 | 0.316 |

| Problem 301 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | F(-2) | N/A | F(-2) | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 0 | 55 | 0 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 0.00 | 2.20 | 0.00 | 1.00 | 1.00 |
| time (sec) | N/A | 0.390 | 91.049 | 0.112 | 0.000 | 0.256 | 0.000 | 0.835 | 0.318 |

| Problem 302 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 0 | 83 | 22 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 0.00 | 3.32 | 0.88 | 1.00 | 1.00 |
| time (sec) | N/A | 0.404 | 49.627 | 1.302 | 0.000 | 0.262 | 20.422 | 0.547 | 0.286 |

| Problem 303 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 0 | 97 | 22 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 0.00 | 3.88 | 0.88 | 1.00 | 1.00 |
| time (sec) | N/A | 0.406 | 45.152 | 0.532 | 0.000 | 0.263 | 30.894 | 0.558 | 0.290 |

| Problem 304 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 0 | 71 | 22 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 0.00 | 2.84 | 0.88 | 1.00 | 1.00 |
| time (sec) | N/A | 0.397 | 164.931 | 0.389 | 0.000 | 0.277 | 73.332 | 1.749 | 0.358 |

| Problem 305 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | F(-2) | N/A | F(-2) | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 0 | 71 | 0 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 0.00 | 2.84 | 0.00 | 1.00 | 1.00 |
| time (sec) | N/A | 0.384 | 15.470 | 0.088 | 0.000 | 0.270 | 0.000 | 1.251 | 0.365 |

| Problem 306 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 0 | 99 | 22 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 0.00 | 3.96 | 0.88 | 1.00 | 1.00 |
| time (sec) | N/A | 0.396 | 27.877 | 1.358 | 0.000 | 0.262 | 26.310 | 0.730 | 0.294 |

| Problem 307 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | F(-2) | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 25 | 25 | 27 | 23 | 0 | 113 | 22 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.08 | 0.92 | 0.00 | 4.52 | 0.88 | 1.00 | 1.00 |
| time (sec) | N/A | 0.403 | 10.788 | 0.798 | 0.000 | 0.265 | 40.213 | 0.770 | 0.290 |

| Problem 308 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 23 | 23 | 25 | 23 | 618 | 71 | 20 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.09 | 1.00 | 26.87 | 3.09 | 0.87 | 1.09 | 1.09 |
| time (sec) | N/A | 0.405 | 1.607 | 2.296 | 10.102 | 0.268 | 52.553 | 0.507 | 0.415 |

| Problem 309 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 23 | 23 | 25 | 23 | 469 | 55 | 20 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.09 | 1.00 | 20.39 | 2.39 | 0.87 | 1.09 | 1.09 |
| time (sec) | N/A | 0.399 | 0.813 | 2.171 | 7.430 | 0.265 | 20.491 | 0.470 | 0.409 |

| Problem 310 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 183 | 176 | 151 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.96 | 0.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.414 | 0.078 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 311 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 89 | 87 | 77 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.98 | 0.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.254 | 0.030 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 312 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 23 | 23 | 25 | 23 | 25 | 25 | 19 | 25 | 25 |
| N.S. | 1 | 1.00 | 1.09 | 1.00 | 1.09 | 1.09 | 0.83 | 1.09 | 1.09 |
| time (sec) | N/A | 0.243 | 0.459 | 4.290 | 0.394 | 0.259 | 1.016 | 0.377 | 0.245 |

| Problem 313 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 135 | 126 | 133 | 215 | 0 | 110 | 0 | 162 | 0 |
| N.S. | 1 | 0.93 | 0.99 | 1.59 | 0.00 | 0.81 | 0.00 | 1.20 | 0.00 |
| time (sec) | N/A | 0.616 | 0.089 | 1.846 | 0.000 | 0.275 | 0.000 | 0.344 | 0.000 |

| Problem 314 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 111 | 105 | 116 | 179 | 0 | 91 | 0 | 125 | 0 |
| N.S. | 1 | 0.95 | 1.05 | 1.61 | 0.00 | 0.82 | 0.00 | 1.13 | 0.00 |
| time (sec) | N/A | 0.418 | 0.075 | 1.751 | 0.000 | 0.247 | 0.000 | 0.341 | 0.000 |

| Problem 315 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 63 | 58 | 64 | 96 | 240 | 63 | 0 | 79 | 0 |
| N.S. | 1 | 0.92 | 1.02 | 1.52 | 3.81 | 1.00 | 0.00 | 1.25 | 0.00 |
| time (sec) | N/A | 0.287 | 0.043 | 1.502 | 0.313 | 0.256 | 0.000 | 0.299 | 0.000 |

| Problem 316 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 31 | 29 | 24 | 23 | 0 | 0 | 0 | 27 | 0 |
| N.S. | 1 | 0.94 | 0.77 | 0.74 | 0.00 | 0.00 | 0.00 | 0.87 | 0.00 |
| time (sec) | N/A | 0.341 | 0.057 | 1.792 | 0.000 | 0.000 | 0.000 | 0.313 | 0.000 |

| Problem 317 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 39 | 37 | 46 | 42 | 0 | 0 | 0 | 44 | 0 |
| N.S. | 1 | 0.95 | 1.18 | 1.08 | 0.00 | 0.00 | 0.00 | 1.13 | 0.00 |
| time (sec) | N/A | 0.418 | 0.046 | 1.755 | 0.000 | 0.000 | 0.000 | 0.349 | 0.000 |

| Problem 318 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 71 | 68 | 88 | 61 | 0 | 0 | 0 | 84 | 0 |
| N.S. | 1 | 0.96 | 1.24 | 0.86 | 0.00 | 0.00 | 0.00 | 1.18 | 0.00 |
| time (sec) | N/A | 0.387 | 0.211 | 1.744 | 0.000 | 0.000 | 0.000 | 0.359 | 0.000 |

| Problem 319 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-1) | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 115 | 104 | 117 | 81 | 0 | 0 | 0 | 128 | 0 |
| N.S. | 1 | 0.90 | 1.02 | 0.70 | 0.00 | 0.00 | 0.00 | 1.11 | 0.00 |
| time (sec) | N/A | 0.741 | 0.073 | 1.707 | 0.000 | 0.000 | 0.000 | 0.368 | 0.000 |

| Problem 320 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | A | B | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 245 | 313 | 272 | 628 | 0 | 243 | 694 | 296 | 0 |
| N.S. | 1 | 1.28 | 1.11 | 2.56 | 0.00 | 0.99 | 2.83 | 1.21 | 0.00 |
| time (sec) | N/A | 1.460 | 0.150 | 2.599 | 0.000 | 0.268 | 1.276 | 0.365 | 0.000 |

| Problem 321 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | F | A | B | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 199 | 238 | 216 | 515 | 0 | 185 | 568 | 227 | 0 |
| N.S. | 1 | 1.20 | 1.09 | 2.59 | 0.00 | 0.93 | 2.85 | 1.14 | 0.00 |
| time (sec) | N/A | 0.675 | 0.125 | 2.621 | 0.000 | 0.252 | 0.899 | 0.370 | 0.000 |

| Problem 322 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | B | A | B | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 110 | 120 | 129 | 280 | 402 | 125 | 298 | 141 | 0 |
| N.S. | 1 | 1.09 | 1.17 | 2.55 | 3.65 | 1.14 | 2.71 | 1.28 | 0.00 |
| time (sec) | N/A | 0.424 | 0.055 | 1.991 | 0.304 | 0.263 | 0.619 | 0.350 | 0.000 |

| Problem 323 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 47 | 42 | 37 | 36 | 0 | 0 | 0 | 41 | 0 |
| N.S. | 1 | 0.89 | 0.79 | 0.77 | 0.00 | 0.00 | 0.00 | 0.87 | 0.00 |
| time (sec) | N/A | 0.366 | 0.517 | 1.787 | 0.000 | 0.000 | 0.000 | 0.341 | 0.000 |

| Problem 324 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 57 | 57 | 70 | 70 | 0 | 0 | 0 | 61 | 0 |
| N.S. | 1 | 1.00 | 1.23 | 1.23 | 0.00 | 0.00 | 0.00 | 1.07 | 0.00 |
| time (sec) | N/A | 0.429 | 0.235 | 1.779 | 0.000 | 0.000 | 0.000 | 0.346 | 0.000 |

| Problem 325 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 90 | 114 | 110 | 108 | 0 | 0 | 0 | 101 | 0 |
| N.S. | 1 | 1.27 | 1.22 | 1.20 | 0.00 | 0.00 | 0.00 | 1.12 | 0.00 |
| time (sec) | N/A | 0.928 | 0.253 | 1.881 | 0.000 | 0.000 | 0.000 | 0.374 | 0.000 |

| Problem 326 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-1) | F | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 155 | 173 | 143 | 148 | 0 | 0 | 0 | 163 | 0 |
| N.S. | 1 | 1.12 | 0.92 | 0.95 | 0.00 | 0.00 | 0.00 | 1.05 | 0.00 |
| time (sec) | N/A | 1.358 | 0.240 | 1.839 | 0.000 | 0.000 | 0.000 | 0.403 | 0.000 |

| Problem 327 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | A | B | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 19 | 19 | 19 | 20 | 0 | 22 | 60 | 19 | 37 |
| N.S. | 1 | 1.00 | 1.00 | 1.05 | 0.00 | 1.16 | 3.16 | 1.00 | 1.95 |
| time (sec) | N/A | 0.266 | 0.023 | 1.882 | 0.000 | 0.264 | 0.445 | 0.292 | 0.527 |

| Problem 328 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | B | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 15 | 15 | 15 | 14 | 130 | 13 | 26 | 13 | 13 |
| N.S. | 1 | 1.00 | 1.00 | 0.93 | 8.67 | 0.87 | 1.73 | 0.87 | 0.87 |
| time (sec) | N/A | 0.254 | 0.017 | 1.759 | 0.295 | 0.247 | 0.297 | 0.325 | 0.303 |

| Problem 329 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | B | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 15 | 15 | 15 | 14 | 83 | 13 | 24 | 13 | 13 |
| N.S. | 1 | 1.00 | 1.00 | 0.93 | 5.53 | 0.87 | 1.60 | 0.87 | 0.87 |
| time (sec) | N/A | 0.230 | 0.015 | 1.760 | 0.284 | 0.260 | 0.248 | 0.298 | 0.298 |

| Problem 330 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | A | B | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 11 | 11 | 11 | 12 | 0 | 13 | 22 | 12 | 11 |
| N.S. | 1 | 1.00 | 1.00 | 1.09 | 0.00 | 1.18 | 2.00 | 1.09 | 1.00 |
| time (sec) | N/A | 0.261 | 0.028 | 1.687 | 0.000 | 0.235 | 0.279 | 0.307 | 0.301 |

| Problem 331 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | B | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 13 | 13 | 13 | 14 | 33 | 13 | 26 | 13 | 13 |
| N.S. | 1 | 1.00 | 1.00 | 1.08 | 2.54 | 1.00 | 2.00 | 1.00 | 1.00 |
| time (sec) | N/A | 0.253 | 0.014 | 1.816 | 0.611 | 0.241 | 0.461 | 0.359 | 0.289 |

| Problem 332 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | A | B | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 15 | 15 | 15 | 14 | 33 | 13 | 29 | 13 | 13 |
| N.S. | 1 | 1.00 | 1.00 | 0.93 | 2.20 | 0.87 | 1.93 | 0.87 | 0.87 |
| time (sec) | N/A | 0.250 | 0.014 | 1.817 | 17.146 | 0.227 | 0.653 | 0.360 | 0.271 |

| Problem 333 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | F | F | F | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 128 | 132 | 144 | 229 | 137 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.03 | 1.12 | 1.79 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.649 | 0.444 | 3.266 | 0.477 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 334 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F | F(-1) |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 97 | 97 | 114 | 189 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.18 | 1.95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.539 | 0.260 | 2.885 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 335 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | B | B | F | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 50 | 48 | 66 | 155 | 160 | 99 | 0 | 83 | 0 |
| N.S. | 1 | 0.96 | 1.32 | 3.10 | 3.20 | 1.98 | 0.00 | 1.66 | 0.00 |
| time (sec) | N/A | 0.268 | 0.077 | 2.000 | 0.333 | 0.261 | 0.000 | 0.324 | 0.000 |

| Problem 336 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 33 | 33 | 35 | 31 | 33 | 87 | 27 | 33 | 33 |
| N.S. | 1 | 1.00 | 1.06 | 0.94 | 1.00 | 2.64 | 0.82 | 1.00 | 1.00 |
| time (sec) | N/A | 0.284 | 0.847 | 2.743 | 0.439 | 0.241 | 3.319 | 0.390 | 0.244 |

| Problem 337 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 33 | 33 | 35 | 31 | 195 | 87 | 29 | 33 | 33 |
| N.S. | 1 | 1.00 | 1.06 | 0.94 | 5.91 | 2.64 | 0.88 | 1.00 | 1.00 |
| time (sec) | N/A | 0.366 | 8.401 | 2.747 | 6.528 | 0.246 | 3.240 | 0.431 | 0.250 |

| Problem 338 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | F | F(-1) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 46 | 46 | 46 | 80 | 206 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 1.74 | 4.48 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.339 | 0.066 | 0.954 | 0.288 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 339 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | B | F | F(-1) | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 46 | 46 | 54 | 80 | 200 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.17 | 1.74 | 4.35 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.267 | 0.062 | 0.887 | 0.308 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 340 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 84 | 86 | 60 | 71 | 76 | 65 | 90 | 140 | 0 |
| N.S. | 1 | 1.02 | 0.71 | 0.85 | 0.90 | 0.77 | 1.07 | 1.67 | 0.00 |
| time (sec) | N/A | 0.247 | 0.044 | 0.109 | 0.335 | 0.248 | 1.484 | 0.260 | 0.000 |

| Problem 341 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 82 | 94 | 87 | 95 | 130 | 65 | 85 | 110 | 0 |
| N.S. | 1 | 1.15 | 1.06 | 1.16 | 1.59 | 0.79 | 1.04 | 1.34 | 0.00 |
| time (sec) | N/A | 0.237 | 0.026 | 0.141 | 0.306 | 0.252 | 0.936 | 0.260 | 0.000 |

| Problem 342 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 62 | 65 | 70 | 62 | 59 | 55 | 65 | 87 | 0 |
| N.S. | 1 | 1.05 | 1.13 | 1.00 | 0.95 | 0.89 | 1.05 | 1.40 | 0.00 |
| time (sec) | N/A | 0.222 | 0.031 | 0.128 | 0.323 | 0.259 | 0.468 | 0.263 | 0.000 |

| Problem 343 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 57 | 62 | 62 | 74 | 88 | 53 | 60 | 59 | 50 |
| N.S. | 1 | 1.09 | 1.09 | 1.30 | 1.54 | 0.93 | 1.05 | 1.04 | 0.88 |
| time (sec) | N/A | 0.211 | 0.020 | 0.109 | 0.297 | 0.250 | 0.280 | 0.263 | 0.362 |

| Problem 344 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 45 | 40 | 43 | 38 | 37 | 38 | 42 | 38 | 37 |
| N.S. | 1 | 0.89 | 0.96 | 0.84 | 0.82 | 0.84 | 0.93 | 0.84 | 0.82 |
| time (sec) | N/A | 0.211 | 0.007 | 0.139 | 0.321 | 0.257 | 0.114 | 0.262 | 0.382 |

| Problem 345 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | B |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 69 | 69 | 64 | 0 | 0 | 0 | 0 | 0 | 57 |
| N.S. | 1 | 1.00 | 0.93 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.83 |
| time (sec) | N/A | 0.290 | 0.075 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.446 |

| Problem 346 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 39 | 39 | 44 | 38 | 57 | 61 | 54 | 354 | 36 |
| N.S. | 1 | 1.00 | 1.13 | 0.97 | 1.46 | 1.56 | 1.38 | 9.08 | 0.92 |
| time (sec) | N/A | 0.208 | 0.006 | 0.101 | 0.286 | 0.274 | 1.180 | 0.319 | 0.336 |

| Problem 347 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 41 | 41 | 46 | 54 | 38 | 42 | 70 | 176 | 0 |
| N.S. | 1 | 1.00 | 1.12 | 1.32 | 0.93 | 1.02 | 1.71 | 4.29 | 0.00 |
| time (sec) | N/A | 0.198 | 0.014 | 0.117 | 0.278 | 0.260 | 0.981 | 0.291 | 0.000 |

| Problem 348 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 64 | 64 | 69 | 61 | 81 | 84 | 126 | 301 | 0 |
| N.S. | 1 | 1.00 | 1.08 | 0.95 | 1.27 | 1.31 | 1.97 | 4.70 | 0.00 |
| time (sec) | N/A | 0.220 | 0.021 | 0.116 | 0.269 | 0.298 | 2.099 | 0.478 | 0.000 |

| Problem 349 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 66 | 70 | 60 | 64 | 61 | 54 | 112 | 342 | 0 |
| N.S. | 1 | 1.06 | 0.91 | 0.97 | 0.92 | 0.82 | 1.70 | 5.18 | 0.00 |
| time (sec) | N/A | 0.215 | 0.027 | 0.101 | 0.275 | 0.290 | 1.906 | 0.294 | 0.000 |

| Problem 350 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 89 | 93 | 63 | 84 | 125 | 97 | 201 | 467 | 0 |
| N.S. | 1 | 1.04 | 0.71 | 0.94 | 1.40 | 1.09 | 2.26 | 5.25 | 0.00 |
| time (sec) | N/A | 0.229 | 0.021 | 0.123 | 0.271 | 0.319 | 5.116 | 1.000 | 0.000 |

| Problem 351 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 91 | 99 | 68 | 72 | 82 | 64 | 170 | 504 | 0 |
| N.S. | 1 | 1.09 | 0.75 | 0.79 | 0.90 | 0.70 | 1.87 | 5.54 | 0.00 |
| time (sec) | N/A | 0.237 | 0.032 | 0.108 | 0.270 | 0.318 | 5.259 | 0.308 | 0.000 |

| Problem 352 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | A | A | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 86 | 98 | 82 | 108 | 0 | 58 | 58 | 0 | 0 |
| N.S. | 1 | 1.14 | 0.95 | 1.26 | 0.00 | 0.67 | 0.67 | 0.00 | 0.00 |
| time (sec) | N/A | 0.233 | 0.161 | 0.937 | 0.000 | 0.097 | 1.356 | 0.000 | 0.000 |

| Problem 353 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | A | A | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 83 | 90 | 93 | 101 | 0 | 59 | 58 | 0 | 0 |
| N.S. | 1 | 1.08 | 1.12 | 1.22 | 0.00 | 0.71 | 0.70 | 0.00 | 0.00 |
| time (sec) | N/A | 0.266 | 0.176 | 0.701 | 0.000 | 0.092 | 1.137 | 0.000 | 0.000 |

| Problem 354 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | A | A | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 61 | 66 | 72 | 88 | 0 | 42 | 58 | 0 | 0 |
| N.S. | 1 | 1.08 | 1.18 | 1.44 | 0.00 | 0.69 | 0.95 | 0.00 | 0.00 |
| time (sec) | N/A | 0.205 | 0.107 | 0.536 | 0.000 | 0.081 | 0.927 | 0.000 | 0.000 |

| Problem 355 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | A | A | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 49 | 49 | 39 | 71 | 0 | 41 | 49 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.80 | 1.45 | 0.00 | 0.84 | 1.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.180 | 10.013 | 0.540 | 0.000 | 0.088 | 0.592 | 0.000 | 0.000 |

| Problem 356 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | B | F | A | A | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 34 | 34 | 44 | 66 | 0 | 45 | 49 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.29 | 1.94 | 0.00 | 1.32 | 1.44 | 0.00 | 0.00 |
| time (sec) | N/A | 0.188 | 0.049 | 0.387 | 0.000 | 0.113 | 0.757 | 0.000 | 0.000 |

| Problem 357 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F | A | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 81 | 83 | 89 | 97 | 0 | 0 | 60 | 0 | 0 |
| N.S. | 1 | 1.02 | 1.10 | 1.20 | 0.00 | 0.00 | 0.74 | 0.00 | 0.00 |
| time (sec) | N/A | 0.264 | 0.140 | 0.502 | 0.000 | 0.000 | 0.969 | 0.000 | 0.000 |

| Problem 358 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F | A | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 61 | 65 | 72 | 87 | 0 | 0 | 61 | 0 | 0 |
| N.S. | 1 | 1.07 | 1.18 | 1.43 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.213 | 0.105 | 0.600 | 0.000 | 0.000 | 1.251 | 0.000 | 0.000 |

| Problem 359 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F | F | A | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 106 | 112 | 100 | 118 | 0 | 0 | 65 | 0 | 0 |
| N.S. | 1 | 1.06 | 0.94 | 1.11 | 0.00 | 0.00 | 0.61 | 0.00 | 0.00 |
| time (sec) | N/A | 0.297 | 0.164 | 0.721 | 0.000 | 0.000 | 1.742 | 0.000 | 0.000 |

| Problem 360 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | B |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 62 | 71 | 58 | 0 | 0 | 0 | 0 | 0 | 50 |
| N.S. | 1 | 1.15 | 0.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.81 |
| time (sec) | N/A | 0.317 | 0.036 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.398 |

| Problem 361 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 78 | 91 | 64 | 53 | 52 | 36 | 54 | 77 | 0 |
| N.S. | 1 | 1.17 | 0.82 | 0.68 | 0.67 | 0.46 | 0.69 | 0.99 | 0.00 |
| time (sec) | N/A | 0.214 | 0.029 | 0.082 | 0.283 | 0.253 | 1.246 | 0.276 | 0.000 |

| Problem 362 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 60 | 68 | 47 | 41 | 40 | 31 | 46 | 50 | 0 |
| N.S. | 1 | 1.13 | 0.78 | 0.68 | 0.67 | 0.52 | 0.77 | 0.83 | 0.00 |
| time (sec) | N/A | 0.198 | 0.020 | 0.077 | 0.292 | 0.264 | 0.512 | 0.292 | 0.000 |

| Problem 363 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 37 | 39 | 46 | 26 | 25 | 24 | 29 | 27 | 37 |
| N.S. | 1 | 1.05 | 1.24 | 0.70 | 0.68 | 0.65 | 0.78 | 0.73 | 1.00 |
| time (sec) | N/A | 0.174 | 0.077 | 0.062 | 0.280 | 0.247 | 0.110 | 0.263 | 0.769 |

| Problem 364 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 56 | 69 | 53 | 97 | 0 | 0 | 0 | 0 | 42 |
| N.S. | 1 | 1.23 | 0.95 | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.75 |
| time (sec) | N/A | 0.313 | 0.027 | 0.697 | 0.000 | 0.000 | 0.000 | 0.000 | 0.538 |

| Problem 365 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | C | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 28 | 28 | 23 | 23 | 22 | 21 | 42 | 40 | 0 |
| N.S. | 1 | 1.00 | 0.82 | 0.82 | 0.79 | 0.75 | 1.50 | 1.43 | 0.00 |
| time (sec) | N/A | 0.167 | 0.012 | 0.070 | 0.265 | 0.245 | 1.585 | 0.283 | 0.000 |

| Problem 366 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 50 | 55 | 32 | 35 | 34 | 28 | 51 | 74 | 0 |
| N.S. | 1 | 1.10 | 0.64 | 0.70 | 0.68 | 0.56 | 1.02 | 1.48 | 0.00 |
| time (sec) | N/A | 0.181 | 0.022 | 0.065 | 0.270 | 0.258 | 2.728 | 0.281 | 0.000 |

| Problem 367 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 68 | 78 | 44 | 47 | 46 | 33 | 66 | 106 | 0 |
| N.S. | 1 | 1.15 | 0.65 | 0.69 | 0.68 | 0.49 | 0.97 | 1.56 | 0.00 |
| time (sec) | N/A | 0.189 | 0.021 | 0.075 | 0.277 | 0.239 | 8.501 | 0.276 | 0.000 |

| Problem 368 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 86 | 101 | 49 | 59 | 58 | 38 | 78 | 138 | 0 |
| N.S. | 1 | 1.17 | 0.57 | 0.69 | 0.67 | 0.44 | 0.91 | 1.60 | 0.00 |
| time (sec) | N/A | 0.197 | 0.021 | 0.079 | 0.270 | 0.248 | 25.745 | 0.272 | 0.000 |

| Problem 369 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 89 | 93 | 91 | 84 | 125 | 118 | 175 | 464 | 0 |
| N.S. | 1 | 1.04 | 1.02 | 0.94 | 1.40 | 1.33 | 1.97 | 5.21 | 0.00 |
| time (sec) | N/A | 0.240 | 0.063 | 0.464 | 0.277 | 0.268 | 3.726 | 1.012 | 0.000 |

| Problem 370 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 64 | 68 | 59 | 67 | 59 | 51 | 107 | 340 | 0 |
| N.S. | 1 | 1.06 | 0.92 | 1.05 | 0.92 | 0.80 | 1.67 | 5.31 | 0.00 |
| time (sec) | N/A | 0.218 | 0.046 | 0.311 | 0.273 | 0.253 | 1.430 | 0.285 | 0.000 |

| Problem 371 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 64 | 64 | 79 | 64 | 81 | 106 | 105 | 298 | 0 |
| N.S. | 1 | 1.00 | 1.23 | 1.00 | 1.27 | 1.66 | 1.64 | 4.66 | 0.00 |
| time (sec) | N/A | 0.222 | 0.036 | 0.362 | 0.281 | 0.260 | 1.959 | 0.491 | 0.000 |

| Problem 372 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | B | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 39 | 39 | 47 | 47 | 36 | 40 | 58 | 174 | 36 |
| N.S. | 1 | 1.00 | 1.21 | 1.21 | 0.92 | 1.03 | 1.49 | 4.46 | 0.92 |
| time (sec) | N/A | 0.186 | 0.029 | 0.320 | 0.274 | 0.247 | 0.912 | 0.281 | 0.313 |

| Problem 373 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | A | A | B | A | B | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 31 | 31 | 89 | 37 | 52 | 75 | 32 | 60 | 32 |
| N.S. | 1 | 1.00 | 2.87 | 1.19 | 1.68 | 2.42 | 1.03 | 1.94 | 1.03 |
| time (sec) | N/A | 0.159 | 0.060 | 0.313 | 0.271 | 0.262 | 0.980 | 0.279 | 0.781 |

| Problem 374 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F | F | F | F(-2) | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 67 | 67 | 61 | 134 | 0 | 0 | 0 | 0 | 57 |
| N.S. | 1 | 1.00 | 0.91 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.85 |
| time (sec) | N/A | 0.290 | 0.073 | 1.025 | 0.000 | 0.000 | 0.000 | 0.000 | 0.460 |

| Problem 375 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 39 | 39 | 39 | 38 | 37 | 40 | 32 | 38 | 37 |
| N.S. | 1 | 1.00 | 1.00 | 0.97 | 0.95 | 1.03 | 0.82 | 0.97 | 0.95 |
| time (sec) | N/A | 0.212 | 0.020 | 0.178 | 0.267 | 0.248 | 0.414 | 0.266 | 0.310 |

| Problem 376 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 57 | 62 | 65 | 55 | 86 | 55 | 112 | 70 | 50 |
| N.S. | 1 | 1.09 | 1.14 | 0.96 | 1.51 | 0.96 | 1.96 | 1.23 | 0.88 |
| time (sec) | N/A | 0.219 | 0.030 | 0.348 | 0.287 | 0.249 | 1.940 | 0.279 | 0.364 |

| Problem 377 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 62 | 65 | 60 | 63 | 58 | 57 | 112 | 88 | 0 |
| N.S. | 1 | 1.05 | 0.97 | 1.02 | 0.94 | 0.92 | 1.81 | 1.42 | 0.00 |
| time (sec) | N/A | 0.235 | 0.046 | 0.356 | 0.291 | 0.254 | 1.674 | 0.272 | 0.000 |

| Problem 378 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 82 | 94 | 77 | 75 | 126 | 67 | 180 | 111 | 0 |
| N.S. | 1 | 1.15 | 0.94 | 0.91 | 1.54 | 0.82 | 2.20 | 1.35 | 0.00 |
| time (sec) | N/A | 0.240 | 0.041 | 0.332 | 0.271 | 0.255 | 3.784 | 0.267 | 0.000 |

| Problem 379 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 81 | 81 | 78 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.230 | 0.091 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 380 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | C | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 68 | 68 | 75 | 0 | 0 | 0 | 82 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.10 | 0.00 | 0.00 | 0.00 | 1.21 | 0.00 | 0.00 |
| time (sec) | N/A | 0.221 | 0.059 | 0.000 | 0.000 | 0.000 | 3.953 | 0.000 | 0.000 |

| Problem 381 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | C | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 69 | 69 | 75 | 0 | 0 | 0 | 75 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.09 | 0.00 | 0.00 | 0.00 | 1.09 | 0.00 | 0.00 |
| time (sec) | N/A | 0.214 | 0.047 | 0.000 | 0.000 | 0.000 | 2.222 | 0.000 | 0.000 |

| Problem 382 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | C | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 60 | 60 | 60 | 0 | 0 | 0 | 71 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.18 | 0.00 | 0.00 |
| time (sec) | N/A | 0.183 | 0.045 | 0.000 | 0.000 | 0.000 | 1.314 | 0.000 | 0.000 |

| Problem 383 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | A | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 75 | 75 | 157 | 143 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 2.09 | 1.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.304 | 0.148 | 0.974 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 384 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | C | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 69 | 69 | 68 | 0 | 0 | 0 | 73 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.99 | 0.00 | 0.00 | 0.00 | 1.06 | 0.00 | 0.00 |
| time (sec) | N/A | 0.224 | 0.061 | 0.000 | 0.000 | 0.000 | 2.270 | 0.000 | 0.000 |

| Problem 385 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | C | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 72 | 73 | 75 | 0 | 0 | 0 | 75 | 0 | 0 |
| N.S. | 1 | 1.01 | 1.04 | 0.00 | 0.00 | 0.00 | 1.04 | 0.00 | 0.00 |
| time (sec) | N/A | 0.225 | 0.046 | 0.000 | 0.000 | 0.000 | 4.232 | 0.000 | 0.000 |

| Problem 386 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | B | B | A | A | B | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 129 | 154 | 116 | 258 | 245 | 97 | 204 | 254 | 0 |
| N.S. | 1 | 1.19 | 0.90 | 2.00 | 1.90 | 0.75 | 1.58 | 1.97 | 0.00 |
| time (sec) | N/A | 0.374 | 0.089 | 0.185 | 0.273 | 0.260 | 0.568 | 0.284 | 0.000 |

| Problem 387 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 115 | 136 | 98 | 191 | 174 | 79 | 133 | 128 | 0 |
| N.S. | 1 | 1.18 | 0.85 | 1.66 | 1.51 | 0.69 | 1.16 | 1.11 | 0.00 |
| time (sec) | N/A | 0.343 | 0.066 | 0.127 | 0.286 | 0.255 | 0.309 | 0.275 | 0.000 |

| Problem 388 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 57 | 52 | 183 | 46 | 45 | 57 | 76 | 49 | 108 |
| N.S. | 1 | 0.91 | 3.21 | 0.81 | 0.79 | 1.00 | 1.33 | 0.86 | 1.89 |
| time (sec) | N/A | 0.251 | 0.103 | 0.174 | 0.275 | 0.257 | 0.128 | 0.281 | 0.789 |

| Problem 389 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 214 | 214 | 221 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.667 | 0.102 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 390 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | A | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 90 | 90 | 81 | 89 | 0 | 280 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.90 | 0.99 | 0.00 | 3.11 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.274 | 0.053 | 0.142 | 0.000 | 0.297 | 0.000 | 0.000 | 0.000 |

| Problem 391 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | A | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 137 | 135 | 148 | 132 | 0 | 392 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 1.08 | 0.96 | 0.00 | 2.86 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.326 | 0.373 | 0.122 | 0.000 | 0.327 | 0.000 | 0.000 | 0.000 |

| Problem 392 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | F(-2) | A | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 190 | 199 | 174 | 245 | 0 | 496 | 0 | 0 | 0 |
| N.S. | 1 | 1.05 | 0.92 | 1.29 | 0.00 | 2.61 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.408 | 0.335 | 0.125 | 0.000 | 0.393 | 0.000 | 0.000 | 0.000 |

| Problem 393 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F(-2) | A | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 336 | 289 | 349 | 346 | 0 | 88 | 0 | 0 | 0 |
| N.S. | 1 | 0.86 | 1.04 | 1.03 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.561 | 0.426 | 1.194 | 0.000 | 0.099 | 0.000 | 0.000 | 0.000 |

| Problem 394 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F(-2) | A | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 287 | 233 | 307 | 295 | 0 | 72 | 0 | 0 | 0 |
| N.S. | 1 | 0.81 | 1.07 | 1.03 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.433 | 0.368 | 0.807 | 0.000 | 0.090 | 0.000 | 0.000 | 0.000 |

| Problem 395 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F(-2) | A | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 237 | 237 | 155 | 153 | 0 | 55 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.65 | 0.65 | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.402 | 10.097 | 0.618 | 0.000 | 0.091 | 0.000 | 0.000 | 0.000 |

| Problem 396 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F(-2) | A | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 126 | 126 | 140 | 114 | 0 | 17 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.11 | 0.90 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.279 | 0.184 | 0.342 | 0.000 | 0.140 | 0.000 | 0.000 | 0.000 |

| Problem 397 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 284 | 240 | 243 | 207 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.85 | 0.86 | 0.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.441 | 0.266 | 0.552 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 398 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | C | A | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 355 | 301 | 370 | 346 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.85 | 1.04 | 0.97 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.528 | 0.519 | 0.837 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 399 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 47 | 35 | 41 | 38 | 37 | 46 | 61 | 37 | 99 |
| N.S. | 1 | 0.74 | 0.87 | 0.81 | 0.79 | 0.98 | 1.30 | 0.79 | 2.11 |
| time (sec) | N/A | 0.255 | 0.022 | 0.071 | 0.278 | 0.243 | 0.236 | 0.278 | 0.767 |

| Problem 400 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | A | A | B | A | B |
| verified | N/A | No | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 47 | 37 | 47 | 0 | 39 | 57 | 80 | 39 | 109 |
| N.S. | 1 | 0.79 | 1.00 | 0.00 | 0.83 | 1.21 | 1.70 | 0.83 | 2.32 |
| time (sec) | N/A | 0.287 | 0.028 | 0.000 | 0.269 | 0.256 | 12.937 | 0.278 | 0.380 |

| Problem 401 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 127 | 127 | 123 | 0 | 0 | 207 | 0 | 664 | 0 |
| N.S. | 1 | 1.00 | 0.97 | 0.00 | 0.00 | 1.63 | 0.00 | 5.23 | 0.00 |
| time (sec) | N/A | 0.293 | 0.068 | 0.000 | 0.000 | 0.261 | 0.000 | 1.028 | 0.000 |

| Problem 402 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 110 | 107 | 162 | 0 | 0 | 144 | 0 | 370 | 0 |
| N.S. | 1 | 0.97 | 1.47 | 0.00 | 0.00 | 1.31 | 0.00 | 3.36 | 0.00 |
| time (sec) | N/A | 0.264 | 0.088 | 0.000 | 0.000 | 0.257 | 0.000 | 0.678 | 0.000 |

| Problem 403 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 63 | 63 | 63 | 0 | 0 | 91 | 0 | 172 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 0.00 | 0.00 | 1.44 | 0.00 | 2.73 | 0.00 |
| time (sec) | N/A | 0.191 | 0.013 | 0.000 | 0.000 | 0.255 | 0.000 | 0.416 | 0.000 |

| Problem 404 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | F | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 43 | 43 | 41 | 45 | 45 | 48 | 0 | 55 | 39 |
| N.S. | 1 | 1.00 | 0.95 | 1.05 | 1.05 | 1.12 | 0.00 | 1.28 | 0.91 |
| time (sec) | N/A | 0.172 | 0.016 | 0.068 | 0.298 | 0.249 | 0.000 | 0.277 | 0.557 |

| Problem 405 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 159 | 159 | 120 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.252 | 0.544 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 406 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 205 | 205 | 164 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.258 | 1.164 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 407 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 227 | 235 | 187 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.04 | 0.82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.342 | 0.335 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 408 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 135 | 135 | 131 | 0 | 0 | 207 | 0 | 617 | 0 |
| N.S. | 1 | 1.00 | 0.97 | 0.00 | 0.00 | 1.53 | 0.00 | 4.57 | 0.00 |
| time (sec) | N/A | 0.271 | 0.076 | 0.000 | 0.000 | 0.261 | 0.000 | 1.005 | 0.000 |

| Problem 409 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 115 | 113 | 166 | 0 | 0 | 144 | 0 | 346 | 0 |
| N.S. | 1 | 0.98 | 1.44 | 0.00 | 0.00 | 1.25 | 0.00 | 3.01 | 0.00 |
| time (sec) | N/A | 0.250 | 0.084 | 0.000 | 0.000 | 0.249 | 0.000 | 0.651 | 0.000 |

| Problem 410 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | F | B | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 67 | 67 | 67 | 0 | 0 | 91 | 0 | 160 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 0.00 | 0.00 | 1.36 | 0.00 | 2.39 | 0.00 |
| time (sec) | N/A | 0.181 | 0.026 | 0.000 | 0.000 | 0.252 | 0.000 | 0.438 | 0.000 |

| Problem 411 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | F | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 45 | 45 | 43 | 45 | 45 | 48 | 0 | 50 | 39 |
| N.S. | 1 | 1.00 | 0.96 | 1.00 | 1.00 | 1.07 | 0.00 | 1.11 | 0.87 |
| time (sec) | N/A | 0.160 | 0.018 | 0.065 | 0.304 | 0.249 | 0.000 | 0.267 | 0.500 |

| Problem 412 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 168 | 168 | 130 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.225 | 0.210 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 413 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 216 | 216 | 183 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.252 | 0.532 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 414 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 240 | 248 | 195 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.03 | 0.81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.342 | 0.480 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 415 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | A | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 40 | 40 | 40 | 0 | 0 | 43 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 0.00 | 0.00 | 1.08 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.163 | 0.010 | 0.000 | 0.000 | 0.240 | 0.000 | 0.000 | 0.000 |

| Problem 416 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | F | A | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 44 | 44 | 44 | 0 | 0 | 43 | 0 | 58 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 0.00 | 0.00 | 0.98 | 0.00 | 1.32 | 0.00 |
| time (sec) | N/A | 0.168 | 0.011 | 0.000 | 0.000 | 0.254 | 0.000 | 0.277 | 0.000 |

| Problem 417 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 277 | 278 | 269 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.97 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.380 | 0.189 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 418 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 247 | 253 | 249 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.348 | 0.240 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 419 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 210 | 210 | 207 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.251 | 0.037 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 420 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 185 | 185 | 143 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.240 | 0.027 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 421 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 238 | 238 | 238 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.284 | 0.444 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 422 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 261 | 265 | 247 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 0.95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.342 | 0.364 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 423 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 317 | 318 | 297 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.379 | 0.569 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 424 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 299 | 300 | 292 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.403 | 0.213 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 425 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 267 | 273 | 265 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 0.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.382 | 0.293 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 426 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 228 | 228 | 225 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.274 | 0.041 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 427 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 201 | 201 | 155 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.253 | 0.042 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 428 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 256 | 256 | 256 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.290 | 0.328 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 429 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 281 | 285 | 270 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.01 | 0.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.364 | 0.575 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 430 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F(-2) | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 339 | 340 | 319 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.381 | 0.636 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 431 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | F(-1) | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 40 | 40 | 42 | 36 | 39 | 38 | 0 | 38 | 39 |
| N.S. | 1 | 1.00 | 1.05 | 0.90 | 0.98 | 0.95 | 0.00 | 0.95 | 0.98 |
| time (sec) | N/A | 0.228 | 0.185 | 2.125 | 1.082 | 0.292 | 0.000 | 0.921 | 0.707 |

| Problem 432 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | F | B | F | F | F(-1) | F | F(-1) |
| verified | N/A | Yes | N/A | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 275 | 282 | 0 | 1171 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.03 | 0.00 | 4.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.761 | 0.000 | 3.272 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 433 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | F | B | F | F | F(-1) | F | F(-1) |
| verified | N/A | Yes | N/A | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 205 | 212 | 0 | 657 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.03 | 0.00 | 3.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.617 | 0.000 | 1.296 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 434 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | F | A | F | F | F(-1) | F | F(-1) |
| verified | N/A | Yes | N/A | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 141 | 144 | 0 | 273 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.02 | 0.00 | 1.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.455 | 0.000 | 0.754 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 435 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 40 | 40 | 42 | 36 | 39 | 48 | 61 | 38 | 39 |
| N.S. | 1 | 1.00 | 1.05 | 0.90 | 0.98 | 1.20 | 1.52 | 0.95 | 0.98 |
| time (sec) | N/A | 0.219 | 0.316 | 0.900 | 0.446 | 0.247 | 133.389 | 0.419 | 0.456 |

| Problem 436 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | F(-1) | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 40 | 40 | 42 | 36 | 225 | 91 | 0 | 38 | 39 |
| N.S. | 1 | 1.00 | 1.05 | 0.90 | 5.62 | 2.28 | 0.00 | 0.95 | 0.98 |
| time (sec) | N/A | 0.218 | 3.156 | 0.806 | 1.893 | 0.248 | 0.000 | 0.542 | 1.289 |

| Problem 437 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 22 | 22 | 22 | 18 | 17 | 17 | 17 | 17 | 17 |
| N.S. | 1 | 1.00 | 1.00 | 0.82 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| time (sec) | N/A | 0.204 | 0.008 | 0.079 | 0.293 | 0.244 | 0.235 | 0.287 | 0.360 |

| Problem 438 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | F | A | F | F(-2) | F | F | B |
| verified | N/A | No | N/A | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 84 | 85 | 0 | 170 | 0 | 0 | 0 | 0 | 70 |
| N.S. | 1 | 1.01 | 0.00 | 2.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.83 |
| time (sec) | N/A | 0.365 | 0.000 | 0.922 | 0.000 | 0.000 | 0.000 | 0.000 | 0.789 |

| Problem 439 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 81 | 73 | 50 | 0 | 0 | 54 | 100 | 97 | 0 |
| N.S. | 1 | 0.90 | 0.62 | 0.00 | 0.00 | 0.67 | 1.23 | 1.20 | 0.00 |
| time (sec) | N/A | 0.268 | 0.124 | 0.000 | 0.000 | 0.255 | 0.511 | 0.295 | 0.000 |

| Problem 440 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 82 | 75 | 50 | 0 | 0 | 45 | 80 | 76 | 0 |
| N.S. | 1 | 0.91 | 0.61 | 0.00 | 0.00 | 0.55 | 0.98 | 0.93 | 0.00 |
| time (sec) | N/A | 0.259 | 0.096 | 0.000 | 0.000 | 0.250 | 0.341 | 0.293 | 0.000 |

| Problem 441 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 41 | 42 | 30 | 0 | 0 | 35 | 53 | 53 | 0 |
| N.S. | 1 | 1.02 | 0.73 | 0.00 | 0.00 | 0.85 | 1.29 | 1.29 | 0.00 |
| time (sec) | N/A | 0.244 | 0.033 | 0.000 | 0.000 | 0.265 | 0.219 | 0.282 | 0.000 |

| Problem 442 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 39 | 41 | 31 | 0 | 0 | 26 | 32 | 31 | 0 |
| N.S. | 1 | 1.05 | 0.79 | 0.00 | 0.00 | 0.67 | 0.82 | 0.79 | 0.00 |
| time (sec) | N/A | 0.189 | 0.025 | 0.000 | 0.000 | 0.259 | 0.099 | 0.273 | 0.000 |

| Problem 443 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 43 | 43 | 75 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.250 | 0.042 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 444 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 83 | 83 | 54 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 0.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.293 | 0.086 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 445 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 101 | 93 | 67 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.92 | 0.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.314 | 0.067 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 446 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 129 | 121 | 84 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.94 | 0.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.322 | 0.067 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 447 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 49 | 47 | 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.96 | 0.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.255 | 0.026 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 448 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 65 | 63 | 48 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.245 | 0.028 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 449 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 12 | 12 | 14 | 11 | 13 | 13 | 10 | 13 | 13 |
| N.S. | 1 | 1.00 | 1.17 | 0.92 | 1.08 | 1.08 | 0.83 | 1.08 | 1.08 |
| time (sec) | N/A | 0.232 | 0.168 | 0.034 | 0.420 | 0.247 | 0.361 | 0.314 | 0.252 |

| Problem 450 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 12 | 12 | 14 | 11 | 13 | 13 | 12 | 13 | 13 |
| N.S. | 1 | 1.00 | 1.17 | 0.92 | 1.08 | 1.08 | 1.00 | 1.08 | 1.08 |
| time (sec) | N/A | 0.269 | 1.474 | 0.031 | 0.420 | 0.244 | 0.381 | 0.329 | 0.251 |

| Problem 451 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 309 | 278 | 148 | 0 | 0 | 129 | 416 | 334 | 0 |
| N.S. | 1 | 0.90 | 0.48 | 0.00 | 0.00 | 0.42 | 1.35 | 1.08 | 0.00 |
| time (sec) | N/A | 0.719 | 0.349 | 0.000 | 0.000 | 0.271 | 0.613 | 0.296 | 0.000 |

| Problem 452 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 205 | 185 | 103 | 0 | 0 | 85 | 243 | 208 | 0 |
| N.S. | 1 | 0.90 | 0.50 | 0.00 | 0.00 | 0.41 | 1.19 | 1.01 | 0.00 |
| time (sec) | N/A | 0.553 | 0.158 | 0.000 | 0.000 | 0.283 | 0.388 | 0.306 | 0.000 |

| Problem 453 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 101 | 94 | 59 | 0 | 0 | 63 | 146 | 108 | 0 |
| N.S. | 1 | 0.93 | 0.58 | 0.00 | 0.00 | 0.62 | 1.45 | 1.07 | 0.00 |
| time (sec) | N/A | 0.429 | 0.132 | 0.000 | 0.000 | 0.273 | 0.305 | 0.305 | 0.000 |

| Problem 454 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | A | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 51 | 49 | 35 | 0 | 0 | 39 | 65 | 43 | 0 |
| N.S. | 1 | 0.96 | 0.69 | 0.00 | 0.00 | 0.76 | 1.27 | 0.84 | 0.00 |
| time (sec) | N/A | 0.197 | 0.022 | 0.000 | 0.000 | 0.278 | 0.120 | 0.288 | 0.000 |

| Problem 455 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 12 | 12 | 14 | 11 | 13 | 13 | 10 | 13 | 13 |
| N.S. | 1 | 1.00 | 1.17 | 0.92 | 1.08 | 1.08 | 0.83 | 1.08 | 1.08 |
| time (sec) | N/A | 0.459 | 0.135 | 0.033 | 0.452 | 0.267 | 0.367 | 0.362 | 0.298 |

| Problem 456 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 12 | 12 | 14 | 11 | 13 | 13 | 12 | 13 | 13 |
| N.S. | 1 | 1.00 | 1.17 | 0.92 | 1.08 | 1.08 | 1.00 | 1.08 | 1.08 |
| time (sec) | N/A | 0.475 | 0.200 | 0.033 | 0.451 | 0.264 | 0.409 | 0.388 | 0.274 |

| Problem 457 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 381 | 350 | 221 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.92 | 0.58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.832 | 0.285 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 458 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 265 | 245 | 161 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.92 | 0.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.664 | 0.152 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 459 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 123 | 116 | 93 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.94 | 0.76 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.505 | 0.124 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 460 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 69 | 67 | 52 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.97 | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.245 | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 461 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 14 | 14 | 16 | 13 | 15 | 15 | 12 | 15 | 15 |
| N.S. | 1 | 1.00 | 1.14 | 0.93 | 1.07 | 1.07 | 0.86 | 1.07 | 1.07 |
| time (sec) | N/A | 0.461 | 0.156 | 0.029 | 0.483 | 0.246 | 0.421 | 0.375 | 0.279 |

| Problem 462 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| verified | N/A | N/A | N/A | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 14 | 14 | 16 | 13 | 15 | 15 | 14 | 15 | 15 |
| N.S. | 1 | 1.00 | 1.14 | 0.93 | 1.07 | 1.07 | 1.00 | 1.07 | 1.07 |
| time (sec) | N/A | 0.481 | 0.368 | 0.032 | 0.482 | 0.239 | 0.470 | 0.369 | 0.273 |

| Problem 463 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 162 | 167 | 69 | 0 | 0 | 71 | 141 | 0 | 0 |
| N.S. | 1 | 1.03 | 0.43 | 0.00 | 0.00 | 0.44 | 0.87 | 0.00 | 0.00 |
| time (sec) | N/A | 0.837 | 0.334 | 0.000 | 0.000 | 0.267 | 13.730 | 0.000 | 0.000 |

| Problem 464 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 112 | 114 | 51 | 0 | 0 | 55 | 95 | 0 | 0 |
| N.S. | 1 | 1.02 | 0.46 | 0.00 | 0.00 | 0.49 | 0.85 | 0.00 | 0.00 |
| time (sec) | N/A | 0.634 | 0.150 | 0.000 | 0.000 | 0.256 | 1.394 | 0.000 | 0.000 |

| Problem 465 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | A | A | F(-2) | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 62 | 61 | 31 | 0 | 0 | 35 | 49 | 0 | 0 |
| N.S. | 1 | 0.98 | 0.50 | 0.00 | 0.00 | 0.56 | 0.79 | 0.00 | 0.00 |
| time (sec) | N/A | 0.492 | 0.084 | 0.000 | 0.000 | 0.262 | 0.140 | 0.000 | 0.000 |

| Problem 466 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 10 | 10 | 10 | 10 | 9 | 9 | 8 | 9 | 9 |
| N.S. | 1 | 1.00 | 1.00 | 1.00 | 0.90 | 0.90 | 0.80 | 0.90 | 0.90 |
| time (sec) | N/A | 0.470 | 0.016 | 0.352 | 0.287 | 0.251 | 0.239 | 0.294 | 0.278 |

| Problem 467 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 45 | 45 | 45 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.519 | 0.060 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 468 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F | F | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 96 | 95 | 84 | 0 | 0 | 0 | 0 | 0 | 0 |
| N.S. | 1 | 0.99 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.578 | 0.129 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Problem 469 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | B | A | F | B | F | B | B |
| verified | N/A | No | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 47 | 48 | 529 | 47 | 0 | 141 | 0 | 95 | 42 |
| N.S. | 1 | 1.02 | 11.26 | 1.00 | 0.00 | 3.00 | 0.00 | 2.02 | 0.89 |
| time (sec) | N/A | 0.247 | 2.784 | 0.592 | 0.000 | 0.261 | 0.000 | 0.318 | 0.740 |

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

| Problem 471 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | A | F | F | F(-1) |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 38 | 38 | 38 | 0 | 0 | 41 | 0 | 0 | 0 |
| N.S. | 1 | 1.00 | 1.00 | 0.00 | 0.00 | 1.08 | 0.00 | 0.00 | 0.00 |
| time (sec) | N/A | 0.272 | 0.040 | 0.000 | 0.000 | 0.264 | 0.000 | 0.000 | 0.000 |

| Problem 472 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | F | F(-2) | A | F | F | B |
| verified | N/A | Yes | Yes | N/A | TBD | TBD | TBD | TBD | TBD |
| size | 30 | 30 | 26 | 0 | 0 | 28 | 0 | 0 | 26 |
| N.S. | 1 | 1.00 | 0.87 | 0.00 | 0.00 | 0.93 | 0.00 | 0.00 | 0.87 |
| time (sec) | N/A | 0.268 | 0.019 | 0.000 | 0.000 | 0.241 | 0.000 | 0.000 | 0.352 |

| Problem 473 | Optimal | Rubi | MMA | Maple | Maxima | Fricas | Sympy | Giac | Mupad |
|---|---|---|---|---|---|---|---|---|---|
| grade | N/A | A | A | A | A | A | A | A | B |
| verified | N/A | Yes | Yes | Yes | TBD | TBD | TBD | TBD | TBD |
| size | 16 | 16 | 16 | 17 | 12 | 14 | 12 | 14 | 12 |
| N.S. | 1 | 1.00 | 1.00 | 1.06 | 0.75 | 0.88 | 0.75 | 0.88 | 0.75 |
| time (sec) | N/A | 0.165 | 0.019 | 0.486 | 0.275 | 0.249 | 0.105 | 0.272 | 0.337 |

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

## 2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi only. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is also given. The larger this ratio is, the harder the integral is to solve. In this test file, problem number [137] had the largest ratio of [1.41667000000000010]

Table 2.1: Rubi specific breakdown of results for each integral

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 1 | A | 8 | 8 | 1.15 | 16 | 0.500 |
| 2 | A | 5 | 5 | 1.22 | 16 | 0.312 |
| 3 | A | 5 | 5 | 1.08 | 14 | 0.357 |
| 4 | A | 1 | 1 | 1.00 | 8 | 0.125 |
| 5 | A | 6 | 5 | 1.00 | 16 | 0.312 |
| 6 | A | 4 | 3 | 1.00 | 16 | 0.188 |
| 7 | A | 5 | 4 | 0.99 | 16 | 0.250 |
| 8 | A | 7 | 6 | 1.09 | 16 | 0.375 |
| 9 | A | 3 | 3 | 1.05 | 18 | 0.167 |
| 10 | A | 3 | 3 | 1.10 | 18 | 0.167 |
| 11 | A | 3 | 3 | 1.15 | 16 | 0.188 |
| 12 | A | 3 | 3 | 1.09 | 10 | 0.300 |
| 13 | A | 7 | 6 | 0.99 | 18 | 0.333 |
| 14 | A | 10 | 9 | 0.93 | 18 | 0.500 |
| 15 | A | 14 | 13 | 0.96 | 18 | 0.722 |
| 16 | A | 4 | 3 | 0.96 | 18 | 0.167 |
| 17 | A | 4 | 3 | 0.95 | 18 | 0.167 |
| 18 | A | 4 | 3 | 0.95 | 16 | 0.188 |
| 19 | A | 8 | 7 | 0.91 | 10 | 0.700 |
| 20 | N/A | 1 | 0 | 1.00 | 18 | 0.000 |
| 21 | N/A | 1 | 0 | 1.00 | 18 | 0.000 |
| 22 | A | 2 | 2 | 1.00 | 18 | 0.111 |

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| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 23 | A | 2 | 2 | 1.00 | 16 | 0.125 |
| 24 | A | 10 | 9 | 0.97 | 10 | 0.900 |
| 25 | N/A | 1 | 0 | 1.00 | 18 | 0.000 |
| 26 | N/A | 1 | 0 | 1.00 | 18 | 0.000 |
| 27 | N/A | 2 | 0 | 1.00 | 18 | 0.000 |
| 28 | A | 4 | 4 | 0.81 | 16 | 0.250 |
| 29 | N/A | 1 | 0 | 1.00 | 18 | 0.000 |
| 30 | N/A | 1 | 0 | 1.00 | 18 | 0.000 |
| 31 | A | 3 | 3 | 0.55 | 31 | 0.097 |
| 32 | A | 3 | 3 | 0.58 | 31 | 0.097 |
| 33 | A | 3 | 3 | 0.59 | 29 | 0.103 |
| 34 | A | 7 | 7 | 0.70 | 31 | 0.226 |
| 35 | A | 7 | 7 | 0.73 | 31 | 0.226 |
| 36 | A | 3 | 3 | 0.52 | 31 | 0.097 |
| 37 | A | 3 | 3 | 0.54 | 31 | 0.097 |
| 38 | A | 3 | 3 | 0.52 | 29 | 0.103 |
| 39 | A | 3 | 3 | 0.66 | 31 | 0.097 |
| 40 | A | 3 | 3 | 0.49 | 31 | 0.097 |
| 41 | A | 3 | 3 | 0.51 | 31 | 0.097 |
| 42 | A | 3 | 3 | 0.50 | 29 | 0.103 |
| 43 | A | 3 | 3 | 0.62 | 31 | 0.097 |
| 44 | A | 3 | 3 | 0.58 | 31 | 0.097 |
| 45 | A | 3 | 3 | 0.60 | 31 | 0.097 |
| 46 | A | 3 | 3 | 0.69 | 29 | 0.103 |
| 47 | A | 10 | 9 | 0.76 | 31 | 0.290 |
| 48 | A | 14 | 13 | 0.76 | 31 | 0.419 |
| 49 | A | 3 | 3 | 0.68 | 31 | 0.097 |
| 50 | A | 3 | 3 | 0.67 | 31 | 0.097 |
| 51 | A | 6 | 6 | 0.69 | 29 | 0.207 |
| 52 | A | 3 | 3 | 0.66 | 31 | 0.097 |
| 53 | A | 3 | 3 | 0.86 | 31 | 0.097 |
| 54 | A | 3 | 3 | 0.68 | 31 | 0.097 |
| 55 | A | 3 | 3 | 0.71 | 31 | 0.097 |

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Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 56 | A | 3 | 3 | 0.70 | 29 | 0.103 |
| 57 | A | 3 | 3 | 0.63 | 31 | 0.097 |
| 58 | A | 3 | 3 | 0.65 | 33 | 0.091 |
| 59 | A | 3 | 3 | 0.65 | 33 | 0.091 |
| 60 | A | 3 | 3 | 0.65 | 31 | 0.097 |
| 61 | A | 7 | 7 | 0.71 | 33 | 0.212 |
| 62 | A | 3 | 3 | 0.63 | 33 | 0.091 |
| 63 | A | 3 | 3 | 0.63 | 33 | 0.091 |
| 64 | A | 3 | 3 | 0.62 | 31 | 0.097 |
| 65 | A | 3 | 3 | 0.69 | 33 | 0.091 |
| 66 | A | 3 | 3 | 0.60 | 33 | 0.091 |
| 67 | A | 3 | 3 | 0.60 | 33 | 0.091 |
| 68 | A | 3 | 3 | 0.58 | 31 | 0.097 |
| 69 | A | 3 | 3 | 0.66 | 33 | 0.091 |
| 70 | A | 6 | 5 | 0.60 | 33 | 0.152 |
| 71 | A | 6 | 5 | 0.59 | 33 | 0.152 |
| 72 | A | 3 | 3 | 0.75 | 31 | 0.097 |
| 73 | A | 11 | 10 | 0.68 | 33 | 0.303 |
| 74 | A | 17 | 16 | 0.65 | 33 | 0.485 |
| 75 | A | 3 | 3 | 0.61 | 33 | 0.091 |
| 76 | A | 3 | 3 | 0.61 | 33 | 0.091 |
| 77 | A | 3 | 3 | 0.59 | 31 | 0.097 |
| 78 | A | 3 | 3 | 0.64 | 33 | 0.091 |
| 79 | A | 3 | 3 | 0.58 | 33 | 0.091 |
| 80 | A | 3 | 3 | 0.60 | 33 | 0.091 |
| 81 | A | 3 | 3 | 0.62 | 31 | 0.097 |
| 82 | N/A | 1 | 0 | 1.00 | 35 | 0.000 |
| 83 | A | 10 | 9 | 0.99 | 35 | 0.257 |
| 84 | A | 9 | 8 | 0.98 | 35 | 0.229 |
| 85 | A | 8 | 7 | 0.99 | 33 | 0.212 |
| 86 | A | 8 | 7 | 1.00 | 25 | 0.280 |
| 87 | N/A | 1 | 0 | 1.00 | 35 | 0.000 |
| 88 | A | 13 | 13 | 1.08 | 21 | 0.619 |

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Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 89 | A | 10 | 10 | 1.11 | 21 | 0.476 |
| 90 | A | 8 | 8 | 1.14 | 19 | 0.421 |
| 91 | A | 4 | 4 | 1.00 | 21 | 0.190 |
| 92 | A | 6 | 6 | 0.99 | 21 | 0.286 |
| 93 | A | 8 | 7 | 1.18 | 21 | 0.333 |
| 94 | A | 8 | 7 | 1.05 | 21 | 0.333 |
| 95 | A | 11 | 10 | 1.06 | 21 | 0.476 |
| 96 | A | 13 | 12 | 1.09 | 21 | 0.571 |
| 97 | A | 14 | 14 | 1.09 | 26 | 0.538 |
| 98 | A | 13 | 13 | 1.08 | 26 | 0.500 |
| 99 | A | 10 | 10 | 1.12 | 24 | 0.417 |
| 100 | A | 4 | 4 | 1.04 | 26 | 0.154 |
| 101 | A | 4 | 4 | 0.99 | 26 | 0.154 |
| 102 | A | 4 | 4 | 0.98 | 26 | 0.154 |
| 103 | A | 8 | 7 | 1.02 | 26 | 0.269 |
| 104 | A | 10 | 9 | 1.05 | 26 | 0.346 |
| 105 | A | 13 | 12 | 1.06 | 26 | 0.462 |
| 106 | A | 17 | 17 | 1.07 | 31 | 0.548 |
| 107 | A | 14 | 14 | 1.09 | 31 | 0.452 |
| 108 | A | 13 | 13 | 1.09 | 29 | 0.448 |
| 109 | A | 4 | 4 | 1.02 | 31 | 0.129 |
| 110 | A | 4 | 4 | 0.99 | 31 | 0.129 |
| 111 | A | 4 | 4 | 0.95 | 31 | 0.129 |
| 112 | A | 4 | 4 | 0.97 | 31 | 0.129 |
| 113 | A | 4 | 4 | 1.02 | 23 | 0.174 |
| 114 | A | 2 | 2 | 1.00 | 25 | 0.080 |
| 115 | A | 2 | 2 | 1.00 | 28 | 0.071 |
| 116 | A | 2 | 2 | 1.00 | 28 | 0.071 |
| 117 | A | 2 | 2 | 1.00 | 26 | 0.077 |
| 118 | A | 2 | 2 | 1.02 | 28 | 0.071 |
| 119 | A | 2 | 2 | 1.00 | 28 | 0.071 |
| 120 | A | 3 | 3 | 0.98 | 33 | 0.091 |
| 121 | A | 4 | 4 | 0.97 | 35 | 0.114 |
| 122 | A | 11 | 10 | 1.21 | 10 | 1.000 |

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## 2.3. Detailed conclusion table specific for Rubi results

Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 123 | A | 8 | 7 | 1.31 | 10 | 0.700 |
| 124 | A | 9 | 8 | 1.06 | 8 | 1.000 |
| 125 | A | 4 | 3 | 0.91 | 6 | 0.500 |
| 126 | A | 9 | 8 | 1.04 | 10 | 0.800 |
| 127 | A | 6 | 5 | 1.03 | 10 | 0.500 |
| 128 | A | 8 | 7 | 1.06 | 10 | 0.700 |
| 129 | A | 9 | 8 | 1.13 | 10 | 0.800 |
| 130 | A | 11 | 10 | 1.19 | 10 | 1.000 |
| 131 | A | 7 | 6 | 0.92 | 12 | 0.500 |
| 132 | A | 6 | 5 | 0.96 | 12 | 0.417 |
| 133 | A | 7 | 6 | 0.95 | 10 | 0.600 |
| 134 | A | 5 | 4 | 1.04 | 8 | 0.500 |
| 135 | A | 10 | 9 | 1.10 | 12 | 0.750 |
| 136 | A | 13 | 12 | 0.90 | 12 | 1.000 |
| 137 | A | 18 | 17 | 1.03 | 12 | 1.417 |
| 138 | A | 8 | 7 | 0.90 | 12 | 0.583 |
| 139 | A | 9 | 8 | 0.94 | 10 | 0.800 |
| 140 | A | 6 | 5 | 0.94 | 8 | 0.625 |
| 141 | A | 11 | 10 | 1.09 | 12 | 0.833 |
| 142 | A | 14 | 13 | 0.94 | 12 | 1.083 |
| 143 | A | 6 | 5 | 0.87 | 12 | 0.417 |
| 144 | A | 7 | 6 | 0.93 | 10 | 0.600 |
| 145 | A | 5 | 4 | 1.00 | 8 | 0.500 |
| 146 | N/A | 5 | 0 | 1.00 | 12 | 0.000 |
| 147 | A | 5 | 4 | 1.71 | 12 | 0.333 |
| 148 | A | 6 | 5 | 1.49 | 10 | 0.500 |
| 149 | A | 6 | 5 | 0.95 | 8 | 0.625 |
| 150 | N/A | 5 | 0 | 1.00 | 12 | 0.000 |
| 151 | A | 5 | 4 | 1.31 | 12 | 0.333 |
| 152 | A | 6 | 5 | 1.24 | 10 | 0.500 |
| 153 | A | 7 | 6 | 0.92 | 8 | 0.750 |
| 154 | N/A | 5 | 0 | 1.00 | 12 | 0.000 |
| 155 | A | 8 | 7 | 1.06 | 18 | 0.389 |

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Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 156 | A | 9 | 8 | 1.11 | 16 | 0.500 |
| 157 | A | 13 | 12 | 0.97 | 14 | 0.857 |
| 158 | A | 9 | 8 | 1.13 | 16 | 0.500 |
| 159 | A | 13 | 12 | 0.94 | 14 | 0.857 |
| 160 | A | 9 | 8 | 1.17 | 16 | 0.500 |
| 161 | A | 15 | 14 | 0.94 | 14 | 1.000 |
| 162 | A | 15 | 14 | 0.94 | 14 | 1.000 |
| 163 | A | 8 | 7 | 0.98 | 18 | 0.389 |
| 164 | A | 9 | 8 | 0.99 | 16 | 0.500 |
| 165 | A | 11 | 10 | 1.01 | 14 | 0.714 |
| 166 | A | 6 | 5 | 0.95 | 16 | 0.312 |
| 167 | A | 13 | 12 | 1.00 | 14 | 0.857 |
| 168 | A | 6 | 5 | 0.94 | 16 | 0.312 |
| 169 | A | 13 | 12 | 0.99 | 14 | 0.857 |
| 170 | A | 6 | 5 | 0.94 | 16 | 0.312 |
| 171 | A | 15 | 14 | 1.02 | 14 | 1.000 |
| 172 | N/A | 3 | 0 | 1.00 | 16 | 0.000 |
| 173 | A | 6 | 5 | 0.97 | 16 | 0.312 |
| 174 | A | 7 | 6 | 0.97 | 14 | 0.429 |
| 175 | A | 7 | 6 | 1.02 | 12 | 0.500 |
| 176 | N/A | 5 | 0 | 1.00 | 16 | 0.000 |
| 177 | A | 7 | 6 | 0.79 | 21 | 0.286 |
| 178 | A | 7 | 6 | 0.92 | 21 | 0.286 |
| 179 | A | 7 | 6 | 0.84 | 21 | 0.286 |
| 180 | A | 6 | 5 | 0.96 | 19 | 0.263 |
| 181 | A | 1 | 1 | 1.00 | 10 | 0.100 |
| 182 | A | 11 | 10 | 0.97 | 21 | 0.476 |
| 183 | A | 7 | 6 | 0.86 | 21 | 0.286 |
| 184 | A | 5 | 4 | 0.92 | 21 | 0.190 |
| 185 | A | 8 | 7 | 0.83 | 21 | 0.333 |
| 186 | A | 6 | 5 | 0.93 | 21 | 0.238 |
| 187 | A | 9 | 8 | 0.84 | 21 | 0.381 |
| 188 | A | 10 | 9 | 0.87 | 23 | 0.391 |

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## 2.3. Detailed conclusion table specific for Rubi results

Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 189 | A | 9 | 8 | 0.88 | 23 | 0.348 |
| 190 | A | 8 | 7 | 0.89 | 23 | 0.304 |
| 191 | A | 7 | 6 | 0.93 | 21 | 0.286 |
| 192 | A | 5 | 4 | 1.03 | 12 | 0.333 |
| 193 | A | 12 | 11 | 0.98 | 23 | 0.478 |
| 194 | A | 9 | 8 | 0.79 | 23 | 0.348 |
| 195 | A | 6 | 5 | 0.87 | 23 | 0.217 |
| 196 | A | 11 | 10 | 0.80 | 23 | 0.435 |
| 197 | A | 16 | 15 | 1.01 | 23 | 0.652 |
| 198 | A | 14 | 13 | 1.03 | 23 | 0.565 |
| 199 | A | 11 | 10 | 0.91 | 23 | 0.435 |
| 200 | A | 9 | 8 | 0.93 | 21 | 0.381 |
| 201 | A | 5 | 4 | 0.93 | 12 | 0.333 |
| 202 | A | 13 | 12 | 0.97 | 23 | 0.522 |
| 203 | A | 10 | 9 | 0.82 | 23 | 0.391 |
| 204 | A | 13 | 12 | 0.93 | 23 | 0.522 |
| 205 | A | 15 | 14 | 0.82 | 23 | 0.609 |
| 206 | A | 13 | 12 | 1.08 | 23 | 0.522 |
| 207 | A | 14 | 13 | 1.00 | 23 | 0.565 |
| 208 | A | 10 | 9 | 0.94 | 21 | 0.429 |
| 209 | A | 7 | 6 | 0.97 | 12 | 0.500 |
| 210 | A | 14 | 13 | 1.00 | 23 | 0.565 |
| 211 | A | 11 | 10 | 0.84 | 23 | 0.435 |
| 212 | A | 14 | 13 | 0.96 | 23 | 0.565 |
| 213 | A | 15 | 14 | 0.83 | 23 | 0.609 |
| 214 | A | 7 | 6 | 0.93 | 12 | 0.500 |
| 215 | A | 6 | 5 | 0.79 | 23 | 0.217 |
| 216 | A | 7 | 6 | 0.82 | 23 | 0.261 |
| 217 | A | 6 | 5 | 0.82 | 23 | 0.217 |
| 218 | A | 13 | 12 | 0.88 | 21 | 0.571 |
| 219 | A | 9 | 8 | 0.91 | 12 | 0.667 |
| 220 | N/A | 4 | 0 | 1.00 | 23 | 0.000 |
| 221 | A | 5 | 4 | 0.81 | 23 | 0.174 |

Continued on next page

Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 222 | A | 5 | 4 | 0.84 | 23 | 0.174 |
| 223 | A | 5 | 4 | 0.84 | 23 | 0.174 |
| 224 | A | 10 | 9 | 0.92 | 21 | 0.429 |
| 225 | A | 11 | 10 | 0.95 | 12 | 0.833 |
| 226 | N/A | 4 | 0 | 1.00 | 23 | 0.000 |
| 227 | A | 8 | 7 | 1.20 | 23 | 0.304 |
| 228 | A | 16 | 15 | 1.12 | 23 | 0.652 |
| 229 | A | 15 | 14 | 1.08 | 23 | 0.609 |
| 230 | A | 16 | 15 | 0.94 | 21 | 0.714 |
| 231 | A | 11 | 10 | 0.93 | 12 | 0.833 |
| 232 | N/A | 4 | 0 | 1.00 | 23 | 0.000 |
| 233 | A | 7 | 6 | 1.16 | 23 | 0.261 |
| 234 | A | 13 | 12 | 1.06 | 23 | 0.522 |
| 235 | A | 16 | 15 | 1.07 | 23 | 0.652 |
| 236 | A | 13 | 12 | 0.93 | 21 | 0.571 |
| 237 | A | 13 | 12 | 0.99 | 12 | 1.000 |
| 238 | N/A | 4 | 0 | 1.00 | 23 | 0.000 |
| 239 | A | 13 | 12 | 1.01 | 12 | 1.000 |
| 240 | A | 8 | 7 | 0.92 | 25 | 0.280 |
| 241 | A | 9 | 8 | 0.93 | 25 | 0.320 |
| 242 | A | 8 | 7 | 0.95 | 23 | 0.304 |
| 243 | A | 13 | 12 | 0.97 | 14 | 0.857 |
| 244 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 245 | A | 23 | 22 | 1.19 | 25 | 0.880 |
| 246 | A | 18 | 17 | 1.22 | 25 | 0.680 |
| 247 | A | 18 | 17 | 0.96 | 23 | 0.739 |
| 248 | A | 13 | 12 | 0.94 | 14 | 0.857 |
| 249 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 250 | A | 13 | 12 | 1.16 | 25 | 0.480 |
| 251 | A | 20 | 19 | 1.17 | 25 | 0.760 |
| 252 | A | 11 | 10 | 0.95 | 23 | 0.435 |
| 253 | A | 15 | 14 | 0.94 | 14 | 1.000 |
| 254 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |

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## 2.3. Detailed conclusion table specific for Rubi results

Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | number of rules / integrand leaf size |
|---|---|---|---|---|---|---|
| 255 | F | 0 | 0 | N/A | 0.000 | N/A |
| 256 | A | 21 | 20 | 0.96 | 23 | 0.870 |
| 257 | A | 15 | 14 | 0.94 | 14 | 1.000 |
| 258 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 259 | A | 6 | 5 | 0.93 | 25 | 0.200 |
| 260 | A | 7 | 6 | 0.94 | 25 | 0.240 |
| 261 | A | 6 | 5 | 0.94 | 25 | 0.200 |
| 262 | A | 15 | 14 | 0.98 | 23 | 0.609 |
| 263 | A | 11 | 10 | 1.01 | 14 | 0.714 |
| 264 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 265 | A | 5 | 4 | 0.93 | 25 | 0.160 |
| 266 | A | 5 | 4 | 0.97 | 25 | 0.160 |
| 267 | A | 5 | 4 | 0.98 | 25 | 0.160 |
| 268 | A | 12 | 11 | 0.98 | 23 | 0.478 |
| 269 | A | 13 | 12 | 1.00 | 14 | 0.857 |
| 270 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 271 | A | 18 | 17 | 1.24 | 25 | 0.680 |
| 272 | A | 17 | 16 | 1.30 | 25 | 0.640 |
| 273 | A | 18 | 17 | 0.96 | 23 | 0.739 |
| 274 | A | 13 | 12 | 0.99 | 14 | 0.857 |
| 275 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 276 | A | 15 | 14 | 1.20 | 25 | 0.560 |
| 277 | A | 18 | 17 | 1.22 | 25 | 0.680 |
| 278 | A | 15 | 14 | 0.98 | 23 | 0.609 |
| 279 | A | 15 | 14 | 1.02 | 14 | 1.000 |
| 280 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 281 | A | 8 | 7 | 1.03 | 23 | 0.304 |
| 282 | A | 7 | 6 | 1.04 | 23 | 0.261 |
| 283 | A | 7 | 6 | 1.04 | 23 | 0.261 |
| 284 | A | 6 | 5 | 1.03 | 23 | 0.217 |
| 285 | A | 6 | 5 | 0.98 | 23 | 0.217 |
| 286 | A | 5 | 4 | 0.97 | 23 | 0.174 |
| 287 | A | 7 | 6 | 0.98 | 23 | 0.261 |

Continued on next page

Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 288 | A | 6 | 5 | 1.02 | 23 | 0.217 |
| 289 | A | 8 | 7 | 1.01 | 23 | 0.304 |
| 290 | A | 7 | 6 | 1.04 | 23 | 0.261 |
| 291 | A | 4 | 3 | 1.01 | 25 | 0.120 |
| 292 | A | 4 | 3 | 1.01 | 25 | 0.120 |
| 293 | A | 4 | 3 | 1.01 | 25 | 0.120 |
| 294 | A | 4 | 3 | 1.01 | 25 | 0.120 |
| 295 | A | 4 | 3 | 0.99 | 25 | 0.120 |
| 296 | A | 4 | 3 | 0.99 | 25 | 0.120 |
| 297 | A | 4 | 3 | 0.98 | 25 | 0.120 |
| 298 | A | 4 | 3 | 1.01 | 25 | 0.120 |
| 299 | A | 4 | 3 | 1.01 | 25 | 0.120 |
| 300 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 301 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 302 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 303 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 304 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 305 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 306 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 307 | N/A | 4 | 0 | 1.00 | 25 | 0.000 |
| 308 | N/A | 4 | 0 | 1.00 | 23 | 0.000 |
| 309 | N/A | 4 | 0 | 1.00 | 23 | 0.000 |
| 310 | A | 4 | 3 | 0.96 | 23 | 0.130 |
| 311 | A | 4 | 3 | 0.98 | 21 | 0.143 |
| 312 | N/A | 3 | 0 | 1.00 | 23 | 0.000 |
| 313 | A | 8 | 7 | 0.93 | 33 | 0.212 |
| 314 | A | 7 | 6 | 0.95 | 33 | 0.182 |
| 315 | A | 5 | 4 | 0.92 | 31 | 0.129 |
| 316 | A | 6 | 5 | 0.94 | 33 | 0.152 |
| 317 | A | 8 | 7 | 0.95 | 33 | 0.212 |
| 318 | A | 6 | 5 | 0.96 | 33 | 0.152 |
| 319 | A | 11 | 10 | 0.90 | 33 | 0.303 |

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2.3. Detailed conclusion table specific for Rubi results

Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 320 | A | 16 | 15 | 1.28 | 33 | 0.455 |
| 321 | A | 12 | 11 | 1.20 | 33 | 0.333 |
| 322 | A | 8 | 7 | 1.09 | 31 | 0.226 |
| 323 | A | 6 | 5 | 0.89 | 33 | 0.152 |
| 324 | A | 6 | 5 | 1.00 | 33 | 0.152 |
| 325 | A | 11 | 10 | 1.27 | 33 | 0.303 |
| 326 | A | 17 | 16 | 1.12 | 33 | 0.485 |
| 327 | A | 3 | 2 | 1.00 | 33 | 0.061 |
| 328 | A | 3 | 2 | 1.00 | 33 | 0.061 |
| 329 | A | 3 | 2 | 1.00 | 31 | 0.065 |
| 330 | A | 3 | 2 | 1.00 | 33 | 0.061 |
| 331 | A | 3 | 2 | 1.00 | 33 | 0.061 |
| 332 | A | 3 | 2 | 1.00 | 33 | 0.061 |
| 333 | A | 10 | 9 | 1.03 | 33 | 0.273 |
| 334 | A | 9 | 8 | 1.00 | 33 | 0.242 |
| 335 | A | 4 | 3 | 0.96 | 31 | 0.097 |
| 336 | N/A | 3 | 0 | 1.00 | 33 | 0.000 |
| 337 | N/A | 4 | 0 | 1.00 | 33 | 0.000 |
| 338 | A | 3 | 2 | 1.00 | 23 | 0.087 |
| 339 | A | 3 | 2 | 1.00 | 36 | 0.056 |
| 340 | A | 6 | 5 | 1.02 | 14 | 0.357 |
| 341 | A | 7 | 6 | 1.15 | 14 | 0.429 |
| 342 | A | 6 | 5 | 1.05 | 14 | 0.357 |
| 343 | A | 6 | 5 | 1.09 | 14 | 0.357 |
| 344 | A | 3 | 2 | 0.89 | 12 | 0.167 |
| 345 | A | 2 | 2 | 1.00 | 14 | 0.143 |
| 346 | A | 6 | 5 | 1.00 | 14 | 0.357 |
| 347 | A | 3 | 3 | 1.00 | 14 | 0.214 |
| 348 | A | 7 | 6 | 1.00 | 14 | 0.429 |
| 349 | A | 4 | 4 | 1.06 | 14 | 0.286 |
| 350 | A | 8 | 7 | 1.04 | 14 | 0.500 |
| 351 | A | 5 | 5 | 1.09 | 14 | 0.357 |
| 352 | A | 5 | 5 | 1.14 | 14 | 0.357 |

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Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 353 | A | 7 | 7 | 1.08 | 14 | 0.500 |
| 354 | A | 4 | 4 | 1.08 | 14 | 0.286 |
| 355 | A | 1 | 1 | 1.00 | 10 | 0.100 |
| 356 | A | 3 | 3 | 1.00 | 14 | 0.214 |
| 357 | A | 7 | 7 | 1.02 | 14 | 0.500 |
| 358 | A | 4 | 4 | 1.07 | 14 | 0.286 |
| 359 | A | 8 | 8 | 1.06 | 14 | 0.571 |
| 360 | A | 9 | 8 | 1.15 | 10 | 0.800 |
| 361 | A | 9 | 8 | 1.17 | 10 | 0.800 |
| 362 | A | 8 | 7 | 1.13 | 8 | 0.875 |
| 363 | A | 7 | 6 | 1.05 | 6 | 1.000 |
| 364 | A | 9 | 8 | 1.23 | 10 | 0.800 |
| 365 | A | 3 | 3 | 1.00 | 10 | 0.300 |
| 366 | A | 4 | 4 | 1.10 | 10 | 0.400 |
| 367 | A | 5 | 5 | 1.15 | 10 | 0.500 |
| 368 | A | 6 | 6 | 1.17 | 10 | 0.600 |
| 369 | A | 9 | 8 | 1.04 | 14 | 0.571 |
| 370 | A | 5 | 5 | 1.06 | 14 | 0.357 |
| 371 | A | 8 | 7 | 1.00 | 14 | 0.500 |
| 372 | A | 4 | 4 | 1.00 | 12 | 0.333 |
| 373 | A | 1 | 1 | 1.00 | 10 | 0.100 |
| 374 | A | 2 | 2 | 1.00 | 14 | 0.143 |
| 375 | A | 3 | 2 | 1.00 | 14 | 0.143 |
| 376 | A | 7 | 6 | 1.09 | 14 | 0.429 |
| 377 | A | 7 | 6 | 1.05 | 14 | 0.429 |
| 378 | A | 8 | 7 | 1.15 | 14 | 0.500 |
| 379 | A | 3 | 3 | 1.00 | 14 | 0.214 |
| 380 | A | 3 | 3 | 1.00 | 14 | 0.214 |
| 381 | A | 3 | 3 | 1.00 | 12 | 0.250 |
| 382 | A | 1 | 1 | 1.00 | 10 | 0.100 |
| 383 | A | 2 | 2 | 1.00 | 14 | 0.143 |
| 384 | A | 3 | 3 | 1.00 | 14 | 0.214 |
| 385 | A | 3 | 3 | 1.01 | 14 | 0.214 |
| 386 | A | 9 | 8 | 1.19 | 16 | 0.500 |

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Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 387 | A | 9 | 8 | 1.18 | 16 | 0.500 |
| 388 | A | 3 | 2 | 0.91 | 14 | 0.143 |
| 389 | A | 2 | 2 | 1.00 | 16 | 0.125 |
| 390 | A | 6 | 5 | 1.00 | 16 | 0.312 |
| 391 | A | 7 | 6 | 0.99 | 16 | 0.375 |
| 392 | A | 10 | 9 | 1.05 | 16 | 0.562 |
| 393 | A | 10 | 10 | 0.86 | 16 | 0.625 |
| 394 | A | 7 | 7 | 0.81 | 16 | 0.438 |
| 395 | A | 1 | 1 | 1.00 | 12 | 0.083 |
| 396 | A | 4 | 4 | 1.00 | 16 | 0.250 |
| 397 | A | 9 | 9 | 0.85 | 16 | 0.562 |
| 398 | A | 11 | 11 | 0.85 | 16 | 0.688 |
| 399 | A | 5 | 4 | 0.74 | 12 | 0.333 |
| 400 | A | 5 | 4 | 0.79 | 14 | 0.286 |
| 401 | A | 3 | 3 | 1.00 | 14 | 0.214 |
| 402 | A | 2 | 2 | 0.97 | 14 | 0.143 |
| 403 | A | 2 | 2 | 1.00 | 14 | 0.143 |
| 404 | A | 1 | 1 | 1.00 | 12 | 0.083 |
| 405 | A | 1 | 1 | 1.00 | 14 | 0.071 |
| 406 | A | 1 | 1 | 1.00 | 14 | 0.071 |
| 407 | A | 2 | 2 | 1.04 | 14 | 0.143 |
| 408 | A | 3 | 3 | 1.00 | 16 | 0.188 |
| 409 | A | 2 | 2 | 0.98 | 16 | 0.125 |
| 410 | A | 2 | 2 | 1.00 | 16 | 0.125 |
| 411 | A | 1 | 1 | 1.00 | 14 | 0.071 |
| 412 | A | 1 | 1 | 1.00 | 16 | 0.062 |
| 413 | A | 1 | 1 | 1.00 | 16 | 0.062 |
| 414 | A | 2 | 2 | 1.03 | 16 | 0.125 |
| 415 | A | 2 | 2 | 1.00 | 8 | 0.250 |
| 416 | A | 2 | 2 | 1.00 | 10 | 0.200 |
| 417 | A | 2 | 2 | 1.00 | 16 | 0.125 |
| 418 | A | 2 | 2 | 1.02 | 16 | 0.125 |
| 419 | A | 1 | 1 | 1.00 | 16 | 0.062 |
| 420 | A | 1 | 1 | 1.00 | 16 | 0.062 |

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## 2.3. Detailed conclusion table specific for Rubi results

Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 421 | A | 1 | 1 | 1.00 | 16 | 0.062 |
| 422 | A | 2 | 2 | 1.02 | 16 | 0.125 |
| 423 | A | 2 | 2 | 1.00 | 16 | 0.125 |
| 424 | A | 2 | 2 | 1.00 | 18 | 0.111 |
| 425 | A | 2 | 2 | 1.02 | 18 | 0.111 |
| 426 | A | 1 | 1 | 1.00 | 18 | 0.056 |
| 427 | A | 1 | 1 | 1.00 | 18 | 0.056 |
| 428 | A | 1 | 1 | 1.00 | 18 | 0.056 |
| 429 | A | 2 | 2 | 1.01 | 18 | 0.111 |
| 430 | A | 2 | 2 | 1.00 | 18 | 0.111 |
| 431 | N/A | 1 | 0 | 1.00 | 40 | 0.000 |
| 432 | A | 12 | 11 | 1.03 | 40 | 0.275 |
| 433 | A | 11 | 10 | 1.03 | 40 | 0.250 |
| 434 | A | 10 | 9 | 1.02 | 38 | 0.237 |
| 435 | N/A | 1 | 0 | 1.00 | 40 | 0.000 |
| 436 | N/A | 1 | 0 | 1.00 | 40 | 0.000 |
| 437 | A | 4 | 3 | 1.00 | 8 | 0.375 |
| 438 | A | 10 | 9 | 1.01 | 10 | 0.900 |
| 439 | A | 5 | 4 | 0.90 | 10 | 0.400 |
| 440 | A | 5 | 4 | 0.91 | 10 | 0.400 |
| 441 | A | 6 | 5 | 1.02 | 8 | 0.625 |
| 442 | A | 3 | 2 | 1.05 | 6 | 0.333 |
| 443 | A | 5 | 4 | 1.00 | 10 | 0.400 |
| 444 | A | 5 | 4 | 1.00 | 10 | 0.400 |
| 445 | A | 5 | 4 | 0.92 | 12 | 0.333 |
| 446 | A | 5 | 4 | 0.94 | 12 | 0.333 |
| 447 | A | 5 | 4 | 0.96 | 10 | 0.400 |
| 448 | A | 4 | 3 | 0.97 | 8 | 0.375 |
| 449 | N/A | 4 | 0 | 1.00 | 12 | 0.000 |
| 450 | N/A | 4 | 0 | 1.00 | 12 | 0.000 |
| 451 | A | 7 | 6 | 0.90 | 12 | 0.500 |
| 452 | A | 6 | 5 | 0.90 | 12 | 0.417 |
| 453 | A | 7 | 6 | 0.93 | 10 | 0.600 |

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Table 2.1 – continued from previous page

| # | grade | number of steps used | number of unique rules | normalized antiderivative leaf size | integrand leaf size | $\frac{\text{number of rules}}{\text{integrand leaf size}}$ |
|---|---|---|---|---|---|---|
| 454 | A | 3 | 2 | 0.96 | 8 | 0.250 |
| 455 | N/A | 6 | 0 | 1.00 | 12 | 0.000 |
| 456 | N/A | 5 | 0 | 1.00 | 12 | 0.000 |
| 457 | A | 7 | 6 | 0.92 | 14 | 0.429 |
| 458 | A | 6 | 5 | 0.92 | 14 | 0.357 |
| 459 | A | 7 | 6 | 0.94 | 12 | 0.500 |
| 460 | A | 4 | 3 | 0.97 | 10 | 0.300 |
| 461 | N/A | 6 | 0 | 1.00 | 14 | 0.000 |
| 462 | N/A | 5 | 0 | 1.00 | 14 | 0.000 |
| 463 | A | 8 | 7 | 1.03 | 21 | 0.333 |
| 464 | A | 7 | 6 | 1.02 | 21 | 0.286 |
| 465 | A | 6 | 5 | 0.98 | 21 | 0.238 |
| 466 | A | 5 | 4 | 1.00 | 21 | 0.190 |
| 467 | A | 5 | 4 | 1.00 | 21 | 0.190 |
| 468 | A | 6 | 5 | 0.99 | 21 | 0.238 |
| 469 | A | 7 | 6 | 1.02 | 10 | 0.600 |
| 470 | F | 0 | 0 | N/A | 0.000 | N/A |
| 471 | A | 3 | 2 | 1.00 | 26 | 0.077 |
| 472 | A | 3 | 2 | 1.00 | 26 | 0.077 |
| 473 | A | 1 | 1 | 1.00 | 28 | 0.036 |
| 474 | F | 0 | 0 | N/A | 0.000 | N/A |

# CHAPTER 3

## LISTING OF INTEGRALS

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



## 3.1.1 Optimal result

Integrand size = 16, antiderivative size = 179

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

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

## 3.1.2 Mathematica [A] (verified)

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

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

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

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

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

### 3.1.3 Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.15, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5242, 497, 25, 687, 25, 27, 676, 223}

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

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

$$\Big\downarrow \ 5242$$

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

$$\Big\downarrow \ 497$$

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

$$\Big\downarrow \ 25$$

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

$$\Big\downarrow \ 687$$

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

$$\Big\downarrow \; 25$$

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

$$\Big\downarrow \; 27$$

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

$$\Big\downarrow \; 676$$

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

$$\Big\downarrow \; 223$$

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

input

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

output

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

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

### 3.1.3.1 Defintions of rubi rules used

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

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

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

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

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

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

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

### 3.1.4 Maple [A] (verified)

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

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

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

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

### 3.1.5 Fricas [A] (verification not implemented)

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

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

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

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

### 3.1.6 Sympy [A] (verification not implemented)

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

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

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

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

### 3.1.7 Maxima [A] (verification not implemented)

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

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

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

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

### 3.1.8 Giac [A] (verification not implemented)

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

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

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

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

### 3.1.9 Mupad [F(-1)]

Timed out.

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

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

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

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



## 3.2.1 Optimal result

Integrand size = 16, antiderivative size = 124

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

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

## 3.2.2 Mathematica [A] (verified)

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

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

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

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

### 3.2.3 Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.22, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {5242, 497, 25, 676, 223}

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

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

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

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

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

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

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

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

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

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

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

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

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

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

### 3.2.3.1 Defintions of rubi rules used

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

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

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

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

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

### 3.2.4 Maple [A] (verified)

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

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

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

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

### 3.2.5 Fricas [A] (verification not implemented)

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

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

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

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

### 3.2.6 Sympy [A] (verification not implemented)

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

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

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

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

### 3.2.7 Maxima [A] (verification not implemented)

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

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

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

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

### 3.2.8 Giac [A] (verification not implemented)

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

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

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

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

### 3.2.9 Mupad [F(-1)]

Timed out.

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

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

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

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

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



## 3.3.1 Optimal result

Integrand size = 14, antiderivative size = 98

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

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

## 3.3.2 Mathematica [A] (verified)

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

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

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

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

### 3.3.3 Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.08, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {5242, 497, 25, 455, 223}

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

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

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

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

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

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

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

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

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

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

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

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

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

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

### 3.3.3.1 Defintions of rubi rules used

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

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

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

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

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

## 3.3.4 Maple [A] (verified)

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

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

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

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

### 3.3.5 Fricas [A] (verification not implemented)

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

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

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

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

### 3.3.6 Sympy [A] (verification not implemented)

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

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

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

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

### 3.3.7 Maxima [A] (verification not implemented)

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

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

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

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

### 3.3.8 Giac [A] (verification not implemented)

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

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

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

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

### 3.3.9 Mupad [B] (verification not implemented)

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

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

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

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

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



## 3.4.1 Optimal result

Integrand size = 8, antiderivative size = 30

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

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

## 3.4.2 Mathematica [A] (verified)

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

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

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

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

### 3.4.3 Rubi [A] (verified)

Time = 0.15 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2009}

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

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

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

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

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

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

#### 3.4.3.1 Defintions of rubi rules used

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

### 3.4.4 Maple [A] (verified)

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

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

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

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

### 3.4.5 Fricas [A] (verification not implemented)

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

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

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

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

### 3.4.6 Sympy [A] (verification not implemented)

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

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

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

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

### 3.4.7 Maxima [A] (verification not implemented)

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

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

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

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

### 3.4.8 Giac [A] (verification not implemented)

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

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

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

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

### 3.4.9 Mupad [B] (verification not implemented)

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

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

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

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

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



## 3.5.1 Optimal result

Integrand size = 16, antiderivative size = 229

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

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

### 3.5.2 Mathematica [A] (verified)

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

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

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

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

### 3.5.3 Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {5240, 5030, 2620, 2715, 2838}

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

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

$$\Big\downarrow \ 5240$$

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

$$\Big\downarrow \ 5030$$

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

$$\Big\downarrow \ 2620$$

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

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

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

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

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

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

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

### 3.5.3.1 Defintions of rubi rules used

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

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

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

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

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

### 3.5.4 Maple [B] (verified)

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

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

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

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

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

### 3.5.5 Fricas [F]

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

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

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

### 3.5.6 Sympy [F]

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

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

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

### 3.5.7 Maxima [F]

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

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

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

### 3.5.8 Giac [F]

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

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

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

### 3.5.9 Mupad [F(-1)]

Timed out.

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

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

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

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



## 3.6.1 Optimal result

Integrand size = 16, antiderivative size = 85

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

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

## 3.6.2 Mathematica [A] (verified)

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

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

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

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

### 3.6.3 Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {5242, 488, 217}

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

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

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

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

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

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

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

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

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

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

#### 3.6.3.1 Defintions of rubi rules used

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

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

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

### 3.6.4 Maple [B] (verified)

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

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

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

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

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

### 3.6.5 Fricas [B] (verification not implemented)

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

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

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

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

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

### 3.6.6 Sympy [F]

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

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

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

### 3.6.7 Maxima [F(-2)]

Exception generated.

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

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

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

### 3.6.8 Giac [B] (verification not implemented)

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

Time = 0.31 (sec) , antiderivative size = 200, normalized size of antiderivative = 2.35

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

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

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

### 3.6.9 Mupad [F(-1)]

Timed out.

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

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

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

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



## 3.7.1 Optimal result

Integrand size = 16, antiderivative size = 135

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

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

## 3.7.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.29 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.53

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

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

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

### 3.7.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.99, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {5242, 491, 488, 217}

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

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

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

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

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

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

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

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

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

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

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

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

### 3.7.3.1 Defintions of rubi rules used

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

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

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

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

## 3.7.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 294 vs. $2(124) = 248$.

Time = 0.33 (sec) , antiderivative size = 295, normalized size of antiderivative = 2.19

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

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

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

## 3.7.5 Fricas [B] (verification not implemented)

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

Time = 0.35 (sec) , antiderivative size = 673, normalized size of antiderivative = 4.99

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

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

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

### 3.7.6 Sympy [F]

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

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

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

### 3.7.7 Maxima [F(-2)]

Exception generated.

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

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

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

### 3.7.8 Giac [F]

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

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

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

### 3.7.9 Mupad [F(-1)]

Timed out.

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

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

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

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



## 3.8.1 Optimal result

Integrand size = 16, antiderivative size = 191

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

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

## 3.8.2 Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 241, normalized size of antiderivative = 1.26

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

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

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

### 3.8.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.09, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {5242, 498, 25, 679, 488, 217}

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

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

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

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

$$\Big\downarrow \text{ 498}$$

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

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

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

$$\Big\downarrow \text{ 679}$$

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

$\Big\downarrow$ 488

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

$\Big\downarrow$ 217

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

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

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

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

#### 3.8.3.1 Defintions of rubi rules used

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

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

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

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

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

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

### 3.8.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 553 vs. 2(176) = 352.

Time = 0.21 (sec) , antiderivative size = 554, normalized size of antiderivative = 2.90

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

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

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

### 3.8.5 Fricas [B] (verification not implemented)

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

Time = 0.86 (sec) , antiderivative size = 1125, normalized size of antiderivative = 5.89

$$\int \frac{a+b\arcsin(cx)}{(d+ex)^4}\,dx$$
$$= \left[ -\frac{4\,ac^6d^6 - 12\,ac^4d^4e^2 + 12\,ac^2d^2e^4 - 4\,ae^6 + (2\,bc^5d^5 + bc^3d^3e^2 + (2\,bc^5d^2e^3 + bc^3e^5)x^3 + 3\,(2\,bc^5d^3e^2 + \cdots}{\cdots} \right.$$
$$-\frac{2\,ac^6d^6 - 6\,ac^4d^4e^2 + 6\,ac^2d^2e^4 - 2\,ae^6 - (2\,bc^5d^5 + bc^3d^3e^2 + (2\,bc^5d^2e^3 + bc^3e^5)x^3 + 3\,(2\,bc^5d^3e^2 + bc \cdots}{6\,(c^6d^9e - 3\,c^4d \cdots}$$

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

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

### 3.8.6 Sympy [F]

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

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

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

### 3.8.7 Maxima [F]

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

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

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

### 3.8.8 Giac [F]

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

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

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

### 3.8.9 Mupad [F(-1)]

Timed out.

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

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

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

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



## 3.9.1 Optimal result

Integrand size = 18, antiderivative size = 374

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

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

### 3.9.2 Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 355, normalized size of antiderivative = 0.95

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

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

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

### 3.9.3 Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 393, normalized size of antiderivative = 1.05, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {5242, 5262, 2009}

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

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

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

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

$$\Big\downarrow \text{ 5262}$$

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

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

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

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

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

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

### 3.9.3.1 Defintions of rubi rules used

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

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

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

## 3.9.4 Maple [A] (verified)

Time = 0.57 (sec) , antiderivative size = 541, normalized size of antiderivative = 1.45

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{a^2(cex+dc)^4}{4c^3e}+\frac{b^2\left(d^3c^3\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{3d^2c^2e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcs\right.}{4}}{}}{}$ |
| default | $\frac{\frac{a^2(cex+dc)^4}{4c^3e}+\frac{b^2\left(d^3c^3\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{3d^2c^2e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcs\right.}{4}}{}}{}$ |
| parts | $\frac{a^2(ex+d)^4}{4e}+\frac{b^2\left(288\arcsin(cx)^2c^4x^4e^3+1152\arcsin(cx)^2c^4x^3de^2+1728\arcsin(cx)^2c^4x^2d^2e+1152\arcsin(cx)^2c^4xd^3\right.}{}$ |

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

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

### 3.9.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 446, normalized size of antiderivative = 1.19

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

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

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

### 3.9.6 Sympy [B] (verification not implemented)

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

Time = 0.48 (sec) , antiderivative size = 743, normalized size of antiderivative = 1.99

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx$$
$$= \begin{cases} a^2d^3x + \frac{3a^2d^2ex^2}{2} + a^2de^2x^3 + \frac{a^2e^3x^4}{4} + 2abd^3x\,\mathrm{asin}\,(cx) + 3abd^2ex^2\,\mathrm{asin}\,(cx) + 2abde^2x^3\,\mathrm{asin}\,(cx) + \frac{abe^3x}{} \\ a^2\left(d^3x + \frac{3d^2ex^2}{2} + de^2x^3 + \frac{e^3x^4}{4}\right) \end{cases}$$

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

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

### 3.9.7 Maxima [F]

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

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

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

### 3.9.8 Giac [B] (verification not implemented)

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

Time = 0.31 (sec) , antiderivative size = 816, normalized size of antiderivative = 2.18

$$\int (d+ex)^3(a+b\arcsin(cx))^2\,dx = \frac{1}{4}\,a^2e^3x^4 + a^2de^2x^3 + b^2d^3x\arcsin{(cx)}^2 + 2\,abd^3x\arcsin{(cx)} + \frac{(c^2x^2-1)b^2de^2x\arcsin{(cx)}^2}{c^2} + \frac{3\,\sqrt{-c^2x^2+1}b^2d^2ex\arcsin{(cx)}}{2\,c} + a^2d^3x - 2\,b^2d^3x + \frac{2\,(c^2x^2-1)abde^2x\arcsin{(cx)}}{c^2} + \frac{3\,(c^2x^2-1)b^2d^2e\arcsin{(cx)}^2}{2\,c^2} + \frac{b^2de^2x\arcsin{(cx)}^2}{c^2} + \frac{3\,\sqrt{-c^2x^2+1}abd^2ex}{2\,c} + \frac{2\,\sqrt{-c^2x^2+1}b^2d^3\arcsin{(cx)}}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}b^2e^3x\arcsin{(cx)}}{8\,c^3} - \frac{2\,(c^2x^2-1)b^2de^2x}{9\,c^2} + \frac{3\,(c^2x^2-1)abd^2e\arcsin{(cx)}}{c^2} + \frac{2\,abde^2x\arcsin{(cx)}}{c^2} + \frac{3\,b^2d^2e\arcsin{(cx)}^2}{4\,c^2} + \frac{(c^2x^2-1)^2b^2e^3\arcsin{(cx)}^2}{4\,c^4} + \frac{2\,\sqrt{-c^2x^2+1}abd^3}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}abe^3x}{8\,c^3} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}b^2de^2\arcsin{(cx)}}{3\,c^3} + \frac{5\,\sqrt{-c^2x^2+1}b^2e^3x\arcsin{(cx)}}{16\,c^3} + \frac{3\,(c^2x^2-1)a^2d^2e}{2\,c^2} - \frac{3\,(c^2x^2-1)b^2d^2e}{4\,c^2} - \frac{14\,b^2de^2x}{9\,c^2} + \frac{3\,abd^2e\arcsin{(cx)}}{2\,c^2} + \frac{(c^2x^2-1)^2abe^3\arcsin{(cx)}}{2\,c^4} + \frac{(c^2x^2-1)b^2e^3\arcsin{(cx)}^2}{2\,c^4} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}abde^2}{3\,c^3} + \frac{5\,\sqrt{-c^2x^2+1}abe^3x}{16\,c^3} + \frac{2\,\sqrt{-c^2x^2+1}b^2de^2\arcsin{(cx)}}{c^3} - \frac{3\,b^2d^2e}{8\,c^2} - \frac{(c^2x^2-1)^2b^2e^3}{32\,c^4} + \frac{(c^2x^2-1)abe^3\arcsin{(cx)}}{c^4} + \frac{5\,b^2e^3\arcsin{(cx)}^2}{32\,c^4} + \frac{2\,\sqrt{-c^2x^2+1}abde^2}{c^3} - \frac{5\,(c^2x^2-1)b^2e^3}{32\,c^4} + \frac{5\,abe^3\arcsin{(cx)}}{16\,c^4} - \frac{17\,b^2e^3}{256\,c^4}$$

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

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

### 3.9.9 Mupad [F(-1)]

Timed out.

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

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

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

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



## 3.10.1 Optimal result

Integrand size = 18, antiderivative size = 242

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

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

### 3.10.2 Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.03

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

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

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

### 3.10.3 Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.10, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {5242, 5262, 2009}

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

$$\int (d+ex)^2(a+b\arcsin(cx))^2\,dx$$
$$\Big\downarrow \; 5242$$
$$\frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e}-\frac{2bc\int \frac{(d+ex)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{3e}$$
$$\Big\downarrow \; 5262$$
$$\frac{(d+ex)^3(a+b\arcsin(cx))^2}{3e}-\frac{2bc\int \left(\frac{(a+b\arcsin(cx))d^3}{\sqrt{1-c^2x^2}}+\frac{3ex(a+b\arcsin(cx))d^2}{\sqrt{1-c^2x^2}}+\frac{3e^2x^2(a+b\arcsin(cx))d}{\sqrt{1-c^2x^2}}+\frac{e^3x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{3e}$$
$$\Big\downarrow \; 2009$$

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

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

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

### 3.10.3.1 Defintions of rubi rules used

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

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

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

### 3.10.4 Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 374, normalized size of antiderivative = 1.55

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{a^2(cex+dc)^3}{3c^2e}+\frac{b^2\left(d^2c^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{dce\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\arcsin(cx)xc-\arcsin(\right.}{2}}{c^2}}{}$ |
| default | $\frac{\frac{a^2(cex+dc)^3}{3c^2e}+\frac{b^2\left(d^2c^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{dce\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\arcsin(cx)xc-\arcsin(\right.}{2}}{c^2}}{}$ |
| parts | $\frac{a^2(ex+d)^3}{3e}+\frac{b^2\left(18\arcsin(cx)^2c^3x^3e^2+54\arcsin(cx)^2c^3x^2de+54\arcsin(cx)^2c^3x\,d^2+12\sqrt{-c^2x^2+1}\arcsin(cx)c^2x^2e^2\right.}{}$ |

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

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

### 3.10.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 290, normalized size of antiderivative = 1.20

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

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

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

### 3.10.6 Sympy [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 454, normalized size of antiderivative = 1.88

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

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

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

### 3.10.7 Maxima [F]

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

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

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

### 3.10.8 Giac [B] (verification not implemented)

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

Time = 0.31 (sec) , antiderivative size = 487, normalized size of antiderivative = 2.01

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

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

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

### 3.10.9 Mupad [F(-1)]

Timed out.

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

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

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

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



## 3.11.1 Optimal result

Integrand size = 16, antiderivative size = 142

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

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

## 3.11.2 Mathematica [A] (verified)

Time = 0.69 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.08

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

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

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

### 3.11.3 Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 164, normalized size of antiderivative = 1.15, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {5242, 5262, 2009}

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

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

$$\Big\downarrow \ 5242$$

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

$$\Big\downarrow \ 5262$$

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

$$\Big\downarrow \ 2009$$

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

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

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

### 3.11.3.1 Defintions of rubi rules used

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

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

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

## 3.11.4 Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.33

| method | result |
|---|---|
| parts | $a^2\left(\frac{1}{2}e\,x^2+dx\right)+\frac{b^2\left(\frac{e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsin(cx)^2-c^2x^2\right)}{4c}+d\left(cx\arcsin(cx)^2-2cx+2\,\text{a}\right.\right.}{c}$ |
| derivativedivides | $\frac{\frac{a^2\left(d\,c^2x+\frac{1}{2}c^2e\,x^2\right)}{c}+\frac{b^2\left(dc\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsi\right.}{4}\right.}{c}}{c}$ |
| default | $\frac{\frac{a^2\left(d\,c^2x+\frac{1}{2}c^2e\,x^2\right)}{c}+\frac{b^2\left(dc\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+\frac{e\left(2\arcsin(cx)^2x^2c^2+2\sqrt{-c^2x^2+1}\,\arcsin(cx)xc-\arcsi\right.}{4}\right.}{c}}{c}$ |

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

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

### 3.11.5 Fricas [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.10

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

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

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

### 3.11.6 Sympy [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.64

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

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

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

### 3.11.7 Maxima [F]

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

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

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

### 3.11.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 244, normalized size of antiderivative = 1.72

$$\begin{aligned}\int (d+ex)(a+b\arcsin(cx))^2\,dx &= b^2dx\arcsin(cx)^2 + 2\,abdx\arcsin(cx) \\ &\quad + \frac{\sqrt{-c^2x^2+1}b^2ex\arcsin(cx)}{2\,c} + a^2dx \\ &\quad - 2\,b^2dx + \frac{(c^2x^2-1)b^2e\arcsin(cx)^2}{2\,c^2} \\ &\quad + \frac{\sqrt{-c^2x^2+1}abex}{2\,c} + \frac{2\,\sqrt{-c^2x^2+1}b^2d\arcsin(cx)}{c} \\ &\quad + \frac{(c^2x^2-1)abe\arcsin(cx)}{c^2} + \frac{b^2e\arcsin(cx)^2}{4\,c^2} \\ &\quad + \frac{2\,\sqrt{-c^2x^2+1}abd}{c} + \frac{(c^2x^2-1)a^2e}{2\,c^2} \\ &\quad - \frac{(c^2x^2-1)b^2e}{4\,c^2} + \frac{abe\arcsin(cx)}{2\,c^2} - \frac{b^2e}{8\,c^2}\end{aligned}$$

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

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

### 3.11.9 Mupad [F(-1)]

Timed out.

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

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

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

# 3.12 $\int (a+b\arcsin(cx))^2\,dx$



## 3.12.1 Optimal result

Integrand size = 10, antiderivative size = 47

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

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

## 3.12.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

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

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

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

### 3.12.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.09, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {5130, 5182, 24}

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

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

$$\Big\downarrow \text{5130}$$

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

$$\Big\downarrow \text{5182}$$

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

$$\Big\downarrow \text{24}$$

$$x(a+b\arcsin(cx))^2-2bc\left(\frac{bx}{c}-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}\right)$$

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

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

#### 3.12.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

### 3.12.4 Maple [A] (verified)

Time = 0.00 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.53

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{cx\,a^2+b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$ | 72 |
| default | $\frac{cx\,a^2+b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)+2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$ | 72 |
| parts | $a^2x+\frac{b^2\left(cx\arcsin(cx)^2-2cx+2\arcsin(cx)\sqrt{-c^2x^2+1}\right)}{c}+\frac{2ab\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)}{c}$ | 73 |

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

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

### 3.12.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.38

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

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

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

### 3.12.6 Sympy [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.74

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

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

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

### 3.12.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.53

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

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

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

### 3.12.8 Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.60

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

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

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

### 3.12.9 Mupad [B] (verification not implemented)

Time = 0.39 (sec) , antiderivative size = 142, normalized size of antiderivative = 3.02

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

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

output
```
piecewise(0 < c, b^2*(x*(asin(c*x)^2 - 2) + 2*asin(c*x)*(1/c^2 - x^2)^(1/2
)) + a^2*x + (2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c, ~0 < c, a^
2*x + b^2*x*(asin(c*x)^2 - 2) + (2*b^2*asin(c*x)*(- c^2*x^2 + 1)^(1/2))/c
+ (2*a*b*((- c^2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c)
```

# 3.13 $\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx$



## 3.13.1 Optimal result

Integrand size = 18, antiderivative size = 347

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx = &-\frac{i(a+b\arcsin(cx))^3}{3be}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}\\ &+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}\\ &-\frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}\\ &-\frac{2ib(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}\\ &+\frac{2b^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{2b^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}\end{aligned}$$

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

### 3.13.2 Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 332, normalized size of antiderivative = 0.96

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx$$
$$= \frac{-\frac{i(a+b\arcsin(cx))^3}{b}+3(a+b\arcsin(cx))^2\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)+3(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right.}{}$$

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

output
```
(((-I)*(a + b*ArcSin[c*x])^3)/b + 3*(a + b*ArcSin[c*x])^2*Log[1 + (I*e*E^(
I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 3*(a + b*ArcSin[c*x])^2*
Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] + 6*b*((-I)*(
a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2
- e^2])] + b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2]
)]) + 6*b*((-I)*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*
d + Sqrt[c^2*d^2 - e^2])] + b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sq
rt[c^2*d^2 - e^2])]))/(3*e)
```

### 3.13.3 Rubi [A] (verified)

Time = 1.05 (sec) , antiderivative size = 343, normalized size of antiderivative = 0.99, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5240, 5030, 2620, 3011, 2720, 7143}

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

$$\int \frac{(a+b\arcsin(cx))^2}{d+ex}\,dx$$
$$\Big\downarrow \text{5240}$$
$$\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd+cex}d\arcsin(cx)$$
$$\Big\downarrow \text{5030}$$
$$\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}}d\arcsin(cx)+\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}}d\arcsin(cx)-\frac{i(a+b\arcsin(cx))^3}{3be}$$

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

$$-\frac{2b\int (a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)}{e}-\frac{2b\int (a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{i(a+b\arcsin(cx))^3}{3be}$$

$$\Big\downarrow \text{3011}$$

$$-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)-ib\int \operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)\right)}{e}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)-ib\int \operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{i(a+b\arcsin(cx))^3}{3be}$$

$$\Big\downarrow \text{2720}$$

$$-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)de^{i\arcsin(cx)}\right)}{e}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)de^{i\arcsin(cx)}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{i(a+b\arcsin(cx))^3}{3be}$$

$$\Big\downarrow \text{7143}$$

$$-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)-b\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)\right)}{e}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)-b\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{i(a+b\arcsin(cx))^3}{3be}$$

---

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

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

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

### 3.13.3.1 Defintions of rubi rules used

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

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

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

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

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

### 3.13.4 Maple [F]

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

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

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

### 3.13.5 Fricas [F]

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

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

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

### 3.13.6 Sympy [F]

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

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

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

### 3.13.7 Maxima [F]

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

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

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

### 3.13.8 Giac [F]

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

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

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

### 3.13.9 Mupad [F(-1)]

Timed out.

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

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

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

# 3.14 $\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$



## 3.14.1 Optimal result

Integrand size = 18, antiderivative size = 309

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

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

### 3.14.2 Mathematica [A] (verified)

Time = 0.27 (sec) , antiderivative size = 231, normalized size of antiderivative = 0.75

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

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

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

### 3.14.3 Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 287, normalized size of antiderivative = 0.93, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5242, 5272, 3042, 3804, 2694, 27, 2620, 2715, 2838}

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

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$$
$$\Big\downarrow \ 5242$$
$$\frac{2bc\int \frac{a+b\arcsin(cx)}{(d+ex)\sqrt{1-c^2x^2}}dx}{e} - \frac{(a+b\arcsin(cx))^2}{e(d+ex)}$$
$$\Big\downarrow \ 5272$$
$$\frac{2bc\int \frac{a+b\arcsin(cx)}{cd+cex}d\arcsin(cx)}{e} - \frac{(a+b\arcsin(cx))^2}{e(d+ex)}$$
$$\Big\downarrow \ 3042$$

$$\frac{2bc\int \frac{a+b\arcsin(cx)}{cd+e\sin(\arcsin(cx))}d\arcsin(cx)}{e}-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}$$

$$\Big\downarrow \text{3804}$$

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2ce^{i\arcsin(cx)}d-iee^{2i\arcsin(cx)}+ie}d\arcsin(cx)}{e}$$

$$\Big\downarrow \text{2694}$$

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\left(\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}\right)}d\arcsin(cx)}{\sqrt{c^2d^2-e^2}}-\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}\right)}d\arcsin(cx)}{\sqrt{c^2d^2-e^2}}\right)}{e}$$

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

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\left(\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}}d\arcsin(cx)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}}d\arcsin(cx)}{2\sqrt{c^2d^2-e^2}}\right)}{e}$$

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

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\left(\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{b\int \log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)d\arcsin(cx)}{e}\right)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{b\int \log\left(1-\right.}{}\right.}{2\sqrt{c^2d^2-e^2}}\right.}{e}$$

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

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\left(\frac{ie\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)de^{i\arcsin(cx)}}{e}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}\right)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{iee^{i\arcsin}}{cd-\sqrt{c^2d^2}}\right.}{e}\right.}{}\right.}{e}$$

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

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

$$-\frac{(a+b\arcsin(cx))^2}{e(d+ex)}+\frac{4bc\left(\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{\sqrt{c^2d^2-e^2}+cd}\right)}{e}-\frac{ib\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}\right)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{ib\,\text{PolyLog}\left(2,\frac{iee^{i}}{cd-}\right.}{e}\right.}{2\sqrt{c^2d^2-e^2}}\right.}{e}$$

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

output
```
-((a + b*ArcSin[c*x])^2/(e*(d + e*x))) + (4*b*c*(((-1/2*I)*e*(((a + b*ArcS
in[c*x])*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e -
 (I*b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e))
/Sqrt[c^2*d^2 - e^2] + ((I/2)*e*(((a + b*ArcSin[c*x])*Log[1 - (I*e*E^(I*Ar
cSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e - (I*b*PolyLog[2, (I*e*E^(I*Ar
cSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e))/Sqrt[c^2*d^2 - e^2]))/e
```

### 3.14.3.1 Defintions of rubi rules used

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

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

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

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

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

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

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

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

### 3.14.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 641 vs. $2(319) = 638$.

Time = 0.78 (sec) , antiderivative size = 642, normalized size of antiderivative = 2.08

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

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

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

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

### 3.14.5 Fricas [F]

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

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

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

### 3.14.6 Sympy [F]

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

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

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

### 3.14.7 Maxima [F(-2)]

Exception generated.

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

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

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

### 3.14.8 Giac [F]

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

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

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

### 3.14.9 Mupad [F(-1)]

Timed out.

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

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

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

# 3.15 $\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$



## 3.15.1 Optimal result

Integrand size = 18, antiderivative size = 401

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

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

### 3.15.2 Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 315, normalized size of antiderivative = 0.79

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

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

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

### 3.15.3 Rubi [A] (verified)

Time = 1.28 (sec) , antiderivative size = 386, normalized size of antiderivative = 0.96, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.722$, Rules used = {5242, 5272, 3042, 3805, 3042, 3147, 16, 3804, 2694, 27, 2620, 2715, 2838}

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

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

$$\Big\downarrow \; 5242$$

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

$$\Big\downarrow \; 5272$$

$$\frac{bc^2\int \frac{a+b\arcsin(cx)}{(cd+cex)^2}d\arcsin(cx)}{e} - \frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}$$

$$\Big\downarrow \; 3042$$

$$\frac{bc^2\int \frac{a+b\arcsin(cx)}{(cd+e\sin(\arcsin(cx)))^2}d\arcsin(cx)}{e}-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}$$

$$\Big\downarrow \text{3805}$$

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

$$\Big\downarrow \text{3042}$$

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

$$\Big\downarrow \text{3147}$$

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

$$\Big\downarrow \text{16}$$

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

$$\Big\downarrow \text{3804}$$

$$-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}+\frac{bc^2\left(\frac{2cd\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2ce^{i\arcsin(cx)}d-iee^{2i\arcsin(cx)}+ie}d\arcsin(cx)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}-\frac{b\log(cd+cex)}{c^2d^2-e^2}\right)}{e}$$

$$\Big\downarrow \text{2694}$$

$$-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}+\frac{bc^2\left(\frac{2cd\left(\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}\right)}d\arcsin(cx)}{\sqrt{c^2d^2-e^2}}-\frac{ie\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}\right)}d\arcsin(cx)}{\sqrt{c^2d^2-e^2}}\right)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}-b\ldots\right)}{e}$$

---

3.15. $\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}dx$

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

$$-\frac{(a+b\arcsin(cx))^2}{2e(d+ex)^2}+\frac{bc^2\left(\frac{2cd\left(\frac{ie\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}+\sqrt{c^2d^2-e^2}}d\arcsin(cx)}{2\sqrt{c^2d^2-e^2}}-\frac{ie\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cd-iee^{i\arcsin(cx)}-\sqrt{c^2d^2-e^2}}d\arcsin(cx)}{2\sqrt{c^2d^2-e^2}}\right)}{c^2d^2-e^2}+\frac{e\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2d^2-e^2)(cd+cex)}-\frac{b\log(ca}{c^2d^2}\right.}{e}$$

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

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

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

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

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

3.15. $\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

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

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

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

### 3.15.3.1 Defintions of rubi rules used

rule 16
```
Int[(c_.)/((a_.) + (b_.)*(x_)), x_Symbol] :> Simp[c*(Log[RemoveContent[a +
b*x, x]]/b), x] /; FreeQ[{a, b, c}, x]
```

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

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

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

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

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

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3147
```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Simp[1/(b^p*f)   Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)
/2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
 - 1)/2] && NeQ[a^2 - b^2, 0]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 3805
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Simp[a/(a^2 - b^2)   Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x]
, x] - Simp[b*d*(m/(f*(a^2 - b^2)))   Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(
a + b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 -
b^2, 0] && IGtQ[m, 0]
```

## 3.15. $\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

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

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

### 3.15.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 965 vs. $2(407) = 814$.

Time = 1.34 (sec) , antiderivative size = 966, normalized size of antiderivative = 2.41

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{a^2c^3}{2(cex+dc)^2e}+b^2c^3\left(-\frac{\arcsin(cx)\left(-2\sqrt{-c^2x^2+1}\,cde-e^2\arcsin(cx)+c^2d^2\arcsin(cx)+4ic^2dex+2ic^2d^2+2ie^2c^2x^2-2\sqrt{-c^2x^2+1}\,e\right.}{2(cex+dc)^2\left(c^2d^2-e^2\right)e}\right.}{}$ |
| default | $\frac{-\frac{a^2c^3}{2(cex+dc)^2e}+b^2c^3\left(-\frac{\arcsin(cx)\left(-2\sqrt{-c^2x^2+1}\,cde-e^2\arcsin(cx)+c^2d^2\arcsin(cx)+4ic^2dex+2ic^2d^2+2ie^2c^2x^2-2\sqrt{-c^2x^2+1}\,e\right.}{2(cex+dc)^2\left(c^2d^2-e^2\right)e}\right.}{}$ |
| parts | $-\frac{a^2}{2(ex+d)^2e}+\frac{b^2\left(-\frac{c^3\arcsin(cx)\left(-2\sqrt{-c^2x^2+1}\,cde-e^2\arcsin(cx)+c^2d^2\arcsin(cx)+4ic^2dex+2ic^2d^2+2ie^2c^2x^2-2\sqrt{-c^2x^2+\right.}{2(cex+dc)^2\left(c^2d^2-e^2\right)e}\right.}{}$ |

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

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

## 3.15.5 Fricas [F]

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

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

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)/(e^3*x^3 + 3*d*e^2*
x^2 + 3*d^2*e*x + d^3), x)
```

## 3.15.6 Sympy [F]

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

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

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

### 3.15.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

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

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

### 3.15.8 Giac [F]

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

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

output
```
integrate((b*arcsin(c*x) + a)^2/(e*x + d)^3, x)
```

### 3.15.9 Mupad [F(-1)]

Timed out.

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

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

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

# 3.16 $\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx$



## 3.16.1 Optimal result

Integrand size = 18, antiderivative size = 393

$$\begin{aligned}
\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx &= \frac{d^3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} \\
&+ \frac{3de^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} \\
&- \frac{3de^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} \\
&- \frac{3d^2e\,\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{2bc^2} \\
&- \frac{e^3\,\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{4bc^4} \\
&+ \frac{e^3\,\text{CosIntegral}\left(\frac{4a}{b}+4\arcsin(cx)\right)\sin\left(\frac{4a}{b}\right)}{8bc^4} \\
&+ \frac{d^3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{3de^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} \\
&+ \frac{3d^2e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2} \\
&+ \frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{4bc^4} \\
&- \frac{3de^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} \\
&- \frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4a}{b}+4\arcsin(cx)\right)}{8bc^4}
\end{aligned}$$

output
```
d^3*Ci(a/b+arcsin(c*x))*cos(a/b)/b/c+3/4*d*e^2*Ci(a/b+arcsin(c*x))*cos(a/b
)/b/c^3-3/4*d*e^2*Ci(3*a/b+3*arcsin(c*x))*cos(3*a/b)/b/c^3+3/2*d^2*e*cos(2
*a/b)*Si(2*a/b+2*arcsin(c*x))/b/c^2+1/4*e^3*cos(2*a/b)*Si(2*a/b+2*arcsin(c
*x))/b/c^4-1/8*e^3*cos(4*a/b)*Si(4*a/b+4*arcsin(c*x))/b/c^4+d^3*Si(a/b+arc
sin(c*x))*sin(a/b)/b/c+3/4*d*e^2*Si(a/b+arcsin(c*x))*sin(a/b)/b/c^3-3/2*d^
2*e*Ci(2*a/b+2*arcsin(c*x))*sin(2*a/b)/b/c^2-1/4*e^3*Ci(2*a/b+2*arcsin(c*x
))*sin(2*a/b)/b/c^4-3/4*d*e^2*Si(3*a/b+3*arcsin(c*x))*sin(3*a/b)/b/c^3+1/8
*e^3*Ci(4*a/b+4*arcsin(c*x))*sin(4*a/b)/b/c^4
```

### 3.16.2 Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 304, normalized size of antiderivative = 0.77

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx$$
$$= \frac{d^3\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)\right)}{bc}$$
$$+ \frac{3de^2\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)-\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\right.\right.}{4bc^3}$$
$$+ \frac{e^3\left(-2\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right)+\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{4a}{b}\right)+2\cos\left(\frac{2a}{b}\right)\right.}{8bc^4}$$
$$+ \frac{3d^2e\left(-\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)+\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)\right)}{2bc^2}$$

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

output
```
(d^3*(Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + Sin[a/b]*SinIntegral[a/b +
 ArcSin[c*x]]))/(b*c) + (3*d*e^2*(Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]]
- Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[c*x])] + Sin[a/b]*SinIntegral[a
/b + ArcSin[c*x]] - Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c*x])]))/(4*b
*c^3) + (e^3*(-2*CosIntegral[2*(a/b + ArcSin[c*x])]*Sin[(2*a)/b] + CosInte
gral[4*(a/b + ArcSin[c*x])]*Sin[(4*a)/b] + 2*Cos[(2*a)/b]*SinIntegral[2*(a
/b + ArcSin[c*x])] - Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c*x])]))/(8*
b*c^4) + (3*d^2*e*(-(CosIntegral[(2*a)/b + 2*ArcSin[c*x]]*Sin[(2*a)/b]) +
Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]]))/(2*b*c^2)
```

### 3.16.3 Rubi [A] (verified)

Time = 1.25 (sec) , antiderivative size = 377, normalized size of antiderivative = 0.96, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {5246, 7293, 2009}

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

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

$$\Big\downarrow \; 5246$$

$$\frac{\int \frac{(cd+cex)^3\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}d\arcsin(cx)}{c^4}$$

$$\Big\downarrow \; 7293$$

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

$$\Big\downarrow \; 2009$$

$$\frac{\frac{c^3d^3\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}+\frac{c^3d^3\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}-\frac{3c^2d^2e\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2b}+\frac{3c^2d^2e\cos\left(\frac{2a}{b}\right)\text{S}}{}$$

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

output
```
((c^3*d^3*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/b + (3*c*d*e^2*Cos[a/b]
*CosIntegral[a/b + ArcSin[c*x]])/(4*b) - (3*c*d*e^2*Cos[(3*a)/b]*CosIntegr
al[(3*a)/b + 3*ArcSin[c*x]])/(4*b) - (3*c^2*d^2*e*CosIntegral[(2*a)/b + 2*
ArcSin[c*x]]*Sin[(2*a)/b])/(2*b) - (e^3*CosIntegral[(2*a)/b + 2*ArcSin[c*x
]]*Sin[(2*a)/b])/(4*b) + (e^3*CosIntegral[(4*a)/b + 4*ArcSin[c*x]]*Sin[(4*
a)/b])/(8*b) + (c^3*d^3*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/b + (3*c*
d*e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*b) + (3*c^2*d^2*e*Cos[(2
*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b) + (e^3*Cos[(2*a)/b]*Sin
Integral[(2*a)/b + 2*ArcSin[c*x]])/(4*b) - (3*c*d*e^2*Sin[(3*a)/b]*SinInte
gral[(3*a)/b + 3*ArcSin[c*x]])/(4*b) - (e^3*Cos[(4*a)/b]*SinIntegral[(4*a)
/b + 4*ArcSin[c*x]])/(8*b))/c^4
```

#### 3.16.3.1 Defintions of rubi rules used

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

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.16.4 Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 327, normalized size of antiderivative = 0.83

| method | result |
|---|---|
| derivativedivides | $\frac{8\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^3d^3+8\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^3d^3+12\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)c^2d^2e-12\sin\left(\frac{2a}{b}\right)\mathrm{C}}{}$ |
| default | $\frac{8\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^3d^3+8\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^3d^3+12\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)c^2d^2e-12\sin\left(\frac{2a}{b}\right)\mathrm{C}}{}$ |

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

output
```
1/8/c^4*(8*Si(arcsin(c*x)+a/b)*sin(a/b)*c^3*d^3+8*Ci(arcsin(c*x)+a/b)*cos(
a/b)*c^3*d^3+12*cos(2*a/b)*Si(2*arcsin(c*x)+2*a/b)*c^2*d^2*e-12*sin(2*a/b)
*Ci(2*arcsin(c*x)+2*a/b)*c^2*d^2*e+6*Si(arcsin(c*x)+a/b)*sin(a/b)*c*d*e^2+
6*Ci(arcsin(c*x)+a/b)*cos(a/b)*c*d*e^2-6*Si(3*arcsin(c*x)+3*a/b)*sin(3*a/b
)*c*d*e^2-6*Ci(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*c*d*e^2+2*cos(2*a/b)*Si(2*a
rcsin(c*x)+2*a/b)*e^3-2*sin(2*a/b)*Ci(2*arcsin(c*x)+2*a/b)*e^3-cos(4*a/b)*
Si(4*arcsin(c*x)+4*a/b)*e^3+sin(4*a/b)*Ci(4*arcsin(c*x)+4*a/b)*e^3)/b
```

### 3.16.5 Fricas [F]

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

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

output
```
integral((e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3)/(b*arcsin(c*x) + a), x)
```

### 3.16.6 Sympy [F]

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

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

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

### 3.16.7 Maxima [F]

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

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

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

### 3.16.8 Giac [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 609, normalized size of antiderivative = 1.55

$$\int \frac{(d+ex)^3}{a+b\arcsin(cx)}\,dx = -\frac{3\,de^2\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin\left(cx\right)\right)}{bc^3} + \frac{d^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{bc} + \frac{e^3\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{bc^4} - \frac{3\,d^2e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{bc^2} - \frac{e^3\cos\left(\frac{a}{b}\right)^4\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)}{bc^4} - \frac{3\,de^2\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin\left(cx\right)\right)}{bc^3} + \frac{3\,d^2e\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{bc^2} + \frac{d^3\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{bc} + \frac{9\,de^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin\left(cx\right)\right)}{4\,bc^3} + \frac{3\,de^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{4\,bc^3} - \frac{e^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{2\,bc^4} - \frac{e^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)\sin\left(\frac{a}{b}\right)}{2\,bc^4} + \frac{e^3\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)}{bc^4} + \frac{3\,de^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin\left(cx\right)\right)}{4\,bc^3} - \frac{3\,d^2e\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{2\,bc^2} + \frac{e^3\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{2\,bc^4} + \frac{3\,de^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin\left(cx\right)\right)}{4\,bc^3} - \frac{e^3\operatorname{Si}\left(\frac{4\,a}{b}+4\,\arcsin\left(cx\right)\right)}{8\,bc^4} - \frac{e^3\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin\left(cx\right)\right)}{4\,bc^4}$$

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

output
```
-3*d*e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d^3*cos(
a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) + e^3*cos(a/b)^3*cos_integral(4
*a/b + 4*arcsin(c*x))*sin(a/b)/(b*c^4) - 3*d^2*e*cos(a/b)*cos_integral(2*a
/b + 2*arcsin(c*x))*sin(a/b)/(b*c^2) - e^3*cos(a/b)^4*sin_integral(4*a/b +
 4*arcsin(c*x))/(b*c^4) - 3*d*e^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b +
 3*arcsin(c*x))/(b*c^3) + 3*d^2*e*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin
(c*x))/(b*c^2) + d^3*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c) + 9/4*
d*e^2*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + 3/4*d*e^2*cos
(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c^3) - 1/2*e^3*cos(a/b)*cos_integ
ral(4*a/b + 4*arcsin(c*x))*sin(a/b)/(b*c^4) - 1/2*e^3*cos(a/b)*cos_integra
l(2*a/b + 2*arcsin(c*x))*sin(a/b)/(b*c^4) + e^3*cos(a/b)^2*sin_integral(4*
a/b + 4*arcsin(c*x))/(b*c^4) + 3/4*d*e^2*sin(a/b)*sin_integral(3*a/b + 3*a
rcsin(c*x))/(b*c^3) - 3/2*d^2*e*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^2
) + 1/2*e^3*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(c*x))/(b*c^4) + 3/4*d
*e^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^3) - 1/8*e^3*sin_integr
al(4*a/b + 4*arcsin(c*x))/(b*c^4) - 1/4*e^3*sin_integral(2*a/b + 2*arcsin(
c*x))/(b*c^4)
```

### 3.16.9 Mupad [F(-1)]

Timed out.

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

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

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

# 3.17 $\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx$



## 3.17.1 Optimal result

Integrand size = 18, antiderivative size = 244

$$
\begin{aligned}
\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx &= \frac{d^2\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} \\
&+ \frac{e^2\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} \\
&- \frac{e^2\cos\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} \\
&- \frac{de\operatorname{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{bc^2} \\
&+ \frac{d^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} \\
&+ \frac{de\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} \\
&- \frac{e^2\sin\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3}
\end{aligned}
$$

output
```
d^2*Ci(a/b+arcsin(c*x))*cos(a/b)/b/c+1/4*e^2*Ci(a/b+arcsin(c*x))*cos(a/b)/
b/c^3-1/4*e^2*Ci(3*a/b+3*arcsin(c*x))*cos(3*a/b)/b/c^3+d*e*cos(2*a/b)*Si(2
*a/b+2*arcsin(c*x))/b/c^2+d^2*Si(a/b+arcsin(c*x))*sin(a/b)/b/c+1/4*e^2*Si(
a/b+arcsin(c*x))*sin(a/b)/b/c^3-d*e*Ci(2*a/b+2*arcsin(c*x))*sin(2*a/b)/b/c
^2-1/4*e^2*Si(3*a/b+3*arcsin(c*x))*sin(3*a/b)/b/c^3
```

### 3.17.2 Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.77

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx$$
$$= \frac{(4c^2d^2+e^2)\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)-e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(cx)\right)\right)-4cde\,\text{C}$$

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

output
```
((4*c^2*d^2 + e^2)*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - e^2*Cos[(3*a)
/b]*CosIntegral[3*(a/b + ArcSin[c*x])] - 4*c*d*e*CosIntegral[2*(a/b + ArcS
in[c*x])]*Sin[(2*a)/b] + 4*c^2*d^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]]
 + e^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] + 4*c*d*e*Cos[(2*a)/b]*SinI
ntegral[2*(a/b + ArcSin[c*x])] - e^2*Sin[(3*a)/b]*SinIntegral[3*(a/b + Arc
Sin[c*x])])/(4*b*c^3)
```

### 3.17.3 Rubi [A] (verified)

Time = 0.87 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.95, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {5246, 7293, 2009}

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

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx$$
$$\Big\downarrow \text{5246}$$
$$\frac{\int \frac{(cd+cex)^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}d\arcsin(cx)}{c^3}$$
$$\Big\downarrow \text{7293}$$
$$\frac{\int \left(\frac{c^2\sqrt{1-c^2x^2}d^2}{a+b\arcsin(cx)}+\frac{ce\sin(2\arcsin(cx))d}{a+b\arcsin(cx)}+\frac{c^2e^2x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)}\right)d\arcsin(cx)}{c^3}$$
$$\Big\downarrow \text{2009}$$

$$\frac{c^2d^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}+\frac{c^2d^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}-\frac{cde\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{b}+\frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegr}}{4b}$$

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

output
```
((c^2*d^2*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/b + (e^2*Cos[a/b]*CosIn
tegral[a/b + ArcSin[c*x]])/(4*b) - (e^2*Cos[(3*a)/b]*CosIntegral[(3*a)/b +
 3*ArcSin[c*x]])/(4*b) - (c*d*e*CosIntegral[(2*a)/b + 2*ArcSin[c*x]]*Sin[(
2*a)/b])/b + (c^2*d^2*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]])/b + (e^2*Si
n[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(4*b) + (c*d*e*Cos[(2*a)/b]*SinInte
gral[(2*a)/b + 2*ArcSin[c*x]])/b - (e^2*Sin[(3*a)/b]*SinIntegral[(3*a)/b +
 3*ArcSin[c*x]])/(4*b))/c^3
```

#### 3.17.3.1 Defintions of rubi rules used

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

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.17.4 Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 206, normalized size of antiderivative = 0.84

| method | result |
|---|---|
| derivativedivides | $\frac{4\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^2d^2+4\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^2d^2+4\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)cde-4\,\text{Ci}\left(2\arcsin(cx\right.}{}$ |
| default | $\frac{4\,\text{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)c^2d^2+4\,\text{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)c^2d^2+4\cos\left(\frac{2a}{b}\right)\text{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)cde-4\,\text{Ci}\left(2\arcsin(cx\right.}{}$ |

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

output
```
1/4/c^3*(4*Si(arcsin(c*x)+a/b)*sin(a/b)*c^2*d^2+4*Ci(arcsin(c*x)+a/b)*cos(
a/b)*c^2*d^2+4*cos(2*a/b)*Si(2*arcsin(c*x)+2*a/b)*c*d*e-4*Ci(2*arcsin(c*x)
+2*a/b)*sin(2*a/b)*c*d*e-sin(3*a/b)*Si(3*arcsin(c*x)+3*a/b)*e^2-cos(3*a/b)
*Ci(3*arcsin(c*x)+3*a/b)*e^2+sin(a/b)*Si(arcsin(c*x)+a/b)*e^2+cos(a/b)*Ci(
arcsin(c*x)+a/b)*e^2)/b
```

## 3.17.5 Fricas [F]

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

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

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

## 3.17.6 Sympy [F]

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

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

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

## 3.17.7 Maxima [F]

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

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

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

### 3.17.8 Giac [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 337, normalized size of antiderivative = 1.38

$$\int \frac{(d+ex)^2}{a+b\arcsin(cx)}\,dx = -\frac{e^2\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} + \frac{d^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{2de\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} - \frac{e^2\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{bc^3} + \frac{2de\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{d^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{3e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} + \frac{e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3} + \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(cx)\right)}{4bc^3} - \frac{de\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{4bc^3}$$

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

output
```
-e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + d^2*cos(a/b)
*cos_integral(a/b + arcsin(c*x))/(b*c) - 2*d*e*cos(a/b)*cos_integral(2*a/b
 + 2*arcsin(c*x))*sin(a/b)/(b*c^2) - e^2*cos(a/b)^2*sin(a/b)*sin_integral(
3*a/b + 3*arcsin(c*x))/(b*c^3) + 2*d*e*cos(a/b)^2*sin_integral(2*a/b + 2*a
rcsin(c*x))/(b*c^2) + d^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c) +
 3/4*e^2*cos(a/b)*cos_integral(3*a/b + 3*arcsin(c*x))/(b*c^3) + 1/4*e^2*co
s(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c^3) + 1/4*e^2*sin(a/b)*sin_inte
gral(3*a/b + 3*arcsin(c*x))/(b*c^3) - d*e*sin_integral(2*a/b + 2*arcsin(c*
x))/(b*c^2) + 1/4*e^2*sin(a/b)*sin_integral(a/b + arcsin(c*x))/(b*c^3)
```

### 3.17.9 Mupad [F(-1)]

Timed out.

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

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

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

# 3.18 $\int \frac{d+ex}{a+b\arcsin(cx)}\,dx$



## 3.18.1 Optimal result

Integrand size = 16, antiderivative size = 115

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \frac{d\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\operatorname{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{2a}{b}\right)}{2bc^2} + \frac{d\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} + \frac{e\cos\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2}$$

output
```
d*Ci(a/b+arcsin(c*x))*cos(a/b)/b/c+1/2*e*cos(2*a/b)*Si(2*a/b+2*arcsin(c*x)
)/b/c^2+d*Si(a/b+arcsin(c*x))*sin(a/b)/b/c-1/2*e*Ci(2*a/b+2*arcsin(c*x))*s
in(2*a/b)/b/c^2
```

## 3.18.2 Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.85

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \frac{2cd\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right) - e\operatorname{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right)\sin\left(\frac{2a}{b}\right) + 2cd\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}\right.}{2bc^2}$$

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

output
```
(2*c*d*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] - e*CosIntegral[2*(a/b + Ar
cSin[c*x])]*Sin[(2*a)/b] + 2*c*d*Sin[a/b]*SinIntegral[a/b + ArcSin[c*x]] +
 e*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])])/(2*b*c^2)
```

### 3.18.3 Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 109, normalized size of antiderivative = 0.95, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$, Rules used = {5246, 7293, 2009}

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

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

$$\Big\downarrow \text{5246}$$

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

$$\Big\downarrow \text{7293}$$

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

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

$$\frac{\frac{cd\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}-\frac{e\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2b}+\frac{cd\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b}+\frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2b}}{c^2}$$

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

output
```
((c*d*Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]])/b - (e*CosIntegral[(2*a)/b
+ 2*ArcSin[c*x]]*Sin[(2*a)/b])/(2*b) + (c*d*Sin[a/b]*SinIntegral[a/b + Arc
Sin[c*x]])/b + (e*Cos[(2*a)/b]*SinIntegral[(2*a)/b + 2*ArcSin[c*x]])/(2*b)
)/c^2
```

#### 3.18.3.1 Defintions of rubi rules used

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

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.18.4 Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.90

| method | result | s |
|---|---|---|
| derivativedivides | $\frac{\frac{d\left(\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{b}+\frac{e\left(\operatorname{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\operatorname{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2cb}}{c}$ | 1 |
| default | $\frac{\frac{d\left(\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)\right)}{b}+\frac{e\left(\operatorname{Si}\left(2\arcsin(cx)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\operatorname{Ci}\left(2\arcsin(cx)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2cb}}{c}$ | 1 |

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

output
```
1/c*(d*(Si(arcsin(c*x)+a/b)*sin(a/b)+Ci(arcsin(c*x)+a/b)*cos(a/b))/b+1/2/c
*e*(Si(2*arcsin(c*x)+2*a/b)*cos(2*a/b)-Ci(2*arcsin(c*x)+2*a/b)*sin(2*a/b))
/b)
```

### 3.18.5 Fricas [F]

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

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

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

### 3.18.6 Sympy [F]

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

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

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

### 3.18.7 Maxima [F]

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

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

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

### 3.18.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.21

$$\int \frac{d+ex}{a+b\arcsin(cx)}\,dx = \frac{d\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{bc^2} + \frac{e\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{bc^2} + \frac{d\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc} - \frac{e\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(cx)\right)}{2bc^2}$$

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

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

### 3.18.9 Mupad [F(-1)]

Timed out.

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

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

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

# 3.19 $\int \frac{1}{a+b\arcsin(cx)}\,dx$



## 3.19.1 Optimal result

Integrand size = 10, antiderivative size = 53

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

output
```
Ci((a+b*arcsin(c*x))/b)*cos(a/b)/b/c+Si((a+b*arcsin(c*x))/b)*sin(a/b)/b/c
```

## 3.19.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.83

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{bc}$$

input
```
Integrate[(a + b*ArcSin[c*x])^(-1),x]
```

output
```
(Cos[a/b]*CosIntegral[a/b + ArcSin[c*x]] + Sin[a/b]*SinIntegral[a/b + ArcS
in[c*x]])/(b*c)
```

### 3.19.3 Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.91, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.700, Rules used = {5134, 3042, 3784, 25, 3042, 3780, 3783}

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

$$\int \frac{1}{a+b\arcsin(cx)}\,dx$$

$$\Big\downarrow \text{ 5134}$$

$$\frac{\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

$$\Big\downarrow \text{ 3784}$$

$$\frac{\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

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

$$\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))+\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))+\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{bc}$$

$$\Big\downarrow \text{ 3780}$$

$$\frac{\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

$$\Big\downarrow \text{ 3783}$$

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{bc}$$

input
```
Int[(a + b*ArcSin[c*x])^(-1),x]
```

output
```
(Cos[a/b]*CosIntegral[(a + b*ArcSin[c*x])/b] + Sin[a/b]*SinIntegral[(a + b
*ArcSin[c*x])/b])/(b*c)
```

### 3.19.3.1 Defintions of rubi rules used

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

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

### 3.19.4 Maple [A] (verified)

Time = 0.01 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.91

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\frac{\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$ | 48 |
| default | $\frac{\frac{\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{c}$ | 48 |

input
```
int(1/(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
1/c*(Si(arcsin(c*x)+a/b)*sin(a/b)/b+Ci(arcsin(c*x)+a/b)*cos(a/b)/b)
```

### 3.19.5 Fricas [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx = \int \frac{1}{b\arcsin(cx)+a}\,dx$$

input
```
integrate(1/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral(1/(b*arcsin(c*x) + a), x)
```

### 3.19.6 Sympy [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx = \int \frac{1}{a+b\,\mathrm{asin}(cx)}\,dx$$

input
```
integrate(1/(a+b*asin(c*x)),x)
```

output
```
Integral(1/(a + b*asin(c*x)), x)
```

### 3.19.7 Maxima [F]

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{b\arcsin{(cx)}+a}\,dx$$

input
```
integrate(1/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
integrate(1/(b*arcsin(c*x) + a), x)
```

### 3.19.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.92

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\frac{\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin{(cx)}\right)}{bc}+\frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin{(cx)}\right)}{bc}$$

input
```
integrate(1/(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
cos(a/b)*cos_integral(a/b + arcsin(c*x))/(b*c) + sin(a/b)*sin_integral(a/b
 + arcsin(c*x))/(b*c)
```

### 3.19.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a+b\arcsin(cx)}\,dx=\int \frac{1}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

input
```
int(1/(a + b*asin(c*x)),x)
```

output
```
int(1/(a + b*asin(c*x)), x)
```

# 3.20 $\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$



## 3.20.1 Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{1}{(d+ex)(a+b\arcsin(cx))},x\right)$$

output
```
Unintegrable(1/(e*x+d)/(a+b*arcsin(c*x)),x)
```

## 3.20.2 Mathematica [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$$

input
```
Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])),x]
```

output
```
Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])), x]
```

## 3.20.3 Rubi [N/A]

Not integrable

Time = 0.18 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5300}

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

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx$$

$$\Big\downarrow \; 5300$$

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}dx$$

input
```
Int[1/((d + e*x)*(a + b*ArcSin[c*x])),x]
```

output
```
$Aborted
```

### 3.20.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

## 3.20.4 Maple [N/A] (verified)

Not integrable

Time = 3.37 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ex+d)\left(a+b\arcsin\left(cx\right)\right)}dx$$

input
```
int(1/(e*x+d)/(a+b*arcsin(c*x)),x)
```

output
```
int(1/(e*x+d)/(a+b*arcsin(c*x)),x)
```

### 3.20.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.39

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx=\int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral(1/(a*e*x + a*d + (b*e*x + b*d)*arcsin(c*x)), x)
```

### 3.20.6 Sympy [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.83

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}\,(cx))\,(d+ex)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*asin(c*x)),x)
```

output
```
Integral(1/((a + b*asin(c*x))*(d + e*x)), x)
```

### 3.20.7 Maxima [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx=\int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
integrate(1/((e*x + d)*(b*arcsin(c*x) + a)), x)
```

### 3.20.8 Giac [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)(b\arcsin(cx)+a)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
integrate(1/((e*x + d)*(b*arcsin(c*x) + a)), x)
```

### 3.20.9 Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(c\,x))\,(d+e\,x)}\,dx$$

input
```
int(1/((a + b*asin(c*x))*(d + e*x)),x)
```

output
```
int(1/((a + b*asin(c*x))*(d + e*x)), x)
```

# 3.21 $\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx$



## 3.21.1 Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx=\text{Int}\left(\frac{1}{(d+ex)^2(a+b\arcsin(cx))},x\right)$$

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

## 3.21.2 Mathematica [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx=\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx$$

input
```
Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])),x]
```

output
```
Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])), x]
```

## 3.21.3 Rubi [N/A]

Not integrable

Time = 0.18 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5300}

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

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}dx$$
$$\Big\downarrow \; 5300$$
$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}dx$$

input
```
Int[1/((d + e*x)^2*(a + b*ArcSin[c*x])),x]
```

output
```
$Aborted
```

### 3.21.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

## 3.21.4 Maple [N/A] (verified)

Not integrable

Time = 1.36 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ex+d)^2\,(a+b\arcsin(cx))}dx$$

input
```
int(1/(e*x+d)^2/(a+b*arcsin(c*x)),x)
```

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

### 3.21.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 49, normalized size of antiderivative = 2.72

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

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

### 3.21.6 Sympy [N/A]

Not integrable

Time = 1.78 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(a+b\operatorname{asin}(cx))\,(d+ex)^2}\,dx$$

input
```
integrate(1/(e*x+d)**2/(a+b*asin(c*x)),x)
```

output
```
Integral(1/((a + b*asin(c*x))*(d + e*x)**2), x)
```

### 3.21.7 Maxima [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

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

### 3.21.8 Giac [N/A]

Not integrable

Time = 0.82 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x)),x, algorithm="giac")
```

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

### 3.21.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

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

input
```
int(1/((a + b*asin(c*x))*(d + e*x)^2),x)
```

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

# 3.22 $\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2} dx$



## 3.22.1 Optimal result

Integrand size = 18, antiderivative size = 362

$$\begin{aligned}\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = &-\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{2dex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}\\ &-\frac{e^2x^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}\\ &+\frac{2de\cos\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}\\ &+\frac{d^2\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c}\\ &+\frac{e^2\operatorname{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b^2c^3}\\ &-\frac{3e^2\operatorname{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b^2c^3}\\ &-\frac{d^2\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{e^2\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3}\\ &+\frac{2de\sin\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}\\ &+\frac{3e^2\cos\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}\end{aligned}$$

output
```
2*d*e*Ci(2*(a+b*arcsin(c*x))/b)*cos(2*a/b)/b^2/c^2-d^2*cos(a/b)*Si((a+b*ar
csin(c*x))/b)/b^2/c-1/4*e^2*cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c^3+3/4*e
^2*cos(3*a/b)*Si(3*(a+b*arcsin(c*x))/b)/b^2/c^3+d^2*Ci((a+b*arcsin(c*x))/b
)*sin(a/b)/b^2/c+1/4*e^2*Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b^2/c^3+2*d*e*Si
(2*(a+b*arcsin(c*x))/b)*sin(2*a/b)/b^2/c^2-3/4*e^2*Ci(3*(a+b*arcsin(c*x))/
b)*sin(3*a/b)/b^2/c^3-d^2*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))-2*d*e*x
*(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))-e^2*x^2*(-c^2*x^2+1)^(1/2)/b/c/(
a+b*arcsin(c*x))
```

### 3.22.2 Mathematica [A] (verified)

Time = 1.63 (sec) , antiderivative size = 290, normalized size of antiderivative = 0.80

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx = -\frac{\frac{4bc^2d^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + \frac{8bc^2dex\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + \frac{4bc^2e^2x^2\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} - 8cde\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(cx)\right)\right) - (4c^2d}{}$$

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

output
```
-1/4*((4*b*c^2*d^2*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (8*b*c^2*d*e*x
*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x]) + (4*b*c^2*e^2*x^2*Sqrt[1 - c^2*x^
2])/(a + b*ArcSin[c*x]) - 8*c*d*e*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin
[c*x])] - (4*c^2*d^2 + e^2)*CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] + 3*e^
2*CosIntegral[3*(a/b + ArcSin[c*x])]*Sin[(3*a)/b] + 4*c^2*d^2*Cos[a/b]*Sin
Integral[a/b + ArcSin[c*x]] + e^2*Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]]
- 8*c*d*e*Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c*x])] - 3*e^2*Cos[(3*a
)/b]*SinIntegral[3*(a/b + ArcSin[c*x])])/(b^2*c^3)
```

### 3.22.3 Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 362, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {5244, 2009}

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

$$\int \frac{(d+ex)^2}{(a+b\arcsin(cx))^2}\,dx$$
$$\Big\downarrow \text{ 5244}$$
$$\int \left(\frac{d^2}{(a+b\arcsin(cx))^2}+\frac{2dex}{(a+b\arcsin(cx))^2}+\frac{e^2x^2}{(a+b\arcsin(cx))^2}\right)dx$$
$$\Big\downarrow \text{ 2009}$$
$$\frac{e^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3}-\frac{3e^2\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}-\frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{4b^2c^3}+\frac{3e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(cx))}{b}\right)}{4b^2c^3}+\frac{2de\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}+\frac{2de\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}+\frac{d^2\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{2dex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{e^2x^2\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

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

output
```
-((d^2*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (2*d*e*x*Sqrt[1 - c
^2*x^2])/(b*c*(a + b*ArcSin[c*x])) - (e^2*x^2*Sqrt[1 - c^2*x^2])/(b*c*(a +
 b*ArcSin[c*x])) + (2*d*e*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c*x]))
/b])/(b^2*c^2) + (d^2*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(b^2*c)
 + (e^2*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(4*b^2*c^3) - (3*e^2*
CosIntegral[(3*(a + b*ArcSin[c*x]))/b]*Sin[(3*a)/b])/(4*b^2*c^3) - (d^2*Co
s[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c) - (e^2*Cos[a/b]*SinInte
gral[(a + b*ArcSin[c*x])/b])/(4*b^2*c^3) + (2*d*e*Sin[(2*a)/b]*SinIntegral
[(2*(a + b*ArcSin[c*x]))/b])/(b^2*c^2) + (3*e^2*Cos[(3*a)/b]*SinIntegral[(
3*(a + b*ArcSin[c*x]))/b])/(4*b^2*c^3)
```

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

#### 3.22.3.1 Defintions of rubi rules used

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

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

### 3.22.4 Maple [A] (verified)

Time = 0.36 (sec) , antiderivative size = 526, normalized size of antiderivative = 1.45

| method | result |
|---|---|
| derivativedivides | $-\frac{4\arcsin(cx)\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b\,c^2d^2-4\arcsin(cx)\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b\,c^2d^2-8\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx\right.}{}$ |
| default | $-\frac{4\arcsin(cx)\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b\,c^2d^2-4\arcsin(cx)\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b\,c^2d^2-8\arcsin(cx)\,\mathrm{Si}\left(2\arcsin(cx\right.}{}$ |

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

output
```
-1/4/c^3*(4*arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b*c^2*d^2-4*arcsin(c*
x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*c^2*d^2-8*arcsin(c*x)*Si(2*arcsin(c*x)+2
*a/b)*sin(2*a/b)*b*c*d*e-8*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*
b*c*d*e+4*Si(arcsin(c*x)+a/b)*cos(a/b)*a*c^2*d^2-4*Ci(arcsin(c*x)+a/b)*sin
(a/b)*a*c^2*d^2+4*(-c^2*x^2+1)^(1/2)*b*c^2*d^2+arcsin(c*x)*Si(arcsin(c*x)+
a/b)*cos(a/b)*b*e^2-arcsin(c*x)*Ci(arcsin(c*x)+a/b)*sin(a/b)*b*e^2-3*arcsi
n(c*x)*Si(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*b*e^2+3*arcsin(c*x)*Ci(3*arcsin(
c*x)+3*a/b)*sin(3*a/b)*b*e^2-8*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a*c*d*e-
8*Ci(2*arcsin(c*x)+2*a/b)*cos(2*a/b)*a*c*d*e+Si(arcsin(c*x)+a/b)*cos(a/b)*
a*e^2-Ci(arcsin(c*x)+a/b)*sin(a/b)*a*e^2+4*sin(2*arcsin(c*x))*b*c*d*e-3*Si
(3*arcsin(c*x)+3*a/b)*cos(3*a/b)*a*e^2+3*Ci(3*arcsin(c*x)+3*a/b)*sin(3*a/b
)*a*e^2+(-c^2*x^2+1)^(1/2)*b*e^2-cos(3*arcsin(c*x))*b*e^2)/(a+b*arcsin(c*x
))/b^2
```

### 3.22.5 Fricas [F]

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

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

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

### 3.22.6 Sympy [F]

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

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

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

### 3.22.7 Maxima [F]

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

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

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

### 3.22.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1276 vs. 2(348) = 696.

Time = 0.38 (sec) , antiderivative size = 1276, normalized size of antiderivative = 3.52

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

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

output
```
4*b*c*d*e*arcsin(c*x)*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*
c^3*arcsin(c*x) + a*b^2*c^3) - 3*b*e^2*arcsin(c*x)*cos(a/b)^2*cos_integral
(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + b*c^2
*d^2*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(
c*x) + a*b^2*c^3) + 3*b*e^2*arcsin(c*x)*cos(a/b)^3*sin_integral(3*a/b + 3*
arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*b*c*d*e*arcsin(c*x)*cos
(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) +
a*b^2*c^3) - b*c^2*d^2*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x)
)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*a*c*d*e*cos(a/b)^2*cos_integral(2*
a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 3*a*e^2*cos(a/b)^
2*cos_integral(3*a/b + 3*arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^
2*c^3) + a*c^2*d^2*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c^3*arcsi
n(c*x) + a*b^2*c^3) + 3*a*e^2*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(c*x
))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 4*a*c*d*e*cos(a/b)*sin(a/b)*sin_int
egral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - a*c^2*d^2
*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c^3*arcsin(c*x) + a*b^2*c^3
) - 2*sqrt(-c^2*x^2 + 1)*b*c^2*d*e*x/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) - 2
*b*c*d*e*arcsin(c*x)*cos_integral(2*a/b + 2*arcsin(c*x))/(b^3*c^3*arcsin(c
*x) + a*b^2*c^3) + 3/4*b*e^2*arcsin(c*x)*cos_integral(3*a/b + 3*arcsin(c*x
))*sin(a/b)/(b^3*c^3*arcsin(c*x) + a*b^2*c^3) + 1/4*b*e^2*arcsin(c*x)*c...
```

### 3.22.9 Mupad [F(-1)]

Timed out.

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

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

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

# 3.23 $\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx$



## 3.23.1 Optimal result

Integrand size = 16, antiderivative size = 181

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

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

### 3.23.2 Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.82

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx$$
$$= \frac{-\frac{bc(d+ex)\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + e\log(a+b\arcsin(cx)) + cd\left(\text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\text{arcs}\right.\right.}{}$$

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

output
```
(-((b*c*(d + e*x)*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])) + e*Log[a + b*Ar
cSin[c*x]] + c*d*(CosIntegral[a/b + ArcSin[c*x]]*Sin[a/b] - Cos[a/b]*SinIn
tegral[a/b + ArcSin[c*x]]) + e*(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c
*x])] - Log[a + b*ArcSin[c*x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[
c*x])]))/(b^2*c^2)
```

### 3.23.3 Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5244, 2009}

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

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx$$
$$\Big\downarrow \text{5244}$$
$$\int \left(\frac{d}{(a+b\arcsin(cx))^2}+\frac{ex}{(a+b\arcsin(cx))^2}\right)dx$$
$$\Big\downarrow \text{2009}$$
$$\frac{e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}+\frac{e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(cx))}{b}\right)}{b^2c^2}+\frac{d\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{d\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}-\frac{ex\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

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

output
```
-((d*Sqrt[1 - c^2*x^2])/(b*c*(a + b*ArcSin[c*x]))) - (e*x*Sqrt[1 - c^2*x^2
])/(b*c*(a + b*ArcSin[c*x])) + (e*Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSi
n[c*x]))/b])/(b^2*c^2) + (d*CosIntegral[(a + b*ArcSin[c*x])/b]*Sin[a/b])/(
b^2*c) - (d*Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2*c) + (e*Sin[
(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c*x]))/b])/(b^2*c^2)
```

### 3.23.3.1 Defintions of rubi rules used

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

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

## 3.23.4 Maple [A] (verified)

Time = 0.15 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.42

| method | result |
|---|---|
| derivativedivides | $-\frac{\frac{d\left(\arcsin(cx)\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b-\arcsin(cx)\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)a-\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\mathrm{s}\right.}{(a+b\arcsin(cx))b^2}}{}$ |
| default | $-\frac{\frac{d\left(\arcsin(cx)\,\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b-\arcsin(cx)\,\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)b+\mathrm{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)a-\mathrm{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\mathrm{s}\right.}{(a+b\arcsin(cx))b^2}}{}$ |

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

output
```
1/c*(-d*(arcsin(c*x)*Si(arcsin(c*x)+a/b)*cos(a/b)*b-arcsin(c*x)*Ci(arcsin(
c*x)+a/b)*sin(a/b)*b+Si(arcsin(c*x)+a/b)*cos(a/b)*a-Ci(arcsin(c*x)+a/b)*si
n(a/b)*a+(-c^2*x^2+1)^(1/2)*b)/(a+b*arcsin(c*x))/b^2+1/2/c*e*(2*arcsin(c*x
)*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*b+2*arcsin(c*x)*Ci(2*arcsin(c*x)+2*a/
b)*cos(2*a/b)*b+2*Si(2*arcsin(c*x)+2*a/b)*sin(2*a/b)*a+2*Ci(2*arcsin(c*x)+
2*a/b)*cos(2*a/b)*a-sin(2*arcsin(c*x))*b)/(a+b*arcsin(c*x))/b^2)
```

### 3.23.5 Fricas [F]

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

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

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

### 3.23.6 Sympy [F]

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

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

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

### 3.23.7 Maxima [F]

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

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

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

### 3.23.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 554 vs. $2(177) = 354$.

Time = 0.36 (sec) , antiderivative size = 554, normalized size of antiderivative = 3.06

$$\int \frac{d+ex}{(a+b\arcsin(cx))^2}\,dx = \frac{2\,be\arcsin(cx)\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} + \frac{bcd\arcsin(cx)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^2\arcsin(cx)+ab^2c^2} + \frac{2\,be\arcsin(cx)\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} - \frac{bcd\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} + \frac{2\,ae\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} + \frac{acd\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c^2\arcsin(cx)+ab^2c^2} + \frac{2\,ae\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} - \frac{acd\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} - \frac{\sqrt{-c^2x^2+1}bcex}{b^3c^2\arcsin(cx)+ab^2c^2} - \frac{be\arcsin(cx)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2} - \frac{\sqrt{-c^2x^2+1}bcd}{b^3c^2\arcsin(cx)+ab^2c^2} - \frac{ae\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(cx)\right)}{b^3c^2\arcsin(cx)+ab^2c^2}$$

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

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

### 3.23.9 Mupad [F(-1)]

Timed out.

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

input
```
int((d + e*x)/(a + b*asin(c*x))^2,x)
```

output
```
int((d + e*x)/(a + b*asin(c*x))^2, x)
```

# 3.24 $\int \frac{1}{(a+b\arcsin(cx))^2}\,dx$



## 3.24.1 Optimal result

Integrand size = 10, antiderivative size = 86

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = -\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))} + \frac{\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2c} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}$$

output
```
-cos(a/b)*Si((a+b*arcsin(c*x))/b)/b^2/c+Ci((a+b*arcsin(c*x))/b)*sin(a/b)/b
^2/c-(-c^2*x^2+1)^(1/2)/b/c/(a+b*arcsin(c*x))
```

## 3.24.2 Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.84

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \frac{-\frac{b\sqrt{1-c^2x^2}}{a+b\arcsin(cx)} + \text{CosIntegral}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right) - \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^2c}$$

input
```
Integrate[(a + b*ArcSin[c*x])^(-2),x]
```

output
```
(-((b*Sqrt[1 - c^2*x^2])/(a + b*ArcSin[c*x])) + CosIntegral[a/b + ArcSin[c
*x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c*x]])/(b^2*c)
```

### 3.24.3 Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.97, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.900, Rules used = {5132, 5224, 25, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(cx))^2}dx$$

$$\Big\downarrow \text{5132}$$

$$-\frac{c\int \frac{x}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}dx}{b}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \text{5224}$$

$$-\frac{\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \text{25}$$

$$\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \text{3784}$$

$$-\frac{-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))-\cos\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \text{3042}$$

$$-\frac{\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(cx)}{b}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \; 3780$$

$$-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(cx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(cx)}d(a+b\arcsin(cx))}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

$$\Big\downarrow \; 3783$$

$$-\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(cx)}{b}\right)-\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(cx)}{b}\right)}{b^2c}-\frac{\sqrt{1-c^2x^2}}{bc(a+b\arcsin(cx))}$$

input
```
Int[(a + b*ArcSin[c*x])^(-2),x]
```

output
```
-(Sqrt[1 - c^2*x^2]/(b*c*(a + b*ArcSin[c*x]))) - (-(CosIntegral[(a + b*Arc
Sin[c*x])/b]*Sin[a/b]) + Cos[a/b]*SinIntegral[(a + b*ArcSin[c*x])/b])/(b^2
*c)
```

### 3.24.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

## 3.24.4 Maple [A] (verified)

Time = 0.01 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.88

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b}-\frac{\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2}}{c}$ | 76 |
| default | $\frac{-\frac{\sqrt{-c^2x^2+1}}{(a+b\arcsin(cx))b}-\frac{\operatorname{Si}\left(\arcsin(cx)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)-\operatorname{Ci}\left(\arcsin(cx)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2}}{c}$ | 76 |

input
```
int(1/(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(-(-c^2*x^2+1)^(1/2)/(a+b*arcsin(c*x))/b-(Si(arcsin(c*x)+a/b)*cos(a/b)
-Ci(arcsin(c*x)+a/b)*sin(a/b))/b^2)
```

### 3.24.5 Fricas [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
integral(1/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

### 3.24.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}\,dx$$

input
```
integrate(1/(a+b*asin(c*x))**2,x)
```

output
```
Integral((a + b*asin(c*x))**(-2), x)
```

### 3.24.7 Maxima [F]

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(b\arcsin\left(cx\right)+a\right)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
((b^2*c^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c^2)*integrate(
sqrt(c*x + 1)*sqrt(-c*x + 1)*x/(a*b*c^2*x^2 - a*b + (b^2*c^2*x^2 - b^2)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x) - sqrt(c*x + 1)*sqrt(-c*x +
1))/(b^2*c*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

### 3.24.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 192 vs. 2(84) = 168.

Time = 0.31 (sec) , antiderivative size = 192, normalized size of antiderivative = 2.23

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \frac{b\arcsin(cx)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin(cx)+ab^2c} - \frac{b\arcsin(cx)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c\arcsin(cx)+ab^2c} + \frac{a\operatorname{Ci}\left(\frac{a}{b}+\arcsin(cx)\right)\sin\left(\frac{a}{b}\right)}{b^3c\arcsin(cx)+ab^2c} - \frac{a\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(cx)\right)}{b^3c\arcsin(cx)+ab^2c} - \frac{\sqrt{-c^2x^2+1}\,b}{b^3c\arcsin(cx)+ab^2c}$$

input
```
integrate(1/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
b*arcsin(c*x)*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*c*arcsin(c*x)
+ a*b^2*c) - b*arcsin(c*x)*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3*c
*arcsin(c*x) + a*b^2*c) + a*cos_integral(a/b + arcsin(c*x))*sin(a/b)/(b^3*
c*arcsin(c*x) + a*b^2*c) - a*cos(a/b)*sin_integral(a/b + arcsin(c*x))/(b^3
*c*arcsin(c*x) + a*b^2*c) - sqrt(-c^2*x^2 + 1)*b/(b^3*c*arcsin(c*x) + a*b^
2*c)
```

### 3.24.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2}\,dx$$

input
```
int(1/(a + b*asin(c*x))^2,x)
```

output
```
int(1/(a + b*asin(c*x))^2, x)
```

# 3.25 $\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$



## 3.25.1 Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{1}{(d+ex)(a+b\arcsin(cx))^2},x\right)$$

output
```
Unintegrable(1/(e*x+d)/(a+b*arcsin(c*x))^2,x)
```

## 3.25.2 Mathematica [N/A]

Not integrable

Time = 10.23 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$$

input
```
Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])^2),x]
```

output
```
Integrate[1/((d + e*x)*(a + b*ArcSin[c*x])^2), x]
```

## 3.25.3 Rubi [N/A]

Not integrable

Time = 0.18 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx$$
$$\Big\downarrow \text{ 5300}$$
$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}dx$$

input
```
Int[1/((d + e*x)*(a + b*ArcSin[c*x])^2),x]
```

output
```
$Aborted
```

### 3.25.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

## 3.25.4 Maple [N/A] (verified)

Not integrable

Time = 5.66 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ex+d)\left(a+b\arcsin\left(cx\right)\right)^{2}}dx$$

input
```
int(1/(e*x+d)/(a+b*arcsin(c*x))^2,x)
```

output
```
int(1/(e*x+d)/(a+b*arcsin(c*x))^2,x)
```

### 3.25.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 51, normalized size of antiderivative = 2.83

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
integral(1/(a^2*e*x + a^2*d + (b^2*e*x + b^2*d)*arcsin(c*x)^2 + 2*(a*b*e*x
 + a*b*d)*arcsin(c*x)), x)
```

### 3.25.6 Sympy [N/A]

Not integrable

Time = 1.67 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(cx))^2\,(d+ex)}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*asin(c*x))**2,x)
```

output
```
Integral(1/((a + b*asin(c*x))**2*(d + e*x)), x)
```

### 3.25.7 Maxima [N/A]

Not integrable

Time = 1.60 (sec) , antiderivative size = 297, normalized size of antiderivative = 16.50

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
((a*b*c*e*x + a*b*c*d + (b^2*c*e*x + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)))*integrate((c^2*d*x + e)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*
c^3*e^2*x^4 + 2*a*b*c^3*d*e*x^3 - 2*a*b*c*d*e*x - a*b*c*d^2 + (a*b*c^3*d^2
 - a*b*c*e^2)*x^2 + (b^2*c^3*e^2*x^4 + 2*b^2*c^3*d*e*x^3 - 2*b^2*c*d*e*x -
 b^2*c*d^2 + (b^2*c^3*d^2 - b^2*c*e^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))), x) - sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*e*x + a*b*c*d + (
b^2*c*e*x + b^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

### 3.25.8 Giac [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)(b\arcsin{(cx)}+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
integrate(1/((e*x + d)*(b*arcsin(c*x) + a)^2), x)
```

### 3.25.9 Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)^2\,\left(d+e\,x\right)}\,dx$$

input
```
int(1/((a + b*asin(c*x))^2*(d + e*x)),x)
```

output
```
int(1/((a + b*asin(c*x))^2*(d + e*x)), x)
```

# 3.26 $\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$



## 3.26.1 Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{1}{(d+ex)^2(a+b\arcsin(cx))^2},x\right)$$

output
```
Unintegrable(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x)
```

## 3.26.2 Mathematica [N/A]

Not integrable

Time = 12.80 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx$$

input
```
Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])^2),x]
```

output
```
Integrate[1/((d + e*x)^2*(a + b*ArcSin[c*x])^2), x]
```

## 3.26.3 Rubi [N/A]

Not integrable

Time = 0.18 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2} \, dx$$
$$\Big\downarrow \; 5300$$
$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}dx$$

input
```
Int[1/((d + e*x)^2*(a + b*ArcSin[c*x])^2),x]
```

output
```
$Aborted
```

### 3.26.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

## 3.26.4 Maple [N/A] (verified)

Not integrable

Time = 1.96 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{1}{\left(ex+d\right)^{2} \left(a+b \arcsin \left(cx\right)\right)^{2}}dx$$

input
```
int(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x)
```

output
```
int(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x)
```

### 3.26.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 92, normalized size of antiderivative = 5.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
integral(1/(a^2*e^2*x^2 + 2*a^2*d*e*x + a^2*d^2 + (b^2*e^2*x^2 + 2*b^2*d*e
*x + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*e^2*x^2 + 2*a*b*d*e*x + a*b*d^2)*arcs
in(c*x)), x)
```

### 3.26.6 Sympy [N/A]

Not integrable

Time = 6.16 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.06

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\operatorname{asin}(cx))^2(d+ex)^2}\,dx$$

input
```
integrate(1/(e*x+d)**2/(a+b*asin(c*x))**2,x)
```

output
```
Integral(1/((a + b*asin(c*x))**2*(d + e*x)**2), x)
```

### 3.26.7 Maxima [N/A]

Not integrable

Time = 2.60 (sec) , antiderivative size = 426, normalized size of antiderivative = 23.67

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
-((a*b*c*e^2*x^2 + 2*a*b*c*d*e*x + a*b*c*d^2 + (b^2*c*e^2*x^2 + 2*b^2*c*d*
e*x + b^2*c*d^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*integrate((c^
2*e*x^2 - c^2*d*x - 2*e)*sqrt(c*x + 1)*sqrt(-c*x + 1)/(a*b*c^3*e^3*x^5 + 3
*a*b*c^3*d*e^2*x^4 - 3*a*b*c*d^2*e*x - a*b*c*d^3 + (3*a*b*c^3*d^2*e - a*b*
c*e^3)*x^3 + (a*b*c^3*d^3 - 3*a*b*c*d*e^2)*x^2 + (b^2*c^3*e^3*x^5 + 3*b^2*
c^3*d*e^2*x^4 - 3*b^2*c*d^2*e*x - b^2*c*d^3 + (3*b^2*c^3*d^2*e - b^2*c*e^3
)*x^3 + (b^2*c^3*d^3 - 3*b^2*c*d*e^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))), x) + sqrt(c*x + 1)*sqrt(-c*x + 1))/(a*b*c*e^2*x^2 + 2*a*b*c*
d*e*x + a*b*c*d^2 + (b^2*c*e^2*x^2 + 2*b^2*c*d*e*x + b^2*c*d^2)*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1)))
```

### 3.26.8 Giac [N/A]

Not integrable

Time = 0.97 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(ex+d)^2(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate(1/(e*x+d)^2/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
integrate(1/((e*x + d)^2*(b*arcsin(c*x) + a)^2), x)
```

### 3.26.9 Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{1}{(d+ex)^2(a+b\arcsin(cx))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(c\,x))^2\,(d+e\,x)^2}\,dx$$

input
```
int(1/((a + b*asin(c*x))^2*(d + e*x)^2),x)
```

output
```
int(1/((a + b*asin(c*x))^2*(d + e*x)^2), x)
```

# 3.27 $\int (d+ex)^m (a+b\arcsin(cx))^2\,dx$



## 3.27.1 Optimal result

Integrand size = 18, antiderivative size = 18

$$\int (d+ex)^m (a+b\arcsin(cx))^2\,dx = \frac{(d+ex)^{1+m}(a+b\arcsin(cx))^2}{e(1+m)} - \frac{2bc\text{Int}\left(\frac{(d+ex)^{1+m}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}},x\right)}{e(1+m)}$$

output
```
(e*x+d)^(1+m)*(a+b*arcsin(c*x))^2/e/(1+m)-2*b*c*Unintegrable((e*x+d)^(1+m)
*(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)/e/(1+m)
```

## 3.27.2 Mathematica [N/A]

Not integrable

Time = 11.40 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int (d+ex)^m (a+b\arcsin(cx))^2\,dx = \int (d+ex)^m (a+b\arcsin(cx))^2\,dx$$

input
```
Integrate[(d + e*x)^m*(a + b*ArcSin[c*x])^2,x]
```

output
```
Integrate[(d + e*x)^m*(a + b*ArcSin[c*x])^2, x]
```

### 3.27.3 Rubi [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5242, 5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5242}$$

$$\frac{(d+ex)^{m+1}(a+b\arcsin(cx))^2}{e(m+1)}-\frac{2bc\int \frac{(d+ex)^{m+1}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{e(m+1)}$$

$$\Big\downarrow \text{5300}$$

$$\frac{(d+ex)^{m+1}(a+b\arcsin(cx))^2}{e(m+1)}-\frac{2bc\int \frac{(d+ex)^{m+1}(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{e(m+1)}$$

input
```
Int[(d + e*x)^m*(a + b*ArcSin[c*x])^2,x]
```

output
```
$Aborted
```

#### 3.27.3.1 Defintions of rubi rules used

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

### 3.27.4 Maple [N/A] (verified)

Not integrable

Time = 0.24 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int (ex+d)^m (a+b\arcsin(cx))^2 \, dx$$

input
```
int((e*x+d)^m*(a+b*arcsin(c*x))^2,x)
```

output
```
int((e*x+d)^m*(a+b*arcsin(c*x))^2,x)
```

### 3.27.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.78

$$\int (d+ex)^m(a+b\arcsin(cx))^2 \, dx = \int (b\arcsin(cx)+a)^2(ex+d)^m \, dx$$

input
```
integrate((e*x+d)^m*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)*(e*x + d)^m, x)
```

### 3.27.6 Sympy [N/A]

Not integrable

Time = 14.92 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int (d+ex)^m(a+b\arcsin(cx))^2 \, dx = \int (a+b\operatorname{asin}(cx))^2 (d+ex)^m \, dx$$

input
```
integrate((e*x+d)**m*(a+b*asin(c*x))**2,x)
```

output
```
Integral((a + b*asin(c*x))**2*(d + e*x)**m, x)
```

### 3.27.7 Maxima [N/A]

Not integrable

Time = 1.68 (sec) , antiderivative size = 227, normalized size of antiderivative = 12.61

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx = \int (b\arcsin(cx)+a)^2(ex+d)^m\,dx$$

input
```
integrate((e*x+d)^m*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
(e*x + d)^(m + 1)*a^2/(e*(m + 1)) + ((b^2*e*x + b^2*d)*(e*x + d)^m*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + (e*m + e)*integrate(2*((b^2*c*e*x
+ b^2*c*d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^m*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) - (a*b*e*m + a*b*e - (a*b*c^2*e*m + a*b*c^2*e)*x^2)*(
e*x + d)^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/((c^2*e*m + c^2*e)*
x^2 - e*m - e), x))/(e*m + e)
```

### 3.27.8 Giac [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx = \int (b\arcsin(cx)+a)^2(ex+d)^m\,dx$$

input
```
integrate((e*x+d)^m*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2*(e*x + d)^m, x)
```

### 3.27.9 Mupad [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int (d+ex)^m(a+b\arcsin(cx))^2\,dx = \int (a+b\,\mathrm{asin}(c\,x))^2\,(d+e\,x)^m\,dx$$

input
```
int((a + b*asin(c*x))^2*(d + e*x)^m,x)
```

output
```
int((a + b*asin(c*x))^2*(d + e*x)^m, x)
```

### 3.27. $\int (d+ex)^m(a+b\arcsin(cx))^2\,dx$

# 3.28 $\int (d+ex)^m(a+b\arcsin(cx))\,dx$



## 3.28.1 Optimal result

Integrand size = 16, antiderivative size = 154

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = -\frac{bc(d+ex)^{2+m}\sqrt{1-\frac{c(d+ex)}{cd-e}}\sqrt{1-\frac{c(d+ex)}{cd+e}}\operatorname{AppellF1}\left(2+m,\frac{1}{2},\frac{1}{2},3+m,\frac{c(d+ex)}{cd-e},\frac{c(d+ex)}{cd+e}\right)}{e^2(1+m)(2+m)\sqrt{1-c^2x^2}} + \frac{(d+ex)^{1+m}(a+b\arcsin(cx))}{e(1+m)}$$

output
```
(e*x+d)^(1+m)*(a+b*arcsin(c*x))/e/(1+m)-b*c*(e*x+d)^(2+m)*AppellF1(2+m,1/2
,1/2,3+m,c*(e*x+d)/(c*d-e),c*(e*x+d)/(c*d+e))*(1-c*(e*x+d)/(c*d-e))^(1/2)*
(1-c*(e*x+d)/(c*d+e))^(1/2)/e^2/(1+m)/(2+m)/(-c^2*x^2+1)^(1/2)
```

## 3.28.2 Mathematica [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (d+ex)^m(a+b\arcsin(cx))\,dx$$

input
```
Integrate[(d + e*x)^m*(a + b*ArcSin[c*x]),x]
```

output
```
Integrate[(d + e*x)^m*(a + b*ArcSin[c*x]), x]
```

### 3.28.3 Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.81, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {5242, 513, 156, 155}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5242}$$

$$\frac{(d+ex)^{m+1}(a+b\arcsin(cx))}{e(m+1)}-\frac{bc\int \frac{(d+ex)^{m+1}}{\sqrt{1-c^2x^2}}dx}{e(m+1)}$$

$$\Big\downarrow \text{513}$$

$$\frac{(d+ex)^{m+1}(a+b\arcsin(cx))}{e(m+1)}-\frac{bc\int \frac{(d+ex)^{m+1}}{\sqrt{1-cx}\sqrt{cx+1}}dx}{e(m+1)}$$

$$\Big\downarrow \text{156}$$

$$\frac{(d+ex)^{m+1}(a+b\arcsin(cx))}{e(m+1)}-\frac{b(cd+e)(d+ex)^m\left(\frac{c(d+ex)}{cd+e}\right)^{-m}\int \frac{\left(\frac{cd}{cd+e}+\frac{cex}{cd+e}\right)^{m+1}}{\sqrt{1-cx}\sqrt{cx+1}}dx}{e(m+1)}$$

$$\Big\downarrow \text{155}$$

$$\frac{(d+ex)^{m+1}(a+b\arcsin(cx))}{e(m+1)}+\frac{\sqrt{2}b\sqrt{1-cx}(cd+e)(d+ex)^m\left(\frac{c(d+ex)}{cd+e}\right)^{-m}\text{AppellF1}\left(\frac{1}{2},\frac{1}{2},-m-1,\frac{3}{2},\frac{1}{2}(1-cx),\frac{e(1-cx)}{cd+e}\right)}{ce(m+1)}$$

input
```
Int[(d + e*x)^m*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[2]*b*(c*d + e)*Sqrt[1 - c*x]*(d + e*x)^m*AppellF1[1/2, 1/2, -1 - m,
3/2, (1 - c*x)/2, (e*(1 - c*x))/(c*d + e)])/(c*e*(1 + m)*((c*(d + e*x))/(c
*d + e))^m) + ((d + e*x)^(1 + m)*(a + b*ArcSin[c*x]))/(e*(1 + m))
```

#### 3.28.3.1 Defintions of rubi rules used

rule 155
```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_] :> Simp[((a + b*x)^(m + 1)/(b*(m + 1)*Simplify[b/(b*c - a*d)]^n*
Simplify[b/(b*e - a*f)]^p))*AppellF1[m + 1, -n, -p, m + 2, (-d)*((a + b*x)/
(b*c - a*d)), (-f)*((a + b*x)/(b*e - a*f))], x] /; FreeQ[{a, b, c, d, e, f,
 m, n, p}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] && GtQ[Sim
plify[b/(b*c - a*d)], 0] && GtQ[Simplify[b/(b*e - a*f)], 0] &&  !(GtQ[Simpl
ify[d/(d*a - c*b)], 0] && GtQ[Simplify[d/(d*e - c*f)], 0] && SimplerQ[c + d
*x, a + b*x]) &&  !(GtQ[Simplify[f/(f*a - e*b)], 0] && GtQ[Simplify[f/(f*c
- e*d)], 0] && SimplerQ[e + f*x, a + b*x])
```

rule 156
```
Int[((a_) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_))
^(p_), x_] :> Simp[(e + f*x)^FracPart[p]/(Simplify[b/(b*e - a*f)]^IntPart[p
]*(b*((e + f*x)/(b*e - a*f)))^FracPart[p])   Int[(a + b*x)^m*(c + d*x)^n*Si
mp[b*(e/(b*e - a*f)) + b*f*(x/(b*e - a*f)), x]^p, x], x] /; FreeQ[{a, b, c,
 d, e, f, m, n, p}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !IntegerQ[p] &
& GtQ[Simplify[b/(b*c - a*d)], 0] &&  !GtQ[Simplify[b/(b*e - a*f)], 0]
```

rule 513
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
a^p   Int[(c + d*x)^n*(1 + Rt[-b/a, 2]*x)^p*(1 - Rt[-b/a, 2]*x)^p, x], x] /
; FreeQ[{a, b, c, d, n, p}, x] && GtQ[a, 0] && NegQ[b/a]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

### 3.28.4 Maple [F]

$$\int (ex+d)^m (a+b\arcsin(cx))\,dx$$

input
```
int((e*x+d)^m*(a+b*arcsin(c*x)),x)
```

output
```
int((e*x+d)^m*(a+b*arcsin(c*x)),x)
```

### 3.28.5 Fricas [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (b\arcsin(cx)+a)(ex+d)^m\,dx$$

input
```
integrate((e*x+d)^m*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral((b*arcsin(c*x) + a)*(e*x + d)^m, x)
```

### 3.28.6 Sympy [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}\,(cx))\,(d+ex)^m\,dx$$

input
```
integrate((e*x+d)**m*(a+b*asin(c*x)),x)
```

output
```
Integral((a + b*asin(c*x))*(d + e*x)**m, x)
```

### 3.28.7 Maxima [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (b\arcsin(cx)+a)(ex+d)^m\,dx$$

input
```
integrate((e*x+d)^m*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
((e*x + d)*(e*x + d)^m*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (e*m +
 e)*integrate((c*e*x + c*d)*sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^m/((c^2
*e*m + c^2*e)*x^2 - e*m - e), x))*b/(e*m + e) + (e*x + d)^(m + 1)*a/(e*(m
+ 1))
```

### 3.28.8 Giac [F]

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (b\arcsin(cx)+a)(ex+d)^m\,dx$$

input
```
integrate((e*x+d)^m*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)*(e*x + d)^m, x)
```

### 3.28.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex)^m(a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(d+e\,x)^m\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)^m,x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^m, x)
```

# 3.29 $\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx$



## 3.29.1 Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx = \text{Int}\left(\frac{(d+ex)^m}{a+b\arcsin(cx)},x\right)$$

output
```
Unintegrable((e*x+d)^m/(a+b*arcsin(c*x)),x)
```

## 3.29.2 Mathematica [N/A]

Not integrable

Time = 0.35 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx = \int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx$$

input
```
Integrate[(d + e*x)^m/(a + b*ArcSin[c*x]),x]
```

output
```
Integrate[(d + e*x)^m/(a + b*ArcSin[c*x]), x]
```

## 3.29.3 Rubi [N/A]

Not integrable

Time = 0.19 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx$$

$$\Big\downarrow \; 5300$$

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}dx$$

input
```
Int[(d + e*x)^m/(a + b*ArcSin[c*x]),x]
```

output
```
$Aborted
```

### 3.29.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

## 3.29.4 Maple [N/A] (verified)

Not integrable

Time = 2.32 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{(ex+d)^m}{a+b\arcsin(cx)}dx$$

input
```
int((e*x+d)^m/(a+b*arcsin(c*x)),x)
```

output
```
int((e*x+d)^m/(a+b*arcsin(c*x)),x)
```

### 3.29.5 Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\int \frac{(ex+d)^m}{b\arcsin(cx)+a}\,dx$$

input
```
integrate((e*x+d)^m/(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
integral((e*x + d)^m/(b*arcsin(c*x) + a), x)
```

### 3.29.6 Sympy [N/A]

Not integrable

Time = 0.95 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.83

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\int \frac{(d+ex)^m}{a+b\,\mathrm{asin}(cx)}\,dx$$

input
```
integrate((e*x+d)**m/(a+b*asin(c*x)),x)
```

output
```
Integral((d + e*x)**m/(a + b*asin(c*x)), x)
```

### 3.29.7 Maxima [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\int \frac{(ex+d)^m}{b\arcsin(cx)+a}\,dx$$

input
```
integrate((e*x+d)^m/(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
integrate((e*x + d)^m/(b*arcsin(c*x) + a), x)
```

### 3.29.8 Giac [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\int \frac{(ex+d)^m}{b\arcsin{(cx)}+a}\,dx$$

input
```
integrate((e*x+d)^m/(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
integrate((e*x + d)^m/(b*arcsin(c*x) + a), x)
```

### 3.29.9 Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{a+b\arcsin(cx)}\,dx=\int \frac{(d+e\,x)^m}{a+b\,\mathrm{asin}\left(c\,x\right)}\,dx$$

input
```
int((d + e*x)^m/(a + b*asin(c*x)),x)
```

output
```
int((d + e*x)^m/(a + b*asin(c*x)), x)
```

# 3.30 $\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx$



## 3.30.1 Optimal result

Integrand size = 18, antiderivative size = 18

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \text{Int}\left(\frac{(d+ex)^m}{(a+b\arcsin(cx))^2},x\right)$$

output
```
Unintegrable((e*x+d)^m/(a+b*arcsin(c*x))^2,x)
```

## 3.30.2 Mathematica [N/A]

Not integrable

Time = 0.73 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx$$

input
```
Integrate[(d + e*x)^m/(a + b*ArcSin[c*x])^2,x]
```

output
```
Integrate[(d + e*x)^m/(a + b*ArcSin[c*x])^2, x]
```

## 3.30.3 Rubi [N/A]

Not integrable

Time = 0.19 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}dx$$
$$\Big\downarrow \text{ 5300}$$
$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}dx$$

input
```
Int[(d + e*x)^m/(a + b*ArcSin[c*x])^2,x]
```

output
```
$Aborted
```

### 3.30.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

## 3.30.4 Maple [N/A] (verified)

Not integrable

Time = 1.45 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.00

$$\int \frac{(ex+d)^m}{(a+b\arcsin(cx))^2}dx$$

input
```
int((e*x+d)^m/(a+b*arcsin(c*x))^2,x)
```

output
```
int((e*x+d)^m/(a+b*arcsin(c*x))^2,x)
```

### 3.30.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.89

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(ex+d)^m}{(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate((e*x+d)^m/(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
integral((e*x + d)^m/(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2), x)
```

### 3.30.6 Sympy [N/A]

Not integrable

Time = 15.55 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.94

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(d+ex)^m}{(a+b\,\mathrm{asin}\,(cx))^2}\,dx$$

input
```
integrate((e*x+d)**m/(a+b*asin(c*x))**2,x)
```

output
```
Integral((d + e*x)**m/(a + b*asin(c*x))**2, x)
```

### 3.30.7 Maxima [N/A]

Not integrable

Time = 1.79 (sec) , antiderivative size = 237, normalized size of antiderivative = 13.17

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(ex+d)^m}{(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate((e*x+d)^m/(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
-(sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^m - (b^2*c*arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1)) + a*b*c)*integrate((c^2*d*x + (c^2*e*m + c^2*e)*x^2 -
 e*m)*sqrt(c*x + 1)*sqrt(-c*x + 1)*(e*x + d)^m/(a*b*c^3*e*x^3 + a*b*c^3*d*
x^2 - a*b*c*e*x - a*b*c*d + (b^2*c^3*e*x^3 + b^2*c^3*d*x^2 - b^2*c*e*x - b
^2*c*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))), x))/(b^2*c*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + a*b*c)
```

### 3.30.8 Giac [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(ex+d)^m}{(b\arcsin(cx)+a)^2}\,dx$$

input
```
integrate((e*x+d)^m/(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
integrate((e*x + d)^m/(b*arcsin(c*x) + a)^2, x)
```

### 3.30.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.11

$$\int \frac{(d+ex)^m}{(a+b\arcsin(cx))^2}\,dx = \int \frac{(d+e\,x)^m}{(a+b\,\mathrm{asin}(c\,x))^2}\,dx$$

input
```
int((d + e*x)^m/(a + b*asin(c*x))^2,x)
```

output
```
int((d + e*x)^m/(a + b*asin(c*x))^2, x)
```

# 3.31 $\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$



## 3.31.1 Optimal result

Integrand size = 31, antiderivative size = 669

$$\begin{aligned}\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx &= \frac{bf^2gx\sqrt{d-c^2dx^2}}{c\sqrt{1-c^2x^2}}+\frac{2bg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}}\\
&\quad-\frac{bcf^3x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{3bfg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}\\
&\quad-\frac{bcf^2gx^3\sqrt{d-c^2dx^2}}{3\sqrt{1-c^2x^2}}+\frac{bg^3x^3\sqrt{d-c^2dx^2}}{45c\sqrt{1-c^2x^2}}\\
&\quad-\frac{3bcfg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{bcg^3x^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}\\
&\quad+\frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\
&\quad-\frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2}\\
&\quad+\frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\
&\quad-\frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c^2}\\
&\quad-\frac{g^3(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^4}\\
&\quad+\frac{g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4}\\
&\quad+\frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}\\
&\quad+\frac{3fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}\end{aligned}$$

output
```
1/2*f^3*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-3/8*f*g^2*x*(a+b*arcsin(c
*x))*(-c^2*d*x^2+d)^(1/2)/c^2+3/4*f*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+
d)^(1/2)-f^2*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2-1/3
*g^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+1/5*g^3*(-c^2
*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+b*f^2*g*x*(-c^2*d*x^2
+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/15*b*g^3*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2
*x^2+1)^(1/2)-1/4*b*c*f^3*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/16
*b*f*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/3*b*c*f^2*g*x^3*(
-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/45*b*g^3*x^3*(-c^2*d*x^2+d)^(1/2)
/c/(-c^2*x^2+1)^(1/2)-3/16*b*c*f*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)
^(1/2)-1/25*b*c*g^3*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*f^3*(a
+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+3/16*f*g^2*(
a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

### 3.31.2 Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 356, normalized size of antiderivative = 0.53

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(225a^2(4c^3f^3+3cfg^2)+30ab\sqrt{1-c^2x^2}(-16g^3-c^2g(120f^2+45fgx+8g^2x^2)+6c^4x(10f^3\right.}{}$$

input
```
Integrate[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(225*a^2*(4*c^3*f^3 + 3*c*f*g^2) + 30*a*b*Sqrt[1 - c^
2*x^2]*(-16*g^3 - c^2*g*(120*f^2 + 45*f*g*x + 8*g^2*x^2) + 6*c^4*x*(10*f^3
 + 20*f^2*g*x + 15*f*g^2*x^2 + 4*g^3*x^3)) + b^2*c*x*(480*g^3 + 5*c^2*g*(7
20*f^2 + 135*f*g*x + 16*g^2*x^2) - 3*c^4*x*(300*f^3 + 400*f^2*g*x + 225*f*
g^2*x^2 + 48*g^3*x^3)) + 30*b*(15*a*(4*c^3*f^3 + 3*c*f*g^2) + b*Sqrt[1 - c
^2*x^2]*(-16*g^3 - c^2*g*(120*f^2 + 45*f*g*x + 8*g^2*x^2) + 6*c^4*x*(10*f^
3 + 20*f^2*g*x + 15*f*g^2*x^2 + 4*g^3*x^3)))*ArcSin[c*x] + 225*b^2*c*f*(4*
c^2*f^2 + 3*g^2)*ArcSin[c*x]^2))/(3600*b*c^4*Sqrt[1 - c^2*x^2])
```

### 3.31.3 Rubi [A] (verified)

Time = 0.96 (sec) , antiderivative size = 371, normalized size of antiderivative = 0.55, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)^3(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{d-c^2dx^2}\int \left(\sqrt{1-c^2x^2}(a+b\arcsin(cx))f^3+3gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))f^2+3g^2x^2\sqrt{1-c^2x^2}(a+b\arcsin\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{3fg^2(a+b\arcsin(cx))^2}{16bc^3}+\frac{1}{2}f^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{f^2g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{c^2}-\frac{3fg^2x\sqrt{1-c^2x^2}(}{8c^2}\right.}{}$$

input
```
Int[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((b*f^2*g*x)/c + (2*b*g^3*x)/(15*c^3) - (b*c*f^3*x^2)
/4 + (3*b*f*g^2*x^2)/(16*c) - (b*c*f^2*g*x^3)/3 + (b*g^3*x^3)/(45*c) - (3*
b*c*f*g^2*x^4)/16 - (b*c*g^3*x^5)/25 + (f^3*x*Sqrt[1 - c^2*x^2]*(a + b*Arc
Sin[c*x]))/2 - (3*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c^2) +
 (3*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/4 - (f^2*g*(1 - c^2*x
^2)^(3/2)*(a + b*ArcSin[c*x]))/c^2 - (g^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSi
n[c*x]))/(3*c^4) + (g^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^4) +
 (f^3*(a + b*ArcSin[c*x])^2)/(4*b*c) + (3*f*g^2*(a + b*ArcSin[c*x])^2)/(16
*b*c^3)))/Sqrt[1 - c^2*x^2]
```

#### 3.31.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.31.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.62 (sec) , antiderivative size = 1396, normalized size of antiderivative = 2.09

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1396 |
| parts | Expression too large to display | 1396 |

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-c^2*d*x^2+d)^(1/2)))+g^3*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15/d
/c^4*(-c^2*d*x^2+d)^(3/2))+3*f*g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/
c^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x
/(-c^2*d*x^2+d)^(1/2))))-f^2*g*(-c^2*d*x^2+d)^(3/2)/c^2/d)+b*(-1/16*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(4*c^2
*f^2+3*g^2)+1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2
*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2
*x^2+1)^(1/2)*x*c-1)*g^3*(I+5*arcsin(c*x))/c^4/(c^2*x^2-1)+3/256*(-d*(c^2*
x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^
(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*g^2*(4*arcsin(c*x)+
I)/c^3/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c
^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(12*I*f^2*c^2+36
*arcsin(c*x)*c^2*f^2+I*g^2+3*arcsin(c*x)*g^2)/c^4/(c^2*x^2-1)+1/16*(-d*(c^
2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^
(1/2)-2*c*x)*f^3*(I+2*arcsin(c*x))/c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/
2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(6*I*f^2*c^2+6*arcsin(c*x)*c^2*f
^2+I*g^2+arcsin(c*x)*g^2)/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(I*(
-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(6*arcsin(c*x)*c^2*f^2-6*I*f^2*c^2+arcs
in(c*x)*g^2-I*g^2)/c^4/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c...
```

### 3.31.5 Fricas [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral((a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 + 3
*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

### 3.31.6 Sympy [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^3\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))*(f + g*x)**3, x)
```

### 3.31.7 Maxima [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a*f^3 - 1/15*a*g^3*(3
*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c^4*d)) +
3/8*a*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*
d) + sqrt(d)*arcsin(c*x)/c^3) - (-c^2*d*x^2 + d)^(3/2)*a*f^2*g/(c^2*d) + s
qrt(d)*integrate((b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*sqrt(c*
x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

### 3.31.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.31.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

# 3.32 $\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$



## 3.32.1 Optimal result

Integrand size = 31, antiderivative size = 450

$$\begin{aligned}\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx &= \frac{2bfgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcf^2x^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}+\frac{bg^2x^2\sqrt{d-c^2dx^2}}{16c\sqrt{1-c^2x^2}}\\&\quad-\frac{2bcfgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}-\frac{bcg^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\&\quad-\frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c^2}+\frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\\&\quad-\frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2}\\&\quad+\frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}+\frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc^3\sqrt{1-c^2x^2}}\end{aligned}$$

output
```
1/2*f^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/8*g^2*x*(a+b*arcsin(c*x
))*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(
1/2)-2/3*f*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+2/3*b
*f*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/4*b*c*f^2*x^2*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*b*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2
*x^2+1)^(1/2)-2/9*b*c*f*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/16
*b*c*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*f^2*(a+b*arcsin(c
*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+1/16*g^2*(a+b*arcsin(c*
x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

### 3.32.2 Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.53

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$

$$= \frac{\sqrt{d-c^2dx^2}\left(-36bcf^2x^2-9bcg^2x^4-\frac{32bfgx(-3+c^2x^2)}{c}+72f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))+36g^2x^3\sqrt{1-\right.}{}$$

input
```
Integrate[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(-36*b*c*f^2*x^2 - 9*b*c*g^2*x^4 - (32*b*f*g*x*(-3 +
c^2*x^2))/c + 72*f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + 36*g^2*x^3*
Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (96*f*g*(1 - c^2*x^2)^(3/2)*(a + b
*ArcSin[c*x]))/c^2 + (36*f^2*(a + b*ArcSin[c*x])^2)/(b*c) + (9*g^2*(b*c^2*
x^2 - 2*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + (a + b*ArcSin[c*x])^2/
b))/c^3))/(144*Sqrt[1 - c^2*x^2])
```

### 3.32.3 Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 263, normalized size of antiderivative = 0.58, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)^2(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{d-c^2dx^2}\int \left(\sqrt{1-c^2x^2}(a+b\arcsin(cx))f^2+2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))f+g^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{g^2(a+b\arcsin(cx))^2}{16bc^3}+\frac{1}{2}f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{2fg(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c^2}-\frac{g^2x\sqrt{1-c^2x^2}(a+b\,\mathrm{a}}{8c^2}\right.}{\sqrt{1}}$$

input
```
Int[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((2*b*f*g*x)/(3*c) - (b*c*f^2*x^2)/4 + (b*g^2*x^2)/(1
6*c) - (2*b*c*f*g*x^3)/9 - (b*c*g^2*x^4)/16 + (f^2*x*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/2 - (g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c^2
) + (g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/4 - (2*f*g*(1 - c^2*x^
2)^(3/2)*(a + b*ArcSin[c*x]))/(3*c^2) + (f^2*(a + b*ArcSin[c*x])^2)/(4*b*c
) + (g^2*(a + b*ArcSin[c*x])^2)/(16*b*c^3)))/Sqrt[1 - c^2*x^2]
```

### 3.32.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.32.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.50 (sec) , antiderivative size = 973, normalized size of antiderivative = 2.16

| method | result |
|---|---|
| default | $a\left(f^2\left(\frac{x\sqrt{-c^2d\,x^2+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}\right)+g^2\left(-\frac{x(-c^2d\,x^2+d)^{\frac{3}{2}}}{4c^2d}+\frac{\frac{x\sqrt{-c^2d\,x^2+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}}{4c^2}\right)\right.$ |
| parts | $a\left(f^2\left(\frac{x\sqrt{-c^2d\,x^2+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}\right)+g^2\left(-\frac{x(-c^2d\,x^2+d)^{\frac{3}{2}}}{4c^2d}+\frac{\frac{x\sqrt{-c^2d\,x^2+d}}{2}+\frac{d\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}}{4c^2}\right)\right.$ |

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-c^2*d*x^2+d)^(1/2)))+g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/c^2*
(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c
^2*d*x^2+d)^(1/2))))-2/3*f*g*(-c^2*d*x^2+d)^(3/2)/c^2/d)+b*(-1/16*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*(4*c^2*f^2
+g^2)+1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*
x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*
g^2*(4*arcsin(c*x)+I)/c^3/(c^2*x^2-1)+1/36*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x
^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*
f*g*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-
c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(I+2*ar
csin(c*x))/c/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1
)^(1/2)*x*c-1)*f*g*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1
/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)-I)/c^2/(c^2*x^2-
1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I
*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(-I+2*arcsin(c*x))/c/(c^2*x^2-1)+1/36*(-d*(
c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+
1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/256*(-d
*(c^2*x^2-1))^(1/2)*(8*I*(-c^2*x^2+1)^(1/2)*c^4*x^4+8*c^5*x^5-8*I*(-c^2*x^
2+1)^(1/2)*x^2*c^2-12*c^3*x^3+I*(-c^2*x^2+1)^(1/2)+4*c*x)*g^2*(-I+4*arc...
```

### 3.32.5 Fricas [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2
+ 2*b*f*g*x + b*f^2)*arcsin(c*x)), x)
```

### 3.32.6 Sympy [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-d(cx-1)(cx+1)}(a+b\,\mathrm{asin}(cx))(f+gx)^2\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))*(f + g*x)**2, x)
```

### 3.32.7 Maxima [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a*f^2 + 1/8*a*g^2*(sq
rt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*d) + sqrt(d)*ar
csin(c*x)/c^3) - 2/3*(-c^2*d*x^2 + d)^(3/2)*a*f*g/(c^2*d) + sqrt(d)*integr
ate((b*g^2*x^2 + 2*b*f*g*x + b*f^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c
*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

### 3.32.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.32.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

# 3.33 $\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$



## 3.33.1 Optimal result

Integrand size = 29, antiderivative size = 238

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx = \frac{bgx\sqrt{d-c^2dx^2}}{3c\sqrt{1-c^2x^2}}-\frac{bcfx^2\sqrt{d-c^2dx^2}}{4\sqrt{1-c^2x^2}}-\frac{bcgx^3\sqrt{d-c^2dx^2}}{9\sqrt{1-c^2x^2}}+\frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c^2}+\frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bc\sqrt{1-c^2x^2}}$$

output
```
1/2*f*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/3*g*(-c^2*x^2+1)*(a+b*arc
sin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+1/3*b*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*
x^2+1)^(1/2)-1/4*b*c*f*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/9*b*c
*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/4*f*(a+b*arcsin(c*x))^2*(
-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

### 3.33.2 Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.55

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(-9bcfx^2-\frac{4bgx(-3+c^2x^2)}{c}+18fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{12g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{c^2}+\frac{9}{}\right.}{36\sqrt{1-c^2x^2}}$$

input
```
Integrate[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(-9*b*c*f*x^2 - (4*b*g*x*(-3 + c^2*x^2))/c + 18*f*x*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - (12*g*(1 - c^2*x^2)^(3/2)*(a + b*Ar
cSin[c*x]))/c^2 + (9*f*(a + b*ArcSin[c*x])^2)/(b*c)))/(36*Sqrt[1 - c^2*x^2
])
```

### 3.33.3 Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.59, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{d-c^2dx^2}\int \left(f\sqrt{1-c^2x^2}(a+b\arcsin(cx))+gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))}{3c^2}+\frac{f(a+b\arcsin(cx))^2}{4bc}-\frac{1}{4}bcfx^2-\frac{1}{9}bcgx^3+\right.}{\sqrt{1-c^2x^2}}$$

input
```
Int[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((b*g*x)/(3*c) - (b*c*f*x^2)/4 - (b*c*g*x^3)/9 + (f*x
*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/2 - (g*(1 - c^2*x^2)^(3/2)*(a + b*
ArcSin[c*x]))/(3*c^2) + (f*(a + b*ArcSin[c*x])^2)/(4*b*c)))/Sqrt[1 - c^2*x
^2]
```

#### 3.33.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.33.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.50 (sec) , antiderivative size = 628, normalized size of antiderivative = 2.64

| method | result |
|---|---|
| default | $\frac{afx\sqrt{-c^2d\,x^2+d}}{2}+\frac{afd\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}-\frac{ag\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}}{3c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{4c(c^2x^2-1)}+\right.$ |
| parts | $\frac{afx\sqrt{-c^2d\,x^2+d}}{2}+\frac{afd\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2\sqrt{c^2d}}-\frac{ag\left(-c^2d\,x^2+d\right)^{\frac{3}{2}}}{3c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{4c(c^2x^2-1)}+\right.$ |

input
```
int((g*x+f)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
1/2*a*f*x*(-c^2*d*x^2+d)^(1/2)+1/2*a*f*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-c^2*d*x^2+d)^(1/2))-1/3*a*g*(-c^2*d*x^2+d)^(3/2)/c^2/d+b*(-1/4*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f+1/72*(-
d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3
*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*
(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+
1)^(1/2)-2*c*x)*f*(I+2*arcsin(c*x))/c/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/
2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)/c^2/(c^2*x^2-1)-
1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(
c*x)-I)/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arcsin(c*x))/c/(c^
2*x^2-1)+1/72*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4
*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))/c^2/(c^2
*x^2-1))
```

## 3.33.5 Fricas [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x)), x
)
```

### 3.33.6 Sympy [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int \sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))\,(f+gx)\;dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))*(f + g*x), x)
```

### 3.33.7 Maxima [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin\,(cx)+a)\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="max
ima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a*f + sqrt(d)*integra
te((b*g*x + b*f)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*s
qrt(-c*x + 1)), x) - 1/3*(-c^2*d*x^2 + d)^(3/2)*a*g/(c^2*d)
```

### 3.33.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2),x, algorithm="gia
c")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.33.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))\,dx=\int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2), x)
```

# 3.34 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$



## 3.34.1 Optimal result

Integrand size = 31, antiderivative size = 736

$$
\begin{aligned}
&\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx \\
&= \frac{a\sqrt{d-c^2dx^2}}{g}-\frac{bcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}}+\frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g} \\
&\quad+\frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg\sqrt{1-c^2x^2}}-\frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)\sqrt{1-c^2x^2}} \\
&\quad+\frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)} \\
&\quad-\frac{a\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{ib\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad-\frac{ib\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{b\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad-\frac{b\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

output
```
a*(-c^2*d*x^2+d)^(1/2)/g+b*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g-b*c*x*(-c^2*
d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+1/2*c*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^
2+d)^(1/2)/b/g/(-c^2*x^2+1)^(1/2)-1/2*(1-c^2*f^2/g^2)*(a+b*arcsin(c*x))^2*
(-c^2*d*x^2+d)^(1/2)/b/c/(g*x+f)/(-c^2*x^2+1)^(1/2)-a*arctan((c^2*f*x+g)/(
c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^
(1/2)/g^2/(-c^2*x^2+1)^(1/2)+I*b*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)
/g^2/(-c^2*x^2+1)^(1/2)-I*b*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f+(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/
(-c^2*x^2+1)^(1/2)+b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^
2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(
1/2)-b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))
*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+1/2*(a+b*
arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)/b/c/(g*x+f)
```

### 3.34.2 Mathematica [A] (verified)

Time = 0.75 (sec) , antiderivative size = 368, normalized size of antiderivative = 0.50

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$$
$$= \frac{\sqrt{d-c^2dx^2}\Big((c^2f^2-g^2)\,(a+b\arcsin(cx))^2+c^2gx(f+gx)(a+b\arcsin(cx))^2+g^2(1-c^2x^2)\,(a+b\arcsi}{}$$

input
```
Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2 + c^2*g*x*(f +
 g*x)*(a + b*ArcSin[c*x])^2 + g^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2 - 2*
b*c*(f + g*x)*(b*c*g*x - g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - I*Sqrt[
c^2*f^2 - g^2]*((a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*
f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c
^2*f^2 - g^2])]) - I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*
f^2 - g^2])] + I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
- g^2])])))/(2*b*c*g^2*(f + g*x)*Sqrt[1 - c^2*x^2])
```

### 3.34.3 Rubi [A] (verified)

Time = 2.21 (sec) , antiderivative size = 517, normalized size of antiderivative = 0.70, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {5276, 5264, 25, 5256, 25, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5264}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)}-\frac{\int -\frac{(gx^2c^2+2fxc^2+g)(a+b\arcsin(cx))^2}{(f+gx)^2}dx}{2bc}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{25}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\int \frac{(gx^2c^2+2fxc^2+g)(a+b\arcsin(cx))^2}{(f+gx)^2}dx}{2bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5256}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{-2bc\int -\frac{\left(\frac{1}{f+gx}-\frac{c^2\left(\frac{f^2}{f+gx}+gx\right)}{g^2}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^2}{f+gx}+\frac{c^2x(a+b\arcsin(cx))^2}{g}}{2bc}+\frac{(1-c^2x^2)(a+b\arcsin}{2bc(f+gx)}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{25}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{2bc\int \frac{\left(\frac{1}{f+gx}-\frac{c^2\left(\frac{f^2}{f+gx}+gx\right)}{g^2}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^2}{f+gx}+\frac{c^2x(a+b\arcsin(cx))^2}{g}}{2bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx)}{2bc(f+gx)}\right.}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 5298

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{2bc\int\left(-\frac{b\arcsin(cx)\left(f^2c^2+g^2x^2c^2+fgxc^2-g^2\right)}{g^2(f+gx)\sqrt{1-c^2x^2}}-\frac{a\left(f^2c^2+g^2x^2c^2+fgxc^2-g^2\right)}{g^2(f+gx)\sqrt{1-c^2x^2}}\right)dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^2}{f+gx}+\frac{c^2x(a+b\arcsin(cx))}{g}}{2bc}\right.}{\sqrt{1-c^2x^2}}$$

$\downarrow$ 2009

$$\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)}+\frac{2bc\left(-\frac{a\sqrt{c^2f^2-g^2}\arctan\left(\frac{c^2fx+g}{\sqrt{1-c^2x^2}\sqrt{c^2f^2-g^2}}\right)}{g^2}+\frac{a\sqrt{1-c^2x^2}}{g}+\frac{b\sqrt{c^2f^2-g^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx}}{cf-\sqrt{c^2f^2-}}\right.}{g^2}\right.}{}\right.$$

input
```
Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(((1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*b*c*(f + g*
x)) + ((c^2*x*(a + b*ArcSin[c*x])^2)/g - ((1 - (c^2*f^2)/g^2)*(a + b*ArcSi
n[c*x])^2)/(f + g*x) + 2*b*c*(-((b*c*x)/g) + (a*Sqrt[1 - c^2*x^2])/g + (b*
Sqrt[1 - c^2*x^2]*ArcSin[c*x])/g - (a*Sqrt[c^2*f^2 - g^2]*ArcTan[(g + c^2*
f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/g^2 + (I*b*Sqrt[c^2*f^2 - g
^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2]
)])/g^2 - (I*b*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x]
)*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^2 + (b*Sqrt[c^2*f^2 - g^2]*PolyLog[2,
 (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2 - (b*Sqrt[c^2*f
^2 - g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])
/g^2))/(2*b*c)))/Sqrt[1 - c^2*x^2]
```

## 3.34. $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$

### 3.34.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5256
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c
*n   Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[
p, 0] && EqQ[e*g - 2*d*h, 0]
```

rule 5264
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[1/(b*c*Sqrt[d]*(n + 1))
   Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[
c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e,
0] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

## 3.34. $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx$

### 3.34.4 Maple [A] (verified)

Time = 0.65 (sec) , antiderivative size = 823, normalized size of antiderivative = 1.12

| method | result |
|---|---|
| default | $\frac{a\left(\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}+\frac{c^{2}df\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}}\right)}{g\sqrt{c^{2}d}}+d\left(c^{2}f^{2}-g^{2}\right)\ln\left(-\frac{2d\left(c^{\cdots}\right.}{\cdots}\right.\cdots\right.}{g}$ |
| parts | $\frac{a\left(\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}+\frac{c^{2}df\arctan\left(\frac{\sqrt{c^{2}d}\,x}{\sqrt{-\left(x+\frac{f}{g}\right)^{2}c^{2}d+\frac{2c^{2}df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^{2}f^{2}-g^{2}\right)}{g^{2}}}}\right)}{g\sqrt{c^{2}d}}+d\left(c^{2}f^{2}-g^{2}\right)\ln\left(-\frac{2d\left(c^{\cdots}\right.}{\cdots}\right.\cdots\right.}{g}$ |

input
```
int((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x,method=_RETURNVERBOSE
)
```

output
```
a/g*((-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)+c^2*
d*f/g/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(
x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^2-g^2)/g
^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^
2)/g^2)^(1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(
1/2))/(x+f/g)))+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2
-1)*arcsin(c*x)^2*f*c/g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+
1)^(1/2)*x*c-1)*(arcsin(c*x)+I)/(c^2*x^2-1)/g+1/2*(-d*(c^2*x^2-1))^(1/2)*(
I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(arcsin(c*x)-I)/(c^2*x^2-1)/g+I*(-c^2*
f^2+g^2)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln
((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^
2+g^2)^(1/2)))-I*arcsin(c*x)*ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*
f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))+dilog((I*c*f+(I*c*x+(-c^2*x^
2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))-dilog((I
*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g
^2)^(1/2))))/(c^2*x^2-1)/g^2)
```

### 3.34.5 Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx=\int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)}{gx+f}\,dx$$

input
```
integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(g*x + f), x)
```

### 3.34.6 Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx=\int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))}{f+gx}\,dx$$

input
```
integrate((a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2)/(g*x+f),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/(f + g*x), x)
```

### 3.34.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="max
ima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

### 3.34.8 Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.34.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{f+g\,x}\,dx$$

input
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x), x)
```

# 3.35 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx$

### 3.35.1 Optimal result

Integrand size = 31, antiderivative size = 860

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = -\frac{a\sqrt{d-c^2dx^2}}{g(f+gx)} - \frac{b\sqrt{d-c^2dx^2}\arcsin(cx)}{g(f+gx)} - \frac{ac^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} - \frac{bc^3f^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{2g^2(c^2f^2-g^2)\sqrt{1-c^2x^2}} + \frac{(g+c^2fx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(c^2f^2-g^2)(f+gx)^2\sqrt{1-c^2x^2}} + \frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bc(f+gx)^2} + \frac{ac^2f\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} - \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{ibc^2f\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{bc\sqrt{d-c^2dx^2}\log(f+gx)}{g^2\sqrt{1-c^2x^2}} - \frac{bc^2f\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}} + \frac{bc^2f\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}$$

output
```
-a*(-c^2*d*x^2+d)^(1/2)/g/(g*x+f)-b*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g/(g*
x+f)-a*c^3*f^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)/(-c^2*x^
2+1)^(1/2)-1/2*b*c^3*f^2*arcsin(c*x)^2*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g
^2)/(-c^2*x^2+1)^(1/2)+1/2*(c^2*f*x+g)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d
)^(1/2)/b/c/(c^2*f^2-g^2)/(g*x+f)^2/(-c^2*x^2+1)^(1/2)+b*c*ln(g*x+f)*(-c^2
*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+a*c^2*f*arctan((c^2*f*x+g)/(c^2*f^2
-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(1/
2)/(-c^2*x^2+1)^(1/2)-I*b*c^2*f*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/
2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(1
/2)/(-c^2*x^2+1)^(1/2)+I*b*c^2*f*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1
/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(
1/2)/(-c^2*x^2+1)^(1/2)-b*c^2*f*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(
c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(1/2)/(-c
^2*x^2+1)^(1/2)+b*c^2*f*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2
*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^2/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1
)^(1/2)+1/2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)/b/
c/(g*x+f)^2
```

## 3.35.2 Mathematica [A] (verified)

Time = 2.37 (sec) , antiderivative size = 600, normalized size of antiderivative = 0.70

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx$$

$$= \frac{\sqrt{d-c^2dx^2}\left(\frac{(c^2f^2-g^2)(a+b\arcsin(cx))^2}{g^2(f+gx)^2} - \frac{2c^2f(a+b\arcsin(cx))^2}{g^2(f+gx)} + \frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{(f+gx)^2} + \frac{4bc^3f\left(-i(a+b\arcsin(cx))\left(\log\left(\right.\right.\right.}{}\right.}{}$$

input
```
Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x)^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2)/(g^2*(f + g*
x)^2) - (2*c^2*f*(a + b*ArcSin[c*x])^2)/(g^2*(f + g*x)) + ((1 - c^2*x^2)*(
a + b*ArcSin[c*x])^2)/(f + g*x)^2 + (4*b*c^3*f*((-I)*(a + b*ArcSin[c*x])*(
Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 -
(I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) - b*PolyLog[2, (I*E^
(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + b*PolyLog[2, (I*E^(I*Arc
Sin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/(g^2*Sqrt[c^2*f^2 - g^2]) + (2
*b*c^2*(-((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c*f + c*g*x)) + b*Log
[f + g*x] + (c*f*(I*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(
-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sq
rt[c^2*f^2 - g^2])]) + b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^
2*f^2 - g^2])] - b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
- g^2])]))/Sqrt[c^2*f^2 - g^2]))/g^2))/(2*b*c*Sqrt[1 - c^2*x^2])
```

### 3.35.3 Rubi [A] (verified)

Time = 2.69 (sec) , antiderivative size = 632, normalized size of antiderivative = 0.73, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.226$, Rules used = {5276, 5264, 27, 5254, 27, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(f+gx)^2}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5264}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}-\frac{\int -\frac{2\left(fxc^2+g\right)(a+b\arcsin(cx))^2}{(f+gx)^3}dx}{2bc}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\int \frac{\left(fxc^2+g\right)(a+b\arcsin(cx))^2}{(f+gx)^3}dx}{bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}\right)}{\sqrt{1-c^2x^2}}$$

$\big\downarrow$ 5254

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\frac{\left(c^2fx+g\right)^2(a+b\arcsin(cx))^2}{2\left(c^2f^2-g^2\right)(f+gx)^2}-2bc\int\frac{\left(fxc^2+g\right)^2(a+b\arcsin(cx))}{2\left(c^2f^2-g^2\right)(f+gx)^2\sqrt{1-c^2x^2}}dx}{bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}\right)}{\sqrt{1-c^2x^2}}$$

$\big\downarrow$ 27

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\frac{\left(c^2fx+g\right)^2(a+b\arcsin(cx))^2}{2\left(c^2f^2-g^2\right)(f+gx)^2}-\frac{bc\int\frac{\left(fxc^2+g\right)^2(a+b\arcsin(cx))}{(f+gx)^2\sqrt{1-c^2x^2}}dx}{c^2f^2-g^2}}{bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}\right)}{\sqrt{1-c^2x^2}}$$

$\big\downarrow$ 5298

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\frac{\left(c^2fx+g\right)^2(a+b\arcsin(cx))^2}{2\left(c^2f^2-g^2\right)(f+gx)^2}-\frac{bc\int\left(\frac{b\arcsin(cx)\left(fxc^2+g\right)^2}{(f+gx)^2\sqrt{1-c^2x^2}}+\frac{a\left(fxc^2+g\right)^2}{(f+gx)^2\sqrt{1-c^2x^2}}\right)dx}{c^2f^2-g^2}}{bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}\right)}{\sqrt{1-c^2x^2}}$$

$\big\downarrow$ 2009

$$\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^2}{2bc(f+gx)^2}+\frac{\frac{\left(c^2fx+g\right)^2(a+b\arcsin(cx))^2}{2\left(c^2f^2-g^2\right)(f+gx)^2}-\frac{bc\left(\frac{ac^3f^2\arcsin(cx)}{g^2}-\frac{ac^2f\sqrt{c^2f^2-g^2}\arctan\left(\frac{c^2fx+g}{\sqrt{1-c^2x^2}\sqrt{c^2f^2-g^2}}\right)}{g^2}+\cdots\right.}{\cdots}}{\cdots}\right.$$

input
```
Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x]))/(f + g*x)^2,x]
```

## 3.35. $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx$

output
```
(Sqrt[d - c^2*d*x^2]*(((1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2*b*c*(f + g*
x)^2) + (((g + c^2*f*x)^2*(a + b*ArcSin[c*x])^2)/(2*(c^2*f^2 - g^2)*(f + g
*x)^2) - (b*c*((a*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2])/(g*(f + g*x)) + (
a*c^3*f^2*ArcSin[c*x])/g^2 + (b*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2]*ArcS
in[c*x])/(g*(f + g*x)) + (b*c^3*f^2*ArcSin[c*x]^2)/(2*g^2) - (a*c^2*f*Sqrt
[c^2*f^2 - g^2]*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2
])])/g^2 + (I*b*c^2*f*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcS
in[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2 - (I*b*c^2*f*Sqrt[c^2*f^2 -
g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2
])])/g^2 + b*c*(1 - (c^2*f^2)/g^2)*Log[f + g*x] + (b*c^2*f*Sqrt[c^2*f^2 -
g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2
- (b*c^2*f*Sqrt[c^2*f^2 - g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + S
qrt[c^2*f^2 - g^2])])/g^2))/(c^2*f^2 - g^2))/(b*c)))/Sqrt[1 - c^2*x^2]
```

### 3.35.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5254
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_)*((f_.)
 + (g_.)*(x_))^(p_.), x_Symbol] :> With[{u = IntHide[(f + g*x)^p*(d + e*x)^
m, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c*n   Int[SimplifyInteg
rand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x], x]] /; Free
Q[{a, b, c, d, e, f, g}, x] && IGtQ[n, 0] && IGtQ[p, 0] && ILtQ[m, 0] && Lt
Q[m + p + 1, 0]
```

rule 5264
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[1/(b*c*Sqrt[d]*(n + 1))
   Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[
c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e,
0] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

### 3.35.4 Maple [A] (warning: unable to verify)

Time = 0.66 (sec) , antiderivative size = 1352, normalized size of antiderivative = 1.57

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1352 |
| parts | Expression too large to display | 1352 |

input
```
int((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f)^2,x,method=_RETURNVERBO
SE)
```

output
```
a/g^2*(1/d/(c^2*f^2-g^2)*g^2/(x+f/g)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)
-d*(c^2*f^2-g^2)/g^2)^(3/2)-c^2*f*g/(c^2*f^2-g^2)*((-(x+f/g)^2*c^2*d+2*c^2
*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)+c^2*d*f/g/(c^2*d)^(1/2)*arctan((
c^2*d)^(1/2)*x/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^
(1/2))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-
g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2)*(-(x+f/g)^2*c^
2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+f/g)))+2*c^2/(c^2*f
^2-g^2)*g^2*(-1/4*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+f/g)^2*c^2*d+2
*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2*d^2*(c^2*f^2-g^2)
/g^2-4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/
g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))))+b*(1/2*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*c/g^2-(-d*(c
^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*arcsin(c*x)*(c^2*f*x
+g-I*(-c^2*x^2+1)^(1/2)*c*f)/(c^2*x^2-1)/g^2/(g*x+f)+(-d*(c^2*x^2-1))^(1/2
)*(-c^2*x^2+1)^(1/2)*(ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2
)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))*arcsin(c*x)*(-c^2*f^2+g^2)^(1/2)*c*
f-ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^
2*f^2+g^2)^(1/2)))*arcsin(c*x)*(-c^2*f^2+g^2)^(1/2)*c*f-I*dilog((I*c*f+(I*
c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2
)))*(-c^2*f^2+g^2)^(1/2)*c*f+I*dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*...
```

## 3.35.5 Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin{(cx)}+a)}{(gx+f)^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f)^2,x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(g^2*x^2 + 2*f*g*x + f^2
), x)
```

### 3.35.6 Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))}{(f+gx)^2}\,dx$$

input
```
integrate((a+b*asin(c*x))*(-c**2*d*x**2+d)**(1/2)/(g*x+f)**2,x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))/(f + g*x)**2, x)
```

### 3.35.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f)^2,x, algorithm="m
axima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

### 3.35.8 Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(g*x+f)^2,x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.35.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{(f+gx)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\sqrt{d-c^2\,d\,x^2}}{(f+g\,x)^2}\,dx$$

input
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x)^2,x)
```

output
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(1/2))/(f + g*x)^2, x)
```

# 3.36 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx$

### 3.36.1 Optimal result

Integrand size = 31, antiderivative size = 959

$$
\begin{aligned}
&\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{3bdf^2gx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} \\
&+ \frac{2bdg^3x\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}} - \frac{5bcdf^3x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{3bdfg^2x^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}} \\
&- \frac{2bcdf^2gx^3\sqrt{d-c^2dx^2}}{5\sqrt{1-c^2x^2}} + \frac{bdg^3x^3\sqrt{d-c^2dx^2}}{105c\sqrt{1-c^2x^2}} + \frac{bc^3df^3x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} \\
&- \frac{7bcdfg^2x^4\sqrt{d-c^2dx^2}}{32\sqrt{1-c^2x^2}} + \frac{3bc^3df^2gx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} \\
&- \frac{8bcdg^3x^5\sqrt{d-c^2dx^2}}{175\sqrt{1-c^2x^2}} + \frac{bc^3dfg^2x^6\sqrt{d-c^2dx^2}}{12\sqrt{1-c^2x^2}} + \frac{bc^3dg^3x^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} \\
&+ \frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{3dfg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} \\
&+ \frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} \\
&- \frac{dg^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^4} \\
&+ \frac{dg^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4} \\
&+ \frac{3df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}} + \frac{3dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

output
```
3/8*d*f^3*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-3/16*d*f*g^2*x*(a+b*arc
sin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+3/8*d*f*g^2*x^3*(a+b*arcsin(c*x))*(-c^2
*d*x^2+d)^(1/2)+1/4*d*f^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^
(1/2)+1/2*d*f*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-
3/5*d*f^2*g*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2-1/5*
d*g^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+1/7*d*g^3*
(-c^2*x^2+1)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+3/5*b*d*f^2*g*x*
(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/35*b*d*g^3*x*(-c^2*d*x^2+d)^(1
/2)/c^3/(-c^2*x^2+1)^(1/2)-5/16*b*c*d*f^3*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x
^2+1)^(1/2)+3/32*b*d*f*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2
/5*b*c*d*f^2*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/105*b*d*g^3*x
^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+1/16*b*c^3*d*f^3*x^4*(-c^2*d*
x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-7/32*b*c*d*f*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/
(-c^2*x^2+1)^(1/2)+3/25*b*c^3*d*f^2*g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1
)^(1/2)-8/175*b*c*d*g^3*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/12*b
*c^3*d*f*g^2*x^6*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/49*b*c^3*d*g^3*
x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+3/16*d*f^3*(a+b*arcsin(c*x))^2
*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+3/32*d*f*g^2*(a+b*arcsin(c*x)
)^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

## 3.36.2 Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 463, normalized size of antiderivative = 0.48

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\left(11025a^2cf(2c^2f^2+g^2)-210ab\sqrt{1-c^2x^2}(32g^3+c^2g(336f^2+105fgx+\right.}{}$$

input
```
Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(11025*a^2*c*f*(2*c^2*f^2 + g^2) - 210*a*b*Sqrt[1 -
 c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6*x^3*(
35*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3 + 336*
f^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)) + b^2*c*x*(6720*g^3 + 35*c^2*g*(201
6*f^2 + 315*f*g*x + 32*g^2*x^2) - 21*c^4*x*(1750*f^3 + 2240*f^2*g*x + 1225
*f*g^2*x^2 + 256*g^3*x^3) + 2*c^6*x^3*(3675*f^3 + 7056*f^2*g*x + 4900*f*g^
2*x^2 + 1200*g^3*x^3)) - 210*b*(-105*a*c*f*(2*c^2*f^2 + g^2) + b*Sqrt[1 -
c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6*x^3*(3
5*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3 + 336*f
^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)))*ArcSin[c*x] + 11025*b^2*c*f*(2*c^2*
f^2 + g^2)*ArcSin[c*x]^2))/(117600*b*c^4*Sqrt[1 - c^2*x^2])
```

### 3.36.3 Rubi [A] (verified)

Time = 1.18 (sec) , antiderivative size = 498, normalized size of antiderivative = 0.52, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)^3(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))f^3+3gx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))f^2+3g^2x^2\left(1-c^2x^2\right)^{3/2}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{d\sqrt{d-c^2dx^2}\left(\frac{3fg^2(a+b\arcsin(cx))^2}{32bc^3}+\frac{1}{4}f^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{3}{8}f^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{3f}{}\right.}{}$$

input
```
Int[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((3*b*f^2*g*x)/(5*c) + (2*b*g^3*x)/(35*c^3) - (5*b*
c*f^3*x^2)/16 + (3*b*f*g^2*x^2)/(32*c) - (2*b*c*f^2*g*x^3)/5 + (b*g^3*x^3)
/(105*c) + (b*c^3*f^3*x^4)/16 - (7*b*c*f*g^2*x^4)/32 + (3*b*c^3*f^2*g*x^5)
/25 - (8*b*c*g^3*x^5)/175 + (b*c^3*f*g^2*x^6)/12 + (b*c^3*g^3*x^7)/49 + (3
*f^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/8 - (3*f*g^2*x*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(16*c^2) + (3*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x]))/8 + (f^3*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (f*
g^2*x^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/2 - (3*f^2*g*(1 - c^2*x^2
)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2) - (g^3*(1 - c^2*x^2)^(5/2)*(a + b*Arc
Sin[c*x]))/(5*c^4) + (g^3*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^4)
 + (3*f^3*(a + b*ArcSin[c*x])^2)/(16*b*c) + (3*f*g^2*(a + b*ArcSin[c*x])^2
)/(32*b*c^3)))/Sqrt[1 - c^2*x^2]
```

### 3.36.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.36.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.72 (sec) , antiderivative size = 2074, normalized size of antiderivative = 2.16

| method | result | size |
|---|---|---|
| default | Expression too large to display | 2074 |
| parts | Expression too large to display | 2074 |

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d
/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^3*(-1/7*x^
2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+3*f*g^2*(-1/
6*x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(
1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^
2*d*x^2+d)^(1/2)))))-3/5*f^2*g/c^2/d*(-c^2*d*x^2+d)^(5/2))+b*(-3/32*(-d*(c
^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(2*c^2
*f^2+g^2)*d-1/6272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7
*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^
2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g^3*(I
+7*arcsin(c*x))*d/c^4/(c^2*x^2-1)-1/768*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^
2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x
^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*
f*g^2*(I+6*arcsin(c*x))*d/c^3/(c^2*x^2-1)-1/3200*(-d*(c^2*x^2-1))^(1/2)*(1
6*c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2
*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(12*I*f^2*c^2+60*arc
sin(c*x)*c^2*f^2-I*g^2-5*arcsin(c*x)*g^2)*d/c^4/(c^2*x^2-1)-1/512*(-d*(c^2
*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(2*I*c^2*f^2+8*arc
sin(c*x)*c^2*f^2-3*I*g^2-12*arcsin(c*x)*g^2)*d/c^3/(c^2*x^2-1)-3/128*(-...
```

### 3.36.5 Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^3(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral(-(a*c^2*d*g^3*x^5 + 3*a*c^2*d*f*g^2*x^4 - 3*a*d*f^2*g*x - a*d*f^3
 + (3*a*c^2*d*f^2*g - a*d*g^3)*x^3 + (a*c^2*d*f^3 - 3*a*d*f*g^2)*x^2 + (b*
c^2*d*g^3*x^5 + 3*b*c^2*d*f*g^2*x^4 - 3*b*d*f^2*g*x - b*d*f^3 + (3*b*c^2*d
*f^2*g - b*d*g^3)*x^3 + (b*c^2*d*f^3 - 3*b*d*f*g^2)*x^2)*arcsin(c*x))*sqrt
(-c^2*d*x^2 + d), x)
```

### 3.36.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

### 3.36.7 Maxima [F]

$$\int (f+gx)^3 \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}} (gx+f)^3 (b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a*f^3 - 1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c^2
*d*x^2 + d)^(5/2)/(c^4*d))*a*g^3 + 1/16*a*f*g^2*(2*(-c^2*d*x^2 + d)^(3/2)*
x/c^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^
2 + 3*d^(3/2)*arcsin(c*x)/c^3) - 3/5*(-c^2*d*x^2 + d)^(5/2)*a*f^2*g/(c^2*d
) + sqrt(d)*integrate(-(b*c^2*d*g^3*x^5 + 3*b*c^2*d*f*g^2*x^4 - 3*b*d*f^2*
g*x - b*d*f^3 + (3*b*c^2*d*f^2*g - b*d*g^3)*x^3 + (b*c^2*d*f^3 - 3*b*d*f*g
^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)), x)
```

### 3.36.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.36.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

# 3.37 $\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx$



## 3.37.1 Optimal result

Integrand size = 31, antiderivative size = 680

$$\begin{aligned}\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx &= \frac{2bdfgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}} \\
&- \frac{5bcdf^2x^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} + \frac{bdg^2x^2\sqrt{d-c^2dx^2}}{32c\sqrt{1-c^2x^2}} - \frac{4bcdfgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}} \\
&+ \frac{bc^3df^2x^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}} - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{2bc^3dfgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}} \\
&+ \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}}{36\sqrt{1-c^2x^2}} + \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c^2} + \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{2dfg\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2} \\
&+ \frac{3df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}} + \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc^3\sqrt{1-c^2x^2}}\end{aligned}$$

output
```
3/8*d*f^2*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/16*d*g^2*x*(a+b*arcsi
n(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+1/8*d*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x
^2+d)^(1/2)+1/4*d*f^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2
)+1/6*d*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-2/5*d*
f*g*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+2/5*b*d*f*g*
x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-5/16*b*c*d*f^2*x^2*(-c^2*d*x^2
+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/32*b*d*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2
*x^2+1)^(1/2)-4/15*b*c*d*f*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1
/16*b*c^3*d*f^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-7/96*b*c*d*g^2
*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/25*b*c^3*d*f*g*x^5*(-c^2*d*
x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/36*b*c^3*d*g^2*x^6*(-c^2*d*x^2+d)^(1/2)/
(-c^2*x^2+1)^(1/2)+3/16*d*f^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c
/(-c^2*x^2+1)^(1/2)+1/32*d*g^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/
c^3/(-c^2*x^2+1)^(1/2)
```

### 3.37.2 Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 332, normalized size of antiderivative = 0.49

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\Big(225a^2(6c^2f^2+g^2)+b^2c^2x(450c^2f^2x(-5+c^2x^2)+192fg(15-10c^2x^2+\dots}{\dots}$$

input
```
Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(225*a^2*(6*c^2*f^2 + g^2) + b^2*c^2*x*(450*c^2*f^2
*x*(-5 + c^2*x^2) + 192*f*g*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 25*g^2*x*(9 -
21*c^2*x^2 + 8*c^4*x^4)) - 30*a*b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1 + c^2*x^
2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*c^4*x^4
)) + 30*b*(15*a*(6*c^2*f^2 + g^2) - b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1 + c^
2*x^2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*c^4
*x^4)))*ArcSin[c*x] + 225*b^2*(6*c^2*f^2 + g^2)*ArcSin[c*x]^2))/(7200*b*c^
3*Sqrt[1 - c^2*x^2])
```

### 3.37.3 Rubi [A] (verified)

Time = 0.95 (sec) , antiderivative size = 367, normalized size of antiderivative = 0.54, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d-c^2dx^2)^{3/2}(f+gx)^2(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)^2(1-c^2x^2)^{3/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \Big((1-c^2x^2)^{3/2}(a+b\arcsin(cx))f^2+2gx(1-c^2x^2)^{3/2}(a+b\arcsin(cx))f+g^2x^2(1-c^2x^2)^{3/2}(a$$
$$\sqrt{1-c^2x^2}$$

$$\Big\downarrow \text{2009}$$

$$d\sqrt{d-c^2dx^2}\Bigg(\frac{g^2(a+b\arcsin(cx))^2}{32bc^3}+\frac{1}{4}f^2x(1-c^2x^2)^{3/2}(a+b\arcsin(cx))+\frac{3}{8}f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{2fg(}{}$$

input
```
Int[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((2*b*f*g*x)/(5*c) - (5*b*c*f^2*x^2)/16 + (b*g^2*x^
2)/(32*c) - (4*b*c*f*g*x^3)/15 + (b*c^3*f^2*x^4)/16 - (7*b*c*g^2*x^4)/96 +
 (2*b*c^3*f*g*x^5)/25 + (b*c^3*g^2*x^6)/36 + (3*f^2*x*Sqrt[1 - c^2*x^2]*(a
 + b*ArcSin[c*x]))/8 - (g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(16*c
^2) + (g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/8 + (f^2*x*(1 - c^2*
x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 + (g^2*x^3*(1 - c^2*x^2)^(3/2)*(a + b*Ar
cSin[c*x]))/6 - (2*f*g*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2) +
(3*f^2*(a + b*ArcSin[c*x])^2)/(16*b*c) + (g^2*(a + b*ArcSin[c*x])^2)/(32*b
*c^3)))/Sqrt[1 - c^2*x^2]
```

### 3.37.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.37.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.56 (sec) , antiderivative size = 1535, normalized size of antiderivative = 2.26

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1535 |
| parts | Expression too large to display | 1535 |

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d
/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^2*(-1/6*x*
(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*
x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*
x^2+d)^(1/2)))))-2/5*f*g/c^2/d*(-c^2*d*x^2+d)^(5/2))+b*(-1/32*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*(6*c^2*f^2+g^2
)*d-1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7
*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^
2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*g^2*(I+6*arcsin(c*x))*d/c^3/(
c^2*x^2-1)-1/400*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-c^2*
x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*
x^2+1)^(1/2)*x*c-1)*f*g*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/512*(-d*(c^2
*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)
^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*(8*arcsin(c*x)*c^2*f
^2+2*I*c^2*f^2-4*arcsin(c*x)*g^2-I*g^2)*d/c^3/(c^2*x^2-1)-1/8*(-d*(c^2*x^2
-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin(c*x)+I)*d/c^2/
(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1
)*f*g*(arcsin(c*x)-I)*d/c^2/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*
(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*(-16*I*c^
2*f^2+32*arcsin(c*x)*c^2*f^2-I*g^2+2*arcsin(c*x)*g^2)*d/c^3/(c^2*x^2-1)...
```

### 3.37.5 Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral(-(a*c^2*d*g^2*x^4 + 2*a*c^2*d*f*g*x^3 - 2*a*d*f*g*x - a*d*f^2 + (
a*c^2*d*f^2 - a*d*g^2)*x^2 + (b*c^2*d*g^2*x^4 + 2*b*c^2*d*f*g*x^3 - 2*b*d*
f*g*x - b*d*f^2 + (b*c^2*d*f^2 - b*d*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^
2 + d), x)
```

### 3.37.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

### 3.37.7 Maxima [F]

$$\int (f+gx)^2 \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a*f^2 + 1/48*a*g^2*(2*(-c^2*d*x^2 + d)^(3/2)*x/c^2 - 8*(-c^2
*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^2 + 3*d^(3/2)*a
rcsin(c*x)/c^3) - 2/5*(-c^2*d*x^2 + d)^(5/2)*a*f*g/(c^2*d) + sqrt(d)*integ
rate(-(b*c^2*d*g^2*x^4 + 2*b*c^2*d*f*g*x^3 - 2*b*d*f*g*x - b*d*f^2 + (b*c^
2*d*f^2 - b*d*g^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1)), x)
```

### 3.37.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.37.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d - c^2dx^2\right)^{3/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

# 3.38 $\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx$



## 3.38.1 Optimal result

Integrand size = 29, antiderivative size = 370

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\frac{bdgx\sqrt{d-c^2dx^2}}{5c\sqrt{1-c^2x^2}}-\frac{5bcdfx^2\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}-\frac{2bcdgx^3\sqrt{d-c^2dx^2}}{15\sqrt{1-c^2x^2}}+\frac{bc^3dfx^4\sqrt{d-c^2dx^2}}{16\sqrt{1-c^2x^2}}+\frac{bc^3dgx^5\sqrt{d-c^2dx^2}}{25\sqrt{1-c^2x^2}}+\frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c^2}+\frac{3df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bc\sqrt{1-c^2x^2}}$$

output
```
3/8*d*f*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/4*d*f*x*(-c^2*x^2+1)*(a
+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/5*d*g*(-c^2*x^2+1)^2*(a+b*arcsin(c*
x))*(-c^2*d*x^2+d)^(1/2)/c^2+1/5*b*d*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+
1)^(1/2)-5/16*b*c*d*f*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/15*b*c
*d*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/16*b*c^3*d*f*x^4*(-c^2*
d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/25*b*c^3*d*g*x^5*(-c^2*d*x^2+d)^(1/2)/
(-c^2*x^2+1)^(1/2)+3/16*d*f*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(
-c^2*x^2+1)^(1/2)
```

### 3.38.2 Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 216, normalized size of antiderivative = 0.58

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \frac{d\sqrt{d-c^2dx^2}\left(225a^2cf-30ab\sqrt{1-c^2x^2}\left(8g(-1+c^2x^2)^2+5c^2fx(-5+2c^2x^2)\right)+b^2cx\right.}{}$$

input
```
Integrate[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(225*a^2*c*f - 30*a*b*Sqrt[1 - c^2*x^2]*(8*g*(-1 +
c^2*x^2)^2 + 5*c^2*f*x*(-5 + 2*c^2*x^2)) + b^2*c*x*(75*c^2*f*x*(-5 + c^2*x
^2) + 16*g*(15 - 10*c^2*x^2 + 3*c^4*x^4)) + 30*b*(15*a*c*f + b*Sqrt[1 - c^
2*x^2]*(5*c^2*f*x*(5 - 2*c^2*x^2) - 8*g*(-1 + c^2*x^2)^2))*ArcSin[c*x] + 2
25*b^2*c*f*ArcSin[c*x]^2))/(1200*b*c^2*Sqrt[1 - c^2*x^2])
```

### 3.38.3 Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 193, normalized size of antiderivative = 0.52, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 5262}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(f(a+b\arcsin(cx))\left(1-c^2x^2\right)^{3/2}+gx(a+b\arcsin(cx))\left(1-c^2x^2\right)^{3/2}\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{d\sqrt{d-c^2dx^2}\left(\frac{1}{4}fx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{3}{8}fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{g\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{5c^2}\right.}{\sqrt{1-c^2x^2}}$$

input
```
Int[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((b*g*x)/(5*c) - (5*b*c*f*x^2)/16 - (2*b*c*g*x^3)/1
5 + (b*c^3*f*x^4)/16 + (b*c^3*g*x^5)/25 + (3*f*x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/8 + (f*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/4 - (g*(1
- c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(5*c^2) + (3*f*(a + b*ArcSin[c*x])^2
)/(16*b*c)))/Sqrt[1 - c^2*x^2]
```

### 3.38.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.38.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.56 (sec) , antiderivative size = 1014, normalized size of antiderivative = 2.74

| method | result |
|---|---|
| default | $\frac{afx(-c^2dx^2+d)^{\frac{3}{2}}}{4}+\frac{3afdx\sqrt{-c^2dx^2+d}}{8}+\frac{3af\,d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8\sqrt{c^2d}}-\frac{ag(-c^2dx^2+d)^{\frac{5}{2}}}{5c^2d}+b\Bigg(-\frac{3\sqrt{-d(c^2x^2-1)}\,\sqrt{-c}}{16c(c^2}$ |
| parts | $\frac{afx(-c^2dx^2+d)^{\frac{3}{2}}}{4}+\frac{3afdx\sqrt{-c^2dx^2+d}}{8}+\frac{3af\,d^2\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{8\sqrt{c^2d}}-\frac{ag(-c^2dx^2+d)^{\frac{5}{2}}}{5c^2d}+b\Bigg(-\frac{3\sqrt{-d(c^2x^2-1)}\,\sqrt{-c}}{16c(c^2}$ |

input

```
int((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE
)
```

output

```
1/4*a*f*x*(-c^2*d*x^2+d)^(3/2)+3/8*a*f*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a*f*d^
2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/5*a*g/c^2/d
*(-c^2*d*x^2+d)^(5/2)+b*(-3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c
/(c^2*x^2-1)*arcsin(c*x)^2*f*d-1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28
*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2
)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(I+5*arcsin(c*x))*d/c^2/(c^2*x^2
-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^
5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*
(4*arcsin(c*x)+I)*d/c/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(
-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2
*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)*d/c^
2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+
2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arcsin(c*x))*d/c/(c^2*x^2-1)
+1/96*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I
*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))*d/c^2/(c^2*x^2-1
)-1/1200*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(11
*I+45*arcsin(c*x))*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/600*(-d*(c^2*x^2
-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(7*I+15*arcsin(c*x))*sin
(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/256*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-
c*x*(-c^2*x^2+1)^(1/2)-I)*f*(17*I+28*arcsin(c*x))*cos(3*arcsin(c*x))*d/...
```

### 3.38.5 Fricas [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="fri
cas")
```

output
```
integral(-(a*c^2*d*g*x^3 + a*c^2*d*f*x^2 - a*d*g*x - a*d*f + (b*c^2*d*g*x^
3 + b*c^2*d*f*x^2 - b*d*g*x - b*d*f)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

### 3.38.6 Sympy [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\int \left(-d(cx-1)\,(cx+1)\right)^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(cx))\,(f+gx)\;dx$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x)),x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))*(f + g*x), x)
```

### 3.38.7 Maxima [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin{(cx)}+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="max
ima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a*f - 1/5*(-c^2*d*x^2 + d)^(5/2)*a*g/(c^2*d) + sqrt(d)*integ
rate(-(b*c^2*d*g*x^3 + b*c^2*d*f*x^2 - b*d*g*x - b*d*f)*sqrt(c*x + 1)*sqrt
(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

### 3.38.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x)),x, algorithm="gia
c")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.38.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d-c^2\,d\,x^2\right)}^{3/2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2), x)
```

# 3.39 $\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx$

### 3.39.1 Optimal result

Integrand size = 31, antiderivative size = 1073

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = -\frac{ad(cf-g)(cf+g)\sqrt{d-c^2dx^2}}{g^3}-\frac{bcdx\sqrt{d-c^2dx^2}}{3g\sqrt{1-c^2x^2}}+\frac{bcd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}}{g^3\sqrt{1-c^2x^2}}-\frac{bc^3dfx^2\sqrt{d-c^2dx^2}}{4g^2\sqrt{1-c^2x^2}}+\frac{bc^3dx^3\sqrt{d-c^2dx^2}}{9g\sqrt{1-c^2x^2}}-\frac{bd(cf-g)(cf+g)\sqrt{d-c^2dx^2}\arcsin(cx)}{g^3}+\frac{c^2dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^2}+\frac{d(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g}+\frac{cdf\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^2\sqrt{1-c^2x^2}}-\frac{cd(cf-g)(cf+g)x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^3\sqrt{1-c^2x^2}}-\frac{d(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)\sqrt{1-c^2x^2}}-\frac{d(cf-g)(cf+g)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^2(f+gx)}+\frac{ad(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^4\sqrt{1-c^2x^2}}-\frac{ibd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}+\frac{ibd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}-\frac{bd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}+\frac{bd(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^4\sqrt{1-c^2x^2}}$$

output
```
-a*d*(c*f-g)*(c*f+g)*(-c^2*d*x^2+d)^(1/2)/g^3-b*d*(c*f-g)*(c*f+g)*arcsin(c
*x)*(-c^2*d*x^2+d)^(1/2)/g^3+1/2*c^2*d*f*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d
)^(1/2)/g^2+1/3*d*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g-1/
3*b*c*d*x*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+b*c*d*(c*f-g)*(c*f+g)*
x*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)-1/4*b*c^3*d*f*x^2*(-c^2*d*x^
2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)+1/9*b*c^3*d*x^3*(-c^2*d*x^2+d)^(1/2)/g/(
-c^2*x^2+1)^(1/2)+1/4*c*d*f*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/g^2
/(-c^2*x^2+1)^(1/2)-1/2*c*d*(c*f-g)*(c*f+g)*x*(a+b*arcsin(c*x))^2*(-c^2*d*
x^2+d)^(1/2)/b/g^3/(-c^2*x^2+1)^(1/2)-1/2*d*(c^2*f^2-g^2)^2*(a+b*arcsin(c*
x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/g^4/(g*x+f)/(-c^2*x^2+1)^(1/2)+a*d*(c^2*f^2
-g^2)^(3/2)*arctan((c^2*f*x+g)/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(-c
^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-I*b*d*(c^2*f^2-g^2)^(3/2)*arcsin(
c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*
d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)+I*b*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*x
)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x
^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-b*d*(c^2*f^2-g^2)^(3/2)*polylog(2,I*(I*
c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/
g^4/(-c^2*x^2+1)^(1/2)+b*d*(c^2*f^2-g^2)^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^
2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^
2+1)^(1/2)-1/2*d*(c*f-g)*(c*f+g)*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)...
```

### 3.39.2 Mathematica [A] (verified)

Time = 1.19 (sec) , antiderivative size = 507, normalized size of antiderivative = 0.47

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \frac{d\sqrt{d-c^2dx^2}\left(-9bc^3fx^2+4bcgx(-3+c^2x^2)+18c^2fx\sqrt{1-c^2x^2}\right.}{}$$

input
```
Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(-9*b*c^3*f*x^2 + 4*b*c*g*x*(-3 + c^2*x^2) + 18*c^2
*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + 12*g*(1 - c^2*x^2)^(3/2)*(a +
 b*ArcSin[c*x]) + (9*c*f*(a + b*ArcSin[c*x])^2)/b + (18*(c^2*f^2 - g^2)*(-
1 + c^2*x^2)*(a + b*ArcSin[c*x])^2)/(b*c*(f + g*x)) - (18*(c^2*f^2 - g^2)*
((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2 + c^2*g*x*(f + g*x)*(a + b*ArcSin[c
*x])^2 - 2*b*c*(f + g*x)*(b*c*g*x - g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
) - I*Sqrt[c^2*f^2 - g^2]*((a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x
])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c
*f + Sqrt[c^2*f^2 - g^2])]) - I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f
- Sqrt[c^2*f^2 - g^2])] + I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sq
rt[c^2*f^2 - g^2])]))))/(b*c*g^2*(f + g*x))))/(36*g^2*Sqrt[1 - c^2*x^2])
```

### 3.39.3 Rubi [A] (verified)

Time = 2.34 (sec) , antiderivative size = 709, normalized size of antiderivative = 0.66, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))}{f+gx}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \frac{\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5266}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(-\frac{x\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^2}{g}+\frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^2}{g^2}+\frac{\left(g^2-c^2f^2\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{g^2(f+gx)}\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$d\sqrt{d-c^2dx^2}\left(-\frac{\left(1-c^2x^2\right)\left(c^2f^2-g^2\right)(a+b\arcsin(cx))^2}{2bcg^2(f+gx)}-\frac{\left(c^2f^2-g^2\right)^2(a+b\arcsin(cx))^2}{2bcg^4(f+gx)}-\frac{cx\left(c^2f^2-g^2\right)(a+b\arcsin(cx))^2}{2bg^3}+\frac{c^2fx\sqrt{1-c^2}\cdots}{}\right.$$

input
```
Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(-1/3*(b*c*x)/g + (b*c*(c^2*f^2 - g^2)*x)/g^3 - (b*
c^3*f*x^2)/(4*g^2) + (b*c^3*x^3)/(9*g) - (a*(c*f - g)*(c*f + g)*Sqrt[1 - c
^2*x^2])/g^3 - (b*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/g^3 +
 (c^2*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*g^2) + ((1 - c^2*x^2)^
(3/2)*(a + b*ArcSin[c*x]))/(3*g) + (c*f*(a + b*ArcSin[c*x])^2)/(4*b*g^2) -
 (c*(c^2*f^2 - g^2)*x*(a + b*ArcSin[c*x])^2)/(2*b*g^3) - ((c^2*f^2 - g^2)^
2*(a + b*ArcSin[c*x])^2)/(2*b*c*g^4*(f + g*x)) - ((c^2*f^2 - g^2)*(1 - c^2
*x^2)*(a + b*ArcSin[c*x])^2)/(2*b*c*g^2*(f + g*x)) + (a*(c^2*f^2 - g^2)^(3
/2)*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/g^4 - (
I*b*(c^2*f^2 - g^2)^(3/2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 - Sqrt[c^2*f^2 - g^2])])/g^4 + (I*b*(c^2*f^2 - g^2)^(3/2)*ArcSin[c*x]*Log
[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^4 - (b*(c^2*f
^2 - g^2)^(3/2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g
^2])])/g^4 + (b*(c^2*f^2 - g^2)^(3/2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(
c*f + Sqrt[c^2*f^2 - g^2])])/g^4))/Sqrt[1 - c^2*x^2]
```

### 3.39.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5266
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.39.4 Maple [A] (verified)

Time = 0.64 (sec) , antiderivative size = 1546, normalized size of antiderivative = 1.44

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1546 |
| parts | Expression too large to display | 1546 |

input
```
int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x,method=_RETURNVERBOSE
)
```

output
```
a/g*(1/3*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(3/2)+
c^2*d*f/g*(-1/4*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+f/g)^2*c^2*d+2*c
^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2*d^2*(c^2*f^2-g^2)/g
^2-4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/g)
^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)))-d*(c^2*f^2-g^2)/
g^2*((-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)+c^2*
d*f/g/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(
x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g^2/(-d*(c^2*f^2-g^2)/g
^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^
2)/g^2)^(1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(
1/2))/(x+f/g))))+b*(1/4*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/(c^2*x^2
-1)*arcsin(c*x)^2*f*(2*c^2*f^2-3*g^2)*d*c/g^4-1/72*(-d*(c^2*x^2-1))^(1/2)*
(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)
*x*c+1)*(I+3*arcsin(c*x))*d/(c^2*x^2-1)/g+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*
I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(I+2*
arcsin(c*x))*d*c/(c^2*x^2-1)/g^2-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c
^2*x^2+1)^(1/2)*x*c-1)*(4*c^2*f^2-5*g^2)*(arcsin(c*x)+I)*d/(c^2*x^2-1)/g^3
-1/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*(4*c^2*f^
2-5*g^2)*(arcsin(c*x)-I)*d/(c^2*x^2-1)/g^3+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*
I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-...
```

### 3.39.5 Fricas [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx=\int \frac{(-c^2dx^2+d)^{\frac{3}{2}}(b\arcsin(cx)+a)}{gx+f}\,dx$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="fri
cas")
```

output
```
integral(-(a*c^2*d*x^2 - a*d + (b*c^2*d*x^2 - b*d)*arcsin(c*x))*sqrt(-c^2*
d*x^2 + d)/(g*x + f), x)
```

### 3.39.6 Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\operatorname{asin}(cx))}{f+gx}\,dx$$

input
```
integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))/(g*x+f),x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))/(f + g*x), x)
```

### 3.39.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="max
ima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

### 3.39.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.39.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(d-c^2\,d\,x^2)^{3/2}}{f+g\,x}\,dx$$

input
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(3/2))/(f + g*x), x)
```

# 3.40 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx$

### 3.40.1 Optimal result

Integrand size = 31, antiderivative size = 1281

$$\int (f+gx)^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\frac{3bd^2f^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}}$$
$$+\frac{2bd^2g^3x\sqrt{d-c^2dx^2}}{63c^3\sqrt{1-c^2x^2}}-\frac{25bcd^2f^3x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}+\frac{15bd^2fg^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}}$$
$$-\frac{3bcd^2f^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}}+\frac{bd^2g^3x^3\sqrt{d-c^2dx^2}}{189c\sqrt{1-c^2x^2}}+\frac{5bc^3d^2f^3x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}$$
$$-\frac{59bcd^2fg^2x^4\sqrt{d-c^2dx^2}}{256\sqrt{1-c^2x^2}}+\frac{9bc^3d^2f^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}}-\frac{bcd^2g^3x^5\sqrt{d-c^2dx^2}}{21\sqrt{1-c^2x^2}}$$
$$+\frac{17bc^3d^2fg^2x^6\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}}-\frac{3bc^5d^2f^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}}+\frac{19bc^3d^2g^3x^7\sqrt{d-c^2dx^2}}{441\sqrt{1-c^2x^2}}$$
$$-\frac{3bc^5d^2fg^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}}-\frac{bc^5d^2g^3x^9\sqrt{d-c^2dx^2}}{81\sqrt{1-c^2x^2}}+\frac{bd^2f^3(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c}$$
$$+\frac{5}{16}d^2f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))-\frac{15d^2fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2}$$
$$+\frac{15}{64}d^2fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))+\frac{5}{24}d^2f^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+\frac{5}{16}d^2fg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+\frac{1}{6}d^2f^3x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$+\frac{3}{8}d^2fg^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))$$
$$-\frac{3d^2f^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2}$$
$$-\frac{d^2g^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^4}$$
$$+\frac{d^2g^3(1-c^2x^2)^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9c^4}$$
$$+\frac{5d^2f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}}+\frac{15d^2fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}}$$

output
```
5/96*b*c^3*d^2*f^3*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/21*b*c*d^
2*g^3*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+19/441*b*c^3*d^2*g^3*x^7
*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/81*b*c^5*d^2*g^3*x^9*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/32*d^2*f^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2
+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)-15/128*d^2*f*g^2*x*(a+b*arcsin(c*x))*(-c^
2*d*x^2+d)^(1/2)/c^2+5/16*d^2*f*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c
^2*d*x^2+d)^(1/2)+3/8*d^2*f*g^2*x^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2
*d*x^2+d)^(1/2)-3/7*d^2*f^2*g*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c^2+2/63*b*d^2*g^3*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)
-25/96*b*c*d^2*f^3*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/189*b*d^2
*g^3*x^3*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+5/16*d^2*f^3*x*(a+b*arc
sin(c*x))*(-c^2*d*x^2+d)^(1/2)+3/7*b*d^2*f^2*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-
c^2*x^2+1)^(1/2)+15/256*b*d^2*f*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1
)^(1/2)+1/36*b*d^2*f^3*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+15/64*d^2
*f*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+5/24*d^2*f^3*x*(-c^2*x^2
+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*f^3*x*(-c^2*x^2+1)^2*(a
+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-1/7*d^2*g^3*(-c^2*x^2+1)^3*(a+b*arcsi
n(c*x))*(-c^2*d*x^2+d)^(1/2)/c^4+1/9*d^2*g^3*(-c^2*x^2+1)^4*(a+b*arcsin(c*
x))*(-c^2*d*x^2+d)^(1/2)/c^4-3/7*b*c*d^2*f^2*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-
c^2*x^2+1)^(1/2)-59/256*b*c*d^2*f*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^...
```

### 3.40.2 Mathematica [A] (verified)

Time = 0.75 (sec) , antiderivative size = 587, normalized size of antiderivative = 0.46

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(99225a^2(8c^3f^3+3cfg^2)+630ab\sqrt{1-c^2x^2}(-256g^3-c^2g(3456f^2+945\right.}{}$$

input
```
Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(99225*a^2*(8*c^3*f^3 + 3*c*f*g^2) + 630*a*b*Sqrt
[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 128*g^2*x^2) + 16*
c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3) - 8*c^6*x^3*(5
46*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^4*x*(924*f^3 +
 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)) + b^2*c*x*(161280*g^3 + 105
*c^2*g*(20736*f^2 + 2835*f*g*x + 256*g^2*x^2) - 945*c^4*x*(1848*f^3 + 2304
*f^2*g*x + 1239*f*g^2*x^2 + 256*g^3*x^3) + 72*c^6*x^3*(9555*f^3 + 18144*f^
2*g*x + 12495*f*g^2*x^2 + 3040*g^3*x^3) - 20*c^8*x^5*(7056*f^3 + 15552*f^2
*g*x + 11907*f*g^2*x^2 + 3136*g^3*x^3)) + 630*b*(315*a*(8*c^3*f^3 + 3*c*f*
g^2) + b*Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 128*g
^2*x^2) + 16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3) -
 8*c^6*x^3*(546*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^4
*x*(924*f^3 + 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)))*ArcSin[c*x] +
 99225*b^2*c*f*(8*c^2*f^2 + 3*g^2)*ArcSin[c*x]^2))/(5080320*b*c^4*Sqrt[1 -
 c^2*x^2])
```

## 3.40.3 Rubi [A] (verified)

Time = 1.34 (sec) , antiderivative size = 630, normalized size of antiderivative = 0.49, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)^3(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \Big(\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))f^3+3gx\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))f^2+3g^2x^2\left(1-c^2x^2\right)^{5/2}}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\left(\frac{15fg^2(a+b\arcsin(cx))^2}{256bc^3}+\frac{1}{6}f^3x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{5}{24}f^3x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx)\right.}{}$$

input
```
Int[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((3*b*f^2*g*x)/(7*c) + (2*b*g^3*x)/(63*c^3) - (25
*b*c*f^3*x^2)/96 + (15*b*f*g^2*x^2)/(256*c) - (3*b*c*f^2*g*x^3)/7 + (b*g^3
*x^3)/(189*c) + (5*b*c^3*f^3*x^4)/96 - (59*b*c*f*g^2*x^4)/256 + (9*b*c^3*f
^2*g*x^5)/35 - (b*c*g^3*x^5)/21 + (17*b*c^3*f*g^2*x^6)/96 - (3*b*c^5*f^2*g
*x^7)/49 + (19*b*c^3*g^3*x^7)/441 - (3*b*c^5*f*g^2*x^8)/64 - (b*c^5*g^3*x^
9)/81 + (b*f^3*(1 - c^2*x^2)^3)/(36*c) + (5*f^3*x*Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x]))/16 - (15*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(12
8*c^2) + (15*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/64 + (5*f^3*
x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (5*f*g^2*x^3*(1 - c^2*x^2)
^(3/2)*(a + b*ArcSin[c*x]))/16 + (f^3*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[
c*x]))/6 + (3*f*g^2*x^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/8 - (3*f^
2*g*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^2) - (g^3*(1 - c^2*x^2)^
(7/2)*(a + b*ArcSin[c*x]))/(7*c^4) + (g^3*(1 - c^2*x^2)^(9/2)*(a + b*ArcSi
n[c*x]))/(9*c^4) + (5*f^3*(a + b*ArcSin[c*x])^2)/(32*b*c) + (15*f*g^2*(a +
 b*ArcSin[c*x])^2)/(256*b*c^3)))/Sqrt[1 - c^2*x^2]
```

### 3.40.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.40.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.77 (sec) , antiderivative size = 2903, normalized size of antiderivative = 2.27

| method | result | size |
|---|---|---|
| default | Expression too large to display | 2903 |
| parts | Expression too large to display | 2903 |

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3*(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d
*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-
c^2*d*x^2+d)^(1/2)))))+g^3*(-1/9*x^2*(-c^2*d*x^2+d)^(7/2)/c^2/d-2/63/d/c^4
*(-c^2*d*x^2+d)^(7/2))+3*f*g^2*(-1/8*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/8/c^2*
(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x
*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x
^2+d)^(1/2))))))-3/7*f^2*g*(-c^2*d*x^2+d)^(7/2)/c^2/d)+b*(-5/256*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*f*(8*c^2*f^
2+3*g^2)*d^2+1/41472*(-d*(c^2*x^2-1))^(1/2)*(256*c^10*x^10-704*c^8*x^8-256
*I*(-c^2*x^2+1)^(1/2)*x^9*c^9+688*c^6*x^6+576*I*(-c^2*x^2+1)^(1/2)*x^7*c^7
-280*c^4*x^4-432*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+41*c^2*x^2+120*I*(-c^2*x^2+1
)^(1/2)*x^3*c^3-9*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g^3*(I+9*arcsin(c*x))*d^2/c^
4/(c^2*x^2-1)+3/25088*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*
c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25
*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(
4*I*c^2*f^2+28*arcsin(c*x)*c^2*f^2-I*g^2-7*arcsin(c*x)*g^2)*d^2/c^4/(c^2*x
^2-1)-1/9216*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f
*(58*I*c^2*f^2+192*arcsin(c*x)*c^2*f^2-39*I*g^2-36*arcsin(c*x)*g^2)*cos(5*
arcsin(c*x))*d^2/c^3/(c^2*x^2-1)-3/640*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-
28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)...
```

### 3.40.5 Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^3(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral((a*c^4*d^2*g^3*x^7 + 3*a*c^4*d^2*f*g^2*x^6 + 3*a*d^2*f^2*g*x + a*
d^2*f^3 + (3*a*c^4*d^2*f^2*g - 2*a*c^2*d^2*g^3)*x^5 + (a*c^4*d^2*f^3 - 6*a
*c^2*d^2*f*g^2)*x^4 - (6*a*c^2*d^2*f^2*g - a*d^2*g^3)*x^3 - (2*a*c^2*d^2*f
^3 - 3*a*d^2*f*g^2)*x^2 + (b*c^4*d^2*g^3*x^7 + 3*b*c^4*d^2*f*g^2*x^6 + 3*b
*d^2*f^2*g*x + b*d^2*f^3 + (3*b*c^4*d^2*f^2*g - 2*b*c^2*d^2*g^3)*x^5 + (b*
c^4*d^2*f^3 - 6*b*c^2*d^2*f*g^2)*x^4 - (6*b*c^2*d^2*f^2*g - b*d^2*g^3)*x^3
 - (2*b*c^2*d^2*f^3 - 3*b*d^2*f*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d
), x)
```

### 3.40.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

### 3.40.7 Maxima [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (gx+f)^3 (b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a*f^3 + 1/128*(8*(-c^2*
d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*d*
x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*ar
csin(c*x)/c^3)*a*f*g^2 - 1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) + 2*(-
c^2*d*x^2 + d)^(7/2)/(c^4*d))*a*g^3 - 3/7*(-c^2*d*x^2 + d)^(7/2)*a*f^2*g/(
c^2*d) + sqrt(d)*integrate((b*c^4*d^2*g^3*x^7 + 3*b*c^4*d^2*f*g^2*x^6 + 3*
b*d^2*f^2*g*x + b*d^2*f^3 + (3*b*c^4*d^2*f^2*g - 2*b*c^2*d^2*g^3)*x^5 + (b
*c^4*d^2*f^3 - 6*b*c^2*d^2*f*g^2)*x^4 - (6*b*c^2*d^2*f^2*g - b*d^2*g^3)*x^
3 - (2*b*c^2*d^2*f^3 - 3*b*d^2*f*g^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

### 3.40.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.40.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d - c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

# 3.41 $\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx$



## 3.41.1 Optimal result

Integrand size = 31, antiderivative size = 940

$$
\begin{aligned}
&\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{2bd^2fgx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} \\
&- \frac{25bcd^2f^2x^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{5bd^2g^2x^2\sqrt{d-c^2dx^2}}{256c\sqrt{1-c^2x^2}} - \frac{2bcd^2fgx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} \\
&+ \frac{5bc^3d^2f^2x^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{59bcd^2g^2x^4\sqrt{d-c^2dx^2}}{768\sqrt{1-c^2x^2}} + \frac{6bc^3d^2fgx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} \\
&+ \frac{17bc^3d^2g^2x^6\sqrt{d-c^2dx^2}}{288\sqrt{1-c^2x^2}} - \frac{2bc^5d^2fgx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} \\
&- \frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}}{64\sqrt{1-c^2x^2}} + \frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} \\
&+ \frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) - \frac{5d^2g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c^2} \\
&+ \frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) + \frac{5}{24}d^2f^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{5}{48}d^2g^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{6}d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{8}d^2g^2x^3\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} \\
&+ \frac{5d^2f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}} + \frac{5d^2g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{256bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

output
```
1/36*b*d^2*f^2*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+5/16*d^2*f^2*x*(a
+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-5/128*d^2*g^2*x*(a+b*arcsin(c*x))*(-c
^2*d*x^2+d)^(1/2)/c^2+5/64*d^2*g^2*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1
/2)+5/24*d^2*f^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+5/4
8*d^2*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*
f^2*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+1/8*d^2*g^2*x^
3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)-2/7*d^2*f*g*(-c^2*
x^2+1)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c^2+2/7*b*d^2*f*g*x*(-c^2*
d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-25/96*b*c*d^2*f^2*x^2*(-c^2*d*x^2+d)^(
1/2)/(-c^2*x^2+1)^(1/2)+5/256*b*d^2*g^2*x^2*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x
^2+1)^(1/2)-2/7*b*c*d^2*f*g*x^3*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/
96*b*c^3*d^2*f^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-59/768*b*c*d^
2*g^2*x^4*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+6/35*b*c^3*d^2*f*g*x^5*(
-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+17/288*b*c^3*d^2*g^2*x^6*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/49*b*c^5*d^2*f*g*x^7*(-c^2*d*x^2+d)^(1/2)/
(-c^2*x^2+1)^(1/2)-1/64*b*c^5*d^2*g^2*x^8*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1
)^(1/2)+5/32*d^2*f^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^
2+1)^(1/2)+5/256*d^2*g^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-
c^2*x^2+1)^(1/2)
```

### 3.41.2 Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 390, normalized size of antiderivative = 0.41

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(11025a^2(8c^2f^2+g^2)+b^2c^2x(-1960c^2f^2x(99-39c^2x^2+8c^4x^4)-4608f}{}$$

input
```
Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(11025*a^2*(8*c^2*f^2 + g^2) + b^2*c^2*x*(-1960*c
^2*f^2*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) - 4608*f*g*(-35 + 35*c^2*x^2 - 21*c
^4*x^4 + 5*c^6*x^6) - 245*g^2*x*(-45 + 177*c^2*x^2 - 136*c^4*x^4 + 36*c^6*
x^6)) + 210*a*b*c*Sqrt[1 - c^2*x^2]*(768*f*g*(-1 + c^2*x^2)^3 + 56*c^2*f^2
*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*(-15 + 118*c^2*x^2 - 136*c^4*x^
4 + 48*c^6*x^6)) + 210*b*(105*a*(8*c^2*f^2 + g^2) + b*c*Sqrt[1 - c^2*x^2]*
(768*f*g*(-1 + c^2*x^2)^3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7
*g^2*x*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6)))*ArcSin[c*x] + 1102
5*b^2*(8*c^2*f^2 + g^2)*ArcSin[c*x]^2))/(564480*b*c^3*Sqrt[1 - c^2*x^2])
```

### 3.41.3 Rubi [A] (verified)

Time = 1.09 (sec) , antiderivative size = 481, normalized size of antiderivative = 0.51, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)^2(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(f^2(a+b\arcsin(cx))\left(1-c^2x^2\right)^{5/2}+g^2x^2(a+b\arcsin(cx))\left(1-c^2x^2\right)^{5/2}+2fgx(a+b\arcsin(c$$
$$\sqrt{1-c^2x^2}$$

$$\Big\downarrow \text{2009}$$

$$d^2\sqrt{d-c^2dx^2}\left(\frac{5g^2(a+b\arcsin(cx))^2}{256bc^3}+\frac{1}{6}f^2x\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{5}{24}f^2x\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))\right.$$

input
```
Int[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((2*b*f*g*x)/(7*c) - (25*b*c*f^2*x^2)/96 + (5*b*g
^2*x^2)/(256*c) - (2*b*c*f*g*x^3)/7 + (5*b*c^3*f^2*x^4)/96 - (59*b*c*g^2*x
^4)/768 + (6*b*c^3*f*g*x^5)/35 + (17*b*c^3*g^2*x^6)/288 - (2*b*c^5*f*g*x^7
)/49 - (b*c^5*g^2*x^8)/64 + (b*f^2*(1 - c^2*x^2)^3)/(36*c) + (5*f^2*x*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/16 - (5*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*
ArcSin[c*x]))/(128*c^2) + (5*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
)/64 + (5*f^2*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (5*g^2*x^3*(
1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/48 + (f^2*x*(1 - c^2*x^2)^(5/2)*(a
 + b*ArcSin[c*x]))/6 + (g^2*x^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x]))/8
 - (2*f*g*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7*c^2) + (5*f^2*(a + b
*ArcSin[c*x])^2)/(32*b*c) + (5*g^2*(a + b*ArcSin[c*x])^2)/(256*b*c^3)))/Sq
rt[1 - c^2*x^2]
```

#### 3.41.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.41.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.66 (sec) , antiderivative size = 2090, normalized size of antiderivative = 2.22

| method | result | size |
|---|---|---|
| default | Expression too large to display | 2090 |
| parts | Expression too large to display | 2090 |

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2*(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d
*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-
c^2*d*x^2+d)^(1/2)))))+g^2*(-1/8*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/8/c^2*(1/6
*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c
^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d
)^(1/2))))))-2/7*f*g*(-c^2*d*x^2+d)^(7/2)/c^2/d)+b*(-5/256*(-d*(c^2*x^2-1)
)^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^2*(8*c^2*f^2+g^2)*d
^2+1/3136*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^
2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*
I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*f*g*(I+7*arcsin
(c*x))*d^2/c^2/(c^2*x^2-1)+1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+
1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*
I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*(6*arc
sin(c*x)*c^2*f^2+I*c^2*f^2-6*arcsin(c*x)*g^2-I*g^2)*d^2/c^3/(c^2*x^2-1)-3/
1024*(-d*(c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*(22*I*c^2
*f^2+32*arcsin(c*x)*c^2*f^2+I*g^2+4*arcsin(c*x)*g^2)*cos(3*arcsin(c*x))*d^
2/c^3/(c^2*x^2-1)-5/64*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2
)*x*c-1)*f*g*(arcsin(c*x)+I)*d^2/c^2/(c^2*x^2-1)-5/64*(-d*(c^2*x^2-1))^(1/
2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)-I)*d^2/c^2/(c^2*x
^2-1)+1/64*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4...
```

### 3.41.5 Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}} (gx+f)^2 (b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="f
ricas")
```

output
```
integral((a*c^4*d^2*g^2*x^6 + 2*a*c^4*d^2*f*g*x^5 - 4*a*c^2*d^2*f*g*x^3 +
2*a*d^2*f*g*x + a*d^2*f^2 + (a*c^4*d^2*f^2 - 2*a*c^2*d^2*g^2)*x^4 - (2*a*c
^2*d^2*f^2 - a*d^2*g^2)*x^2 + (b*c^4*d^2*g^2*x^6 + 2*b*c^4*d^2*f*g*x^5 - 4
*b*c^2*d^2*f*g*x^3 + 2*b*d^2*f*g*x + b*d^2*f^2 + (b*c^4*d^2*f^2 - 2*b*c^2*
d^2*g^2)*x^4 - (2*b*c^2*d^2*f^2 - b*d^2*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d
*x^2 + d), x)
```

### 3.41.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

### 3.41.7 Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^2(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="m
axima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a*f^2 + 1/384*(8*(-c^2*
d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*d*
x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*ar
csin(c*x)/c^3)*a*g^2 - 2/7*(-c^2*d*x^2 + d)^(7/2)*a*f*g/(c^2*d) + sqrt(d)*
integrate((b*c^4*d^2*g^2*x^6 + 2*b*c^4*d^2*f*g*x^5 - 4*b*c^2*d^2*f*g*x^3 +
 2*b*d^2*f*g*x + b*d^2*f^2 + (b*c^4*d^2*f^2 - 2*b*c^2*d^2*g^2)*x^4 - (2*b*
c^2*d^2*f^2 - b*d^2*g^2)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1)), x)
```

### 3.41.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.41.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

# 3.42 $\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx$



## 3.42.1 Optimal result

Integrand size = 29, antiderivative size = 517

$$
\begin{aligned}
\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx &= \frac{bd^2gx\sqrt{d-c^2dx^2}}{7c\sqrt{1-c^2x^2}} \\
&- \frac{25bcd^2fx^2\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} - \frac{bcd^2gx^3\sqrt{d-c^2dx^2}}{7\sqrt{1-c^2x^2}} \\
&+ \frac{5bc^3d^2fx^4\sqrt{d-c^2dx^2}}{96\sqrt{1-c^2x^2}} + \frac{3bc^3d^2gx^5\sqrt{d-c^2dx^2}}{35\sqrt{1-c^2x^2}} - \frac{bc^5d^2gx^7\sqrt{d-c^2dx^2}}{49\sqrt{1-c^2x^2}} \\
&+ \frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}}{36c} + \frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&+ \frac{1}{6}d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx)) \\
&- \frac{d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c^2} \\
&+ \frac{5d^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{32bc\sqrt{1-c^2x^2}}
\end{aligned}
$$

output
```
1/36*b*d^2*f*(-c^2*x^2+1)^(5/2)*(-c^2*d*x^2+d)^(1/2)/c+5/16*d^2*f*x*(a+b*a
rcsin(c*x))*(-c^2*d*x^2+d)^(1/2)+5/24*d^2*f*x*(-c^2*x^2+1)*(a+b*arcsin(c*x
))*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*f*x*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))*(-c^2
*d*x^2+d)^(1/2)-1/7*d^2*g*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^
(1/2)/c^2+1/7*b*d^2*g*x*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-25/96*b*
c*d^2*f*x^2*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/7*b*c*d^2*g*x^3*(-c^
2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/96*b*c^3*d^2*f*x^4*(-c^2*d*x^2+d)^(1
/2)/(-c^2*x^2+1)^(1/2)+3/35*b*c^3*d^2*g*x^5*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2
+1)^(1/2)-1/49*b*c^5*d^2*g*x^7*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/3
2*d^2*f*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

### 3.42.2 Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 251, normalized size of antiderivative = 0.49

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(11025a^2cf+210ab\sqrt{1-c^2x^2}\left(48g\left(-1+c^2x^2\right)^3+7c^2fx(33-26c^2x^2+\right.\right.}{}$$

input
```
Integrate[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(11025*a^2*c*f + 210*a*b*Sqrt[1 - c^2*x^2]*(48*g*
(-1 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)) + b^2*c*x*(-24
5*c^2*f*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) - 288*g*(-35 + 35*c^2*x^2 - 21*c^4
*x^4 + 5*c^6*x^6)) + 210*b*(105*a*c*f + b*Sqrt[1 - c^2*x^2]*(48*g*(-1 + c^
2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x] + 11025*b
^2*c*f*ArcSin[c*x]^2))/(70560*b*c^2*Sqrt[1 - c^2*x^2])
```

### 3.42.3 Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 256, normalized size of antiderivative = 0.50, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)(a+b\arcsin(cx))\,dx$$

$\Big\downarrow$ 5276

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))dx}{\sqrt{1-c^2x^2}}$$

$\Big\downarrow$ 5262

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(f(a+b\arcsin(cx))\left(1-c^2x^2\right)^{5/2}+gx(a+b\arcsin(cx))\left(1-c^2x^2\right)^{5/2}\right)dx}{\sqrt{1-c^2x^2}}$$

$\Big\downarrow$ 2009

$$d^2\sqrt{d-c^2dx^2}\left(\frac{1}{6}fx\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))+\frac{5}{24}fx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))+\frac{5}{16}fx\sqrt{1-c^2x^2}(a+\right.$$

input
```
Int[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((b*g*x)/(7*c) - (25*b*c*f*x^2)/96 - (b*c*g*x^3)/
7 + (5*b*c^3*f*x^4)/96 + (3*b*c^3*g*x^5)/35 - (b*c^5*g*x^7)/49 + (b*f*(1 -
 c^2*x^2)^3)/(36*c) + (5*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/16 + (
5*f*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/24 + (f*x*(1 - c^2*x^2)^(5/
2)*(a + b*ArcSin[c*x]))/6 - (g*(1 - c^2*x^2)^(7/2)*(a + b*ArcSin[c*x]))/(7
*c^2) + (5*f*(a + b*ArcSin[c*x])^2)/(32*b*c)))/Sqrt[1 - c^2*x^2]
```

### 3.42.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.42.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.63 (sec) , antiderivative size = 1423, normalized size of antiderivative = 2.75

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1423 |
| parts | Expression too large to display | 1423 |

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE
)
```

output
```
1/6*a*f*x*(-c^2*d*x^2+d)^(5/2)+5/24*a*f*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*a*f*
d^2*x*(-c^2*d*x^2+d)^(1/2)+5/16*a*f*d^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)
*x/(-c^2*d*x^2+d)^(1/2))-1/7*a*g*(-c^2*d*x^2+d)^(7/2)/c^2/d+b*(-5/32*(-d*(
c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f*d^2+1/6
272*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7*(-c^2*x^2+
1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^2-56*I*(-c^
2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(I+7*arcsin(c*x))*d
^2/c^2/(c^2*x^2-1)+1/2304*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)
*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*
x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*f*(I+6*arcsin(
c*x))*d^2/c/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+
1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1
))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)*d^2/c^2/(c
^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*
c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-I+2*arcsin(c*x))*d^2/c/(c^2*x^2-1)
+1/128*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*
I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-I+3*arcsin(c*x))*d^2/c^2/(c^2*x^
2-1)-1/7840*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*
(11*I+70*arcsin(c*x))*cos(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-3/15680*(-d*(
c^2*x^2-1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(9*I+35*arcsin...
```

### 3.42.5 Fricas [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="fri
cas")
```

output
```
integral((a*c^4*d^2*g*x^5 + a*c^4*d^2*f*x^4 - 2*a*c^2*d^2*g*x^3 - 2*a*c^2*
d^2*f*x^2 + a*d^2*g*x + a*d^2*f + (b*c^4*d^2*g*x^5 + b*c^4*d^2*f*x^4 - 2*b
*c^2*d^2*g*x^3 - 2*b*c^2*d^2*f*x^2 + b*d^2*g*x + b*d^2*f)*arcsin(c*x))*sqr
t(-c^2*d*x^2 + d), x)
```

### 3.42.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\text{Timed out}$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x)),x)
```

output
```
Timed out
```

### 3.42.7 Maxima [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="max
ima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a*f - 1/7*(-c^2*d*x^2 +
 d)^(7/2)*a*g/(c^2*d) + sqrt(d)*integrate((b*c^4*d^2*g*x^5 + b*c^4*d^2*f*x
^4 - 2*b*c^2*d^2*g*x^3 - 2*b*c^2*d^2*f*x^2 + b*d^2*g*x + b*d^2*f)*sqrt(c*x
 + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
```

### 3.42.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x)),x, algorithm="gia
c")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.42.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2), x)
```

# 3.43 $\int \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx$

## 3.43.1 Optimal result

Integrand size = 31, antiderivative size = 1648

$$
\begin{aligned}
\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx &= \frac{ad^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}}{g^5} \\
&+ \frac{2bcd^2x\sqrt{d-c^2dx^2}}{15g\sqrt{1-c^2x^2}} + \frac{bcd^2(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}}{3g^3\sqrt{1-c^2x^2}} \\
&- \frac{bcd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}}{g^5\sqrt{1-c^2x^2}} - \frac{bc^3d^2fx^2\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&+ \frac{bc^3d^2f(c^2f^2-2g^2)\,x^2\sqrt{d-c^2dx^2}}{4g^4\sqrt{1-c^2x^2}} + \frac{bc^3d^2x^3\sqrt{d-c^2dx^2}}{45g\sqrt{1-c^2x^2}} \\
&- \frac{bc^3d^2(c^2f^2-2g^2)\,x^3\sqrt{d-c^2dx^2}}{9g^3\sqrt{1-c^2x^2}} + \frac{bc^5d^2fx^4\sqrt{d-c^2dx^2}}{16g^2\sqrt{1-c^2x^2}} \\
&- \frac{bc^5d^2x^5\sqrt{d-c^2dx^2}}{25g\sqrt{1-c^2x^2}} + \frac{bd^2(c^2f^2-g^2)^2\sqrt{d-c^2dx^2}\arcsin(cx)}{g^5} \\
&+ \frac{c^2d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8g^2} \\
&- \frac{c^2d^2f(c^2f^2-2g^2)\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2g^4} \\
&- \frac{c^4d^2fx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{4g^2} \\
&- \frac{d^2(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g} \\
&- \frac{d^2(c^2f^2-2g^2)(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3g^3} \\
&+ \frac{d^2(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5g} \\
&- \frac{cd^2f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16bg^2\sqrt{1-c^2x^2}} \\
&- \frac{cd^2f(c^2f^2-2g^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{4bg^4\sqrt{1-c^2x^2}} \\
&+ \frac{cd^2(c^2f^2-g^2)^2\,x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bg^5\sqrt{1-c^2x^2}} \\
&+ \frac{d^2(c^2f^2-g^2)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^6(f+gx)\sqrt{1-c^2x^2}} \\
&+ \frac{d^2(c^2f^2-g^2)^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{2bcg^4(f+gx)} \\
&- \frac{ad^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^6\sqrt{1-c^2x^2}} \\
&+ \frac{ibd^2(c^2f^2-g^2)^{5/2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^6\sqrt{1-c^2x^2}}
\end{aligned}
$$

output
```
-1/25*b*c^5*d^2*x^5*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+1/8*c^2*d^2*
f*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g^2-1/4*c^4*d^2*f*x^3*(a+b*arcs
in(c*x))*(-c^2*d*x^2+d)^(1/2)/g^2+2/15*b*c*d^2*x*(-c^2*d*x^2+d)^(1/2)/g/(-
c^2*x^2+1)^(1/2)+1/45*b*c^3*d^2*x^3*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1
/2)+a*d^2*(c^2*f^2-g^2)^2*(-c^2*d*x^2+d)^(1/2)/g^5+b*d^2*(c^2*f^2-g^2)^2*a
rcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^5-b*c*d^2*(c^2*f^2-g^2)^2*x*(-c^2*d*x^2+
d)^(1/2)/g^5/(-c^2*x^2+1)^(1/2)-a*d^2*(c^2*f^2-g^2)^(5/2)*arctan((c^2*f*x+
g)/(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*
x^2+1)^(1/2)+b*d^2*(c^2*f^2-g^2)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/
2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/
2)-b*d^2*(c^2*f^2-g^2)^(5/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f
+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)+I*b*d^2
*(c^2*f^2-g^2)^(5/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-
(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)-1/3*d^2*
(-c^2*x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g+1/5*d^2*(-c^2*x^2+1)
^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g-1/3*d^2*(c^2*f^2-2*g^2)*(-c^2*
x^2+1)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g^3-1/16*b*c^3*d^2*f*x^2*(-c
^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-1/9*b*c^3*d^2*(c^2*f^2-2*g^2)*x^3
*(-c^2*d*x^2+d)^(1/2)/g^3/(-c^2*x^2+1)^(1/2)+1/16*b*c^5*d^2*f*x^4*(-c^2*d*
x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-1/16*c*d^2*f*(a+b*arcsin(c*x))^2*(-...
```

### 3.43.2 Mathematica [A] (verified)

Time = 2.13 (sec) , antiderivative size = 787, normalized size of antiderivative = 0.48

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx =$$

$$-\frac{d^2\sqrt{d-c^2dx^2}\left(-900bc^3f(c^2f^2-2g^2)x^2-225bc^5fg^2x^4+144bc^5g^3x^5+400bcg(c^2f^2-2g^2)x(-3+c^2x^2\right.}{}$$

input
```
Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
-1/3600*(d^2*Sqrt[d - c^2*d*x^2]*(-900*b*c^3*f*(c^2*f^2 - 2*g^2)*x^2 - 225
*b*c^5*f*g^2*x^4 + 144*b*c^5*g^3*x^5 + 400*b*c*g*(c^2*f^2 - 2*g^2)*x*(-3 +
 c^2*x^2) + 1800*c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]) + 900*c^4*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - 720*c^4
*g^3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) + 1200*g*(c^2*f^2 - 2*g^2)*
(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]) + (900*c*f*(c^2*f^2 - 2*g^2)*(a +
b*ArcSin[c*x])^2)/b + (1800*(-(c^2*f^2) + g^2)^2*(-1 + c^2*x^2)*(a + b*Arc
Sin[c*x])^2)/(b*c*(f + g*x)) - 80*g^3*(6*b*c*x + b*c^3*x^3 - 6*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x]) - 3*c^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
])) + 225*c*f*g^2*(b*c^2*x^2 - 2*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
 + (a + b*ArcSin[c*x])^2/b) - (1800*(-(c^2*f^2) + g^2)^2*(c^2*g*x*(a + b*A
rcSin[c*x])^2 + ((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^2)/(f + g*x) - 2*b*c*
(b*c*g*x - g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - I*Sqrt[c^2*f^2 - g^2]
*((a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*
f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])
]) - I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] +
 I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/(
b*c*g^2)))/(g^4*Sqrt[1 - c^2*x^2])
```

### 3.43.3 Rubi [A] (verified)

Time = 2.85 (sec) , antiderivative size = 1019, normalized size of antiderivative = 0.62, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))}{f+gx}dx$$

$$\Big\downarrow \ 5276$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \frac{\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \ 5266$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(\frac{x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^4}{g}-\frac{fx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^4}{g^2}-\frac{f\left(c^2f^2-2g^2\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^2}{g^4}+\frac{(c^2f}{}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \ 2009$$

$$d^2\sqrt{d-c^2dx^2}\left(-\frac{bx^5c^5}{25g}+\frac{bfx^4c^5}{16g^2}-\frac{fx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))c^4}{4g^2}-\frac{b(c^2f^2-2g^2)x^3c^3}{9g^3}+\frac{bx^3c^3}{45g}+\frac{bf(c^2f^2-2g^2)x^2c^3}{4g^4}-\frac{bfx^2c^3}{16g^2}\right.$$

input
```
Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x]))/(f + g*x),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((2*b*c*x)/(15*g) + (b*c*(c^2*f^2 - 2*g^2)*x)/(3*
g^3) - (b*c*(c^2*f^2 - g^2)^2*x)/g^5 - (b*c^3*f*x^2)/(16*g^2) + (b*c^3*f*(
c^2*f^2 - 2*g^2)*x^2)/(4*g^4) + (b*c^3*x^3)/(45*g) - (b*c^3*(c^2*f^2 - 2*g
^2)*x^3)/(9*g^3) + (b*c^5*f*x^4)/(16*g^2) - (b*c^5*x^5)/(25*g) + (a*(c^2*f
^2 - g^2)^2*Sqrt[1 - c^2*x^2])/g^5 + (b*(c^2*f^2 - g^2)^2*Sqrt[1 - c^2*x^2
]*ArcSin[c*x])/g^5 + (c^2*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*g^
2) - (c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*
g^4) - (c^4*f*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(4*g^2) - ((1 - c
^2*x^2)^(3/2)*(a + b*ArcSin[c*x]))/(3*g) - ((c^2*f^2 - 2*g^2)*(1 - c^2*x^2
)^(3/2)*(a + b*ArcSin[c*x]))/(3*g^3) + ((1 - c^2*x^2)^(5/2)*(a + b*ArcSin[
c*x]))/(5*g) - (c*f*(a + b*ArcSin[c*x])^2)/(16*b*g^2) - (c*f*(c^2*f^2 - 2*
g^2)*(a + b*ArcSin[c*x])^2)/(4*b*g^4) + (c*(c^2*f^2 - g^2)^2*x*(a + b*ArcS
in[c*x])^2)/(2*b*g^5) + ((c^2*f^2 - g^2)^3*(a + b*ArcSin[c*x])^2)/(2*b*c*g
^6*(f + g*x)) + ((c^2*f^2 - g^2)^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^2)/(2
*b*c*g^4*(f + g*x)) - (a*(c^2*f^2 - g^2)^(5/2)*ArcTan[(g + c^2*f*x)/(Sqrt[
c^2*f^2 - g^2]*Sqrt[1 - c^2*x^2])])/g^6 + (I*b*(c^2*f^2 - g^2)^(5/2)*ArcSi
n[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^6 -
 (I*b*(c^2*f^2 - g^2)^(5/2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c
*f + Sqrt[c^2*f^2 - g^2])])/g^6 + (b*(c^2*f^2 - g^2)^(5/2)*PolyLog[2, (I*E
^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^6 - (b*(c^2*f^2 - g...
```

#### 3.43.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5266
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.43.4 Maple [A] (verified)

Time = 0.73 (sec) , antiderivative size = 2580, normalized size of antiderivative = 1.57

| method | result | size |
|---|---|---|
| default | Expression too large to display | 2580 |
| parts | Expression too large to display | 2580 |

input
```
int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x,method=_RETURNVERBOSE
)
```

output
```
a/g*(1/5*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(5/2)+
c^2*d*f/g*(-1/8*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(-(x+f/g)^2*c^2*d+2*c
^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(3/2)-3/16*(4*c^2*d^2*(c^2*f^2-g^2)/
g^2-4*c^4*d^2*f^2/g^2)/c^2/d*(-1/4*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(-
(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2*
d^2*(c^2*f^2-g^2)/g^2-4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*arctan((c^2*d
)^(1/2)*x/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)
)))-d*(c^2*f^2-g^2)/g^2*(1/3*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*
f^2-g^2)/g^2)^(3/2)+c^2*d*f/g*(-1/4*(-2*(x+f/g)*c^2*d+2*c^2*d*f/g)/c^2/d*(
-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2)-1/8*(4*c^2
*d^2*(c^2*f^2-g^2)/g^2-4*c^4*d^2*f^2/g^2)/c^2/d/(c^2*d)^(1/2)*arctan((c^2*
d)^(1/2)*x/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2
)))-d*(c^2*f^2-g^2)/g^2*((-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-
g^2)/g^2)^(1/2)+c^2*d*f/g/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-(x+f/g)^2
*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))+d*(c^2*f^2-g^2)/g^2
/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/
g)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*
(c^2*f^2-g^2)/g^2)^(1/2))/(x+f/g)))))+b*(-1/16*(-d*(c^2*x^2-1))^(1/2)*(-c^
2*x^2+1)^(1/2)/(c^2*x^2-1)*arcsin(c*x)^2*f*(8*c^4*f^4-20*c^2*f^2*g^2+15*g^
4)*d^2*c/g^6+1/800*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(...
```

### 3.43.5 Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{(-c^2dx^2+d)^{\frac{5}{2}}(b\arcsin(cx)+a)}{gx+f}\,dx$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="fri
cas")
```

output
```
integral((a*c^4*d^2*x^4 - 2*a*c^2*d^2*x^2 + a*d^2 + (b*c^4*d^2*x^4 - 2*b*c
^2*d^2*x^2 + b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(g*x + f), x)
```

### 3.43.6 Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \int \frac{(-d(cx-1)(cx+1))^{\frac{5}{2}}(a+b\,\mathrm{asin}(cx))}{f+gx}\,dx$$

input
```
integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))/(g*x+f),x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))/(f + g*x), x)
```

### 3.43.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))}{f+gx}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="max
ima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

### 3.43.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(d - c^2dx^2)^{5/2} (a + b \arcsin(cx))}{f + gx} dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))/(g*x+f),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.43.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(d - c^2dx^2)^{5/2} (a + b \arcsin(cx))}{f + gx} dx = \int \frac{(a + b \operatorname{asin}(c\,x)) \left(d - c^2\,d\,x^2\right)^{5/2}}{f + g\,x} dx$$

input
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))*(d - c^2*d*x^2)^(5/2))/(f + g*x), x)
```

# 3.44 $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$



## 3.44.1 Optimal result

Integrand size = 31, antiderivative size = 450

$$\begin{aligned}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx &= \frac{3bf^2gx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{2bg^3x\sqrt{1-c^2x^2}}{3c^3\sqrt{d-c^2dx^2}}\\ &+\frac{3bfg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}}+\frac{bg^3x^3\sqrt{1-c^2x^2}}{9c\sqrt{d-c^2dx^2}}\\ &-\frac{3f^2g(1-c^2x^2)\,(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}}\\ &-\frac{2g^3(1-c^2x^2)\,(a+b\arcsin(cx))}{3c^4\sqrt{d-c^2dx^2}}\\ &-\frac{3fg^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}}\\ &-\frac{g^3x^2(1-c^2x^2)\,(a+b\arcsin(cx))}{3c^2\sqrt{d-c^2dx^2}}\\ &+\frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}\\ &+\frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
-3*f^2*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)-2/3*g^3*(
-c^2*x^2+1)*(a+b*arcsin(c*x))/c^4/(-c^2*d*x^2+d)^(1/2)-3/2*f*g^2*x*(-c^2*x
^2+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)-1/3*g^3*x^2*(-c^2*x^2+1)*
(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)+3*b*f^2*g*x*(-c^2*x^2+1)^(1/2)/
c/(-c^2*d*x^2+d)^(1/2)+2/3*b*g^3*x*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(
1/2)+3/4*b*f*g^2*x^2*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/9*b*g^3*x
^3*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/2*f^3*(a+b*arcsin(c*x))^2*(
-c^2*x^2+1)^(1/2)/b/c/(-c^2*d*x^2+d)^(1/2)+3/4*f*g^2*(a+b*arcsin(c*x))^2*(
-c^2*x^2+1)^(1/2)/b/c^3/(-c^2*d*x^2+d)^(1/2)
```

## 3.44.2 Mathematica [A] (verified)

Time = 1.14 (sec) , antiderivative size = 343, normalized size of antiderivative = 0.76

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{-18bc\sqrt{d}f(2c^2f^2+3g^2)(-1+c^2x^2)\arcsin(cx)^2-36acf(2c^2f^2+3g^2)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{cx}{\sqrt{d}}\right.}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(-18*b*c*Sqrt[d]*f*(2*c^2*f^2 + 3*g^2)*(-1 + c^2*x^2)*ArcSin[c*x]^2 - 36*a
*c*f*(2*c^2*f^2 + 3*g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x
*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] - Sqrt[d]*g*(-1 + c^2*x^2)
*(8*b*c*x*(6*g^2 + c^2*(27*f^2 + g^2*x^2)) - 12*a*Sqrt[1 - c^2*x^2]*(4*g^2
 + c^2*(18*f^2 + 9*f*g*x + 2*g^2*x^2)) - 27*b*c*f*g*Cos[2*ArcSin[c*x]]) +
6*b*Sqrt[d]*g*(-1 + c^2*x^2)*ArcSin[c*x]*(4*Sqrt[1 - c^2*x^2]*(2*g^2 + c^2
*(9*f^2 + g^2*x^2)) + 9*c*f*g*Sin[2*ArcSin[c*x]]))/(72*c^4*Sqrt[d]*Sqrt[1
- c^2*x^2]*Sqrt[d - c^2*d*x^2])
```

## 3.44.3 Rubi [A] (verified)

Time = 0.79 (sec) , antiderivative size = 262, normalized size of antiderivative = 0.58, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

3.44. $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$
$$\Big\downarrow \ 5276$$
$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$
$$\Big\downarrow \ 5262$$
$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(a+b\arcsin(cx))f^3}{\sqrt{1-c^2x^2}}+\frac{3gx(a+b\arcsin(cx))f^2}{\sqrt{1-c^2x^2}}+\frac{3g^2x^2(a+b\arcsin(cx))f}{\sqrt{1-c^2x^2}}+\frac{g^3x^3(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$
$$\Big\downarrow \ 2009$$
$$\frac{\sqrt{1-c^2x^2}\left(\frac{3fg^2(a+b\arcsin(cx))^2}{4bc^3}-\frac{3f^2g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}-\frac{3fg^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^2}-\frac{g^3x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^2}\right.}{\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*((3*b*f^2*g*x)/c + (2*b*g^3*x)/(3*c^3) + (3*b*f*g^2*x^2
)/(4*c) + (b*g^3*x^3)/(9*c) - (3*f^2*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
]))/c^2 - (2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^4) - (3*f*g^2
*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c^2) - (g^3*x^2*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(3*c^2) + (f^3*(a + b*ArcSin[c*x])^2)/(2*b*c) +
(3*f*g^2*(a + b*ArcSin[c*x])^2)/(4*b*c^3)))/Sqrt[d - c^2*d*x^2]
```

### 3.44.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.44.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.55 (sec) , antiderivative size = 856, normalized size of antiderivative = 1.90

| method | result |
|---|---|
| default | $a\left(\frac{f^3\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^3\left(-\frac{x^2\sqrt{-c^2d\,x^2+d}}{3c^2d}-\frac{2\sqrt{-c^2d\,x^2+d}}{3d\,c^4}\right)+3f\,g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right.\right.$ |
| parts | $a\left(\frac{f^3\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}+g^3\left(-\frac{x^2\sqrt{-c^2d\,x^2+d}}{3c^2d}-\frac{2\sqrt{-c^2d\,x^2+d}}{3d\,c^4}\right)+3f\,g^2\left(-\frac{x\sqrt{-c^2d\,x^2+d}}{2c^2d}+\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{2c^2\sqrt{c^2d}}\right.\right.$ |

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^3*(-1/
3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(
-1/2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/
2)*x/(-c^2*d*x^2+d)^(1/2)))-3*f^2*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*f*
(2*c^2*f^2+3*g^2)+1/144*(-d*(c^2*x^2-1))^(1/2)*(2*c^2*x^2-2*I*c*x*(-c^2*x^
2+1)^(1/2)-1)*g^3*(I+3*arcsin(c*x))/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))
^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(4*arcsin(c*x)*c^2*f^2+4*I*c
^2*f^2+arcsin(c*x)*g^2+I*g^2)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)
*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(4*arcsin(c*x)*c^2*f^2-4*I*c^2*f^2
+arcsin(c*x)*g^2-I*g^2)/c^4/d/(c^2*x^2-1)+1/144*(-d*(c^2*x^2-1))^(1/2)*(2*
I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*g^3*(-I+3*arcsin(c*x))/c^4/d/(c^2*x^
2-1)+3/16*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*f*g^
2+3/8*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*f*g^2*arcsin(c*x)*x-1/24*(-
d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*g^3*cos(4*arcsin(c*x))+
1/72*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*g^3*sin(4*arcsin(c*x))+3/16*
(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2*cos(3*arcsin(c*x))+3/8*(-d*
(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*f*g^2*arcsin(c*x)*sin(3*arcsin(c*x)))
```

### 3.44.5 Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-(a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 +
3*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^
2*d*x^2 - d), x)
```

### 3.44.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.44.7 Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
-1/3*a*g^3*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c^4
*d)) - 3/2*a*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt
(d))) + 1/2*b*f^3*arcsin(c*x)^2/(c*sqrt(d)) + 3*b*f^2*g*x/(c*sqrt(d)) + a*
f^3*arcsin(c*x)/(c*sqrt(d)) - 3*sqrt(-c^2*d*x^2 + d)*b*f^2*g*arcsin(c*x)/(
c^2*d) - 3*sqrt(-c^2*d*x^2 + d)*a*f^2*g/(c^2*d) - sqrt(d)*integrate((b*g^3
*x^3 + 3*b*f*g^2*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x +
 1)*sqrt(-c*x + 1))/(c^2*d*x^2 - d), x)
```

### 3.44.8 Giac [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
integrate((g*x + f)^3*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

### 3.44.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

# 3.45 $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$



## 3.45.1 Optimal result

Integrand size = 31, antiderivative size = 270

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{2bfgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}+\frac{bg^2x^2\sqrt{1-c^2x^2}}{4c\sqrt{d-c^2dx^2}} - \frac{2fg(1-c^2x^2)\,(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}} - \frac{g^2x(1-c^2x^2)\,(a+b\arcsin(cx))}{2c^2\sqrt{d-c^2dx^2}} + \frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}} + \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4bc^3\sqrt{d-c^2dx^2}}$$

output
```
-2*f*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)-1/2*g^2*x*(
-c^2*x^2+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)+2*b*f*g*x*(-c^2*x^2
+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/4*b*g^2*x^2*(-c^2*x^2+1)^(1/2)/c/(-c^2*
d*x^2+d)^(1/2)+1/2*f^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c/(-c^2*d*
x^2+d)^(1/2)+1/4*g^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^3/(-c^2*d*
x^2+d)^(1/2)
```

### 3.45.2 Mathematica [A] (verified)

Time = 0.66 (sec) , antiderivative size = 266, normalized size of antiderivative = 0.99

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{-2b\sqrt{d}(2c^2f^2+g^2)\left(-1+c^2x^2\right)\arcsin(cx)^2-4a(2c^2f^2+g^2)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx^2}}{\sqrt{d}(-1+c^2x^2)}\right)}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(-2*b*Sqrt[d]*(2*c^2*f^2 + g^2)*(-1 + c^2*x^2)*ArcSin[c*x]^2 - 4*a*(2*c^2*
f^2 + g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*
d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + Sqrt[d]*g*(-1 + c^2*x^2)*(4*c*(-4*b*c*
f*x + a*(4*f + g*x)*Sqrt[1 - c^2*x^2]) + b*g*Cos[2*ArcSin[c*x]]) + 2*b*Sqr
t[d]*g*(-1 + c^2*x^2)*ArcSin[c*x]*(8*c*f*Sqrt[1 - c^2*x^2] + g*Sin[2*ArcSi
n[c*x]]))/(8*c^3*Sqrt[d]*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2])
```

### 3.45.3 Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.60, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$$
$$\Big\downarrow \text{5276}$$
$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$
$$\Big\downarrow \text{5262}$$
$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(a+b\arcsin(cx))f^2}{\sqrt{1-c^2x^2}}+\frac{2gx(a+b\arcsin(cx))f}{\sqrt{1-c^2x^2}}+\frac{g^2x^2(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$
$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{g^2(a+b\arcsin(cx))^2}{4bc^3}-\frac{2fg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}-\frac{g^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c^2}+\frac{f^2(a+b\arcsin(cx))^2}{2bc}+\frac{2bfgx}{c}+\frac{bg^2}{4}\right.}{\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*((2*b*f*g*x)/c + (b*g^2*x^2)/(4*c) - (2*f*g*Sqrt[1 - c^
2*x^2]*(a + b*ArcSin[c*x]))/c^2 - (g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x]))/(2*c^2) + (f^2*(a + b*ArcSin[c*x])^2)/(2*b*c) + (g^2*(a + b*ArcSin[c
*x])^2)/(4*b*c^3)))/Sqrt[d - c^2*d*x^2]
```

### 3.45.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.45.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.50 (sec) , antiderivative size = 505, normalized size of antiderivative = 1.87

| method | result |
|---|---|
| default | $a\left(\frac{f^2 \arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d\, x^2+d}}\right)}{\sqrt{c^2 d}}+g^2\left(-\frac{x\sqrt{-c^2 d\, x^2+d}}{2c^2 d}+\frac{\arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d\, x^2+d}}\right)}{2c^2\sqrt{c^2 d}}\right)-\frac{2fg\sqrt{-c^2 d\, x^2+d}}{c^2 d}\right)+b\left(-\frac{\sqrt{-d(c^2 x}}{}\right.$ |
| parts | $a\left(\frac{f^2 \arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d\, x^2+d}}\right)}{\sqrt{c^2 d}}+g^2\left(-\frac{x\sqrt{-c^2 d\, x^2+d}}{2c^2 d}+\frac{\arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d\, x^2+d}}\right)}{2c^2\sqrt{c^2 d}}\right)-\frac{2fg\sqrt{-c^2 d\, x^2+d}}{c^2 d}\right)+b\left(-\frac{\sqrt{-d(c^2 x}}{}\right.$ |

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^2*(-1/
2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*
x/(-c^2*d*x^2+d)^(1/2)))-2*f*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b*(-1/4*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*(2*c^2*
f^2+g^2)-(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(
arcsin(c*x)+I)/c^2/d/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1
/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1)+1/16*(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*g^2+1/8*(-d*(c^2*x^2-1))^(
1/2)/c^2/d/(c^2*x^2-1)*g^2*arcsin(c*x)*x+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d
/(c^2*x^2-1)*g^2*cos(3*arcsin(c*x))+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*
x^2-1)*g^2*arcsin(c*x)*sin(3*arcsin(c*x)))
```

## 3.45.5 Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2
 + 2*b*f*g*x + b*f^2)*arcsin(c*x))/(c^2*d*x^2 - d), x)
```

### 3.45.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.45.7 Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
-1/2*a*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d))) +
1/2*b*f^2*arcsin(c*x)^2/(c*sqrt(d)) + b*g^2*integrate(x^2*arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 2*
b*f*g*x/(c*sqrt(d)) + a*f^2*arcsin(c*x)/(c*sqrt(d)) - 2*sqrt(-c^2*d*x^2 +
d)*b*f*g*arcsin(c*x)/(c^2*d) - 2*sqrt(-c^2*d*x^2 + d)*a*f*g/(c^2*d)
```

### 3.45.8 Giac [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
integrate((g*x + f)^2*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

### 3.45.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{{\left(f+g\,x\right)}^2\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

# 3.46 $\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx$



## 3.46.1 Optimal result

Integrand size = 29, antiderivative size = 126

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{bgx\sqrt{1-c^2x^2}}{c\sqrt{d-c^2dx^2}}-\frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{c^2\sqrt{d-c^2dx^2}}+\frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc\sqrt{d-c^2dx^2}}$$

output
```
-g*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c^2/(-c^2*d*x^2+d)^(1/2)+b*g*x*(-c^2*x^2
+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/2*f*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1
/2)/b/c/(-c^2*d*x^2+d)^(1/2)
```

## 3.46.2 Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.37

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{2\sqrt{d}g\left(-a+ac^2x^2+bcx\sqrt{1-c^2x^2}\right)+2b\sqrt{d}g(-1+c^2x^2)\arcsin(cx)+bc\sqrt{d}f\sqrt{1-c^2x^2}\arcsin(cx)^2-2a}{2c^2\sqrt{d}\sqrt{d-c^2dx^2}}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(2*Sqrt[d]*g*(-a + a*c^2*x^2 + b*c*x*Sqrt[1 - c^2*x^2]) + 2*b*Sqrt[d]*g*(-
1 + c^2*x^2)*ArcSin[c*x] + b*c*Sqrt[d]*f*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2 -
 2*a*c*f*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1
 + c^2*x^2))])/(2*c^2*Sqrt[d]*Sqrt[d - c^2*d*x^2])
```

### 3.46.3 Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.69, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}+\frac{gx(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^2}+\frac{f(a+b\arcsin(cx))^2}{2bc}+\frac{bgx}{c}\right)}{\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*((b*g*x)/c - (g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/
c^2 + (f*(a + b*ArcSin[c*x])^2)/(2*b*c)))/Sqrt[d - c^2*d*x^2]
```

### 3.46.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.46.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.47 (sec) , antiderivative size = 247, normalized size of antiderivative = 1.96

| method | result |
|---|---|
| default | $\frac{af\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}-\frac{ag\sqrt{-c^2d\,x^2+d}}{c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{2cd(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-icx\sqrt{-}\right.}{2c^2d(c^2}\right.$ |
| parts | $\frac{af\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2d\,x^2+d}}\right)}{\sqrt{c^2d}}-\frac{ag\sqrt{-c^2d\,x^2+d}}{c^2d}+b\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^2f}{2cd(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\left(c^2x^2-icx\sqrt{-}\right.}{2c^2d(c^2}\right.$ |

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
a*f/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-a*g/c^2/d*(
-c^2*d*x^2+d)^(1/2)+b*(-1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/
(c^2*x^2-1)*arcsin(c*x)^2*f-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^
2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)/c^2/d/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)-I)/c^2/d/(c^2*x
^2-1))
```

### 3.46.5 Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="fri
cas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(
c^2*d*x^2 - d), x)
```

### 3.46.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.46.7 Maxima [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.71

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \frac{bf\arcsin(cx)^2}{2c\sqrt{d}} + \frac{bgx}{c\sqrt{d}} + \frac{af\arcsin(cx)}{c\sqrt{d}} - \frac{\sqrt{-c^2dx^2+d}\,bg\arcsin(cx)}{c^2d} - \frac{\sqrt{-c^2dx^2+d}\,ag}{c^2d}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="max
ima")
```

output
```
1/2*b*f*arcsin(c*x)^2/(c*sqrt(d)) + b*g*x/(c*sqrt(d)) + a*f*arcsin(c*x)/(c
*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*b*g*arcsin(c*x)/(c^2*d) - sqrt(-c^2*d*x^2
 + d)*a*g/(c^2*d)
```

### 3.46.8 Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(1/2),x, algorithm="gia
c")
```

output
```
integrate((g*x + f)*(b*arcsin(c*x) + a)/sqrt(-c^2*d*x^2 + d), x)
```

### 3.46.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(1/2), x)
```

# 3.47 $\int \frac{a+b \arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$



## 3.47.1 Optimal result

Integrand size = 31, antiderivative size = 380

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} - \frac{b\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

output
```
-I*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2
)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+I*(a
+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/
2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)-b*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^
(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+b*polylog(2,I*(I*c*x+(-c^2*
x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2
)^(1/2)/(-c^2*d*x^2+d)^(1/2)
```

### 3.47.2 Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.61

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{\sqrt{1-c^2x^2}\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)\right)-b\,\text{PolyLog}\left(2,-\frac{i}{-c}\right.\right.}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])
*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 + Sqrt[c^2*f^2 - g^2])]) - b*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f
) + Sqrt[c^2*f^2 - g^2])] + b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sq
rt[c^2*f^2 - g^2])]))/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2])
```

### 3.47.3 Rubi [A] (verified)

Time = 1.02 (sec) , antiderivative size = 288, normalized size of antiderivative = 0.76, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.290$, Rules used = {5276, 5272, 3042, 3804, 2694, 27, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}(f+gx)}\,dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{ 5272}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{cf+cgx}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3804}$$

$$\frac{2\sqrt{1-c^2x^2}\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2ce^{i\arcsin(cx)}f-ie^{2i\arcsin(cx)}g+ig}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2694}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2620}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{b\int \log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right.}{g}\right.}{2\sqrt{c^2}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2715}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}}{g}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(\right.}{}\right.}{}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2838}$$

3.47. $\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{ib\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}-\frac{ib\,\mathrm{P}\cdots}{\cdots}\right)}{2\sqrt{c^2f^2-g^2}}\cdots\right)}{\sqrt{d-c^2dx^2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(2*Sqrt[1 - c^2*x^2]*(((-1/2*I)*g*(((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*Ar
cSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*Ar
cSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g))/Sqrt[c^2*f^2 - g^2] + ((I/
2)*g*(((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2
*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2
*f^2 - g^2])])/g))/Sqrt[c^2*f^2 - g^2]))/Sqrt[d - c^2*d*x^2]
```

### 3.47.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.47. $\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$

### 3.47.4 Maple [A] (verified)

Time = 0.49 (sec) , antiderivative size = 508, normalized size of antiderivative = 1.34

| method | result |
|---|---|
| default | $-\frac{a\ln\left(\frac{-\frac{2d(c^2f^2-g^2)}{g^2}+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d(c^2f^2-g^2)}{g^2}}\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}-\frac{d(c^2f^2-g^2)}{g^2}}}{x+\frac{f}{g}}\right)}{g\sqrt{-\frac{d(c^2f^2-g^2)}{g^2}}}-\frac{ib\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2f^2}}{}$ |
| parts | $-\frac{a\ln\left(\frac{-\frac{2d(c^2f^2-g^2)}{g^2}+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d(c^2f^2-g^2)}{g^2}}\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df\left(x+\frac{f}{g}\right)}{g}-\frac{d(c^2f^2-g^2)}{g^2}}}{x+\frac{f}{g}}\right)}{g\sqrt{-\frac{d(c^2f^2-g^2)}{g^2}}}-\frac{ib\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2f^2}}{}$ |

input
```
int((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
-a/g/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(
x+f/g)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g
)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+f/g))-I*b*(-d*(c^2*x^2-1))^(1/2)*(-c^2*f^
2+g^2)^(1/2)*(-c^2*x^2+1)^(1/2)*(I*arcsin(c*x)*ln((I*c*f+(I*c*x+(-c^2*x^2+
1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))-I*arcsin(c
*x)*ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-
c^2*f^2+g^2)^(1/2)))+dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g
^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))-dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^
(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2))))/d/(c^2*x^2-1
)/(c^2*f^2-g^2)
```

### 3.47.5 Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx=\int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="fri
cas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*g*x^3 + c^2*d*f*
x^2 - d*g*x - d*f), x)
```

### 3.47.6 Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}\,(cx)}{\sqrt{-d\,(cx-1)\,(cx+1)}\,(f+gx)}\,dx$$

input
```
integrate((a+b*asin(c*x))/(g*x+f)/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)), x)
```

### 3.47.7 Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{b\arcsin\,(cx)+a}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="max
ima")
```

output
```
integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*(g*x + f)), x)
```

### 3.47.8 Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.47.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(1/2)), x)
```

# 3.48 $\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$



## 3.48.1 Optimal result

Integrand size = 31, antiderivative size = 507

$$\begin{aligned}\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx &= \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))}{(c^2f^2-g^2)\,(f+gx)\sqrt{d-c^2dx^2}} \\ &\quad - \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\ &\quad + \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\ &\quad - \frac{bc\sqrt{1-c^2x^2}\log(f+gx)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} \\ &\quad - \frac{bc^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} \\ &\quad + \frac{bc^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
g*(-c^2*x^2+1)*(a+b*arcsin(c*x))/(c^2*f^2-g^2)/(g*x+f)/(-c^2*d*x^2+d)^(1/2
)-b*c*ln(g*x+f)*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)-I*c^
2*f*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^
2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+I*c
^2*f*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g
^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-b*
c^2*f*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*
(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+b*c^2*f*polylo
g(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)
^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)
```

### 3.48.2 Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 295, normalized size of antiderivative = 0.58

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \frac{c\sqrt{1-c^2x^2}\left(\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}-b\log(f+gx)+\frac{cf\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)\right)\cdots}{\sqrt{c\cdots}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(c*Sqrt[1 - c^2*x^2]*((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c*f + c*g
*x) - b*Log[f + g*x] + (c*f*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*Arc
Sin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x]
)*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) - b*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*
g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] + b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/
(c*f + Sqrt[c^2*f^2 - g^2])]))/Sqrt[c^2*f^2 - g^2]))/((c^2*f^2 - g^2)*Sqrt
[d - c^2*d*x^2])
```

### 3.48.3 Rubi [A] (verified)

Time = 1.35 (sec) , antiderivative size = 384, normalized size of antiderivative = 0.76, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.419$, Rules used = {5276, 5272, 3042, 3805, 3042, 3147, 16, 3804, 2694, 27, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{\sqrt{d-c^2dx^2}(f+gx)^2}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{c\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(cf+cgx)^2}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{c\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(cf+g\sin(\arcsin(cx)))^2}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3805}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{cf\int \frac{a+b\arcsin(cx)}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}-\frac{bg\int \frac{\sqrt{1-c^2x^2}}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{cf\int \frac{a+b\arcsin(cx)}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}-\frac{bg\int \frac{\cos(\arcsin(cx))}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3147}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{cf\int \frac{a+b\arcsin(cx)}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}-\frac{b\int \frac{1}{cf+cgx}d(cgx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{16}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{cf\int \frac{a+b\arcsin(cx)}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}-\frac{b\log(cf+cgx)}{c^2f^2-g^2}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3804}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2ce^{i\arcsin(cx)}f-ie^{2i\arcsin(cx)}g+ig}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{(c^2f^2-g^2)(cf+cgx)}-\frac{b\log(cf+cgx)}{c^2f^2-g^2}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2694}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{2\left(cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}\right)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arc}{(c^2f^2-g^2)(cf+}}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}\right)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx)}{(c^2f^2-g^2)(cf+cgx)}}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2620}$$

3.48. $\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{b\int\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-\cdots}}\right)}{g}\cdots\right)}{2\sqrt{\cdots}}\right)}{c^2f^2-g^2}\cdots\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 2715$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{ib\int e^{-i\arcsin(cx)}\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}}{g}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{ib\int e^{-i\arcsin(cx)}\log\cdots}{\cdots}\cdots\right)}{\cdots}\right)}{c^2f^2-g^2}\cdots\right)}{\sqrt{d-c^2dx^2}\cdots}$$

$$\Big\downarrow \; 2838$$

3.48. $\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{ib\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}-\frac{ib}{}\cdots\right)}{2\sqrt{c^2f^2-g^2}}\right)}{c^2f^2-g^2}\cdots\right)}{\sqrt{d-c^2dx^2}}$$

input
```
Int[(a + b*ArcSin[c*x])/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(c*Sqrt[1 - c^2*x^2]*((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/((c^2*f^2
- g^2)*(c*f + c*g*x)) - (b*Log[c*f + c*g*x])/(c^2*f^2 - g^2) + (2*c*f*(((-
1/2*I)*g*(((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt
[c^2*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt
[c^2*f^2 - g^2])])/g))/Sqrt[c^2*f^2 - g^2] + ((I/2)*g*(((a + b*ArcSin[c*x]
)*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (I*b*P
olyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g))/Sqrt[c
^2*f^2 - g^2]))/(c^2*f^2 - g^2)))/Sqrt[d - c^2*d*x^2]
```

### 3.48.3.1 Defintions of rubi rules used

rule 16
```
Int[(c_.)/((a_.) + (b_.)*(x_)), x_Symbol] :> Simp[c*(Log[RemoveContent[a +
b*x, x]]/b), x] /; FreeQ[{a, b, c}, x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3147
```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Simp[1/(b^p*f)   Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)
/2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
 - 1)/2] && NeQ[a^2 - b^2, 0]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

## 3.48. $\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

rule 3805
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Simp[a/(a^2 - b^2)   Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x]
, x] - Simp[b*d*(m/(f*(a^2 - b^2)))   Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(
a + b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 -
b^2, 0] && IGtQ[m, 0]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.48.4 Maple [A] (verified)

Time = 0.65 (sec) , antiderivative size = 932, normalized size of antiderivative = 1.84

| method | result |
|---|---|
| default | $\frac{a\sqrt{-\left(x+\frac{f}{g}\right)^2 c^2 d+\frac{2c^2 df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^2f^2-g^2\right)}{g^2}}}{d(c^2f^2-g^2)\left(x+\frac{f}{g}\right)}-\frac{a c^2 f \ln\left(\frac{-\frac{2d\left(c^2f^2-g^2\right)}{g^2}+\frac{2c^2 df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d\left(c^2f^2-g^2\right)}{g^2}}\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df(}{g}}}{x+\frac{f}{g}}\right)}{g(c^2f^2-g^2)\sqrt{-\frac{d\left(c^2f^2-g^2\right)}{g^2}}}$ |
| parts | $\frac{a\sqrt{-\left(x+\frac{f}{g}\right)^2 c^2 d+\frac{2c^2 df\left(x+\frac{f}{g}\right)}{g}-\frac{d\left(c^2f^2-g^2\right)}{g^2}}}{d(c^2f^2-g^2)\left(x+\frac{f}{g}\right)}-\frac{a c^2 f \ln\left(\frac{-\frac{2d\left(c^2f^2-g^2\right)}{g^2}+\frac{2c^2 df\left(x+\frac{f}{g}\right)}{g}+2\sqrt{-\frac{d\left(c^2f^2-g^2\right)}{g^2}}\sqrt{-\left(x+\frac{f}{g}\right)^2c^2d+\frac{2c^2df(}{g}}}{x+\frac{f}{g}}\right)}{g(c^2f^2-g^2)\sqrt{-\frac{d\left(c^2f^2-g^2\right)}{g^2}}}$ |

input
```
int((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a/d/(c^2*f^2-g^2)/(x+f/g)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2
-g^2)/g^2)^(1/2)-a/g*c^2*f/(c^2*f^2-g^2)/(-d*(c^2*f^2-g^2)/g^2)^(1/2)*ln((
-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^2)/g^2)^(1/2)*
(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))/(x+f/g))
+b*((-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*arcsin(c*x
)*(c^2*f*x+g-I*(-c^2*x^2+1)^(1/2)*c*f)/d/(c^2*x^2-1)/(c^2*f^2-g^2)/(g*x+f)
-(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(-ln((I*c*f+(I*c*x+(-c^2*x^2+1)
^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))*arcsin(c*x)*
(-c^2*f^2+g^2)^(1/2)*c*f+ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+
g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))*arcsin(c*x)*(-c^2*f^2+g^2)^(1/2)
*c*f+2*ln(I*c*x+(-c^2*x^2+1)^(1/2))*c^2*f^2-ln((I*c*x+(-c^2*x^2+1)^(1/2))^
2*g+2*I*c*f*(I*c*x+(-c^2*x^2+1)^(1/2))-g)*c^2*f^2+I*dilog((I*c*f+(I*c*x+(-
c^2*x^2+1)^(1/2))*g-(-c^2*f^2+g^2)^(1/2))/(I*c*f-(-c^2*f^2+g^2)^(1/2)))*(-
c^2*f^2+g^2)^(1/2)*c*f-I*dilog((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f
^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))*(-c^2*f^2+g^2)^(1/2)*c*f-2*ln
(I*c*x+(-c^2*x^2+1)^(1/2))*g^2+ln((I*c*x+(-c^2*x^2+1)^(1/2))^2*g+2*I*c*f*(
I*c*x+(-c^2*x^2+1)^(1/2))-g)*g^2)*c/d/(c^2*x^2-1)/(c^2*f^2-g^2)^2)
```

### 3.48.5 Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx=\int \frac{b\arcsin(cx)+a}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^2*d*g^2*x^4 + 2*c^2*
d*f*g*x^3 - 2*d*f*g*x - d*f^2 + (c^2*d*f^2 - d*g^2)*x^2), x)
```

### 3.48.6 Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx=\int \frac{a+b\,\mathrm{asin}\,(cx)}{\sqrt{-d\,(cx-1)\,(cx+1)}\,(f+gx)^2}\,dx$$

input
```
integrate((a+b*asin(c*x))/(g*x+f)**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)**2), x)
```

### 3.48.7 Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx=\int \frac{b\arcsin{(cx)}+a}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
integrate((b*arcsin(c*x) + a)/(sqrt(-c^2*d*x^2 + d)*(g*x + f)^2), x)
```

### 3.48.8 Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.48.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{{\left(f+g\,x\right)}^2\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)), x)
```

# 3.49 $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$



## 3.49.1 Optimal result

Integrand size = 31, antiderivative size = 315

$$\begin{aligned}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx &= -\frac{bg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} \\ &+ \frac{(g(3c^2f^2+g^2)+c^2f(c^2f^2+3g^2)\,x)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} \\ &+ \frac{g^3(1-c^2x^2)\,(a+b\arcsin(cx))}{c^4d\sqrt{d-c^2dx^2}} - \frac{3fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} \\ &+ \frac{b(cf+g)^3\sqrt{1-c^2x^2}\log(1-cx)}{2c^4d\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^3\sqrt{1-c^2x^2}\log(1+cx)}{2c^4d\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
(g*(3*c^2*f^2+g^2)+c^2*f*(c^2*f^2+3*g^2)*x)*(a+b*arcsin(c*x))/c^4/d/(-c^2*
d*x^2+d)^(1/2)+g^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))/c^4/d/(-c^2*d*x^2+d)^(1/
2)-b*g^3*x*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-3/2*f*g^2*(a+b*ar
csin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f+g)
^3*ln(-c*x+1)*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f-g)^
3*ln(c*x+1)*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)
```

### 3.49.2 Mathematica [A] (verified)

Time = 0.81 (sec) , antiderivative size = 194, normalized size of antiderivative = 0.62

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-2bcg^3x+2g^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))-\frac{3cfg^2(a+b\arcsin(}{b}\right.}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-2*b*c*g^3*x + 2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x]) - (3*c*f*g^2*(a + b*ArcSin[c*x])^2)/b + (c*f - g)^3*(-((a + b*ArcSin[
c*x])*Cot[(Pi + 2*ArcSin[c*x])/4]) + 2*b*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])
 + (c*f + g)^3*(2*b*Log[Cos[(Pi + 2*ArcSin[c*x])/4]] + (a + b*ArcSin[c*x])
*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^4*d*Sqrt[d - c^2*d*x^2])
```

### 3.49.3 Rubi [A] (verified)

Time = 0.73 (sec) , antiderivative size = 213, normalized size of antiderivative = 0.68, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(-\frac{x(a+b\arcsin(cx))g^3}{c^2\sqrt{1-c^2x^2}}-\frac{3f(a+b\arcsin(cx))g^2}{c^2\sqrt{1-c^2x^2}}+\frac{(c^2f^3+3g^2f+g(3c^2f^2+g^2)x)(a+b\arcsin(cx))}{c^2(1-c^2x^2)^{3/2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{3fg^2(a+b\arcsin(cx))^2}{2bc^3}+\frac{(c^2fx(c^2f^2+3g^2)+g(3c^2f^2+g^2))(a+b\arcsin(cx))}{c^4\sqrt{1-c^2x^2}}+\frac{g^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^4}-\frac{bg\operatorname{arctanh}}{}\right.}{d\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-((b*g^3*x)/c^3) + ((g*(3*c^2*f^2 + g^2) + c^2*f*(c^2*
f^2 + 3*g^2)*x)*(a + b*ArcSin[c*x]))/(c^4*Sqrt[1 - c^2*x^2]) + (g^3*Sqrt[1
 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^4 - (3*f*g^2*(a + b*ArcSin[c*x])^2)/(2*
b*c^3) - (b*g*(3*c^2*f^2 + g^2)*ArcTanh[c*x])/c^4 + (b*f*(c^2*f^2 + 3*g^2)
*Log[1 - c^2*x^2])/(2*c^3)))/(d*Sqrt[d - c^2*d*x^2])
```

### 3.49.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.49.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.86 (sec) , antiderivative size = 724, normalized size of antiderivative = 2.30

| method | result |
|---|---|
| default | $a\left(\frac{f^3 x}{d\sqrt{-c^2 d\,x^2+d}}+g^3\left(-\frac{x^2}{c^2 d\sqrt{-c^2 d\,x^2+d}}+\frac{2}{d\,c^4\sqrt{-c^2 d\,x^2+d}}\right)+3f\,g^2\left(\frac{x}{c^2 d\sqrt{-c^2 d\,x^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{c^2 d\sqrt{c^2 d}}\right)\right.$ |
| parts | $a\left(\frac{f^3 x}{d\sqrt{-c^2 d\,x^2+d}}+g^3\left(-\frac{x^2}{c^2 d\sqrt{-c^2 d\,x^2+d}}+\frac{2}{d\,c^4\sqrt{-c^2 d\,x^2+d}}\right)+3f\,g^2\left(\frac{x}{c^2 d\sqrt{-c^2 d\,x^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{c^2 d\sqrt{c^2 d}}\right)\right.$ |

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^3/d*x/(-c^2*d*x^2+d)^(1/2)+g^3*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d/c
^4/(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d/(c^
2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+3*f^2*g/c^2/d/(-c
^2*d*x^2+d)^(1/2))+b*(3/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^
3/(c^2*x^2-1)*arcsin(c*x)^2*f*g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-
c^2*x^2+1)^(1/2)*x*c-1)*g^3*(arcsin(c*x)+I)/d^2/c^4/(c^2*x^2-1)+1/2*(-d*(c
^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g^3*(arcsin(c*x)-I)/
d^2/c^4/(c^2*x^2-1)+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^3/
(c^2*x^2-1)*f*(c^2*f^2+3*g^2)*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)/d^2/c^4/(
c^2*x^2-1)*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c^3*f^3+c^4*f^3*x+3*I*(-c^2*x
^2+1)^(1/2)*c*f*g^2+3*c^2*f*g^2*x+3*f^2*g*c^2+g^3)-(-d*(c^2*x^2-1))^(1/2)*
(-c^2*x^2+1)^(1/2)*(c^3*f^3-3*c^2*f^2*g+3*c*f*g^2-g^3)*ln(I*c*x+(-c^2*x^2+
1)^(1/2)+I)/d^2/c^4/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/
d^2/c^4/(c^2*x^2-1)*(c^3*f^3+3*c^2*f^2*g+3*c*f*g^2+g^3)*ln(I*c*x+(-c^2*x^2
+1)^(1/2)-I))
```

### 3.49.5 Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="f
ricas")
```

output
```
integral((a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 + 3
*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^4
*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

### 3.49.6 Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^3}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(3/2), x
)
```

### 3.49.7 Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="m
axima")
```

output
```
-a*g^3*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 + d)*c^4*d))
 + 3*a*f*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2)))
+ b*f^3*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*f^3*x/(sqrt(-c^2*d*x^2
+ d)*d) - 1/2*b*f^3*log(x^2 - 1/c^2)/(c*d^(3/2)) + 3*a*f^2*g/(sqrt(-c^2*d*
x^2 + d)*c^2*d) - integrate((b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^2*d*x^2 - d)*sqrt(c*x + 1)*sqrt
(-c*x + 1)), x)/sqrt(d)
```

### 3.49.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.49.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

# 3.50 $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$



## 3.50.1 Optimal result

Integrand size = 31, antiderivative size = 213

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{(2fg+(c^2f^2+g^2)\,x)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2bc^3d\sqrt{d-c^2dx^2}} + \frac{b(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{2c^3d\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^2\sqrt{1-c^2x^2}\log(1+cx)}{2c^3d\sqrt{d-c^2dx^2}}$$

output
```
(2*f*g+(c^2*f^2+g^2)*x)*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/2*g
^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2
*b*(c*f+g)^2*ln(-c*x+1)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)+1/2*
b*(c*f-g)^2*ln(c*x+1)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

## 3.50.2 Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.73

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-\frac{g^2(a+b\arcsin(cx))^2}{b}+(-cf+g)^2\left(-((a+b\arcsin(cx))\cot\left(\frac{1}{4}\right.\right.\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-((g^2*(a + b*ArcSin[c*x])^2)/b) + (-(c*f) + g)^2*(-((
a + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*x])/4]) + 2*b*Log[Sin[(Pi + 2*ArcS
in[c*x])/4]]) + (c*f + g)^2*(2*b*Log[Cos[(Pi + 2*ArcSin[c*x])/4]] + (a + b
*ArcSin[c*x])*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^3*d*Sqrt[d - c^2*d*x^2])
```

### 3.50.3 Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.67, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(f^2c^2+2fgxc^2+g^2)(a+b\arcsin(cx))}{c^2(1-c^2x^2)^{3/2}}-\frac{g^2(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{g^2(a+b\arcsin(cx))^2}{2bc^3}+\frac{(x(c^2f^2+g^2)+2fg)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{2bfg\text{arctanh}(cx)}{c^2}+\frac{b(c^2f^2+g^2)\log(1-c^2x^2)}{2c^3}\right)}{d\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((2*f*g + (c^2*f^2 + g^2)*x)*(a + b*ArcSin[c*x]))/(c^2
*Sqrt[1 - c^2*x^2]) - (g^2*(a + b*ArcSin[c*x])^2)/(2*b*c^3) - (2*b*f*g*Arc
Tanh[c*x])/c^2 + (b*(c^2*f^2 + g^2)*Log[1 - c^2*x^2])/(2*c^3)))/(d*Sqrt[d
- c^2*d*x^2])
```

#### 3.50.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.50.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.78 (sec) , antiderivative size = 488, normalized size of antiderivative = 2.29

| method | result |
|---|---|
| default | $a\left(\frac{f^2 x}{d\sqrt{-c^2 d x^2+d}}+g^2\left(\frac{x}{c^2 d\sqrt{-c^2 d x^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d x^2+d}}\right)}{c^2 d\sqrt{c^2 d}}\right)+\frac{2fg}{c^2 d\sqrt{-c^2 d x^2+d}}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2}}{2d^2c^3(c^2x^2}\right.$ |
| parts | $a\left(\frac{f^2 x}{d\sqrt{-c^2 d x^2+d}}+g^2\left(\frac{x}{c^2 d\sqrt{-c^2 d x^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d x^2+d}}\right)}{c^2 d\sqrt{c^2 d}}\right)+\frac{2fg}{c^2 d\sqrt{-c^2 d x^2+d}}\right)+b\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2}}{2d^2c^3(c^2x^2}\right.$ |

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBO
SE)
```

output
```
a*(f^2/d*x/(-c^2*d*x^2+d)^(1/2)+g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d/
(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+2*f*g/c^2/d/(-
c^2*d*x^2+d)^(1/2))+b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c
^3/(c^2*x^2-1)*g^2*arcsin(c*x)^2+2*I*(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(
1/2)/d^2/c^3/(c^2*x^2-1)*(c^2*f^2+g^2)*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)*
(c*x+I*(-c^2*x^2+1)^(1/2))*arcsin(c*x)*(c^2*f^2+g^2-2*I*(-c^2*x^2+1)^(1/2)
*c*f*g+2*x*c^2*f*g)/d^2/c^3/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/d^2/c^3/(c^2*x^2-1)*(c^2*f^2-2*c*f*g+g^2)*ln(I*c*x+(-c^2*x^2+1)^(1
/2)+I)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x^2-1)*(c^2*
f^2+2*c*f*g+g^2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

### 3.50.5 Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2
+ 2*b*f*g*x + b*f^2)*arcsin(c*x))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

### 3.50.6 Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(cx))(f+gx)^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(3/2), x
)
```

### 3.50.7 Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="m
axima")
```

output
```
a*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) + b*f^2
*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*f^2*x/(sqrt(-c^2*d*x^2 + d)*d)
 + sqrt(d)*integrate((b*g^2*x^2 + 2*b*f*g*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 +
d^2), x) - 1/2*b*f^2*log(x^2 - 1/c^2)/(c*d^(3/2)) + 2*a*f*g/(sqrt(-c^2*d*x
^2 + d)*c^2*d)
```

### 3.50.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.50.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

3.50. $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$

# 3.51 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx$



## 3.51.1 Optimal result

Integrand size = 29, antiderivative size = 144

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{(g+c^2fx)\,(a+b\arcsin(cx))}{c^2d\sqrt{d-c^2dx^2}} + \frac{b(cf+g)\sqrt{1-c^2x^2}\log(1-cx)}{2c^2d\sqrt{d-c^2dx^2}} + \frac{b(cf-g)\sqrt{1-c^2x^2}\log(1+cx)}{2c^2d\sqrt{d-c^2dx^2}}$$

output
```
(c^2*f*x+g)*(a+b*arcsin(c*x))/c^2/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f+g)*ln(
-c*x+1)*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f-g)*ln(c*x
+1)*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)
```

## 3.51.2 Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.94

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left((cf-g)\left(-\left((a+b\arcsin(cx))\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)+2\right.\right.}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((c*f - g)*(-((a + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*
x])/4]) + 2*b*Log[Sin[(Pi + 2*ArcSin[c*x])/4]]) + (c*f + g)*(2*b*Log[Cos[(
Pi + 2*ArcSin[c*x])/4]] + (a + b*ArcSin[c*x])*Tan[(Pi + 2*ArcSin[c*x])/4])
))/(2*c^2*d*Sqrt[d - c^2*d*x^2])
```

### 3.51.3 Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.69, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {5276, 5260, 27, 452, 219, 240}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}dx$$

$$\Big\downarrow \; 5276$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 5260$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-bc\int \frac{fxc^2+g}{c^2(1-c^2x^2)}dx\right)}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 27$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{b\int \frac{fxc^2+g}{1-c^2x^2}dx}{c}\right)}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 452$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{b\left(c^2f\int \frac{x}{1-c^2x^2}dx+g\int \frac{1}{1-c^2x^2}dx\right)}{c}\right)}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 219$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{b\left(c^2f\int \frac{x}{1-c^2x^2}dx+\frac{g\,\text{arctanh}(cx)}{c}\right)}{c}\right)}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 240$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{c^2\sqrt{1-c^2x^2}}-\frac{b\left(\frac{g\,\text{arctanh}(cx)}{c}-\frac{1}{2}f\log(1-c^2x^2)\right)}{c}\right)}{d\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((g + c^2*f*x)*(a + b*ArcSin[c*x]))/(c^2*Sqrt[1 - c^2*
x^2]) - (b*((g*ArcTanh[c*x])/c - (f*Log[1 - c^2*x^2])/2))/c))/(d*Sqrt[d -
c^2*d*x^2])
```

### 3.51.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 240
```
Int[(x_)/((a_) + (b_.)*(x_)^2), x_Symbol] :> Simp[Log[RemoveContent[a + b*x
^2, x]]/(2*b), x] /; FreeQ[{a, b}, x]
```

rule 452
```
Int[((c_) + (d_.)*(x_))/((a_) + (b_.)*(x_)^2), x_Symbol] :> Simp[c   Int[1/
(a + b*x^2), x], x] + Simp[d   Int[x/(a + b*x^2), x], x] /; FreeQ[{a, b, c,
 d}, x] && NeQ[b*c^2 + a*d^2, 0]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.51.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.87 (sec) , antiderivative size = 305, normalized size of antiderivative = 2.12

| method | result |
|---|---|
| default | $a\left(\frac{fx}{d\sqrt{-c^2dx^2+d}}+\frac{g}{c^2d\sqrt{-c^2dx^2+d}}\right)+b\left(\frac{2i\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,f\arcsin(cx)}{d^2c(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)\left(i\sqrt{-c^2x^2\right.}}{d^2c^2(c^2x^2-1)}\right.$ |
| parts | $a\left(\frac{fx}{d\sqrt{-c^2dx^2+d}}+\frac{g}{c^2d\sqrt{-c^2dx^2+d}}\right)+b\left(\frac{2i\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,f\arcsin(cx)}{d^2c(c^2x^2-1)}-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)\left(i\sqrt{-c^2x^2\right.}}{d^2c^2(c^2x^2-1)}\right.$ |

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE
)
```

output
```
a*(f/d*x/(-c^2*d*x^2+d)^(1/2)+g/c^2/d/(-c^2*d*x^2+d)^(1/2))+b*(2*I*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c/(c^2*x^2-1)*f*arcsin(c*x)-(-d*(c^
2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c*f+
c^2*f*x+g)-(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(c*f-g)*ln(I*c*x+(-c^
2*x^2+1)^(1/2)+I)/d^2/c^2/(c^2*x^2-1)-(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^
(1/2)/d^2/c^2/(c^2*x^2-1)*(c*f+g)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

### 3.51.5 Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(gx+f)(b\arcsin{(cx)}+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(c
^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

### 3.51.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(a+b\operatorname{asin}(cx))\,(f+gx)}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(3/2), x)
```

### 3.51.7 Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="max
ima")
```

output
```
b*f*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a*f*x/(sqrt(-c^2*d*x^2 + d)*d
) - 1/2*b*f*log(x^2 - 1/c^2)/(c*d^(3/2)) + (sqrt(c*x + 1)*sqrt(-c*x + 1)*c
^3*d^2*integrate(x^2/(c^4*d^2*x^4 - c^2*d^2*x^2 + (c^2*d^2*x^2 - d^2)*e^(l
og(c*x + 1) + log(-c*x + 1))), x) + arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))*b*g/(sqrt(c*x + 1)*sqrt(-c*x + 1)*c^2*d^(3/2)) + a*g/(sqrt(-c^2*d*x^
2 + d)*c^2*d)
```

### 3.51.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(3/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.51.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(f+g\,x)\;(a+b\,\mathrm{asin}(c\,x))}{{(d-c^2\,d\,x^2)}^{3/2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(3/2), x)
```

# 3.52 $\int \frac{a+b\arcsin(cx)}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx$



## 3.52.1 Optimal result

Integrand size = 31, antiderivative size = 654

$$
\begin{aligned}
\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx &= -\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}} \\
&+ \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&- \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&+ \frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf+g)\sqrt{d-c^2dx^2}} + \frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{d(cf-g)\sqrt{d-c^2dx^2}} \\
&+ \frac{bg^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} - \frac{bg^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d\left(c^2f^2-g^2\right)^{3/2}\sqrt{d-c^2dx^2}} \\
&+ \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}
\end{aligned}
$$

output
```
-1/2*(a+b*arcsin(c*x))*cot(1/4*Pi+1/2*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/d/(c
*f-g)/(-c^2*d*x^2+d)^(1/2)+b*ln(cos(1/4*Pi+1/2*arcsin(c*x)))*(-c^2*x^2+1)^
(1/2)/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)+b*ln(sin(1/4*Pi+1/2*arcsin(c*x)))*(-c
^2*x^2+1)^(1/2)/d/(c*f-g)/(-c^2*d*x^2+d)^(1/2)+I*g^2*(a+b*arcsin(c*x))*ln(
1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(
1/2)/d/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-I*g^2*(a+b*arcsin(c*x))*ln
(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^
(1/2)/d/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+b*g^2*polylog(2,I*(I*c*x+
(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2
*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-b*g^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)
^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3
/2)/(-c^2*d*x^2+d)^(1/2)+1/2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)*tan(1/4*
Pi+1/2*arcsin(c*x))/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)
```

### 3.52.2 Mathematica [A] (verified)

Time = 1.56 (sec) , antiderivative size = 359, normalized size of antiderivative = 0.55

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx=\frac{\sqrt{1-c^2x^2}\left(\frac{-((a+b\arcsin(cx))\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right))+2b\log\left(\sin\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)\right)}{cf-g}+\frac{2g^2}{}\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-((a + b*ArcSin[c*x])*Cot[(Pi + 2*ArcSin[c*x])/4]) +
2*b*Log[Sin[(Pi + 2*ArcSin[c*x])/4]])/(c*f - g) + (2*g^2*(I*(a + b*ArcSin[
c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - L
og[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]) + b*PolyLog[2
, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - b*PolyLog[2
, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/((c*f - g)*(c*f +
 g)*Sqrt[c^2*f^2 - g^2]) + (2*b*Log[Cos[(Pi + 2*ArcSin[c*x])/4]] + (a + b*
ArcSin[c*x])*Tan[(Pi + 2*ArcSin[c*x])/4])/(c*f + g)))/(2*d*Sqrt[d - c^2*d*
x^2])
```

### 3.52.3 Rubi [A] (verified)

Time = 1.40 (sec) , antiderivative size = 431, normalized size of antiderivative = 0.66, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{(d-c^2dx^2)^{3/2}(f+gx)}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(a+b\arcsin(cx))g^2}{(g-cf)(cf+g)(f+gx)\sqrt{1-c^2x^2}}-\frac{c(a+b\arcsin(cx))}{2(cf+g)(cx-1)\sqrt{1-c^2x^2}}+\frac{c(a+b\arcsin(cx))}{2(cf-g)(cx+1)\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{1-c^2x^2}\left(\frac{ig^2(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}}-\frac{ig^2(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{(c^2f^2-g^2)^{3/2}}+\frac{\tan\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(a+b\arcsin}{2(cf+g)}\right.$$

input
```
Int[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-1/2*((a + b*ArcSin[c*x])*Cot[Pi/4 + ArcSin[c*x]/2])/(
c*f - g) + (I*g^2*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 - Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) - (I*g^2*(a + b*ArcSin[c*x
])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*f^2
- g^2)^(3/2) + (b*Log[Cos[Pi/4 + ArcSin[c*x]/2]])/(c*f + g) + (b*Log[Sin[P
i/4 + ArcSin[c*x]/2]])/(c*f - g) + (b*g^2*PolyLog[2, (I*E^(I*ArcSin[c*x])*
g)/(c*f - Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) - (b*g^2*PolyLog[2,
 (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/
2) + ((a + b*ArcSin[c*x])*Tan[Pi/4 + ArcSin[c*x]/2])/(2*(c*f + g))))/(d*Sq
rt[d - c^2*d*x^2])
```

#### 3.52.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.52.4 Maple [A] (verified)

Time = 1.39 (sec) , antiderivative size = 1094, normalized size of antiderivative = 1.67

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1094 |
| parts | Expression too large to display | 1094 |

input
```
int((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBOSE
)
```

output
```
-a*g/d/(c^2*f^2-g^2)/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)
/g^2)^(1/2)+a*f/(c^2*f^2-g^2)/d/(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c
^2*f^2-g^2)/g^2)^(1/2)*x*c^2+a*g/d/(c^2*f^2-g^2)/(-d*(c^2*f^2-g^2)/g^2)^(1
/2)*ln((-2*d*(c^2*f^2-g^2)/g^2+2*c^2*d*f/g*(x+f/g)+2*(-d*(c^2*f^2-g^2)/g^2
)^(1/2)*(-(x+f/g)^2*c^2*d+2*c^2*d*f/g*(x+f/g)-d*(c^2*f^2-g^2)/g^2)^(1/2))/
(x+f/g))+b*(-(-d*(c^2*x^2-1))^(1/2)*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c*f+
c^2*f*x-g)/d^2/(c^2*x^2-1)/(c^2*f^2-g^2)+(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1
))^(1/2)*(-ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*c^3*f^3-ln(I*c*x+(-c^2*x^2+1)^(1
/2)+I)*c^3*f^3+2*ln(I*c*x+(-c^2*x^2+1)^(1/2))*c^3*f^3+ln(I*c*x+(-c^2*x^2+1
)^(1/2)-I)*c^2*f^2*g-ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c^2*f^2*g+arcsin(c*x)*
(-c^2*f^2+g^2)^(1/2)*ln((I*c*f+(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)
^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))*g^2-arcsin(c*x)*(-c^2*f^2+g^2)^(1/2)
*ln((-I*c*f-(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(-I*c*f+(-c
^2*f^2+g^2)^(1/2)))*g^2-I*(-c^2*f^2+g^2)^(1/2)*dilog((I*c*f+(I*c*x+(-c^2*x
^2+1)^(1/2))*g+(-c^2*f^2+g^2)^(1/2))/(I*c*f+(-c^2*f^2+g^2)^(1/2)))*g^2+I*(
-c^2*f^2+g^2)^(1/2)*dilog((-I*c*f-(I*c*x+(-c^2*x^2+1)^(1/2))*g+(-c^2*f^2+g
^2)^(1/2))/(-I*c*f+(-c^2*f^2+g^2)^(1/2)))*g^2+ln(I*c*x+(-c^2*x^2+1)^(1/2)-
I)*c*f*g^2+ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)*c*f*g^2-2*ln(I*c*x+(-c^2*x^2+1)^
(1/2))*c*f*g^2-ln(I*c*x+(-c^2*x^2+1)^(1/2)-I)*g^3+ln(I*c*x+(-c^2*x^2+1)^(1
/2)+I)*g^3)/d^2/(c^2*x^2-1)/(c^2*f^2-g^2)/(c*f-g)/(c*f+g))
```

### 3.52.5 Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^4*d^2*g*x^5 + c^4*d^2
*f*x^4 - 2*c^2*d^2*g*x^3 - 2*c^2*d^2*f*x^2 + d^2*g*x + d^2*f), x)
```

### 3.52.6 Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}\,(cx)}{\left(-d\,(cx-1)\,(cx+1)\right)^{\frac{3}{2}}\,(f+gx)}\,dx$$

input
```
integrate((a+b*asin(c*x))/(g*x+f)/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))/((-d*(c*x - 1)*(c*x + 1))**(3/2)*(f + g*x)), x)
```

### 3.52.7 Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{b\arcsin\,(cx)+a}{\left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="max
ima")
```

output
```
integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(3/2)*(g*x + f)), x)
```

### 3.52.8 Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.52.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)\,\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(3/2)), x)
```

# 3.53 $\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$



## 3.53.1 Optimal result

Integrand size = 31, antiderivative size = 528

$$
\begin{aligned}
\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx &= -\frac{b(f+gx)^2\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&- \frac{bfg^3x\sqrt{1-c^2x^2}}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bg^4\sqrt{1-c^2x^2}\arcsin(cx)^2}{2c^5d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{(f+gx)\left(g(c^2f^2-3g^2)+2c^2f(c^2f^2-2g^2)x\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{(g+c^2fx)(f+gx)^3(a+b\arcsin(cx))}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} \\
&+ \frac{fg(2c^2f^2-5g^2)(1-c^2x^2)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{g^4\sqrt{1-c^2x^2}\arcsin(cx)(a+b\arcsin(cx))}{c^5d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{b(cf-2g)(cf+g)^3\sqrt{1-c^2x^2}\log(1-cx)}{3c^5d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{b(cf-g)^3(cf+2g)\sqrt{1-c^2x^2}\log(1+cx)}{3c^5d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

output
```
1/3*(g*x+f)*(g*(c^2*f^2-3*g^2)+2*c^2*f*(c^2*f^2-2*g^2)*x)*(a+b*arcsin(c*x)
)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*(c^2*f*x+g)*(g*x+f)^3*(a+b*arcsin(c*x))
/c^2/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)+1/3*f*g*(2*c^2*f^2-5*g^2)*(-c^2
*x^2+1)*(a+b*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/6*b*(g*x+f)^2*(2*
c^2*f*g*x+c^2*f^2+g^2)/c^3/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/3
*b*f*g^3*x*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)-1/2*b*g^4*arcsi
n(c*x)^2*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+g^4*arcsin(c*x)*(
a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*
f-2*g)*(c*f+g)^3*ln(-c*x+1)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x^2+d)^(1/2
)+1/3*b*(c*f-g)^3*(c*f+2*g)*ln(c*x+1)*(-c^2*x^2+1)^(1/2)/c^5/d^2/(-c^2*d*x
^2+d)^(1/2)
```

### 3.53.2 Mathematica [A] (verified)

Time = 2.55 (sec) , antiderivative size = 868, normalized size of antiderivative = 1.64

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{\left(d-c^2dx^2\right)^{5/2}}\,dx = \sqrt{-d\left(-1+c^2x^2\right)}\left(\frac{4ac^2f^3g+4afg^3+ac^4f^4x+6ac^2f^2g^2x+ag^4x}{3c^4d^3\left(-1+c^2x^2\right)^2} - \frac{2a(-6fg^3+c^4f^4x-3c^2f^2g^2x-2g^4x)}{3c^4d^3\left(-1+c^2x^2\right)}\right) - \frac{ag^4\arctan\left(\frac{cx\sqrt{-d(-1+c^2x^2)}}{\sqrt{d}(-1+c^2x^2)}\right)}{c^5d^{5/2}}$$
$$+\frac{bf^2g^2\left(-2cx\arcsin(cx)+\frac{-1+\frac{2cx\arcsin(cx)}{\sqrt{1-c^2x^2}}}{\sqrt{1-c^2x^2}}-2\sqrt{1-c^2x^2}\log\left(\sqrt{1-c^2x^2}\right)\right)}{c^3d^2\sqrt{d\left(1-c^2x^2\right)}}$$
$$+\frac{bf^4\left(4cx\arcsin(cx)+\frac{-1+\frac{2cx\arcsin(cx)}{\sqrt{1-c^2x^2}}}{\sqrt{1-c^2x^2}}+4\sqrt{1-c^2x^2}\log\left(\sqrt{1-c^2x^2}\right)\right)}{6cd^2\sqrt{d\left(1-c^2x^2\right)}}$$
$$+\frac{bf^3g\left(8\arcsin(cx)+3\sqrt{1-c^2x^2}\left(\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\sin\left(\frac{1}{2}\arcsin(cx)\right)\right)-\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)+\mathrm{s}\right.\right.\right.}{}$$
$$-\frac{bfg^3\left(4\arcsin(cx)+12\arcsin(cx)\cos(2\arcsin(cx))+5\cos(3\arcsin(cx))\log\left(\cos\left(\frac{1}{2}\arcsin(cx)\right)-\sin\left(\frac{1}{2}\mathrm{a}\right.\right.\right.}{}$$
$$+\frac{bg^4\left(\sqrt{1-c^2x^2}\left(3\arcsin(cx)^2-8\log\left(\sqrt{1-c^2x^2}\right)\right)-\frac{1+\frac{2\arcsin(cx)\sin(3\arcsin(cx))}{\sqrt{1-c^2x^2}}}{\sqrt{1-c^2x^2}}\right)}{6c^5d^2\sqrt{d\left(1-c^2x^2\right)}}$$

input
```
Integrate[((f + g*x)^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
Sqrt[-(d*(-1 + c^2*x^2))]*((4*a*c^2*f^3*g + 4*a*f*g^3 + a*c^4*f^4*x + 6*a*
c^2*f^2*g^2*x + a*g^4*x)/(3*c^4*d^3*(-1 + c^2*x^2)^2) - (2*a*(-6*f*g^3 + c
^4*f^4*x - 3*c^2*f^2*g^2*x - 2*g^4*x))/(3*c^4*d^3*(-1 + c^2*x^2))) - (a*g^
4*ArcTan[(c*x*Sqrt[-(d*(-1 + c^2*x^2))])/(Sqrt[d]*(-1 + c^2*x^2))])/(c^5*d
^(5/2)) + (b*f^2*g^2*(-2*c*x*ArcSin[c*x] + (-1 + (2*c*x*ArcSin[c*x])/Sqrt[
1 - c^2*x^2])/Sqrt[1 - c^2*x^2] - 2*Sqrt[1 - c^2*x^2]*Log[Sqrt[1 - c^2*x^2
]]))/(c^3*d^2*Sqrt[d*(1 - c^2*x^2)]) + (b*f^4*(4*c*x*ArcSin[c*x] + (-1 + (
2*c*x*ArcSin[c*x])/Sqrt[1 - c^2*x^2])/Sqrt[1 - c^2*x^2] + 4*Sqrt[1 - c^2*x
^2]*Log[Sqrt[1 - c^2*x^2]]))/(6*c*d^2*Sqrt[d*(1 - c^2*x^2)]) + (b*f^3*g*(8
*ArcSin[c*x] + 3*Sqrt[1 - c^2*x^2]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*
x]/2]] - Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]]) + Cos[3*ArcSin[c*x]
]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin[c*x]/2] +
 Sin[ArcSin[c*x]/2]]) - 2*Sin[2*ArcSin[c*x]]))/(6*c^2*d*(d*(1 - c^2*x^2))^
(3/2)) - (b*f*g^3*(4*ArcSin[c*x] + 12*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + 5*C
os[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] + 15*Sqrt[1
 - c^2*x^2]*(Log[Cos[ArcSin[c*x]/2] - Sin[ArcSin[c*x]/2]] - Log[Cos[ArcSin
[c*x]/2] + Sin[ArcSin[c*x]/2]]) - 5*Cos[3*ArcSin[c*x]]*Log[Cos[ArcSin[c*x]
/2] + Sin[ArcSin[c*x]/2]] + 2*Sin[2*ArcSin[c*x]]))/(6*c^4*d*(d*(1 - c^2*x^
2))^(3/2)) + (b*g^4*(Sqrt[1 - c^2*x^2]*(3*ArcSin[c*x]^2 - 8*Log[Sqrt[1 - c
^2*x^2]]) - (1 + (2*ArcSin[c*x]*Sin[3*ArcSin[c*x]])/Sqrt[1 - c^2*x^2])/...
```

### 3.53.3 Rubi [A] (verified)

Time = 0.90 (sec) , antiderivative size = 452, normalized size of antiderivative = 0.86, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}} \, dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{\sqrt{1-c^2x^2}\left(-bc\int \left(\frac{\arcsin(cx)g^4}{c^5\sqrt{1-c^2x^2}}+\frac{f(2c^2f^2-5g^2)g}{3c^4}+\frac{(f+gx)(2f(c^2f^2-2g^2)xc^2+g(c^2f^2-3g^2))}{3c^4(1-c^2x^2)}+\frac{(fxc^2+g)(f+gx)^3}{3c^2(1-c^2x^2)^2}\right)dx+\frac{g^4\,\text{arcsi}}{}\right.}{}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{g^4\arcsin(cx)(a+b\arcsin(cx))}{c^5}+\frac{(f+gx)^3(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{fg\sqrt{1-c^2x^2}(2c^2f^2-5g^2)(a+b\arcsin(cx))}{3c^4}+\frac{(f+gx)(2c\ldots}{\ldots}\right.}{\ldots}$$

input
```
Int[((f + g*x)^4*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((g + c^2*f*x)*(f + g*x)^3*(a + b*ArcSin[c*x]))/(3*c^2
*(1 - c^2*x^2)^(3/2)) + ((f + g*x)*(g*(c^2*f^2 - 3*g^2) + 2*c^2*f*(c^2*f^2
 - 2*g^2)*x)*(a + b*ArcSin[c*x]))/(3*c^4*Sqrt[1 - c^2*x^2]) + (f*g*(2*c^2*
f^2 - 5*g^2)*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(3*c^4) + (g^4*ArcSin[
c*x]*(a + b*ArcSin[c*x]))/c^5 - b*c*((f*g^3*x)/(3*c^4) + (f*g*(2*c^2*f^2 -
 5*g^2)*x)/(3*c^4) - (2*f*g*(c^2*f^2 - 2*g^2)*x)/(3*c^4) + (c*f + g)^4/(12
*c^6*(1 - c*x)) + (c*f - g)^4/(12*c^6*(1 + c*x)) + (g^4*ArcSin[c*x]^2)/(2*
c^6) + (f*g*(3*c^2*f^2 - 7*g^2)*ArcTanh[c*x])/(3*c^5) + (g*(c*f + g)^3*Log
[1 - c*x])/(6*c^6) - ((c*f - g)^3*g*Log[1 + c*x])/(6*c^6) - ((2*c^4*f^4 -
3*c^2*f^2*g^2 - 3*g^4)*Log[1 - c^2*x^2])/(6*c^6))))/(d^2*Sqrt[d - c^2*d*x^
2])
```

### 3.53.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.53.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.02 (sec) , antiderivative size = 6743, normalized size of antiderivative = 12.77

| method | result | size |
|---|---|---|
| default | Expression too large to display | 6743 |
| parts | Expression too large to display | 6743 |

input
```
int((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBO
SE)
```

output
```
result too large to display
```

### 3.53.5 Fricas [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^4(b\arcsin{(cx)}+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="f
ricas")
```

output
```
integral(-(a*g^4*x^4 + 4*a*f*g^3*x^3 + 6*a*f^2*g^2*x^2 + 4*a*f^3*g*x + a*f
^4 + (b*g^4*x^4 + 4*b*f*g^3*x^3 + 6*b*f^2*g^2*x^2 + 4*b*f^3*g*x + b*f^4)*a
rcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*
x^2 - d^3), x)
```

### 3.53.6 Sympy [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}{(cx)})\,(f+gx)^4}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**4*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**4/(-d*(c*x - 1)*(c*x + 1))**(5/2), x
)
```

### 3.53.7 Maxima [F]

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^4(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="m
axima")
```

output
```
1/6*b*c*f^4*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/
2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f^4*(2*x/(sqrt(-c^2*d*x^2 + d)
*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*(x*(3*x^2/((-c^2*d
*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) - x/(sqrt(-c^2*
d*x^2 + d)*c^4*d^2) + 3*arcsin(c*x)/(c^5*d^(5/2)))*a*g^4 + 1/3*a*f^4*(2*x/
(sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + 4/3*a*f*g^3*(
3*x^2/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) -
 2*a*f^2*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)
*c^2*d)) - sqrt(d)*integrate((b*g^4*x^4 + 4*b*f*g^3*x^3 + 6*b*f^2*g^2*x^2
+ 4*b*f^3*g*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sqrt(c*x + 1)*sqr
t(-c*x + 1))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x) + 4/3
*a*f^3*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

### 3.53.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^4*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.53.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^4(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^4\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^4*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

# 3.54 $\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$



## 3.54.1 Optimal result

Integrand size = 31, antiderivative size = 410

$$\begin{aligned}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx &= -\frac{b(f+gx)\left(c^2f^2+g^2+2c^2fgx\right)}{6c^3d^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\ &+ \frac{2(cf-g)(cf+g)\left(g+c^2fx\right)(a+b\arcsin(cx))}{3c^4d^2\sqrt{d-c^2dx^2}} \\ &+ \frac{\left(g+c^2fx\right)(f+gx)^2(a+b\arcsin(cx))}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{b(cf-g)(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{3c^4d^2\sqrt{d-c^2dx^2}} \\ &- \frac{bg(cf+g)^2\sqrt{1-c^2x^2}\log(1-cx)}{12c^4d^2\sqrt{d-c^2dx^2}} + \frac{b(cf-g)^2g\sqrt{1-c^2x^2}\log(1+cx)}{12c^4d^2\sqrt{d-c^2dx^2}} \\ &+ \frac{b(cf-g)^2(cf+g)\sqrt{1-c^2x^2}\log(1+cx)}{3c^4d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
2/3*(c*f-g)*(c*f+g)*(c^2*f*x+g)*(a+b*arcsin(c*x))/c^4/d^2/(-c^2*d*x^2+d)^(
1/2)+1/3*(c^2*f*x+g)*(g*x+f)^2*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*x^2+1)/(-c^
2*d*x^2+d)^(1/2)-1/6*b*(g*x+f)*(2*c^2*f*g*x+c^2*f^2+g^2)/c^3/d^2/(-c^2*x^2
+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f-g)*(c*f+g)^2*ln(-c*x+1)*(-c^2*x^
2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*b*g*(c*f+g)^2*ln(-c*x+1)*(-c^
2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/12*b*(c*f-g)^2*g*ln(c*x+1)*(
-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f-g)^2*(c*f+g)*ln(
c*x+1)*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)
```

### 3.54.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.95 (sec) , antiderivative size = 366, normalized size of antiderivative = 0.89

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{d-c^2dx^2}\Big(ibcg(3c^2f^2-5g^2)\left(1-c^2x^2\right)^{3/2}\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c^2}x\right.\right.}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(I*b*c*g*(3*c^2*f^2 - 5*g^2)*(1 - c^2*x^2)^(3/2)*Elli
pticF[I*ArcSinh[Sqrt[-c^2]*x], 1] - Sqrt[-c^2]*(-6*a*c^2*f^2*g + 4*a*g^3 -
 6*a*c^4*f^3*x - 6*a*c^2*g^3*x^2 + 4*a*c^6*f^3*x^3 - 6*a*c^4*f*g^2*x^3 + b
*c^3*f^3*Sqrt[1 - c^2*x^2] + 3*b*c*f*g^2*Sqrt[1 - c^2*x^2] + 3*b*c^3*f^2*g
*x*Sqrt[1 - c^2*x^2] + b*c*g^3*x*Sqrt[1 - c^2*x^2] + 2*b*(2*g^3 + 2*c^6*f^
3*x^3 - 3*c^2*g*(f^2 + g^2*x^2) - 3*c^4*f*x*(f^2 + g^2*x^2))*ArcSin[c*x] -
 b*c*f*(2*c^2*f^2 - 3*g^2)*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2])))/(6*c^4
*Sqrt[-c^2]*d^3*(-1 + c^2*x^2)^2)
```

### 3.54.3 Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 277, normalized size of antiderivative = 0.68, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}dx$$

$$\Big\downarrow \; 5276$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 5260$$

$$\frac{\sqrt{1-c^2x^2}\left(-bc\int \left(\frac{(fxc^2+g)(f+gx)^2}{3c^2(1-c^2x^2)^2}+\frac{2(cf-g)(cf+g)(fxc^2+g)}{3c^4(1-c^2x^2)}\right)dx+\frac{(f+gx)^2(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{2(cf-g)(cf+g)(c^2fx\cdots}{3c^4\sqrt{1-\cdots}}\right.}{d^2\sqrt{d-c^2dx^2}}$$

$\downarrow$ 2009

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(f+gx)^2(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{2(cf-g)(cf+g)(c^2fx+g)(a+b\arcsin(cx))}{3c^4\sqrt{1-c^2x^2}}-bc\left(\frac{2g\text{arctanh}(cx)(cf+g)(cf-g)}{3c^5}+\frac{(c\ldots}{12c^5\ldots}\right.\right.}{d^2\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((g + c^2*f*x)*(f + g*x)^2*(a + b*ArcSin[c*x]))/(3*c^2
*(1 - c^2*x^2)^(3/2)) + (2*(c*f - g)*(c*f + g)*(g + c^2*f*x)*(a + b*ArcSin
[c*x]))/(3*c^4*Sqrt[1 - c^2*x^2]) - b*c*((c*f + g)^3/(12*c^5*(1 - c*x)) +
(c*f - g)^3/(12*c^5*(1 + c*x)) + (2*(c*f - g)*g*(c*f + g)*ArcTanh[c*x])/(3
*c^5) + (g*(c*f + g)^2*Log[1 - c*x])/(12*c^5) - ((c*f - g)^2*g*Log[1 + c*x
])/(12*c^5) - (f*(c*f - g)*(c*f + g)*Log[1 - c^2*x^2])/(3*c^4))))/(d^2*Sqr
t[d - c^2*d*x^2])
```

### 3.54.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] && !GtQ[d, 0]
```

### 3.54.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.01 (sec) , antiderivative size = 5114, normalized size of antiderivative = 12.47

| method | result | size |
|---|---|---|
| default | Expression too large to display | 5114 |
| parts | Expression too large to display | 5114 |

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBO
SE)
```

output
```
result too large to display
```

### 3.54.5 Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="f
ricas")
```

output
```
integral(-(a*g^3*x^3 + 3*a*f*g^2*x^2 + 3*a*f^2*g*x + a*f^3 + (b*g^3*x^3 +
3*b*f*g^2*x^2 + 3*b*f^2*g*x + b*f^3)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(c^
6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

### 3.54.6 Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)^3}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(5/2), x
)
```

### 3.54.7 Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="m
axima")
```

output
```
1/6*b*c*f^3*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/
2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f^3*(2*x/(sqrt(-c^2*d*x^2 + d)
*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*f^3*(2*x/(sqrt(-
c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + 1/3*a*g^3*(3*x^2/((-
c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) - a*f*g^2*
(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) + in
tegrate((b*g^3*x^3 + 3*b*f*g^2*x^2 + 3*b*f^2*g*x)*arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt(c*x + 1)*sqrt
(-c*x + 1)), x)/sqrt(d) + a*f^2*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

### 3.54.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.54.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{{(f+g\,x)}^3\,(a+b\,\mathrm{asin}(c\,x))}{{(d-c^2\,d\,x^2)}^{5/2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

# 3.55 $\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$



## 3.55.1 Optimal result

Integrand size = 31, antiderivative size = 271

$$\begin{aligned}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx &= -\frac{bx(2fg+(c^2f^2+g^2)\,x)}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}\\ &+\frac{2f(g+c^2fx)\,(a+b\arcsin(cx))}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{x(f+gx)^2(a+b\arcsin(cx))}{3d^2\,(1-c^2x^2)\,\sqrt{d-c^2dx^2}}\\ &+\frac{b(2cf-g)(cf+g)\sqrt{1-c^2x^2}\log(1-cx)}{6c^3d^2\sqrt{d-c^2dx^2}}\\ &+\frac{b(cf-g)(2cf+g)\sqrt{1-c^2x^2}\log(1+cx)}{6c^3d^2\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
2/3*f*(c^2*f*x+g)*(a+b*arcsin(c*x))/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*x*(g*
x+f)^2*(a+b*arcsin(c*x))/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)-1/6*b*x*(2*
f*g+(c^2*f^2+g^2)*x)/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)+1/6*b*(
2*c*f-g)*(c*f+g)*ln(-c*x+1)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2
)+1/6*b*(c*f-g)*(2*c*f+g)*ln(c*x+1)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2
+d)^(1/2)
```

### 3.55.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.75 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.05

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \frac{c\sqrt{d-c^2dx^2}\left(2ibc^2fg(1-c^2x^2)^{3/2}\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c^2}x\right),1\right)-\sqrt{}\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(c*Sqrt[d - c^2*d*x^2]*((2*I)*b*c^2*f*g*(1 - c^2*x^2)^(3/2)*EllipticF[I*Ar
cSinh[Sqrt[-c^2]*x], 1] - Sqrt[-c^2]*(-4*a*c*f*g - 6*a*c^3*f^2*x + 4*a*c^5
*f^2*x^3 - 2*a*c^3*g^2*x^3 + b*c^2*f^2*Sqrt[1 - c^2*x^2] + b*g^2*Sqrt[1 -
c^2*x^2] + 2*b*c^2*f*g*x*Sqrt[1 - c^2*x^2] + 2*b*c*(-2*f*g - c^2*g^2*x^3 +
 c^2*f^2*x*(-3 + 2*c^2*x^2))*ArcSin[c*x] - b*(2*c^2*f^2 - g^2)*(1 - c^2*x^
2)^(3/2)*Log[-1 + c^2*x^2])))/(6*(-c^2)^(5/2)*d^3*(-1 + c^2*x^2)^2)
```

### 3.55.3 Rubi [A] (verified)

Time = 0.54 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.71, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{\sqrt{1-c^2x^2}\left(-bc\int \left(\frac{x(f+gx)^2}{3(1-c^2x^2)^2}+\frac{2f(fxc^2+g)}{3c^2(1-c^2x^2)}\right)dx+\frac{x(f+gx)^2(a+b\arcsin(cx))}{3(1-c^2x^2)^{3/2}}+\frac{2f(c^2fx+g)(a+b\arcsin(cx))}{3c^2\sqrt{1-c^2x^2}}\right)}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{x(f+gx)^2(a+b\arcsin(cx))}{3(1-c^2x^2)^{3/2}}+\frac{2f(c^2fx+g)(a+b\arcsin(cx))}{3c^2\sqrt{1-c^2x^2}}-bc\left(\frac{fg\text{arctanh}(cx)}{3c^3}-\frac{f^2\log(1-c^2x^2)}{3c^2}+\frac{(f+gx)^2}{6c^2(1-c^2x^2)}+\frac{g^2}{}\right.\right.}{d^2\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((x*(f + g*x)^2*(a + b*ArcSin[c*x]))/(3*(1 - c^2*x^2)^(
3/2)) + (2*f*(g + c^2*f*x)*(a + b*ArcSin[c*x]))/(3*c^2*Sqrt[1 - c^2*x^2])
- b*c*((f + g*x)^2/(6*c^2*(1 - c^2*x^2)) + (f*g*ArcTanh[c*x])/(3*c^3) - (f
^2*Log[1 - c^2*x^2])/(3*c^2) + (g^2*Log[1 - c^2*x^2])/(6*c^4))))/(d^2*Sqrt
[d - c^2*d*x^2])
```

### 3.55.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.55.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.88 (sec) , antiderivative size = 3783, normalized size of antiderivative = 13.96

| method | result | size |
|---|---|---|
| default | Expression too large to display | 3783 |
| parts | Expression too large to display | 3783 |

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBO
SE)
```

output
```
-14/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c
^4*x^6*f*g+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2
*x^2-4)*c^2*(-c^2*x^2+1)*x^5*g^2+16/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^
6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^4*f*g-8/3*I*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*f
^2+4/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*
(-c^2*x^2+1)^(1/2)*x*f*g-8/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^
4*x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)*x^6*f*g+4*b*(-d*(c^2*x^2-1))^(1/2)/d^3
/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*arcsin(c*x)*x^3*g^2+7*b*
(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*arcsin(
c*x)*x^5*g^2-2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x
^2-4)*c^4*arcsin(c*x)*x^7*g^2-2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10
*c^4*x^4+11*c^2*x^2-4)*c^4*arcsin(c*x)*x^5*f^2+I*b*(-d*(c^2*x^2-1))^(1/2)/
d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2+1)*x*f^2-6*b*(-d*(c^2*x^
2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*arcsin(c*x)*x^2*f*g+17
/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*ar
csin(c*x)*x^3*f^2-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+1
1*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*x^2*f^2-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3
/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*x^2*g^2+2*b*(-d*
(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)/c^2*arcsin(c...
```

### 3.55.5 Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (b*g^2*x^2
 + 2*b*f*g*x + b*f^2)*arcsin(c*x))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^
3*x^2 - d^3), x)
```

### 3.55.6 Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx)^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(5/2), x
)
```

### 3.55.7 Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="m
axima")
```

output
```
1/6*b*c*f^2*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/
2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f^2*(2*x/(sqrt(-c^2*d*x^2 + d)
*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*f^2*(2*x/(sqrt(-
c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) - 1/3*a*g^2*(x/(sqrt(-
c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) - sqrt(d)*inte
grate((b*g^2*x^2 + 2*b*f*g*x)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(c*x, sq
rt(c*x + 1)*sqrt(-c*x + 1))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 -
 d^3), x) + 2/3*a*f*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

### 3.55.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.55.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

# 3.56 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx$



## 3.56.1 Optimal result

Integrand size = 29, antiderivative size = 228

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{b(f+gx)}{6cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} + \frac{2fx(a+b\arcsin(cx))}{3d^2\sqrt{d-c^2dx^2}} + \frac{(g+c^2fx)(a+b\arcsin(cx))}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} - \frac{bg\sqrt{1-c^2x^2}\operatorname{arctanh}(cx)}{6c^2d^2\sqrt{d-c^2dx^2}} + \frac{bf\sqrt{1-c^2x^2}\log(1-c^2x^2)}{3cd^2\sqrt{d-c^2dx^2}}$$

output
```
2/3*f*x*(a+b*arcsin(c*x))/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*(c^2*f*x+g)*(a+b*ar
csin(c*x))/c^2/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)-1/6*b*(g*x+f)/c/d^2/(
-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/6*b*g*arctanh(c*x)*(-c^2*x^2+1)^(
1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*f*ln(-c^2*x^2+1)*(-c^2*x^2+1)^(1/2
)/c/d^2/(-c^2*d*x^2+d)^(1/2)
```

## 3.56.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 4 vs. order 3 in optimal.

Time = 0.57 (sec) , antiderivative size = 208, normalized size of antiderivative = 0.91

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = -\frac{\sqrt{d-c^2dx^2}\left(ibcg(1-c^2x^2)^{3/2}\operatorname{EllipticF}\left(i\operatorname{arcsinh}\left(\sqrt{-c^2}x\right),1\right)+\sqrt{-c^2}\left(2ag+6ac^2fx-4ac^4fx^3-bcf\sqrt{\right.\right.}}{6\left(-c^2\right)^{3/2}d^3\left(\right.}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
-1/6*(Sqrt[d - c^2*d*x^2]*(I*b*c*g*(1 - c^2*x^2)^(3/2)*EllipticF[I*ArcSinh
[Sqrt[-c^2]*x], 1] + Sqrt[-c^2]*(2*a*g + 6*a*c^2*f*x - 4*a*c^4*f*x^3 - b*c
*f*Sqrt[1 - c^2*x^2] - b*c*g*x*Sqrt[1 - c^2*x^2] + 2*b*(g + c^2*f*x*(3 - 2
*c^2*x^2))*ArcSin[c*x] + 2*b*c*f*(1 - c^2*x^2)^(3/2)*Log[-1 + c^2*x^2])))/
((-c^2)^(3/2)*d^3*(-1 + c^2*x^2)^2)
```

### 3.56.3 Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.70, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {5276, 5260, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5260}$$

$$\frac{\sqrt{1-c^2x^2}\left(-bc\int \left(\frac{2fx}{3(1-c^2x^2)}+\frac{fxc^2+g}{3c^2(1-c^2x^2)^2}\right)dx+\frac{(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{2fx(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}\right)}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{(c^2fx+g)(a+b\arcsin(cx))}{3c^2(1-c^2x^2)^{3/2}}+\frac{2fx(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}}-bc\left(\frac{g\text{arctanh}(cx)}{6c^3}+\frac{f+gx}{6c^2(1-c^2x^2)}-\frac{f\log(1-c^2x^2)}{3c^2}\right)\right)}{d^2\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((g + c^2*f*x)*(a + b*ArcSin[c*x]))/(3*c^2*(1 - c^2*x^
2)^(3/2)) + (2*f*x*(a + b*ArcSin[c*x]))/(3*Sqrt[1 - c^2*x^2]) - b*c*((f +
g*x)/(6*c^2*(1 - c^2*x^2)) + (g*ArcTanh[c*x])/(6*c^3) - (f*Log[1 - c^2*x^2
])/(3*c^2)))))/(d^2*Sqrt[d - c^2*d*x^2])
```

### 3.56.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5260
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_) + (g_.)*(x_))^(m_.)*((d_) + (e
_.)*(x_)^2)^(p_), x_Symbol] :> With[{u = IntHide[(f + g*x)^m*(d + e*x^2)^p,
 x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c   Int[1/Sqrt[1 - c^2*x^2]
   u, x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IG
tQ[m, 0] && ILtQ[p + 1/2, 0] && GtQ[d, 0] && (LtQ[m, -2*p - 1] || GtQ[m, 3]
)
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.56.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.96 (sec) , antiderivative size = 2237, normalized size of antiderivative = 9.81

| method | result | size |
|---|---|---|
| default | Expression too large to display | 2237 |
| parts | Expression too large to display | 2237 |

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE
)
```

output
```
2/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^6
*x^7*f+14/3*I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^
2-4)*c*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*f+2/3*I*b*(-d*(c^2*x^2-1))^(1/2)
/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*(-c^2*x^2+1)*x^6*g-5/3*I*b*(-
d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*(-c^2*x^2
+1)*x^3*f-3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-
4)*arcsin(c*x)*x^2*g-4*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+
11*c^2*x^2-4)*f*x*arcsin(c*x)+2/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-
10*c^4*x^4+11*c^2*x^2-4)/c*(-c^2*x^2+1)^(1/2)*f-I*b*(-d*(c^2*x^2-1))^(1/2)
/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*f*x-I*b*(-d*(c^2*x^2-1))^(1/2)/d^
3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*x^2*g-7/3*I*b*(-d*(c^2*x^2-1))^(1/2)
/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^6*g-7/3*I*b*(-d*(c^2*x^2-1)
)^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^4*x^5*f+8/3*I*b*(-d*(c^2
*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^4*g+8/3*I*b*(
-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c^2*x^3*f+I*
b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*(-c^2*x^2
+1)*x^2*g+I*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^4+11*c^2*x^2-
4)*(-c^2*x^2+1)*x*f+17/3*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*c^6*x^6-10*c^4*x^
4+11*c^2*x^2-4)*c^2*arcsin(c*x)*x^3*f-1/2*b*(-d*(c^2*x^2-1))^(1/2)/d^3/(3*
c^6*x^6-10*c^4*x^4+11*c^2*x^2-4)*c*(-c^2*x^2+1)^(1/2)*x^2*f-2/3*b*(-c^2...
```

### 3.56.5 Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="fri
cas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(
c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

### 3.56.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(5/2), x)
```

### 3.56.7 Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="max
ima")
```

output
```
1/6*b*c*f*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/2)
) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 1/3*b*f*(2*x/(sqrt(-c^2*d*x^2 + d)*d^2
) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a*f*(2*x/(sqrt(-c^2*d*
x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + b*g*integrate(x*arctan2(c*
x, sqrt(c*x + 1)*sqrt(-c*x + 1))/((c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2)*sqrt
(c*x + 1)*sqrt(-c*x + 1)), x)/sqrt(d) + 1/3*a*g/((-c^2*d*x^2 + d)^(3/2)*c^
2*d)
```

### 3.56.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(-c^2*d*x^2+d)^(5/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.56.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d - c^2*d*x^2)^(5/2), x)
```

# 3.57 $\int \frac{a+b \arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx$

### 3.57.1 Optimal result

Integrand size = 31, antiderivative size = 1300

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx =$$
$$-\frac{(cf-2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf-g)^2\sqrt{d-c^2dx^2}}$$
$$-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf-g)\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}}$$
$$-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\csc^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf-g)\sqrt{d-c^2dx^2}}$$
$$-\frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{ig^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{b\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{6d^2(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf+2g)\sqrt{1-c^2x^2}\log\left(\cos\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf+g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b(cf-2g)\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{2d^2(cf-g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{b\sqrt{1-c^2x^2}\log\left(\sin\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\right)}{6d^2(cf-g)\sqrt{d-c^2dx^2}}-\frac{bg^4\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}$$
$$+\frac{bg^4\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d^2(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}-\frac{b\sqrt{1-c^2x^2}\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{12d^2(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{(cf+2g)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{4d^2(cf+g)^2\sqrt{d-c^2dx^2}}$$
$$+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))\sec^2\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{24d^2(cf+g)\sqrt{d-c^2dx^2}}$$

output
```
-1/4*(c*f-2*g)*(a+b*arcsin(c*x))*cot(1/4*Pi+1/2*arcsin(c*x))*(-c^2*x^2+1)^
(1/2)/d^2/(c*f-g)^2/(-c^2*d*x^2+d)^(1/2)-1/12*(a+b*arcsin(c*x))*cot(1/4*Pi
+1/2*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)/(-c^2*d*x^2+d)^(1/2)-1/24
*b*csc(1/4*Pi+1/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)/(-c^2*d*x^
2+d)^(1/2)-1/24*(a+b*arcsin(c*x))*cot(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*Pi+1
/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)/(-c^2*d*x^2+d)^(1/2)+1/6*
b*ln(cos(1/4*Pi+1/2*arcsin(c*x)))*(-c^2*x^2+1)^(1/2)/d^2/(c*f+g)/(-c^2*d*x
^2+d)^(1/2)+1/2*b*(c*f+2*g)*ln(cos(1/4*Pi+1/2*arcsin(c*x)))*(-c^2*x^2+1)^(
1/2)/d^2/(c*f+g)^2/(-c^2*d*x^2+d)^(1/2)+1/2*b*(c*f-2*g)*ln(sin(1/4*Pi+1/2*
arcsin(c*x)))*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)^2/(-c^2*d*x^2+d)^(1/2)+1/6*b*
ln(sin(1/4*Pi+1/2*arcsin(c*x)))*(-c^2*x^2+1)^(1/2)/d^2/(c*f-g)/(-c^2*d*x^2
+d)^(1/2)-I*g^4*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f
-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(c^2*f^2-g^2)^(5/2)/(-c^2*d*
x^2+d)^(1/2)+I*g^4*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(
c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(c^2*f^2-g^2)^(5/2)/(-c^2
*d*x^2+d)^(1/2)-b*g^4*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f
^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d^2/(c^2*f^2-g^2)^(5/2)/(-c^2*d*x^2+d)^
(1/2)+b*g^4*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1
/2)))*(-c^2*x^2+1)^(1/2)/d^2/(c^2*f^2-g^2)^(5/2)/(-c^2*d*x^2+d)^(1/2)-1/24
*b*sec(1/4*Pi+1/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d^2/(c*f+g)/(-c^2*d...
```

### 3.57.2 Mathematica [A] (warning: unable to verify)

Time = 12.89 (sec) , antiderivative size = 2078, normalized size of antiderivative = 1.60

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx = \text{Result too large to show}$$

input
```
Integrate[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(5/2)),x]
```

output
```
Sqrt[-(d*(-1 + c^2*x^2))]*((a*g - a*c^2*f*x)/(3*d^3*(-(c^2*f^2) + g^2)*(-1
 + c^2*x^2)^2) + (-3*a*g^3 - 2*a*c^4*f^3*x + 5*a*c^2*f*g^2*x)/(3*d^3*(-(c^
2*f^2) + g^2)^2*(-1 + c^2*x^2))) + (a*g^4*Log[f + g*x])/(d^(5/2)*(-(c*f) +
 g)^2*(c*f + g)^2*Sqrt[-(c^2*f^2) + g^2]) - (a*g^4*Log[d*g + c^2*d*f*x + S
qrt[d]*Sqrt[-(c^2*f^2) + g^2]*Sqrt[-(d*(-1 + c^2*x^2))]])/(d^(5/2)*(-(c*f)
 + g)^2*(c*f + g)^2*Sqrt[-(c^2*f^2) + g^2]) + (b*((g*(-(c^2*f^2) + 7*g^2)*
(1 - c^2*x^2)^(3/2)*ArcSin[c*x])/(6*(-(c^2*f^2) + g^2)^2*(d*(1 - c^2*x^2))
^(3/2)) + ((4*c*f + 7*g)*(1 - c^2*x^2)^(3/2)*Log[Cos[ArcSin[c*x]/2] - Sin[
ArcSin[c*x]/2]])/(6*(c*f + g)^2*(d*(1 - c^2*x^2))^(3/2)) + ((4*c*f - 7*g)*
(1 - c^2*x^2)^(3/2)*Log[Cos[ArcSin[c*x]/2] + Sin[ArcSin[c*x]/2]])/(6*(c*f
- g)^2*(d*(1 - c^2*x^2))^(3/2)) + (g^4*(1 - c^2*x^2)^(3/2)*((Pi*ArcTan[(g
+ c*f*Tan[ArcSin[c*x]/2])/Sqrt[c^2*f^2 - g^2]])/Sqrt[c^2*f^2 - g^2] + (2*(
Pi/2 - ArcSin[c*x])*ArcTanh[((c*f + g)*Cot[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-
(c^2*f^2) + g^2]] - 2*ArcCos[-((c*f)/g)]*ArcTanh[((-(c*f) + g)*Tan[(Pi/2 -
 ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]] + (ArcCos[-((c*f)/g)] - (2*I)*(A
rcTanh[((c*f + g)*Cot[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]] - A
rcTanh[((-(c*f) + g)*Tan[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]])
)*Log[Sqrt[-(c^2*f^2) + g^2]/(Sqrt[2]*E^((I/2)*(Pi/2 - ArcSin[c*x]))*Sqrt[
g]*Sqrt[c*f + c*g*x])] + (ArcCos[-((c*f)/g)] + (2*I)*(ArcTanh[((c*f + g)*C
ot[(Pi/2 - ArcSin[c*x])/2])/Sqrt[-(c^2*f^2) + g^2]] - ArcTanh[((-(c*f) ...
```

### 3.57.3 Rubi [A] (verified)

Time = 2.08 (sec) , antiderivative size = 821, normalized size of antiderivative = 0.63, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx)}{\left(d-c^2dx^2\right)^{5/2}(f+gx)}dx$$

$$\Big\downarrow \; 5276$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{a+b\arcsin(cx)}{(f+gx)\left(1-c^2x^2\right)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 5274$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(a+b\arcsin(cx))g^4}{(g-cf)^2(cf+g)^2(f+gx)\sqrt{1-c^2x^2}}-\frac{c(cf+2g)(a+b\arcsin(cx))}{4(cf+g)^2(cx-1)\sqrt{1-c^2x^2}}+\frac{c(cf-2g)(a+b\arcsin(cx))}{4(cf-g)^2(cx+1)\sqrt{1-c^2x^2}}+\frac{c(a+b\arcsin(cx))}{4(cf+g)(cx-1)^2\sqrt{1-c^2x^2}}\right.}{d^2\sqrt{d-c^2dx^2}}$$

$\downarrow$ 2009

$$\sqrt{1-c^2x^2}\left(-\frac{i(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)g^4}{(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}}+\frac{i(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)g^4}{(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}}-\frac{b\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(cf-g)^2(cf+g)^2\sqrt{c^2f^2-g^2}}\right.$$

input
```
Int[(a + b*ArcSin[c*x])/((f + g*x)*(d - c^2*d*x^2)^(5/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-1/4*((c*f - 2*g)*(a + b*ArcSin[c*x])*Cot[Pi/4 + ArcSi
n[c*x]/2])/(c*f - g)^2 - ((a + b*ArcSin[c*x])*Cot[Pi/4 + ArcSin[c*x]/2])/(
12*(c*f - g)) - (b*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(24*(c*f - g)) - ((a + b*A
rcSin[c*x])*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(24*(c*
f - g)) - (I*g^4*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
- Sqrt[c^2*f^2 - g^2])])/((c*f - g)^2*(c*f + g)^2*Sqrt[c^2*f^2 - g^2]) + (
I*g^4*(a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*
f^2 - g^2])])/((c*f - g)^2*(c*f + g)^2*Sqrt[c^2*f^2 - g^2]) + (b*Log[Cos[P
i/4 + ArcSin[c*x]/2]])/(6*(c*f + g)) + (b*(c*f + 2*g)*Log[Cos[Pi/4 + ArcSi
n[c*x]/2]])/(2*(c*f + g)^2) + (b*(c*f - 2*g)*Log[Sin[Pi/4 + ArcSin[c*x]/2]
])/(2*(c*f - g)^2) + (b*Log[Sin[Pi/4 + ArcSin[c*x]/2]])/(6*(c*f - g)) - (b
*g^4*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/((c*
f - g)^2*(c*f + g)^2*Sqrt[c^2*f^2 - g^2]) + (b*g^4*PolyLog[2, (I*E^(I*ArcS
in[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/((c*f - g)^2*(c*f + g)^2*Sqrt[c^
2*f^2 - g^2]) - (b*Sec[Pi/4 + ArcSin[c*x]/2]^2)/(24*(c*f + g)) + ((a + b*A
rcSin[c*x])*Tan[Pi/4 + ArcSin[c*x]/2])/(12*(c*f + g)) + ((c*f + 2*g)*(a +
b*ArcSin[c*x])*Tan[Pi/4 + ArcSin[c*x]/2])/(4*(c*f + g)^2) + ((a + b*ArcSin
[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/2])/(24*(c*f + g
))))/(d^2*Sqrt[d - c^2*d*x^2])
```

### 3.57.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.57.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 7970 vs. 2(1102) = 2204.

Time = 1.50 (sec) , antiderivative size = 7971, normalized size of antiderivative = 6.13

| method | result | size |
|---|---|---|
| default | Expression too large to display | 7971 |
| parts | Expression too large to display | 7971 |

input
```
int((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBOSE
)
```

output
```
result too large to display
```

### 3.57.5 Fricas [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x, algorithm="fri
cas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b*arcsin(c*x) + a)/(c^6*d^3*g*x^7 + c^6*d^
3*f*x^6 - 3*c^4*d^3*g*x^5 - 3*c^4*d^3*f*x^4 + 3*c^2*d^3*g*x^3 + 3*c^2*d^3*
f*x^2 - d^3*g*x - d^3*f), x)
```

### 3.57.6 Sympy [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{a+b\operatorname{asin}\left(cx\right)}{\left(-d\left(cx-1\right)\left(cx+1\right)\right)^{\frac{5}{2}}\left(f+gx\right)}\,dx$$

input
```
integrate((a+b*asin(c*x))/(g*x+f)/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))/((-d*(c*x - 1)*(c*x + 1))**(5/2)*(f + g*x)), x)
```

### 3.57.7 Maxima [F]

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx=\int \frac{b\arcsin\left(cx\right)+a}{\left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x, algorithm="max
ima")
```

output
```
integrate((b*arcsin(c*x) + a)/((-c^2*d*x^2 + d)^(5/2)*(g*x + f)), x)
```

### 3.57.8 Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\left(d-c^2dx^2\right)^{5/2}}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))/(g*x+f)/(-c^2*d*x^2+d)^(5/2),x, algorithm="gia
c")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.57.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx)}{(f+gx)\,(d-c^2dx^2)^{5/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x)}{(f+g\,x)\,\left(d-c^2\,d\,x^2\right)^{5/2}}\,dx$$

input
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(5/2)),x)
```

output
```
int((a + b*asin(c*x))/((f + g*x)*(d - c^2*d*x^2)^(5/2)), x)
```

# 3.58 $\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$

### 3.58.1 Optimal result

Integrand size = 33, antiderivative size = 1154

$$
\begin{aligned}
&\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx \\
&= \frac{4b^2f^2g\sqrt{d-c^2dx^2}}{3c^2}+\frac{52b^2g^3\sqrt{d-c^2dx^2}}{225c^4}-\frac{1}{4}b^2f^3x\sqrt{d-c^2dx^2} \\
&+\frac{3b^2fg^2x\sqrt{d-c^2dx^2}}{64c^2}-\frac{3}{32}b^2fg^2x^3\sqrt{d-c^2dx^2}+\frac{4abg^3x\sqrt{d-c^2dx^2}}{15c^3\sqrt{1-c^2x^2}} \\
&+\frac{2b^2f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{9c^2}+\frac{26b^2g^3(1-c^2x^2)\sqrt{d-c^2dx^2}}{675c^4} \\
&-\frac{2b^2g^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^4}+\frac{b^2f^3\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} \\
&-\frac{3b^2fg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{4b^2g^3x\sqrt{d-c^2dx^2}\arcsin(cx)}{15c^3\sqrt{1-c^2x^2}} \\
&+\frac{2bf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{c\sqrt{1-c^2x^2}}-\frac{bcf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\
&+\frac{3bfg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}}-\frac{2bcf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3\sqrt{1-c^2x^2}} \\
&+\frac{2bg^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{45c\sqrt{1-c^2x^2}}-\frac{3bcfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&-\frac{2bcg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{2g^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^4} \\
&+\frac{1}{2}f^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{3fg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} \\
&-\frac{g^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{15c^2}+\frac{3}{4}fg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+\frac{1}{5}g^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{f^2g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{c^2} \\
&+\frac{f^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{fg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc^3\sqrt{1-c^2x^2}}
\end{aligned}
$$

output
```
4/15*a*b*g^3*x*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)-3/64*b^2*f*g^2*
arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+4/15*b^2*g^3*x*arc
sin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)-1/2*b*c*f^3*x^2*(a+b*
arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/45*b*g^3*x^3*(a+b*a
rcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-2/25*b*c*g^3*x^5*(a+
b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/8*f*g^2*(a+b*arcs
in(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)+52/225*b^2*g^3*(-
c^2*d*x^2+d)^(1/2)/c^4-1/4*b^2*f^3*x*(-c^2*d*x^2+d)^(1/2)-2/15*g^3*(a+b*ar
csin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^4+1/2*f^3*x*(a+b*arcsin(c*x))^2*(-c^2*
d*x^2+d)^(1/2)+1/5*g^3*x^4*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-f^2*g*
(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+3/4*f*g^2*x^3*(a
+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+4/3*b^2*f^2*g*(-c^2*d*x^2+d)^(1/2)/
c^2-3/32*b^2*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2)+26/675*b^2*g^3*(-c^2*x^2+1)*(-
c^2*d*x^2+d)^(1/2)/c^4-2/125*b^2*g^3*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c
^4-1/15*g^3*x^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+3/64*b^2*f*g^
2*x*(-c^2*d*x^2+d)^(1/2)/c^2+2/9*b^2*f^2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/
2)/c^2-3/8*f*g^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*b^2*f^
3*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+1/6*f^3*(a+b*arcsi
n(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+2*b*f^2*g*x*(a+b*arc
sin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+3/8*b*f*g^2*x^2*(a+...
```

### 3.58.2 Mathematica [A] (verified)

Time = 0.74 (sec) , antiderivative size = 708, normalized size of antiderivative = 0.61

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$

$$= \frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}f^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{3}{4}fg^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{1}{5}g^3x^4\sqrt{1-c^2x\right.}{}$$

input
```
Integrate[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((f^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 +
(3*f*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/4 + (g^3*x^4*Sqrt[1
- c^2*x^2]*(a + b*ArcSin[c*x])^2)/5 - (f^2*g*(1 - c^2*x^2)^(3/2)*(a + b*Ar
cSin[c*x])^2)/c^2 + (f^3*(a + b*ArcSin[c*x])^3)/(6*b*c) - (2*b*g^3*(15*a*c
^5*x^5 + b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4) + 15*b*c^5*x^5*Ar
cSin[c*x]))/(375*c^4) - (2*b*f^2*g*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3
*a*c*x*(-3 + c^2*x^2) + 3*b*c*x*(-3 + c^2*x^2)*ArcSin[c*x]))/(9*c^2) - (b*
f^3*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x])
)/(4*c) - (3*b*f*g^2*(8*a*c^4*x^4 + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2
) + b*(-3 + 8*c^4*x^4)*ArcSin[c*x]))/(64*c^3) + (g^3*(-9*a^2*Sqrt[1 - c^2*
x^2]*(2 + c^2*x^2) + 6*a*b*c*x*(6 + c^2*x^2) + 2*b^2*Sqrt[1 - c^2*x^2]*(20
 + c^2*x^2) + 6*b*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x*(6 + c^2*x
^2))*ArcSin[c*x] - 9*b^2*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]^2))/(
135*c^4) - (f*g^2*(6*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (2*(a +
 b*ArcSin[c*x])^3)/b - 3*b*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 +
2*c^2*x^2)*ArcSin[c*x]))/(16*c^3)))/Sqrt[1 - c^2*x^2]
```

### 3.58.3 Rubi [A] (verified)

Time = 1.74 (sec) , antiderivative size = 750, normalized size of antiderivative = 0.65, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)^3(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{d-c^2dx^2}\int \left(\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2f^3+3gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2f^2+3g^2x^2\sqrt{1-c^2x^2}(a+b\,\text{arc}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{d-c^2dx^2}\left(\frac{fg^2(a+b\arcsin(cx))^3}{8bc^3}+\frac{1}{2}f^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{f^2g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c^2}-\frac{3fg^2x\sqrt{1-c^2x^2}}{8}\right.$$

input
```
Int[(f + g*x)^3*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((4*a*b*g^3*x)/(15*c^3) + (4*b^2*f^2*g*Sqrt[1 - c^2*x
^2])/(3*c^2) + (52*b^2*g^3*Sqrt[1 - c^2*x^2])/(225*c^4) - (b^2*f^3*x*Sqrt[
1 - c^2*x^2])/4 + (3*b^2*f*g^2*x*Sqrt[1 - c^2*x^2])/(64*c^2) - (3*b^2*f*g^
2*x^3*Sqrt[1 - c^2*x^2])/32 + (2*b^2*f^2*g*(1 - c^2*x^2)^(3/2))/(9*c^2) +
(26*b^2*g^3*(1 - c^2*x^2)^(3/2))/(675*c^4) - (2*b^2*g^3*(1 - c^2*x^2)^(5/2
))/(125*c^4) + (b^2*f^3*ArcSin[c*x])/(4*c) - (3*b^2*f*g^2*ArcSin[c*x])/(64
*c^3) + (4*b^2*g^3*x*ArcSin[c*x])/(15*c^3) + (2*b*f^2*g*x*(a + b*ArcSin[c*
x]))/c - (b*c*f^3*x^2*(a + b*ArcSin[c*x]))/2 + (3*b*f*g^2*x^2*(a + b*ArcSi
n[c*x]))/(8*c) - (2*b*c*f^2*g*x^3*(a + b*ArcSin[c*x]))/3 + (2*b*g^3*x^3*(a
 + b*ArcSin[c*x]))/(45*c) - (3*b*c*f*g^2*x^4*(a + b*ArcSin[c*x]))/8 - (2*b
*c*g^3*x^5*(a + b*ArcSin[c*x]))/25 - (2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x])^2)/(15*c^4) + (f^3*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 -
(3*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) - (g^3*x^2*Sqr
t[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(15*c^2) + (3*f*g^2*x^3*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x])^2)/4 + (g^3*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x])^2)/5 - (f^2*g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/c^2 + (f^3*
(a + b*ArcSin[c*x])^3)/(6*b*c) + (f*g^2*(a + b*ArcSin[c*x])^3)/(8*b*c^3)))
/Sqrt[1 - c^2*x^2]
```

### 3.58.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.58.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.86 (sec) , antiderivative size = 2728, normalized size of antiderivative = 2.36

| method | result | size |
|---|---|---|
| default | Expression too large to display | 2728 |
| parts | Expression too large to display | 2728 |

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^3*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1
/2)*x/(-c^2*d*x^2+d)^(1/2)))+g^3*(-1/5*x^2*(-c^2*d*x^2+d)^(3/2)/c^2/d-2/15
/d/c^4*(-c^2*d*x^2+d)^(3/2))+3*f*g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/
4/c^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)
*x/(-c^2*d*x^2+d)^(1/2))))-f^2*g*(-c^2*d*x^2+d)^(3/2)/c^2/d)+b^2*(-1/24*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*f*(4
*c^2*f^2+3*g^2)+1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*
(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*
(-c^2*x^2+1)^(1/2)*x*c-1)*g^3*(10*I*arcsin(c*x)+25*arcsin(c*x)^2-2)/c^4/(c
^2*x^2-1)+3/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*
c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c
*x)*f*g^2*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1)+1/864*(-d*(c
^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(
-c^2*x^2+1)^(1/2)*x*c+1)*g*(72*I*arcsin(c*x)*c^2*f^2+108*arcsin(c*x)^2*c^2
*f^2+6*I*arcsin(c*x)*g^2+9*arcsin(c*x)^2*g^2-24*c^2*f^2-2*g^2)/c^4/(c^2*x^
2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^
3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^3*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c
^2*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)
*g*(12*I*arcsin(c*x)*c^2*f^2+6*arcsin(c*x)^2*c^2*f^2+2*I*arcsin(c*x)*g^2+a
rcsin(c*x)^2*g^2-12*c^2*f^2-2*g^2)/c^4/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1)...
```

### 3.58.5 Fricas [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral((a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*g
^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*b
*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d), x)
```

### 3.58.6 Sympy [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int \sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))^2(f+gx)^3\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))**2*(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2*(f + g*x)**3, x
)
```

### 3.58.7 Maxima [F]

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\int \sqrt{-c^2dx^2+d}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm=
"maxima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2*f^3 - 1/15*a^2*g^
3*(3*(-c^2*d*x^2 + d)^(3/2)*x^2/(c^2*d) + 2*(-c^2*d*x^2 + d)^(3/2)/(c^4*d)
) + 3/8*a^2*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x
/(c^2*d) + sqrt(d)*arcsin(c*x)/c^3) - (-c^2*d*x^2 + d)^(3/2)*a^2*f^2*g/(c^
2*d) + sqrt(d)*integrate(((b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x +
 b^2*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^3*x^3 +
3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

### 3.58.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.58.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

# 3.59 $\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$



## 3.59.1 Optimal result

Integrand size = 33, antiderivative size = 737

$$\begin{aligned}
&\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx \\
&= \frac{8b^2fg\sqrt{d-c^2dx^2}}{9c^2}-\frac{1}{4}b^2f^2x\sqrt{d-c^2dx^2}+\frac{b^2g^2x\sqrt{d-c^2dx^2}}{64c^2}-\frac{1}{32}b^2g^2x^3\sqrt{d-c^2dx^2} \\
&\quad+\frac{4b^2fg(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}+\frac{b^2f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} \\
&\quad-\frac{b^2g^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c^3\sqrt{1-c^2x^2}}+\frac{4bfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}} \\
&\quad-\frac{bcf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}}+\frac{bg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c\sqrt{1-c^2x^2}} \\
&\quad-\frac{4bcfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}-\frac{bcg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} \\
&\quad+\frac{1}{2}f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{8c^2} \\
&\quad+\frac{1}{4}g^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{2fg(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2} \\
&\quad+\frac{f^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}+\frac{g^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{24bc^3\sqrt{1-c^2x^2}}
\end{aligned}$$

output
```
8/9*b^2*f*g*(-c^2*d*x^2+d)^(1/2)/c^2-1/4*b^2*f^2*x*(-c^2*d*x^2+d)^(1/2)+1/
64*b^2*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2-1/32*b^2*g^2*x^3*(-c^2*d*x^2+d)^(1/2
)+4/27*b^2*f*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+1/2*f^2*x*(a+b*arcsin
(c*x))^2*(-c^2*d*x^2+d)^(1/2)-1/8*g^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)
^(1/2)/c^2+1/4*g^2*x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-2/3*f*g*(-
c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*b^2*f^2*arcsin
(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/64*b^2*g^2*arcsin(c*x)*(
-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+4/3*b*f*g*x*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*c*f^2*x^2*(a+b*arcsin(c*x))
*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/8*b*g^2*x^2*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/9*b*c*f*g*x^3*(a+b*arcsin(c*x))
*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-1/8*b*c*g^2*x^4*(a+b*arcsin(c*x))
*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*f^2*(a+b*arcsin(c*x))^3*(-c^2
*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+1/24*g^2*(a+b*arcsin(c*x))^3*(-c^2*
d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)
```

### 3.59.2 Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 441, normalized size of antiderivative = 0.60

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+\frac{1}{4}g^2x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{2fg(1-c^2x^2)^{3/2}(a+b\,a}{3c^2}\right.}{}$$

input
```
Integrate[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 +
(g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/4 - (2*f*g*(1 - c^2*x^2)
^(3/2)*(a + b*ArcSin[c*x])^2)/(3*c^2) + (f^2*(a + b*ArcSin[c*x])^3)/(6*b*c
) - (4*b*f*g*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x*(-3 + c^2*x^2)
+ 3*b*c*x*(-3 + c^2*x^2)*ArcSin[c*x]))/(27*c^2) - (b*f^2*(c*x*(2*a*c*x + b
*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x]))/(4*c) - (b*g^2*(8*a
*c^4*x^4 + b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) + b*(-3 + 8*c^4*x^4)*Ar
cSin[c*x]))/(64*c^3) - (g^2*(6*b*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^2 - 2*(a + b*ArcSin[c*x])^3 - 3*b^2*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2])
+ b*(-1 + 2*c^2*x^2)*ArcSin[c*x])))/(48*b*c^3)))/Sqrt[1 - c^2*x^2]
```

### 3.59.3 Rubi [A] (verified)

Time = 1.14 (sec) , antiderivative size = 477, normalized size of antiderivative = 0.65, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)^2(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \ 5276$$

$$\frac{\sqrt{d-c^2dx^2}\int (f+gx)^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \ 5262$$

$$\frac{\sqrt{d-c^2dx^2}\int \Big(f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+g^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+2fgx\sqrt{1-c^2x^2}(a+b\arcsin\cdots}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \ 2009$$

$$\sqrt{d-c^2dx^2}\Bigg(\frac{g^2(a+b\arcsin(cx))^3}{24bc^3}+\frac{1}{2}f^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{2fg\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{3c^2}-\frac{g^2x\sqrt{1-c^2x^2}(a+\cdots}{8c^2}\cdots$$

input
```
Int[(f + g*x)^2*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((8*b^2*f*g*Sqrt[1 - c^2*x^2])/(9*c^2) - (b^2*f^2*x*S
qrt[1 - c^2*x^2])/4 + (b^2*g^2*x*Sqrt[1 - c^2*x^2])/(64*c^2) - (b^2*g^2*x^
3*Sqrt[1 - c^2*x^2])/32 + (4*b^2*f*g*(1 - c^2*x^2)^(3/2))/(27*c^2) + (b^2*
f^2*ArcSin[c*x])/(4*c) - (b^2*g^2*ArcSin[c*x])/(64*c^3) + (4*b*f*g*x*(a +
b*ArcSin[c*x]))/(3*c) - (b*c*f^2*x^2*(a + b*ArcSin[c*x]))/2 + (b*g^2*x^2*(
a + b*ArcSin[c*x]))/(8*c) - (4*b*c*f*g*x^3*(a + b*ArcSin[c*x]))/9 - (b*c*g
^2*x^4*(a + b*ArcSin[c*x]))/8 + (f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x
])^2)/2 - (g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(8*c^2) + (g^2*x
^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/4 - (2*f*g*(1 - c^2*x^2)^(3/2)
*(a + b*ArcSin[c*x])^2)/(3*c^2) + (f^2*(a + b*ArcSin[c*x])^3)/(6*b*c) + (g
^2*(a + b*ArcSin[c*x])^3)/(24*b*c^3)))/Sqrt[1 - c^2*x^2]
```

#### 3.59.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.59.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.73 (sec) , antiderivative size = 1852, normalized size of antiderivative = 2.51

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1852 |
| parts | Expression too large to display | 1852 |

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1
/2)*x/(-c^2*d*x^2+d)^(1/2)))+g^2*(-1/4*x*(-c^2*d*x^2+d)^(3/2)/c^2/d+1/4/c^
2*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(
-c^2*d*x^2+d)^(1/2))))-2/3*f*g*(-c^2*d*x^2+d)^(3/2)/c^2/d)+b^2*(-1/24*(-d*
(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*(4*c^2
*f^2+g^2)+1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*
c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+4*c
*x)*g^2*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)/c^3/(c^2*x^2-1)+1/108*(-d*(c^2
*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(-c
^2*x^2+1)^(1/2)*x*c+1)*f*g*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^
2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^
3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(2*I*arcsin(c*x)+2*arcsin(c*x)^2-1)/c/(c
^2*x^2-1)-1/4*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*
f*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/(c^2*x^2-1)-1/4*(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsi
n(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f^2*(-2*I*arcsin(c*x)+2*ar
csin(c*x)^2-1)/c/(c^2*x^2-1)+1/108*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c
^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*f*g*(-6*
I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1)+1/512*(-d*(c^2*x^2-1))...
```

### 3.59.5 Fricas [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral((a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin
(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

### 3.59.6 Sympy [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)^2\;dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))**2*(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2*(f + g*x)**2, x
)
```

### 3.59.7 Maxima [F]

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int\sqrt{-c^2dx^2+d}(gx+f)^2(b\arcsin\,(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm=
"maxima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2*f^2 + 1/8*a^2*g^2
*(sqrt(-c^2*d*x^2 + d)*x/c^2 - 2*(-c^2*d*x^2 + d)^(3/2)*x/(c^2*d) + sqrt(d
)*arcsin(c*x)/c^3) - 2/3*(-c^2*d*x^2 + d)^(3/2)*a^2*f*g/(c^2*d) + sqrt(d)*
integrate(((b^2*g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arctan2(c*x, sqrt(c*x + 1
)*sqrt(-c*x + 1))^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arctan2(c*x,
 sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

### 3.59.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.59.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx=\int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

# 3.60 $\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$



## 3.60.1 Optimal result

Integrand size = 31, antiderivative size = 396

$$\begin{aligned}\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx &= \frac{4b^2g\sqrt{d-c^2dx^2}}{9c^2}-\frac{1}{4}b^2fx\sqrt{d-c^2dx^2} \\ &+\frac{2b^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{27c^2}+\frac{b^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{4c\sqrt{1-c^2x^2}} \\ &+\frac{2bgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{3c\sqrt{1-c^2x^2}}-\frac{bcfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{2\sqrt{1-c^2x^2}} \\ &-\frac{2bcgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{9\sqrt{1-c^2x^2}}+\frac{1}{2}fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\ &-\frac{g(1-c^2x^2)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{3c^2}+\frac{f\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{6bc\sqrt{1-c^2x^2}}\end{aligned}$$

output
```
4/9*b^2*g*(-c^2*d*x^2+d)^(1/2)/c^2-1/4*b^2*f*x*(-c^2*d*x^2+d)^(1/2)+2/27*b
^2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+1/2*f*x*(a+b*arcsin(c*x))^2*(-c
^2*d*x^2+d)^(1/2)-1/3*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1
/2)/c^2+1/4*b^2*f*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/
3*b*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-1/2*b*
c*f*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/9*b*c*
g*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/6*f*(a+b
*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

### 3.60.2 Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 225, normalized size of antiderivative = 0.57

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx$$
$$=\frac{\sqrt{d-c^2dx^2}\left(54fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{36g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{c^2}+\frac{18f(a+b\arcsin(cx))^3}{bc}-\frac{8bg\left(b\sqrt{1-\cdots}\right.}{\cdots}\right.}{108\sqrt{1-c^2x\cdots}}$$

input
```
Integrate[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*(54*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (36
*g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/c^2 + (18*f*(a + b*ArcSin[c*
x])^3)/(b*c) - (8*b*g*(b*Sqrt[1 - c^2*x^2]*(-7 + c^2*x^2) + 3*a*c*x*(-3 +
c^2*x^2) + 3*b*c*x*(-3 + c^2*x^2)*ArcSin[c*x]))/c^2 - (27*b*f*(c*x*(2*a*c*
x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*ArcSin[c*x]))/c))/(108*Sqrt[
1 - c^2*x^2])
```

### 3.60.3 Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 256, normalized size of antiderivative = 0.65, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{d-c^2dx^2}(f+gx)(a+b\arcsin(cx))^2\,dx$$
$$\Big\downarrow \text{5276}$$
$$\frac{\sqrt{d-c^2dx^2}\int(f+gx)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$
$$\Big\downarrow \text{5262}$$
$$\frac{\sqrt{d-c^2dx^2}\int\left(f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\right)dx}{\sqrt{1-c^2x^2}}$$
$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{1}{2}fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2-\frac{g(1-c^2x^2)^{3/2}(a+b\arcsin(cx))^2}{3c^2}-\frac{1}{2}bcfx^2(a+b\arcsin(cx))+\frac{f(a+b\arcsin}{6b}\right.}{\sqrt{}}$$

input
```
Int[(f + g*x)*Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2,x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((4*b^2*g*Sqrt[1 - c^2*x^2])/(9*c^2) - (b^2*f*x*Sqrt[
1 - c^2*x^2])/4 + (2*b^2*g*(1 - c^2*x^2)^(3/2))/(27*c^2) + (b^2*f*ArcSin[c
*x])/(4*c) + (2*b*g*x*(a + b*ArcSin[c*x]))/(3*c) - (b*c*f*x^2*(a + b*ArcSi
n[c*x]))/2 - (2*b*c*g*x^3*(a + b*ArcSin[c*x]))/9 + (f*x*Sqrt[1 - c^2*x^2]*
(a + b*ArcSin[c*x])^2)/2 - (g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(
3*c^2) + (f*(a + b*ArcSin[c*x])^3)/(6*b*c)))/Sqrt[1 - c^2*x^2]
```

### 3.60.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.60.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.65 (sec) , antiderivative size = 1236, normalized size of antiderivative = 3.12

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1236 |
| parts | Expression too large to display | 1236 |

input
```
int((g*x+f)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
1/2*a^2*f*x*(-c^2*d*x^2+d)^(1/2)+1/2*a^2*f*d/(c^2*d)^(1/2)*arctan((c^2*d)^
(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/3*a^2*g*(-c^2*d*x^2+d)^(3/2)/c^2/d+b^2*(-1
/6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*f
+1/216*(-d*(c^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1
)^(1/2)+3*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2
)/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2
*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(2*I*arcsin(c*x)+2*arcsin(c*x
)^2-1)/c/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1
/2)*x*c-1)*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/(c^2*x^2-1)-1/8*(-d*(c^
2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*
I*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+
1)^(1/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-2*I*arcsin(c*x)
+2*arcsin(c*x)^2-1)/c/(c^2*x^2-1)+1/216*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^
3*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(
-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^2/(c^2*x^2-1))+2*a*b*(-1/4*(-d*(c^2*
x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^2*f+1/72*(-d*(c
^2*x^2-1))^(1/2)*(4*c^4*x^4-5*c^2*x^2-4*I*c^3*x^3*(-c^2*x^2+1)^(1/2)+3*I*(
-c^2*x^2+1)^(1/2)*x*c+1)*g*(I+3*arcsin(c*x))/c^2/(c^2*x^2-1)+1/16*(-d*(c^2
*x^2-1))^(1/2)*(-2*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+2*c^3*x^3+I*(-c^2*x^2+1)^(
1/2)-2*c*x)*f*(I+2*arcsin(c*x))/c/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2...
```

### 3.60.5 Fricas [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(
c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x)), x)
```

### 3.60.6 Sympy [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-d(cx-1)(cx+1)}(a+b\operatorname{asin}(cx))^2(f+gx)\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))**2*(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2*(f + g*x), x)
```

### 3.60.7 Maxima [F]

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int \sqrt{-c^2dx^2+d}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
1/2*(sqrt(-c^2*d*x^2 + d)*x + sqrt(d)*arcsin(c*x)/c)*a^2*f - 1/3*(-c^2*d*x
^2 + d)^(3/2)*a^2*g/(c^2*d) + sqrt(d)*integrate(((b^2*g*x + b^2*f)*arctan2
(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g*x + a*b*f)*arctan2(c*x, s
qrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

### 3.60.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.60.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\sqrt{d-c^2\,d\,x^2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2), x)
```

# 3.61 $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

### 3.61.1 Optimal result

Integrand size = 33, antiderivative size = 1442

$$
\begin{aligned}
&\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx \\
&= \frac{a^2\sqrt{d-c^2dx^2}}{g}-\frac{2b^2\sqrt{d-c^2dx^2}}{g}-\frac{2abcx\sqrt{d-c^2dx^2}}{g\sqrt{1-c^2x^2}} \\
&\quad+\frac{2ab\sqrt{d-c^2dx^2}\arcsin(cx)}{g}-\frac{2b^2cx\sqrt{d-c^2dx^2}\arcsin(cx)}{g\sqrt{1-c^2x^2}} \\
&\quad+\frac{b^2\sqrt{d-c^2dx^2}\arcsin(cx)^2}{g}+\frac{cx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bg\sqrt{1-c^2x^2}} \\
&\quad-\frac{\left(1-\frac{c^2f^2}{g^2}\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)\sqrt{1-c^2x^2}}+\frac{\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{3bc(f+gx)} \\
&\quad-\frac{a^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{g+c^2fx}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{2iab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad-\frac{2iab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad-\frac{ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{2ab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{2b^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad-\frac{2ab\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad-\frac{2b^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\arcsin(cx)\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad+\frac{2ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}} \\
&\quad-\frac{2ib^2\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g^2\sqrt{1-c^2x^2}}
\end{aligned}
$$

output
```
a^2*(-c^2*d*x^2+d)^(1/2)/g-2*b^2*(-c^2*d*x^2+d)^(1/2)/g+2*a*b*arcsin(c*x)*
(-c^2*d*x^2+d)^(1/2)/g+b^2*arcsin(c*x)^2*(-c^2*d*x^2+d)^(1/2)/g-2*a*b*c*x*
(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)-2*b^2*c*x*arcsin(c*x)*(-c^2*d*x^
2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+1/3*c*x*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)
^(1/2)/b/g/(-c^2*x^2+1)^(1/2)-1/3*(1-c^2*f^2/g^2)*(a+b*arcsin(c*x))^3*(-c^
2*d*x^2+d)^(1/2)/b/c/(g*x+f)/(-c^2*x^2+1)^(1/2)-a^2*arctan((c^2*f*x+g)/(c^
2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1
/2)/g^2/(-c^2*x^2+1)^(1/2)+I*b^2*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^
(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/
2)/g^2/(-c^2*x^2+1)^(1/2)-2*I*a*b*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2
)/g^2/(-c^2*x^2+1)^(1/2)+2*I*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/
(c*f-(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-
c^2*x^2+1)^(1/2)+2*I*a*b*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(
c*f-(c^2*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c
^2*x^2+1)^(1/2)+2*a*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f
^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^
(1/2)+2*b^2*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2
*f^2-g^2)^(1/2)))*(c^2*f^2-g^2)^(1/2)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1
)^(1/2)-2*a*b*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^...
```

### 3.61.2 Mathematica [A] (verified)

Time = 0.97 (sec) , antiderivative size = 516, normalized size of antiderivative = 0.36

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$$
$$= \frac{\sqrt{d-c^2dx^2}\Big((c^2f^2-g^2)\,(a+b\arcsin(cx))^3+c^2gx(f+gx)(a+b\arcsin(cx))^3+g^2(1-c^2x^2)\,(a+b\arcsi$$

input
```
Integrate[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(Sqrt[d - c^2*d*x^2]*((c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^3 + c^2*g*x*(f +
 g*x)*(a + b*ArcSin[c*x])^3 + g^2*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^3 + 3*
b*c*(f + g*x)*(g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*g*(a*c*x +
b*Sqrt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]) + I*Sqrt[c^2*f^2 - g^2]*((a + b*A
rcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2
])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^
2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x
])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2
, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + 2*b^2*PolyLog[3,
(I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] - 2*b^2*PolyLog[3, (I
*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/(3*b*c*g^2*(f + g*x
)*Sqrt[1 - c^2*x^2])
```

### 3.61.3 Rubi [A] (verified)

Time = 3.19 (sec) , antiderivative size = 1018, normalized size of antiderivative = 0.71, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.212$, Rules used = {5276, 5264, 25, 5256, 25, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{d-c^2dx^2}\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5264}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^3}{3bc(f+gx)}-\frac{\int -\frac{(gx^2c^2+2fxc^2+g)(a+b\arcsin(cx))^3}{(f+gx)^2}dx}{3bc}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{25}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{\int \frac{(gx^2c^2+2fxc^2+g)(a+b\arcsin(cx))^3}{(f+gx)^2}dx}{3bc}+\frac{(1-c^2x^2)(a+b\arcsin(cx))^3}{3bc(f+gx)}\right)}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5256}$$

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{-3bc\int -\frac{\left(\frac{1}{f+gx}-\frac{c^2\left(\frac{f^2}{f+gx}+gx\right)}{g^2}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^3}{f+gx}+\frac{c^2x(a+b\arcsin(cx))^3}{g}}{3bc}+\frac{(1-c^2x^2)(a+b\arcsi\ldots}{3bc(f+gx)}\right.}{\sqrt{1-c^2x^2}}$$

$\big\downarrow$ 25

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{3bc\int \frac{\left(\frac{1}{f+gx}-\frac{c^2\left(\frac{f^2}{f+gx}+gx\right)}{g^2}\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^3}{f+gx}+\frac{c^2x(a+b\arcsin(cx))^3}{g}}{3bc}+\frac{(1-c^2x^2)(a+b\arcsin(c\ldots}{3bc(f+gx)}\right.}{\sqrt{1-c^2x^2}}$$

$\big\downarrow$ 5298

$$\frac{\sqrt{d-c^2dx^2}\left(\frac{3bc\int\left(-\frac{(f^2c^2+g^2x^2c^2+fgxc^2-g^2)a^2}{g^2(f+gx)\sqrt{1-c^2x^2}}-\frac{2b(f^2c^2+g^2x^2c^2+fgxc^2-g^2)\arcsin(cx)a}{g^2(f+gx)\sqrt{1-c^2x^2}}-\frac{b^2(f^2c^2+g^2x^2c^2+fgxc^2-g^2)\arcsin(cx)^2}{g^2(f+gx)\sqrt{1-c^2x^2}}\right)dx-\frac{(1\ldots}{\ldots}}{3bc}\right.}{\sqrt{1-c^2x^2}}$$

$\big\downarrow$ 2009

$$\sqrt{d-c^2dx^2}\left(\frac{(1-c^2x^2)(a+b\arcsin(cx))^3}{3bc(f+gx)}+\frac{\frac{c^2x(a+b\arcsin(cx))^3}{g}-\frac{\left(1-\frac{c^2f^2}{g^2}\right)(a+b\arcsin(cx))^3}{f+gx}+3bc\left(-\frac{\sqrt{c^2f^2-g^2}\arctan\left(\frac{fxc^2+g}{\sqrt{c^2f^2-g^2}\sqrt{1-c^2x^2}}\right)\ldots}{g^2}\right.}{\ldots}\right.$$

input
```
Int[(Sqrt[d - c^2*d*x^2]*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

3.61. $\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

output
```
(Sqrt[d - c^2*d*x^2]*(((1 - c^2*x^2)*(a + b*ArcSin[c*x])^3)/(3*b*c*(f + g*
x)) + ((c^2*x*(a + b*ArcSin[c*x])^3)/g - ((1 - (c^2*f^2)/g^2)*(a + b*ArcSi
n[c*x])^3)/(f + g*x) + 3*b*c*((-2*a*b*c*x)/g + (a^2*Sqrt[1 - c^2*x^2])/g -
 (2*b^2*Sqrt[1 - c^2*x^2])/g - (2*b^2*c*x*ArcSin[c*x])/g + (2*a*b*Sqrt[1 -
 c^2*x^2]*ArcSin[c*x])/g + (b^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x]^2)/g - (a^2*
Sqrt[c^2*f^2 - g^2]*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2
*x^2])])/g^2 + ((2*I)*a*b*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*
ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2 + (I*b^2*Sqrt[c^2*f^2 -
g^2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g
^2])])/g^2 - ((2*I)*a*b*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*Log[1 - (I*E^(I*Ar
cSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^2 - (I*b^2*Sqrt[c^2*f^2 - g^
2]*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2
])])/g^2 + (2*a*b*Sqrt[c^2*f^2 - g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(
c*f - Sqrt[c^2*f^2 - g^2])])/g^2 + (2*b^2*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*
PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^2 - (2*
a*b*Sqrt[c^2*f^2 - g^2]*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2
*f^2 - g^2])])/g^2 - (2*b^2*Sqrt[c^2*f^2 - g^2]*ArcSin[c*x]*PolyLog[2, (I*
E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^2 + ((2*I)*b^2*Sqrt[c
^2*f^2 - g^2]*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2
])])/g^2 - ((2*I)*b^2*Sqrt[c^2*f^2 - g^2]*PolyLog[3, (I*E^(I*ArcSin[c*x...
```

### 3.61.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5256
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c
*n   Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[
p, 0] && EqQ[e*g - 2*d*h, 0]
```

rule 5264
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_)*Sqrt[
(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[(f + g*x)^m*(d + e*x^2)*((a + b*Arc
Sin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[1/(b*c*Sqrt[d]*(n + 1))
   Int[(d*g*m + 2*e*f*x + e*g*(m + 2)*x^2)*(f + g*x)^(m - 1)*(a + b*ArcSin[
c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && EqQ[c^2*d + e,
0] && ILtQ[m, 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

### 3.61.4 Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2\sqrt{-c^2d\,x^2+d}}{gx+f}dx$$

input
```
int((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x)
```

output
```
int((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x)
```

### 3.61.5 Fricas [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{\sqrt{-c^2dx^2+d}(b\arcsin(cx)+a)^2}{gx+f}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(g*x + f), x)
```

### 3.61.6 Sympy [F]

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{\sqrt{-d\,(cx-1)\,(cx+1)}(a+b\,\mathrm{asin}\,(cx))^2}{f+gx}\,dx$$

input
```
integrate((a+b*asin(c*x))**2*(-c**2*d*x**2+d)**(1/2)/(g*x+f),x)
```

output
```
Integral(sqrt(-d*(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))**2/(f + g*x), x)
```

### 3.61.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="m
axima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

### 3.61.8 Giac [F(-2)]

Exception generated.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/(g*x+f),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.61.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2\sqrt{d-c^2\,d\,x^2}}{f+g\,x}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(1/2))/(f + g*x), x)
```

# 3.62 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx$

### 3.62.1 Optimal result

Integrand size = 33, antiderivative size = 1685

$$\int (f+gx)^3\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\frac{16b^2df^2g\sqrt{d-c^2dx^2}}{25c^2}$$
$$+\frac{304b^2dg^3\sqrt{d-c^2dx^2}}{3675c^4}-\frac{15}{64}b^2df^3x\sqrt{d-c^2dx^2}-\frac{7b^2dfg^2x\sqrt{d-c^2dx^2}}{384c^2}$$
$$-\frac{43}{576}b^2dfg^2x^3\sqrt{d-c^2dx^2}+\frac{1}{36}b^2c^2dfg^2x^5\sqrt{d-c^2dx^2}$$
$$+\frac{4abdg^3x\sqrt{d-c^2dx^2}}{35c^3\sqrt{1-c^2x^2}}+\frac{8b^2df^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{75c^2}$$
$$+\frac{152b^2dg^3(1-c^2x^2)\sqrt{d-c^2dx^2}}{11025c^4}-\frac{1}{32}b^2df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}$$
$$+\frac{6b^2df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2}+\frac{38b^2dg^3(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{6125c^4}$$
$$-\frac{2b^2dg^3(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^4}+\frac{9b^2df^3\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}}$$
$$+\frac{7b^2dfg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{384c^3\sqrt{1-c^2x^2}}+\frac{4b^2dg^3x\sqrt{d-c^2dx^2}\arcsin(cx)}{35c^3\sqrt{1-c^2x^2}}$$
$$+\frac{6bdf^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}}-\frac{3bcdf^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}}$$
$$+\frac{3bdfg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}}-\frac{4bcdf^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5\sqrt{1-c^2x^2}}$$
$$+\frac{2bdg^3x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{105c\sqrt{1-c^2x^2}}-\frac{7bcdfg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}}$$
$$+\frac{6bc^3df^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}}-\frac{16bcdg^3x^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{175\sqrt{1-c^2x^2}}$$
$$+\frac{bc^3dfg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{6\sqrt{1-c^2x^2}}+\frac{2bc^3dg^3x^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}}$$
$$+\frac{bdf^3(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c}-\frac{2dg^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^4}$$
$$+\frac{3}{8}df^3x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{3dfg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2}$$
$$-\frac{dg^3x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{35c^2}+\frac{3}{8}dfg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+\frac{3}{35}dg^3x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{4}df^3x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+\frac{1}{2}dfg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$+\frac{1}{7}dg^3x^4\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2$$
$$-\frac{3df^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2}$$
$$+\frac{df^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}+\frac{dfg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{16bc^3\sqrt{1-c^2x^2}}$$

output
```
9/64*b^2*d*f^3*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+1/8*d
*f^3*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+8/75*
b^2*d*f^2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+6/125*b^2*d*f^2*g*(-c^2*
x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/8*b*d*f^3*(-c^2*x^2+1)^(3/2)*(a+b*arcs
in(c*x))*(-c^2*d*x^2+d)^(1/2)/c-3/16*d*f*g^2*x*(a+b*arcsin(c*x))^2*(-c^2*d
*x^2+d)^(1/2)/c^2+1/2*d*f*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d
*x^2+d)^(1/2)-3/5*d*f^2*g*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d
)^(1/2)/c^2-7/384*b^2*d*f*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2+1/36*b^2*c^2*d*f*
g^2*x^5*(-c^2*d*x^2+d)^(1/2)+304/3675*b^2*d*g^3*(-c^2*d*x^2+d)^(1/2)/c^4-1
5/64*b^2*d*f^3*x*(-c^2*d*x^2+d)^(1/2)+16/25*b^2*d*f^2*g*(-c^2*d*x^2+d)^(1/
2)/c^2-43/576*b^2*d*f*g^2*x^3*(-c^2*d*x^2+d)^(1/2)+152/11025*b^2*d*g^3*(-c
^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^4-1/32*b^2*d*f^3*x*(-c^2*x^2+1)*(-c^2*d*x
^2+d)^(1/2)+38/6125*b^2*d*g^3*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^4-2/34
3*b^2*d*g^3*(-c^2*x^2+1)^3*(-c^2*d*x^2+d)^(1/2)/c^4-1/35*d*g^3*x^2*(a+b*ar
csin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+3/8*d*f*g^2*x^3*(a+b*arcsin(c*x))^2*
(-c^2*d*x^2+d)^(1/2)+1/4*d*f^3*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*
x^2+d)^(1/2)+1/7*d*g^3*x^4*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)
^(1/2)+6/5*b*d*f^2*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+
1)^(1/2)+3/16*b*d*f*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2
*x^2+1)^(1/2)-4/5*b*c*d*f^2*g*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2...
```

### 3.62.2 Mathematica [A] (verified)

Time = 1.50 (sec) , antiderivative size = 872, normalized size of antiderivative = 0.52

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \frac{d\sqrt{d-c^2dx^2}\left(3087000a^3cf(2c^2f^2+g^2)-88200a^2b\sqrt{1-c^2x^2}(32g^3+c^2g(336f^2+105\right.}{}$$

input
```
Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(3087000*a^3*c*f*(2*c^2*f^2 + g^2) - 88200*a^2*b*Sq
rt[1 - c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6
*x^3*(35*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3
+ 336*f^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)) + 840*a*b^2*c*x*(6720*g^3 + 3
5*c^2*g*(2016*f^2 + 315*f*g*x + 32*g^2*x^2) - 21*c^4*x*(1750*f^3 + 2240*f^
2*g*x + 1225*f*g^2*x^2 + 256*g^3*x^3) + 2*c^6*x^3*(3675*f^3 + 7056*f^2*g*x
 + 4900*f*g^2*x^2 + 1200*g^3*x^3)) + b^3*Sqrt[1 - c^2*x^2]*(4785152*g^3 +
c^2*g*(39250176*f^2 - 900375*f*g*x - 429824*g^2*x^2) + 4*c^6*x^3*(385875*f
^3 + 592704*f^2*g*x + 343000*f*g^2*x^2 + 72000*g^3*x^3) - 2*c^4*x*(6559875
*f^3 + 5005056*f^2*g*x + 1843625*f*g^2*x^2 + 278784*g^3*x^3)) + 105*b*(882
00*a^2*c*f*(2*c^2*f^2 + g^2) - 1680*a*b*Sqrt[1 - c^2*x^2]*(32*g^3 + c^2*g*
(336*f^2 + 105*f*g*x + 16*g^2*x^2) + 4*c^6*x^3*(35*f^3 + 84*f^2*g*x + 70*f
*g^2*x^2 + 20*g^3*x^3) - 2*c^4*x*(175*f^3 + 336*f^2*g*x + 245*f*g^2*x^2 +
64*g^3*x^3)) + b^2*c*(35*g^2*(245*f + 1536*g*x) + 70*c^2*(1785*f^3 + 8064*
f^2*g*x + 1260*f*g^2*x^2 + 128*g^3*x^3) - 168*c^4*x^2*(1750*f^3 + 2240*f^2
*g*x + 1225*f*g^2*x^2 + 256*g^3*x^3) + 16*c^6*x^4*(3675*f^3 + 7056*f^2*g*x
 + 4900*f*g^2*x^2 + 1200*g^3*x^3)))*ArcSin[c*x] - 88200*b^2*(-105*a*c*f*(2
*c^2*f^2 + g^2) + b*Sqrt[1 - c^2*x^2]*(32*g^3 + c^2*g*(336*f^2 + 105*f*g*x
 + 16*g^2*x^2) + 4*c^6*x^3*(35*f^3 + 84*f^2*g*x + 70*f*g^2*x^2 + 20*g^3*x^
3) - 2*c^4*x*(175*f^3 + 336*f^2*g*x + 245*f*g^2*x^2 + 64*g^3*x^3)))*Arc...
```

### 3.62.3 Rubi [A] (verified)

Time = 2.41 (sec) , antiderivative size = 1066, normalized size of antiderivative = 0.63, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)^3(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \ 5276$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)^3\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \ 5262$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2f^3+3gx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2f^2+3g^2x^2\left(1-c^2x^2\right)^{3}\right.}{\sqrt{1-c^2x^2}}$$

$\big\downarrow$ 2009

$$d\sqrt{d-c^2dx^2}\bigg(\tfrac{2}{49}bc^3g^3(a+b\arcsin(cx))x^7+\tfrac{1}{6}bc^3fg^2(a+b\arcsin(cx))x^6-\tfrac{16}{175}bcg^3(a+b\arcsin(cx))x^5+\tfrac{6}{25}bc^3f$$

input
```
Int[(f + g*x)^3*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((4*a*b*g^3*x)/(35*c^3) + (16*b^2*f^2*g*Sqrt[1 - c^
2*x^2])/(25*c^2) + (304*b^2*g^3*Sqrt[1 - c^2*x^2])/(3675*c^4) - (15*b^2*f^
3*x*Sqrt[1 - c^2*x^2])/64 - (7*b^2*f*g^2*x*Sqrt[1 - c^2*x^2])/(384*c^2) -
(43*b^2*f*g^2*x^3*Sqrt[1 - c^2*x^2])/576 + (b^2*c^2*f*g^2*x^5*Sqrt[1 - c^2
*x^2])/36 + (8*b^2*f^2*g*(1 - c^2*x^2)^(3/2))/(75*c^2) + (152*b^2*g^3*(1 -
 c^2*x^2)^(3/2))/(11025*c^4) - (b^2*f^3*x*(1 - c^2*x^2)^(3/2))/32 + (6*b^2
*f^2*g*(1 - c^2*x^2)^(5/2))/(125*c^2) + (38*b^2*g^3*(1 - c^2*x^2)^(5/2))/(
6125*c^4) - (2*b^2*g^3*(1 - c^2*x^2)^(7/2))/(343*c^4) + (9*b^2*f^3*ArcSin[
c*x])/(64*c) + (7*b^2*f*g^2*ArcSin[c*x])/(384*c^3) + (4*b^2*g^3*x*ArcSin[c
*x])/(35*c^3) + (6*b*f^2*g*x*(a + b*ArcSin[c*x]))/(5*c) - (3*b*c*f^3*x^2*(
a + b*ArcSin[c*x]))/8 + (3*b*f*g^2*x^2*(a + b*ArcSin[c*x]))/(16*c) - (4*b*
c*f^2*g*x^3*(a + b*ArcSin[c*x]))/5 + (2*b*g^3*x^3*(a + b*ArcSin[c*x]))/(10
5*c) - (7*b*c*f*g^2*x^4*(a + b*ArcSin[c*x]))/16 + (6*b*c^3*f^2*g*x^5*(a +
b*ArcSin[c*x]))/25 - (16*b*c*g^3*x^5*(a + b*ArcSin[c*x]))/175 + (b*c^3*f*g
^2*x^6*(a + b*ArcSin[c*x]))/6 + (2*b*c^3*g^3*x^7*(a + b*ArcSin[c*x]))/49 +
 (b*f^3*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(8*c) - (2*g^3*Sqrt[1 - c^2*x
^2]*(a + b*ArcSin[c*x])^2)/(35*c^4) + (3*f^3*x*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x])^2)/8 - (3*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(16*
c^2) - (g^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(35*c^2) + (3*f*g
^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/8 + (3*g^3*x^4*Sqrt[1 -...
```

### 3.62.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.62.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.05 (sec) , antiderivative size = 4176, normalized size of antiderivative = 2.48

| method | result | size |
|---|---|---|
| default | Expression too large to display | 4176 |
| parts | Expression too large to display | 4176 |

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^3*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2
*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^3*(-1/7*
x^2*(-c^2*d*x^2+d)^(5/2)/c^2/d-2/35/d/c^4*(-c^2*d*x^2+d)^(5/2))+3*f*g^2*(-
1/6*x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d
*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-
c^2*d*x^2+d)^(1/2)))))-3/5*f^2*g/c^2/d*(-c^2*d*x^2+d)^(5/2))+b^2*(-1/16*(-
d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*f*(2
*c^2*f^2+g^2)*d-1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*
I*c^7*x^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-
25*c^2*x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g
^3*(14*I*arcsin(c*x)+49*arcsin(c*x)^2-2)*d/c^4/(c^2*x^2-1)-1/2304*(-d*(c^2
*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2
+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*
(-c^2*x^2+1)^(1/2)-6*c*x)*f*g^2*(6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d/c^3
/(c^2*x^2-1)-1/16000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^6-28*c^4*x^4-16*I*(-
c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^(1/2)*x^3*c^3-5*I*(-
c^2*x^2+1)^(1/2)*x*c-1)*g*(300*arcsin(c*x)^2*c^2*f^2+120*I*arcsin(c*x)*c^2
*f^2-25*arcsin(c*x)^2*g^2-10*I*arcsin(c*x)*g^2-24*c^2*f^2+2*g^2)*d/c^4/(c^
2*x^2-1)-1/1024*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^2+1)^(1/2)*x^4*c^4+8*
c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(-c^2*x^2+1)^(1/2)+...
```

### 3.62.5 Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral(-(a^2*c^2*d*g^3*x^5 + 3*a^2*c^2*d*f*g^2*x^4 - 3*a^2*d*f^2*g*x - a
^2*d*f^3 + (3*a^2*c^2*d*f^2*g - a^2*d*g^3)*x^3 + (a^2*c^2*d*f^3 - 3*a^2*d*
f*g^2)*x^2 + (b^2*c^2*d*g^3*x^5 + 3*b^2*c^2*d*f*g^2*x^4 - 3*b^2*d*f^2*g*x
- b^2*d*f^3 + (3*b^2*c^2*d*f^2*g - b^2*d*g^3)*x^3 + (b^2*c^2*d*f^3 - 3*b^2
*d*f*g^2)*x^2)*arcsin(c*x)^2 + 2*(a*b*c^2*d*g^3*x^5 + 3*a*b*c^2*d*f*g^2*x^
4 - 3*a*b*d*f^2*g*x - a*b*d*f^3 + (3*a*b*c^2*d*f^2*g - a*b*d*g^3)*x^3 + (a
*b*c^2*d*f^3 - 3*a*b*d*f*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

### 3.62.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

### 3.62.7 Maxima [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a^2*f^3 - 1/35*(5*(-c^2*d*x^2 + d)^(5/2)*x^2/(c^2*d) + 2*(-c
^2*d*x^2 + d)^(5/2)/(c^4*d))*a^2*g^3 + 1/16*a^2*f*g^2*(2*(-c^2*d*x^2 + d)^
(3/2)*x/c^2 - 8*(-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*
d*x/c^2 + 3*d^(3/2)*arcsin(c*x)/c^3) - 3/5*(-c^2*d*x^2 + d)^(5/2)*a^2*f^2*
g/(c^2*d) + sqrt(d)*integrate(-((b^2*c^2*d*g^3*x^5 + 3*b^2*c^2*d*f*g^2*x^4
 - 3*b^2*d*f^2*g*x - b^2*d*f^3 + (3*b^2*c^2*d*f^2*g - b^2*d*g^3)*x^3 + (b^
2*c^2*d*f^3 - 3*b^2*d*f*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
))^2 + 2*(a*b*c^2*d*g^3*x^5 + 3*a*b*c^2*d*f*g^2*x^4 - 3*a*b*d*f^2*g*x - a*
b*d*f^3 + (3*a*b*c^2*d*f^2*g - a*b*d*g^3)*x^3 + (a*b*c^2*d*f^3 - 3*a*b*d*f
*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(
-c*x + 1), x)
```

### 3.62.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.62.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \int (f+g\,x)^3 \,(a+b\,\mathrm{asin}(c\,x))^2 \,\left(d-c^2\,d\,x^2\right)^{3/2} \,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

## 3.62. $\int (f+gx)^3 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx$

# 3.63 $\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx$

### 3.63.1 Optimal result

Integrand size = 33, antiderivative size = 1108

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \frac{32b^2dfg\sqrt{d-c^2dx^2}}{75c^2} - \frac{15}{64}b^2df^2x\sqrt{d-c^2dx^2} - \frac{7b^2dg^2x\sqrt{d-c^2dx^2}}{1152c^2} - \frac{43b^2dg^2x^3\sqrt{d-c^2dx^2}}{1728} + \frac{1}{108}b^2c^2dg^2x^5\sqrt{d-c^2dx^2} + \frac{16b^2dfg(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2} - \frac{1}{32}b^2df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{4b^2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2} + \frac{9b^2df^2\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} + \frac{7b^2dg^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c^3\sqrt{1-c^2x^2}} + \frac{4bdfgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} - \frac{3bcdf^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} + \frac{bdg^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16c\sqrt{1-c^2x^2}} - \frac{8bcdfgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} - \frac{7bcdg^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48\sqrt{1-c^2x^2}} + \frac{4bc^3dfgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} + \frac{bc^3dg^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18\sqrt{1-c^2x^2}} + \frac{bdf^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} + \frac{3}{8}df^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{dg^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{16c^2} + \frac{1}{8}dg^2x^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{4}df^2x\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 + \frac{1}{6}dg^2x^3\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 - \frac{2dfg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} + \frac{df^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}} + \frac{dg^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{48bc^3\sqrt{1-c^2x^2}}$$

output
```
16/225*b^2*d*f*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+4/125*b^2*d*f*g*(-c
^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/8*b*d*f^2*(-c^2*x^2+1)^(3/2)*(a+b*a
rcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c-2/5*d*f*g*(-c^2*x^2+1)^2*(a+b*arcsin(c*
x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+9/64*b^2*d*f^2*arcsin(c*x)*(-c^2*d*x^2+d)^(
1/2)/c/(-c^2*x^2+1)^(1/2)+7/1152*b^2*d*g^2*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2
)/c^3/(-c^2*x^2+1)^(1/2)+1/8*d*f^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2
)/b/c/(-c^2*x^2+1)^(1/2)+1/48*d*g^2*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/
2)/b/c^3/(-c^2*x^2+1)^(1/2)+1/6*d*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2
*(-c^2*d*x^2+d)^(1/2)+32/75*b^2*d*f*g*(-c^2*d*x^2+d)^(1/2)/c^2-7/1152*b^2*
d*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2+1/108*b^2*c^2*d*g^2*x^5*(-c^2*d*x^2+d)^(1
/2)-1/32*b^2*d*f^2*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)-1/16*d*g^2*x*(a+b*a
rcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+1/4*d*f^2*x*(-c^2*x^2+1)*(a+b*arcsi
n(c*x))^2*(-c^2*d*x^2+d)^(1/2)+4/5*b*d*f*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-8/15*b*c*d*f*g*x^3*(a+b*arcsin(c*x))*(-c^2*
d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+4/25*b*c^3*d*f*g*x^5*(a+b*arcsin(c*x))*(
-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-15/64*b^2*d*f^2*x*(-c^2*d*x^2+d)^(1
/2)-43/1728*b^2*d*g^2*x^3*(-c^2*d*x^2+d)^(1/2)+3/8*d*f^2*x*(a+b*arcsin(c*x
))^2*(-c^2*d*x^2+d)^(1/2)+1/8*d*g^2*x^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)
^(1/2)-3/8*b*c*d*f^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+
1)^(1/2)+1/16*b*d*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^...
```

### 3.63.2 Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 616, normalized size of antiderivative = 0.56

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \frac{d\sqrt{d-c^2dx^2}\Big(9000a^3(6c^2f^2+g^2)+120ab^2c^2x(450c^2f^2x(-5+c^2x^2)+192fg(15-10\ldots}{}$$

input
```
Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(9000*a^3*(6*c^2*f^2 + g^2) + 120*a*b^2*c^2*x*(450*
c^2*f^2*x*(-5 + c^2*x^2) + 192*f*g*(15 - 10*c^2*x^2 + 3*c^4*x^4) + 25*g^2*
x*(9 - 21*c^2*x^2 + 8*c^4*x^4)) - 1800*a^2*b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(
-1 + c^2*x^2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2
+ 8*c^4*x^4)) + b^3*c*Sqrt[1 - c^2*x^2]*(6750*c^2*f^2*x*(-17 + 2*c^2*x^2)
+ 1536*f*g*(149 - 38*c^2*x^2 + 9*c^4*x^4) + 125*g^2*x*(-21 - 86*c^2*x^2 +
32*c^4*x^4)) + 15*b*(1800*a^2*(6*c^2*f^2 + g^2) + b^2*(175*g^2 + 90*c^2*(8
5*f^2 + 256*f*g*x + 20*g^2*x^2) - 120*c^4*x^2*(150*f^2 + 128*f*g*x + 35*g^
2*x^2) + 16*c^6*x^4*(225*f^2 + 288*f*g*x + 100*g^2*x^2)) - 240*a*b*c*Sqrt[
1 - c^2*x^2]*(96*f*g*(-1 + c^2*x^2)^2 + 30*c^2*f^2*x*(-5 + 2*c^2*x^2) + 5*
g^2*x*(3 - 14*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x] + 1800*b^2*(15*a*(6*c^2*f
^2 + g^2) - b*c*Sqrt[1 - c^2*x^2]*(96*f*g*(-1 + c^2*x^2)^2 + 30*c^2*f^2*x*
(-5 + 2*c^2*x^2) + 5*g^2*x*(3 - 14*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x]^2 +
9000*b^3*(6*c^2*f^2 + g^2)*ArcSin[c*x]^3))/(432000*b*c^3*Sqrt[1 - c^2*x^2]
)
```

### 3.63.3 Rubi [A] (verified)

Time = 1.59 (sec) , antiderivative size = 699, normalized size of antiderivative = 0.63, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)^2(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(f^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2+g^2x^2\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2+2fgx\left(1-c^2x^2\right)^{3/2}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{d\sqrt{d-c^2dx^2}\left(\frac{4}{25}bc^3fgx^5(a+b\arcsin(cx))+\frac{1}{18}bc^3g^2x^6(a+b\arcsin(cx))+\frac{g^2(a+b\arcsin(cx))^3}{48bc^3}+\frac{1}{4}f^2x\left(1-c^2x^2\right)^{3/2}\right.}{}$$

input
```
Int[(f + g*x)^2*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((32*b^2*f*g*Sqrt[1 - c^2*x^2])/(75*c^2) - (15*b^2*
f^2*x*Sqrt[1 - c^2*x^2])/64 - (7*b^2*g^2*x*Sqrt[1 - c^2*x^2])/(1152*c^2) -
 (43*b^2*g^2*x^3*Sqrt[1 - c^2*x^2])/1728 + (b^2*c^2*g^2*x^5*Sqrt[1 - c^2*x
^2])/108 + (16*b^2*f*g*(1 - c^2*x^2)^(3/2))/(225*c^2) - (b^2*f^2*x*(1 - c^
2*x^2)^(3/2))/32 + (4*b^2*f*g*(1 - c^2*x^2)^(5/2))/(125*c^2) + (9*b^2*f^2*
ArcSin[c*x])/(64*c) + (7*b^2*g^2*ArcSin[c*x])/(1152*c^3) + (4*b*f*g*x*(a +
 b*ArcSin[c*x]))/(5*c) - (3*b*c*f^2*x^2*(a + b*ArcSin[c*x]))/8 + (b*g^2*x^
2*(a + b*ArcSin[c*x]))/(16*c) - (8*b*c*f*g*x^3*(a + b*ArcSin[c*x]))/15 - (
7*b*c*g^2*x^4*(a + b*ArcSin[c*x]))/48 + (4*b*c^3*f*g*x^5*(a + b*ArcSin[c*x
]))/25 + (b*c^3*g^2*x^6*(a + b*ArcSin[c*x]))/18 + (b*f^2*(1 - c^2*x^2)^2*(
a + b*ArcSin[c*x]))/(8*c) + (3*f^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])
^2)/8 - (g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(16*c^2) + (g^2*x^
3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/8 + (f^2*x*(1 - c^2*x^2)^(3/2)*
(a + b*ArcSin[c*x])^2)/4 + (g^2*x^3*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x]
)^2)/6 - (2*f*g*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(5*c^2) + (f^2*
(a + b*ArcSin[c*x])^3)/(8*b*c) + (g^2*(a + b*ArcSin[c*x])^3)/(48*b*c^3)))/
Sqrt[1 - c^2*x^2]
```

### 3.63.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.63.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.93 (sec) , antiderivative size = 3032, normalized size of antiderivative = 2.74

| method | result | size |
|---|---|---|
| default | Expression too large to display | 3032 |
| parts | Expression too large to display | 3032 |

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2
*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))))+g^2*(-1/6*
x*(-c^2*d*x^2+d)^(5/2)/c^2/d+1/6/c^2*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/
2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*
d*x^2+d)^(1/2)))))-2/5*f*g/c^2/d*(-c^2*d*x^2+d)^(5/2))+b^2*(-1/48*(-d*(c^2
*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*(6*c^2*f^2
+g^2)*d-1/6912*(-d*(c^2*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32
*c^7*x^7+48*I*(-c^2*x^2+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+38*c^3*x^3+I*(-c^2*x^2+1)^(1/2)-6*c*x)*g^2*(6*I*arcsin(c*x)+18*a
rcsin(c*x)^2-1)*d/c^3/(c^2*x^2-1)-1/2000*(-d*(c^2*x^2-1))^(1/2)*(16*c^6*x^
6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x^2+1)^
(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(10*I*arcsin(c*x)+25*arcsi
n(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/1024*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2*x^
2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-I*(
-c^2*x^2+1)^(1/2)+4*c*x)*(8*I*arcsin(c*x)*c^2*f^2+16*arcsin(c*x)^2*c^2*f^2
-4*I*arcsin(c*x)*g^2-8*arcsin(c*x)^2*g^2-2*c^2*f^2+g^2)*d/c^3/(c^2*x^2-1)-
1/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsi
n(c*x)^2-2+2*I*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/8*(-d*(c^2*x^2-1))^(1/2)*(
I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsin(c*x))*
d/c^2/(c^2*x^2-1)+1/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2)*...
```

### 3.63.5 Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral(-(a^2*c^2*d*g^2*x^4 + 2*a^2*c^2*d*f*g*x^3 - 2*a^2*d*f*g*x - a^2*d
*f^2 + (a^2*c^2*d*f^2 - a^2*d*g^2)*x^2 + (b^2*c^2*d*g^2*x^4 + 2*b^2*c^2*d*
f*g*x^3 - 2*b^2*d*f*g*x - b^2*d*f^2 + (b^2*c^2*d*f^2 - b^2*d*g^2)*x^2)*arc
sin(c*x)^2 + 2*(a*b*c^2*d*g^2*x^4 + 2*a*b*c^2*d*f*g*x^3 - 2*a*b*d*f*g*x -
a*b*d*f^2 + (a*b*c^2*d*f^2 - a*b*d*g^2)*x^2)*arcsin(c*x))*sqrt(-c^2*d*x^2
+ d), x)
```

### 3.63.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

### 3.63.7 Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a^2*f^2 + 1/48*a^2*g^2*(2*(-c^2*d*x^2 + d)^(3/2)*x/c^2 - 8*(
-c^2*d*x^2 + d)^(5/2)*x/(c^2*d) + 3*sqrt(-c^2*d*x^2 + d)*d*x/c^2 + 3*d^(3/
2)*arcsin(c*x)/c^3) - 2/5*(-c^2*d*x^2 + d)^(5/2)*a^2*f*g/(c^2*d) + sqrt(d)
*integrate(-((b^2*c^2*d*g^2*x^4 + 2*b^2*c^2*d*f*g*x^3 - 2*b^2*d*f*g*x - b^
2*d*f^2 + (b^2*c^2*d*f^2 - b^2*d*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt
(-c*x + 1))^2 + 2*(a*b*c^2*d*g^2*x^4 + 2*a*b*c^2*d*f*g*x^3 - 2*a*b*d*f*g*x
 - a*b*d*f^2 + (a*b*c^2*d*f^2 - a*b*d*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

### 3.63.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.63.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx = \int (f+g\,x)^2\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{3/2} \,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

# 3.64 $\int (f+gx) \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx$



## 3.64.1 Optimal result

Integrand size = 31, antiderivative size = 621

$$\begin{aligned}
\int (f+gx) \left(d-c^2dx^2\right)^{3/2} (a+b\arcsin(cx))^2 \, dx &= \frac{16b^2dg\sqrt{d-c^2dx^2}}{75c^2} \\
&- \frac{15}{64}b^2dfx\sqrt{d-c^2dx^2} + \frac{8b^2dg(1-c^2x^2)\sqrt{d-c^2dx^2}}{225c^2} \\
&- \frac{1}{32}b^2dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2} + \frac{2b^2dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{125c^2} \\
&+ \frac{9b^2df\sqrt{d-c^2dx^2}\arcsin(cx)}{64c\sqrt{1-c^2x^2}} + \frac{2bdgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{5c\sqrt{1-c^2x^2}} \\
&- \frac{3bcdfx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8\sqrt{1-c^2x^2}} - \frac{4bcdgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{15\sqrt{1-c^2x^2}} \\
&+ \frac{2bc^3dgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{25\sqrt{1-c^2x^2}} \\
&+ \frac{bdf(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{8c} \\
&+ \frac{3}{8}dfx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&+ \frac{1}{4}dfx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2 \\
&- \frac{dg(1-c^2x^2)^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{5c^2} \\
&+ \frac{df\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^3}{8bc\sqrt{1-c^2x^2}}
\end{aligned}$$

output
```
16/75*b^2*d*g*(-c^2*d*x^2+d)^(1/2)/c^2-15/64*b^2*d*f*x*(-c^2*d*x^2+d)^(1/2
)+8/225*b^2*d*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2-1/32*b^2*d*f*x*(-c^2
*x^2+1)*(-c^2*d*x^2+d)^(1/2)+2/125*b^2*d*g*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(
1/2)/c^2+1/8*b*d*f*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)/c+3/8*d*f*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/4*d*f*x*(-c^2*x^
2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-1/5*d*g*(-c^2*x^2+1)^2*(a+b*
arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+9/64*b^2*d*f*arcsin(c*x)*(-c^2*d*x
^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+2/5*b*d*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-3/8*b*c*d*f*x^2*(a+b*arcsin(c*x))*(-c^2*d*x
^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-4/15*b*c*d*g*x^3*(a+b*arcsin(c*x))*(-c^2*d*
x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+2/25*b*c^3*d*g*x^5*(a+b*arcsin(c*x))*(-c^2
*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+1/8*d*f*(a+b*arcsin(c*x))^3*(-c^2*d*x^2
+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

### 3.64.2 Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 395, normalized size of antiderivative = 0.64

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \frac{d\sqrt{d-c^2dx^2}\left(9000a^3cf-1800a^2b\sqrt{1-c^2x^2}\left(8g\left(-1+c^2x^2\right)^2+5c^2fx\left(-5+2c^2x^2\right)\right)-\right.}{}$$

input
```
Integrate[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(9000*a^3*c*f - 1800*a^2*b*Sqrt[1 - c^2*x^2]*(8*g*(
-1 + c^2*x^2)^2 + 5*c^2*f*x*(-5 + 2*c^2*x^2)) + 120*a*b^2*c*x*(75*c^2*f*x*
(-5 + c^2*x^2) + 16*g*(15 - 10*c^2*x^2 + 3*c^4*x^4)) + b^3*Sqrt[1 - c^2*x^
2]*(1125*c^2*f*x*(-17 + 2*c^2*x^2) + 128*g*(149 - 38*c^2*x^2 + 9*c^4*x^4))
 + 15*b*(1800*a^2*c*f - 240*a*b*Sqrt[1 - c^2*x^2]*(8*g*(-1 + c^2*x^2)^2 +
5*c^2*f*x*(-5 + 2*c^2*x^2)) + b^2*c*(128*g*x*(15 - 10*c^2*x^2 + 3*c^4*x^4)
 + 75*f*(17 - 40*c^2*x^2 + 8*c^4*x^4)))*ArcSin[c*x] + 1800*b^2*(15*a*c*f +
 b*Sqrt[1 - c^2*x^2]*(5*c^2*f*x*(5 - 2*c^2*x^2) - 8*g*(-1 + c^2*x^2)^2))*A
rcSin[c*x]^2 + 9000*b^3*c*f*ArcSin[c*x]^3))/(72000*b*c^2*Sqrt[1 - c^2*x^2]
)
```

### 3.64.3 Rubi [A] (verified)

Time = 0.88 (sec) , antiderivative size = 384, normalized size of antiderivative = 0.62, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{3/2}(f+gx)(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \ 5276$$

$$\frac{d\sqrt{d-c^2dx^2}\int (f+gx)\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \ 5262$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(f\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2+gx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \ 2009$$

$$\frac{d\sqrt{d-c^2dx^2}\left(\frac{2}{25}bc^3gx^5(a+b\arcsin(cx))+\frac{1}{4}fx\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2+\frac{3}{8}fx\sqrt{1-c^2x^2}(a+b\arcsin(ca\right.}{}$$

input
```
Int[(f + g*x)*(d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((16*b^2*g*Sqrt[1 - c^2*x^2])/(75*c^2) - (15*b^2*f*
x*Sqrt[1 - c^2*x^2])/64 + (8*b^2*g*(1 - c^2*x^2)^(3/2))/(225*c^2) - (b^2*f
*x*(1 - c^2*x^2)^(3/2))/32 + (2*b^2*g*(1 - c^2*x^2)^(5/2))/(125*c^2) + (9*
b^2*f*ArcSin[c*x])/(64*c) + (2*b*g*x*(a + b*ArcSin[c*x]))/(5*c) - (3*b*c*f
*x^2*(a + b*ArcSin[c*x]))/8 - (4*b*c*g*x^3*(a + b*ArcSin[c*x]))/15 + (2*b*
c^3*g*x^5*(a + b*ArcSin[c*x]))/25 + (b*f*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x
]))/(8*c) + (3*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/8 + (f*x*(1 -
c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/4 - (g*(1 - c^2*x^2)^(5/2)*(a + b*Ar
cSin[c*x])^2)/(5*c^2) + (f*(a + b*ArcSin[c*x])^3)/(8*b*c)))/Sqrt[1 - c^2*x
^2]
```

### 3.64.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.64.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.80 (sec) , antiderivative size = 2021, normalized size of antiderivative = 3.25

| method | result | size |
|---|---|---|
| default | Expression too large to display | 2021 |
| parts | Expression too large to display | 2021 |

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBO
SE)
```

output
```
1/4*a^2*f*x*(-c^2*d*x^2+d)^(3/2)+3/8*a^2*f*d*x*(-c^2*d*x^2+d)^(1/2)+3/8*a^
2*f*d^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/5*a^2
*g/c^2/d*(-c^2*d*x^2+d)^(5/2)+b^2*(-1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1
)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)^3*f*d-1/4000*(-d*(c^2*x^2-1))^(1/2)*(16*
c^6*x^6-28*c^4*x^4-16*I*(-c^2*x^2+1)^(1/2)*x^5*c^5+13*c^2*x^2+20*I*(-c^2*x
^2+1)^(1/2)*x^3*c^3-5*I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(10*I*arcsin(c*x)+25*a
rcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/512*(-d*(c^2*x^2-1))^(1/2)*(-8*I*(-c^2
*x^2+1)^(1/2)*x^4*c^4+8*c^5*x^5+8*I*(-c^2*x^2+1)^(1/2)*x^2*c^2-12*c^3*x^3-
I*(-c^2*x^2+1)^(1/2)+4*c*x)*f*(4*I*arcsin(c*x)+8*arcsin(c*x)^2-1)*d/c/(c^2
*x^2-1)-1/16*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g
*(arcsin(c*x)^2-2+2*I*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/16*(-d*(c^2*x^2-1))
^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*I*arcsin(
c*x))*d/c^2/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1/2
)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-2*I*arcsin(c*x)+2*arcs
in(c*x)^2-1)*d/c/(c^2*x^2-1)+1/288*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3*(-c
^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-6*I*
arcsin(c*x)+9*arcsin(c*x)^2-2)*d/c^2/(c^2*x^2-1)-1/18000*(-d*(c^2*x^2-1))^
(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(330*I*arcsin(c*x)+675*arcsin
(c*x)^2-134)*cos(4*arcsin(c*x))*d/c^2/(c^2*x^2-1)-1/9000*(-d*(c^2*x^2-1))^
(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*g*(210*I*arcsin(c*x)+225*arc...
```

### 3.64.5 Fricas [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="f
ricas")
```

output
```
integral(-(a^2*c^2*d*g*x^3 + a^2*c^2*d*f*x^2 - a^2*d*g*x - a^2*d*f + (b^2*
c^2*d*g*x^3 + b^2*c^2*d*f*x^2 - b^2*d*g*x - b^2*d*f)*arcsin(c*x)^2 + 2*(a*
b*c^2*d*g*x^3 + a*b*c^2*d*f*x^2 - a*b*d*g*x - a*b*d*f)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d), x)
```

### 3.64.6 Sympy [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int(-d(cx-1)\,(cx+1))^{\frac{3}{2}}\,(a+b\operatorname{asin}(cx))^2\,(f+gx)\,dx$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2,x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2*(f + g*x), x
)
```

### 3.64.7 Maxima [F]

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx=\int\left(-c^2dx^2+d\right)^{\frac{3}{2}}(gx+f)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="m
axima")
```

output
```
1/8*(2*(-c^2*d*x^2 + d)^(3/2)*x + 3*sqrt(-c^2*d*x^2 + d)*d*x + 3*d^(3/2)*a
rcsin(c*x)/c)*a^2*f - 1/5*(-c^2*d*x^2 + d)^(5/2)*a^2*g/(c^2*d) + sqrt(d)*i
ntegrate(-((b^2*c^2*d*g*x^3 + b^2*c^2*d*f*x^2 - b^2*d*g*x - b^2*d*f)*arcta
n2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^2*d*g*x^3 + a*b*c^2*d*f
*x^2 - a*b*d*g*x - a*b*d*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sq
rt(c*x + 1)*sqrt(-c*x + 1), x)
```

### 3.64.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2,x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.64.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{3/2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2), x)
```

# 3.65 $\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$



## 3.65.1 Optimal result

Integrand size = 33, antiderivative size = 1992

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Too large to display}$$

output
```
-1/4*b^2*c^2*d*f*x*(-c^2*d*x^2+d)^(1/2)/g^2+1/2*c^2*d*f*x*(a+b*arcsin(c*x)
)^2*(-c^2*d*x^2+d)^(1/2)/g^2+a^2*d*(c^2*f^2-g^2)^(3/2)*arctan((c^2*f*x+g)/
(c^2*f^2-g^2)^(1/2)/(-c^2*x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2
+1)^(1/2)-b^2*d*(c*f-g)*(c*f+g)*arcsin(c*x)^2*(-c^2*d*x^2+d)^(1/2)/g^3+I*b
^2*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g
/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-4/
9*b^2*d*(-c^2*d*x^2+d)^(1/2)/g-a^2*d*(c*f-g)*(c*f+g)*(-c^2*d*x^2+d)^(1/2)/
g^3+2*I*a*b*d*(c^2*f^2-g^2)^(3/2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(
1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(
1/2)+2*I*b^2*d*(c^2*f^2-g^2)^(3/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-2
*a*b*d*(c*f-g)*(c*f+g)*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^3+1/4*b^2*c*d*f*
arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-2/3*b*c*d*x*(a+b*a
rcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+2/9*b*c^3*d*x^3*(a+b
*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/g/(-c^2*x^2+1)^(1/2)+1/6*c*d*f*(a+b*arc
sin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/g^2/(-c^2*x^2+1)^(1/2)-2*a*b*d*(c^2*f^2
-g^2)^(3/2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1
/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-2*b^2*d*(c^2*f^2-g^2)^(3
/2)*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2
)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)+2*a*b*d*(c^2*f^2-...
```

### 3.65.2 Mathematica [A] (verified)

Time = 1.73 (sec) , antiderivative size = 740, normalized size of antiderivative = 0.37

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \frac{d\sqrt{d-c^2dx^2}\left(54c^2fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+36g(1-c^2x\right.}{}$$

input
```
Integrate[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*(54*c^2*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2
 + 36*g*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2 + (18*c*f*(a + b*ArcSin[
c*x])^3)/b + (36*(c^2*f^2 - g^2)*(-1 + c^2*x^2)*(a + b*ArcSin[c*x])^3)/(b*
c*(f + g*x)) - 27*b*c*f*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c
^2*x^2)*ArcSin[c*x]) - 8*b*g*(b*Sqrt[1 - c^2*x^2]*(7 - c^2*x^2) + 9*c*x*(a
 + b*ArcSin[c*x]) - 3*c^3*x^3*(a + b*ArcSin[c*x])) - (36*(c^2*f^2 - g^2)*(
(c^2*f^2 - g^2)*(a + b*ArcSin[c*x])^3 + c^2*g*x*(f + g*x)*(a + b*ArcSin[c*
x])^3 + 3*b*c*(f + g*x)*(g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*g
*(a*c*x + b*Sqrt[1 - c^2*x^2] + b*c*x*ArcSin[c*x]) + I*Sqrt[c^2*f^2 - g^2]
*((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2
*f^2 - g^2])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f
 + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*
ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*(a + b*ArcSin[c*x])
*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + 2*b^2*P
olyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] - 2*b^2*Pol
yLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/(b*c*g^2*
(f + g*x))))/(108*g^2*Sqrt[1 - c^2*x^2])
```

### 3.65.3 Rubi [A] (verified)

Time = 3.77 (sec) , antiderivative size = 1369, normalized size of antiderivative = 0.69, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \frac{\left(1-c^2x^2\right)^{3/2}(a+b\arcsin(cx))^2}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5266}$$

$$\frac{d\sqrt{d-c^2dx^2}\int \left(-\frac{c^2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g}+\frac{(g^2-c^2f^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g^2(f+gx)}+\frac{c^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{g^2}\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$d\sqrt{d-c^2dx^2}\left(\frac{2bx^3(a+b\arcsin(cx))c^3}{9g}-\frac{bfx^2(a+b\arcsin(cx))c^3}{2g^2}+\frac{fx\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^2}{2g^2}-\frac{b^2fx\sqrt{1-c^2x^2}c^2}{4g^2}-\frac{(c^2f^2-g^2)x(\right.$$

input
```
Int[((d - c^2*d*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(d*Sqrt[d - c^2*d*x^2]*((2*a*b*c*(c^2*f^2 - g^2)*x)/g^3 - (4*b^2*Sqrt[1 -
c^2*x^2])/(9*g) - (a^2*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2])/g^3 + (2*b^2
*(c*f - g)*(c*f + g)*Sqrt[1 - c^2*x^2])/g^3 - (b^2*c^2*f*x*Sqrt[1 - c^2*x^
2])/(4*g^2) - (2*b^2*(1 - c^2*x^2)^(3/2))/(27*g) + (b^2*c*f*ArcSin[c*x])/(
4*g^2) + (2*b^2*c*(c^2*f^2 - g^2)*x*ArcSin[c*x])/g^3 - (2*a*b*(c*f - g)*(c
*f + g)*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/g^3 - (b^2*(c*f - g)*(c*f + g)*Sqrt
[1 - c^2*x^2]*ArcSin[c*x]^2)/g^3 - (2*b*c*x*(a + b*ArcSin[c*x]))/(3*g) - (
b*c^3*f*x^2*(a + b*ArcSin[c*x]))/(2*g^2) + (2*b*c^3*x^3*(a + b*ArcSin[c*x]
))/(9*g) + (c^2*f*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*g^2) + ((1
 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*g) + (c*f*(a + b*ArcSin[c*x])^
3)/(6*b*g^2) - (c*(c^2*f^2 - g^2)*x*(a + b*ArcSin[c*x])^3)/(3*b*g^3) - ((c
^2*f^2 - g^2)^2*(a + b*ArcSin[c*x])^3)/(3*b*c*g^4*(f + g*x)) - ((c^2*f^2 -
 g^2)*(1 - c^2*x^2)*(a + b*ArcSin[c*x])^3)/(3*b*c*g^2*(f + g*x)) + (a^2*(c
^2*f^2 - g^2)^(3/2)*ArcTan[(g + c^2*f*x)/(Sqrt[c^2*f^2 - g^2]*Sqrt[1 - c^2
*x^2])])/g^4 - ((2*I)*a*b*(c^2*f^2 - g^2)^(3/2)*ArcSin[c*x]*Log[1 - (I*E^(
I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g^4 - (I*b^2*(c^2*f^2 - g^
2)^(3/2)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2
 - g^2])])/g^4 + ((2*I)*a*b*(c^2*f^2 - g^2)^(3/2)*ArcSin[c*x]*Log[1 - (I*E
^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g^4 + (I*b^2*(c^2*f^2 -
g^2)^(3/2)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^...
```

3.65. $\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

### 3.65.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5266
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.65.4 Maple [F]

$$\int \frac{\left(-c^{2} d\,x^{2}+d \right)^{\frac{3}{2}} \left(a +b \arcsin \left(c x \right)\right)^{2}}{g x +f}d x$$

input
```
int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

output
```
int((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

## 3.65.5 Fricas [F]

$$\int \frac{\left(d-c^2dx^2\right)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx=\int \frac{{\left(-c^{2} d x^{2} + d\right)}^{\frac{3}{2}} {\left(b \arcsin \left(c x\right) + a\right)}^{2}}{g x + f}\,{d x}$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="f
ricas")
```

output
```
integral(-(a^2*c^2*d*x^2 - a^2*d + (b^2*c^2*d*x^2 - b^2*d)*arcsin(c*x)^2 +
 2*(a*b*c^2*d*x^2 - a*b*d)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(g*x + f), x)
```

### 3.65.6 Sympy [F]

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx=\int \frac{(-d(cx-1)(cx+1))^{\frac{3}{2}}(a+b\,\text{asin}\,(cx))^2}{f+gx}\,dx$$

input
```
integrate((-c**2*d*x**2+d)**(3/2)*(a+b*asin(c*x))**2/(g*x+f),x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(3/2)*(a + b*asin(c*x))**2/(f + g*x), x
)
```

### 3.65.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="m
axima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

### 3.65.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(3/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.65.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{3/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{3/2}}{f+g\,x}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(3/2))/(f + g*x), x)
```

# 3.66 $\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b \arcsin(cx))^2 \, dx$



## 3.66.1 Optimal result

Integrand size = 33, antiderivative size = 2290

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b \arcsin(cx))^2 \, dx = \text{Too large to display}$$

output
```
1/18*b*d^2*f^3*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c
-15/128*d^2*f*g^2*x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+5/16*d^2*
f*g^2*x^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+3/8*d^2*f*
g^2*x^3*(-c^2*x^2+1)^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)-3/7*d^2*f^
2*g*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+115/1152*b
^2*d^2*f^3*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+5/48*d^2*
f^3*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)-359/12
288*b^2*d^2*f*g^2*x*(-c^2*d*x^2+d)^(1/2)/c^2+209/4608*b^2*c^2*d^2*f*g^2*x^
5*(-c^2*d*x^2+d)^(1/2)-3/256*b^2*c^4*d^2*f*g^2*x^7*(-c^2*d*x^2+d)^(1/2)+16
/245*b^2*d^2*f^2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+36/1225*b^2*d^2*f
^2*g*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+6/343*b^2*d^2*f^2*g*(-c^2*x^2
+1)^3*(-c^2*d*x^2+d)^(1/2)/c^2+5/48*b*d^2*f^3*(-c^2*x^2+1)^(3/2)*(a+b*arcs
in(c*x))*(-c^2*d*x^2+d)^(1/2)/c-59/128*b*c*d^2*f*g^2*x^4*(a+b*arcsin(c*x))
*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+18/35*b*c^3*d^2*f^2*g*x^5*(a+b*ar
csin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+17/48*b*c^3*d^2*f*g^2*x
^6*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-6/49*b*c^5*d^
2*f^2*g*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-3/32
*b*c^5*d^2*f*g^2*x^8*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(
1/2)+6/7*b*d^2*f^2*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+
1)^(1/2)+15/128*b*d^2*f*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/...
```

### 3.66.2 Mathematica [A] (verified)

Time = 1.28 (sec) , antiderivative size = 1114, normalized size of antiderivative = 0.49

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(333396000a^3(8c^3f^3+3cfg^2)+3175200a^2b\sqrt{1-c^2x^2}(-256g^3-c^2g(34\right.}{}$$

input
```
Integrate[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(333396000*a^3*(8*c^3*f^3 + 3*c*f*g^2) + 3175200*
a^2*b*Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(3456*f^2 + 945*f*g*x + 128*g^2*
x^2) + 16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 189*f*g^2*x^2 + 56*g^3*x^3) - 8*
c^6*x^3*(546*f^3 + 1296*f^2*g*x + 1071*f*g^2*x^2 + 304*g^3*x^3) + 6*c^4*x*
(924*f^3 + 1728*f^2*g*x + 1239*f*g^2*x^2 + 320*g^3*x^3)) - 10080*a*b^2*c*x
*(-161280*g^3 - 105*c^2*g*(20736*f^2 + 2835*f*g*x + 256*g^2*x^2) + 945*c^4
*x*(1848*f^3 + 2304*f^2*g*x + 1239*f*g^2*x^2 + 256*g^3*x^3) - 72*c^6*x^3*(
9555*f^3 + 18144*f^2*g*x + 12495*f*g^2*x^2 + 3040*g^3*x^3) + 20*c^8*x^5*(7
056*f^3 + 15552*f^2*g*x + 11907*f*g^2*x^2 + 3136*g^3*x^3)) - b^3*Sqrt[1 -
c^2*x^2]*(-1257472000*g^3 + c^2*g*(-12905422848*f^2 + 748057275*f*g*x + 18
4115200*g^2*x^2) + 400*c^8*x^5*(592704*f^3 + 1119744*f^2*g*x + 750141*f*g^
2*x^2 + 175616*g^3*x^3) - 8*c^6*x^3*(179663400*f^3 + 262020096*f^2*g*x + 1
45166175*f*g^2*x^2 + 29363200*g^3*x^3) + 6*c^4*x*(1107615600*f^3 + 7534632
96*f^2*g*x + 249815475*f*g^2*x^2 + 34304000*g^3*x^3)) + 315*b*(3175200*a^2
*(8*c^3*f^3 + 3*c*f*g^2) + 20160*a*b*Sqrt[1 - c^2*x^2]*(-256*g^3 - c^2*g*(
3456*f^2 + 945*f*g*x + 128*g^2*x^2) + 16*c^8*x^5*(84*f^3 + 216*f^2*g*x + 1
89*f*g^2*x^2 + 56*g^3*x^3) - 8*c^6*x^3*(546*f^3 + 1296*f^2*g*x + 1071*f*g^
2*x^2 + 304*g^3*x^3) + 6*c^4*x*(924*f^3 + 1728*f^2*g*x + 1239*f*g^2*x^2 +
320*g^3*x^3)) + b^2*c*(315*g^2*(7539*f + 16384*g*x) - 30240*c^4*x^2*(1848*
f^3 + 2304*f^2*g*x + 1239*f*g^2*x^2 + 256*g^3*x^3) + 3360*c^2*(6279*f^3...
```

### 3.66.3 Rubi [A] (verified)

Time = 3.24 (sec) , antiderivative size = 1379, normalized size of antiderivative = 0.60, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)^3(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{ 5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int(f+gx)^3\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int\left(\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2f^3+3gx\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2f^2+3g^2x^2\left(1-c^2x^2\right)\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\left(-\frac{2}{81}bc^5g^3(a+b\arcsin(cx))x^9-\frac{3}{32}bc^5fg^2(a+b\arcsin(cx))x^8+\frac{38}{441}bc^3g^3(a+b\arcsin(cx))x^7-\frac{6}{49}\right.}{}$$

input
```
Int[(f + g*x)^3*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((4*a*b*g^3*x)/(63*c^3) + (96*b^2*f^2*g*Sqrt[1 -
c^2*x^2])/(245*c^2) + (160*b^2*g^3*Sqrt[1 - c^2*x^2])/(3969*c^4) - (245*b^
2*f^3*x*Sqrt[1 - c^2*x^2])/1152 - (359*b^2*f*g^2*x*Sqrt[1 - c^2*x^2])/(122
88*c^2) - (1079*b^2*f*g^2*x^3*Sqrt[1 - c^2*x^2])/18432 + (209*b^2*c^2*f*g^
2*x^5*Sqrt[1 - c^2*x^2])/4608 - (3*b^2*c^4*f*g^2*x^7*Sqrt[1 - c^2*x^2])/25
6 + (16*b^2*f^2*g*(1 - c^2*x^2)^(3/2))/(245*c^2) + (80*b^2*g^3*(1 - c^2*x^
2)^(3/2))/(11907*c^4) - (65*b^2*f^3*x*(1 - c^2*x^2)^(3/2))/1728 + (36*b^2*
f^2*g*(1 - c^2*x^2)^(5/2))/(1225*c^2) + (4*b^2*g^3*(1 - c^2*x^2)^(5/2))/(1
323*c^4) - (b^2*f^3*x*(1 - c^2*x^2)^(5/2))/108 + (6*b^2*f^2*g*(1 - c^2*x^2
)^(7/2))/(343*c^2) + (50*b^2*g^3*(1 - c^2*x^2)^(7/2))/(27783*c^4) - (2*b^2
*g^3*(1 - c^2*x^2)^(9/2))/(729*c^4) + (115*b^2*f^3*ArcSin[c*x])/(1152*c) +
 (359*b^2*f*g^2*ArcSin[c*x])/(12288*c^3) + (4*b^2*g^3*x*ArcSin[c*x])/(63*c
^3) + (6*b*f^2*g*x*(a + b*ArcSin[c*x]))/(7*c) - (5*b*c*f^3*x^2*(a + b*ArcS
in[c*x]))/16 + (15*b*f*g^2*x^2*(a + b*ArcSin[c*x]))/(128*c) - (6*b*c*f^2*g
*x^3*(a + b*ArcSin[c*x]))/7 + (2*b*g^3*x^3*(a + b*ArcSin[c*x]))/(189*c) -
(59*b*c*f*g^2*x^4*(a + b*ArcSin[c*x]))/128 + (18*b*c^3*f^2*g*x^5*(a + b*Ar
cSin[c*x]))/35 - (2*b*c*g^3*x^5*(a + b*ArcSin[c*x]))/21 + (17*b*c^3*f*g^2*
x^6*(a + b*ArcSin[c*x]))/48 - (6*b*c^5*f^2*g*x^7*(a + b*ArcSin[c*x]))/49 +
 (38*b*c^3*g^3*x^7*(a + b*ArcSin[c*x]))/441 - (3*b*c^5*f*g^2*x^8*(a + b*Ar
cSin[c*x]))/32 - (2*b*c^5*g^3*x^9*(a + b*ArcSin[c*x]))/81 + (5*b*f^3*(1...
```

3.66. $\int (f+gx)^3\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx$

### 3.66.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.66.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.22 (sec) , antiderivative size = 5977, normalized size of antiderivative = 2.61

| method | result | size |
|---|---|---|
| default | Expression too large to display | 5977 |
| parts | Expression too large to display | 5977 |

input
```
int((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
result too large to display
```

### 3.66.5 Fricas [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^3(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral((a^2*c^4*d^2*g^3*x^7 + 3*a^2*c^4*d^2*f*g^2*x^6 + 3*a^2*d^2*f^2*g*
x + a^2*d^2*f^3 + (3*a^2*c^4*d^2*f^2*g - 2*a^2*c^2*d^2*g^3)*x^5 + (a^2*c^4
*d^2*f^3 - 6*a^2*c^2*d^2*f*g^2)*x^4 - (6*a^2*c^2*d^2*f^2*g - a^2*d^2*g^3)*
x^3 - (2*a^2*c^2*d^2*f^3 - 3*a^2*d^2*f*g^2)*x^2 + (b^2*c^4*d^2*g^3*x^7 + 3
*b^2*c^4*d^2*f*g^2*x^6 + 3*b^2*d^2*f^2*g*x + b^2*d^2*f^3 + (3*b^2*c^4*d^2*
f^2*g - 2*b^2*c^2*d^2*g^3)*x^5 + (b^2*c^4*d^2*f^3 - 6*b^2*c^2*d^2*f*g^2)*x
^4 - (6*b^2*c^2*d^2*f^2*g - b^2*d^2*g^3)*x^3 - (2*b^2*c^2*d^2*f^3 - 3*b^2*
d^2*f*g^2)*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*g^3*x^7 + 3*a*b*c^4*d^2*f*g
^2*x^6 + 3*a*b*d^2*f^2*g*x + a*b*d^2*f^3 + (3*a*b*c^4*d^2*f^2*g - 2*a*b*c^
2*d^2*g^3)*x^5 + (a*b*c^4*d^2*f^3 - 6*a*b*c^2*d^2*f*g^2)*x^4 - (6*a*b*c^2*
d^2*f^2*g - a*b*d^2*g^3)*x^3 - (2*a*b*c^2*d^2*f^3 - 3*a*b*d^2*f*g^2)*x^2)*
arcsin(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

### 3.66.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Timed out}$$

input
```
integrate((g*x+f)**3*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

### 3.66.7 Maxima [F]

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^3(b\arcsin{(cx)}+a)^2\,dx$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2*f^3 + 1/128*(8*(-c^
2*d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*
d*x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*
arcsin(c*x)/c^3)*a^2*f*g^2 - 1/63*(7*(-c^2*d*x^2 + d)^(7/2)*x^2/(c^2*d) +
2*(-c^2*d*x^2 + d)^(7/2)/(c^4*d))*a^2*g^3 - 3/7*(-c^2*d*x^2 + d)^(7/2)*a^2
*f^2*g/(c^2*d) + sqrt(d)*integrate(((b^2*c^4*d^2*g^3*x^7 + 3*b^2*c^4*d^2*f
*g^2*x^6 + 3*b^2*d^2*f^2*g*x + b^2*d^2*f^3 + (3*b^2*c^4*d^2*f^2*g - 2*b^2*
c^2*d^2*g^3)*x^5 + (b^2*c^4*d^2*f^3 - 6*b^2*c^2*d^2*f*g^2)*x^4 - (6*b^2*c^
2*d^2*f^2*g - b^2*d^2*g^3)*x^3 - (2*b^2*c^2*d^2*f^3 - 3*b^2*d^2*f*g^2)*x^2
)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*g^3*x^7 +
3*a*b*c^4*d^2*f*g^2*x^6 + 3*a*b*d^2*f^2*g*x + a*b*d^2*f^3 + (3*a*b*c^4*d^2
*f^2*g - 2*a*b*c^2*d^2*g^3)*x^5 + (a*b*c^4*d^2*f^3 - 6*a*b*c^2*d^2*f*g^2)*
x^4 - (6*a*b*c^2*d^2*f^2*g - a*b*d^2*g^3)*x^3 - (2*a*b*c^2*d^2*f^3 - 3*a*b
*d^2*f*g^2)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)
*sqrt(-c*x + 1), x)
```

### 3.66.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^3*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.66.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^3 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)^3*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

# 3.67 $\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx$

### 3.67.1 Optimal result

Integrand size = 33, antiderivative size = 1533

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \frac{64b^2d^2fg\sqrt{d-c^2dx^2}}{245c^2}$$

$$-\frac{245b^2d^2f^2x\sqrt{d-c^2dx^2}}{1152}-\frac{359b^2d^2g^2x\sqrt{d-c^2dx^2}}{36864c^2}-\frac{1079b^2d^2g^2x^3\sqrt{d-c^2dx^2}}{55296}$$

$$+\frac{209b^2c^2d^2g^2x^5\sqrt{d-c^2dx^2}}{13824}-\frac{1}{256}b^2c^4d^2g^2x^7\sqrt{d-c^2dx^2}$$

$$+\frac{32b^2d^2fg(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2}-\frac{65b^2d^2f^2x(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728}$$

$$+\frac{24b^2d^2fg(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2}-\frac{1}{108}b^2d^2f^2x\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}$$

$$+\frac{4b^2d^2fg(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2}+\frac{115b^2d^2f^2\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}}$$

$$+\frac{359b^2d^2g^2\sqrt{d-c^2dx^2}\arcsin(cx)}{36864c^3\sqrt{1-c^2x^2}}+\frac{4bd^2fgx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}}$$

$$-\frac{5bcd^2f^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}}+\frac{5bd^2g^2x^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{128c\sqrt{1-c^2x^2}}$$

$$-\frac{4bcd^2fgx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}}-\frac{59bcd^2g^2x^4\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{384\sqrt{1-c^2x^2}}$$

$$+\frac{12bc^3d^2fgx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}}+\frac{17bc^3d^2g^2x^6\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{144\sqrt{1-c^2x^2}}$$

$$-\frac{4bc^5d^2fgx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}}-\frac{bc^5d^2g^2x^8\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{32\sqrt{1-c^2x^2}}$$

$$+\frac{5bd^2f^2(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c}$$

$$+\frac{bd^2f^2(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c}$$

$$+\frac{5}{16}d^2f^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2-\frac{5d^2g^2x\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2}{128c^2}+\frac{5}{64}d^2g^2x^3\sqrt{d-c^2dx^2}(a+b$$

output
```
32/735*b^2*d^2*f*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2+24/1225*b^2*d^2*f
*g*(-c^2*x^2+1)^2*(-c^2*d*x^2+d)^(1/2)/c^2+4/7*b*d^2*f*g*x*(a+b*arcsin(c*x
))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-4/7*b*c*d^2*f*g*x^3*(a+b*arcs
in(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+12/35*b*c^3*d^2*f*g*x^5*(
a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-4/49*b*c^5*d^2*f*
g*x^7*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+4/343*b^2*
d^2*f*g*(-c^2*x^2+1)^3*(-c^2*d*x^2+d)^(1/2)/c^2+5/48*b*d^2*f^2*(-c^2*x^2+1
)^(3/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c+1/18*b*d^2*f^2*(-c^2*x^2+
1)^(5/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c-2/7*d^2*f*g*(-c^2*x^2+1)
^3*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/c^2+115/1152*b^2*d^2*f^2*arcsi
n(c*x)*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)+359/36864*b^2*d^2*g^2*arc
sin(c*x)*(-c^2*d*x^2+d)^(1/2)/c^3/(-c^2*x^2+1)^(1/2)+5/48*d^2*f^2*(a+b*arc
sin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)+5/384*d^2*g^2*(a+b
*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c^3/(-c^2*x^2+1)^(1/2)-5/16*b*c*d^2
*f^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/128*b
*d^2*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c/(-c^2*x^2+1)^(1/2)-5
9/384*b*c*d^2*g^2*x^4*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^
(1/2)+17/144*b*c^3*d^2*g^2*x^6*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/(-c^
2*x^2+1)^(1/2)-1/32*b*c^5*d^2*g^2*x^8*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/
2)/(-c^2*x^2+1)^(1/2)+64/245*b^2*d^2*f*g*(-c^2*d*x^2+d)^(1/2)/c^2-359/3...
```

### 3.67.2 Mathematica [A] (verified)

Time = 0.94 (sec) , antiderivative size = 742, normalized size of antiderivative = 0.48

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(12348000a^3(8c^2f^2+g^2)-3360ab^2c^2x(1960c^2f^2x(99-39c^2x^2+8c^4x^4)}{}$$

input
```
Integrate[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(12348000*a^3*(8*c^2*f^2 + g^2) - 3360*a*b^2*c^2*
x*(1960*c^2*f^2*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) + 4608*f*g*(-35 + 35*c^2*x
^2 - 21*c^4*x^4 + 5*c^6*x^6) + 245*g^2*x*(-45 + 177*c^2*x^2 - 136*c^4*x^4
+ 36*c^6*x^6)) + 352800*a^2*b*c*Sqrt[1 - c^2*x^2]*(768*f*g*(-1 + c^2*x^2)^
3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*(-15 + 118*c^2*x^
2 - 136*c^4*x^4 + 48*c^6*x^6)) - b^3*c*Sqrt[1 - c^2*x^2]*(274400*c^2*f^2*x
*(897 - 194*c^2*x^2 + 32*c^4*x^4) + 147456*f*g*(-2161 + 757*c^2*x^2 - 351*
c^4*x^4 + 75*c^6*x^6) + 8575*g^2*x*(1077 + 2158*c^2*x^2 - 1672*c^4*x^4 + 4
32*c^6*x^6)) + 105*b*(352800*a^2*(8*c^2*f^2 + g^2) + b^2*(87955*g^2 + 1120
*c^2*(2093*f^2 + 4608*f*g*x + 315*g^2*x^2) - 3360*c^4*x^2*(1848*f^2 + 1536
*f*g*x + 413*g^2*x^2) - 640*c^8*x^6*(784*f^2 + 1152*f*g*x + 441*g^2*x^2) +
 1792*c^6*x^4*(1365*f^2 + 1728*f*g*x + 595*g^2*x^2)) + 6720*a*b*c*Sqrt[1 -
 c^2*x^2]*(768*f*g*(-1 + c^2*x^2)^3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^
4*x^4) + 7*g^2*x*(-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6)))*ArcSin[c
*x] + 352800*b^2*(105*a*(8*c^2*f^2 + g^2) + b*c*Sqrt[1 - c^2*x^2]*(768*f*g
*(-1 + c^2*x^2)^3 + 56*c^2*f^2*x*(33 - 26*c^2*x^2 + 8*c^4*x^4) + 7*g^2*x*(
-15 + 118*c^2*x^2 - 136*c^4*x^4 + 48*c^6*x^6)))*ArcSin[c*x]^2 + 12348000*b
^3*(8*c^2*f^2 + g^2)*ArcSin[c*x]^3))/(948326400*b*c^3*Sqrt[1 - c^2*x^2])
```

### 3.67.3 Rubi [A] (verified)

Time = 2.15 (sec) , antiderivative size = 922, normalized size of antiderivative = 0.60, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)^2(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)^2\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(f^2(a+b\arcsin(cx))^2\left(1-c^2x^2\right)^{5/2}+g^2x^2(a+b\arcsin(cx))^2\left(1-c^2x^2\right)^{5/2}+2fgx(a+b\arcsin(\ldots\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$d^2\sqrt{d-c^2dx^2}\Big(-\tfrac{1}{32}bc^5g^2(a+b\arcsin(cx))x^8-\tfrac{4}{49}bc^5fg(a+b\arcsin(cx))x^7-\tfrac{1}{256}b^2c^4g^2\sqrt{1-c^2x^2}x^7+\tfrac{17}{144}bc^3g^2($$

input
```
Int[(f + g*x)^2*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((64*b^2*f*g*Sqrt[1 - c^2*x^2])/(245*c^2) - (245*
b^2*f^2*x*Sqrt[1 - c^2*x^2])/1152 - (359*b^2*g^2*x*Sqrt[1 - c^2*x^2])/(368
64*c^2) - (1079*b^2*g^2*x^3*Sqrt[1 - c^2*x^2])/55296 + (209*b^2*c^2*g^2*x^
5*Sqrt[1 - c^2*x^2])/13824 - (b^2*c^4*g^2*x^7*Sqrt[1 - c^2*x^2])/256 + (32
*b^2*f*g*(1 - c^2*x^2)^(3/2))/(735*c^2) - (65*b^2*f^2*x*(1 - c^2*x^2)^(3/2
))/1728 + (24*b^2*f*g*(1 - c^2*x^2)^(5/2))/(1225*c^2) - (b^2*f^2*x*(1 - c^
2*x^2)^(5/2))/108 + (4*b^2*f*g*(1 - c^2*x^2)^(7/2))/(343*c^2) + (115*b^2*f
^2*ArcSin[c*x])/(1152*c) + (359*b^2*g^2*ArcSin[c*x])/(36864*c^3) + (4*b*f*
g*x*(a + b*ArcSin[c*x]))/(7*c) - (5*b*c*f^2*x^2*(a + b*ArcSin[c*x]))/16 +
(5*b*g^2*x^2*(a + b*ArcSin[c*x]))/(128*c) - (4*b*c*f*g*x^3*(a + b*ArcSin[c
*x]))/7 - (59*b*c*g^2*x^4*(a + b*ArcSin[c*x]))/384 + (12*b*c^3*f*g*x^5*(a
+ b*ArcSin[c*x]))/35 + (17*b*c^3*g^2*x^6*(a + b*ArcSin[c*x]))/144 - (4*b*c
^5*f*g*x^7*(a + b*ArcSin[c*x]))/49 - (b*c^5*g^2*x^8*(a + b*ArcSin[c*x]))/3
2 + (5*b*f^2*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(48*c) + (b*f^2*(1 - c^2
*x^2)^3*(a + b*ArcSin[c*x]))/(18*c) + (5*f^2*x*Sqrt[1 - c^2*x^2]*(a + b*Ar
cSin[c*x])^2)/16 - (5*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(128*
c^2) + (5*g^2*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/64 + (5*f^2*x*(
1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/24 + (5*g^2*x^3*(1 - c^2*x^2)^(3
/2)*(a + b*ArcSin[c*x])^2)/48 + (f^2*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c
*x])^2)/6 + (g^2*x^3*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/8 - (2*...
```

### 3.67.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.67.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.06 (sec) , antiderivative size = 4170, normalized size of antiderivative = 2.72

| method | result | size |
|---|---|---|
| default | Expression too large to display | 4170 |
| parts | Expression too large to display | 4170 |

input
```
int((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2*(1/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4
*d*(1/2*x*(-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/
(-c^2*d*x^2+d)^(1/2)))))+g^2*(-1/8*x*(-c^2*d*x^2+d)^(7/2)/c^2/d+1/8/c^2*(1
/6*x*(-c^2*d*x^2+d)^(5/2)+5/6*d*(1/4*x*(-c^2*d*x^2+d)^(3/2)+3/4*d*(1/2*x*(
-c^2*d*x^2+d)^(1/2)+1/2*d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2
+d)^(1/2))))))-2/7*f*g*(-c^2*d*x^2+d)^(7/2)/c^2/d)+b^2*(-5/384*(-d*(c^2*x^
2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/(c^2*x^2-1)*arcsin(c*x)^3*(8*c^2*f^2+g^
2)*d^2+1/21952*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x^7
*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*x^
2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*f*g*(14*I*
arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-3/274400*(-d*(c^2*x^2-
1))^(1/2)*(I*c^2*x^2-c*x*(-c^2*x^2+1)^(1/2)-I)*f*g*(630*I*arcsin(c*x)+1225
*arcsin(c*x)^2-106)*sin(6*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)+1/6912*(-d*(c^2
*x^2-1))^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2
+1)^(1/2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*
(-c^2*x^2+1)^(1/2)-6*c*x)*(6*I*arcsin(c*x)*c^2*f^2+18*arcsin(c*x)^2*c^2*f^
2-6*I*arcsin(c*x)*g^2-18*arcsin(c*x)^2*g^2-c^2*f^2+g^2)*d^2/c^3/(c^2*x^2-1
)+1/65536*(-d*(c^2*x^2-1))^(1/2)*(-128*I*(-c^2*x^2+1)^(1/2)*x^8*c^8+128*c^
9*x^9+256*I*(-c^2*x^2+1)^(1/2)*x^6*c^6-320*c^7*x^7-160*I*(-c^2*x^2+1)^(1/2
)*x^4*c^4+272*c^5*x^5+32*I*(-c^2*x^2+1)^(1/2)*c^2*x^2-88*c^3*x^3-I*(-c^...
```

### 3.67.5 Fricas [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx=\int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"fricas")
```

output
```
integral((a^2*c^4*d^2*g^2*x^6 + 2*a^2*c^4*d^2*f*g*x^5 - 4*a^2*c^2*d^2*f*g*
x^3 + 2*a^2*d^2*f*g*x + a^2*d^2*f^2 + (a^2*c^4*d^2*f^2 - 2*a^2*c^2*d^2*g^2
)*x^4 - (2*a^2*c^2*d^2*f^2 - a^2*d^2*g^2)*x^2 + (b^2*c^4*d^2*g^2*x^6 + 2*b
^2*c^4*d^2*f*g*x^5 - 4*b^2*c^2*d^2*f*g*x^3 + 2*b^2*d^2*f*g*x + b^2*d^2*f^2
 + (b^2*c^4*d^2*f^2 - 2*b^2*c^2*d^2*g^2)*x^4 - (2*b^2*c^2*d^2*f^2 - b^2*d^
2*g^2)*x^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*g^2*x^6 + 2*a*b*c^4*d^2*f*g*x^5
 - 4*a*b*c^2*d^2*f*g*x^3 + 2*a*b*d^2*f*g*x + a*b*d^2*f^2 + (a*b*c^4*d^2*f^
2 - 2*a*b*c^2*d^2*g^2)*x^4 - (2*a*b*c^2*d^2*f^2 - a*b*d^2*g^2)*x^2)*arcsin
(c*x))*sqrt(-c^2*d*x^2 + d), x)
```

### 3.67.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx=\text{Timed out}$$

input
```
integrate((g*x+f)**2*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

### 3.67.7 Maxima [F]

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)^2(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"maxima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2*f^2 + 1/384*(8*(-c^
2*d*x^2 + d)^(5/2)*x/c^2 - 48*(-c^2*d*x^2 + d)^(7/2)*x/(c^2*d) + 10*(-c^2*
d*x^2 + d)^(3/2)*d*x/c^2 + 15*sqrt(-c^2*d*x^2 + d)*d^2*x/c^2 + 15*d^(5/2)*
arcsin(c*x)/c^3)*a^2*g^2 - 2/7*(-c^2*d*x^2 + d)^(7/2)*a^2*f*g/(c^2*d) + sq
rt(d)*integrate(((b^2*c^4*d^2*g^2*x^6 + 2*b^2*c^4*d^2*f*g*x^5 - 4*b^2*c^2*
d^2*f*g*x^3 + 2*b^2*d^2*f*g*x + b^2*d^2*f^2 + (b^2*c^4*d^2*f^2 - 2*b^2*c^2
*d^2*g^2)*x^4 - (2*b^2*c^2*d^2*f^2 - b^2*d^2*g^2)*x^2)*arctan2(c*x, sqrt(c
*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*g^2*x^6 + 2*a*b*c^4*d^2*f*g*x^5
 - 4*a*b*c^2*d^2*f*g*x^3 + 2*a*b*d^2*f*g*x + a*b*d^2*f^2 + (a*b*c^4*d^2*f^
2 - 2*a*b*c^2*d^2*g^2)*x^4 - (2*a*b*c^2*d^2*f^2 - a*b*d^2*g^2)*x^2)*arctan
2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1), x)
```

### 3.67.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)^2*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm=
"giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.67.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx)^2 \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)^2*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

# 3.68 $\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx$



## 3.68.1 Optimal result

Integrand size = 31, antiderivative size = 878

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \frac{32b^2d^2g\sqrt{d-c^2dx^2}}{245c^2}$$
$$-\frac{245b^2d^2fx\sqrt{d-c^2dx^2}}{1152}+\frac{16b^2d^2g(1-c^2x^2)\sqrt{d-c^2dx^2}}{735c^2}-\frac{65b^2d^2fx(1-c^2x^2)\sqrt{d-c^2dx^2}}{1728}$$
$$+\frac{12b^2d^2g(1-c^2x^2)^2\sqrt{d-c^2dx^2}}{1225c^2}-\frac{1}{108}b^2d^2fx\left(1-c^2x^2\right)^2\sqrt{d-c^2dx^2}$$
$$+\frac{2b^2d^2g(1-c^2x^2)^3\sqrt{d-c^2dx^2}}{343c^2}+\frac{115b^2d^2f\sqrt{d-c^2dx^2}\arcsin(cx)}{1152c\sqrt{1-c^2x^2}}$$
$$+\frac{2bd^2gx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7c\sqrt{1-c^2x^2}}-\frac{5bcd^2fx^2\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{16\sqrt{1-c^2x^2}}$$
$$-\frac{2bcd^2gx^3\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{7\sqrt{1-c^2x^2}}+\frac{6bc^3d^2gx^5\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{35\sqrt{1-c^2x^2}}$$
$$-\frac{2bc^5d^2gx^7\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{49\sqrt{1-c^2x^2}}+\frac{5bd^2f(1-c^2x^2)^{3/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{48c}$$
$$+\frac{bd^2f(1-c^2x^2)^{5/2}\sqrt{d-c^2dx^2}(a+b\arcsin(cx))}{18c}$$
$$+\frac{5}{16}d^2fx\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{5}{24}d^2fx\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}(a+b\arcsin(cx))^2+\frac{1}{6}d^2fx\left(1-c^2x^2\right)^2$$

output
```
32/245*b^2*d^2*g*(-c^2*d*x^2+d)^(1/2)/c^2-245/1152*b^2*d^2*f*x*(-c^2*d*x^2
+d)^(1/2)+16/735*b^2*d^2*g*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)/c^2-65/1728*b
^2*d^2*f*x*(-c^2*x^2+1)*(-c^2*d*x^2+d)^(1/2)+12/1225*b^2*d^2*g*(-c^2*x^2+1
)^2*(-c^2*d*x^2+d)^(1/2)/c^2-1/108*b^2*d^2*f*x*(-c^2*x^2+1)^2*(-c^2*d*x^2+
d)^(1/2)+2/343*b^2*d^2*g*(-c^2*x^2+1)^3*(-c^2*d*x^2+d)^(1/2)/c^2+5/48*b*d^
2*f*(-c^2*x^2+1)^(3/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c+1/18*b*d^2
*f*(-c^2*x^2+1)^(5/2)*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2)/c+5/16*d^2*f*
x*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+5/24*d^2*f*x*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)+1/6*d^2*f*x*(-c^2*x^2+1)^2*(a+b*arcsin
(c*x))^2*(-c^2*d*x^2+d)^(1/2)-1/7*d^2*g*(-c^2*x^2+1)^3*(a+b*arcsin(c*x))^2
*(-c^2*d*x^2+d)^(1/2)/c^2+115/1152*b^2*d^2*f*arcsin(c*x)*(-c^2*d*x^2+d)^(1
/2)/c/(-c^2*x^2+1)^(1/2)+2/7*b*d^2*g*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1
/2)/c/(-c^2*x^2+1)^(1/2)-5/16*b*c*d^2*f*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2+
d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/7*b*c*d^2*g*x^3*(a+b*arcsin(c*x))*(-c^2*d*x^
2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+6/35*b*c^3*d^2*g*x^5*(a+b*arcsin(c*x))*(-c^2
*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)-2/49*b*c^5*d^2*g*x^7*(a+b*arcsin(c*x))*
(-c^2*d*x^2+d)^(1/2)/(-c^2*x^2+1)^(1/2)+5/48*d^2*f*(a+b*arcsin(c*x))^3*(-c
^2*d*x^2+d)^(1/2)/b/c/(-c^2*x^2+1)^(1/2)
```

### 3.68.2 Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 470, normalized size of antiderivative = 0.54

$$\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx = \frac{d^2\sqrt{d-c^2dx^2}\Big(3087000a^3cf+88200a^2b\sqrt{1-c^2x^2}\Big(48g\left(-1+c^2x^2\right)^3+7c^2fx(33-26c}{}$$

input
```
Integrate[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(3087000*a^3*c*f + 88200*a^2*b*Sqrt[1 - c^2*x^2]*
(48*g*(-1 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)) - 840*a*
b^2*c*x*(245*c^2*f*x*(99 - 39*c^2*x^2 + 8*c^4*x^4) + 288*g*(-35 + 35*c^2*x
^2 - 21*c^4*x^4 + 5*c^6*x^6)) + b^3*Sqrt[1 - c^2*x^2]*(-8575*c^2*f*x*(897
- 194*c^2*x^2 + 32*c^4*x^4) - 2304*g*(-2161 + 757*c^2*x^2 - 351*c^4*x^4 +
75*c^6*x^6)) + 105*b*(88200*a^2*c*f + 1680*a*b*Sqrt[1 - c^2*x^2]*(48*g*(-1
 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x^4)) + b^2*c*(-2304*g*
x*(-35 + 35*c^2*x^2 - 21*c^4*x^4 + 5*c^6*x^6) - 245*f*(-299 + 792*c^2*x^2
- 312*c^4*x^4 + 64*c^6*x^6)))*ArcSin[c*x] + 88200*b^2*(105*a*c*f + b*Sqrt[
1 - c^2*x^2]*(48*g*(-1 + c^2*x^2)^3 + 7*c^2*f*x*(33 - 26*c^2*x^2 + 8*c^4*x
^4)))*ArcSin[c*x]^2 + 3087000*b^3*c*f*ArcSin[c*x]^3))/(29635200*b*c^2*Sqrt
[1 - c^2*x^2])
```

### 3.68.3 Rubi [A] (verified)

Time = 1.12 (sec) , antiderivative size = 513, normalized size of antiderivative = 0.58, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(d-c^2dx^2\right)^{5/2}(f+gx)(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int (f+gx)\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(f(a+b\arcsin(cx))^2\left(1-c^2x^2\right)^{5/2}+gx(a+b\arcsin(cx))^2\left(1-c^2x^2\right)^{5/2}\right)dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \text{2009}$$

$$d^2\sqrt{d-c^2dx^2}\left(-\frac{2}{49}bc^5gx^7(a+b\arcsin(cx))+\frac{6}{35}bc^3gx^5(a+b\arcsin(cx))+\frac{1}{6}fx\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2\right.$$

input
```
Int[(f + g*x)*(d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((32*b^2*g*Sqrt[1 - c^2*x^2])/(245*c^2) - (245*b^
2*f*x*Sqrt[1 - c^2*x^2])/1152 + (16*b^2*g*(1 - c^2*x^2)^(3/2))/(735*c^2) -
 (65*b^2*f*x*(1 - c^2*x^2)^(3/2))/1728 + (12*b^2*g*(1 - c^2*x^2)^(5/2))/(1
225*c^2) - (b^2*f*x*(1 - c^2*x^2)^(5/2))/108 + (2*b^2*g*(1 - c^2*x^2)^(7/2
))/(343*c^2) + (115*b^2*f*ArcSin[c*x])/(1152*c) + (2*b*g*x*(a + b*ArcSin[c
*x]))/(7*c) - (5*b*c*f*x^2*(a + b*ArcSin[c*x]))/16 - (2*b*c*g*x^3*(a + b*A
rcSin[c*x]))/7 + (6*b*c^3*g*x^5*(a + b*ArcSin[c*x]))/35 - (2*b*c^5*g*x^7*(
a + b*ArcSin[c*x]))/49 + (5*b*f*(1 - c^2*x^2)^2*(a + b*ArcSin[c*x]))/(48*c
) + (b*f*(1 - c^2*x^2)^3*(a + b*ArcSin[c*x]))/(18*c) + (5*f*x*Sqrt[1 - c^2
*x^2]*(a + b*ArcSin[c*x])^2)/16 + (5*f*x*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin
[c*x])^2)/24 + (f*x*(1 - c^2*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/6 - (g*(1 -
 c^2*x^2)^(7/2)*(a + b*ArcSin[c*x])^2)/(7*c^2) + (5*f*(a + b*ArcSin[c*x])^
3)/(48*b*c)))/Sqrt[1 - c^2*x^2]
```

### 3.68.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.68. $\int (f+gx)\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2\,dx$

### 3.68.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.94 (sec) , antiderivative size = 2852, normalized size of antiderivative = 3.25

| method | result | size |
|---|---|---|
| default | Expression too large to display | 2852 |
| parts | Expression too large to display | 2852 |

input
```
int((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBO
SE)
```

output
```
1/6*a^2*f*x*(-c^2*d*x^2+d)^(5/2)+5/24*a^2*f*d*x*(-c^2*d*x^2+d)^(3/2)+5/16*
a^2*f*d^2*x*(-c^2*d*x^2+d)^(1/2)+5/16*a^2*f*d^3/(c^2*d)^(1/2)*arctan((c^2*
d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-1/7*a^2*g*(-c^2*d*x^2+d)^(7/2)/c^2/d+b^2*
(-5/48*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/(c^2*x^2-1)*arcsin(c*x)
^3*f*d^2+1/43904*(-d*(c^2*x^2-1))^(1/2)*(64*c^8*x^8-144*c^6*x^6-64*I*c^7*x
^7*(-c^2*x^2+1)^(1/2)+104*c^4*x^4+112*I*(-c^2*x^2+1)^(1/2)*x^5*c^5-25*c^2*
x^2-56*I*(-c^2*x^2+1)^(1/2)*x^3*c^3+7*I*(-c^2*x^2+1)^(1/2)*x*c+1)*g*(14*I*
arcsin(c*x)+49*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)+1/6912*(-d*(c^2*x^2-1)
)^(1/2)*(-32*I*(-c^2*x^2+1)^(1/2)*c^6*x^6+32*c^7*x^7+48*I*(-c^2*x^2+1)^(1/
2)*x^4*c^4-64*c^5*x^5-18*I*(-c^2*x^2+1)^(1/2)*x^2*c^2+38*c^3*x^3+I*(-c^2*x
^2+1)^(1/2)-6*c*x)*f*(6*I*arcsin(c*x)+18*arcsin(c*x)^2-1)*d^2/c/(c^2*x^2-1
)-5/128*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arc
sin(c*x)^2-2+2*I*arcsin(c*x))*d^2/c^2/(c^2*x^2-1)-5/128*(-d*(c^2*x^2-1))^(
1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arcsin(c*x)^2-2-2*I*arcsin(c*
x))*d^2/c^2/(c^2*x^2-1)+15/256*(-d*(c^2*x^2-1))^(1/2)*(2*I*(-c^2*x^2+1)^(1
/2)*x^2*c^2+2*c^3*x^3-I*(-c^2*x^2+1)^(1/2)-2*c*x)*f*(-2*I*arcsin(c*x)+2*ar
csin(c*x)^2-1)*d^2/c/(c^2*x^2-1)+1/384*(-d*(c^2*x^2-1))^(1/2)*(4*I*c^3*x^3
*(-c^2*x^2+1)^(1/2)+4*c^4*x^4-3*I*(-c^2*x^2+1)^(1/2)*x*c-5*c^2*x^2+1)*g*(-
6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)*d^2/c^2/(c^2*x^2-1)-1/137200*(-d*(c^2*x
^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(385*I*arcsin(c*x)+...
```

### 3.68.5 Fricas [F]

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)^2 \, dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="f
ricas")
```

output
```
integral((a^2*c^4*d^2*g*x^5 + a^2*c^4*d^2*f*x^4 - 2*a^2*c^2*d^2*g*x^3 - 2*
a^2*c^2*d^2*f*x^2 + a^2*d^2*g*x + a^2*d^2*f + (b^2*c^4*d^2*g*x^5 + b^2*c^4
*d^2*f*x^4 - 2*b^2*c^2*d^2*g*x^3 - 2*b^2*c^2*d^2*f*x^2 + b^2*d^2*g*x + b^2
*d^2*f)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*g*x^5 + a*b*c^4*d^2*f*x^4 - 2*a*b*c
^2*d^2*g*x^3 - 2*a*b*c^2*d^2*f*x^2 + a*b*d^2*g*x + a*b*d^2*f)*arcsin(c*x))
*sqrt(-c^2*d*x^2 + d), x)
```

### 3.68.6 Sympy [F(-1)]

Timed out.

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \text{Timed out}$$

input
```
integrate((g*x+f)*(-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2,x)
```

output
```
Timed out
```

### 3.68.7 Maxima [F]

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2 \, dx = \int \left(-c^2dx^2+d\right)^{\frac{5}{2}}(gx+f)(b\arcsin(cx)+a)^2 \, dx$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="m
axima")
```

output
```
1/48*(8*(-c^2*d*x^2 + d)^(5/2)*x + 10*(-c^2*d*x^2 + d)^(3/2)*d*x + 15*sqrt
(-c^2*d*x^2 + d)*d^2*x + 15*d^(5/2)*arcsin(c*x)/c)*a^2*f - 1/7*(-c^2*d*x^2
 + d)^(7/2)*a^2*g/(c^2*d) + sqrt(d)*integrate(((b^2*c^4*d^2*g*x^5 + b^2*c^
4*d^2*f*x^4 - 2*b^2*c^2*d^2*g*x^3 - 2*b^2*c^2*d^2*f*x^2 + b^2*d^2*g*x + b^
2*d^2*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*c^4*d^2*g*x
^5 + a*b*c^4*d^2*f*x^4 - 2*a*b*c^2*d^2*g*x^3 - 2*a*b*c^2*d^2*f*x^2 + a*b*d
^2*g*x + a*b*d^2*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x +
 1)*sqrt(-c*x + 1), x)
```

### 3.68.8 Giac [F(-2)]

Exception generated.

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2,x, algorithm="g
iac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.68.9 Mupad [F(-1)]

Timed out.

$$\int (f+gx) \left(d-c^2dx^2\right)^{5/2} (a+b\arcsin(cx))^2\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(d-c^2\,d\,x^2\right)^{5/2}\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2),x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2), x)
```

# 3.69 $\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$



## 3.69.1 Optimal result

Integrand size = 33, antiderivative size = 2989

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \text{Too large to display}$$

output
```
-a^2*d^2*(c^2*f^2-g^2)^(5/2)*arctan((c^2*f*x+g)/(c^2*f^2-g^2)^(1/2)/(-c^2*
x^2+1)^(1/2))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)+2*I*b^2*d^2*(c^2
*f^2-g^2)^(5/2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2
)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)+I*b^2*d^2*(c^2*f^2-g
^2)^(5/2)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-
g^2)^(1/2)))*(-c^2*d*x^2+d)^(1/2)/g^6/(-c^2*x^2+1)^(1/2)+52/225*b^2*d^2*(-
c^2*d*x^2+d)^(1/2)/g-2/15*d^2*(a+b*arcsin(c*x))^2*(-c^2*d*x^2+d)^(1/2)/g+b
^2*d^2*(c^2*f^2-g^2)^2*arcsin(c*x)^2*(-c^2*d*x^2+d)^(1/2)/g^5+a^2*d^2*(c^2
*f^2-g^2)^2*(-c^2*d*x^2+d)^(1/2)/g^5-1/6*c*d^2*f*(c^2*f^2-2*g^2)*(a+b*arcs
in(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/g^4/(-c^2*x^2+1)^(1/2)+1/3*c*d^2*(c^2*f^
2-g^2)^2*x*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/g^5/(-c^2*x^2+1)^(1/
2)+1/3*d^2*(c^2*f^2-g^2)^3*(a+b*arcsin(c*x))^3*(-c^2*d*x^2+d)^(1/2)/b/c/g^
6/(g*x+f)/(-c^2*x^2+1)^(1/2)+1/3*d^2*(c^2*f^2-g^2)^2*(a+b*arcsin(c*x))^3*(
-c^2*x^2+1)^(1/2)*(-c^2*d*x^2+d)^(1/2)/b/c/g^4/(g*x+f)-2*a*b*c*d^2*(c^2*f^
2-g^2)^2*x*(-c^2*d*x^2+d)^(1/2)/g^5/(-c^2*x^2+1)^(1/2)-1/4*b^2*c*d^2*f*(c^
2*f^2-2*g^2)*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^4/(-c^2*x^2+1)^(1/2)-2*b^2
*c*d^2*(c^2*f^2-g^2)^2*x*arcsin(c*x)*(-c^2*d*x^2+d)^(1/2)/g^5/(-c^2*x^2+1)
^(1/2)+2/3*b*c*d^2*(c^2*f^2-2*g^2)*x*(a+b*arcsin(c*x))*(-c^2*d*x^2+d)^(1/2
)/g^3/(-c^2*x^2+1)^(1/2)-1/8*b*c^3*d^2*f*x^2*(a+b*arcsin(c*x))*(-c^2*d*x^2
+d)^(1/2)/g^2/(-c^2*x^2+1)^(1/2)-2/9*b*c^3*d^2*(c^2*f^2-2*g^2)*x^3*(a+b...
```

### 3.69.2 Mathematica [A] (verified)

Time = 3.67 (sec) , antiderivative size = 1275, normalized size of antiderivative = 0.43

$$\int \frac{(d-c^2dx^2)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx = \frac{d^2\sqrt{d-c^2dx^2}\left(-\frac{c^2f(c^2f^2-2g^2)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2g^4}-\frac{c^4fx^3\sqrt{1-c^2x^2}}{4}\right.}{}$$

input
```
Integrate[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

output
```
(d^2*Sqrt[d - c^2*d*x^2]*(-1/2*(c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x])^2)/g^4 - (c^4*f*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x])^2)/(4*g^2) + (c^4*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(5*g)
 - ((c^2*f^2 - 2*g^2)*(1 - c^2*x^2)^(3/2)*(a + b*ArcSin[c*x])^2)/(3*g^3) -
 (c*f*(c^2*f^2 - 2*g^2)*(a + b*ArcSin[c*x])^3)/(6*b*g^4) - ((-(c^2*f^2) +
g^2)^2*(-1 + c^2*x^2)*(a + b*ArcSin[c*x])^3)/(3*b*c*g^4*(f + g*x)) + (b*c*
f*(c^2*f^2 - 2*g^2)*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x
^2)*ArcSin[c*x]))/(4*g^4) + (2*b*(c^2*f^2 - 2*g^2)*(b*Sqrt[1 - c^2*x^2]*(7
 - c^2*x^2) + 9*c*x*(a + b*ArcSin[c*x]) - 3*c^3*x^3*(a + b*ArcSin[c*x])))/
(27*g^3) + (b*c*f*(b*c*x*Sqrt[1 - c^2*x^2]*(3 + 2*c^2*x^2) - 3*b*ArcSin[c*
x] + 8*c^4*x^4*(a + b*ArcSin[c*x])))/(64*g^2) - (2*b*(b*Sqrt[1 - c^2*x^2]*
(8 + 4*c^2*x^2 + 3*c^4*x^4) + 15*c^5*x^5*(a + b*ArcSin[c*x])))/(375*g) + (
c*f*(6*b*c*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*(a + b*ArcSin[c*x
])^3 - 3*b^2*(c*x*(2*a*c*x + b*Sqrt[1 - c^2*x^2]) + b*(-1 + 2*c^2*x^2)*Arc
Sin[c*x])))/(48*b*g^2) - (9*c^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^
2 - 2*b*(b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + 3*c^3*x^3*(a + b*ArcSin[c*x])
) + 18*(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*(a*c*x + b*Sqrt[1 -
c^2*x^2] + b*c*x*ArcSin[c*x])))/(135*g) + ((-(c^2*f^2) + g^2)^2*((c^2*f^2
- g^2)*(a + b*ArcSin[c*x])^3 + c^2*g*x*(f + g*x)*(a + b*ArcSin[c*x])^3 + 3
*b*c*(f + g*x)*(g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - 2*b*g*(a*c*...
```

### 3.69.3 Rubi [A] (verified)

Time = 4.96 (sec) , antiderivative size = 1986, normalized size of antiderivative = 0.66, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$$

$$\Big\downarrow \; 5276$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \frac{\left(1-c^2x^2\right)^{5/2}(a+b\arcsin(cx))^2}{f+gx}dx}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \; 5266$$

$$\frac{d^2\sqrt{d-c^2dx^2}\int \left(\frac{x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^4}{g}-\frac{fx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^4}{g^2}-\frac{f\left(c^2f^2-2g^2\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^2}{g^4}+\frac{(}{}\right.}{\sqrt{1-c^2x^2}}$$

$$\Big\downarrow \; 2009$$

$$d^2\sqrt{d-c^2dx^2}\left(-\frac{2bx^5(a+b\arcsin(cx))c^5}{25g}+\frac{bfx^4(a+b\arcsin(cx))c^5}{8g^2}+\frac{x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2c^4}{5g}-\frac{fx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{4g^2}\right.$$

input
```
Int[((d - c^2*d*x^2)^(5/2)*(a + b*ArcSin[c*x])^2)/(f + g*x),x]
```

## 3.69. $\int \frac{\left(d-c^2dx^2\right)^{5/2}(a+b\arcsin(cx))^2}{f+gx}\,dx$

output
```
(d^2*Sqrt[d - c^2*d*x^2]*((4*a*b*c*x)/(15*g) - (2*a*b*c*(c^2*f^2 - g^2)^2*
x)/g^5 + (52*b^2*Sqrt[1 - c^2*x^2])/(225*g) + (4*b^2*(c^2*f^2 - 2*g^2)*Sqr
t[1 - c^2*x^2])/(9*g^3) + (a^2*(c^2*f^2 - g^2)^2*Sqrt[1 - c^2*x^2])/g^5 -
(2*b^2*(c^2*f^2 - g^2)^2*Sqrt[1 - c^2*x^2])/g^5 - (b^2*c^2*f*x*Sqrt[1 - c^
2*x^2])/(64*g^2) + (b^2*c^2*f*(c^2*f^2 - 2*g^2)*x*Sqrt[1 - c^2*x^2])/(4*g^
4) + (b^2*c^4*f*x^3*Sqrt[1 - c^2*x^2])/(32*g^2) + (26*b^2*(1 - c^2*x^2)^(3
/2))/(675*g) + (2*b^2*(c^2*f^2 - 2*g^2)*(1 - c^2*x^2)^(3/2))/(27*g^3) - (2
*b^2*(1 - c^2*x^2)^(5/2))/(125*g) + (b^2*c*f*ArcSin[c*x])/(64*g^2) - (b^2*
c*f*(c^2*f^2 - 2*g^2)*ArcSin[c*x])/(4*g^4) + (4*b^2*c*x*ArcSin[c*x])/(15*g
) - (2*b^2*c*(c^2*f^2 - g^2)^2*x*ArcSin[c*x])/g^5 + (2*a*b*(c^2*f^2 - g^2)
^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/g^5 + (b^2*(c^2*f^2 - g^2)^2*Sqrt[1 - c^
2*x^2]*ArcSin[c*x]^2)/g^5 + (2*b*c*(c^2*f^2 - 2*g^2)*x*(a + b*ArcSin[c*x])
)/(3*g^3) - (b*c^3*f*x^2*(a + b*ArcSin[c*x]))/(8*g^2) + (b*c^3*f*(c^2*f^2
- 2*g^2)*x^2*(a + b*ArcSin[c*x]))/(2*g^4) + (2*b*c^3*x^3*(a + b*ArcSin[c*x
]))/(45*g) - (2*b*c^3*(c^2*f^2 - 2*g^2)*x^3*(a + b*ArcSin[c*x]))/(9*g^3) +
 (b*c^5*f*x^4*(a + b*ArcSin[c*x]))/(8*g^2) - (2*b*c^5*x^5*(a + b*ArcSin[c*
x]))/(25*g) - (2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(15*g) + (c^2*f*
x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(8*g^2) - (c^2*f*(c^2*f^2 - 2*g
^2)*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/(2*g^4) - (c^2*x^2*Sqrt[1 -
 c^2*x^2]*(a + b*ArcSin[c*x])^2)/(15*g) - (c^4*f*x^3*Sqrt[1 - c^2*x^2]*...
```

### 3.69.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5266
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[Sqrt[d + e*x^2]*(a
 + b*ArcSin[c*x])^n, (f + g*x)^m*(d + e*x^2)^(p - 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && IGtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.69.4 Maple [F]

$$\int \frac{\left(-c^{2} d\,x^{2}+d\right)^{\frac{5}{2}} \left(a +b \arcsin \left(c x \right)\right)^{2}}{g x +f}d x$$

input
```
int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

output
```
int((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x)
```

### 3.69.5 Fricas [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{\left(-c^{2} d x^{2} + d\right)^{\frac{5}{2}} {\left(b \arcsin\left(c x\right) + a\right)}^{2}}{g x + f}\,{d x}$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="f
ricas")
```

output
```
integral((a^2*c^4*d^2*x^4 - 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^4*d^2*x^4
 - 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arcsin(c*x)^2 + 2*(a*b*c^4*d^2*x^4 - 2*a*b
*c^2*d^2*x^2 + a*b*d^2)*arcsin(c*x))*sqrt(-c^2*d*x^2 + d)/(g*x + f), x)
```

### 3.69.6 Sympy [F]

$$\int \frac{(d-c^2dx^2)^{5/2}\,(a+b\arcsin(cx))^2}{f+gx}\,dx = \int \frac{\left(- d \left(c x - 1\right) \left(c x + 1\right)\right)^{\frac{5}{2}} \left(a + b \operatorname{asin}{\left(c x \right)}\right)^{2}}{f + g x}\, dx$$

input
```
integrate((-c**2*d*x**2+d)**(5/2)*(a+b*asin(c*x))**2/(g*x+f),x)
```

output
```
Integral((-d*(c*x - 1)*(c*x + 1))**(5/2)*(a + b*asin(c*x))**2/(f + g*x), x
)
```

### 3.69.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2}{f+gx} \, dx = \text{Exception raised: ValueError}$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="m
axima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(g-c*f>0)', see `assume?` for mor
e details)
```

### 3.69.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2}{f+gx} \, dx = \text{Exception raised: TypeError}$$

input
```
integrate((-c^2*d*x^2+d)^(5/2)*(a+b*arcsin(c*x))^2/(g*x+f),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.69.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(d-c^2dx^2)^{5/2} (a+b\arcsin(cx))^2}{f+gx} \, dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(d-c^2\,d\,x^2)^{5/2}}{f+g\,x} \, dx$$

input
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/(f + g*x),x)
```

output
```
int(((a + b*asin(c*x))^2*(d - c^2*d*x^2)^(5/2))/(f + g*x), x)
```

# 3.70 $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$

### 3.70.1 Optimal result

Integrand size = 33, antiderivative size = 692

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{6b^2f^2g(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{14b^2g^3(1-c^2x^2)}{9c^4\sqrt{d-c^2dx^2}} + \frac{3b^2fg^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} - \frac{2b^2g^3(1-c^2x^2)^2}{27c^4\sqrt{d-c^2dx^2}} - \frac{3b^2fg^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} + \frac{6bf^2gx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} + \frac{4bg^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{3c^3\sqrt{d-c^2dx^2}} + \frac{3bfg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} + \frac{2bg^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c\sqrt{d-c^2dx^2}} - \frac{3f^2g(1-c^2x^2)(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} - \frac{2g^3(1-c^2x^2)(a+b\arcsin(cx))^2}{3c^4\sqrt{d-c^2dx^2}} - \frac{3fg^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} - \frac{g^3x^2(1-c^2x^2)(a+b\arcsin(cx))^2}{3c^2\sqrt{d-c^2dx^2}} + \frac{f^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} + \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{2bc^3\sqrt{d-c^2dx^2}}$$

output
```
6*b^2*f^2*g*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)^(1/2)+14/9*b^2*g^3*(-c^2*x^2+1
)/c^4/(-c^2*d*x^2+d)^(1/2)+3/4*b^2*f*g^2*x*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)
^(1/2)-2/27*b^2*g^3*(-c^2*x^2+1)^2/c^4/(-c^2*d*x^2+d)^(1/2)-3*f^2*g*(-c^2*
x^2+1)*(a+b*arcsin(c*x))^2/c^2/(-c^2*d*x^2+d)^(1/2)-2/3*g^3*(-c^2*x^2+1)*(
a+b*arcsin(c*x))^2/c^4/(-c^2*d*x^2+d)^(1/2)-3/2*f*g^2*x*(-c^2*x^2+1)*(a+b*
arcsin(c*x))^2/c^2/(-c^2*d*x^2+d)^(1/2)-1/3*g^3*x^2*(-c^2*x^2+1)*(a+b*arcs
in(c*x))^2/c^2/(-c^2*d*x^2+d)^(1/2)-3/4*b^2*f*g^2*arcsin(c*x)*(-c^2*x^2+1)
^(1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+6*b*f^2*g*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)
^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+4/3*b*g^3*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(
1/2)/c^3/(-c^2*d*x^2+d)^(1/2)+3/2*b*f*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+
1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+2/9*b*g^3*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+
1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+1/3*f^3*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(
1/2)/b/c/(-c^2*d*x^2+d)^(1/2)+1/2*f*g^2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(
1/2)/b/c^3/(-c^2*d*x^2+d)^(1/2)
```

### 3.70.2 Mathematica [A] (verified)

Time = 1.57 (sec) , antiderivative size = 582, normalized size of antiderivative = 0.84

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{-36a^2d(1-c^2x^2)^{3/2}\left(4g^3+c^2g(18f^2+9fgx+2g^2x^2)\right)-216abc^3df^3(-1+c^2x^2)\arcsin(cx)^2-72b^2c^3df^3}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(-36*a^2*d*(1 - c^2*x^2)^(3/2)*(4*g^3 + c^2*g*(18*f^2 + 9*f*g*x + 2*g^2*x^
2)) - 216*a*b*c^3*d*f^3*(-1 + c^2*x^2)*ArcSin[c*x]^2 - 72*b^2*c^3*d*f^3*(-
1 + c^2*x^2)*ArcSin[c*x]^3 - 1296*a*b*c^2*d*f^2*g*(-1 + c^2*x^2)*(c*x - Sq
rt[1 - c^2*x^2]*ArcSin[c*x]) - 48*a*b*d*g^3*(-1 + c^2*x^2)*(6*c*x + c^3*x^
3 - 3*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]) + 648*b^2*c^2*d*f^2*g*(
1 - c^2*x^2)*(2*c*x*ArcSin[c*x] - Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x]^2))
- 108*a^2*c*Sqrt[d]*f*(2*c^2*f^2 + 3*g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d
*x^2]*ArcTan[(c*x*Sqrt[d - c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 162*a*b
*c*d*f*g^2*(-1 + c^2*x^2)*(-2*ArcSin[c*x]^2 + Cos[2*ArcSin[c*x]] + 2*ArcSi
n[c*x]*Sin[2*ArcSin[c*x]]) + 27*b^2*c*d*f*g^2*(1 - c^2*x^2)*(4*ArcSin[c*x]
^3 - 6*ArcSin[c*x]*Cos[2*ArcSin[c*x]] + (3 - 6*ArcSin[c*x]^2)*Sin[2*ArcSin
[c*x]]) - 2*b^2*d*g^3*(1 - c^2*x^2)*(81*Sqrt[1 - c^2*x^2]*(-2 + ArcSin[c*x
]^2) - (-2 + 9*ArcSin[c*x]^2)*Cos[3*ArcSin[c*x]] + 6*ArcSin[c*x]*(-27*c*x
+ Sin[3*ArcSin[c*x]])))/(216*c^4*d*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2])
```

### 3.70.3 Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 417, normalized size of antiderivative = 0.60, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {5276, 5272, 3042, 3798, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{\sqrt{1-c^2x^2}\int (cf+cgx)^3(a+b\arcsin(cx))^2d\arcsin(cx)}{c^4\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\sqrt{1-c^2x^2}\int (a+b\arcsin(cx))^2(cf+g\sin(\arcsin(cx)))^3d\arcsin(cx)}{c^4\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3798}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(f^3(a+b\arcsin(cx))^2c^3+g^3x^3(a+b\arcsin(cx))^2c^3+3fg^2x^2(a+b\arcsin(cx))^2c^3+3f^2gx(a+b\text{ar}\right.}{c^4\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{c^3f^3(a+b\arcsin(cx))^3}{3b}+6bc^3f^2gx(a+b\arcsin(cx))+\frac{3}{2}bc^3fg^2x^2(a+b\arcsin(cx))+\frac{2}{9}bc^3g^3x^3(a+b\text{arcsi}\right.}{}$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*(6*b^2*c^2*f^2*g*Sqrt[1 - c^2*x^2] + (14*b^2*g^3*Sqrt[1
 - c^2*x^2])/9 + (3*b^2*c^2*f*g^2*x*Sqrt[1 - c^2*x^2])/4 - (2*b^2*g^3*(1 -
 c^2*x^2)^(3/2))/27 - (3*b^2*c*f*g^2*ArcSin[c*x])/4 + 6*b*c^3*f^2*g*x*(a +
 b*ArcSin[c*x]) + (4*b*c*g^3*x*(a + b*ArcSin[c*x]))/3 + (3*b*c^3*f*g^2*x^2
*(a + b*ArcSin[c*x]))/2 + (2*b*c^3*g^3*x^3*(a + b*ArcSin[c*x]))/9 - 3*c^2*
f^2*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (2*g^3*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x])^2)/3 - (3*c^2*f*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c
*x])^2)/2 - (c^2*g^3*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/3 + (c^3
*f^3*(a + b*ArcSin[c*x])^3)/(3*b) + (c*f*g^2*(a + b*ArcSin[c*x])^3)/(2*b))
)/(c^4*Sqrt[d - c^2*d*x^2])
```

### 3.70.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3798
```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.70.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.81 (sec) , antiderivative size = 1636, normalized size of antiderivative = 2.36

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1636 |
| parts | Expression too large to display | 1636 |

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^3/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^3*(-
1/3*x^2/c^2/d*(-c^2*d*x^2+d)^(1/2)-2/3/d/c^4*(-c^2*d*x^2+d)^(1/2))+3*f*g^2
*(-1/2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(
1/2)*x/(-c^2*d*x^2+d)^(1/2)))-3*f^2*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b^2*(-1/
6*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^
3*f*(2*c^2*f^2+3*g^2)+1/432*(-d*(c^2*x^2-1))^(1/2)*(2*c^2*x^2-2*I*c*x*(-c^
2*x^2+1)^(1/2)-1)*g^3*(6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1
)-3/8*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(8*I*a
rcsin(c*x)*c^2*f^2+4*arcsin(c*x)^2*c^2*f^2+2*I*arcsin(c*x)*g^2+arcsin(c*x)
^2*g^2-8*c^2*f^2-2*g^2)/c^4/d/(c^2*x^2-1)-3/8*(-d*(c^2*x^2-1))^(1/2)*(I*(-
c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(4*arcsin(c*x)^2*c^2*f^2-8*I*arcsin(c*x)
*c^2*f^2+arcsin(c*x)^2*g^2-2*I*arcsin(c*x)*g^2-8*c^2*f^2-2*g^2)/c^4/d/(c^2
*x^2-1)+1/432*(-d*(c^2*x^2-1))^(1/2)*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2
-1)*g^3*(-6*I*arcsin(c*x)+9*arcsin(c*x)^2-2)/c^4/d/(c^2*x^2-1)+3/8*(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*g^2*f*arcsin(c*x)+3/1
6*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)*g^2*f*(2*arcsin(c*x)^2-1)*x-1/2
16*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*g^3*(9*arcsin(c*x)^2-2)*cos(4*
arcsin(c*x))+1/36*(-d*(c^2*x^2-1))^(1/2)/c^4/d/(c^2*x^2-1)*arcsin(c*x)*g^3
*sin(4*arcsin(c*x))+3/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*g^2*f*arc
sin(c*x)*cos(3*arcsin(c*x))+3/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-...
```

### 3.70.5 Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral(-(a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*
g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*
b*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

### 3.70.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.70.7 Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"maxima")
```

output
```
-1/3*a^2*g^3*(sqrt(-c^2*d*x^2 + d)*x^2/(c^2*d) + 2*sqrt(-c^2*d*x^2 + d)/(c
^4*d)) - 3/2*a^2*f*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*
sqrt(d))) + a*b*f^3*arcsin(c*x)^2/(c*sqrt(d)) + 6*a*b*f^2*g*x/(c*sqrt(d))
+ a^2*f^3*arcsin(c*x)/(c*sqrt(d)) - 6*sqrt(-c^2*d*x^2 + d)*a*b*f^2*g*arcsi
n(c*x)/(c^2*d) - 3*sqrt(-c^2*d*x^2 + d)*a^2*f^2*g/(c^2*d) - sqrt(d)*integr
ate(((b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arctan2(c*x
, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^3*x^3 + 3*a*b*f*g^2*x^2)*arct
an2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)/(c^2*
d*x^2 - d), x)
```

### 3.70.8 Giac [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^3(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"giac")
```

output
```
integrate((g*x + f)^3*(b*arcsin(c*x) + a)^2/sqrt(-c^2*d*x^2 + d), x)
```

### 3.70.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

# 3.71 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$



## 3.71.1 Optimal result

Integrand size = 33, antiderivative size = 410

$$\begin{aligned}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx &= \frac{4b^2fg(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}}+\frac{b^2g^2x(1-c^2x^2)}{4c^2\sqrt{d-c^2dx^2}} \\ &\quad -\frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{4c^3\sqrt{d-c^2dx^2}} \\ &\quad +\frac{4bfgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} \\ &\quad +\frac{bg^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c\sqrt{d-c^2dx^2}} \\ &\quad -\frac{2fg(1-c^2x^2)(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} \\ &\quad -\frac{g^2x(1-c^2x^2)(a+b\arcsin(cx))^2}{2c^2\sqrt{d-c^2dx^2}} \\ &\quad +\frac{f^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}} \\ &\quad +\frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{6bc^3\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
4*b^2*f*g*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)^(1/2)+1/4*b^2*g^2*x*(-c^2*x^2+1)
/c^2/(-c^2*d*x^2+d)^(1/2)-2*f*g*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c^2/(-c^2
*d*x^2+d)^(1/2)-1/2*g^2*x*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c^2/(-c^2*d*x^2
+d)^(1/2)-1/4*b^2*g^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/(-c^2*d*x^2+d)^(1
/2)+4*b*f*g*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+
1/2*b*g^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c/(-c^2*d*x^2+d)^(1/2)+
1/3*f^2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c/(-c^2*d*x^2+d)^(1/2)+1/
6*g^2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/(-c^2*d*x^2+d)^(1/2)
```

## 3.71.2 Mathematica [A] (verified)

Time = 1.35 (sec) , antiderivative size = 400, normalized size of antiderivative = 0.98

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{-4b^2\sqrt{d}(2c^2f^2+g^2)\left(-1+c^2x^2\right)\arcsin(cx)^3-12a^2(2c^2f^2+g^2)\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}\arctan\left(\frac{cx\sqrt{d-c^2dx}}{\sqrt{d}(-1+c^2x}\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(-4*b^2*Sqrt[d]*(2*c^2*f^2 + g^2)*(-1 + c^2*x^2)*ArcSin[c*x]^3 - 12*a^2*(2
*c^2*f^2 + g^2)*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2*d*x^2]*ArcTan[(c*x*Sqrt[d -
 c^2*d*x^2])/(Sqrt[d]*(-1 + c^2*x^2))] + 6*b*Sqrt[d]*g*(-1 + c^2*x^2)*ArcS
in[c*x]*(16*c*f*(-(b*c*x) + a*Sqrt[1 - c^2*x^2]) + b*g*Cos[2*ArcSin[c*x]]
+ 2*a*g*Sin[2*ArcSin[c*x]]) + 3*Sqrt[d]*g*(-1 + c^2*x^2)*(4*c*(-8*a*b*c*f*
x - 8*b^2*f*Sqrt[1 - c^2*x^2] + a^2*(4*f + g*x)*Sqrt[1 - c^2*x^2]) + 2*a*b
*g*Cos[2*ArcSin[c*x]] - b^2*g*Sin[2*ArcSin[c*x]]) + 6*b*Sqrt[d]*(-1 + c^2*
x^2)*ArcSin[c*x]^2*(-2*a*(2*c^2*f^2 + g^2) + 8*b*c*f*g*Sqrt[1 - c^2*x^2] +
 b*g^2*Sin[2*ArcSin[c*x]]))/(24*c^3*Sqrt[d]*Sqrt[1 - c^2*x^2]*Sqrt[d - c^2
*d*x^2])
```

### 3.71.3 Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 240, normalized size of antiderivative = 0.59, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {5276, 5272, 3042, 3798, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$$

$$\Big\downarrow \; 5276$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 5272$$

$$\frac{\sqrt{1-c^2x^2}\int (cf+cgx)^2(a+b\arcsin(cx))^2d\arcsin(cx)}{c^3\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 3042$$

$$\frac{\sqrt{1-c^2x^2}\int (a+b\arcsin(cx))^2(cf+g\sin(\arcsin(cx)))^2d\arcsin(cx)}{c^3\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 3798$$

$$\frac{\sqrt{1-c^2x^2}\int \left(c^2f^2(a+b\arcsin(cx))^2+c^2g^2x^2(a+b\arcsin(cx))^2+2c^2fgx(a+b\arcsin(cx))^2\right)d\arcsin(cx)}{c^3\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 2009$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{c^2f^2(a+b\arcsin(cx))^3}{3b}-2cfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2+4bc^2fgx(a+b\arcsin(cx))-\frac{1}{2}cg^2x\sqrt{1-c^2x\right.}{}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*(4*b^2*c*f*g*Sqrt[1 - c^2*x^2] + (b^2*c*g^2*x*Sqrt[1 -
c^2*x^2])/4 - (b^2*g^2*ArcSin[c*x])/4 + 4*b*c^2*f*g*x*(a + b*ArcSin[c*x])
+ (b*c^2*g^2*x^2*(a + b*ArcSin[c*x]))/2 - 2*c*f*g*Sqrt[1 - c^2*x^2]*(a + b
*ArcSin[c*x])^2 - (c*g^2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/2 + (c
^2*f^2*(a + b*ArcSin[c*x])^3)/(3*b) + (g^2*(a + b*ArcSin[c*x])^3)/(6*b)))/
(c^3*Sqrt[d - c^2*d*x^2])
```

### 3.71.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3798
```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.71.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.70 (sec) , antiderivative size = 928, normalized size of antiderivative = 2.26

| method | result |
|---|---|
| default | $a^2\left(\frac{f^2\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{\sqrt{c^2 d}}+g^2\left(-\frac{x\sqrt{-c^2 d\,x^2+d}}{2c^2 d}+\frac{\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{2c^2\sqrt{c^2 d}}\right)-\frac{2fg\sqrt{-c^2 d\,x^2+d}}{c^2 d}\right)+b^2\left(-\frac{\sqrt{-d(c}}{}\right.$ |
| parts | $a^2\left(\frac{f^2\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{\sqrt{c^2 d}}+g^2\left(-\frac{x\sqrt{-c^2 d\,x^2+d}}{2c^2 d}+\frac{\arctan\left(\frac{\sqrt{c^2 d}\,x}{\sqrt{-c^2 d\,x^2+d}}\right)}{2c^2\sqrt{c^2 d}}\right)-\frac{2fg\sqrt{-c^2 d\,x^2+d}}{c^2 d}\right)+b^2\left(-\frac{\sqrt{-d(c}}{}\right.$ |

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))+g^2*(-
1/2*x/c^2/d*(-c^2*d*x^2+d)^(1/2)+1/2/c^2/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2
)*x/(-c^2*d*x^2+d)^(1/2)))-2*f*g/c^2/d*(-c^2*d*x^2+d)^(1/2))+b^2*(-1/6*(-d
*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^3*(2*
c^2*f^2+g^2)-(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f
*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1
/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*f*g*(arcsin(c*x)^2-2-2*I*arcsin(c
*x))/c^2/d/(c^2*x^2-1)+1/8*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d
/(c^2*x^2-1)*arcsin(c*x)*g^2+1/16*(-d*(c^2*x^2-1))^(1/2)/c^2/d/(c^2*x^2-1)
*g^2*(2*arcsin(c*x)^2-1)*x+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)*ar
csin(c*x)*g^2*cos(3*arcsin(c*x))+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^
2-1)*g^2*(2*arcsin(c*x)^2-1)*sin(3*arcsin(c*x)))+2*a*b*(-1/4*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*arcsin(c*x)^2*(2*c^2*f^2+g^
2)-(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*f*g*(arcsin
(c*x)+I)/c^2/d/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*
c+c^2*x^2-1)*f*g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1)+1/16*(-d*(c^2*x^2-1))^(
1/2)*(-c^2*x^2+1)^(1/2)/c^3/d/(c^2*x^2-1)*g^2+1/8*(-d*(c^2*x^2-1))^(1/2)/c
^2/d/(c^2*x^2-1)*g^2*arcsin(c*x)*x+1/16*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*
x^2-1)*g^2*cos(3*arcsin(c*x))+1/8*(-d*(c^2*x^2-1))^(1/2)/c^3/d/(c^2*x^2-1)
*g^2*arcsin(c*x)*sin(3*arcsin(c*x)))
```

### 3.71.5 Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^2(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral(-(a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*
x + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsi
n(c*x))*sqrt(-c^2*d*x^2 + d)/(c^2*d*x^2 - d), x)
```

### 3.71.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.71.7 Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^2(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"maxima")
```

output
```
-1/2*a^2*g^2*(sqrt(-c^2*d*x^2 + d)*x/(c^2*d) - arcsin(c*x)/(c^3*sqrt(d)))
+ a*b*f^2*arcsin(c*x)^2/(c*sqrt(d)) + 4*a*b*f*g*x/(c*sqrt(d)) + a^2*f^2*ar
csin(c*x)/(c*sqrt(d)) - 4*sqrt(-c^2*d*x^2 + d)*a*b*f*g*arcsin(c*x)/(c^2*d)
 - 2*sqrt(-c^2*d*x^2 + d)*a^2*f*g/(c^2*d) - sqrt(d)*integrate((2*a*b*g^2*x
^2*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)*sqrt(c*x + 1)*sq
rt(-c*x + 1)/(c^2*d*x^2 - d), x)
```

### 3.71.8 Giac [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"giac")
```

output
```
integrate((g*x + f)^2*(b*arcsin(c*x) + a)^2/sqrt(-c^2*d*x^2 + d), x)
```

### 3.71.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx=\int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

# 3.72 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx$



## 3.72.1 Optimal result

Integrand size = 31, antiderivative size = 171

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{2b^2g(1-c^2x^2)}{c^2\sqrt{d-c^2dx^2}} + \frac{2bgx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c\sqrt{d-c^2dx^2}} - \frac{g(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^2\sqrt{d-c^2dx^2}} + \frac{f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc\sqrt{d-c^2dx^2}}$$

output
```
2*b^2*g*(-c^2*x^2+1)/c^2/(-c^2*d*x^2+d)^(1/2)-g*(-c^2*x^2+1)*(a+b*arcsin(c
*x))^2/c^2/(-c^2*d*x^2+d)^(1/2)+2*b*g*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/
2)/c/(-c^2*d*x^2+d)^(1/2)+1/3*f*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c
/(-c^2*d*x^2+d)^(1/2)
```

## 3.72.2 Mathematica [A] (verified)

Time = 0.68 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.69

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c} + \frac{f(a+b\arcsin(cx))^3}{3b} + \frac{2bg\left(acx+b\sqrt{1-c^2x^2}+bcx\arcsin(cx)\right)}{c}\right)}{c\sqrt{d-c^2dx^2}}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*(-((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/c) + (f*
(a + b*ArcSin[c*x])^3)/(3*b) + (2*b*g*(a*c*x + b*Sqrt[1 - c^2*x^2] + b*c*x
*ArcSin[c*x]))/c))/(c*Sqrt[d - c^2*d*x^2])
```

### 3.72.3 Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.75, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{gx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}\right)dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^2}+\frac{f(a+b\arcsin(cx))^3}{3bc}+\frac{2abgx}{c}+\frac{2b^2gx\arcsin(cx)}{c}+\frac{2b^2g\sqrt{1-c^2x^2}}{c^2}\right)}{\sqrt{d-c^2dx^2}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/Sqrt[d - c^2*d*x^2],x]
```

output
```
(Sqrt[1 - c^2*x^2]*((2*a*b*g*x)/c + (2*b^2*g*Sqrt[1 - c^2*x^2])/c^2 + (2*b
^2*g*x*ArcSin[c*x])/c - (g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/c^2 +
(f*(a + b*ArcSin[c*x])^3)/(3*b*c)))/Sqrt[d - c^2*d*x^2]
```

#### 3.72.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.72.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 0.64 (sec) , antiderivative size = 460, normalized size of antiderivative = 2.69

| method | result |
|---|---|
| default | $\frac{a^2 f \arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d\, x^2+d}}\right)}{\sqrt{c^2 d}} - \frac{a^2 g\sqrt{-c^2 d\, x^2+d}}{c^2 d} + b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3 f}{3cd(c^2x^2-1)} - \sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\right.\right.$ |
| parts | $\frac{a^2 f \arctan\left(\frac{\sqrt{c^2 d}\, x}{\sqrt{-c^2 d\, x^2+d}}\right)}{\sqrt{c^2 d}} - \frac{a^2 g\sqrt{-c^2 d\, x^2+d}}{c^2 d} + b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2x^2+1}\,\arcsin(cx)^3 f}{3cd(c^2x^2-1)} - \sqrt{-d(c^2x^2-1)}\left(c^2x^2-icx\right.\right.$ |

input
```
int((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
a^2*f/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2))-a^2*g/c^2
/d*(-c^2*d*x^2+d)^(1/2)+b^2*(-1/3*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2
)/c/d/(c^2*x^2-1)*arcsin(c*x)^3*f-1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-
c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/c^2/d/(c^2*x^2
-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g*(arc
sin(c*x)^2-2-2*I*arcsin(c*x))/c^2/d/(c^2*x^2-1))+2*a*b*(-1/2*(-d*(c^2*x^2-
1))^(1/2)*(-c^2*x^2+1)^(1/2)/c/d/(c^2*x^2-1)*arcsin(c*x)^2*f-1/2*(-d*(c^2*
x^2-1))^(1/2)*(c^2*x^2-I*(-c^2*x^2+1)^(1/2)*x*c-1)*g*(arcsin(c*x)+I)/c^2/d
/(c^2*x^2-1)-1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-
1)*g*(arcsin(c*x)-I)/c^2/d/(c^2*x^2-1))
```

### 3.72.5 Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin
(c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x))/(c^2*d*x^2 - d), x)
```

### 3.72.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.72.7 Maxima [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.08

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \frac{b^2f\arcsin(cx)^3}{3\,c\sqrt{d}} + 2\,b^2g\left(\frac{x\arcsin(cx)}{c\sqrt{d}} + \frac{\sqrt{-c^2x^2+1}}{c^2\sqrt{d}}\right) + \frac{abf\arcsin(cx)^2}{c\sqrt{d}} + \frac{2\,abgx}{c\sqrt{d}} + \frac{a^2f\arcsin(cx)}{c\sqrt{d}} - \frac{\sqrt{-c^2dx^2+d}b^2g\arcsin(cx)^2}{c^2d} - \frac{2\sqrt{-c^2dx^2+d}abg\arcsin(cx)}{c^2d} - \frac{\sqrt{-c^2dx^2+d}a^2g}{c^2d}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
1/3*b^2*f*arcsin(c*x)^3/(c*sqrt(d)) + 2*b^2*g*(x*arcsin(c*x)/(c*sqrt(d)) +
 sqrt(-c^2*x^2 + 1)/(c^2*sqrt(d))) + a*b*f*arcsin(c*x)^2/(c*sqrt(d)) + 2*a
*b*g*x/(c*sqrt(d)) + a^2*f*arcsin(c*x)/(c*sqrt(d)) - sqrt(-c^2*d*x^2 + d)*
b^2*g*arcsin(c*x)^2/(c^2*d) - 2*sqrt(-c^2*d*x^2 + d)*a*b*g*arcsin(c*x)/(c^
2*d) - sqrt(-c^2*d*x^2 + d)*a^2*g/(c^2*d)
```

### 3.72.8 Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
integrate((g*x + f)*(b*arcsin(c*x) + a)^2/sqrt(-c^2*d*x^2 + d), x)
```

### 3.72.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(1/2), x)
```

# 3.73 $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$



## 3.73.1 Optimal result

Integrand size = 33, antiderivative size = 589

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx &= -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}\\
&+\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}\\
&-\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}\\
&+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}\\
&-\frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}\\
&+\frac{2ib^2\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{\sqrt{c^2f^2-g^2}\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
-I*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g
^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+I*
(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)
^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2*b*(
a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^
2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2*b
*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-
g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2
*I*b^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))
*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*polyl
og(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1
)^(1/2)/(c^2*f^2-g^2)^(1/2)/(-c^2*d*x^2+d)^(1/2)
```

### 3.73.2 Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 357, normalized size of antiderivative = 0.61

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx =$$
$$-\frac{i\sqrt{1-c^2x^2}\left((a+b\arcsin(cx))^2\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-2}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

output
```
((-I)*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x]
)*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^
(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*
x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I
)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2
*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f
^2 - g^2])] - 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])]))/(Sqrt[c^2*f^2 - g^2]*Sqrt[d - c^2*d*x^2])
```

### 3.73.3 Rubi [A] (verified)

Time = 1.60 (sec) , antiderivative size = 402, normalized size of antiderivative = 0.68, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.303, Rules used = {5276, 5272, 3042, 3804, 2694, 27, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}(f+gx)}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{cf+cgx}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3804}$$

$$\frac{2\sqrt{1-c^2x^2}\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2ce^{i\arcsin(cx)}f-ie^{2i\arcsin(cx)}g+ig}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2694}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2\left(cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2\left(cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2620}$$

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\int(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\cdots}{g}\cdots\right.}{\cdots}\cdots\right.}{\sqrt{d-c^2dx^2}}$$

$\downarrow$ 3011

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-ib\int\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin\cdots\right.}{g}\cdots\right.}{2\sqrt{c^2f^2-g^2}}\cdots\right.}{\sqrt{\cdots}}$$

$\downarrow$ 2720

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin\cdots}}{cf+\sqrt{c^2\cdots}}\cdots\right.\right.}{g}\cdots\right.}{2\sqrt{c^2f^2-g^2}}\cdots\right.}{\cdots}$$

$\downarrow$ 7143

$$\frac{2\sqrt{1-c^2x^2}\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)\right)}{g}\right)}{2\sqrt{c^2f^2-g^2}}-\cdots\right.}{\sqrt{d-c^2dx^2}}$$

input
```
Int[(a + b*ArcSin[c*x])^2/((f + g*x)*Sqrt[d - c^2*d*x^2]),x]
```

3.73. $\int\frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$

output
```
(2*Sqrt[1 - c^2*x^2]*(((-1/2*I)*g*(((a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*
ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g - (2*b*(I*(a + b*ArcSin[c*
x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] - b*Po
lyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]))/g))/Sqrt[c
^2*f^2 - g^2] + ((I/2)*g*(((a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*
x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (2*b*(I*(a + b*ArcSin[c*x])*PolyL
og[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - b*PolyLog[3,
(I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))/g))/Sqrt[c^2*f^2 -
g^2]))/Sqrt[d - c^2*d*x^2]
```

### 3.73.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

## 3.73. $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx$

### 3.73.4 Maple [F]

$$\int \frac{\left(a+b \arcsin \left(c x\right)\right)^{2}}{\left(g x+f\right) \sqrt{-c^{2} d \,x^{2}+d}}d x$$

input
```
int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x)
```

### 3.73.5 Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx=\int \frac{(b\arcsin\left(cx\right)+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2)/(c^2*d*g*x^3 + c^2*d*f*x^2 - d*g*x - d*f), x)
```

### 3.73.6 Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx=\int \frac{\left(a+b\operatorname{asin}\left(cx\right)\right)^2}{\sqrt{-d\left(cx-1\right)\left(cx+1\right)}\left(f+gx\right)}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(g*x+f)/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)), x)
```

### 3.73.7 Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="m
axima")
```

output
```
integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*(g*x + f)), x)
```

### 3.73.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(1/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.73.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(f+g\,x)\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(1/2)), x)
```

# 3.74 $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

### 3.74.1 Optimal result

Integrand size = 33, antiderivative size = 1113

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \frac{ic\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{g(1-c^2x^2)(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(f+gx)\sqrt{d-c^2dx^2}} - \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} - \frac{2bc\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{ic^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} - \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2ib^2c\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)\sqrt{d-c^2dx^2}} + \frac{2bc^2f\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} - \frac{2ib^2c^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}} + \frac{2ib^2c^2f\sqrt{1-c^2x^2}\,\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$

output
```
g*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/(c^2*f^2-g^2)/(g*x+f)/(-c^2*d*x^2+d)^(1
/2)+I*c*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d
)^(1/2)-2*b*c*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(
c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)
-I*c^2*f*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2
*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1
/2)-2*b*c*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*
f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)+I*c
^2*f*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2
-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+
2*I*b^2*c*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2
)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)-2*b*c^2*f*(a+b*a
rcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1
/2)))*(-c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*
c*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^
2*x^2+1)^(1/2)/(c^2*f^2-g^2)/(-c^2*d*x^2+d)^(1/2)+2*b*c^2*f*(a+b*arcsin(c*
x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-
c^2*x^2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*c^2*f*po
lylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^
2+1)^(1/2)/(c^2*f^2-g^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*c^2*f*polyl...
```

### 3.74.2 Mathematica [A] (verified)

Time = 0.57 (sec) , antiderivative size = 651, normalized size of antiderivative = 0.58

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$$
$$= \frac{c\sqrt{1-c^2x^2}\left(i(a+b\arcsin(cx))^2+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cf+cgx}-2b(a+b\arcsin(cx))\log\left(1+\frac{ie^{i\arcsin(cx)}g}{-cf+\sqrt{c^2f^2-g^2}}\right)-\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

output
```
(c*Sqrt[1 - c^2*x^2]*(I*(a + b*ArcSin[c*x])^2 + (g*Sqrt[1 - c^2*x^2]*(a +
b*ArcSin[c*x])^2)/(c*f + c*g*x) - 2*b*(a + b*ArcSin[c*x])*Log[1 + (I*E^(I*
ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - 2*b*(a + b*ArcSin[c*x])*
Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + (2*I)*b^2*P
olyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b^2
*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (I*c*f*
((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2*
f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])
*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g
)/(c*f - Sqrt[c^2*f^2 - g^2])]))/Sqrt[c^2*f^2 - g^2] + (c*f*(2*b*(a + b*Ar
cSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]
 + I*((a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^
2*f^2 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*
f^2 - g^2])])))/Sqrt[c^2*f^2 - g^2]))/((c^2*f^2 - g^2)*Sqrt[d - c^2*d*x^2]
)
```

### 3.74.3 Rubi [A] (verified)

Time = 3.00 (sec) , antiderivative size = 721, normalized size of antiderivative = 0.65, number of steps used = 17, number of rules used = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.485$, Rules used = {5276, 5272, 3042, 3805, 3042, 3804, 2694, 27, 2620, 3011, 2720, 5030, 2620, 2715, 2838, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{\sqrt{d-c^2dx^2}(f+gx)^2}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{1-c^2x^2}}dx}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5272}$$

$$\frac{c\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(cf+cgx)^2}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{c\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(cf+g\sin(\arcsin(cx)))^2}d\arcsin(cx)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3805}$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{cf\int \frac{(a+b\arcsin(cx))^2}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3042}$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{cf\int \frac{(a+b\arcsin(cx))^2}{cf+g\sin(\arcsin(cx))}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(cf+cgx)}\right)}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{3804}$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{2cf\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2ce^{i\arcsin(cx)}f-ie^{2i\arcsin(cx)}g+ig}d\arcsin(cx)}{c^2f^2-g^2}+\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(c}{(c^2f^2-g^2)(cf+cgx)}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2694}$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{2cf\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{2\left(cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}\right)}d\arcsin(cx)}{\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\,ar}{2\left(cf-ie^{i\arcsin(cx)}g-\right.}}{\sqrt{c^2f^2}}\right.}{c^2f^2-g^2}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int \frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{2cf\left(\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)}{2\sqrt{c^2f^2-g^2}}-\frac{ig\int \frac{e^{i\arcsin(cx)}(a+b\arcsin(cx}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2}}}{2\sqrt{c^2f^2-g^2}}\right.}{c^2f^2-g^2}\right.}{\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2620}$$

3.74. $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

$$\frac{c\sqrt{1-c^2x^2}\left(-\frac{2bg\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{cf+cgx}d\arcsin(cx)}{c^2f^2-g^2}+\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\int(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\cdots}}{cf+\cdots}\right.\cdots}{g}\cdots\right)}{2\sqrt{c^2f^2-g^2}}\cdots\right)}{\cdots}\cdots\right)}{\cdots}$$

$$\Big\downarrow \text{ 3011}$$

$$\frac{c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-ib\int\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)\cdots\right.}{g}\cdots\right)}{2\sqrt{c^2f^2-g^2}}\cdots\right)}{\cdots}\cdots\right)}{\cdots}$$

$$\Big\downarrow \text{ 2720}$$

## 3.74. $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

$$c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{ie^{i}}{cf+}\right.\right.}{g}\right.}{2\sqrt{c^2f^2-g^2}}\right.}{}\right.$$

$$\Big\downarrow \text{5030}$$

$$c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{ie^{i}}{cf+}\right.\right.}{g}\right.}{2\sqrt{c^2f^2-g^2}}\right.}{}\right.$$

$$\Big\downarrow \text{2620}$$

## 3.74. $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

$$c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{ie^{i}\cdots}{cf+\cdots}\right.\right.}{g}\cdots}{2\sqrt{c^2f^2-g^2}}\cdots}{\cdots}\cdots\right.$$

$\downarrow$ 2715

$$c\sqrt{1-c^2x^2}\left(\frac{g\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{(c^2f^2-g^2)(cf+cgx)}-\frac{2bg\left(-\frac{i(a+b\arcsin(cx))^2}{2bg}+\frac{\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)(a+b\arcsin(cx))}{g}+\frac{\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)(a+b\,\mathrm{ar}\cdots}{g}\cdots\right.}{\cdots}\cdots\right.$$

$\downarrow$ 2838

## 3.74. $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

$$c\sqrt{1-c^2x^2}\left(\frac{2cf\left(\frac{ig\left(\frac{(a+b\arcsin(cx))^2\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{ie^{i\cdots}}{cf+\cdots}\right.\right.}{g}\cdots\right.}{2\sqrt{c^2f^2-g^2}}\cdots\right.}{\cdots}\cdots\right.$$

$\downarrow$ 7143

$$c\sqrt{1-c^2x^2}\left(-\frac{2bg\left(\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}+\frac{(a+b\arcsin(cx))\log\left(1-\frac{ige^{i\arcsin(cx)}}{\sqrt{c^2f^2-g^2}+cf}\right)}{g}-\frac{i(a+b\arcsin(cx))^2}{2bg}-\frac{ib\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin\cdots}}{cf-\sqrt{c^2\cdots}}\right.}{g}\cdots\right.}{c^2f^2-g^2}\cdots\right.$$

input
```
Int[(a + b*ArcSin[c*x])^2/((f + g*x)^2*Sqrt[d - c^2*d*x^2]),x]
```

## 3.74. $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

output
```
(c*Sqrt[1 - c^2*x^2]*((g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/((c^2*f^
2 - g^2)*(c*f + c*g*x)) - (2*b*g*(((-1/2*I)*(a + b*ArcSin[c*x])^2)/(b*g) +
 ((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2
- g^2])])/g + ((a + b*ArcSin[c*x])*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f +
Sqrt[c^2*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f -
Sqrt[c^2*f^2 - g^2])])/g - (I*b*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f +
Sqrt[c^2*f^2 - g^2])])/g))/(c^2*f^2 - g^2) + (2*c*f*(((-1/2*I)*g*(((a + b*
ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
])/g - (2*b*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f
 - Sqrt[c^2*f^2 - g^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqr
t[c^2*f^2 - g^2])]))/g))/Sqrt[c^2*f^2 - g^2] + ((I/2)*g*(((a + b*ArcSin[c*
x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (2
*b*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c
^2*f^2 - g^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])]))/g))/Sqrt[c^2*f^2 - g^2]))/(c^2*f^2 - g^2)))/Sqrt[d - c^2*d*x^2
]
```

#### 3.74.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

## 3.74. $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 3805
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Simp[a/(a^2 - b^2)   Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x]
, x] - Simp[b*d*(m/(f*(a^2 - b^2)))   Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(
a + b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 -
b^2, 0] && IGtQ[m, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

## 3.74. $\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx$

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

### 3.74.4 Maple [F]

$$\int \frac{(a+b\arcsin{(cx)})^2}{(gx+f)^2\sqrt{-c^2d\,x^2+d}}dx$$

input
```
int((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x)
```

### 3.74.5 Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"fricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^
2)/(c^2*d*g^2*x^4 + 2*c^2*d*f*g*x^3 - 2*d*f*g*x - d*f^2 + (c^2*d*f^2 - d*g
^2)*x^2), x)
```

### 3.74.6 Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2}{\sqrt{-d\,(cx-1)\,(cx+1)}\,(f+gx)^2}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(g*x+f)**2/(-c**2*d*x**2+d)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/(sqrt(-d*(c*x - 1)*(c*x + 1))*(f + g*x)**2),
 x)
```

### 3.74.7 Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{\sqrt{-c^2dx^2+d}(gx+f)^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"maxima")
```

output
```
integrate((b*arcsin(c*x) + a)^2/(sqrt(-c^2*d*x^2 + d)*(g*x + f)^2), x)
```

### 3.74.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)^2/(-c^2*d*x^2+d)^(1/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.74.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)^2\sqrt{d-c^2dx^2}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(f+g\,x\right)^2\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((f + g*x)^2*(d - c^2*d*x^2)^(1/2)), x)
```

# 3.75 $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$



## 3.75.1 Optimal result

Integrand size = 33, antiderivative size = 738

$$\begin{aligned}
\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= -\frac{2abg^3x\sqrt{1-c^2x^2}}{c^3d\sqrt{d-c^2dx^2}} \\
&- \frac{2b^2g^3(1-c^2x^2)}{c^4d\sqrt{d-c^2dx^2}} - \frac{2b^2g^3x\sqrt{1-c^2x^2}\arcsin(cx)}{c^3d\sqrt{d-c^2dx^2}} \\
&+ \frac{g(3c^2f^2+g^2)\,(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} + \frac{f\left(f^2+\frac{3g^2}{c^2}\right)x(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} \\
&- \frac{if(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} \\
&+ \frac{g^3(1-c^2x^2)\,(a+b\arcsin(cx))^2}{c^4d\sqrt{d-c^2dx^2}} - \frac{fg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{bc^3d\sqrt{d-c^2dx^2}} \\
&+ \frac{4ibg(3c^2f^2+g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} \\
&+ \frac{2bf(c^2f^2+3g^2)\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} \\
&- \frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} \\
&+ \frac{2ib^2g(3c^2f^2+g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^4d\sqrt{d-c^2dx^2}} \\
&- \frac{ib^2f(c^2f^2+3g^2)\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}
\end{aligned}$$

output
```
-2*b^2*g^3*(-c^2*x^2+1)/c^4/d/(-c^2*d*x^2+d)^(1/2)+g*(3*c^2*f^2+g^2)*(a+b*
arcsin(c*x))^2/c^4/d/(-c^2*d*x^2+d)^(1/2)+f*(f^2+3*g^2/c^2)*x*(a+b*arcsin(
c*x))^2/d/(-c^2*d*x^2+d)^(1/2)+g^3*(-c^2*x^2+1)*(a+b*arcsin(c*x))^2/c^4/d/
(-c^2*d*x^2+d)^(1/2)-2*a*b*g^3*x*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(
1/2)-2*b^2*g^3*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
-I*f*(c^2*f^2+3*g^2)*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*
x^2+d)^(1/2)-f*g^2*(a+b*arcsin(c*x))^3*(-c^2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*
x^2+d)^(1/2)+4*I*b*g*(3*c^2*f^2+g^2)*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*
x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*b*f*(c^2*f^2
+3*g^2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^
(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*g*(3*c^2*f^2+g^2)*polylog(2,-I*(I
*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)+2*
I*b^2*g*(3*c^2*f^2+g^2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+
1)^(1/2)/c^4/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*f*(c^2*f^2+3*g^2)*polylog(2,-(I*
c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

## 3.75.2 Mathematica [A] (verified)

Time = 2.52 (sec) , antiderivative size = 325, normalized size of antiderivative = 0.44

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(2g^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2 - \frac{2cfg^2(a+b\arcsin(cx))^3}{b} - 4b\right.}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(2*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2 - (2*c*f
*g^2*(a + b*ArcSin[c*x])^3)/b - 4*b*g^3*(a*c*x + b*Sqrt[1 - c^2*x^2] + b*c
*x*ArcSin[c*x]) + (c*f - g)^3*(-((a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[
c*x])/4]) + I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/
E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])) - (c*f +
g)^3*(I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*A
rcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]) - (a + b*ArcSin[
c*x])^2*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^4*d*Sqrt[d - c^2*d*x^2])
```

### 3.75.3 Rubi [A] (verified)

Time = 1.27 (sec) , antiderivative size = 447, normalized size of antiderivative = 0.61, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(-\frac{x(a+b\arcsin(cx))^2g^3}{c^2\sqrt{1-c^2x^2}}-\frac{3f(a+b\arcsin(cx))^2g^2}{c^2\sqrt{1-c^2x^2}}+\frac{(c^2f^3+3g^2f+g(3c^2f^2+g^2)x)(a+b\arcsin(cx))^2}{c^2(1-c^2x^2)^{3/2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{4ibg(3c^2f^2+g^2)\arctan(e^{i\arcsin(cx)})(a+b\arcsin(cx))}{c^4}-\frac{fg^2(a+b\arcsin(cx))^3}{bc^3}+\frac{fx\left(\frac{3g^2}{c^2}+f^2\right)(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{g(3c^2f^2+\ldots$$

input
```
Int[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-2*a*b*g^3*x)/c^3 - (2*b^2*g^3*Sqrt[1 - c^2*x^2])/c^4
 - (2*b^2*g^3*x*ArcSin[c*x])/c^3 - (I*f*(c^2*f^2 + 3*g^2)*(a + b*ArcSin[c*
x])^2)/c^3 + (g*(3*c^2*f^2 + g^2)*(a + b*ArcSin[c*x])^2)/(c^4*Sqrt[1 - c^2
*x^2]) + (f*(f^2 + (3*g^2)/c^2)*x*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*x^2]
 + (g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])^2)/c^4 - (f*g^2*(a + b*ArcSi
n[c*x])^3)/(b*c^3) + ((4*I)*b*g*(3*c^2*f^2 + g^2)*(a + b*ArcSin[c*x])*ArcT
an[E^(I*ArcSin[c*x])])/c^4 + (2*b*f*(c^2*f^2 + 3*g^2)*(a + b*ArcSin[c*x])*
Log[1 + E^((2*I)*ArcSin[c*x])])/c^3 - ((2*I)*b^2*g*(3*c^2*f^2 + g^2)*PolyL
og[2, (-I)*E^(I*ArcSin[c*x])])/c^4 + ((2*I)*b^2*g*(3*c^2*f^2 + g^2)*PolyLo
g[2, I*E^(I*ArcSin[c*x])])/c^4 - (I*b^2*f*(c^2*f^2 + 3*g^2)*PolyLog[2, -E^
((2*I)*ArcSin[c*x])])/c^3))/(d*Sqrt[d - c^2*d*x^2])
```

### 3.75.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.75.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1527 vs. 2(731) = 1462.

Time = 1.19 (sec) , antiderivative size = 1528, normalized size of antiderivative = 2.07

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1528 |
| parts | Expression too large to display | 1528 |

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^3/d*x/(-c^2*d*x^2+d)^(1/2)+g^3*(-x^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+2/d
/c^4/(-c^2*d*x^2+d)^(1/2))+3*f*g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/d/(
c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+3*f^2*g/c^2/d/(
-c^2*d*x^2+d)^(1/2))+b^2*((-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^
3/(c^2*x^2-1)*arcsin(c*x)^3*f*g^2+1/2*(-d*(c^2*x^2-1))^(1/2)*(c^2*x^2-I*(-
c^2*x^2+1)^(1/2)*x*c-1)*g^3*(arcsin(c*x)^2-2+2*I*arcsin(c*x))/d^2/c^4/(c^2
*x^2-1)+1/2*(-d*(c^2*x^2-1))^(1/2)*(I*(-c^2*x^2+1)^(1/2)*x*c+c^2*x^2-1)*g^
3*(arcsin(c*x)^2-2-2*I*arcsin(c*x))/d^2/c^4/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(
1/2)/d^2/c^4/(c^2*x^2-1)*arcsin(c*x)^2*(I*(-c^2*x^2+1)^(1/2)*c^3*f^3+c^4*f
^3*x+3*I*(-c^2*x^2+1)^(1/2)*c*f*g^2+3*c^2*f*g^2*x+3*f^2*g*c^2+g^3)+(-d*(c^
2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(2*I*arcsin(c*x)^2*c^3*f^3+I*polylog(2,
-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^3*f^3-2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2
)*arcsin(c*x)*c^3*f^3+6*I*arcsin(c*x)^2*c*f*g^2-6*arcsin(c*x)*ln(1+I*(I*c*
x+(-c^2*x^2+1)^(1/2)))*c^2*f^2*g+6*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^
(1/2)))*c^2*f^2*g+6*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*f^2*g-6*I*
dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c^2*f^2*g+3*I*polylog(2,-(I*c*x+(-c^
2*x^2+1)^(1/2))^2)*c*f*g^2-6*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*arcsin(c*x
)*c*f*g^2-2*arcsin(c*x)*ln(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g^3+2*arcsin(c*
x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g^3+2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1
)^(1/2)))*g^3-2*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g^3)/d^2/c^4/(c...
```

## 3.75.5 Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"fricas")
```

output
```
integral((a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*g
^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*b
*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-c
^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

### 3.75.6 Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)^3}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(3/2)
, x)
```

### 3.75.7 Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"maxima")
```

output
```
-a^2*g^3*(x^2/(sqrt(-c^2*d*x^2 + d)*c^2*d) - 2/(sqrt(-c^2*d*x^2 + d)*c^4*d
)) + 3*a^2*f*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2
))) + 2*a*b*f^3*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a^2*f^3*x/(sqrt(-
c^2*d*x^2 + d)*d) - a*b*f^3*log(x^2 - 1/c^2)/(c*d^(3/2)) + 3*a^2*f^2*g/(sq
rt(-c^2*d*x^2 + d)*c^2*d) - sqrt(d)*integrate(((b^2*g^3*x^3 + 3*b^2*f*g^2*
x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^
2 + 2*(a*b*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x)*arctan2(c*x, sqrt(c*
x + 1)*sqrt(-c*x + 1)))/((c^2*d^2*x^2 - d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1))
, x)
```

### 3.75.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.75.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

# 3.76 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$



## 3.76.1 Optimal result

Integrand size = 33, antiderivative size = 513

$$
\begin{aligned}
\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{2fg(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} \\
&+ \frac{(c^2f^2+g^2)\,x(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} \\
&- \frac{i(c^2f^2+g^2)\,\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{c^3d\sqrt{d-c^2dx^2}} - \frac{g^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{3bc^3d\sqrt{d-c^2dx^2}} \\
&+ \frac{8ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\
&+ \frac{2b(c^2f^2+g^2)\,\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}} \\
&- \frac{4ib^2fg\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\
&+ \frac{4ib^2fg\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\
&- \frac{ib^2(c^2f^2+g^2)\,\sqrt{1-c^2x^2}\,\text{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{c^3d\sqrt{d-c^2dx^2}}
\end{aligned}
$$

output
```
2*f*g*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+(c^2*f^2+g^2)*x*(a+b*
arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*(c^2*f^2+g^2)*(a+b*arcsin(c*x)
)^2*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-1/3*g^2*(a+b*arcsin(c*x)
)^3*(-c^2*x^2+1)^(1/2)/b/c^3/d/(-c^2*d*x^2+d)^(1/2)+8*I*b*f*g*(a+b*arcsin(
c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^
2+d)^(1/2)+2*b*(c^2*f^2+g^2)*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1
/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)-4*I*b^2*f*g*polylog(
2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(
1/2)+4*I*b^2*f*g*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2
)/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*(c^2*f^2+g^2)*polylog(2,-(I*c*x+(-c^2*x
^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c^3/d/(-c^2*d*x^2+d)^(1/2)
```

### 3.76.2 Mathematica [A] (verified)

Time = 1.58 (sec) , antiderivative size = 259, normalized size of antiderivative = 0.50

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(-\frac{2g^2(a+b\arcsin(cx))^3}{b}+3(-cf+g)^2\left(-(a+b\arcsin(cx))^2\cot\right.\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-2*g^2*(a + b*ArcSin[c*x])^3)/b + 3*(-(c*f) + g)^2*(-
((a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[c*x])/4]) + I*((a + b*ArcSin[c*x
])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/E^(I*ArcSin[c*x])]) + 4*b^2*Poly
Log[2, (-I)/E^(I*ArcSin[c*x])])) - 3*(c*f + g)^2*(I*((a + b*ArcSin[c*x])*(
a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[
2, (-I)*E^(I*ArcSin[c*x])]) - (a + b*ArcSin[c*x])^2*Tan[(Pi + 2*ArcSin[c*x
])/4])))/(6*c^3*d*Sqrt[d - c^2*d*x^2])
```

### 3.76.3 Rubi [A] (verified)

Time = 1.11 (sec) , antiderivative size = 314, normalized size of antiderivative = 0.61, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(f^2c^2+2fgxc^2+g^2)(a+b\arcsin(cx))^2}{c^2(1-c^2x^2)^{3/2}}-\frac{g^2(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{1-c^2x^2}\left(\frac{8ibfg\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^2}-\frac{g^2(a+b\arcsin(cx))^3}{3bc^3}+\frac{x(c^2f^2+g^2)(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}+\frac{2fg(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}-\right.$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((-I)*(c^2*f^2 + g^2)*(a + b*ArcSin[c*x])^2)/c^3 + (2*
f*g*(a + b*ArcSin[c*x])^2)/(c^2*Sqrt[1 - c^2*x^2]) + ((c^2*f^2 + g^2)*x*(a
 + b*ArcSin[c*x])^2)/(c^2*Sqrt[1 - c^2*x^2]) - (g^2*(a + b*ArcSin[c*x])^3)
/(3*b*c^3) + ((8*I)*b*f*g*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c
^2 + (2*b*(c^2*f^2 + g^2)*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x]
)])/c^3 - ((4*I)*b^2*f*g*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c^2 + ((4*I)*
b^2*f*g*PolyLog[2, I*E^(I*ArcSin[c*x])])/c^2 - (I*b^2*(c^2*f^2 + g^2)*Poly
Log[2, -E^((2*I)*ArcSin[c*x])])/c^3))/(d*Sqrt[d - c^2*d*x^2])
```

### 3.76.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.76.4 Maple [A] (verified)

Time = 1.08 (sec) , antiderivative size = 975, normalized size of antiderivative = 1.90

| method | result |
|---|---|
| default | $a^2\left(\frac{f^2x}{d\sqrt{-c^2dx^2+d}}+g^2\left(\frac{x}{c^2d\sqrt{-c^2dx^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)+\frac{2fg}{c^2d\sqrt{-c^2dx^2+d}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2}}{3d^2c^3(c^2}\right.$ |
| parts | $a^2\left(\frac{f^2x}{d\sqrt{-c^2dx^2+d}}+g^2\left(\frac{x}{c^2d\sqrt{-c^2dx^2+d}}-\frac{\arctan\left(\frac{\sqrt{c^2d}\,x}{\sqrt{-c^2dx^2+d}}\right)}{c^2d\sqrt{c^2d}}\right)+\frac{2fg}{c^2d\sqrt{-c^2dx^2+d}}\right)+b^2\left(\frac{\sqrt{-d(c^2x^2-1)}\,\sqrt{-c^2}}{3d^2c^3(c^2}\right.$ |

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVER
BOSE)
```

output
```
a^2*(f^2/d*x/(-c^2*d*x^2+d)^(1/2)+g^2*(x/c^2/d/(-c^2*d*x^2+d)^(1/2)-1/c^2/
d/(c^2*d)^(1/2)*arctan((c^2*d)^(1/2)*x/(-c^2*d*x^2+d)^(1/2)))+2*f*g/c^2/d/
(-c^2*d*x^2+d)^(1/2))+b^2*(1/3*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d
^2/c^3/(c^2*x^2-1)*g^2*arcsin(c*x)^3-(-d*(c^2*x^2-1))^(1/2)*(c*x+I*(-c^2*x
^2+1)^(1/2))*arcsin(c*x)^2*(c^2*f^2+g^2-2*I*(-c^2*x^2+1)^(1/2)*c*f*g+2*x*c
^2*f*g)/d^2/c^3/(c^2*x^2-1)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)*(-2*
I*arcsin(c*x)^2*c^2*f^2+2*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*arcsin(c*x)*c
^2*f^2-I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c^2*f^2+4*ln(1+I*(I*c*x+
(-c^2*x^2+1)^(1/2)))*arcsin(c*x)*c*f*g-4*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)*arcsin(c*x)*c*f*g-4*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c*f*g+4*I*di
log(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*c*f*g-2*I*arcsin(c*x)^2*g^2+2*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))^2)*arcsin(c*x)*g^2-I*polylog(2,-(I*c*x+(-c^2*x^2+1
)^(1/2))^2)*g^2)/d^2/c^3/(c^2*x^2-1))+2*a*b*(1/2*(-d*(c^2*x^2-1))^(1/2)*(-
c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x^2-1)*g^2*arcsin(c*x)^2+2*I*(-c^2*x^2+1)^(1
/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^3/(c^2*x^2-1)*(c^2*f^2+g^2)*arcsin(c*x)-(
-d*(c^2*x^2-1))^(1/2)*(c*x+I*(-c^2*x^2+1)^(1/2))*arcsin(c*x)*(c^2*f^2+g^2-
2*I*(-c^2*x^2+1)^(1/2)*c*f*g+2*x*c^2*f*g)/d^2/c^3/(c^2*x^2-1)-(-d*(c^2*x^2
-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2/c^3/(c^2*x^2-1)*(c^2*f^2-2*c*f*g+g^2)*ln
(I*c*x+(-c^2*x^2+1)^(1/2)+I)-(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/d^2
/c^3/(c^2*x^2-1)*(c^2*f^2+2*c*f*g+g^2)*ln(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

## 3.76.5 Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"fricas")
```

output
```
integral((a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin
(c*x))*sqrt(-c^2*d*x^2 + d)/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d^2), x)
```

### 3.76.6 Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)^2}{(-d\,(cx-1)\,(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(3/2)
, x)
```

### 3.76.7 Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"maxima")
```

output
```
a^2*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d) - arcsin(c*x)/(c^3*d^(3/2))) + 2*a
*b*f^2*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a^2*f^2*x/(sqrt(-c^2*d*x^2
 + d)*d) - a*b*f^2*log(x^2 - 1/c^2)/(c*d^(3/2)) - sqrt(d)*integrate(((b^2*
g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)
)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x +
 1)))/((c^2*d^2*x^2 - d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 2*a^2*f*g/(
sqrt(-c^2*d*x^2 + d)*c^2*d)
```

### 3.76.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.76.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{3/2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

# 3.77 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$



## 3.77.1 Optimal result

Integrand size = 31, antiderivative size = 410

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx &= \frac{g(a+b\arcsin(cx))^2}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{fx(a+b\arcsin(cx))^2}{d\sqrt{d-c^2dx^2}} - \frac{if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cd\sqrt{d-c^2dx^2}} \\ &+ \frac{4ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{2bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}} \\ &- \frac{2ib^2g\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} \\ &+ \frac{2ib^2g\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{c^2d\sqrt{d-c^2dx^2}} - \frac{ib^2f\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{cd\sqrt{d-c^2dx^2}}\end{aligned}$$

output
```
g*(a+b*arcsin(c*x))^2/c^2/d/(-c^2*d*x^2+d)^(1/2)+f*x*(a+b*arcsin(c*x))^2/d
/(-c^2*d*x^2+d)^(1/2)-I*f*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c/d/(-c^2
*d*x^2+d)^(1/2)+4*I*b*g*(a+b*arcsin(c*x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))
*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)+2*b*f*(a+b*arcsin(c*x))*ln(
1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2
)-2*I*b^2*g*polylog(2,-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^
2/d/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*g*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))
*(-c^2*x^2+1)^(1/2)/c^2/d/(-c^2*d*x^2+d)^(1/2)-I*b^2*f*polylog(2,-(I*c*x+(
-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d/(-c^2*d*x^2+d)^(1/2)
```

## 3.77.2 Mathematica [A] (verified)

Time = 1.00 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.58

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left((cf-g)\left(-(a+b\arcsin(cx))^2\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)+i\right.\right.}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((c*f - g)*(-((a + b*ArcSin[c*x])^2*Cot[(Pi + 2*ArcSin[
c*x])/4]) + I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] - (4*I)*b*Log[1 + I/
E^(I*ArcSin[c*x])]) + 4*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])) - (c*f +
g)*(I*((a + b*ArcSin[c*x])*(a + b*ArcSin[c*x] + (4*I)*b*Log[1 + I*E^(I*Arc
Sin[c*x])]) + 4*b^2*PolyLog[2, (-I)*E^(I*ArcSin[c*x])]) - (a + b*ArcSin[c*
x])^2*Tan[(Pi + 2*ArcSin[c*x])/4])))/(2*c^2*d*Sqrt[d - c^2*d*x^2])
```

## 3.77.3 Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 243, normalized size of antiderivative = 0.59, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}+\frac{gx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{3/2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\sqrt{1-c^2x^2}\left(\frac{4ibg\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{c^2}+\frac{fx(a+b\arcsin(cx))^2}{\sqrt{1-c^2x^2}}+\frac{g(a+b\arcsin(cx))^2}{c^2\sqrt{1-c^2x^2}}-\frac{if(a+b\arcsin(cx))^2}{c}+\frac{2bf\log(1+e^2}{}\right.}{d\sqrt{d-c^2d}}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(3/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((-I)*f*(a + b*ArcSin[c*x])^2)/c + (g*(a + b*ArcSin[c*
x])^2)/(c^2*Sqrt[1 - c^2*x^2]) + (f*x*(a + b*ArcSin[c*x])^2)/Sqrt[1 - c^2*
x^2] + ((4*I)*b*g*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c^2 + (2*
b*f*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])/c - ((2*I)*b^2*g*P
olyLog[2, (-I)*E^(I*ArcSin[c*x])])/c^2 + ((2*I)*b^2*g*PolyLog[2, I*E^(I*Ar
cSin[c*x])])/c^2 - (I*b^2*f*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c))/(d*Sqr
t[d - c^2*d*x^2])
```

### 3.77.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.77.4 Maple [A] (verified)

Time = 1.20 (sec) , antiderivative size = 612, normalized size of antiderivative = 1.49

| method | result |
|---|---|
| default | $a^2\left(\frac{fx}{d\sqrt{-c^2dx^2+d}}+\frac{g}{c^2d\sqrt{-c^2dx^2+d}}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2\left(i\sqrt{-c^2x^2+1}\,cf+c^2fx+g\right)}{d^2c^2(c^2x^2-1)}+\frac{\sqrt{-c^2x^2+1}\,\sqrt{-d}}{}\right.$ |
| parts | $a^2\left(\frac{fx}{d\sqrt{-c^2dx^2+d}}+\frac{g}{c^2d\sqrt{-c^2dx^2+d}}\right)+b^2\left(-\frac{\sqrt{-d(c^2x^2-1)}\,\arcsin(cx)^2\left(i\sqrt{-c^2x^2+1}\,cf+c^2fx+g\right)}{d^2c^2(c^2x^2-1)}+\frac{\sqrt{-c^2x^2+1}\,\sqrt{-d}}{}\right.$ |

input
```
int((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x,method=_RETURNVERBO
SE)
```

output
```
a^2*(f/d*x/(-c^2*d*x^2+d)^(1/2)+g/c^2/d/(-c^2*d*x^2+d)^(1/2))+b^2*(-(-d*(c
^2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)*arcsin(c*x)^2*(I*(-c^2*x^2+1)^(1/2)*c
*f+c^2*f*x+g)+(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)*(2*I*arcsin(c*x)^2
*c*f+I*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*c*f-2*arcsin(c*x)*ln(1+(I*
c*x+(-c^2*x^2+1)^(1/2))^2)*c*f+2*I*dilog(1+I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g
-2*I*dilog(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g-2*arcsin(c*x)*ln(1+I*(I*c*x+(
-c^2*x^2+1)^(1/2)))*g+2*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*g)/
d^2/c^2/(c^2*x^2-1))+2*a*b*(2*I*(-d*(c^2*x^2-1))^(1/2)*(-c^2*x^2+1)^(1/2)/
d^2/c/(c^2*x^2-1)*f*arcsin(c*x)-(-d*(c^2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)
*arcsin(c*x)*(I*(-c^2*x^2+1)^(1/2)*c*f+c^2*f*x+g)-(-c^2*x^2+1)^(1/2)*(-d*(
c^2*x^2-1))^(1/2)*(c*f-g)*ln(I*c*x+(-c^2*x^2+1)^(1/2)+I)/d^2/c^2/(c^2*x^2-
1)-(-c^2*x^2+1)^(1/2)*(-d*(c^2*x^2-1))^(1/2)/d^2/c^2/(c^2*x^2-1)*(c*f+g)*l
n(I*c*x+(-c^2*x^2+1)^(1/2)-I))
```

### 3.77.5 Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx=\int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(
c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x))/(c^4*d^2*x^4 - 2*c^2*d^2*x^2 + d
^2), x)
```

### 3.77.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2(f+gx)}{(-d(cx-1)(cx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(3/2), x
)
```

### 3.77.7 Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="m
axima")
```

output
```
2*a*b*f*x*arcsin(c*x)/(sqrt(-c^2*d*x^2 + d)*d) + a^2*f*x/(sqrt(-c^2*d*x^2
+ d)*d) - sqrt(d)*integrate((2*a*b*g*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*
x + 1)) + (b^2*g*x + b^2*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/
((c^2*d^2*x^2 - d^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) - a*b*f*log(x^2 - 1
/c^2)/(c*d^(3/2)) + a^2*g/(sqrt(-c^2*d*x^2 + d)*c^2*d)
```

### 3.77.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(3/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.77.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(3/2), x)
```

# 3.78 $\int \frac{(a+b \arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx$

### 3.78.1 Optimal result

Integrand size = 33, antiderivative size = 1137

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = -\frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf-g)\sqrt{d-c^2dx^2}} + \frac{i\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{2d(cf+g)\sqrt{d-c^2dx^2}}$$
$$-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\cot\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf-g)\sqrt{d-c^2dx^2}}$$
$$+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{-i\arcsin(cx)}\right)}{d(cf+g)\sqrt{d-c^2dx^2}}$$
$$+\frac{2b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1-ie^{i\arcsin(cx)}\right)}{d(cf-g)\sqrt{d-c^2dx^2}}$$
$$+\frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$-\frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{-i\arcsin(cx)}\right)}{d(cf+g)\sqrt{d-c^2dx^2}}$$
$$-\frac{2ib^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{d(cf-g)\sqrt{d-c^2dx^2}}$$
$$+\frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$-\frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+\frac{2ib^2g^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$-\frac{2ib^2g^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{d(c^2f^2-g^2)^{3/2}\sqrt{d-c^2dx^2}}$$
$$+\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2\tan\left(\frac{\pi}{4}+\frac{1}{2}\arcsin(cx)\right)}{2d(cf+g)\sqrt{d-c^2dx^2}}$$

output
```
-1/2*I*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d/(c*f-g)/(-c^2*d*x^2+d)^(1/
2)+1/2*I*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/d/(c*f+g)/(-c^2*d*x^2+d)^(
1/2)-1/2*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*(-c^2*x^2+1)^(1/2
)/d/(c*f-g)/(-c^2*d*x^2+d)^(1/2)+2*b*(a+b*arcsin(c*x))*ln(1-I/(I*c*x+(-c^2
*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)+2*b*(a+b
*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c*f
-g)/(-c^2*d*x^2+d)^(1/2)+I*g^2*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2
+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)
^(3/2)/(-c^2*d*x^2+d)^(1/2)-I*g^2*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*
x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g
^2)^(3/2)/(-c^2*d*x^2+d)^(1/2)+2*I*b^2*polylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/
2)))*(-c^2*x^2+1)^(1/2)/d/(c*f+g)/(-c^2*d*x^2+d)^(1/2)-2*I*b^2*polylog(2,I
*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c*f-g)/(-c^2*d*x^2+d)^(
1/2)+2*b*g^2*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c
*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/(-c^2*d*
x^2+d)^(1/2)-2*b*g^2*(a+b*arcsin(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/
2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/
(-c^2*d*x^2+d)^(1/2)+2*I*b^2*g^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/
(c*f-(c^2*f^2-g^2)^(1/2)))*(-c^2*x^2+1)^(1/2)/d/(c^2*f^2-g^2)^(3/2)/(-c^2*
d*x^2+d)^(1/2)-2*I*b^2*g^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*...
```

### 3.78.2 Mathematica [A] (warning: unable to verify)

Time = 3.81 (sec) , antiderivative size = 597, normalized size of antiderivative = 0.53

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\left(d-c^2dx^2\right)^{3/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{-((a+b\arcsin(cx))(-ia+a\cot\left(\frac{1}{4}(\pi+2\arcsin(cx))\right)+b\arcsin(cx)\left(-i+\cot\left(\frac{1}{4}(\pi+2\arcs\right.\right.}{cf-g}\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c*x])^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((-((a + b*ArcSin[c*x])*((-I)*a + a*Cot[(Pi + 2*ArcSin[
c*x])/4] + b*ArcSin[c*x]*(-I + Cot[(Pi + 2*ArcSin[c*x])/4]) - 4*b*Log[1 +
I/E^(I*ArcSin[c*x])])) + (4*I)*b^2*PolyLog[2, (-I)/E^(I*ArcSin[c*x])])/(c*
f - g) + ((2*I)*g^2*((a + b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*g)
/(-(c*f) + Sqrt[c^2*f^2 - g^2])] - (a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*A
rcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*(a + b*ArcSin[c*x])*
PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*
(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])] + 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 -
 g^2])] - 2*b^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g
^2])]))/((c*f - g)*(c*f + g)*Sqrt[c^2*f^2 - g^2]) + ((-4*I)*b^2*PolyLog[2,
 (-I)*E^(I*ArcSin[c*x])] + (a + b*ArcSin[c*x])*((-I)*a + 4*b*Log[1 + I*E^(
I*ArcSin[c*x])] + a*Tan[(Pi + 2*ArcSin[c*x])/4] + b*ArcSin[c*x]*(-I + Tan[
(Pi + 2*ArcSin[c*x])/4]))))/(c*f + g)))/(2*d*Sqrt[d - c^2*d*x^2])
```

### 3.78.3 Rubi [A] (verified)

Time = 2.26 (sec) , antiderivative size = 722, normalized size of antiderivative = 0.64, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{3/2}(f+gx)}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(1-c^2x^2)^{3/2}}dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5274}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(-\frac{c(a+b\arcsin(cx))^2}{2(cf+g)(cx-1)\sqrt{1-c^2x^2}}+\frac{c(a+b\arcsin(cx))^2}{2(cf-g)(cx+1)\sqrt{1-c^2x^2}}+\frac{g^2(a+b\arcsin(cx))^2}{(g-cf)(cf+g)(f+gx)\sqrt{1-c^2x^2}}\right)dx}{d\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{1-c^2x^2}\left(\frac{2bg^2(a+b\arcsin(cx))\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}}-\frac{2bg^2(a+b\arcsin(cx))\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{(c^2f^2-g^2)^{3/2}}+\frac{ig^2(a+b\arcsin(cx))^2}{(c^2f^2\cdots}\right.$$

input
```
Int[(a + b*ArcSin[c*x])^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((-1/2*I)*(a + b*ArcSin[c*x])^2)/(c*f - g) + ((I/2)*(a
 + b*ArcSin[c*x])^2)/(c*f + g) - ((a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[
c*x]/2])/(2*(c*f - g)) + (2*b*(a + b*ArcSin[c*x])*Log[1 - I/E^(I*ArcSin[c*
x])])/(c*f + g) + (2*b*(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(
c*f - g) + (I*g^2*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c
*f - Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) - (I*g^2*(a + b*ArcSin[c
*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*
f^2 - g^2)^(3/2) + ((2*I)*b^2*PolyLog[2, I/E^(I*ArcSin[c*x])])/(c*f + g) -
 ((2*I)*b^2*PolyLog[2, I*E^(I*ArcSin[c*x])])/(c*f - g) + (2*b*g^2*(a + b*A
rcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
])/(c^2*f^2 - g^2)^(3/2) - (2*b*g^2*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I
*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) + ((2
*I)*b^2*g^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
])/(c^2*f^2 - g^2)^(3/2) - ((2*I)*b^2*g^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*
g)/(c*f + Sqrt[c^2*f^2 - g^2])])/(c^2*f^2 - g^2)^(3/2) + ((a + b*ArcSin[c*
x])^2*Tan[Pi/4 + ArcSin[c*x]/2])/(2*(c*f + g))))/(d*Sqrt[d - c^2*d*x^2])
```

### 3.78.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] && !GtQ[d, 0]
```

### 3.78.4 Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(gx+f)(-c^2d\,x^2+d)^{\frac{3}{2}}}dx$$

input
```
int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x)
```

output
```
int((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x)
```

### 3.78.5 Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="f
ricas")
```

output
```
integral(sqrt(-c^2*d*x^2 + d)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2
)/(c^4*d^2*g*x^5 + c^4*d^2*f*x^4 - 2*c^2*d^2*g*x^3 - 2*c^2*d^2*f*x^2 + d^2
*g*x + d^2*f), x)
```

### 3.78.6 Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(cx))^2}{(-d(cx-1)(cx+1))^{\frac{3}{2}}(f+gx)}\,dx$$

input
```
integrate((a+b*asin(c*x))**2/(g*x+f)/(-c**2*d*x**2+d)**(3/2),x)
```

output
```
Integral((a + b*asin(c*x))**2/((-d*(c*x - 1)*(c*x + 1))**(3/2)*(f + g*x)),
 x)
```

### 3.78.7 Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{3}{2}}(gx+f)}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="m
axima")
```

output
```
integrate((b*arcsin(c*x) + a)^2/((-c^2*d*x^2 + d)^(3/2)*(g*x + f)), x)
```

### 3.78.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\,(d-c^2dx^2)^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x))^2/(g*x+f)/(-c^2*d*x^2+d)^(3/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.78.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2}{(f+gx)\,(d-c^2dx^2)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2}{(f+g\,x)\,\left(d-c^2\,d\,x^2\right)^{3/2}}\,dx$$

input
```
int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)),x)
```

output
```
int((a + b*asin(c*x))^2/((f + g*x)*(d - c^2*d*x^2)^(3/2)), x)
```

# 3.79 $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$



## 3.79.1 Optimal result

Integrand size = 33, antiderivative size = 1589

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Too large to display}$$

output
```
1/3*I*b^2*(c*f+g)^3*polylog(2,I/(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(
1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/12*I*(c*f+g)^3*(a+b*arcsin(c*x))^2*(-c
^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/4*I*(c*f-2*g)*(c*f+g)^2*(a+
b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*I*(c
*f-g)^3*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2
)-1/6*b^2*(c*f-g)^3*cot(1/4*Pi+1/2*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^4/d^2
/(-c^2*d*x^2+d)^(1/2)-1/12*(c*f-g)^3*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*ar
csin(c*x))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/4*(c*f-g)^2*(
c*f+2*g)*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*(-c^2*x^2+1)^(1/2
)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/12*b*(c*f-g)^3*(a+b*arcsin(c*x))*csc(1/4*
Pi+1/2*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)-1/24
*(c*f-g)^3*(a+b*arcsin(c*x))^2*cot(1/4*Pi+1/2*arcsin(c*x))*csc(1/4*Pi+1/2*
arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+b*(c*f-2*g)
*(c*f+g)^2*(a+b*arcsin(c*x))*ln(1-I/(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+
1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b*(c*f+g)^3*(a+b*arcsin(c*x))*ln
(1-I/(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)
^(1/2)+1/3*b*(c*f-g)^3*(a+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))
)*(-c^2*x^2+1)^(1/2)/c^4/d^2/(-c^2*d*x^2+d)^(1/2)+b*(c*f-g)^2*(c*f+2*g)*(a
+b*arcsin(c*x))*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^4/
d^2/(-c^2*d*x^2+d)^(1/2)+I*b^2*(c*f-2*g)*(c*f+g)^2*polylog(2,I/(I*c*x+(...
```

### 3.79.2 Mathematica [A] (verified)

Time = 6.26 (sec) , antiderivative size = 715, normalized size of antiderivative = 0.45

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{(cf-g)^2(cf+2g)\left(ib\left(\frac{(a+b\arcsin(cx))^2}{b}-4\left(i(a+b\arcsin(cx))\log\left(1+e^{\frac{1}{2}i(\pi-2\arcsin(cx))}\right)\right.\right.\right.}{}\right.}{}$$

input
```
Integrate[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((c*f - g)^2*(c*f + 2*g)*(I*b*((a + b*ArcSin[c*x])^2/b
 - 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))] - b*Po
lyLog[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi
/4 - ArcSin[c*x]/2]))/(4*c^4) - ((c*f - g)^3*(2*b*(a + b*ArcSin[c*x])*Sec[
Pi/4 - ArcSin[c*x]/2]^2 + 4*b^2*Tan[Pi/4 - ArcSin[c*x]/2] + (a + b*ArcSin[
c*x])^2*Sec[Pi/4 - ArcSin[c*x]/2]^2*Tan[Pi/4 - ArcSin[c*x]/2] - 2*(I*b*((a
 + b*ArcSin[c*x])^2/b - 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*
ArcSin[c*x]))] - b*PolyLog[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*
ArcSin[c*x])^2*Tan[Pi/4 - ArcSin[c*x]/2])))/(24*c^4) - ((c*f - 2*g)*(c*f +
 g)^2*(I*b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^(
(I/2)*(Pi + 2*ArcSin[c*x]))] + b*PolyLog[2, -E^((I/2)*(Pi + 2*ArcSin[c*x])
)])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2]))/(4*c^4) - ((c*f +
 g)^3*(2*b*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2 - 4*b^2*Tan[Pi/
4 + ArcSin[c*x]/2] - (a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan
[Pi/4 + ArcSin[c*x]/2] + 2*(I*b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a + b*Arc
Sin[c*x])*Log[1 + E^((I/2)*(Pi + 2*ArcSin[c*x]))] + b*PolyLog[2, -E^((I/2)
*(Pi + 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2
])))/(24*c^4)))/(d^2*Sqrt[d - c^2*d*x^2])
```

### 3.79.3 Rubi [A] (verified)

Time = 2.34 (sec) , antiderivative size = 918, normalized size of antiderivative = 0.58, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5276, 5274, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

$$\Big\downarrow \; 5276$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 5274$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{(a+b\arcsin(cx))^2(cf-g)^3}{4c^3(cx+1)^2\sqrt{1-c^2x^2}}+\frac{(cf+2g)(a+b\arcsin(cx))^2(cf-g)^2}{4c^3(cx+1)\sqrt{1-c^2x^2}}-\frac{(cf-2g)(cf+g)^2(a+b\arcsin(cx))^2}{4c^3(cx-1)\sqrt{1-c^2x^2}}+\frac{(cf+g)^3(a+b\arcsin}{4c^3(cx-1)^2\sqrt{1-}}\right.}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 2009$$

$$\frac{\sqrt{1-c^2x^2}\left(-\frac{i(a+b\arcsin(cx))^2(cf-g)^3}{12c^4}-\frac{b(a+b\arcsin(cx))\csc^2\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)(cf-g)^3}{12c^4}-\frac{(a+b\arcsin(cx))^2\cot\left(\frac{1}{2}\arcsin(cx)+\frac{\pi}{4}\right)\csc^2}{24c^4}\right.}{}$$

input

```
Int[((f + g*x)^3*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output

```
(Sqrt[1 - c^2*x^2]*(((-1/12*I)*(c*f - g)^3*(a + b*ArcSin[c*x])^2)/c^4 + ((
I/4)*(c*f - 2*g)*(c*f + g)^2*(a + b*ArcSin[c*x])^2)/c^4 + ((I/12)*(c*f + g
)^3*(a + b*ArcSin[c*x])^2)/c^4 - ((I/4)*(c*f - g)^2*(c*f + 2*g)*(a + b*Arc
Sin[c*x])^2)/c^4 - (b^2*(c*f - g)^3*Cot[Pi/4 + ArcSin[c*x]/2])/(6*c^4) - (
(c*f - g)^3*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(12*c^4) - ((
c*f - g)^2*(c*f + 2*g)*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2])/(4
*c^4) - (b*(c*f - g)^3*(a + b*ArcSin[c*x])*Csc[Pi/4 + ArcSin[c*x]/2]^2)/(1
2*c^4) - ((c*f - g)^3*(a + b*ArcSin[c*x])^2*Cot[Pi/4 + ArcSin[c*x]/2]*Csc[
Pi/4 + ArcSin[c*x]/2]^2)/(24*c^4) + (b*(c*f - 2*g)*(c*f + g)^2*(a + b*ArcS
in[c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/c^4 + (b*(c*f + g)^3*(a + b*ArcSin[
c*x])*Log[1 - I/E^(I*ArcSin[c*x])])/(3*c^4) + (b*(c*f - g)^3*(a + b*ArcSin
[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/(3*c^4) + (b*(c*f - g)^2*(c*f + 2*g)*
(a + b*ArcSin[c*x])*Log[1 - I*E^(I*ArcSin[c*x])])/c^4 + (I*b^2*(c*f - 2*g)
*(c*f + g)^2*PolyLog[2, I/E^(I*ArcSin[c*x])])/c^4 + ((I/3)*b^2*(c*f + g)^3
*PolyLog[2, I/E^(I*ArcSin[c*x])])/c^4 - ((I/3)*b^2*(c*f - g)^3*PolyLog[2,
I*E^(I*ArcSin[c*x])])/c^4 - (I*b^2*(c*f - g)^2*(c*f + 2*g)*PolyLog[2, I*E^
(I*ArcSin[c*x])])/c^4 - (b*(c*f + g)^3*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcS
in[c*x]/2]^2)/(12*c^4) + (b^2*(c*f + g)^3*Tan[Pi/4 + ArcSin[c*x]/2])/(6*c^
4) + ((c*f - 2*g)*(c*f + g)^2*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]
/2])/(4*c^4) + ((c*f + g)^3*(a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x...
```

## 3.79. $\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

### 3.79.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5274
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcSin[c*x]
)^n/Sqrt[d + e*x^2], (f + g*x)^m*(d + e*x^2)^(p + 1/2), x], x] /; FreeQ[{a,
 b, c, d, e, f, g}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && ILtQ[p + 1/2,
 0] && GtQ[d, 0] && IGtQ[n, 0]
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

## 3.79.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 13139 vs. 2(1473) = 2946.

Time = 1.40 (sec) , antiderivative size = 13140, normalized size of antiderivative = 8.27

| method | result | size |
|---|---|---|
| default | Expression too large to display | 13140 |
| parts | Expression too large to display | 13140 |

input
```
int((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
result too large to display
```

### 3.79.5 Fricas [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"fricas")
```

output
```
integral(-(a^2*g^3*x^3 + 3*a^2*f*g^2*x^2 + 3*a^2*f^2*g*x + a^2*f^3 + (b^2*
g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x + b^2*f^3)*arcsin(c*x)^2 + 2*(a*
b*g^3*x^3 + 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x + a*b*f^3)*arcsin(c*x))*sqrt(-
c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2 - d^3), x)
```

### 3.79.6 Sympy [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(a+b\operatorname{asin}(cx))^2(f+gx)^3}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**3*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**3/(-d*(c*x - 1)*(c*x + 1))**(5/2)
, x)
```

### 3.79.7 Maxima [F]

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)^3(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"maxima")
```

output
```
1/3*a*b*c*f^3*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(
5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*f^3*(2*x/(sqrt(-c^2*d*x^2
+ d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*f^3*(2*x/(
sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + 1/3*a^2*g^3*(3
*x^2/((-c^2*d*x^2 + d)^(3/2)*c^2*d) - 2/((-c^2*d*x^2 + d)^(3/2)*c^4*d)) -
a^2*f*g^2*(x/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^
2*d)) + sqrt(d)*integrate(((b^2*g^3*x^3 + 3*b^2*f*g^2*x^2 + 3*b^2*f^2*g*x
+ b^2*f^3)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^3*x^3 +
 3*a*b*f*g^2*x^2 + 3*a*b*f^2*g*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1
)))/((c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
 + a^2*f^2*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

### 3.79.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^3*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.79.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^3(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^3*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

# 3.80 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$

### 3.80.1 Optimal result

Integrand size = 33, antiderivative size = 1025

$$
\begin{aligned}
&\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{2b^2fg}{3c^2d^2\sqrt{d-c^2dx^2}} + \frac{b^2f^2x}{3d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{b^2g^2x}{3c^2d^2\sqrt{d-c^2dx^2}} - \frac{b^2g^2\sqrt{1-c^2x^2}\arcsin(cx)}{3c^3d^2\sqrt{d-c^2dx^2}} - \frac{bf^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&- \frac{2bfgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} - \frac{bg^2x^2(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&+ \frac{2f^2x(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}} + \frac{2fg(a+b\arcsin(cx))^2}{3c^2d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} \\
&+ \frac{f^2x(a+b\arcsin(cx))^2}{3d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} + \frac{g^2x^3(a+b\arcsin(cx))^2}{3d^2\left(1-c^2x^2\right)\sqrt{d-c^2dx^2}} \\
&- \frac{2if^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} + \frac{ig^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{4ibfg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{4bf^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&- \frac{2bg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}} \\
&- \frac{2ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+ \frac{2ib^2fg\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&- \frac{2ib^2f^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&+ \frac{ib^2g^2\sqrt{1-c^2x^2}\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3c^3d^2\sqrt{d-c^2dx^2}}
\end{aligned}
$$

output
```
2/3*b^2*f*g/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b^2*f^2*x/d^2/(-c^2*d*x^2+d)^
(1/2)+1/3*b^2*g^2*x/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+2/3*f^2*x*(a+b*arcsin(c*x
))^2/d^2/(-c^2*d*x^2+d)^(1/2)+2/3*f*g*(a+b*arcsin(c*x))^2/c^2/d^2/(-c^2*x^
2+1)/(-c^2*d*x^2+d)^(1/2)+1/3*f^2*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)/(
-c^2*d*x^2+d)^(1/2)+1/3*g^2*x^3*(a+b*arcsin(c*x))^2/d^2/(-c^2*x^2+1)/(-c^2
*d*x^2+d)^(1/2)-1/3*b*f^2*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c^2
*d*x^2+d)^(1/2)-2/3*b*f*g*x*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)/(-c
^2*d*x^2+d)^(1/2)-1/3*b*g^2*x^2*(a+b*arcsin(c*x))/c/d^2/(-c^2*x^2+1)^(1/2)
/(-c^2*d*x^2+d)^(1/2)-1/3*b^2*g^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3/d^2/(
-c^2*d*x^2+d)^(1/2)+2/3*I*b^2*f*g*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*
(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*I*b*f*g*(a+b*arcsin(c*
x))*arctan(I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^
2+d)^(1/2)+1/3*I*b^2*g^2*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^
2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)+4/3*b*f^2*(a+b*arcsin(c*x))*ln(1+(
I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)
-2/3*b*g^2*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+
1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2)-2/3*I*b^2*f*g*polylog(2,-I*(I*c*x+(-
c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)-2/3*I*f
^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I
*g^2*(a+b*arcsin(c*x))^2*(-c^2*x^2+1)^(1/2)/c^3/d^2/(-c^2*d*x^2+d)^(1/2...
```

### 3.80.2 Mathematica [A] (verified)

Time = 6.27 (sec) , antiderivative size = 711, normalized size of antiderivative = 0.69

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{(c^2f^2-g^2)\left(ib\left(\frac{(a+b\arcsin(cx))^2}{b}-4\left(i(a+b\arcsin(cx))\log\left(1+e^{\frac{1}{2}i(\pi-2\arcsin(cx)}\right.\right.\right.\right.}{}\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*(((c^2*f^2 - g^2)*(I*b*((a + b*ArcSin[c*x])^2/b - 4*(I*
(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))] - b*PolyLog[2,
 -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 - Arc
Sin[c*x]/2]))/(4*c^3) - ((c*f - g)^2*(2*b*(a + b*ArcSin[c*x])*Sec[Pi/4 - A
rcSin[c*x]/2]^2 + 4*b^2*Tan[Pi/4 - ArcSin[c*x]/2] + (a + b*ArcSin[c*x])^2*
Sec[Pi/4 - ArcSin[c*x]/2]^2*Tan[Pi/4 - ArcSin[c*x]/2] - 2*(I*b*((a + b*Arc
Sin[c*x])^2/b - 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c
*x]))] - b*PolyLog[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c
*x])^2*Tan[Pi/4 - ArcSin[c*x]/2])))/(24*c^3) - ((c^2*f^2 - g^2)*(I*b*((a +
 b*ArcSin[c*x])^2/b + 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi + 2*Ar
cSin[c*x]))] + b*PolyLog[2, -E^((I/2)*(Pi + 2*ArcSin[c*x]))])) - (a + b*Ar
cSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2]))/(4*c^3) - ((c*f + g)^2*(2*b*(a +
b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x]/2]^2 - 4*b^2*Tan[Pi/4 + ArcSin[c*x]/
2] - (a + b*ArcSin[c*x])^2*Sec[Pi/4 + ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c
*x]/2] + 2*(I*b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a + b*ArcSin[c*x])*Log[1
+ E^((I/2)*(Pi + 2*ArcSin[c*x]))] + b*PolyLog[2, -E^((I/2)*(Pi + 2*ArcSin[
c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c*x]/2])))/(24*c^3)))/
(d^2*Sqrt[d - c^2*d*x^2])
```

## 3.80.3 Rubi [A] (verified)

Time = 1.43 (sec) , antiderivative size = 614, normalized size of antiderivative = 0.60, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$$

$$\Big\downarrow \; 5276$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 5262$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{g^2x^2(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{2fgx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \; 2009$$

$$\sqrt{1-c^2x^2}\left(\frac{4ibfg\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^2}+\frac{ig^2(a+b\arcsin(cx))^2}{3c^3}-\frac{2bg^2\log\left(1+e^{2i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^3}+\frac{2f^2x(a+b\,\mathrm{ar}}{3\sqrt{1-}}\right.$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((2*b^2*f*g)/(3*c^2*Sqrt[1 - c^2*x^2]) + (b^2*f^2*x)/(3
*Sqrt[1 - c^2*x^2]) + (b^2*g^2*x)/(3*c^2*Sqrt[1 - c^2*x^2]) - (b^2*g^2*Arc
Sin[c*x])/(3*c^3) - (b*f^2*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) - (2*b
*f*g*x*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) - (b*g^2*x^2*(a + b*ArcSin
[c*x]))/(3*c*(1 - c^2*x^2)) - (((2*I)/3)*f^2*(a + b*ArcSin[c*x])^2)/c + ((
I/3)*g^2*(a + b*ArcSin[c*x])^2)/c^3 + (2*f*g*(a + b*ArcSin[c*x])^2)/(3*c^2
*(1 - c^2*x^2)^(3/2)) + (f^2*x*(a + b*ArcSin[c*x])^2)/(3*(1 - c^2*x^2)^(3/
2)) + (g^2*x^3*(a + b*ArcSin[c*x])^2)/(3*(1 - c^2*x^2)^(3/2)) + (2*f^2*x*(
a + b*ArcSin[c*x])^2)/(3*Sqrt[1 - c^2*x^2]) + (((4*I)/3)*b*f*g*(a + b*ArcS
in[c*x])*ArcTan[E^(I*ArcSin[c*x])])/c^2 + (4*b*f^2*(a + b*ArcSin[c*x])*Log
[1 + E^((2*I)*ArcSin[c*x])])/(3*c) - (2*b*g^2*(a + b*ArcSin[c*x])*Log[1 +
E^((2*I)*ArcSin[c*x])])/(3*c^3) - (((2*I)/3)*b^2*f*g*PolyLog[2, (-I)*E^(I*
ArcSin[c*x])])/c^2 + (((2*I)/3)*b^2*f*g*PolyLog[2, I*E^(I*ArcSin[c*x])])/c
^2 - (((2*I)/3)*b^2*f^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c + ((I/3)*b^2
*g^2*PolyLog[2, -E^((2*I)*ArcSin[c*x])])/c^3))/(d^2*Sqrt[d - c^2*d*x^2])
```

### 3.80.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.80.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 9719 vs. 2(974) = 1948.

Time = 1.24 (sec) , antiderivative size = 9720, normalized size of antiderivative = 9.48

| method | result | size |
|---|---|---|
| default | Expression too large to display | 9720 |
| parts | Expression too large to display | 9720 |

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVER
BOSE)
```

output
```
result too large to display
```

### 3.80.5 Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"fricas")
```

output
```
integral(-(a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*
x + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsi
n(c*x))*sqrt(-c^2*d*x^2 + d)/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 + 3*c^2*d^3*x^2
- d^3), x)
```

### 3.80.6 Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(a+b\operatorname{asin}(cx))^2(f+gx)^2}{(-d(cx-1)(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**2/(-d*(c*x - 1)*(c*x + 1))**(5/2)
, x)
```

### 3.80.7 Maxima [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"maxima")
```

output
```
1/3*a*b*c*f^2*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(
5/2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*f^2*(2*x/(sqrt(-c^2*d*x^2
+ d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*f^2*(2*x/(
sqrt(-c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) - 1/3*a^2*g^2*(x
/(sqrt(-c^2*d*x^2 + d)*c^2*d^2) - x/((-c^2*d*x^2 + d)^(3/2)*c^2*d)) + sqrt
(d)*integrate(((b^2*g^2*x^2 + 2*b^2*f*g*x + b^2*f^2)*arctan2(c*x, sqrt(c*x
 + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x)*arctan2(c*x, sqrt(
c*x + 1)*sqrt(-c*x + 1)))/((c^4*d^3*x^4 - 2*c^2*d^3*x^2 + d^3)*sqrt(c*x +
1)*sqrt(-c*x + 1)), x) + 2/3*a^2*f*g/((-c^2*d*x^2 + d)^(3/2)*c^2*d)
```

### 3.80.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm=
"giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.80.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

# 3.81 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx$



## 3.81.1 Optimal result

Integrand size = 31, antiderivative size = 641

$$\begin{aligned}
\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx &= \frac{b^2g}{3c^2d^2\sqrt{d-c^2dx^2}}+\frac{b^2fx}{3d^2\sqrt{d-c^2dx^2}} \\
&-\frac{bf(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}}-\frac{bgx(a+b\arcsin(cx))}{3cd^2\sqrt{1-c^2x^2}\sqrt{d-c^2dx^2}} \\
&+\frac{2fx(a+b\arcsin(cx))^2}{3d^2\sqrt{d-c^2dx^2}}+\frac{g(a+b\arcsin(cx))^2}{3c^2d^2(1-c^2x^2)\sqrt{d-c^2dx^2}} \\
&+\frac{fx(a+b\arcsin(cx))^2}{3d^2(1-c^2x^2)\sqrt{d-c^2dx^2}}-\frac{2if\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{3cd^2\sqrt{d-c^2dx^2}} \\
&+\frac{2ibg\sqrt{1-c^2x^2}(a+b\arcsin(cx))\arctan\left(e^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+\frac{4bf\sqrt{1-c^2x^2}(a+b\arcsin(cx))\log\left(1+e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}} \\
&-\frac{ib^2g\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&+\frac{ib^2g\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,ie^{i\arcsin(cx)}\right)}{3c^2d^2\sqrt{d-c^2dx^2}} \\
&-\frac{2ib^2f\sqrt{1-c^2x^2}\operatorname{PolyLog}\left(2,-e^{2i\arcsin(cx)}\right)}{3cd^2\sqrt{d-c^2dx^2}}
\end{aligned}$$

output
```
1/3*b^2*g/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*b^2*f*x/d^2/(-c^2*d*x^2+d)^(1/2
)+2/3*f*x*(a+b*arcsin(c*x))^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*g*(a+b*arcsin(c
*x))^2/c^2/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)+1/3*f*x*(a+b*arcsin(c*x))
^2/d^2/(-c^2*x^2+1)/(-c^2*d*x^2+d)^(1/2)-1/3*b*f*(a+b*arcsin(c*x))/c/d^2/(
-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-1/3*b*g*x*(a+b*arcsin(c*x))/c/d^2/(
-c^2*x^2+1)^(1/2)/(-c^2*d*x^2+d)^(1/2)-2/3*I*f*(a+b*arcsin(c*x))^2*(-c^2*x
^2+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)+2/3*I*b*g*(a+b*arcsin(c*x))*arctan(
I*c*x+(-c^2*x^2+1)^(1/2))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+
4/3*b*f*(a+b*arcsin(c*x))*ln(1+(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2+1)^
(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)-1/3*I*b^2*g*polylog(2,-I*(I*c*x+(-c^2*x^2
+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x^2+d)^(1/2)+1/3*I*b^2*g*po
lylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2)))*(-c^2*x^2+1)^(1/2)/c^2/d^2/(-c^2*d*x
^2+d)^(1/2)-2/3*I*b^2*f*polylog(2,-(I*c*x+(-c^2*x^2+1)^(1/2))^2)*(-c^2*x^2
+1)^(1/2)/c/d^2/(-c^2*d*x^2+d)^(1/2)
```

### 3.81.2 Mathematica [A] (verified)

Time = 6.23 (sec) , antiderivative size = 683, normalized size of antiderivative = 1.07

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \frac{\sqrt{1-c^2x^2}\left(\frac{f\left(ib\left(\frac{(a+b\arcsin(cx))^2}{b}-4\left(i(a+b\arcsin(cx))\log\left(1+e^{\frac{1}{2}i(\pi-2\arcsin(cx))}\right)-b\,\mathrm{PolyL}\right.\right.\right.}{4c}\right.}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((f*(I*b*((a + b*ArcSin[c*x])^2/b - 4*(I*(a + b*ArcSin[
c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))] - b*PolyLog[2, -E^((I/2)*(Pi
 - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 - ArcSin[c*x]/2]))/
(4*c) - ((c*f - g)*(2*b*(a + b*ArcSin[c*x])*Sec[Pi/4 - ArcSin[c*x]/2]^2 +
4*b^2*Tan[Pi/4 - ArcSin[c*x]/2] + (a + b*ArcSin[c*x])^2*Sec[Pi/4 - ArcSin[
c*x]/2]^2*Tan[Pi/4 - ArcSin[c*x]/2] - 2*(I*b*((a + b*ArcSin[c*x])^2/b - 4*
(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi - 2*ArcSin[c*x]))] - b*PolyLog
[2, -E^((I/2)*(Pi - 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 -
ArcSin[c*x]/2])))/(24*c^2) - (f*(I*b*((a + b*ArcSin[c*x])^2/b + 4*(I*(a +
b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi + 2*ArcSin[c*x]))] + b*PolyLog[2, -E^(
(I/2)*(Pi + 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Tan[Pi/4 + ArcSin[c
*x]/2]))/(4*c) - ((c*f + g)*(2*b*(a + b*ArcSin[c*x])*Sec[Pi/4 + ArcSin[c*x
]/2]^2 - 4*b^2*Tan[Pi/4 + ArcSin[c*x]/2] - (a + b*ArcSin[c*x])^2*Sec[Pi/4
+ ArcSin[c*x]/2]^2*Tan[Pi/4 + ArcSin[c*x]/2] + 2*(I*b*((a + b*ArcSin[c*x])
^2/b + 4*(I*(a + b*ArcSin[c*x])*Log[1 + E^((I/2)*(Pi + 2*ArcSin[c*x]))] +
b*PolyLog[2, -E^((I/2)*(Pi + 2*ArcSin[c*x]))])) - (a + b*ArcSin[c*x])^2*Ta
n[Pi/4 + ArcSin[c*x]/2])))/(24*c^2)))/(d^2*Sqrt[d - c^2*d*x^2])
```

### 3.81.3 Rubi [A] (verified)

Time = 0.94 (sec) , antiderivative size = 398, normalized size of antiderivative = 0.62, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {5276, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}dx$$

$$\Big\downarrow \text{5276}$$

$$\frac{\sqrt{1-c^2x^2}\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{5262}$$

$$\frac{\sqrt{1-c^2x^2}\int \left(\frac{f(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}+\frac{gx(a+b\arcsin(cx))^2}{(1-c^2x^2)^{5/2}}\right)dx}{d^2\sqrt{d-c^2dx^2}}$$

$$\Big\downarrow \text{2009}$$

$$\sqrt{1-c^2x^2}\left(\frac{2ibg\arctan\left(e^{i\arcsin(cx)}\right)(a+b\arcsin(cx))}{3c^2}-\frac{bf(a+b\arcsin(cx))}{3c(1-c^2x^2)}+\frac{2fx(a+b\arcsin(cx))^2}{3\sqrt{1-c^2x^2}}+\frac{fx(a+b\arcsin(cx))^2}{3(1-c^2x^2)^{3/2}}-\frac{bgx(a+b\arc}{3c(1-c}\right.$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d - c^2*d*x^2)^(5/2),x]
```

output
```
(Sqrt[1 - c^2*x^2]*((b^2*g)/(3*c^2*Sqrt[1 - c^2*x^2]) + (b^2*f*x)/(3*Sqrt[
1 - c^2*x^2]) - (b*f*(a + b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) - (b*g*x*(a
+ b*ArcSin[c*x]))/(3*c*(1 - c^2*x^2)) - (((2*I)/3)*f*(a + b*ArcSin[c*x])^2
)/c + (g*(a + b*ArcSin[c*x])^2)/(3*c^2*(1 - c^2*x^2)^(3/2)) + (f*x*(a + b*
ArcSin[c*x])^2)/(3*(1 - c^2*x^2)^(3/2)) + (2*f*x*(a + b*ArcSin[c*x])^2)/(3
*Sqrt[1 - c^2*x^2]) + (((2*I)/3)*b*g*(a + b*ArcSin[c*x])*ArcTan[E^(I*ArcSi
n[c*x])])/c^2 + (4*b*f*(a + b*ArcSin[c*x])*Log[1 + E^((2*I)*ArcSin[c*x])])
/(3*c) - ((I/3)*b^2*g*PolyLog[2, (-I)*E^(I*ArcSin[c*x])])/c^2 + ((I/3)*b^2
*g*PolyLog[2, I*E^(I*ArcSin[c*x])])/c^2 - (((2*I)/3)*b^2*f*PolyLog[2, -E^(
(2*I)*ArcSin[c*x])])/c))/(d^2*Sqrt[d - c^2*d*x^2])
```

### 3.81.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5276
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Simp[Simp[(d + e*x^2)^p/(1 - c^2*x^2)^
p]   Int[(f + g*x)^m*(1 - c^2*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ
[{a, b, c, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && Intege
rQ[p - 1/2] &&  !GtQ[d, 0]
```

### 3.81.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 5893 vs. 2(610) = 1220.

Time = 1.25 (sec) , antiderivative size = 5894, normalized size of antiderivative = 9.20

| method | result | size |
|---|---|---|
| default | Expression too large to display | 5894 |
| parts | Expression too large to display | 5894 |

input
```
int((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x,method=_RETURNVERBO
SE)
```

output
```
result too large to display
```

### 3.81.5 Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="f
ricas")
```

output
```
integral(-sqrt(-c^2*d*x^2 + d)*(a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin
(c*x)^2 + 2*(a*b*g*x + a*b*f)*arcsin(c*x))/(c^6*d^3*x^6 - 3*c^4*d^3*x^4 +
3*c^2*d^3*x^2 - d^3), x)
```

### 3.81.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx=\int \frac{(a+b\operatorname{asin}{(cx)})^2\,(f+gx)}{(-d\,(cx-1)\,(cx+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))**2/(-c**2*d*x**2+d)**(5/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)/(-d*(c*x - 1)*(c*x + 1))**(5/2), x
)
```

### 3.81.7 Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)^2}{(-c^2dx^2+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="m
axima")
```

output
```
1/3*a*b*c*f*(1/(c^4*d^(5/2)*x^2 - c^2*d^(5/2)) + 2*log(c*x + 1)/(c^2*d^(5/
2)) + 2*log(c*x - 1)/(c^2*d^(5/2))) + 2/3*a*b*f*(2*x/(sqrt(-c^2*d*x^2 + d)
*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d))*arcsin(c*x) + 1/3*a^2*f*(2*x/(sqrt(-
c^2*d*x^2 + d)*d^2) + x/((-c^2*d*x^2 + d)^(3/2)*d)) + sqrt(d)*integrate((2
*a*b*g*x*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + (b^2*g*x + b^2*f)*ar
ctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2)/((c^4*d^3*x^4 - 2*c^2*d^3*x^2
+ d^3)*sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 1/3*a^2*g/((-c^2*d*x^2 + d)^(3/
2)*c^2*d)
```

### 3.81.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(-c^2*d*x^2+d)^(5/2),x, algorithm="g
iac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:index.cc index_m i_lex_is_greater E
rror: Bad Argument Value
```

### 3.81.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d-c^2dx^2)^{5/2}}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{(d-c^2\,d\,x^2)^{5/2}}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d - c^2*d*x^2)^(5/2), x)
```

# 3.82 $\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$



## 3.82.1 Optimal result

Integrand size = 35, antiderivative size = 35

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \text{Int}\left(\frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}},x\right)$$

output
```
Unintegrable((a+b*arcsin(c*x))^n*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

## 3.82.2 Mathematica [N/A]

Not integrable

Time = 0.17 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.06

$$\int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(a+b\arcsin(cx))^n\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

input
```
Integrate[((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
Integrate[((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2], x]
```

## 3.82.3 Rubi [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^n \log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}dx$$
$$\Big\downarrow \ 5300$$
$$\int \frac{(a+b\arcsin(cx))^n \log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}dx$$

input
```
Int[((a + b*ArcSin[c*x])^n*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
$Aborted
```

### 3.82.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

## 3.82.4 Maple [N/A] (verified)

Not integrable

Time = 7.07 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.94

$$\int \frac{(a+b\arcsin(cx))^n \ln\left(h(gx+f)^m\right)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int((a+b*arcsin(c*x))^n*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^n*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

### 3.82.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.34

$$\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^n\log((gx+f)^mh)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)^n*log((g*x + f)^m*h)/(c^2
*x^2 - 1), x)
```

### 3.82.6 Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\text{Timed out}$$

input
```
integrate((a+b*asin(c*x))**n*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Timed out
```

### 3.82.7 Maxima [N/A]

Not integrable

Time = 1.93 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^n\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^n\log((gx+f)^mh)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="maxima")
```

output
```
integrate((b*arcsin(c*x) + a)^n*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

### 3.82.8 Giac [N/A]

Not integrable

Time = 0.43 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^n \log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin\left(cx\right)+a)^n \log \left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^n*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^n*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

### 3.82.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(cx))^n \log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\ln\left(h\left(f+g\,x\right)^m\right)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^n}{\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^n)/(1 - c^2*x^2)^(1/2),x)
```

output
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^n)/(1 - c^2*x^2)^(1/2), x)
```

# 3.83 $\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$



## 3.83.1 Optimal result

Integrand size = 35, antiderivative size = 634

$$\begin{aligned}
&\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx\\
&=\frac{im(a+b\arcsin(cx))^5}{20b^2c}-\frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{4bc}\\
&-\frac{m(a+b\arcsin(cx))^4\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{4bc}+\frac{(a+b\arcsin(cx))^4\log\left(h(f+gx)^m\right)}{4bc}\\
&+\frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}\\
&+\frac{im(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}\\
&-\frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}\\
&-\frac{3bm(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}\\
&-\frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}\\
&-\frac{6ib^2m(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}\\
&+\frac{6b^3m\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c}+\frac{6b^3m\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}
\end{aligned}$$

output
```
1/20*I*m*(a+b*arcsin(c*x))^5/b^2/c+1/4*(a+b*arcsin(c*x))^4*ln(h*(g*x+f)^m)
/b/c-1/4*m*(a+b*arcsin(c*x))^4*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c
^2*f^2-g^2)^(1/2)))/b/c-1/4*m*(a+b*arcsin(c*x))^4*ln(1-I*(I*c*x+(-c^2*x^2+
1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/b/c+I*m*(a+b*arcsin(c*x))^3*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*(a+b*ar
csin(c*x))^3*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(
1/2)))/c-3*b*m*(a+b*arcsin(c*x))^2*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f-(c^2*f^2-g^2)^(1/2)))/c-3*b*m*(a+b*arcsin(c*x))^2*polylog(3,I*(I*c*
x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c-6*I*b^2*m*(a+b*arcsin
(c*x))*polylog(4,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))
/c-6*I*b^2*m*(a+b*arcsin(c*x))*polylog(4,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c
*f+(c^2*f^2-g^2)^(1/2)))/c+6*b^3*m*polylog(5,I*(I*c*x+(-c^2*x^2+1)^(1/2))*
g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+6*b^3*m*polylog(5,I*(I*c*x+(-c^2*x^2+1)^(1/
2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c
```

### 3.83.2 Mathematica [F]

$$\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

input
```
Integrate[((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
Integrate[((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2], x]
```

### 3.83.3 Rubi [A] (verified)

Time = 2.08 (sec) , antiderivative size = 628, normalized size of antiderivative = 0.99, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.257, Rules used = {5278, 5240, 5030, 2620, 3011, 7163, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

$$\Big\downarrow \; 5278$$

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\int\frac{(a+b\arcsin(cx))^4}{f+gx}dx}{4bc}$$

$\downarrow$ 5240

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^4}{cf+cgx}d\arcsin(cx)}{4bc}$$

$\downarrow$ 5030

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\left(\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^4}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)+\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^4}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)-\frac{i(a+b\arcsin(cx))^5}{5bg}\right)}{4bc}$$

$\downarrow$ 2620

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\left(-\frac{4b\int(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}-\frac{4b\int(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}+\frac{(a+b\arcsin}{}\right.}{4bc}$$

$\downarrow$ 3011

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\int(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)\right)}{g}-\frac{4b\left(i(a+b\arcs\right.}{}\right.}{}$$

$\downarrow$ 7163

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc}-\frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\left(2ib\int(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)-i(a+b\arcsin(c\right.\right.}{g}\right.}{}$$

$\downarrow$ 7163

3.83. $\int\frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}dx$

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc} - \frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\left(2ib\left(ib\int\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)-i(a+b\arcsin(cx))\operatorname{PolyLog}\left(\right.\right.\right.\right.}{g}\right.}{}$$

$\downarrow$ 2720

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc} - \frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\left(2ib\left(b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}-i(a+b\arcsin(c\right.\right.\right.}{g}\right.}{}$$

$\downarrow$ 7143

$$\frac{(a+b\arcsin(cx))^4\log(h(f+gx)^m)}{4bc} - \frac{gm\left(-\frac{4b\left(i(a+b\arcsin(cx))^3\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-3ib\left(2ib\left(b\operatorname{PolyLog}\left(5,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-i(a+b\arcsin(cx))\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-}}\right.\right.\right.\right.}{g}\right.}{}$$

input
```
Int[((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
((a + b*ArcSin[c*x])^4*Log[h*(f + g*x)^m])/(4*b*c) - (g*m*(((-1/5*I)*(a +
b*ArcSin[c*x])^5)/(b*g) + ((a + b*ArcSin[c*x])^4*Log[1 - (I*E^(I*ArcSin[c*
x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + ((a + b*ArcSin[c*x])^4*Log[1 - (I
*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (4*b*(I*(a + b*Arc
Sin[c*x])^3*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
] - (3*I)*b*((-I)*(a + b*ArcSin[c*x])^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)
/(c*f - Sqrt[c^2*f^2 - g^2])] + (2*I)*b*((-I)*(a + b*ArcSin[c*x])*PolyLog[
4, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])] + b*PolyLog[5, (I*
E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]))))/g - (4*b*(I*(a + b*A
rcSin[c*x])^3*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2
])] - (3*I)*b*((-I)*(a + b*ArcSin[c*x])^2*PolyLog[3, (I*E^(I*ArcSin[c*x])*
g)/(c*f + Sqrt[c^2*f^2 - g^2])] + (2*I)*b*((-I)*(a + b*ArcSin[c*x])*PolyLo
g[4, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] + b*PolyLog[5, (
I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]))))/g))/(4*b*c)
```

### 3.83. $\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

#### 3.83.3.1 Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 5278
```
Int[(Log[(h_.)*((f_.) + (g_.)*(x_))^(m_.)]*((a_.) + ArcSin[(c_.)*(x_)]*(b_.
))^(n_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[Log[h*(f + g*x)^m]*(
(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[g*(m/(b*c*Sqr
t[d]*(n + 1)))   Int[(a + b*ArcSin[c*x])^(n + 1)/(f + g*x), x], x] /; FreeQ
[{a, b, c, d, e, f, g, h, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && IGtQ[
n, 0]
```

---

3.83. $\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

### 3.83.4 Maple [F]

$$\int \frac{(a+b\arcsin(cx))^3 \ln\left(h(gx+f)^m\right)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int((a+b*arcsin(c*x))^3*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^3*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

### 3.83.5 Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^3 \log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^3 \log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="fricas")
```

output
```
integral(-(b^3*arcsin(c*x)^3 + 3*a*b^2*arcsin(c*x)^2 + 3*a^2*b*arcsin(c*x)
 + a^3)*sqrt(-c^2*x^2 + 1)*log((g*x + f)^m*h)/(c^2*x^2 - 1), x)
```

### 3.83.6 Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(a+b\,\mathrm{asin}\,(cx))^3\log(h(f+gx)^m)}{\sqrt{-(cx-1)(cx+1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))**3*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**3*log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1
)), x)
```

### 3.83.7 Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)^3\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="maxima")
```

output
```
(b^3*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^3/(sqrt(c*x +
1)*sqrt(-c*x + 1)), x)*log(h) + 3*a*b^2*c*integrate(arctan2(c*x, sqrt(c*x
+ 1)*sqrt(-c*x + 1))^2/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)*log(h) + 3*a^2*b
*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqr
t(-c*x + 1)), x)*log(h) + b^3*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1))^3*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 3*a*b^2
*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log((g*x + f)^m)
/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + 3*a^2*b*c*integrate(arctan2(c*x, sqr
t(c*x + 1)*sqrt(-c*x + 1))*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1))
, x) + a^3*c*integrate(log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
 + a^3*arctan2(c*x, sqrt(-c^2*x^2 + 1))*log(h))/c
```

### 3.83.8 Giac [F]

$$\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin\left(cx\right)+a)^3\log\left((gx+f)^mh\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^3*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^3*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

### 3.83.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln\left(h\left(f+g\,x\right)^m\right)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^3}{\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^3)/(1 - c^2*x^2)^(1/2),x)
```

output
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^3)/(1 - c^2*x^2)^(1/2), x)
```

# 3.84 $\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$



## 3.84.1 Optimal result

Integrand size = 35, antiderivative size = 514

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \frac{im(a+b\arcsin(cx))^4}{12b^2c} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{3bc} - \frac{m(a+b\arcsin(cx))^3\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{3bc} + \frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc} + \frac{im(a+b\arcsin(cx))^2\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im(a+b\arcsin(cx))^2\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{2bm(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{2bm(a+b\arcsin(cx))\,\mathrm{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{2ib^2m\,\mathrm{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{2ib^2m\,\mathrm{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

output
```
1/12*I*m*(a+b*arcsin(c*x))^4/b^2/c+1/3*(a+b*arcsin(c*x))^3*ln(h*(g*x+f)^m)
/b/c-1/3*m*(a+b*arcsin(c*x))^3*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c
^2*f^2-g^2)^(1/2)))/b/c-1/3*m*(a+b*arcsin(c*x))^3*ln(1-I*(I*c*x+(-c^2*x^2+
1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/b/c+I*m*(a+b*arcsin(c*x))^2*polylog
(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*(a+b*ar
csin(c*x))^2*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(
1/2)))/c-2*b*m*(a+b*arcsin(c*x))*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/
(c*f-(c^2*f^2-g^2)^(1/2)))/c-2*b*m*(a+b*arcsin(c*x))*polylog(3,I*(I*c*x+(-
c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c-2*I*b^2*m*polylog(4,I*(I*
c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c-2*I*b^2*m*polylog(4
,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c
```

### 3.84.2 Mathematica [F]

$$\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$$

input
```
Integrate[((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
Integrate[((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2], x]
```

### 3.84.3 Rubi [A] (verified)

Time = 1.65 (sec) , antiderivative size = 506, normalized size of antiderivative = 0.98, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.229, Rules used = {5278, 5240, 5030, 2620, 3011, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$$

$$\Big\downarrow \text{5278}$$

$$\frac{(a+b\arcsin(cx))^3\log(h(f+gx)^m)}{3bc}-\frac{gm\int \frac{(a+b\arcsin(cx))^3}{f+gx}dx}{3bc}$$

$$\Big\downarrow \text{5240}$$

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^3}{cf+cgx}d\arcsin(cx)}{3bc}$$

$\downarrow$ 5030

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\left(\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^3}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)+\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^3}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)-\frac{i(a+b\arcsin(cx))^4}{4bg}\right)}{3bc}$$

$\downarrow$ 2620

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\left(-\frac{3b\int(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}-\frac{3b\int(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}+\frac{(a+b\arcsin}{\ldots}\right.}{3bc}$$

$\downarrow$ 3011

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\left(-\frac{3b\left(i(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-2ib\int(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)\right)}{g}-\frac{3b\left(i(a+b\arcsi\right.}{\ldots}\right.}{\ldots}$$

$\downarrow$ 7163

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\left(-\frac{3b\left(i(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-2ib\left(ib\int\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)-i(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie}{cf}\right.\right.\right.}{g}\right.}{\ldots}$$

$\downarrow$ 2720

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\left(-\frac{3b\left(i(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-2ib\left(b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}-i(a+b\arcsin(cx))\operatorname{P}\right.\right.}{g}\right.}{\ldots}$$

$\downarrow$ 7143

3.84. $\int\frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}dx$

$$\frac{(a+b\arcsin(cx))^3\log\left(h(f+gx)^m\right)}{3bc}-\frac{gm\left(-\frac{3b\left(i(a+b\arcsin(cx))^2\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-2ib\left(b\operatorname{PolyLog}\left(4,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-i(a+b\arcsin(cx))\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)\right.\right.}{g}\right.}{}$$

input
```
Int[((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
((a + b*ArcSin[c*x])^3*Log[h*(f + g*x)^m])/(3*b*c) - (g*m*(((-1/4*I)*(a +
b*ArcSin[c*x])^4)/(b*g) + ((a + b*ArcSin[c*x])^3*Log[1 - (I*E^(I*ArcSin[c*
x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + ((a + b*ArcSin[c*x])^3*Log[1 - (I
*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (3*b*(I*(a + b*Arc
Sin[c*x])^2*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])
] - (2*I)*b*((-I)*(a + b*ArcSin[c*x])*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(
c*f - Sqrt[c^2*f^2 - g^2])] + b*PolyLog[4, (I*E^(I*ArcSin[c*x])*g)/(c*f -
Sqrt[c^2*f^2 - g^2])])))/g - (3*b*(I*(a + b*ArcSin[c*x])^2*PolyLog[2, (I*E
^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])] - (2*I)*b*((-I)*(a + b*Ar
cSin[c*x])*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])]
 + b*PolyLog[4, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])))/g)
)/(3*b*c)
```

### 3.84.3.1 Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 5278
```
Int[(Log[(h_.)*((f_.) + (g_.)*(x_))^(m_.)]*((a_.) + ArcSin[(c_.)*(x_)]*(b_.
))^(n_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[Log[h*(f + g*x)^m]*(
(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[g*(m/(b*c*Sqr
t[d]*(n + 1)))   Int[(a + b*ArcSin[c*x])^(n + 1)/(f + g*x), x], x] /; FreeQ
[{a, b, c, d, e, f, g, h, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && IGtQ[
n, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

## 3.84. $\int \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

### 3.84.4 Maple [F]

$$\int \frac{(a+b\arcsin(cx))^2 \ln(h(gx+f)^m)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int((a+b*arcsin(c*x))^2*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))^2*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

### 3.84.5 Fricas [F]

$$\int \frac{(a+b\arcsin(cx))^2 \log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)^2 \log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*(b^2*arcsin(c*x)^2 + 2*a*b*arcsin(c*x) + a^2)
*log((g*x + f)^m*h)/(c^2*x^2 - 1), x)
```

### 3.84.6 Sympy [F]

$$\int \frac{(a+b\arcsin(cx))^2 \log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(cx))^2 \log(h(f+gx)^m)}{\sqrt{-(cx-1)(cx+1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))**2*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))**2*log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1
)), x)
```

### 3.84.7 Maxima [F]

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2\log\left(\left(gx+f\right)^mh\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="maxima")
```

output
```
(b^2*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2/(sqrt(c*x +
1)*sqrt(-c*x + 1)), x)*log(h) + 2*a*b*c*integrate(arctan2(c*x, sqrt(c*x +
1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x)*log(h) + b^2*c*integ
rate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2*log((g*x + f)^m)/(sqrt(c
*x + 1)*sqrt(-c*x + 1)), x) + 2*a*b*c*integrate(arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1))*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a^2
*c*integrate(log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a^2*arc
tan2(c*x, sqrt(-c^2*x^2 + 1))*log(h))/c
```

### 3.84.8 Giac [F]

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\left(b\arcsin\left(cx\right)+a\right)^2\log\left(\left(gx+f\right)^mh\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))^2*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algor
ithm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)^2*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

### 3.84.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln\left(h\left(f+g\,x\right)^m\right)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^2)/(1 - c^2*x^2)^(1/2),x)
```

output
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x))^2)/(1 - c^2*x^2)^(1/2), x)
```

# 3.85 $\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$



## 3.85.1 Optimal result

Integrand size = 33, antiderivative size = 390

$$\begin{aligned}\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx &= \frac{im(a+b\arcsin(cx))^3}{6b^2c} \\ &- \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{2bc} \\ &- \frac{m(a+b\arcsin(cx))^2\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{2bc} \\ &+ \frac{(a+b\arcsin(cx))^2\log(h(f+gx)^m)}{2bc} \\ &+ \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\ &+ \frac{im(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} \\ &- \frac{bm\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} \\ &- \frac{bm\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}\end{aligned}$$

output
```
1/6*I*m*(a+b*arcsin(c*x))^3/b^2/c+1/2*(a+b*arcsin(c*x))^2*ln(h*(g*x+f)^m)/
b/c-1/2*m*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^
2*f^2-g^2)^(1/2)))/b/c-1/2*m*(a+b*arcsin(c*x))^2*ln(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/b/c+I*m*(a+b*arcsin(c*x))*polylog(2,
I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*(a+b*arcsi
n(c*x))*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2))
)/c-b*m*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2))
)/c-b*m*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2))
)/c
```

### 3.85.2 Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 2724 vs. $2(390) = 780$.

Time = 10.46 (sec) , antiderivative size = 2724, normalized size of antiderivative = 6.98

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \text{Result too large to show}$$

input
```
Integrate[((a + b*ArcSin[c*x])*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

output
```
(m*ArcSin[c*x]*(2*a + b*ArcSin[c*x])*Log[f + g*x])/(2*c) + (a*ArcSin[c*x]*
(-(m*Log[f + g*x]) + Log[h*(f + g*x)^m]))/c + (b*f*(-(m*Log[f + g*x]) + Lo
g[h*(f + g*x)^m])*((-I)*ArcSin[c*x]*(Log[1 + (I*E^(I*ArcSin[c*x])*g)/(-(c*
f) + Sqrt[c^2*f^2 - g^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c
^2*f^2 - g^2])]) - PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^
2*f^2 - g^2])] + PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 -
g^2])]))/Sqrt[c^2*f^2 - g^2] + (a*g*m*(-1/2*(((3*I)/2)*Pi*ArcSin[c*x] - (I
/2)*ArcSin[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] - Pi*Log[1 + I*E^(I
*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 + I*E^(I*ArcSin[c*x])] - 2*Pi*Log[Cos
[ArcSin[c*x]/2]] + Pi*Log[-Cos[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2,
 (-I)*E^(I*ArcSin[c*x])])/(c*(-c^(-1) - f/g)*g) + ((I/2)*Pi*ArcSin[c*x] -
(I/2)*ArcSin[c*x]^2 + 2*Pi*Log[1 + E^((-I)*ArcSin[c*x])] + Pi*Log[1 - I*E^
(I*ArcSin[c*x])] + 2*ArcSin[c*x]*Log[1 - I*E^(I*ArcSin[c*x])] - 2*Pi*Log[C
os[ArcSin[c*x]/2]] - Pi*Log[Sin[(Pi + 2*ArcSin[c*x])/4]] - (2*I)*PolyLog[2
, I*E^(I*ArcSin[c*x])])/(2*c*(c^(-1) - f/g)*g) + (((-1/2*I)*ArcSin[c*x]^2)
/g + (ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^
2])])/g + (ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2
 - g^2])])/g - (I*PolyLog[2, ((-I)*E^(I*ArcSin[c*x])*g)/(-(c*f) + Sqrt[c^2
*f^2 - g^2])])/g - (I*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f
^2 - g^2])])/g)/(c^2*(-c^(-1) - f/g)*(c^(-1) - f/g))))/c - a*c*g*m*(-1/...
```

### 3.85.3 Rubi [A] (verified)

Time = 1.26 (sec) , antiderivative size = 386, normalized size of antiderivative = 0.99, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.212, Rules used = {5278, 5240, 5030, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}dx$$

$$\Big\downarrow \text{ 5278}$$

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\int\frac{(a+b\arcsin(cx))^2}{f+gx}dx}{2bc}$$

$$\Big\downarrow \text{ 5240}$$

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\int\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))^2}{cf+cgx}d\arcsin(cx)}{2bc}$$

$$\Big\downarrow \text{ 5030}$$

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)+\int\frac{e^{i\arcsin(cx)}(a+b\arcsin(cx))^2}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)-\frac{i(a+b\arcsin(cx))^3}{3bg}\right)}{2bc}$$

$\downarrow$ 2620

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(-\frac{2b\int(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}-\frac{2b\int(a+b\arcsin(cx))\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}+\frac{(a+b\arcsin(c}{}\right.}{2bc}$$

$\downarrow$ 3011

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-ib\int\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\right.\right.}{}\right.}{}$$

$\downarrow$ 2720

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-b\int e^{-i\arcsin(cx)}\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx)\right.}{}\right.}{}$$

$\downarrow$ 7143

$$\frac{(a+b\arcsin(cx))^2\log\left(h(f+gx)^m\right)}{2bc}-\frac{gm\left(-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)-b\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)\right)}{g}-\frac{2b\left(i(a+b\arcsin(cx))\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right.\right.}{g}\right.}{}$$

input
```
Int[((a + b*ArcSin[c*x])*Log[h*(f + g*x)^m])/Sqrt[1 - c^2*x^2],x]
```

3.85. $\int\frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

output
```
((a + b*ArcSin[c*x])^2*Log[h*(f + g*x)^m])/(2*b*c) - (g*m*(((-1/3*I)*(a +
b*ArcSin[c*x])^3)/(b*g) + ((a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*
x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g + ((a + b*ArcSin[c*x])^2*Log[1 - (I
*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/g - (2*b*(I*(a + b*Arc
Sin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]
- b*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]))/g -
(2*b*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt
[c^2*f^2 - g^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f
^2 - g^2])]))/g))/(2*b*c)
```

### 3.85.3.1 Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 5278
```
Int[(Log[(h_.)*((f_.) + (g_.)*(x_))^(m_.)]*((a_.) + ArcSin[(c_.)*(x_)]*(b_.
))^(n_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[Log[h*(f + g*x)^m]*(
(a + b*ArcSin[c*x])^(n + 1)/(b*c*Sqrt[d]*(n + 1))), x] - Simp[g*(m/(b*c*Sqr
t[d]*(n + 1)))   Int[(a + b*ArcSin[c*x])^(n + 1)/(f + g*x), x], x] /; FreeQ
[{a, b, c, d, e, f, g, h, m}, x] && EqQ[c^2*d + e, 0] && GtQ[d, 0] && IGtQ[
n, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

## 3.85.4 Maple [F]

$$\int \frac{(a+b\arcsin(cx))\ln\left(h(gx+f)^m\right)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int((a+b*arcsin(c*x))*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int((a+b*arcsin(c*x))*ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

## 3.85.5 Fricas [F]

$$\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{(b\arcsin(cx)+a)\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorit
hm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)*log((g*x + f)^m*h)/(c^2*x
^2 - 1), x)
```

### 3.85.6 Sympy [F]

$$\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(a+b\operatorname{asin}(cx))\log(h(f+gx)^m)}{\sqrt{-(cx-1)(cx+1)}}\,dx$$

input
```
integrate((a+b*asin(c*x))*ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Integral((a + b*asin(c*x))*log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1)),
 x)
```

### 3.85.7 Maxima [F]

$$\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorit
hm="maxima")
```

output
```
(b*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(sqrt(c*x + 1)*s
qrt(-c*x + 1)), x)*log(h) + b*c*integrate(arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1))*log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a*c*integ
rate(log((g*x + f)^m)/(sqrt(c*x + 1)*sqrt(-c*x + 1)), x) + a*arctan2(c*x,
sqrt(-c^2*x^2 + 1))*log(h))/c
```

### 3.85.8 Giac [F]

$$\int \frac{(a+b\arcsin(cx))\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{(b\arcsin(cx)+a)\log((gx+f)^m h)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate((a+b*arcsin(c*x))*log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorit
hm="giac")
```

output
```
integrate((b*arcsin(c*x) + a)*log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

### 3.85.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(cx))\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx=\int \frac{\ln\left(h\,{\left(f+g\,x\right)}^m\right)\,\left(a+b\,\mathrm{asin}\left(c\,x\right)\right)}{\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x)))/(1 - c^2*x^2)^(1/2),x)
```

output
```
int((log(h*(f + g*x)^m)*(a + b*asin(c*x)))/(1 - c^2*x^2)^(1/2), x)
```

# 3.86 $\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$



## 3.86.1 Optimal result

Integrand size = 25, antiderivative size = 237

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \frac{im\arcsin(cx)^2}{2c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} + \frac{im\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

output
```
1/2*I*m*arcsin(c*x)^2/c+arcsin(c*x)*ln(h*(g*x+f)^m)/c-m*arcsin(c*x)*ln(1-I
*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c-m*arcsin(c*x)*l
n(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c+I*m*polylo
g(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f-(c^2*f^2-g^2)^(1/2)))/c+I*m*polylo
g(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*g/(c*f+(c^2*f^2-g^2)^(1/2)))/c
```

### 3.86.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.04

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \frac{im\arcsin(cx)^2}{2c} - \frac{m\arcsin(cx)\log\left(1-\frac{ice^{i\arcsin(cx)}g}{c^2f-c\sqrt{c^2f^2-g^2}}\right)}{c} - \frac{m\arcsin(cx)\log\left(1-\frac{ice^{i\arcsin(cx)}g}{c^2f+c\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} + \frac{im\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{c} + \frac{im\,\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{c}$$

input
```
Integrate[Log[h*(f + g*x)^m]/Sqrt[1 - c^2*x^2],x]
```

output
```
((I/2)*m*ArcSin[c*x]^2)/c - (m*ArcSin[c*x]*Log[1 - (I*c*E^(I*ArcSin[c*x])*
g)/(c^2*f - c*Sqrt[c^2*f^2 - g^2])])/c - (m*ArcSin[c*x]*Log[1 - (I*c*E^(I*
ArcSin[c*x])*g)/(c^2*f + c*Sqrt[c^2*f^2 - g^2])])/c + (ArcSin[c*x]*Log[h*(
f + g*x)^m])/c + (I*m*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f
^2 - g^2])])/c + (I*m*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f
^2 - g^2])])/c
```

### 3.86.3 Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {2851, 27, 5240, 5030, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx$$

$$\Big\downarrow \text{2851}$$

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c} - gm\int \frac{\arcsin(cx)}{c(f+gx)}dx$$

$$\Big\downarrow \text{27}$$

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\int\frac{\arcsin(cx)}{f+gx}dx}{c}$$

$\Big\downarrow$ 5240

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\int\frac{\sqrt{1-c^2x^2}\arcsin(cx)}{cf+cgx}d\arcsin(cx)}{c}$$

$\Big\downarrow$ 5030

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\left(\int\frac{e^{i\arcsin(cx)}\arcsin(cx)}{cf-ie^{i\arcsin(cx)}g-\sqrt{c^2f^2-g^2}}d\arcsin(cx)+\int\frac{e^{i\arcsin(cx)}\arcsin(cx)}{cf-ie^{i\arcsin(cx)}g+\sqrt{c^2f^2-g^2}}d\arcsin(cx)-\frac{i\arcsin(cx)^2}{2g}\right)}{c}$$

$\Big\downarrow$ 2620

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\left(-\frac{\int\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}-\frac{\int\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)d\arcsin(cx)}{g}+\frac{\arcsin(cx)\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}+\frac{\arcsin(cx)\log}{}\right.}{c}$$

$\Big\downarrow$ 2715

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\left(\frac{i\int e^{-i\arcsin(cx)}\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}}{g}+\frac{i\int e^{-i\arcsin(cx)}\log\left(1-\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)de^{i\arcsin(cx)}}{g}+\frac{\arcsin(cx)\log\left(1-\frac{ige^{i\,a}}{cf-\sqrt{}}\right.}{g}\right.}{c}$$

$\Big\downarrow$ 2838

$$\frac{\arcsin(cx)\log\left(h(f+gx)^m\right)}{c}-\frac{gm\left(-\frac{i\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}-\frac{i\,\mathrm{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}g}{cf+\sqrt{c^2f^2-g^2}}\right)}{g}+\frac{\arcsin(cx)\log\left(1-\frac{ige^{i\arcsin(cx)}}{cf-\sqrt{c^2f^2-g^2}}\right)}{g}+\frac{\arcsin(cx)\log\left(1-\frac{ige^{i\arcsin(}}{\sqrt{c^2f^2-g^2}}\right.}{g}\right.}{c}$$

input
```
Int[Log[h*(f + g*x)^m]/Sqrt[1 - c^2*x^2],x]
```

3.86. $\int\frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}}\,dx$

output
```
(ArcSin[c*x]*Log[h*(f + g*x)^m])/c - (g*m*(((-1/2*I)*ArcSin[c*x]^2)/g + (A
rcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])])/g
 + (ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2]
)])/g - (I*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f - Sqrt[c^2*f^2 - g^2])]
)/g - (I*PolyLog[2, (I*E^(I*ArcSin[c*x])*g)/(c*f + Sqrt[c^2*f^2 - g^2])])/
g))/c
```

### 3.86.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 2851
```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/Sqrt[(f_) + (g_.)*
(x_)^2], x_Symbol] :> With[{u = IntHide[1/Sqrt[f + g*x^2], x]}, Simp[u*(a +
 b*Log[c*(d + e*x)^n]), x] - Simp[b*e*n   Int[SimplifyIntegrand[u/(d + e*x)
, x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && GtQ[f, 0]
```

rule 5030
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Int[(e + f*x)^m*(E^(I*(c + d*x))/(a - Rt[a^2 - b^2, 2] - I*b*E^(
I*(c + d*x)))), x] + Int[(e + f*x)^m*(E^(I*(c + d*x))/(a + Rt[a^2 - b^2, 2]
 - I*b*E^(I*(c + d*x)))), x]) /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0]
 && PosQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

### 3.86.4 Maple [F]

$$\int \frac{\ln\left(h(gx+f)^m\right)}{\sqrt{-c^2x^2+1}}dx$$

input
```
int(ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

output
```
int(ln(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x)
```

### 3.86.5 Fricas [F]

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorithm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*log((g*x + f)^m*h)/(c^2*x^2 - 1), x)
```

### 3.86.6 Sympy [F]

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{-\left(cx-1\right)\left(cx+1\right)}}\,dx$$

input
```
integrate(ln(h*(g*x+f)**m)/(-c**2*x**2+1)**(1/2),x)
```

output
```
Integral(log(h*(f + g*x)**m)/sqrt(-(c*x - 1)*(c*x + 1)), x)
```

### 3.86.7 Maxima [F]

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorithm="maxima")
```

output
```
integrate(log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

### 3.86.8 Giac [F]

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\log\left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}}\,dx$$

input
```
integrate(log(h*(g*x+f)^m)/(-c^2*x^2+1)^(1/2),x, algorithm="giac")
```

output
```
integrate(log((g*x + f)^m*h)/sqrt(-c^2*x^2 + 1), x)
```

### 3.86.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}}\,dx = \int \frac{\ln\left(h\,(f+g\,x)^m\right)}{\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int(log(h*(f + g*x)^m)/(1 - c^2*x^2)^(1/2),x)
```

output
```
int(log(h*(f + g*x)^m)/(1 - c^2*x^2)^(1/2), x)
```

# 3.87 $\int \frac{\log(h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$



## 3.87.1 Optimal result

Integrand size = 35, antiderivative size = 35

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \text{Int}\left(\frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))},x\right)$$

output
```
Unintegrable(ln(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

## 3.87.2 Mathematica [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.06

$$\int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\log\left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx$$

input
```
Integrate[Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

output
```
Integrate[Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])), x]
```

## 3.87.3 Rubi [N/A]

Not integrable

Time = 0.33 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}dx$$

$$\Big\downarrow \text{5300}$$

$$\int \frac{\log \left(h(f+gx)^m\right)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}dx$$

input
```
Int[Log[h*(f + g*x)^m]/(Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x])),x]
```

output
```
$Aborted
```

### 3.87.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

## 3.87.4 Maple [N/A] (verified)

Not integrable

Time = 12.39 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.94

$$\int \frac{\ln \left(h (g x +f )^{m}\right)}{\left(a +b \arcsin \left(c x \right)\right) \sqrt{-c^{2} x^{2}+1}}d x$$

input
```
int(ln(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

output
```
int(ln(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x)
```

### 3.87.5 Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.63

$$\int \frac{\log (h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\log ((gx+f)^m h)}{\sqrt{-c^2x^2+1}(b\arcsin (cx)+a)}\,dx$$

input
```
integrate(log(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorit
hm="fricas")
```

output
```
integral(-sqrt(-c^2*x^2 + 1)*log((g*x + f)^m*h)/(a*c^2*x^2 + (b*c^2*x^2 -
b)*arcsin(c*x) - a), x)
```

### 3.87.6 Sympy [N/A]

Not integrable

Time = 9.44 (sec) , antiderivative size = 34, normalized size of antiderivative = 0.97

$$\int \frac{\log (h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\log (h(f+gx)^m)}{\sqrt{-(cx-1)(cx+1)}\,(a+b\operatorname{asin}(cx))}\,dx$$

input
```
integrate(ln(h*(g*x+f)**m)/(a+b*asin(c*x))/(-c**2*x**2+1)**(1/2),x)
```

output
```
Integral(log(h*(f + g*x)**m)/(sqrt(-(c*x - 1)*(c*x + 1))*(a + b*asin(c*x))
), x)
```

### 3.87.7 Maxima [N/A]

Not integrable

Time = 1.01 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{\log (h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\log ((gx+f)^m h)}{\sqrt{-c^2x^2+1}(b\arcsin (cx)+a)}\,dx$$

input
```
integrate(log(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorit
hm="maxima")
```

output
```
integrate(log((g*x + f)^m*h)/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

### 3.87.8 Giac [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{\log (h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\log \left((gx+f)^m h\right)}{\sqrt{-c^2x^2+1}(b\arcsin(cx)+a)}\,dx$$

input
```
integrate(log(h*(g*x+f)^m)/(a+b*arcsin(c*x))/(-c^2*x^2+1)^(1/2),x, algorit
hm="giac")
```

output
```
integrate(log((g*x + f)^m*h)/(sqrt(-c^2*x^2 + 1)*(b*arcsin(c*x) + a)), x)
```

### 3.87.9 Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.00

$$\int \frac{\log (h(f+gx)^m)}{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}\,dx = \int \frac{\ln \left(h\,(f+g\,x)^m\right)}{(a+b\,\mathrm{asin}\,(c\,x))\,\sqrt{1-c^2\,x^2}}\,dx$$

input
```
int(log(h*(f + g*x)^m)/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)),x)
```

output
```
int(log(h*(f + g*x)^m)/((a + b*asin(c*x))*(1 - c^2*x^2)^(1/2)), x)
```

# 3.88 $\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$



## 3.88.1 Optimal result

Integrand size = 21, antiderivative size = 351

$$\begin{aligned}\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx &= \frac{be(4e^2g+25c^2d(ef+dg))\,x^2\sqrt{1-c^2x^2}}{75c^3}+\frac{be^2(ef+3dg)x^3\sqrt{1-c^2x^2}}{16c}+\frac{be^3gx^4\sqrt{1-c^2x^2}}{25c}\\ &+\frac{b(32(75c^4d^3f+8e^3g+50c^2de(ef+dg))+75c^2(8c^2d^2(3ef+dg)+3e^2(ef+3dg))\,x)\sqrt{1-c^2x^2}}{2400c^5}\\ &-\frac{b(8c^2d^2(3ef+dg)+3e^2(ef+3dg))\arcsin(cx)}{32c^4}+d^3fx(a+b\arcsin(cx))\\ &+\frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx))+de(ef+dg)x^3(a+b\arcsin(cx))\\ &+\frac{1}{4}e^2(ef+3dg)x^4(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))\end{aligned}$$

output
```
-1/32*b*(8*c^2*d^2*(d*g+3*e*f)+3*e^2*(3*d*g+e*f))*arcsin(c*x)/c^4+d^3*f*x*
(a+b*arcsin(c*x))+1/2*d^2*(d*g+3*e*f)*x^2*(a+b*arcsin(c*x))+d*e*(d*g+e*f)*
x^3*(a+b*arcsin(c*x))+1/4*e^2*(3*d*g+e*f)*x^4*(a+b*arcsin(c*x))+1/5*e^3*g*
x^5*(a+b*arcsin(c*x))+1/75*b*e*(4*e^2*g+25*c^2*d*(d*g+e*f))*x^2*(-c^2*x^2+
1)^(1/2)/c^3+1/16*b*e^2*(3*d*g+e*f)*x^3*(-c^2*x^2+1)^(1/2)/c+1/25*b*e^3*g*
x^4*(-c^2*x^2+1)^(1/2)/c+1/2400*b*(2400*c^4*d^3*f+256*e^3*g+1600*c^2*d*e*(
d*g+e*f)+75*c^2*(8*c^2*d^2*(d*g+3*e*f)+3*e^2*(3*d*g+e*f))*x)*(-c^2*x^2+1)^
(1/2)/c^5
```

### 3.88.2 Mathematica [A] (verified)

Time = 0.42 (sec) , antiderivative size = 305, normalized size of antiderivative = 0.87

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{120ac^5x(10d^3(2f+gx)+10d^2ex(3f+2gx)+5de^2x^2(4f+3gx)+e^3x^3(5f+4gx))+b\sqrt{1-c^2x^2}(256e^3}{}$$

input
```
Integrate[(d + e*x)^3*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

output
```
(120*a*c^5*x*(10*d^3*(2*f + g*x) + 10*d^2*e*x*(3*f + 2*g*x) + 5*d*e^2*x^2*
(4*f + 3*g*x) + e^3*x^3*(5*f + 4*g*x)) + b*Sqrt[1 - c^2*x^2]*(256*e^3*g +
2*c^4*(300*d^3*(4*f + g*x) + 100*d^2*e*x*(9*f + 4*g*x) + 25*d*e^2*x^2*(16*
f + 9*g*x) + 3*e^3*x^3*(25*f + 16*g*x)) + c^2*e*(1600*d^2*g + 25*d*e*(64*f
 + 27*g*x) + e^2*x*(225*f + 128*g*x))) + 15*b*c*(-40*c^2*d^2*(3*e*f + d*g)
 - 15*e^2*(e*f + 3*d*g) + 8*c^4*x*(10*d^3*(2*f + g*x) + 10*d^2*e*x*(3*f +
2*g*x) + 5*d*e^2*x^2*(4*f + 3*g*x) + e^3*x^3*(5*f + 4*g*x)))*ArcSin[c*x])/
(2400*c^5)
```

### 3.88.3 Rubi [A] (verified)

Time = 1.28 (sec) , antiderivative size = 379, normalized size of antiderivative = 1.08, number of steps used = 13, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {5248, 27, 2340, 25, 2340, 25, 2340, 25, 27, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$$
$$\Big\downarrow \; 5248$$
$$-bc\int \frac{x\left(4e^3gx^4+5e^2(ef+3dg)x^3+20de(ef+dg)x^2+10d^2(3ef+dg)x+20d^3f\right)}{20\sqrt{1-c^2x^2}}dx+ d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+ dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$
$$\Big\downarrow \; 27$$

$$-\frac{1}{20}bc\int \frac{x(4e^3gx^4+5e^2(ef+3dg)x^3+20de(ef+dg)x^2+10d^2(3ef+dg)x+20d^3f)}{\sqrt{1-c^2x^2}}dx+ d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+ dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{20}bc\left(-\frac{\int -\frac{x(100c^2fd^3+50c^2(3ef+dg)xd^2+25c^2e^2(ef+3dg)x^3+4e(25d(ef+dg)c^2+4e^2g)x^2)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{4e^3gx^4\sqrt{1-c^2x^2}}{5c^2}\right)+ d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+ dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 25

$$-\frac{1}{20}bc\left(\frac{\int \frac{x(100c^2fd^3+50c^2(3ef+dg)xd^2+25c^2e^2(ef+3dg)x^3+4e(25d(ef+dg)c^2+4e^2g)x^2)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{4e^3gx^4\sqrt{1-c^2x^2}}{5c^2}\right)+ d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+ dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{20}bc\left(\frac{-\frac{\int -\frac{x\left(400d^3fc^4+16e\left(25d(ef+dg)c^2+4e^2g\right)x^2c^2+25\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}e^2x^3\sqrt{1-c^2x^2}(3dg+ef)}{5c^2}-4e\right. d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+ dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 25

$$-\frac{1}{20}bc\left(\frac{\frac{\int \frac{x\left(400d^3fc^4+16e\left(25d(ef+dg)c^2+4e^2g\right)x^2c^2+25\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}e^2x^3\sqrt{1-c^2x^2}(3dg+ef)}{5c^2}-4e^3ga\right. d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+ dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

3.88. $\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$

$\downarrow$ 2340

$$-\frac{1}{20}bc\left(\frac{\frac{-\frac{\int -\frac{c^2x\left(75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2+16\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}ex^2\sqrt{1-c^2x^2}\left(25c^2d(dg+ef)+4e^2g\right)}{4c^2}-\frac{25}{4}e^2x}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 25

$$-\frac{1}{20}bc\left(\frac{\frac{\frac{\int \frac{c^2x\left(75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2+16\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}ex^2\sqrt{1-c^2x^2}\left(25c^2d(dg+ef)+4e^2g\right)}{4c^2}-\frac{25}{4}e^2x^3}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 27

$$-\frac{1}{20}bc\left(\frac{\frac{\frac{1}{3}\int \frac{x\left(75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)xc^2+16\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}ex^2\sqrt{1-c^2x^2}\left(25c^2d(dg+ef)+4e^2g\right)}{4c^2}-\frac{25}{4}e^2x^3}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\downarrow$ 533

$$-\frac{1}{20}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{\int \frac{c^2\left(75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)+32\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)x\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{75}{2}x\sqrt{1-c^2x^2}\left(8c^2d^2(dg+3ef)+3e^2(3dg+ef)\right)\right)-\frac{16}{3}}{4c^2}}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

---

3.88. $\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$

$\Big\downarrow$ 27

$$-\frac{1}{20}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\int\frac{75\left(8c^2(3ef+dg)d^2+3e^2(ef+3dg)\right)+32\left(75d^3fc^4+50de(ef+dg)c^2+8e^3g\right)x}{\sqrt{1-c^2x^2}}dx-\frac{75}{2}x\sqrt{1-c^2x^2}\left(8c^2d^2(dg+3ef)+3e^2(3dg+ef)\right)\right)-\frac{16}{3}ex}{4c^2}}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\Big\downarrow$ 455

$$-\frac{1}{20}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\left(75\left(8c^2d^2(dg+3ef)+3e^2(3dg+ef)\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-\frac{32\sqrt{1-c^2x^2}\left(75c^4d^3f+50c^2de(dg+ef)+8e^3g\right)}{c^2}\right)-\frac{75}{2}x\sqrt{1-c^2x^2}\left(8c^2d^2(dg+3ef)\right.}{4c^2}}{5c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))$$

$\Big\downarrow$ 223

$$d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}e^2x^4(3dg+ef)(a+b\arcsin(cx))+dex^3(dg+ef)(a+b\arcsin(cx))+\frac{1}{5}e^3gx^5(a+b\arcsin(cx))-$$

$$\frac{1}{20}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\left(\frac{75\arcsin(cx)\left(8c^2d^2(dg+3ef)+3e^2(3dg+ef)\right)}{c}-\frac{32\sqrt{1-c^2x^2}\left(75c^4d^3f+50c^2de(dg+ef)+8e^3g\right)}{c^2}\right)-\frac{75}{2}x\sqrt{1-c^2x^2}\left(8c^2d^2(dg+3ef)+3e^2(3dg-\right.}{4c^2}}{5c^2}\right.$$

input
```
Int[(d + e*x)^3*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

## 3.88. $\int(d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$

output
```
d^3*f*x*(a + b*ArcSin[c*x]) + (d^2*(3*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/
2 + d*e*(e*f + d*g)*x^3*(a + b*ArcSin[c*x]) + (e^2*(e*f + 3*d*g)*x^4*(a +
b*ArcSin[c*x]))/4 + (e^3*g*x^5*(a + b*ArcSin[c*x]))/5 - (b*c*((-4*e^3*g*x^
4*Sqrt[1 - c^2*x^2])/(5*c^2) + ((-25*e^2*(e*f + 3*d*g)*x^3*Sqrt[1 - c^2*x^
2])/4 + ((-16*e*(4*e^2*g + 25*c^2*d*(e*f + d*g))*x^2*Sqrt[1 - c^2*x^2])/3
+ ((-75*(8*c^2*d^2*(3*e*f + d*g) + 3*e^2*(e*f + 3*d*g))*x*Sqrt[1 - c^2*x^2
])/2 + ((-32*(75*c^4*d^3*f + 8*e^3*g + 50*c^2*d*e*(e*f + d*g))*Sqrt[1 - c^
2*x^2])/c^2 + (75*(8*c^2*d^2*(3*e*f + d*g) + 3*e^2*(e*f + 3*d*g))*ArcSin[c
*x])/c)/2)/3)/(4*c^2))/(5*c^2)))/20
```

### 3.88.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

## 3.88.4 Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 445, normalized size of antiderivative = 1.27

| method | result |
|---|---|
| parts | $a\left(\frac{e^3 g x^5}{5}+\frac{\left(3d e^2 g+e^3 f\right)x^4}{4}+\frac{\left(3d^2 eg+3d e^2 f\right)x^3}{3}+\frac{\left(d^3 g+3d^2 ef\right)x^2}{2}+d^3 f x\right)+$ $b\left(\frac{c \arcsin(cx) e^3 g x^5}{5}+\frac{3c \operatorname{ar}\ldots\right.$ |
| derivativedivides | $\frac{a\left(\frac{e^3 g c^5 x^5}{5}+\frac{\left(3dc e^2 g+e^3 cf\right)c^4 x^4}{4}+\frac{\left(3d^2 c^2 eg+3d c^2 e^2 f\right)c^3 x^3}{3}+\frac{\left(c^3 d^3 g+3d^2 c^3 ef\right)c^2 x^2}{2}+d^3 c^5 f x\right)}{c^4}+$ $b\left(\frac{\arcsin(cx) e^3 g c^5 x^5}{5}+\frac{3\,\mathrm{a}\ldots\right.$ |
| default | $\frac{a\left(\frac{e^3 g c^5 x^5}{5}+\frac{\left(3dc e^2 g+e^3 cf\right)c^4 x^4}{4}+\frac{\left(3d^2 c^2 eg+3d c^2 e^2 f\right)c^3 x^3}{3}+\frac{\left(c^3 d^3 g+3d^2 c^3 ef\right)c^2 x^2}{2}+d^3 c^5 f x\right)}{c^4}+$ $b\left(\frac{\arcsin(cx) e^3 g c^5 x^5}{5}+\frac{3\,\mathrm{a}\ldots\right.$ |

input
```
int((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/5*e^3*g*x^5+1/4*(3*d*e^2*g+e^3*f)*x^4+1/3*(3*d^2*e*g+3*d*e^2*f)*x^3+1
/2*(d^3*g+3*d^2*e*f)*x^2+d^3*f*x)+b/c*(1/5*c*arcsin(c*x)*e^3*g*x^5+3/4*c*a
rcsin(c*x)*x^4*d*e^2*g+1/4*c*arcsin(c*x)*x^4*e^3*f+c*arcsin(c*x)*x^3*d^2*e
*g+c*arcsin(c*x)*x^3*d*e^2*f+1/2*c*arcsin(c*x)*x^2*d^3*g+3/2*c*arcsin(c*x)
*x^2*d^2*e*f+arcsin(c*x)*d^3*f*c*x-1/60/c^4*(12*e^3*g*(-1/5*c^4*x^4*(-c^2*
x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))-60*d
^3*c^4*f*(-c^2*x^2+1)^(1/2)+3*(15*c*d*e^2*g+5*c*e^3*f)*(-1/4*c^3*x^3*(-c^2
*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+3*(10*c^3*d^3*g+
30*c^3*d^2*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))+3*(20*c^2*d^
2*e*g+20*c^2*d*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1
/2))))
```

## 3.88.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 441, normalized size of antiderivative = 1.26

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{480\,ac^5e^3gx^5 + 2400\,ac^5d^3fx + 600\,(ac^5e^3f + 3\,ac^5de^2g)x^4 + 2400\,(ac^5de^2f + ac^5d^2eg)x^3 + 1200\,(3\,ac^5d^2}{}$$

input
```
integrate((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/2400*(480*a*c^5*e^3*g*x^5 + 2400*a*c^5*d^3*f*x + 600*(a*c^5*e^3*f + 3*a*
c^5*d*e^2*g)*x^4 + 2400*(a*c^5*d*e^2*f + a*c^5*d^2*e*g)*x^3 + 1200*(3*a*c^
5*d^2*e*f + a*c^5*d^3*g)*x^2 + 15*(32*b*c^5*e^3*g*x^5 + 160*b*c^5*d^3*f*x
+ 40*(b*c^5*e^3*f + 3*b*c^5*d*e^2*g)*x^4 + 160*(b*c^5*d*e^2*f + b*c^5*d^2*
e*g)*x^3 + 80*(3*b*c^5*d^2*e*f + b*c^5*d^3*g)*x^2 - 15*(8*b*c^3*d^2*e + b*
c*e^3)*f - 5*(8*b*c^3*d^3 + 9*b*c*d*e^2)*g)*arcsin(c*x) + (96*b*c^4*e^3*g*
x^4 + 150*(b*c^4*e^3*f + 3*b*c^4*d*e^2*g)*x^3 + 32*(25*b*c^4*d*e^2*f + (25
*b*c^4*d^2*e + 4*b*c^2*e^3)*g)*x^2 + 800*(3*b*c^4*d^3 + 2*b*c^2*d*e^2)*f +
 64*(25*b*c^2*d^2*e + 4*b*e^3)*g + 75*(3*(8*b*c^4*d^2*e + b*c^2*e^3)*f + (
8*b*c^4*d^3 + 9*b*c^2*d*e^2)*g)*x)*sqrt(-c^2*x^2 + 1))/c^5
```

### 3.88.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 770 vs. $2(338) = 676$.

Time = 0.50 (sec) , antiderivative size = 770, normalized size of antiderivative = 2.19

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^3fx + \frac{ad^3gx^2}{2} + \frac{3ad^2efx^2}{2} + ad^2egx^3 + ade^2fx^3 + \frac{3ade^2gx^4}{4} + \frac{ae^3fx^4}{4} + \frac{ae^3gx^5}{5} + bd^3fx\operatorname{asin}(cx) + \frac{bd^3gx^2\operatorname{as}}{2} \\ a\left(d^3fx + \frac{d^3gx^2}{2} + \frac{3d^2efx^2}{2} + d^2egx^3 + de^2fx^3 + \frac{3de^2gx^4}{4} + \frac{e^3fx^4}{4} + \frac{e^3gx^5}{5}\right) \end{cases}$$

input
```
integrate((e*x+d)**3*(g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**3*f*x + a*d**3*g*x**2/2 + 3*a*d**2*e*f*x**2/2 + a*d**2*e*g
*x**3 + a*d*e**2*f*x**3 + 3*a*d*e**2*g*x**4/4 + a*e**3*f*x**4/4 + a*e**3*g
*x**5/5 + b*d**3*f*x*asin(c*x) + b*d**3*g*x**2*asin(c*x)/2 + 3*b*d**2*e*f*
x**2*asin(c*x)/2 + b*d**2*e*g*x**3*asin(c*x) + b*d*e**2*f*x**3*asin(c*x) +
 3*b*d*e**2*g*x**4*asin(c*x)/4 + b*e**3*f*x**4*asin(c*x)/4 + b*e**3*g*x**5
*asin(c*x)/5 + b*d**3*f*sqrt(-c**2*x**2 + 1)/c + b*d**3*g*x*sqrt(-c**2*x**
2 + 1)/(4*c) + 3*b*d**2*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**2*e*g*x**2
*sqrt(-c**2*x**2 + 1)/(3*c) + b*d*e**2*f*x**2*sqrt(-c**2*x**2 + 1)/(3*c) +
 3*b*d*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e**3*f*x**3*sqrt(-c**2*
x**2 + 1)/(16*c) + b*e**3*g*x**4*sqrt(-c**2*x**2 + 1)/(25*c) - b*d**3*g*as
in(c*x)/(4*c**2) - 3*b*d**2*e*f*asin(c*x)/(4*c**2) + 2*b*d**2*e*g*sqrt(-c*
*2*x**2 + 1)/(3*c**3) + 2*b*d*e**2*f*sqrt(-c**2*x**2 + 1)/(3*c**3) + 9*b*d
*e**2*g*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 3*b*e**3*f*x*sqrt(-c**2*x**2 +
1)/(32*c**3) + 4*b*e**3*g*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) - 9*b*d*e**2
*g*asin(c*x)/(32*c**4) - 3*b*e**3*f*asin(c*x)/(32*c**4) + 8*b*e**3*g*sqrt(
-c**2*x**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d**3*f*x + d**3*g*x**2/2 + 3*d**
2*e*f*x**2/2 + d**2*e*g*x**3 + d*e**2*f*x**3 + 3*d*e**2*g*x**4/4 + e**3*f*
x**4/4 + e**3*g*x**5/5), True))
```

### 3.88.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 528, normalized size of antiderivative = 1.50

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{5}ae^3gx^5 + \frac{1}{4}ae^3fx^4 + \frac{3}{4}ade^2gx^4 + ade^2fx^3 + ad^2egx^3 + \frac{3}{2}ad^2efx^2 + \frac{1}{2}ad^3gx^2 + \frac{3}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2ef + \frac{1}{3}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde^2f + \frac{1}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^3f + \frac{1}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^3g + \frac{1}{3}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2eg + \frac{3}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bde^2g + \frac{1}{75}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^3g + ad^3fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^3f}{c}$$

input
```
integrate((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/5*a*e^3*g*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^4 + a*d*e^2*f*x^3 + a*
d^2*e*g*x^3 + 3/2*a*d^2*e*f*x^2 + 1/2*a*d^3*g*x^2 + 3/4*(2*x^2*arcsin(c*x)
 + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e*f + 1/3*(3*x^3*
arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b
*d*e^2*f + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqr
t(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3*f + 1/4*(2*x^2*arcsin(
c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3*g + 1/3*(3*x^
3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))
*b*d^2*e*g + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*s
qrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e^2*g + 1/75*(15*x^5*a
rcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4
+ 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^3*g + a*d^3*f*x + (c*x*arcsin(c*x) + sq
rt(-c^2*x^2 + 1))*b*d^3*f/c
```

### 3.88.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 784 vs. $2(324) = 648$.

Time = 0.31 (sec) , antiderivative size = 784, normalized size of antiderivative = 2.23

$$
\begin{aligned}
\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx = {} & \frac{1}{5}ae^3gx^5 + \frac{1}{4}ae^3fx^4 + \frac{3}{4}ade^2gx^4 \\
& + ade^2fx^3 + ad^2egx^3 + bd^3fx\arcsin(cx) \\
& + ad^3fx + \frac{(c^2x^2-1)bde^2fx\arcsin(cx)}{c^2} \\
& + \frac{(c^2x^2-1)bd^2egx\arcsin(cx)}{c^2} \\
& + \frac{3\sqrt{-c^2x^2+1}bd^2efx}{4c} + \frac{\sqrt{-c^2x^2+1}bd^3gx}{4c} \\
& + \frac{3(c^2x^2-1)bd^2ef\arcsin(cx)}{2c^2} \\
& + \frac{(c^2x^2-1)bd^3g\arcsin(cx)}{2c^2} \\
& + \frac{bde^2fx\arcsin(cx)}{c^2} + \frac{bd^2egx\arcsin(cx)}{c^2} \\
& + \frac{(c^2x^2-1)^2be^3gx\arcsin(cx)}{5c^4} \\
& + \frac{\sqrt{-c^2x^2+1}bd^3f}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^3fx}{16c^3} \\
& - \frac{3(-c^2x^2+1)^{\frac{3}{2}}bde^2gx}{16c^3} + \frac{3(c^2x^2-1)ad^2ef}{2c^2} \\
& + \frac{(c^2x^2-1)ad^3g}{2c^2} + \frac{3bd^2ef\arcsin(cx)}{4c^2} \\
& + \frac{(c^2x^2-1)^2be^3f\arcsin(cx)}{4c^4} + \frac{bd^3g\arcsin(cx)}{4c^2} \\
& + \frac{3(c^2x^2-1)^2bde^2g\arcsin(cx)}{4c^4} \\
& + \frac{2(c^2x^2-1)be^3gx\arcsin(cx)}{5c^4} \\
& - \frac{(-c^2x^2+1)^{\frac{3}{2}}bde^2f}{3c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd^2eg}{3c^3} \\
& + \frac{5\sqrt{-c^2x^2+1}be^3fx}{32c^3} + \frac{15\sqrt{-c^2x^2+1}bde^2gx}{32c^3} \\
& + \frac{(c^2x^2-1)be^3f\arcsin(cx)}{2c^4} \\
& + \frac{3(c^2x^2-1)bde^2g\arcsin(cx)}{2c^4} \\
& + \frac{be^3gx\arcsin(cx)}{5c^4} + \frac{\sqrt{-c^2x^2+1}bde^2f}{c^3} \\
& + \frac{\sqrt{-c^2x^2+1}bd^2eg}{c^3} \\
& + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^3g}{25c^5} \\
& + \frac{3be^3f\arcsin(cx)}{32c^4} + \frac{15bde^2g\arcsin(cx)}{32c^4}
\end{aligned}
$$

3.88. $\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx$

input
```
integrate((e*x+d)^3*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/5*a*e^3*g*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^4 + a*d*e^2*f*x^3 + a*
d^2*e*g*x^3 + b*d^3*f*x*arcsin(c*x) + a*d^3*f*x + (c^2*x^2 - 1)*b*d*e^2*f*
x*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*b*d^2*e*g*x*arcsin(c*x)/c^2 + 3/4*sqrt(-
c^2*x^2 + 1)*b*d^2*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d^3*g*x/c + 3/2*(c^2
*x^2 - 1)*b*d^2*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^3*g*arcsin(c*x
)/c^2 + b*d*e^2*f*x*arcsin(c*x)/c^2 + b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/5*(c
^2*x^2 - 1)^2*b*e^3*g*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^3*f/c - 1
/16*(-c^2*x^2 + 1)^(3/2)*b*e^3*f*x/c^3 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d*e^2
*g*x/c^3 + 3/2*(c^2*x^2 - 1)*a*d^2*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d^3*g/c^2
 + 3/4*b*d^2*e*f*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e^3*f*arcsin(c*x)
/c^4 + 1/4*b*d^3*g*arcsin(c*x)/c^2 + 3/4*(c^2*x^2 - 1)^2*b*d*e^2*g*arcsin(
c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e^3*g*x*arcsin(c*x)/c^4 - 1/3*(-c^2*x^2 + 1
)^(3/2)*b*d*e^2*f/c^3 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d^2*e*g/c^3 + 5/32*sqrt
(-c^2*x^2 + 1)*b*e^3*f*x/c^3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d*e^2*g*x/c^3 +
1/2*(c^2*x^2 - 1)*b*e^3*f*arcsin(c*x)/c^4 + 3/2*(c^2*x^2 - 1)*b*d*e^2*g*ar
csin(c*x)/c^4 + 1/5*b*e^3*g*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d*e^2
*f/c^3 + sqrt(-c^2*x^2 + 1)*b*d^2*e*g/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2
*x^2 + 1)*b*e^3*g/c^5 + 5/32*b*e^3*f*arcsin(c*x)/c^4 + 15/32*b*d*e^2*g*arc
sin(c*x)/c^4 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e^3*g/c^5 + 1/5*sqrt(-c^2*x^2 +
 1)*b*e^3*g/c^5
```

### 3.88.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3(f+gx)(a+b\arcsin(cx))\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d+e\,x\right)}^3\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^3,x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^3, x)
```

# 3.89 $\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$



## 3.89.1 Optimal result

Integrand size = 21, antiderivative size = 248

$$\begin{aligned}\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx &= \frac{be(ef+2dg)x^2\sqrt{1-c^2x^2}}{9c}+\frac{be^2gx^3\sqrt{1-c^2x^2}}{16c}\\
&+\frac{b(32(9c^2d^2f+2e(ef+2dg))+9(3e^2g+8c^2d(2ef+dg))x)\sqrt{1-c^2x^2}}{288c^3}\\
&-\frac{b(3e^2g+8c^2d(2ef+dg))\arcsin(cx)}{32c^4}\\
&+d^2fx(a+b\arcsin(cx))+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx))\\
&+\frac{1}{3}e(ef+2dg)x^3(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))\end{aligned}$$

output
```
-1/32*b*(3*e^2*g+8*c^2*d*(d*g+2*e*f))*arcsin(c*x)/c^4+d^2*f*x*(a+b*arcsin(
c*x))+1/2*d*(d*g+2*e*f)*x^2*(a+b*arcsin(c*x))+1/3*e*(2*d*g+e*f)*x^3*(a+b*a
rcsin(c*x))+1/4*e^2*g*x^4*(a+b*arcsin(c*x))+1/9*b*e*(2*d*g+e*f)*x^2*(-c^2*
x^2+1)^(1/2)/c+1/16*b*e^2*g*x^3*(-c^2*x^2+1)^(1/2)/c+1/288*b*(288*c^2*d^2*
f+64*e*(2*d*g+e*f)+9*(3*e^2*g+8*c^2*d*(d*g+2*e*f))*x)*(-c^2*x^2+1)^(1/2)/c
^3
```

### 3.89.2 Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 211, normalized size of antiderivative = 0.85

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$=\frac{24ac^4x(6d^2(2f+gx)+4dex(3f+2gx)+e^2x^2(4f+3gx))+bc\sqrt{1-c^2x^2}(e(64ef+128dg+27egx)+2}{}$$

input
```
Integrate[(d + e*x)^2*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

output
```
(24*a*c^4*x*(6*d^2*(2*f + g*x) + 4*d*e*x*(3*f + 2*g*x) + e^2*x^2*(4*f + 3*
g*x)) + b*c*Sqrt[1 - c^2*x^2]*(e*(64*e*f + 128*d*g + 27*e*g*x) + 2*c^2*(36
*d^2*(4*f + g*x) + 8*d*e*x*(9*f + 4*g*x) + e^2*x^2*(16*f + 9*g*x))) + 3*b*
(-9*e^2*g - 24*c^2*d*(2*e*f + d*g) + 8*c^4*x*(6*d^2*(2*f + g*x) + 4*d*e*x*
(3*f + 2*g*x) + e^2*x^2*(4*f + 3*g*x)))*ArcSin[c*x])/(288*c^4)
```

### 3.89.3 Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 275, normalized size of antiderivative = 1.11, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules used = {5248, 27, 2340, 25, 2340, 25, 27, 533, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5248}$$

$$-bc\int \frac{x\left(3e^2gx^3+4e(ef+2dg)x^2+6d(2ef+dg)x+12d^2f\right)}{12\sqrt{1-c^2x^2}}dx+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{12}bc\int \frac{x\left(3e^2gx^3+4e(ef+2dg)x^2+6d(2ef+dg)x+12d^2f\right)}{\sqrt{1-c^2x^2}}dx+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{2340}$$

$$-\frac{1}{12}bc\left(-\frac{\int -\frac{x(48c^2fd^2+16c^2e(ef+2dg)x^2+3(8d(2ef+dg)c^2+3e^2g)x)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{12}bc\left(\frac{\int \frac{x(48c^2fd^2+16c^2e(ef+2dg)x^2+3(8d(2ef+dg)c^2+3e^2g)x)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{12}bc\left(\frac{-\frac{\int -\frac{c^2x\left(16\left(9c^2fd^2+2e(ef+2dg)\right)+9\left(8d(2ef+dg)c^2+3e^2g\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}ex^2\sqrt{1-c^2x^2}(2dg+ef)}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{12}bc\left(\frac{\frac{\int \frac{c^2x\left(16\left(9c^2fd^2+2e(ef+2dg)\right)+9\left(8d(2ef+dg)c^2+3e^2g\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}ex^2\sqrt{1-c^2x^2}(2dg+ef)}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\int \frac{x(16(9c^2fd^2+2e(ef+2dg))+9(8d(2ef+dg)c^2+3e^2g)x)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}ex^2\sqrt{1-c^2x^2}(2dg+ef)}{4c^2}-\frac{3e^2gx^3\sqrt{1-c^2x^2}}{4c^2}\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 533$$

---

3.89. $\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{\int \frac{32\left(9c^2fd^2+2e(ef+2dg)\right)xc^2+9\left(8d(2ef+dg)c^2+3e^2g\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3e^2g}{c^2}+8d(dg+2ef)\right)\right)-\frac{16}{3}ex^2\sqrt{1-c^2x^2}}{4c^2}\right.$$

$$d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 455$$

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{9\left(8c^2d(dg+2ef)+3e^2g\right)\int \frac{1}{\sqrt{1-c^2x^2}}dx-32\sqrt{1-c^2x^2}\left(9c^2d^2f+2e(2dg+ef)\right)}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3e^2g}{c^2}+8d(dg+2ef)\right)\right)-}{4c^2}\right.$$

$$d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 223$$

$$d^2fx(a+b\arcsin(cx))+\frac{1}{3}ex^3(2dg+ef)(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}e^2gx^4(a+b\arcsin(cx))-$$

$$\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{9\arcsin(cx)\left(8c^2d(dg+2ef)+3e^2g\right)}{c}-32\sqrt{1-c^2x^2}\left(9c^2d^2f+2e(2dg+ef)\right)}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3e^2g}{c^2}+8d(dg+2ef)\right)\right)-\frac{16}{3}ex^2}{4c^2}\right.$$

input
```
Int[(d + e*x)^2*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

output
```
d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2
+ (e*(e*f + 2*d*g)*x^3*(a + b*ArcSin[c*x]))/3 + (e^2*g*x^4*(a + b*ArcSin[c
*x]))/4 - (b*c*((-3*e^2*g*x^3*Sqrt[1 - c^2*x^2])/(4*c^2) + ((-16*e*(e*f +
2*d*g)*x^2*Sqrt[1 - c^2*x^2])/3 + ((-9*((3*e^2*g)/c^2 + 8*d*(2*e*f + d*g))
*x*Sqrt[1 - c^2*x^2])/2 + (-32*(9*c^2*d^2*f + 2*e*(e*f + 2*d*g))*Sqrt[1 -
c^2*x^2] + (9*(3*e^2*g + 8*c^2*d*(2*e*f + d*g))*ArcSin[c*x])/c)/(2*c^2))/3
)/(4*c^2)))/12
```

## 3.89. $\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$

### 3.89.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

## 3.89.4 Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.23

| method | result |
|---|---|
| parts | $a\left(\frac{e^2 g\,x^4}{4}+\frac{(2deg+e^2 f)x^3}{3}+\frac{(d^2 g+2def)x^2}{2}+d^2 f x\right)+\frac{b\left(\frac{c\arcsin(cx)e^2 g\,x^4}{4}+\frac{2c\arcsin(cx)x^3 deg}{3}+\frac{c\arcsin(cx)x}{3}\right.}{}$ |
| derivativedivides | $\frac{a\left(\frac{e^2 g\,c^4 x^4}{4}+\frac{(2dceg+e^2 cf)c^3 x^3}{3}+\frac{(c^2 d^2 g+2d\,c^2 ef)c^2 x^2}{2}+d^2 c^4 fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)e^2 g\,c^4 x^4}{4}+\frac{2\arcsin(cx)c^4 deg\,x^3}{3}+\frac{\arcsin(cx)c}{3}\right.}{}$ |
| default | $\frac{a\left(\frac{e^2 g\,c^4 x^4}{4}+\frac{(2dceg+e^2 cf)c^3 x^3}{3}+\frac{(c^2 d^2 g+2d\,c^2 ef)c^2 x^2}{2}+d^2 c^4 fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)e^2 g\,c^4 x^4}{4}+\frac{2\arcsin(cx)c^4 deg\,x^3}{3}+\frac{\arcsin(cx)c}{3}\right.}{}$ |

input
```
int((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/4*e^2*g*x^4+1/3*(2*d*e*g+e^2*f)*x^3+1/2*(d^2*g+2*d*e*f)*x^2+d^2*f*x)+
b/c*(1/4*c*arcsin(c*x)*e^2*g*x^4+2/3*c*arcsin(c*x)*x^3*d*e*g+1/3*c*arcsin(
c*x)*x^3*e^2*f+1/2*c*arcsin(c*x)*x^2*d^2*g+c*arcsin(c*x)*x^2*d*e*f+arcsin(
c*x)*d^2*f*c*x-1/12/c^3*(3*e^2*g*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*
(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-12*d^2*c^3*f*(-c^2*x^2+1)^(1/2)+(8*c*d
*e*g+4*c*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+(
6*c^2*d^2*g+12*c^2*d*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))
```

## 3.89.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.19

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$=\frac{72\,ac^4e^2gx^4+288\,ac^4d^2fx+96\,(ac^4e^2f+2\,ac^4deg)x^3+144\,(2\,ac^4def+ac^4d^2g)x^2+3\,(24\,bc^4e^2gx^4+96}{}$$

input
```
integrate((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/288*(72*a*c^4*e^2*g*x^4 + 288*a*c^4*d^2*f*x + 96*(a*c^4*e^2*f + 2*a*c^4*
d*e*g)*x^3 + 144*(2*a*c^4*d*e*f + a*c^4*d^2*g)*x^2 + 3*(24*b*c^4*e^2*g*x^4
 + 96*b*c^4*d^2*f*x - 48*b*c^2*d*e*f + 32*(b*c^4*e^2*f + 2*b*c^4*d*e*g)*x^
3 + 48*(2*b*c^4*d*e*f + b*c^4*d^2*g)*x^2 - 3*(8*b*c^2*d^2 + 3*b*e^2)*g)*ar
csin(c*x) + (18*b*c^3*e^2*g*x^3 + 128*b*c*d*e*g + 32*(b*c^3*e^2*f + 2*b*c^
3*d*e*g)*x^2 + 32*(9*b*c^3*d^2 + 2*b*c*e^2)*f + 9*(16*b*c^3*d*e*f + (8*b*c
^3*d^2 + 3*b*c*e^2)*g)*x)*sqrt(-c^2*x^2 + 1))/c^4
```

### 3.89.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 502 vs. $2(235) = 470$.

Time = 0.36 (sec) , antiderivative size = 502, normalized size of antiderivative = 2.02

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^2fx + \frac{ad^2gx^2}{2} + adefx^2 + \frac{2adegx^3}{3} + \frac{ae^2fx^3}{3} + \frac{ae^2gx^4}{4} + bd^2fx\,\mathrm{asin}\,(cx) + \frac{bd^2gx^2\,\mathrm{asin}\,(cx)}{2} + bdefx^2\,\mathrm{asin}\,(cx \\ a\left(d^2fx + \frac{d^2gx^2}{2} + defx^2 + \frac{2degx^3}{3} + \frac{e^2fx^3}{3} + \frac{e^2gx^4}{4}\right) \end{cases}$$

input
```
integrate((e*x+d)**2*(g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**2*f*x + a*d**2*g*x**2/2 + a*d*e*f*x**2 + 2*a*d*e*g*x**3/3
+ a*e**2*f*x**3/3 + a*e**2*g*x**4/4 + b*d**2*f*x*asin(c*x) + b*d**2*g*x**2
*asin(c*x)/2 + b*d*e*f*x**2*asin(c*x) + 2*b*d*e*g*x**3*asin(c*x)/3 + b*e**
2*f*x**3*asin(c*x)/3 + b*e**2*g*x**4*asin(c*x)/4 + b*d**2*f*sqrt(-c**2*x**
2 + 1)/c + b*d**2*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d*e*f*x*sqrt(-c**2*x*
*2 + 1)/(2*c) + 2*b*d*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*f*x**2*
sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) - b
*d**2*g*asin(c*x)/(4*c**2) - b*d*e*f*asin(c*x)/(2*c**2) + 4*b*d*e*g*sqrt(-
c**2*x**2 + 1)/(9*c**3) + 2*b*e**2*f*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e
**2*g*x*sqrt(-c**2*x**2 + 1)/(32*c**3) - 3*b*e**2*g*asin(c*x)/(32*c**4), N
e(c, 0)), (a*(d**2*f*x + d**2*g*x**2/2 + d*e*f*x**2 + 2*d*e*g*x**3/3 + e**
2*f*x**3/3 + e**2*g*x**4/4), True))
```

### 3.89.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 353, normalized size of antiderivative = 1.42

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{4}ae^2gx^4 + \frac{1}{3}ae^2fx^3 + \frac{2}{3}adegx^3 + adefx^2 + \frac{1}{2}ad^2gx^2$$
$$+ \frac{1}{2}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdef$$
$$+ \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2f$$
$$+ \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2g$$
$$+ \frac{2}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdeg$$
$$+ \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^2g$$
$$+ ad^2fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^2f}{c}$$

input
```
integrate((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/4*a*e^2*g*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + a*d*e*f*x^2 + 1/2*a*
d^2*g*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(
c*x)/c^3))*b*d*e*f + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^
2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^2*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(
-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*g + 2/9*(3*x^3*arcsin(c*x) +
 c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e*g + 1/32
*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)
*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^2*g + a*d^2*f*x + (c*x*arcsin(c*x) + sq
rt(-c^2*x^2 + 1))*b*d^2*f/c
```

### 3.89.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 491 vs. $2(225) = 450$.

Time = 0.31 (sec) , antiderivative size = 491, normalized size of antiderivative = 1.98

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{4}\,ae^2gx^4 + \frac{1}{3}\,ae^2fx^3 + \frac{2}{3}\,adegx^3 + bd^2fx\arcsin(cx) + ad^2fx + \frac{(c^2x^2-1)be^2fx\arcsin(cx)}{3\,c^2} + \frac{2\,(c^2x^2-1)bdegx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}bdefx}{2\,c} + \frac{\sqrt{-c^2x^2+1}bd^2gx}{4\,c} + \frac{(c^2x^2-1)bdef\arcsin(cx)}{c^2} + \frac{(c^2x^2-1)bd^2g\arcsin(cx)}{2\,c^2} + \frac{be^2fx\arcsin(cx)}{3\,c^2} + \frac{2\,bdegx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}bd^2f}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2gx}{16\,c^3} + \frac{(c^2x^2-1)adef}{c^2} + \frac{(c^2x^2-1)ad^2g}{2\,c^2} + \frac{bdef\arcsin(cx)}{2\,c^2} + \frac{bd^2g\arcsin(cx)}{4\,c^2} + \frac{(c^2x^2-1)^2be^2g\arcsin(cx)}{4\,c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2f}{9\,c^3} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}bdeg}{9\,c^3} + \frac{5\,\sqrt{-c^2x^2+1}be^2gx}{32\,c^3} + \frac{(c^2x^2-1)be^2g\arcsin(cx)}{2\,c^4} + \frac{\sqrt{-c^2x^2+1}be^2f}{3\,c^3} + \frac{2\,\sqrt{-c^2x^2+1}bdeg}{3\,c^3} + \frac{5\,be^2g\arcsin(cx)}{32\,c^4}$$

input
```
integrate((e*x+d)^2*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/4*a*e^2*g*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + b*d^2*f*x*arcsin(c*x
) + a*d^2*f*x + 1/3*(c^2*x^2 - 1)*b*e^2*f*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2
 - 1)*b*d*e*g*x*arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b*d*e*f*x/c + 1/4
*sqrt(-c^2*x^2 + 1)*b*d^2*g*x/c + (c^2*x^2 - 1)*b*d*e*f*arcsin(c*x)/c^2 +
1/2*(c^2*x^2 - 1)*b*d^2*g*arcsin(c*x)/c^2 + 1/3*b*e^2*f*x*arcsin(c*x)/c^2
+ 2/3*b*d*e*g*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d^2*f/c - 1/16*(-c^
2*x^2 + 1)^(3/2)*b*e^2*g*x/c^3 + (c^2*x^2 - 1)*a*d*e*f/c^2 + 1/2*(c^2*x^2
- 1)*a*d^2*g/c^2 + 1/2*b*d*e*f*arcsin(c*x)/c^2 + 1/4*b*d^2*g*arcsin(c*x)/c
^2 + 1/4*(c^2*x^2 - 1)^2*b*e^2*g*arcsin(c*x)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2
)*b*e^2*f/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*d*e*g/c^3 + 5/32*sqrt(-c^2*x^2
+ 1)*b*e^2*g*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e^2*g*arcsin(c*x)/c^4 + 1/3*sqrt(
-c^2*x^2 + 1)*b*e^2*f/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b*d*e*g/c^3 + 5/32*b*e^
2*g*arcsin(c*x)/c^4
```

### 3.89.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2(f+gx)(a+b\arcsin(cx))\,dx = \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,{\left(d+e\,x\right)}^2\,dx$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^2,x)
```

output
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x)^2, x)
```

# 3.90 $\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$



## 3.90.1 Optimal result

Integrand size = 19, antiderivative size = 148

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \frac{begx^2\sqrt{1-c^2x^2}}{9c} + \frac{b(4(9c^2df+2eg)+9c^2(ef+dg)x)\sqrt{1-c^2x^2}}{36c^3} - \frac{b(ef+dg)\arcsin(cx)}{4c^2} + dfx(a+b\arcsin(cx)) + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}egx^3(a+b\arcsin(cx))$$

output
```
-1/4*b*(d*g+e*f)*arcsin(c*x)/c^2+d*f*x*(a+b*arcsin(c*x))+1/2*(d*g+e*f)*x^2
*(a+b*arcsin(c*x))+1/3*e*g*x^3*(a+b*arcsin(c*x))+1/9*b*e*g*x^2*(-c^2*x^2+1
)^(1/2)/c+1/36*b*(36*c^2*d*f+8*e*g+9*c^2*(d*g+e*f)*x)*(-c^2*x^2+1)^(1/2)/c
^3
```

### 3.90.2 Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.93

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$$
$$=\frac{6ac^3x(3d(2f+gx)+ex(3f+2gx))+b\sqrt{1-c^2x^2}(8eg+c^2(9d(4f+gx)+ex(9f+4gx)))+3bc(12c^2df}{36c^3}$$

input
```
Integrate[(d + e*x)*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

output
```
(6*a*c^3*x*(3*d*(2*f + g*x) + e*x*(3*f + 2*g*x)) + b*Sqrt[1 - c^2*x^2]*(8*
e*g + c^2*(9*d*(4*f + g*x) + e*x*(9*f + 4*g*x))) + 3*b*c*(12*c^2*d*f*x + 4
*c^2*e*g*x^3 + 3*d*g*(-1 + 2*c^2*x^2) + e*f*(-3 + 6*c^2*x^2))*ArcSin[c*x])
/(36*c^3)
```

### 3.90.3 Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.14, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.421, Rules used = {5248, 27, 2340, 25, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \text{5248}$$

$$-bc\int \frac{x\left(2egx^2+3(ef+dg)x+6df\right)}{6\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{6}bc\int \frac{x\left(2egx^2+3(ef+dg)x+6df\right)}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$$\Big\downarrow \text{2340}$$

$$-\frac{1}{6}bc\left(-\frac{\int -\frac{x(9(ef+dg)xc^2+2(9dfc^2+2eg))}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$\Big\downarrow$ 25

$$-\frac{1}{6}bc\left(\frac{\int \frac{x(9(ef+dg)xc^2+2(9dfc^2+2eg))}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$\Big\downarrow$ 533

$$-\frac{1}{6}bc\left(\frac{\frac{\int \frac{c^2(9(ef+dg)+4(9dfc^2+2eg)x)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}(dg+ef)}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$\Big\downarrow$ 27

$$-\frac{1}{6}bc\left(\frac{\frac{1}{2}\int \frac{9(ef+dg)+4(9dfc^2+2eg)x}{\sqrt{1-c^2x^2}}dx-\frac{9}{2}x\sqrt{1-c^2x^2}(dg+ef)}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$\Big\downarrow$ 455

$$-\frac{1}{6}bc\left(\frac{\frac{1}{2}\left(9(dg+ef)\int \frac{1}{\sqrt{1-c^2x^2}}dx-4\sqrt{1-c^2x^2}\left(\frac{2eg}{c^2}+9df\right)\right)-\frac{9}{2}x\sqrt{1-c^2x^2}(dg+ef)}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))$$

$\Big\downarrow$ 223

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{3}egx^3(a+b\arcsin(cx))-\frac{1}{6}bc\left(\frac{\frac{1}{2}\left(\frac{9\arcsin(cx)(dg+ef)}{c}-4\sqrt{1-c^2x^2}\left(\frac{2eg}{c^2}+9df\right)\right)-\frac{9}{2}x\sqrt{1-c^2x^2}(dg+ef)}{3c^2}-\frac{2egx^2\sqrt{1-c^2x^2}}{3c^2}\right)$$

input
```
Int[(d + e*x)*(f + g*x)*(a + b*ArcSin[c*x]),x]
```

3.90. $\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$

output
```
d*f*x*(a + b*ArcSin[c*x]) + ((e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + (e*g
*x^3*(a + b*ArcSin[c*x]))/3 - (b*c*((-2*e*g*x^2*Sqrt[1 - c^2*x^2])/(3*c^2)
 + ((-9*(e*f + d*g)*x*Sqrt[1 - c^2*x^2])/2 + (-4*(9*d*f + (2*e*g)/c^2)*Sqr
t[1 - c^2*x^2] + (9*(e*f + d*g)*ArcSin[c*x])/c)/2)/(3*c^2)))/6
```

### 3.90.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

### 3.90.4 Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.20

| method | result |
|---|---|
| parts | $a\left(\frac{eg\,x^3}{3}+\frac{(dg+ef)x^2}{2}+dfx\right)+\frac{b\left(\frac{c\arcsin(cx)eg\,x^3}{3}+\frac{c\arcsin(cx)x^2dg}{2}+\frac{c\arcsin(cx)x^2ef}{2}+\arcsin(cx)dfcx-\frac{2eg\left(-\right.}{}\right.}{}$ |
| derivativedivides | $\frac{\frac{a\left(\frac{eg\,c^3x^3}{3}+\frac{(dcg+ecf)c^2x^2}{2}+d\,c^3fx\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)eg\,c^3x^3}{3}+\frac{\arcsin(cx)c^3dg\,x^2}{2}+\frac{\arcsin(cx)c^3ef\,x^2}{2}+\arcsin(cx)d\,c^3fx-\frac{eg\left(-\frac{c^2}{}\right.}{}\right.}{}}{c}$ |
| default | $\frac{\frac{a\left(\frac{eg\,c^3x^3}{3}+\frac{(dcg+ecf)c^2x^2}{2}+d\,c^3fx\right)}{c^2}+\frac{b\left(\frac{\arcsin(cx)eg\,c^3x^3}{3}+\frac{\arcsin(cx)c^3dg\,x^2}{2}+\frac{\arcsin(cx)c^3ef\,x^2}{2}+\arcsin(cx)d\,c^3fx-\frac{eg\left(-\frac{c^2}{}\right.}{}\right.}{}}{c}$ |

input
```
int((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/3*e*g*x^3+1/2*(d*g+e*f)*x^2+d*f*x)+b/c*(1/3*c*arcsin(c*x)*e*g*x^3+1/2
*c*arcsin(c*x)*x^2*d*g+1/2*c*arcsin(c*x)*x^2*e*f+arcsin(c*x)*d*f*c*x-1/6/c
^2*(2*e*g*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))-6*d*c^2
*f*(-c^2*x^2+1)^(1/2)+(3*c*d*g+3*c*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*a
rcsin(c*x))))
```

### 3.90.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.09

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$$
$$=\frac{12\,ac^3egx^3+36\,ac^3dfx+18\,(ac^3ef+ac^3dg)x^2+3\,(4\,bc^3egx^3+12\,bc^3dfx-3\,bcef-3\,bcdg+6\,(bc^3ef+}{36\,c^3}$$

input
```
integrate((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/36*(12*a*c^3*e*g*x^3 + 36*a*c^3*d*f*x + 18*(a*c^3*e*f + a*c^3*d*g)*x^2 +
 3*(4*b*c^3*e*g*x^3 + 12*b*c^3*d*f*x - 3*b*c*e*f - 3*b*c*d*g + 6*(b*c^3*e*
f + b*c^3*d*g)*x^2)*arcsin(c*x) + (4*b*c^2*e*g*x^2 + 36*b*c^2*d*f + 8*b*e*
g + 9*(b*c^2*e*f + b*c^2*d*g)*x)*sqrt(-c^2*x^2 + 1))/c^3
```

### 3.90.6 Sympy [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.80

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} adfx + \frac{adgx^2}{2} + \frac{aefx^2}{2} + \frac{aegx^3}{3} + bdfx\operatorname{asin}(cx) + \frac{bdgx^2\operatorname{asin}(cx)}{2} + \frac{befx^2\operatorname{asin}(cx)}{2} + \frac{begx^3\operatorname{asin}(cx)}{3} + \frac{bdf\sqrt{-c^2x^2+1}}{c} + \\ a\left(dfx + \frac{dgx^2}{2} + \frac{efx^2}{2} + \frac{egx^3}{3}\right) \end{cases}$$

input
```
integrate((e*x+d)*(g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d*f*x + a*d*g*x**2/2 + a*e*f*x**2/2 + a*e*g*x**3/3 + b*d*f*x*
asin(c*x) + b*d*g*x**2*asin(c*x)/2 + b*e*f*x**2*asin(c*x)/2 + b*e*g*x**3*a
sin(c*x)/3 + b*d*f*sqrt(-c**2*x**2 + 1)/c + b*d*g*x*sqrt(-c**2*x**2 + 1)/(
4*c) + b*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*e*g*x**2*sqrt(-c**2*x**2 + 1
)/(9*c) - b*d*g*asin(c*x)/(4*c**2) - b*e*f*asin(c*x)/(4*c**2) + 2*b*e*g*sq
rt(-c**2*x**2 + 1)/(9*c**3), Ne(c, 0)), (a*(d*f*x + d*g*x**2/2 + e*f*x**2/
2 + e*g*x**3/3), True))
```

### 3.90.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.34

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{3}\,aegx^3 + \frac{1}{2}\,aefx^2 + \frac{1}{2}\,adgx^2 + \frac{1}{4}\left(2\,x^2\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin\left(cx\right)}{c^3}\right)\right)bef + \frac{1}{4}\left(2\,x^2\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin\left(cx\right)}{c^3}\right)\right)bdg + \frac{1}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)beg + adfx + \frac{\left(cx\arcsin\left(cx\right) + \sqrt{-c^2x^2+1}\right)bdf}{c}$$

input
```
integrate((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/3*a*e*g*x^3 + 1/2*a*e*f*x^2 + 1/2*a*d*g*x^2 + 1/4*(2*x^2*arcsin(c*x) + c
*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*e*f + 1/4*(2*x^2*arcsin(c
*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*g + 1/9*(3*x^3*a
rcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*
e*g + a*d*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*f/c
```

### 3.90.8 Giac [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.75

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \frac{1}{3}\,aegx^3 + bdfx\arcsin(cx) + adfx + \frac{(c^2x^2-1)begx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}befx}{4\,c} + \frac{\sqrt{-c^2x^2+1}bdgx}{4\,c} + \frac{(c^2x^2-1)bef\arcsin(cx)}{2\,c^2} + \frac{(c^2x^2-1)bdg\arcsin(cx)}{2\,c^2} + \frac{begx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}bdf}{c} + \frac{(c^2x^2-1)aef}{2\,c^2} + \frac{(c^2x^2-1)adg}{2\,c^2} + \frac{bef\arcsin(cx)}{4\,c^2} + \frac{bdg\arcsin(cx)}{4\,c^2} - \frac{(-c^2x^2+1)^{\frac{3}{2}}beg}{9\,c^3} + \frac{\sqrt{-c^2x^2+1}beg}{3\,c^3}$$

input
```
integrate((e*x+d)*(g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/3*a*e*g*x^3 + b*d*f*x*arcsin(c*x) + a*d*f*x + 1/3*(c^2*x^2 - 1)*b*e*g*x*
arcsin(c*x)/c^2 + 1/4*sqrt(-c^2*x^2 + 1)*b*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1
)*b*d*g*x/c + 1/2*(c^2*x^2 - 1)*b*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*
b*d*g*arcsin(c*x)/c^2 + 1/3*b*e*g*x*arcsin(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b
*d*f/c + 1/2*(c^2*x^2 - 1)*a*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d*g/c^2 + 1/4*b
*e*f*arcsin(c*x)/c^2 + 1/4*b*d*g*arcsin(c*x)/c^2 - 1/9*(-c^2*x^2 + 1)^(3/2
)*b*e*g/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*e*g/c^3
```

### 3.90.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx = \begin{cases} \frac{a\,x^2\,(d\,g+e\,f)}{2} + a\,d\,f\,x + b\,e\,g\left(\frac{\sqrt{\frac{1}{c^2}-x^2}\,\left(\frac{2}{c^2}+x^2\right)}{9} + \frac{x^3\,\mathrm{asin}(c\,x)}{3}\right) + \frac{a\,e\,g\,x^3}{3} + \frac{b\,d\,f\,\left(\sqrt{1-c^2\,x^2}+c\,x\,\mathrm{asin}(c\,x)\right)}{c} + \frac{b\,d\,g\,\left(\ldots\right.}{\ldots} \\ \int (f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)\,(d+e\,x)\,dx \end{cases}$$

input
```
int((f + g*x)*(a + b*asin(c*x))*(d + e*x),x)
```

output
```
piecewise(0 < c, (a*x^2*(d*g + e*f))/2 + a*d*f*x + b*e*g*(((1/c^2 - x^2)^(
1/2)*(2/c^2 + x^2))/9 + (x^3*asin(c*x))/3) + (a*e*g*x^3)/3 + (b*d*f*((- c^
2*x^2 + 1)^(1/2) + c*x*asin(c*x)))/c + (b*d*g*((asin(c*x)*(2*c^2*x^2 - 1))
/4 + (c*x*(- c^2*x^2 + 1)^(1/2))/4))/c^2 + (b*e*f*((asin(c*x)*(2*c^2*x^2 -
 1))/4 + (c*x*(- c^2*x^2 + 1)^(1/2))/4))/c^2, ~0 < c, int((f + g*x)*(a + b
*asin(c*x))*(d + e*x), x))
```

## 3.90. $\int (d+ex)(f+gx)(a+b\arcsin(cx))\,dx$

# 3.91 $\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx$



## 3.91.1 Optimal result

Integrand size = 21, antiderivative size = 344

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx &= \frac{bg\sqrt{1-c^2x^2}}{ce}-\frac{ib(ef-dg)\arcsin(cx)^2}{2e^2}\\&\quad+\frac{gx(a+b\arcsin(cx))}{e}\\&\quad+\frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2}\\&\quad+\frac{b(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2}\\&\quad-\frac{b(ef-dg)\arcsin(cx)\log(d+ex)}{e^2}\\&\quad+\frac{(ef-dg)(a+b\arcsin(cx))\log(d+ex)}{e^2}\\&\quad-\frac{ib(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2}\\&\quad-\frac{ib(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2}\end{aligned}$$

output
```
-1/2*I*b*(-d*g+e*f)*arcsin(c*x)^2/e^2+g*x*(a+b*arcsin(c*x))/e-b*(-d*g+e*f)
*arcsin(c*x)*ln(e*x+d)/e^2+(-d*g+e*f)*(a+b*arcsin(c*x))*ln(e*x+d)/e^2+b*(-
d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2
)^(1/2)))/e^2+b*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))
/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2-I*b*(-d*g+e*f)*polylog(2,I*e*(I*c*x+(-c^2*
x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2-I*b*(-d*g+e*f)*polylog(2,I*e*
(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2+b*g*(-c^2*x^2+1)
^(1/2)/c/e
```

### 3.91.2 Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 322, normalized size of antiderivative = 0.94

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx$$
$$= \frac{\frac{beg\sqrt{1-c^2x^2}}{c} - \frac{1}{2}ib(ef-dg)\arcsin(cx)^2 + egx(a+b\arcsin(cx)) + b(ef-dg)\arcsin(cx)\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-}}\right.}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
((b*e*g*Sqrt[1 - c^2*x^2])/c - (I/2)*b*(e*f - d*g)*ArcSin[c*x]^2 + e*g*x*(
a + b*ArcSin[c*x]) + b*(e*f - d*g)*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*
x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + b*(e*f - d*g)*ArcSin[c*x]*Log[1 - (
I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - b*(e*f - d*g)*ArcSin
[c*x]*Log[d + e*x] + (e*f - d*g)*(a + b*ArcSin[c*x])*Log[d + e*x] - I*b*(e
*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])]
- I*b*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 -
 e^2])])/e^2
```

### 3.91.3 Rubi [A] (verified)

Time = 0.92 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx$$

$$\Big\downarrow \text{ 5252}$$

$$-bc\int \frac{egx+(ef-dg)\log(d+ex)}{e^2\sqrt{1-c^2x^2}}dx+\frac{(ef-dg)\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{gx(a+b\arcsin(cx))}{e}$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{bc\int \frac{egx+(ef-dg)\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{e^2}+\frac{(ef-dg)\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{gx(a+b\arcsin(cx))}{e}$$

$$\Big\downarrow \text{ 7293}$$

$$-\frac{bc\int \left(\frac{egx}{\sqrt{1-c^2x^2}}+\frac{(ef-dg)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{e^2}+\frac{(ef-dg)\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{gx(a+b\arcsin(cx))}{e}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{(ef-dg)\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{gx(a+b\arcsin(cx))}{e}-\frac{bc\left(\frac{i(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{i(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{\arcsin(cx)(ef-dg)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{\arcsin(cx}{}}{e^2}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
(g*x*(a + b*ArcSin[c*x]))/e + ((e*f - d*g)*(a + b*ArcSin[c*x])*Log[d + e*x
])/e^2 - (b*c*(-((e*g*Sqrt[1 - c^2*x^2])/c^2) + ((I/2)*(e*f - d*g)*ArcSin[
c*x]^2)/c - ((e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d
- Sqrt[c^2*d^2 - e^2])])/c - ((e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*Ar
cSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + ((e*f - d*g)*ArcSin[c*x]*Log
[d + e*x])/c + (I*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sq
rt[c^2*d^2 - e^2])])/c + (I*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))
/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/e^2
```

## 3.91. $\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx$

#### 3.91.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.91.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1565 vs. $2(357) = 714$.

Time = 1.90 (sec) , antiderivative size = 1566, normalized size of antiderivative = 4.55

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 1566 |
| derivativedivides | Expression too large to display | 1584 |
| default | Expression too large to display | 1584 |

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

output
```
a*(g/e*x+(-d*g+e*f)/e^2*ln(e*x+d))+I*b*c^2/e^2*d^3*g/(c^2*d^2-e^2)*dilog((
I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+
e^2)^(1/2)))+b*g*(-c^2*x^2+1)^(1/2)/c/e-I*b*d*g/(c^2*d^2-e^2)*dilog((I*d*c
+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^
(1/2)))+I*b*c^2/e^2*d^3*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(
1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c^2/e*f*arcs
in(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2
)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+b*c^2/e*f*arcsin(c*x)/(c^2*d^2-
e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(
-c^2*d^2+e^2)^(1/2)))*d^2-b*c^2/e^2*d^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*
d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^
2)^(1/2)))-b*c^2/e^2*d^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^
2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-1/2*
I*b*arcsin(c*x)^2/e*f+I*b*e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+
1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-I*b*c^2/e*
f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(
1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+b*d*g*arcsin(c*x)/(c^2*d^2-e^2)*ln
((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^
2+e^2)^(1/2)))-b*e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+
1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*e*f*a...
```

### 3.91.5 Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="fricas")
```

output
```
integral((a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(e*x + d), x)
```

### 3.91.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{d+ex}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x), x)
```

### 3.91.7 Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxima")
```

output
```
a*g*(x/e - d*log(e*x + d)/e^2) + a*f*log(e*x + d)/e + integrate((b*g*x + b
*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x)
```

### 3.91.8 Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac")
```

output
```
integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d), x)
```

### 3.91.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{d+e\,x}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x),x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x), x)
```

# 3.92 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$



## 3.92.1 Optimal result

Integrand size = 21, antiderivative size = 358

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = & -\frac{ibg\arcsin(cx)^2}{2e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)} \\ & +\frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\ & +\frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} \\ & +\frac{bg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2} \\ & -\frac{bg\arcsin(cx)\log(d+ex)}{e^2} \\ & +\frac{g(a+b\arcsin(cx))\log(d+ex)}{e^2} \\ & -\frac{ibg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2} \\ & -\frac{ibg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2}\end{aligned}$$

output
```
-1/2*I*b*g*arcsin(c*x)^2/e^2-(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)-b*g*
arcsin(c*x)*ln(e*x+d)/e^2+g*(a+b*arcsin(c*x))*ln(e*x+d)/e^2+b*g*arcsin(c*x
)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2+b*g*a
rcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/
e^2-I*b*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2
)))/e^2-I*b*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^
(1/2)))/e^2+b*c*(-d*g+e*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^
2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(1/2)
```

### 3.92.2 Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 334, normalized size of antiderivative = 0.93

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$

$$= \frac{-\frac{1}{2}ibg\arcsin(cx)^2 - \frac{(ef-dg)(a+b\arcsin(cx))}{d+ex} + \frac{bc(ef-dg)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}} + bg\arcsin(cx)\log\left(1+\frac{iee^{i\arcsin}}{-cd+\sqrt{c^2}}\right.}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
((-1/2*I)*b*g*ArcSin[c*x]^2 - ((e*f - d*g)*(a + b*ArcSin[c*x]))/(d + e*x)
+ (b*c*(e*f - d*g)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*
x^2])])/Sqrt[c^2*d^2 - e^2] + b*g*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*x
]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + b*g*ArcSin[c*x]*Log[1 - (I*e*E^(I*Ar
cSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - b*g*ArcSin[c*x]*Log[d + e*x] +
g*(a + b*ArcSin[c*x])*Log[d + e*x] - I*b*g*PolyLog[2, (I*e*E^(I*ArcSin[c*x
]))/(c*d - Sqrt[c^2*d^2 - e^2])] - I*b*g*PolyLog[2, (I*e*E^(I*ArcSin[c*x])
)/(c*d + Sqrt[c^2*d^2 - e^2])])/e^2
```

### 3.92.3 Rubi [A] (verified)

Time = 1.52 (sec) , antiderivative size = 354, normalized size of antiderivative = 0.99, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {5252, 25, 27, 7292, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$

$$\Big\downarrow \text{ 5252}$$

$$-bc\int -\frac{ef-dg-g(d+ex)\log(d+ex)}{e^2(d+ex)\sqrt{1-c^2x^2}}dx-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 25}$$

$$bc\int \frac{ef-dg-g(d+ex)\log(d+ex)}{e^2(d+ex)\sqrt{1-c^2x^2}}dx-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{bc\int \frac{ef-dg-g(d+ex)\log(d+ex)}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 7292}$$

$$\frac{bc\int \frac{ef\left(1-\frac{dg}{ef}\right)-g(d+ex)\log(d+ex)}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 7293}$$

$$\frac{bc\int \left(\frac{ef-dg}{(d+ex)\sqrt{1-c^2x^2}}-\frac{g\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{ 2009}$$

$$-\frac{(ef-dg)(a+b\arcsin(cx))}{e^2(d+ex)}+\frac{g\log(d+ex)(a+b\arcsin(cx))}{e^2}+\frac{bc\left(-\frac{ig\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{ig\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{g\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{g\arcsin(cx)\log\left(1-\frac{iee^{i\arcsi}}{\sqrt{c^2d^2-e}}\right.}{c}\right.}{e^2}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

3.92. $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$

output
```
-(((e*f - d*g)*(a + b*ArcSin[c*x]))/(e^2*(d + e*x))) + (g*(a + b*ArcSin[c*
x])*Log[d + e*x])/e^2 + (b*c*(((-1/2*I)*g*ArcSin[c*x]^2)/c + ((e*f - d*g)*
ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^
2 - e^2] + (g*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*
d^2 - e^2])])/c + (g*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sq
rt[c^2*d^2 - e^2])])/c - (g*ArcSin[c*x]*Log[d + e*x])/c - (I*g*PolyLog[2,
(I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - (I*g*PolyLog[2,
(I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/e^2
```

#### 3.92.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.92.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 953 vs. $2(367) = 734$.

Time = 2.27 (sec) , antiderivative size = 954, normalized size of antiderivative = 2.66

| method | result |
|---|---|
| derivativedivides | $\frac{ac\left(\frac{g\ln(cex+dc)}{e^2}+\frac{c(dg-ef)}{e^2(cex+dc)}\right)+bc\left(-\frac{ig\arcsin(cx)^2}{2e^2}+\frac{(dg-ef)\arcsin(cx)c}{e^2(cex+dc)}+\frac{ig\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e+\sqrt{-c^2d^2+e^2}}{idc+\sqrt{-c^2d^2+e^2}}\right)}{c^2d^2-e^2}\right.}{}$ |
| default | $\frac{ac\left(\frac{g\ln(cex+dc)}{e^2}+\frac{c(dg-ef)}{e^2(cex+dc)}\right)+bc\left(-\frac{ig\arcsin(cx)^2}{2e^2}+\frac{(dg-ef)\arcsin(cx)c}{e^2(cex+dc)}+\frac{ig\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e+\sqrt{-c^2d^2+e^2}}{idc+\sqrt{-c^2d^2+e^2}}\right)}{c^2d^2-e^2}\right.}{}$ |
| parts | $a\left(-\frac{-dg+ef}{e^2(ex+d)}+\frac{g\ln(ex+d)}{e^2}\right)+\frac{b\left(-\frac{ic\arcsin(cx)^2g}{2e^2}+\frac{(dg-ef)\arcsin(cx)c^2}{e^2(cex+dc)}-\frac{ic^3g\,\mathrm{dilog}\left(\frac{idc+\left(icx+\sqrt{-c^2x^2+1}\right)e-\sqrt{-c}}{idc-\sqrt{-c^2d^2+e^2}}\right.}{e^2\left(c^2d^2-e^2\right)}\right.}{}$ |

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(a*c*(g/e^2*ln(c*e*x+c*d)+c*(d*g-e*f)/e^2/(c*e*x+c*d))+b*c*(-1/2*I*g*a
rcsin(c*x)^2/e^2+(d*g-e*f)*arcsin(c*x)*c/e^2/(c*e*x+c*d)+I*g/(c^2*d^2-e^2)
*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-
c^2*d^2+e^2)^(1/2)))-I/e^2*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1
)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*c^2*d^2-2*I
/e*c*f/(c^2*d^2-e^2)^(1/2)*arctanh(1/2*(2*I*e*(I*c*x+(-c^2*x^2+1)^(1/2))-2
*d*c)/(c^2*d^2-e^2)^(1/2))+1/e^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*
c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2
)))*c^2*d^2+1/e^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1
)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*c^2*d^2-g*a
rcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+
e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-g*arcsin(c*x)/(c^2*d^2-e^2)*ln((
I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+
e^2)^(1/2)))+2*I/e^2*c*d*g/(c^2*d^2-e^2)^(1/2)*arctanh(1/2*(2*I*e*(I*c*x+(
-c^2*x^2+1)^(1/2))-2*d*c)/(c^2*d^2-e^2)^(1/2))+I*g/(c^2*d^2-e^2)*dilog((I*
d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^
2)^(1/2)))-I/e^2*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e
+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*c^2*d^2))
```

### 3.92.5 Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)}{(ex+d)^2}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fricas")
```

output
```
integral((a*g*x + a*f + (b*g*x + b*f)*arcsin(c*x))/(e^2*x^2 + 2*d*e*x + d^
2), x)
```

### 3.92.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\operatorname{asin}{(cx)})(f+gx)}{(d+ex)^2}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**2, x)
```

### 3.92.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.92.8 Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^2}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="giac")
```

output
```
integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^2, x)
```

### 3.92.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d+e\,x)^2}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^2,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^2, x)
```

# 3.93 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$



## 3.93.1 Optimal result

Integrand size = 21, antiderivative size = 202

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{2e\left(c^2d^2-e^2\right)(d+ex)} + \frac{bg^2\arcsin(cx)}{2e^2(ef-dg)} - \frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2} - \frac{bc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^2\left(c^2d^2-e^2\right)^{3/2}}$$

output
```
1/2*b*g^2*arcsin(c*x)/e^2/(-d*g+e*f)-1/2*(g*x+f)^2*(a+b*arcsin(c*x))/(-d*g
+e*f)/(e*x+d)^2-1/2*b*c*(2*e^2*g-c^2*d*(d*g+e*f))*arctan((c^2*d*x+e)/(c^2*
d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(3/2)+1/2*b*c*(-d*g+e
*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)
```

## 3.93.2 Mathematica [A] (verified)

Time = 0.74 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.30

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \frac{\frac{a(-ef+dg)}{(d+ex)^2} - \frac{2ag}{d+ex} - \frac{bce(ef-dg)\sqrt{1-c^2x^2}}{(-c^2d^2+e^2)(d+ex)} - \frac{b(dg+e(f+2gx))\arcsin(cx)}{(d+ex)^2} + \frac{bc(-2e^2g+c^2d(ef+dg))\log(d+ex)}{(cd-e)(cd+e)\sqrt{-c^2d^2+e^2}} + \frac{bc(-2e^2g+c^2d(ef+\cdots}{(-\cdots}}{2e^2}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
((a*(-(e*f) + d*g))/(d + e*x)^2 - (2*a*g)/(d + e*x) - (b*c*e*(e*f - d*g)*S
qrt[1 - c^2*x^2])/((-(c^2*d^2) + e^2)*(d + e*x)) - (b*(d*g + e*(f + 2*g*x)
)*ArcSin[c*x])/(d + e*x)^2 + (b*c*(-2*e^2*g + c^2*d*(e*f + d*g))*Log[d + e
*x])/((c*d - e)*(c*d + e)*Sqrt[-(c^2*d^2) + e^2]) + (b*c*(-2*e^2*g + c^2*d
*(e*f + d*g))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])
/((-(c*d) + e)*(c*d + e)*Sqrt[-(c^2*d^2) + e^2]))/(2*e^2)
```

### 3.93.3 Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.18, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {5252, 27, 715, 719, 223, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}dx$$

$$\Big\downarrow \text{ 5252}$$

$$-bc\int -\frac{(f+gx)^2}{2(ef-dg)(d+ex)^2\sqrt{1-c^2x^2}}dx-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{bc\int \frac{(f+gx)^2}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{ 715}$$

$$\frac{bc\left(\frac{\int \frac{c^2df^2-g(2ef-dg)+\left(\frac{c^2d^2}{e}-e\right)g^2x}{(d+ex)\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{ 719}$$

$$\frac{bc\left(\frac{\frac{g^2(cd-e)(cd+e)\int \frac{1}{\sqrt{1-c^2x^2}}dx}{e^2}-\frac{(ef-dg)\left(2e^2g-c^2d(dg+ef)\right)\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^2}}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{223}$$

$$\frac{bc\left(\frac{\frac{g^2\arcsin(cx)(cd-e)(cd+e)}{ce^2}-\frac{(ef-dg)\left(2e^2g-c^2d(dg+ef)\right)\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}dx}{e^2}}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{488}$$

$$\frac{bc\left(\frac{\frac{(ef-dg)\left(2e^2g-c^2d(dg+ef)\right)\int \frac{1}{-c^2d^2+e^2-\frac{\left(dxc^2+e\right)^2}{1-c^2x^2}}d\frac{dxc^2+e}{\sqrt{1-c^2x^2}}}{e^2}+\frac{g^2\arcsin(cx)(cd-e)(cd+e)}{ce^2}}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{217}$$

$$\frac{bc\left(\frac{\frac{g^2\arcsin(cx)(cd-e)(cd+e)}{ce^2}-\frac{(ef-dg)\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)\left(2e^2g-c^2d(dg+ef)\right)}{e^2\sqrt{c^2d^2-e^2}}}{c^2d^2-e^2}+\frac{\sqrt{1-c^2x^2}(ef-dg)^2}{e(c^2d^2-e^2)(d+ex)}\right)}{2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))}{2(d+ex)^2(ef-dg)}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
-1/2*((f + g*x)^2*(a + b*ArcSin[c*x]))/((e*f - d*g)*(d + e*x)^2) + (b*c*((
(e*f - d*g)^2*Sqrt[1 - c^2*x^2])/(e*(c^2*d^2 - e^2)*(d + e*x)) + (((c*d -
e)*(c*d + e)*g^2*ArcSin[c*x])/(c*e^2) - ((e*f - d*g)*(2*e^2*g - c^2*d*(e*f
 + d*g))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e
^2*Sqrt[c^2*d^2 - e^2]))/(c^2*d^2 - e^2)))/(2*(e*f - d*g))
```

## 3.93. $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

### 3.93.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 715
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_) + (c_.)*(x_)^
2)^(p_), x_Symbol] :> With[{Q = PolynomialQuotient[(f + g*x)^n, d + e*x, x]
, R = PolynomialRemainder[(f + g*x)^n, d + e*x, x]}, Simp[(e*R*(d + e*x)^(m
 + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + Simp[1/((m + 1)*
(c*d^2 + a*e^2))   Int[(d + e*x)^(m + 1)*(a + c*x^2)^p*ExpandToSum[(m + 1)*
(c*d^2 + a*e^2)*Q + c*d*R*(m + 1) - c*e*R*(m + 2*p + 3)*x, x], x], x]] /; F
reeQ[{a, c, d, e, f, g, p}, x] && IGtQ[n, 1] && ILtQ[m, -1] && NeQ[c*d^2 +
a*e^2, 0] && (NeQ[m + n, 0] || EqQ[p, -2^(-1)])
```

rule 719
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] +
Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c,
d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

### 3.93.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 534 vs. $2(186) = 372$.

Time = 2.56 (sec) , antiderivative size = 535, normalized size of antiderivative = 2.65

| method | result |
|---|---|
| parts | $a\left(-\frac{g}{e^{2}(ex+d)}-\frac{-dg+ef}{2e^{2}(ex+d)^{2}}\right)+\frac{b\left(\frac{c^{3}\arcsin(cx)dg}{2e^{2}(cex+dc)^{2}}-\frac{c^{3}\arcsin(cx)f}{2e(cex+dc)^{2}}-\frac{c^{2}\arcsin(cx)g}{e^{2}(cex+dc)}+\frac{c^{2}\left(-\frac{2g\ln\left(-\frac{2\left(c^{2}d^{2}-e^{2}\right)}{e^{2}}+\frac{2dc \cdots}{\cdots}\right)}{\cdots}\cdots\right)}{\cdots}\cdots\right)}{\cdots}$ |
| derivativedivides | $\frac{a\,c^{2}\left(\frac{c(dg-ef)}{2e^{2}(cex+dc)^{2}}-\frac{g}{e^{2}(cex+dc)}\right)+b\,c^{2}\left(\frac{\arcsin(cx)cdg}{2e^{2}(cex+dc)^{2}}-\frac{\arcsin(cx)cf}{2e(cex+dc)^{2}}-\frac{\arcsin(cx)g}{e^{2}(cex+dc)}+\frac{-\frac{2g\ln\left(-\frac{2\left(c^{2}d^{2}-e^{2}\right)}{e^{2}}+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}+\cdots\right)}{\cdots}\cdots}{\cdots}\cdots\right)}{\cdots}$ |
|  | $a\,c^{2}\left(\frac{c(dg-ef)}{2e^{2}(cex+dc)^{2}}-\frac{g}{e^{2}(cex+dc)}\right)+b\,c^{2}\left(\frac{\arcsin(cx)cdg}{2e^{2}(cex+dc)^{2}}-\frac{\arcsin(cx)cf}{2e(cex+dc)^{2}}-\frac{\arcsin(cx)g}{e^{2}(cex+dc)}+\frac{-\frac{2g\ln\left(-\frac{2\left(c^{2}d^{2}-e^{2}\right)}{e^{2}}+\frac{2dc\left(cx+\frac{dc}{e}\right)}{e}+\cdots\right)}{\cdots}\cdots}{\cdots}\cdots\right)$ |

3.93. $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^{3}}\,dx$

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
a*(-g/e^2/(e*x+d)-1/2*(-d*g+e*f)/e^2/(e*x+d)^2)+b/c*(1/2*c^3*arcsin(c*x)/e
^2/(c*e*x+c*d)^2*d*g-1/2*c^3*arcsin(c*x)/e/(c*e*x+c*d)^2*f-c^2*arcsin(c*x)
*g/e^2/(c*e*x+c*d)+1/2*c^2/e^2*(-2*g/e/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(
c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d
*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))-c*(d*g-
e*f)/e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c
/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2
)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2
)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e
)))))
```

### 3.93.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 578 vs. $2(185) = 370$.

Time = 3.24 (sec) , antiderivative size = 1184, normalized size of antiderivative = 5.86

$$\int \frac{(f + gx)(a + b \arcsin(cx))}{(d + ex)^3} \, dx = \text{Too large to display}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fricas")
```

output
```
[-1/4*(4*(a*c^4*d^4*e - 2*a*c^2*d^2*e^3 + a*e^5)*g*x + (b*c^3*d^3*e*f + (b
*c^3*d*e^3*f + (b*c^3*d^2*e^2 - 2*b*c*e^4)*g)*x^2 + (b*c^3*d^4 - 2*b*c*d^2
*e^2)*g + 2*(b*c^3*d^2*e^2*f + (b*c^3*d^3*e - 2*b*c*d*e^3)*g)*x)*sqrt(-c^2
*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 - 2*sqr
t(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d
*e*x + d^2)) + 2*(a*c^4*d^4*e - 2*a*c^2*d^2*e^3 + a*e^5)*f + 2*(a*c^4*d^5
- 2*a*c^2*d^3*e^2 + a*d*e^4)*g + 2*(2*(b*c^4*d^4*e - 2*b*c^2*d^2*e^3 + b*e
^5)*g*x + (b*c^4*d^4*e - 2*b*c^2*d^2*e^3 + b*e^5)*f + (b*c^4*d^5 - 2*b*c^2
*d^3*e^2 + b*d*e^4)*g)*arcsin(c*x) - 2*sqrt(-c^2*x^2 + 1)*((b*c^3*d^3*e^2
- b*c*d*e^4)*f - (b*c^3*d^4*e - b*c*d^2*e^3)*g + ((b*c^3*d^2*e^3 - b*c*e^5
)*f - (b*c^3*d^3*e^2 - b*c*d*e^4)*g)*x))/(c^4*d^6*e^2 - 2*c^2*d^4*e^4 + d^
2*e^6 + (c^4*d^4*e^4 - 2*c^2*d^2*e^6 + e^8)*x^2 + 2*(c^4*d^5*e^3 - 2*c^2*d
^3*e^5 + d*e^7)*x), -1/2*(2*(a*c^4*d^4*e - 2*a*c^2*d^2*e^3 + a*e^5)*g*x -
(b*c^3*d^3*e*f + (b*c^3*d*e^3*f + (b*c^3*d^2*e^2 - 2*b*c*e^4)*g)*x^2 + (b*
c^3*d^4 - 2*b*c*d^2*e^2)*g + 2*(b*c^3*d^2*e^2*f + (b*c^3*d^3*e - 2*b*c*d*e
^3)*g)*x)*sqrt(c^2*d^2 - e^2)*arctan(sqrt(c^2*d^2 - e^2)*(c^2*d*x + e)*sqr
t(-c^2*x^2 + 1)/(c^2*d^2 - (c^4*d^2 - c^2*e^2)*x^2 - e^2)) + (a*c^4*d^4*e
- 2*a*c^2*d^2*e^3 + a*e^5)*f + (a*c^4*d^5 - 2*a*c^2*d^3*e^2 + a*d*e^4)*g +
 (2*(b*c^4*d^4*e - 2*b*c^2*d^2*e^3 + b*e^5)*g*x + (b*c^4*d^4*e - 2*b*c^2*d
^2*e^3 + b*e^5)*f + (b*c^4*d^5 - 2*b*c^2*d^3*e^2 + b*d*e^4)*g)*arcsin(c...
```

### 3.93.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{(d+ex)^3}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**3, x)
```

### 3.93.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.93.8 Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^3}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="giac")
```

output
```
integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^3, x)
```

### 3.93.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(f+g\,x)\,(a+b\,\mathrm{asin}(c\,x))}{(d+e\,x)^3}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^3,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^3, x)
```

# 3.94 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$



## 3.94.1 Optimal result

Integrand size = 21, antiderivative size = 257

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{6e\left(c^2d^2-e^2\right)(d+ex)^2}+\frac{bc\left(c^2df-eg\right)\sqrt{1-c^2x^2}}{2\left(c^2d^2-e^2\right)^2(d+ex)}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}+\frac{bc^3\left(e^2(ef-4dg)+c^2d^2(2ef+dg)\right)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e^2\left(c^2d^2-e^2\right)^{5/2}}$$

output
```
-1/3*(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)^3-1/2*g*(a+b*arcsin(c*x))/e^
2/(e*x+d)^2+1/6*b*c^3*(e^2*(-4*d*g+e*f)+c^2*d^2*(d*g+2*e*f))*arctan((c^2*d
*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(5/2)+1/6*
b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)^2+1/2*b*c*(c^2*d
*f-e*g)*(-c^2*x^2+1)^(1/2)/(c^2*d^2-e^2)^2/(e*x+d)
```

## 3.94.2 Mathematica [A] (verified)

Time = 0.76 (sec) , antiderivative size = 321, normalized size of antiderivative = 1.25

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \frac{\frac{a(-2ef+2dg)}{(d+ex)^3}-\frac{3ag}{(d+ex)^2}+\frac{bce\sqrt{1-c^2x^2}\left(c^2d\left(4def-d^2g+3e^2fx\right)-e^2(2dg+e(f+3gx))\right)}{\left(-c^2d^2+e^2\right)^2(d+ex)^2}-\frac{b(2ef+dg+3egx)\arcsin(cx)}{(d+ex)^3}+\frac{bc^3\left(e^2(ef-4dg\right.}{(-cd+e)}}{6e^2}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
((a*(-2*e*f + 2*d*g))/(d + e*x)^3 - (3*a*g)/(d + e*x)^2 + (b*c*e*Sqrt[1 -
c^2*x^2]*(c^2*d*(4*d*e*f - d^2*g + 3*e^2*f*x) - e^2*(2*d*g + e*(f + 3*g*x)
)))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (b*(2*e*f + d*g + 3*e*g*x)*ArcSin
[c*x])/(d + e*x)^3 + (b*c^3*(e^2*(e*f - 4*d*g) + c^2*d^2*(2*e*f + d*g))*Lo
g[d + e*x])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]) - (b*c^3*(
e^2*(e*f - 4*d*g) + c^2*d^2*(2*e*f + d*g))*Log[e + c^2*d*x + Sqrt[-(c^2*d^
2) + e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2)
+ e^2]))/(6*e^2)
```

### 3.94.3 Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.05, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {5252, 27, 688, 27, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$

$$\Big\downarrow \; 5252$$

$$-bc\int -\frac{2ef+dg+3egx}{6e^2(d+ex)^3\sqrt{1-c^2x^2}}dx-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$$\Big\downarrow \; 27$$

$$\frac{bc\int \frac{2ef+dg+3egx}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$$\Big\downarrow \; 688$$

$$\frac{bc\left(\frac{\int -\frac{2\left(-d(2ef+dg)c^2+e(ef-dg)xc^2+3e^2g\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}\right)}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$$\Big\downarrow \; 27$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\int \frac{-d(2ef+dg)c^2+e(ef-dg)xc^2+3e^2g}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$$\Big\downarrow \; 679$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}-\frac{-\frac{c^2\left(c^2d^2(dg+2ef)+e^2(ef-4dg)\right)\int \frac{1}{(d+ex)\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}-\frac{3e^2\sqrt{1-c^2x^2}\left(c^2df-eg\right)}{\left(c^2d^2-e^2\right)(d+ex)}}{c^2d^2-e^2}\right)}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$$\Big\downarrow \; 488$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\frac{c^2\left(c^2d^2(dg+2ef)+e^2(ef-4dg)\right)\int \frac{1}{-c^2d^2+e^2-\frac{\left(dxc^2+e\right)^2}{1-c^2x^2}}d\frac{dxc^2+e}{\sqrt{1-c^2x^2}}}{c^2d^2-e^2}-\frac{3e^2\sqrt{1-c^2x^2}\left(c^2df-eg\right)}{\left(c^2d^2-e^2\right)(d+ex)}}{c^2d^2-e^2}\right)}{6e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}$$

$$\Big\downarrow \; 217$$

$$-\frac{(ef-dg)(a+b\arcsin(cx))}{3e^2(d+ex)^3}-\frac{g(a+b\arcsin(cx))}{2e^2(d+ex)^2}+\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^2}-\frac{-\frac{c^2\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)\left(c^2d^2(dg+2ef)+e^2(ef-4dg)\right)}{\left(c^2d^2-e^2\right)^{3/2}}-\frac{3e^2\sqrt{1-c^2x^2}\left(c^2df-eg\right)}{\left(c^2d^2-e^2\right)(d+ex)}}{c^2d^2-e^2}\right)}{6e^2}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
-1/3*((e*f - d*g)*(a + b*ArcSin[c*x]))/(e^2*(d + e*x)^3) - (g*(a + b*ArcSi
n[c*x]))/(2*e^2*(d + e*x)^2) + (b*c*((e*(e*f - d*g)*Sqrt[1 - c^2*x^2])/((c
^2*d^2 - e^2)*(d + e*x)^2) - ((-3*e^2*(c^2*d*f - e*g)*Sqrt[1 - c^2*x^2])/(
(c^2*d^2 - e^2)*(d + e*x)) - (c^2*(e^2*(e*f - 4*d*g) + c^2*d^2*(2*e*f + d*
g))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^
2 - e^2)^(3/2))/(c^2*d^2 - e^2)))/(6*e^2)
```

## 3.94. $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

### 3.94.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

### 3.94.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 907 vs. 2(237) = 474.

Time = 3.43 (sec) , antiderivative size = 908, normalized size of antiderivative = 3.53

| method | result |
|---|---|
| parts | $a\left(-\frac{g}{2e^2(ex+d)^2}-\frac{-dg+ef}{3e^2(ex+d)^3}\right)+\frac{b\left(\frac{c^4\arcsin(cx)dg}{3e^2(cex+dc)^3}-\frac{c^4\arcsin(cx)f}{3e(cex+dc)^3}-\frac{c^3\arcsin(cx)g}{2e^2(cex+dc)^2}+\frac{c^3\left(3g\left(\frac{e^2\sqrt{-\left(cx+\frac{dc}{e}\right)^2+\frac{2dc}{\ldots}}}{\left(c^2d^2-e^2\right)\ldots}\right.\right.}{\ldots}\right.}{\ldots}$ |

3.94. $\int\frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/2*g/e^2/(e*x+d)^2-1/3*(-d*g+e*f)/e^2/(e*x+d)^3)+b/c*(1/3*c^4*arcsin(
c*x)/e^2/(c*e*x+c*d)^3*d*g-1/3*c^4*arcsin(c*x)/e/(c*e*x+c*d)^3*f-1/2*c^3*a
rcsin(c*x)*g/e^2/(c*e*x+c*d)^2+1/6*c^3/e^2*(3*g/e^2*(1/(c^2*d^2-e^2)*e^2/(
c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*
c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*
c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+
d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))-2*c*(d*g-e*f)/e^3*(1/2/(c^2
*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e
^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-
(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-
e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/
e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d
^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^
2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^
2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*
x+d*c/e)))))
```

### 3.94.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 946 vs. $2(237) = 474$.

Time = 16.15 (sec) , antiderivative size = 1920, normalized size of antiderivative = 7.47

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fricas")
```

output
```
[-1/12*(6*(a*c^6*d^6*e - 3*a*c^4*d^4*e^3 + 3*a*c^2*d^2*e^5 - a*e^7)*g*x -
sqrt(-c^2*d^2 + e^2)*(((2*b*c^5*d^2*e^4 + b*c^3*e^6)*f + (b*c^5*d^3*e^3 -
4*b*c^3*d*e^5)*g)*x^3 + 3*((2*b*c^5*d^3*e^3 + b*c^3*d*e^5)*f + (b*c^5*d^4*
e^2 - 4*b*c^3*d^2*e^4)*g)*x^2 + (2*b*c^5*d^5*e + b*c^3*d^3*e^3)*f + (b*c^5
*d^6 - 4*b*c^3*d^4*e^2)*g + 3*((2*b*c^5*d^4*e^2 + b*c^3*d^2*e^4)*f + (b*c^
5*d^5*e - 4*b*c^3*d^3*e^3)*g)*x)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2 -
 c^2*e^2)*x^2 + 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) +
2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 4*(a*c^6*d^6*e - 3*a*c^4*d^4*e^3 + 3*a
*c^2*d^2*e^5 - a*e^7)*f + 2*(a*c^6*d^7 - 3*a*c^4*d^5*e^2 + 3*a*c^2*d^3*e^4
 - a*d*e^6)*g + 2*(3*(b*c^6*d^6*e - 3*b*c^4*d^4*e^3 + 3*b*c^2*d^2*e^5 - b*
e^7)*g*x + 2*(b*c^6*d^6*e - 3*b*c^4*d^4*e^3 + 3*b*c^2*d^2*e^5 - b*e^7)*f +
 (b*c^6*d^7 - 3*b*c^4*d^5*e^2 + 3*b*c^2*d^3*e^4 - b*d*e^6)*g)*arcsin(c*x)
- 2*sqrt(-c^2*x^2 + 1)*(3*((b*c^5*d^3*e^4 - b*c^3*d*e^6)*f - (b*c^3*d^2*e^
5 - b*c*e^7)*g)*x^2 + (4*b*c^5*d^5*e^2 - 5*b*c^3*d^3*e^4 + b*c*d*e^6)*f -
(b*c^5*d^6*e + b*c^3*d^4*e^3 - 2*b*c*d^2*e^5)*g + ((7*b*c^5*d^4*e^3 - 8*b*
c^3*d^2*e^5 + b*c*e^7)*f - (b*c^5*d^5*e^2 + 4*b*c^3*d^3*e^4 - 5*b*c*d*e^6)
*g)*x))/(c^6*d^9*e^2 - 3*c^4*d^7*e^4 + 3*c^2*d^5*e^6 - d^3*e^8 + (c^6*d^6*
e^5 - 3*c^4*d^4*e^7 + 3*c^2*d^2*e^9 - e^11)*x^3 + 3*(c^6*d^7*e^4 - 3*c^4*d
^5*e^6 + 3*c^2*d^3*e^8 - d*e^10)*x^2 + 3*(c^6*d^8*e^3 - 3*c^4*d^6*e^5 + 3*
c^2*d^4*e^7 - d^2*e^9)*x), -1/6*(3*(a*c^6*d^6*e - 3*a*c^4*d^4*e^3 + 3*a...
```

## 3.94.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx)}{(d+ex)^4}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**4,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**4, x)
```

### 3.94.7 Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="maxima")
```

output
```
-1/6*(3*e*x + d)*a*g/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/3
*a*f/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e) - 1/6*((3*b*e*g*x + 2*b
*e*f + b*d*g)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 6*(e^5*x^3 + 3*
d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2)*integrate(1/6*(3*b*c*e*g*x + 2*b*c*e*f
+ b*c*d*g)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x + 1))/(c^4*e^5*x^7 + 3*c^4*d
*e^4*x^6 - 3*c^2*d^2*e^3*x^3 - c^2*d^3*e^2*x^2 + (3*c^4*d^2*e^3 - c^2*e^5)
*x^5 + (c^4*d^3*e^2 - 3*c^2*d*e^4)*x^4 + (c^2*e^5*x^5 + 3*c^2*d*e^4*x^4 -
3*d^2*e^3*x - d^3*e^2 + (3*c^2*d^2*e^3 - e^5)*x^3 + (c^2*d^3*e^2 - 3*d*e^4
)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))/(e^5*x^3 + 3*d*e^4*x^2 + 3*d
^2*e^3*x + d^3*e^2)
```

### 3.94.8 Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="giac")
```

output
```
integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^4, x)
```

### 3.94.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{(d+e\,x)^4}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^4,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^4, x)
```

# 3.95 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$



## 3.95.1 Optimal result

Integrand size = 21, antiderivative size = 360

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx &= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{12e(c^2d^2-e^2)(d+ex)^3}-\frac{bc(4e^2g-c^2d(5ef-dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^2(d+ex)^2}\\&\quad+\frac{bc^3(4e^2(ef-4dg)+c^2d^2(11ef+dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^3(d+ex)}\\&\quad-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}\\&\quad-\frac{bc^3(4e^4g-c^2de^2(9ef-13dg)-2c^4d^3(3ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{24e^2(c^2d^2-e^2)^{7/2}}\end{aligned}$$

output
```
-1/4*(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)^4-1/3*g*(a+b*arcsin(c*x))/e^
2/(e*x+d)^3-1/24*b*c^3*(4*e^4*g-c^2*d*e^2*(-13*d*g+9*e*f)-2*c^4*d^3*(d*g+3
*e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2
*d^2-e^2)^(7/2)+1/12*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*
x+d)^3-1/24*b*c*(4*e^2*g-c^2*d*(-d*g+5*e*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2
-e^2)^2/(e*x+d)^2+1/24*b*c^3*(4*e^2*(-4*d*g+e*f)+c^2*d^2*(d*g+11*e*f))*(-c
^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)^3/(e*x+d)
```

### 3.95.2 Mathematica [A] (verified)

Time = 1.07 (sec) , antiderivative size = 418, normalized size of antiderivative = 1.16

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$$
$$= \frac{\frac{a(-6ef+6dg)}{(d+ex)^4} - \frac{8ag}{(d+ex)^3} - \frac{be\sqrt{1-c^2x^2}\left(c^5d^2\left(-2d^3g+11e^3fx^2+d^2e(18f+gx)+de^2x(27f+gx)\right)+2ce^4(dg+e(f+2gx))-c^3e^2\left(15d^3g-4e^3fx^2\right.\right.}{\left(-c^2d^2+e^2\right)^3(d+ex)^3}}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

output
```
((a*(-6*e*f + 6*d*g))/(d + e*x)^4 - (8*a*g)/(d + e*x)^3 - (b*e*Sqrt[1 - c^
2*x^2]*(c^5*d^2*(-2*d^3*g + 11*e^3*f*x^2 + d^2*e*(18*f + g*x) + d*e^2*x*(2
7*f + g*x)) + 2*c*e^4*(d*g + e*(f + 2*g*x)) - c^3*e^2*(15*d^3*g - 4*e^3*f*
x^2 + 5*d^2*e*(f + 7*g*x) + d*e^2*x*(-3*f + 16*g*x))))/((-(c^2*d^2) + e^2)
^3*(d + e*x)^3) - (2*b*(3*e*f + d*g + 4*e*g*x)*ArcSin[c*x])/(d + e*x)^4 +
(b*c^3*(4*e^4*g - 2*c^4*d^3*(3*e*f + d*g) + c^2*d*e^2*(-9*e*f + 13*d*g))*L
og[d + e*x])/((-(c*d) + e)^3*(c*d + e)^3*Sqrt[-(c^2*d^2) + e^2]) + (b*c^3*
(-4*e^4*g + c^2*d*e^2*(9*e*f - 13*d*g) + 2*c^4*d^3*(3*e*f + d*g))*Log[e +
c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^3*(c*d
+ e)^3*Sqrt[-(c^2*d^2) + e^2]))/(24*e^2)
```

### 3.95.3 Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 382, normalized size of antiderivative = 1.06, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules used = {5252, 27, 688, 27, 688, 25, 27, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$$

$$\Big\downarrow \; 5252$$

$$-bc\int -\frac{3ef+dg+4egx}{12e^2(d+ex)^4\sqrt{1-c^2x^2}}dx - \frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4} - \frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \; 27$$

$$\frac{bc\int \frac{3ef+dg+4egx}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{\int -\frac{3\left(-d(3ef+dg)c^2+2e(ef-dg)xc^2+4e^2g\right)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\int \frac{-d(3ef+dg)c^2+2e(ef-dg)xc^2+4e^2g}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{\int -\frac{c^2\left(2\left(c^2(3ef+dg)d^2+2e^2(ef-3dg)\right)+e\left(4e^2g-c^2d(5ef-dg)\right)x\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2\left(c^2d^2-e^2\right)}+\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}}{c^2d^2-e^2}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{25}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\int \frac{c^2\left(2\left(c^2(3ef+dg)d^2+2e^2(ef-3dg)\right)+e\left(4e^2g-c^2d(5ef-dg)\right)x\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

---

3.95. $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{c^2\int\frac{2\left(c^2(3ef+dg)d^2+2e^2(ef-3dg)\right)+e\left(4e^2g-c^2d(5ef-dg)\right)x}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right)}{12e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$\downarrow$ 679

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(dg+11ef)+4e^2(ef-4dg)\right)}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{\left(-2c^4d^3(dg+3ef)-c^2de^2(9ef-13dg)+4e^4\cdots\right.}{c^2d^2-e^2}\cdots\right.}{2\left(c^2d^2-e^2\right)}\cdots}{c^2d^2-e^2}\cdots\right.}{12e^2}\cdots-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$\downarrow$ 488

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{c^2\left(\frac{\left(-2c^4d^3(dg+3ef)-c^2de^2(9ef-13dg)+4e^4g\right)\int\frac{1}{-c^2d^2+e^2-\frac{\left(dxc^2+e\right)^2}{1-c^2x^2}}d\frac{dxc^2+e}{\sqrt{1-c^2x^2}}}{c^2d^2-e^2}+\frac{e\cdots}{\cdots}\cdots\right.}{2\left(c^2d^2-e^2\right)}\cdots}{c^2d^2-e^2}\cdots\right.}{12e^2}\cdots-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}$$

$\downarrow$ 217

$$-\frac{(ef-dg)(a+b\arcsin(cx))}{4e^2(d+ex)^4}-\frac{g(a+b\arcsin(cx))}{3e^2(d+ex)^3}+\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2g-c^2d(5ef-dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(dg+11ef)+4e^2(ef-4dg)\right)}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)\left(-2c^4d^3(dg\cdots\right.}{\left(c^2d^2-e^2\right)^3\cdots}\cdots\right.}{2\left(c^2d^2-e^2\right)}\cdots}{c^2d^2-e^2}\cdots\right.}{12e^2}$$

3.95. $\int\frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

output
```
-1/4*((e*f - d*g)*(a + b*ArcSin[c*x]))/(e^2*(d + e*x)^4) - (g*(a + b*ArcSi
n[c*x]))/(3*e^2*(d + e*x)^3) + (b*c*((e*(e*f - d*g)*Sqrt[1 - c^2*x^2])/((c
^2*d^2 - e^2)*(d + e*x)^3) - ((e*(4*e^2*g - c^2*d*(5*e*f - d*g))*Sqrt[1 -
c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2) - (c^2*((e*(4*e^2*(e*f - 4*d*g)
+ c^2*d^2*(11*e*f + d*g))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) -
 ((4*e^4*g - c^2*d*e^2*(9*e*f - 13*d*g) - 2*c^4*d^3*(3*e*f + d*g))*ArcTan[
(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3
/2)))/(2*(c^2*d^2 - e^2)))/(c^2*d^2 - e^2)))/(12*e^2)
```

### 3.95.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

### 3.95.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1549 vs. $2(336) = 672$.

Time = 3.39 (sec) , antiderivative size = 1550, normalized size of antiderivative = 4.31

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 1550 |
| derivativedivides | Expression too large to display | 1554 |
| default | Expression too large to display | 1554 |

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/4*(-d*g+e*f)/e^2/(e*x+d)^4-1/3*g/e^2/(e*x+d)^3)+b/c*(1/4*c^5*arcsin(
c*x)/e^2/(c*e*x+c*d)^4*d*g-1/4*c^5*arcsin(c*x)/e/(c*e*x+c*d)^4*f-1/3*c^4*a
rcsin(c*x)*g/e^2/(c*e*x+c*d)^3+1/12*c^4/e^2*(4*g/e^3*(1/2/(c^2*d^2-e^2)*e^
2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/
2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^
2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*
d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*
d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)
^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln(
(-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(
c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))-3
*c*(d*g-e*f)/e^4*(1/3/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^3*(-(c*x+d*c/e)^2+2*d*
c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+5/3*d*c*e/(c^2*d^2-e^2)*(1/2/(c^2
*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e
^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-
(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-
e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/
e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d
^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^
2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)...
```

### 3.95.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1407 vs. $2(334) = 668$.

Time = 64.66 (sec) , antiderivative size = 2839, normalized size of antiderivative = 7.89

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Too large to display}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="fricas")
```

output
```
[-1/48*(16*(a*c^8*d^8*e - 4*a*c^6*d^6*e^3 + 6*a*c^4*d^4*e^5 - 4*a*c^2*d^2*
e^7 + a*e^9)*g*x + ((3*(2*b*c^7*d^3*e^5 + 3*b*c^5*d*e^7)*f + (2*b*c^7*d^4*
e^4 - 13*b*c^5*d^2*e^6 - 4*b*c^3*e^8)*g)*x^4 + 4*(3*(2*b*c^7*d^4*e^4 + 3*b
*c^5*d^2*e^6)*f + (2*b*c^7*d^5*e^3 - 13*b*c^5*d^3*e^5 - 4*b*c^3*d*e^7)*g)*
x^3 + 6*(3*(2*b*c^7*d^5*e^3 + 3*b*c^5*d^3*e^5)*f + (2*b*c^7*d^6*e^2 - 13*b
*c^5*d^4*e^4 - 4*b*c^3*d^2*e^6)*g)*x^2 + 3*(2*b*c^7*d^7*e + 3*b*c^5*d^5*e^
3)*f + (2*b*c^7*d^8 - 13*b*c^5*d^6*e^2 - 4*b*c^3*d^4*e^4)*g + 4*(3*(2*b*c^
7*d^6*e^2 + 3*b*c^5*d^4*e^4)*f + (2*b*c^7*d^7*e - 13*b*c^5*d^5*e^3 - 4*b*c
^3*d^3*e^5)*g)*x)*sqrt(-c^2*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4
*d^2 - c^2*e^2)*x^2 - 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 +
 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 12*(a*c^8*d^8*e - 4*a*c^6*d^6*e^
3 + 6*a*c^4*d^4*e^5 - 4*a*c^2*d^2*e^7 + a*e^9)*f + 4*(a*c^8*d^9 - 4*a*c^6*
d^7*e^2 + 6*a*c^4*d^5*e^4 - 4*a*c^2*d^3*e^6 + a*d*e^8)*g + 4*(4*(b*c^8*d^8
*e - 4*b*c^6*d^6*e^3 + 6*b*c^4*d^4*e^5 - 4*b*c^2*d^2*e^7 + b*e^9)*g*x + 3*
(b*c^8*d^8*e - 4*b*c^6*d^6*e^3 + 6*b*c^4*d^4*e^5 - 4*b*c^2*d^2*e^7 + b*e^9
)*f + (b*c^8*d^9 - 4*b*c^6*d^7*e^2 + 6*b*c^4*d^5*e^4 - 4*b*c^2*d^3*e^6 + b
*d*e^8)*g)*arcsin(c*x) - 2*sqrt(-c^2*x^2 + 1)*(((11*b*c^7*d^4*e^5 - 7*b*c^
5*d^2*e^7 - 4*b*c^3*e^9)*f + (b*c^7*d^5*e^4 - 17*b*c^5*d^3*e^6 + 16*b*c^3*
d*e^8)*g)*x^3 + ((38*b*c^7*d^5*e^4 - 31*b*c^5*d^3*e^6 - 7*b*c^3*d*e^8)*f +
 (2*b*c^7*d^6*e^3 - 53*b*c^5*d^4*e^5 + 55*b*c^3*d^2*e^7 - 4*b*c*e^9)*g)...
```

### 3.95.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx)}{(d+ex)^5}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**5,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**5, x)
```

### 3.95.7 Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)}{(ex+d)^5}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="maxima")
```

output
```
-1/12*(4*e*x + d)*a*g/(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x
 + d^4*e^2) - 1/4*a*f/(e^5*x^4 + 4*d*e^4*x^3 + 6*d^2*e^3*x^2 + 4*d^3*e^2*x
 + d^4*e) - 1/12*((4*b*e*g*x + 3*b*e*f + b*d*g)*arctan2(c*x, sqrt(c*x + 1)
*sqrt(-c*x + 1)) + 12*(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x
 + d^4*e^2)*integrate(1/12*(4*b*c*e*g*x + 3*b*c*e*f + b*c*d*g)*e^(1/2*log(
c*x + 1) + 1/2*log(-c*x + 1))/(c^4*e^6*x^8 + 4*c^4*d*e^5*x^7 - 4*c^2*d^3*e
^3*x^3 - c^2*d^4*e^2*x^2 + (6*c^4*d^2*e^4 - c^2*e^6)*x^6 + 4*(c^4*d^3*e^3
- c^2*d*e^5)*x^5 + (c^4*d^4*e^2 - 6*c^2*d^2*e^4)*x^4 + (c^2*e^6*x^6 + 4*c^
2*d*e^5*x^5 - 4*d^3*e^3*x - d^4*e^2 + (6*c^2*d^2*e^4 - e^6)*x^4 + 4*(c^2*d
^3*e^3 - d*e^5)*x^3 + (c^2*d^4*e^2 - 6*d^2*e^4)*x^2)*e^(log(c*x + 1) + log
(-c*x + 1))), x))/(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x + d
^4*e^2)
```

### 3.95.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.95.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^5}\,dx=\int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{{(d+e\,x)}^5}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^5,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^5, x)
```

# 3.96 $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$



## 3.96.1 Optimal result

Integrand size = 21, antiderivative size = 457

$$\begin{aligned}\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx &= \frac{bc(ef-dg)\sqrt{1-c^2x^2}}{20e(c^2d^2-e^2)(d+ex)^4} - \frac{bc(5e^2g-c^2d(7ef-2dg))\sqrt{1-c^2x^2}}{60e(c^2d^2-e^2)^2(d+ex)^3} \\ &\quad + \frac{bc^3(e^2(9ef-34dg)+c^2d^2(26ef-dg))\sqrt{1-c^2x^2}}{120e(c^2d^2-e^2)^3(d+ex)^2} \\ &\quad - \frac{bc^3(4e^4g-c^2de^2(11ef-18dg)-c^4d^3(10ef+dg))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^4(d+ex)} \\ &\quad - \frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5} - \frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4} \\ &\quad + \frac{bc^5(c^2d^2e^2(24ef-19dg)+3e^4(ef-6dg)+2c^4d^4(4ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{40e^2(c^2d^2-e^2)^{9/2}}\end{aligned}$$

output
```
-1/5*(-d*g+e*f)*(a+b*arcsin(c*x))/e^2/(e*x+d)^5-1/4*g*(a+b*arcsin(c*x))/e^
2/(e*x+d)^4+1/40*b*c^5*(c^2*d^2*e^2*(-19*d*g+24*e*f)+3*e^4*(-6*d*g+e*f)+2*
c^4*d^4*(d*g+4*e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(
1/2))/e^2/(c^2*d^2-e^2)^(9/2)+1/20*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^
2*d^2-e^2)/(e*x+d)^4-1/60*b*c*(5*e^2*g-c^2*d*(-2*d*g+7*e*f))*(-c^2*x^2+1)^
(1/2)/e/(c^2*d^2-e^2)^2/(e*x+d)^3+1/120*b*c^3*(e^2*(-34*d*g+9*e*f)+c^2*d^2
*(-d*g+26*e*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)^3/(e*x+d)^2-1/24*b*c^3*
(4*e^4*g-c^2*d*e^2*(-18*d*g+11*e*f)-c^4*d^3*(d*g+10*e*f))*(-c^2*x^2+1)^(1/
2)/e/(c^2*d^2-e^2)^4/(e*x+d)
```

### 3.96.2 Mathematica [A] (verified)

Time = 1.31 (sec) , antiderivative size = 494, normalized size of antiderivative = 1.08

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$$
$$= \frac{\frac{3a(-8ef+8dg)}{(d+ex)^5}-\frac{30ag}{(d+ex)^4}+\frac{bce\sqrt{1-c^2x^2}\left(-6\left(-c^2d^2+e^2\right)^3(ef-dg)-2\left(-c^2d^2+e^2\right)^2\left(5e^2g+c^2d(-7ef+2dg)\right)(d+ex)-c^2\left(c^2d^2-e^2\right)\left(c^2d^2(-\right.\right.}{\left(-c^2d^2+e^2\right)^4(d+}}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

output
```
((3*a*(-8*e*f + 8*d*g))/(d + e*x)^5 - (30*a*g)/(d + e*x)^4 + (b*c*e*Sqrt[1
 - c^2*x^2]*(-6*(-(c^2*d^2) + e^2)^3*(e*f - d*g) - 2*(-(c^2*d^2) + e^2)^2*
(5*e^2*g + c^2*d*(-7*e*f + 2*d*g))*(d + e*x) - c^2*(c^2*d^2 - e^2)*(c^2*d^
2*(-26*e*f + d*g) + e^2*(-9*e*f + 34*d*g))*(d + e*x)^2 + 5*c^2*(-4*e^4*g +
 c^2*d*e^2*(11*e*f - 18*d*g) + c^4*d^3*(10*e*f + d*g))*(d + e*x)^3))/((-(c
^2*d^2) + e^2)^4*(d + e*x)^4) - (6*b*(4*e*f + d*g + 5*e*g*x)*ArcSin[c*x])/
(d + e*x)^5 + (3*b*c^5*(c^2*d^2*e^2*(24*e*f - 19*d*g) + 3*e^4*(e*f - 6*d*g
) + 2*c^4*d^4*(4*e*f + d*g))*Log[d + e*x])/((-(c*d) + e)^4*(c*d + e)^4*Sqr
t[-(c^2*d^2) + e^2]) - (3*b*c^5*(c^2*d^2*e^2*(24*e*f - 19*d*g) + 3*e^4*(e*
f - 6*d*g) + 2*c^4*d^4*(4*e*f + d*g))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) +
e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^4*(c*d + e)^4*Sqrt[-(c^2*d^2) + e^2
]))/(120*e^2)
```

### 3.96.3 Rubi [A] (verified)

Time = 0.91 (sec) , antiderivative size = 497, normalized size of antiderivative = 1.09, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {5252, 27, 688, 27, 688, 25, 27, 688, 25, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$$

$$\Big\downarrow \; 5252$$

$$-bc\int -\frac{4ef+dg+5egx}{20e^2(d+ex)^5\sqrt{1-c^2x^2}}dx-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \; 27$$

$$\frac{bc\int \frac{4ef+dg+5egx}{(d+ex)^5\sqrt{1-c^2x^2}}dx}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{\int -\frac{4\left(-d(4ef+dg)c^2+3e(ef-dg)xc^2+5e^2g\right)}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{4(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\int \frac{-d(4ef+dg)c^2+3e(ef-dg)xc^2+5e^2g}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{\int -\frac{c^2\left(3\left(c^2(4ef+dg)d^2+e^2(3ef-8dg)\right)+2e\left(5e^2g-c^2d(7ef-2dg)\right)x\right)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3\left(c^2d^2-e^2\right)}+\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}}{c^2d^2-e^2}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \text{25}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\int \frac{c^2\left(3\left(c^2(4ef+dg)d^2+e^2(3ef-8dg)\right)+2e\left(5e^2g-c^2d(7ef-2dg)\right)x\right)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \text{27}$$

3.96. $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}dx$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\int\frac{3\left(c^2(4ef+dg)d^2+e^2(3ef-8dg)\right)+2e\left(5e^2g-c^2d(7ef-2dg)\right)x}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\right)}{20e^2}-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\big\downarrow$ 688

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{\int-\frac{e\left(c^2(26ef-dg)d^2+e^2(9ef-34dg)\right)xc^2+2\left(-3d^3(4ef+dg)c^4-de^2(23ef-28dg)c^2+10\cdots\right.}{(d+ex)^2\sqrt{1-c^2x^2}}}{2\left(c^2d^2-e^2\right)}\cdots\right)}{3\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\cdots\right)}{20e^2}\cdots-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\big\downarrow$ 25

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(26ef-dg)+e^2(9ef-34dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\int\frac{e\left(c^2(26ef-dg)d^2+e^2(9ef-34dg)\right)xc^2\cdots}{(d+\cdots}}{\cdots}\right)}{3\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\cdots\right)}{20e^2}\cdots-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$\big\downarrow$ 679

3.96. $\int\frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}dx$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(26ef-dg)+e^2(9ef-34dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{5e\sqrt{1-c^2x^2}\left(c^4\left(-d^3\right)(dg+10ef)-c^2de^2 \cdots\right.}{\left(c^2d^2-e^2\right)(d+ex) \cdots}\right.}{\cdots}}{c^2d^2-e^2 \cdots}\right.}{20e^2 \cdots}$$

$$\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \; 488$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(26ef-dg)+e^2(9ef-34dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\frac{3c^2\left(2c^4d^4(dg+4ef)+c^2d^2e^2(24ef-19dg \cdots\right.}{\cdots}}{\cdots}\right.}{\cdots}}{c^2d^2-e \cdots}\right.}{20e^2 \cdots}$$

$$\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}$$

$$\Big\downarrow \; 217$$

3.96. $\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$

$$-\frac{(ef-dg)(a+b\arcsin(cx))}{5e^2(d+ex)^5}-\frac{g(a+b\arcsin(cx))}{4e^2(d+ex)^4}+$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(ef-dg)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2g-c^2d(7ef-2dg)\right)}{3\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{c^2\left(\frac{e\sqrt{1-c^2x^2}\left(c^2d^2(26ef-dg)+e^2(9ef-34dg)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{5e\sqrt{1-c^2x^2}\left(c^4\left(-d^3\right)(dg+10ef)-c^2de^2\cdots\right.}{\left(c^2d^2-e^2\right)(d+ex)}\cdots\right)}{\cdots}}{c^2d^2-e^2}\cdots\right)}{20e^2}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

output
```
-1/5*((e*f - d*g)*(a + b*ArcSin[c*x]))/(e^2*(d + e*x)^5) - (g*(a + b*ArcSi
n[c*x]))/(4*e^2*(d + e*x)^4) + (b*c*((e*(e*f - d*g)*Sqrt[1 - c^2*x^2])/((c
^2*d^2 - e^2)*(d + e*x)^4) - ((e*(5*e^2*g - c^2*d*(7*e*f - 2*d*g))*Sqrt[1
- c^2*x^2])/(3*(c^2*d^2 - e^2)*(d + e*x)^3) - (c^2*((e*(e^2*(9*e*f - 34*d*
g) + c^2*d^2*(26*e*f - d*g))*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*
x)^2) - ((5*e*(4*e^4*g - c^2*d*e^2*(11*e*f - 18*d*g) - c^4*d^3*(10*e*f + d
*g))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - (3*c^2*(c^2*d^2*e^2*
(24*e*f - 19*d*g) + 3*e^4*(e*f - 6*d*g) + 2*c^4*d^4*(4*e*f + d*g))*ArcTan[
(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3
/2))/(2*(c^2*d^2 - e^2))))/(3*(c^2*d^2 - e^2)))/(c^2*d^2 - e^2)))/(20*e^2)
```

### 3.96.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

### 3.96.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2405 vs. $2(429) = 858$.

Time = 3.40 (sec) , antiderivative size = 2406, normalized size of antiderivative = 5.26

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 2406 |
| derivativedivides | Expression too large to display | 2420 |
| default | Expression too large to display | 2420 |

input
```
int((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/4*g/e^2/(e*x+d)^4-1/5*(-d*g+e*f)/e^2/(e*x+d)^5)-1/4*b*c^4*arcsin(c*x
)*g/e^2/(c*e*x+c*d)^4+1/5*b*c^5*arcsin(c*x)/e^2/(c*e*x+c*d)^5*d*g-1/5*b*c^
5*arcsin(c*x)/e/(c*e*x+c*d)^5*f+1/12*b*c^4/e^4*g/(c^2*d^2-e^2)/(c*x+d*c/e)
^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+17/60*b*c^
5/e^3*g*d/(c^2*d^2-e^2)^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e
)-(c^2*d^2-e^2)/e^2)^(1/2)+13/12*b*c^6/e^2*g*d^2/(c^2*d^2-e^2)^3/(c*x+d*c/
e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-11/8*b*c^7
/e^3*g*d^3/(c^2*d^2-e^2)^3/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)
/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*
c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))+9/20*b*c^5/e^3*g*d/
(c^2*d^2-e^2)^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/
e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*
c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e))-1/6*b*c^4/e^2*g/(c^2*d^2-e^2)^
2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)
-1/20*b*c^5/e^5/(c^2*d^2-e^2)/(c*x+d*c/e)^4*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d
*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*d*g+1/20*b*c^5/e^4/(c^2*d^2-e^2)/(c*x+d*c/e
)^4*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f-7/60*b*
c^6/e^4*d^2/(c^2*d^2-e^2)^2/(c*x+d*c/e)^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c
/e)-(c^2*d^2-e^2)/e^2)^(1/2)*g+7/60*b*c^6/e^3*d/(c^2*d^2-e^2)^2/(c*x+d*c/e
)^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)*f-7/24...
```

### 3.96.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1939 vs. $2(426) = 852$.

Time = 175.63 (sec) , antiderivative size = 3904, normalized size of antiderivative = 8.54

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \text{Too large to display}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="fricas")
```

output
```
[-1/240*(60*(a*c^10*d^10*e - 5*a*c^8*d^8*e^3 + 10*a*c^6*d^6*e^5 - 10*a*c^4
*d^4*e^7 + 5*a*c^2*d^2*e^9 - a*e^11)*g*x - 3*(((8*b*c^9*d^4*e^6 + 24*b*c^7
*d^2*e^8 + 3*b*c^5*e^10)*f + (2*b*c^9*d^5*e^5 - 19*b*c^7*d^3*e^7 - 18*b*c^
5*d*e^9)*g)*x^5 + 5*((8*b*c^9*d^5*e^5 + 24*b*c^7*d^3*e^7 + 3*b*c^5*d*e^9)*
f + (2*b*c^9*d^6*e^4 - 19*b*c^7*d^4*e^6 - 18*b*c^5*d^2*e^8)*g)*x^4 + 10*((
8*b*c^9*d^6*e^4 + 24*b*c^7*d^4*e^6 + 3*b*c^5*d^2*e^8)*f + (2*b*c^9*d^7*e^3
 - 19*b*c^7*d^5*e^5 - 18*b*c^5*d^3*e^7)*g)*x^3 + 10*((8*b*c^9*d^7*e^3 + 24
*b*c^7*d^5*e^5 + 3*b*c^5*d^3*e^7)*f + (2*b*c^9*d^8*e^2 - 19*b*c^7*d^6*e^4
- 18*b*c^5*d^4*e^6)*g)*x^2 + (8*b*c^9*d^9*e + 24*b*c^7*d^7*e^3 + 3*b*c^5*d
^5*e^5)*f + (2*b*c^9*d^10 - 19*b*c^7*d^8*e^2 - 18*b*c^5*d^6*e^4)*g + 5*((8
*b*c^9*d^8*e^2 + 24*b*c^7*d^6*e^4 + 3*b*c^5*d^4*e^6)*f + (2*b*c^9*d^9*e -
19*b*c^7*d^7*e^3 - 18*b*c^5*d^5*e^5)*g)*x)*sqrt(-c^2*d^2 + e^2)*log((2*c^2
*d*e*x - c^2*d^2 + (2*c^4*d^2 - c^2*e^2)*x^2 + 2*sqrt(-c^2*d^2 + e^2)*(c^2
*d*x + e)*sqrt(-c^2*x^2 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 48*(a*c
^10*d^10*e - 5*a*c^8*d^8*e^3 + 10*a*c^6*d^6*e^5 - 10*a*c^4*d^4*e^7 + 5*a*c
^2*d^2*e^9 - a*e^11)*f + 12*(a*c^10*d^11 - 5*a*c^8*d^9*e^2 + 10*a*c^6*d^7*
e^4 - 10*a*c^4*d^5*e^6 + 5*a*c^2*d^3*e^8 - a*d*e^10)*g + 12*(5*(b*c^10*d^1
0*e - 5*b*c^8*d^8*e^3 + 10*b*c^6*d^6*e^5 - 10*b*c^4*d^4*e^7 + 5*b*c^2*d^2*
e^9 - b*e^11)*g*x + 4*(b*c^10*d^10*e - 5*b*c^8*d^8*e^3 + 10*b*c^6*d^6*e^5
- 10*b*c^4*d^4*e^7 + 5*b*c^2*d^2*e^9 - b*e^11)*f + (b*c^10*d^11 - 5*b*c...
```

### 3.96.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx=\int \frac{(a+b\operatorname{asin}(cx))\,(f+gx)}{(d+ex)^6}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))/(e*x+d)**6,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x)/(d + e*x)**6, x)
```

### 3.96.7 Maxima [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)}{(ex+d)^6}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="maxima")
```

output
```
-1/20*(5*e*x + d)*a*g/(e^7*x^5 + 5*d*e^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4
*x^2 + 5*d^4*e^3*x + d^5*e^2) - 1/5*a*f/(e^6*x^5 + 5*d*e^5*x^4 + 10*d^2*e^
4*x^3 + 10*d^3*e^3*x^2 + 5*d^4*e^2*x + d^5*e) - 1/20*((5*b*e*g*x + 4*b*e*f
 + b*d*g)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 20*(e^7*x^5 + 5*d*e
^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4*x^2 + 5*d^4*e^3*x + d^5*e^2)*integrat
e(1/20*(5*b*c*e*g*x + 4*b*c*e*f + b*c*d*g)*e^(1/2*log(c*x + 1) + 1/2*log(-
c*x + 1))/(c^4*e^7*x^9 + 5*c^4*d*e^6*x^8 - 5*c^2*d^4*e^3*x^3 - c^2*d^5*e^2
*x^2 + (10*c^4*d^2*e^5 - c^2*e^7)*x^7 + 5*(2*c^4*d^3*e^4 - c^2*d*e^6)*x^6
+ 5*(c^4*d^4*e^3 - 2*c^2*d^2*e^5)*x^5 + (c^4*d^5*e^2 - 10*c^2*d^3*e^4)*x^4
 + (c^2*e^7*x^7 + 5*c^2*d*e^6*x^6 - 5*d^4*e^3*x - d^5*e^2 + (10*c^2*d^2*e^
5 - e^7)*x^5 + 5*(2*c^2*d^3*e^4 - d*e^6)*x^4 + 5*(c^2*d^4*e^3 - 2*d^2*e^5)
*x^3 + (c^2*d^5*e^2 - 10*d^3*e^4)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))),
x))/(e^7*x^5 + 5*d*e^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4*x^2 + 5*d^4*e^3*x
 + d^5*e^2)
```

### 3.96.8 Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)}{(ex+d)^6}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="giac")
```

output
```
integrate((g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^6, x)
```

### 3.96.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(f+g\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)}{{\left(d+e\,x\right)}^6}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^6,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x)))/(d + e*x)^6, x)
```

# 3.97 $\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$



## 3.97.1 Optimal result

Integrand size = 26, antiderivative size = 512

$$
\begin{aligned}
&\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx \\
&= \frac{b(12e^2(eg+3dh)+25c^2d(3e^2f+3deg+d^2h))\,x^2\sqrt{1-c^2x^2}}{225c^3} \\
&\quad+\frac{be(5e^2h+9c^2(e^2f+3deg+3d^2h))\,x^3\sqrt{1-c^2x^2}}{144c^3} \\
&\quad+\frac{be^2(eg+3dh)x^4\sqrt{1-c^2x^2}}{25c}+\frac{be^3hx^5\sqrt{1-c^2x^2}}{36c} \\
&\quad+\frac{b(32(225c^4d^3f+24e^2(eg+3dh)+50c^2d(3e^2f+3deg+d^2h))+75(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e}{7200c^5} \\
&\quad-\frac{b(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e^2f+3deg+3d^2h))\arcsin(cx)}{96c^6} \\
&\quad+d^3fx(a+b\arcsin(cx))+\frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad+\frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx))+\frac{1}{4}e\left(e^2f+3deg+3d^2h\right)x^4(a+b\arcsin(cx)) \\
&\quad+\frac{1}{5}e^2(eg+3dh)x^5(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))
\end{aligned}
$$

output
```
-1/96*b*(24*c^4*d^2*(d*g+3*e*f)+5*e^3*h+9*c^2*e*(3*d^2*h+3*d*e*g+e^2*f))*a
rcsin(c*x)/c^6+d^3*f*x*(a+b*arcsin(c*x))+1/2*d^2*(d*g+3*e*f)*x^2*(a+b*arcs
in(c*x))+1/3*d*(d^2*h+3*d*e*g+3*e^2*f)*x^3*(a+b*arcsin(c*x))+1/4*e*(3*d^2*
h+3*d*e*g+e^2*f)*x^4*(a+b*arcsin(c*x))+1/5*e^2*(3*d*h+e*g)*x^5*(a+b*arcsin
(c*x))+1/6*e^3*h*x^6*(a+b*arcsin(c*x))+1/225*b*(12*e^2*(3*d*h+e*g)+25*c^2*
d*(d^2*h+3*d*e*g+3*e^2*f))*x^2*(-c^2*x^2+1)^(1/2)/c^3+1/144*b*e*(5*e^2*h+9
*c^2*(3*d^2*h+3*d*e*g+e^2*f))*x^3*(-c^2*x^2+1)^(1/2)/c^3+1/25*b*e^2*(3*d*h
+e*g)*x^4*(-c^2*x^2+1)^(1/2)/c+1/36*b*e^3*h*x^5*(-c^2*x^2+1)^(1/2)/c+1/720
0*b*(7200*c^4*d^3*f+768*e^2*(3*d*h+e*g)+1600*c^2*d*(d^2*h+3*d*e*g+3*e^2*f)
+75*(24*c^4*d^2*(d*g+3*e*f)+5*e^3*h+9*c^2*e*(3*d^2*h+3*d*e*g+e^2*f))*x)*(-
c^2*x^2+1)^(1/2)/c^5
```

### 3.97.2 Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 463, normalized size of antiderivative = 0.90

$$\int (d+ex)^3 \left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx = ad^3fx+\frac{1}{2}ad^2(3ef+dg)x^2 + \frac{1}{3}ad\left(3e^2f+3deg+d^2h\right)x^3+\frac{1}{4}ae\left(e^2f+3deg+3d^2h\right)x^4+\frac{1}{5}ae^2(eg+3dh)x^5+\frac{1}{6}ae^3hx^6 + \frac{b\sqrt{1-c^2x^2}(3e^2(256eg+768dh+125ehx)+c^2(1600d^3h+75d^2e(64g+27hx)+e^3x(675f+384gx+}{} - \frac{b(24c^4d^2(3ef+dg)+5e^3h+9c^2e(e^2f+3deg+3d^2h))\arcsin(cx)}{96c^6} + \frac{1}{60}bx\left(10d^3(6f+x(3g+2hx))+15d^2ex(6f+x(4g+3hx))+3de^2x^2(20f+3x(5g+4hx)) + e^3x^3(15f+2x(6g+5hx))\right)\arcsin(cx)$$

input
```
Integrate[(d + e*x)^3*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
a*d^3*f*x + (a*d^2*(3*e*f + d*g)*x^2)/2 + (a*d*(3*e^2*f + 3*d*e*g + d^2*h)
*x^3)/3 + (a*e*(e^2*f + 3*d*e*g + 3*d^2*h)*x^4)/4 + (a*e^2*(e*g + 3*d*h)*x
^5)/5 + (a*e^3*h*x^6)/6 + (b*Sqrt[1 - c^2*x^2]*(3*e^2*(256*e*g + 768*d*h +
 125*e*h*x) + c^2*(1600*d^3*h + 75*d^2*e*(64*g + 27*h*x) + e^3*x*(675*f +
384*g*x + 250*h*x^2) + 3*d*e^2*(1600*f + 675*g*x + 384*h*x^2)) + 2*c^4*(10
0*d^3*(36*f + x*(9*g + 4*h*x)) + 75*d^2*e*x*(36*f + x*(16*g + 9*h*x)) + 3*
d*e^2*x^2*(400*f + 9*x*(25*g + 16*h*x)) + e^3*x^3*(225*f + 4*x*(36*g + 25*
h*x)))))/(7200*c^5) - (b*(24*c^4*d^2*(3*e*f + d*g) + 5*e^3*h + 9*c^2*e*(e^
2*f + 3*d*e*g + 3*d^2*h))*ArcSin[c*x])/(96*c^6) + (b*x*(10*d^3*(6*f + x*(3
*g + 2*h*x)) + 15*d^2*e*x*(6*f + x*(4*g + 3*h*x)) + 3*d*e^2*x^2*(20*f + 3*
x*(5*g + 4*h*x)) + e^3*x^3*(15*f + 2*x*(6*g + 5*h*x)))*ArcSin[c*x])/60
```

### 3.97.3 Rubi [A] (verified)

Time = 2.24 (sec) , antiderivative size = 556, normalized size of antiderivative = 1.09, number of steps used = 14, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$, Rules used = {5248, 27, 2340, 27, 2340, 25, 2340, 27, 2340, 25, 27, 533, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx)) \, dx$$

$$\Big\downarrow \text{5248}$$

$$-bc\int \frac{x\left(10(6f+x(3g+2hx))d^3+15ex(6f+x(4g+3hx))d^2+3e^2x^2(20f+3x(5g+4hx))d+e^3x^3(15f+2x(\right.}{60\sqrt{1-c^2x^2}}$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+ b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+ b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{60}bc\int \frac{x\left(10(6f+x(3g+2hx))d^3+15ex(6f+x(4g+3hx))d^2+3e^2x^2(20f+3x(5g+4hx))d+e^3x^3(15f+2\right.}{\sqrt{1-c^2x^2}}$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+ b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+ b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{2340}$$

$$-\frac{1}{60}bc\left(-\frac{\int -\frac{2x\left(36c^2e^2(eg+3dh)x^4+5e\left(9\left(3hd^2+3egd+e^2f\right)c^2+5e^2h\right)x^3+60c^2d\left(hd^2+3egd+3e^2f\right)x^2+90c^2d^2(3ef+dg)x+180c^2d^3f\right)}{\sqrt{1-c^2x^2}}dx}{6c^2} -\right.$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+ b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+ b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{60}bc\Bigg(\frac{\int \frac{x\left(36c^2e^2(eg+3dh)x^4+5e\left(9\left(3hd^2+3egd+e^2f\right)c^2+5e^2h\right)x^3+60c^2d\left(hd^2+3egd+3e^2f\right)x^2+90c^2d^2(3ef+dg)x+180c^2d^3f\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{5e^3}{}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\Bigg(\frac{-\frac{\int -\frac{x\left(900d^3fc^4+450d^2(3ef+dg)xc^4+25e\left(9\left(3hd^2+3egd+e^2f\right)c^2+5e^2h\right)x^3c^2+12\left(25d\left(hd^2+3egd+3e^2f\right)c^2+12e^2(eg+3dh)\right)x^2c^2\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{36}{5}e^2}{3c^2}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{60}bc\Bigg(\frac{\frac{\int \frac{x\left(900d^3fc^4+450d^2(3ef+dg)xc^4+25e\left(9\left(3hd^2+3egd+e^2f\right)c^2+5e^2h\right)x^3c^2+12\left(25d\left(hd^2+3egd+3e^2f\right)c^2+12e^2(eg+3dh)\right)x^2c^2\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{36}{5}e^2x^4\sqrt{}}{3c^2}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\Bigg(\frac{\frac{-\frac{\int -\frac{3x\left(1200d^3fc^6+16\left(25d\left(hd^2+3egd+3e^2f\right)c^2+12e^2(eg+3dh)\right)x^2c^4+25\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}ex^3\sqrt{1-}}{5c^2}}{3c^2}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

---

3.97. $\int (d+ex)^3\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$

$\downarrow$ 27

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\int\frac{x\left(1200d^3fc^6+16\left(25d\left(hd^2+3egd+3e^2f\right)c^2+12e^2(eg+3dh)\right)x^2c^4+25\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}ex^3\sqrt{1-c^2}}{5c^2}}{3c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(-\frac{\int-\frac{c^4x\left(16\left(225d^3fc^4+50d\left(hd^2+3egd+3e^2f\right)c^2+24e^2(eg+3dh)\right)+75\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}c^2x^2\sqrt{1-c^2}\right.}{4c^2}}{5c^2}}{3c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\downarrow$ 25

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{\int\frac{c^4x\left(16\left(225d^3fc^4+50d\left(hd^2+3egd+3e^2f\right)c^2+24e^2(eg+3dh)\right)+75\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}c^2x^2\sqrt{1-c^2x^2}\right.}{4c^2}}{5c^2}}{3c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$\downarrow$ 27

3.97. $\int(d+ex)^3\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(\frac{1}{3}c^2\int\frac{x\left(16\left(225d^3fc^4+50d\left(hd^2+3egd+3e^2f\right)c^2+24e^2(eg+3dh)\right)+75\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)x\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}c^2x^2\sqrt{1-c^2x^2}\cdots}{4c^2}}{5c^2}}{3c^2}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{533}$$

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{\int\frac{32\left(225d^3fc^4+50d\left(hd^2+3egd+3e^2f\right)c^2+24e^2(eg+3dh)\right)xc^2+75\left(24d^2(3ef+dg)c^4+9e\left(3hd^2+3egd+e^2f\right)c^2+5e^3h\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{75x\sqrt{1-c^2x^2}\left(24\cdots\right.}{\cdots}\right.\right.}{4c^2}\cdots}{\cdots}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{455}$$

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{75\left(24c^4d^2(dg+3ef)+9c^2e\left(3d^2h+3deg+e^2f\right)+5e^3h\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-32\sqrt{1-c^2x^2}\left(225c^4d^3f+50c^2d\left(d^2h+3deg+3e^2f\right)+24e^2(3dh+eg)\right)}{2c^2}-\cdots\right.\right.}{4c^2}\cdots}{\cdots}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))$$

$$\Big\downarrow \text{223}$$

---

3.97. $\int(d+ex)^3\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{4}ex^4(a+b\arcsin(cx))\left(3d^2h+3deg+e^2f\right)+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{5}e^2x^5(3dh+eg)(a+b\arcsin(cx))+\frac{1}{6}e^3hx^6(a+b\arcsin(cx))-$$

$$\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{\frac{75\arcsin(cx)\left(24c^4d^2(dg+3ef)+9c^2e\left(3d^2h+3deg+e^2f\right)+5e^3h\right)}{c}-32\sqrt{1-c^2x^2}\left(225c^4d^3f+50c^2d\left(d^2h+3deg+3e^2f\right)+24e^2(3dh+eg)\right)}{2c^2}-\frac{75x\sqrt{1}\cdots}{\cdots}\cdots\right.\right.}{4c^2}\cdots}{\cdots}\right.$$

input
```
Int[(d + e*x)^3*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
d^3*f*x*(a + b*ArcSin[c*x]) + (d^2*(3*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/
2 + (d*(3*e^2*f + 3*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + (e*(e^2*f
+ 3*d*e*g + 3*d^2*h)*x^4*(a + b*ArcSin[c*x]))/4 + (e^2*(e*g + 3*d*h)*x^5*(
a + b*ArcSin[c*x]))/5 + (e^3*h*x^6*(a + b*ArcSin[c*x]))/6 - (b*c*((-5*e^3*
h*x^5*Sqrt[1 - c^2*x^2])/(3*c^2) + ((-36*e^2*(e*g + 3*d*h)*x^4*Sqrt[1 - c^
2*x^2])/5 + ((-25*e*(5*e^2*h + 9*c^2*(e^2*f + 3*d*e*g + 3*d^2*h))*x^3*Sqrt
[1 - c^2*x^2])/4 + (3*((-16*c^2*(12*e^2*(e*g + 3*d*h) + 25*c^2*d*(3*e^2*f
+ 3*d*e*g + d^2*h))*x^2*Sqrt[1 - c^2*x^2])/3 + (c^2*((-75*(24*c^4*d^2*(3*e
*f + d*g) + 5*e^3*h + 9*c^2*e*(e^2*f + 3*d*e*g + 3*d^2*h))*x*Sqrt[1 - c^2*
x^2])/(2*c^2) + (-32*(225*c^4*d^3*f + 24*e^2*(e*g + 3*d*h) + 50*c^2*d*(3*e
^2*f + 3*d*e*g + d^2*h))*Sqrt[1 - c^2*x^2] + (75*(24*c^4*d^2*(3*e*f + d*g)
 + 5*e^3*h + 9*c^2*e*(e^2*f + 3*d*e*g + 3*d^2*h))*ArcSin[c*x])/c)/(2*c^2))
)/3))/(4*c^2))/(5*c^2))/(3*c^2)))/60
```

### 3.97.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

### 3.97.4 Maple [A] (verified)

Time = 0.37 (sec) , antiderivative size = 633, normalized size of antiderivative = 1.24

| method | result |
|---|---|
| parts | $a\left(\frac{e^3 h x^6}{6}+\frac{(3d e^2 h+e^3 g)x^5}{5}+\frac{(3d^2 eh+3d e^2 g+e^3 f)x^4}{4}+\frac{(d^3 h+3d^2 eg+3d e^2 f)x^3}{3}+\frac{(d^3 g+3d^2 ef)x^2}{2}+d^3 f$ |
| derivativedivides | $\frac{a\left(\frac{e^3 h c^6 x^6}{6}+\frac{\left(3dc e^2 h+e^3 cg\right)c^5 x^5}{5}+\frac{\left(3d^2 c^2 eh+3d c^2 e^2 g+e^3 c^2 f\right)c^4 x^4}{4}+\frac{\left(c^3 d^3 h+3d^2 c^3 eg+3d c^3 e^2 f\right)c^3 x^3}{3}+\frac{\left(c^4 d^3 g+3d^2 c^4 ef\right)c^2}{2}\right.}{c^5}$ |
| default | $\frac{a\left(\frac{e^3 h c^6 x^6}{6}+\frac{\left(3dc e^2 h+e^3 cg\right)c^5 x^5}{5}+\frac{\left(3d^2 c^2 eh+3d c^2 e^2 g+e^3 c^2 f\right)c^4 x^4}{4}+\frac{\left(c^3 d^3 h+3d^2 c^3 eg+3d c^3 e^2 f\right)c^3 x^3}{3}+\frac{\left(c^4 d^3 g+3d^2 c^4 ef\right)c^2}{2}\right.}{c^5}$ |

input
```
int((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/6*e^3*h*x^6+1/5*(3*d*e^2*h+e^3*g)*x^5+1/4*(3*d^2*e*h+3*d*e^2*g+e^3*f)
*x^4+1/3*(d^3*h+3*d^2*e*g+3*d*e^2*f)*x^3+1/2*(d^3*g+3*d^2*e*f)*x^2+d^3*f*x
)+b/c*(1/6*c*arcsin(c*x)*e^3*h*x^6+3/5*c*arcsin(c*x)*x^5*d*e^2*h+1/5*c*arc
sin(c*x)*e^3*g*x^5+3/4*c*arcsin(c*x)*x^4*d^2*e*h+3/4*c*arcsin(c*x)*x^4*d*e
^2*g+1/4*c*arcsin(c*x)*x^4*e^3*f+1/3*c*arcsin(c*x)*x^3*d^3*h+c*arcsin(c*x)
*x^3*d^2*e*g+c*arcsin(c*x)*x^3*d*e^2*f+1/2*c*arcsin(c*x)*x^2*d^3*g+3/2*c*a
rcsin(c*x)*x^2*d^2*e*f+arcsin(c*x)*d^3*f*c*x-1/60/c^5*(10*e^3*h*(-1/6*c^5*
x^5*(-c^2*x^2+1)^(1/2)-5/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+
1)^(1/2)+5/16*arcsin(c*x))-60*d^3*c^5*f*(-c^2*x^2+1)^(1/2)+(36*c*d*e^2*h+1
2*c*e^3*g)*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2
)-8/15*(-c^2*x^2+1)^(1/2))+(30*c^4*d^3*g+90*c^4*d^2*e*f)*(-1/2*c*x*(-c^2*x
^2+1)^(1/2)+1/2*arcsin(c*x))+(45*c^2*d^2*e*h+45*c^2*d*e^2*g+15*c^2*e^3*f)*
(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x
))+(20*c^3*d^3*h+60*c^3*d^2*e*g+60*c^3*d*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)
^(1/2)-2/3*(-c^2*x^2+1)^(1/2))))
```

### 3.97.5 Fricas [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 676, normalized size of antiderivative = 1.32

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{1200\,ac^6e^3hx^6 + 7200\,ac^6d^3fx + 1440\,(ac^6e^3g + 3\,ac^6de^2h)x^5 + 1800\,(ac^6e^3f + 3\,ac^6de^2g + 3\,ac^6d^2eh)x^4}{}$$

input
```
integrate((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/7200*(1200*a*c^6*e^3*h*x^6 + 7200*a*c^6*d^3*f*x + 1440*(a*c^6*e^3*g + 3*
a*c^6*d*e^2*h)*x^5 + 1800*(a*c^6*e^3*f + 3*a*c^6*d*e^2*g + 3*a*c^6*d^2*e*h
)*x^4 + 2400*(3*a*c^6*d*e^2*f + 3*a*c^6*d^2*e*g + a*c^6*d^3*h)*x^3 + 3600*
(3*a*c^6*d^2*e*f + a*c^6*d^3*g)*x^2 + 15*(80*b*c^6*e^3*h*x^6 + 480*b*c^6*d
^3*f*x + 96*(b*c^6*e^3*g + 3*b*c^6*d*e^2*h)*x^5 + 120*(b*c^6*e^3*f + 3*b*c
^6*d*e^2*g + 3*b*c^6*d^2*e*h)*x^4 + 160*(3*b*c^6*d*e^2*f + 3*b*c^6*d^2*e*g
 + b*c^6*d^3*h)*x^3 + 240*(3*b*c^6*d^2*e*f + b*c^6*d^3*g)*x^2 - 45*(8*b*c^
4*d^2*e + b*c^2*e^3)*f - 15*(8*b*c^4*d^3 + 9*b*c^2*d*e^2)*g - 5*(27*b*c^2*
d^2*e + 5*b*e^3)*h)*arcsin(c*x) + (200*b*c^5*e^3*h*x^5 + 288*(b*c^5*e^3*g
+ 3*b*c^5*d*e^2*h)*x^4 + 50*(9*b*c^5*e^3*f + 27*b*c^5*d*e^2*g + (27*b*c^5*
d^2*e + 5*b*c^3*e^3)*h)*x^3 + 32*(75*b*c^5*d*e^2*f + 3*(25*b*c^5*d^2*e + 4
*b*c^3*e^3)*g + (25*b*c^5*d^3 + 36*b*c^3*d*e^2)*h)*x^2 + 2400*(3*b*c^5*d^3
 + 2*b*c^3*d*e^2)*f + 192*(25*b*c^3*d^2*e + 4*b*c*e^3)*g + 64*(25*b*c^3*d^
3 + 36*b*c*d*e^2)*h + 75*(9*(8*b*c^5*d^2*e + b*c^3*e^3)*f + 3*(8*b*c^5*d^3
 + 9*b*c^3*d*e^2)*g + (27*b*c^3*d^2*e + 5*b*c*e^3)*h)*x)*sqrt(-c^2*x^2 + 1
))/c^6
```

### 3.97.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1263 vs. $2(505) = 1010$.

Time = 0.67 (sec) , antiderivative size = 1263, normalized size of antiderivative = 2.47

$$\int (d + ex)^3 \left(f + gx + hx^2\right) (a + b \arcsin(cx)) \, dx = \text{Too large to display}$$

input
```
integrate((e*x+d)**3*(h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**3*f*x + a*d**3*g*x**2/2 + a*d**3*h*x**3/3 + 3*a*d**2*e*f*x
**2/2 + a*d**2*e*g*x**3 + 3*a*d**2*e*h*x**4/4 + a*d*e**2*f*x**3 + 3*a*d*e*
*2*g*x**4/4 + 3*a*d*e**2*h*x**5/5 + a*e**3*f*x**4/4 + a*e**3*g*x**5/5 + a*
e**3*h*x**6/6 + b*d**3*f*x*asin(c*x) + b*d**3*g*x**2*asin(c*x)/2 + b*d**3*
h*x**3*asin(c*x)/3 + 3*b*d**2*e*f*x**2*asin(c*x)/2 + b*d**2*e*g*x**3*asin(
c*x) + 3*b*d**2*e*h*x**4*asin(c*x)/4 + b*d*e**2*f*x**3*asin(c*x) + 3*b*d*e
**2*g*x**4*asin(c*x)/4 + 3*b*d*e**2*h*x**5*asin(c*x)/5 + b*e**3*f*x**4*asi
n(c*x)/4 + b*e**3*g*x**5*asin(c*x)/5 + b*e**3*h*x**6*asin(c*x)/6 + b*d**3*
f*sqrt(-c**2*x**2 + 1)/c + b*d**3*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**3*
h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + 3*b*d**2*e*f*x*sqrt(-c**2*x**2 + 1)/(4
*c) + b*d**2*e*g*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d**2*e*h*x**3*sqrt(
-c**2*x**2 + 1)/(16*c) + b*d*e**2*f*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*
d*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d*e**2*h*x**4*sqrt(-c**2*x
**2 + 1)/(25*c) + b*e**3*f*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e**3*g*x**
4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e**3*h*x**5*sqrt(-c**2*x**2 + 1)/(36*c)
- b*d**3*g*asin(c*x)/(4*c**2) - 3*b*d**2*e*f*asin(c*x)/(4*c**2) + 2*b*d**3
*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 2*b*d**2*e*g*sqrt(-c**2*x**2 + 1)/(3*c*
*3) + 9*b*d**2*e*h*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 2*b*d*e**2*f*sqrt(-c
**2*x**2 + 1)/(3*c**3) + 9*b*d*e**2*g*x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 4
*b*d*e**2*h*x**2*sqrt(-c**2*x**2 + 1)/(25*c**3) + 3*b*e**3*f*x*sqrt(-c*...
```

3.97. $\int (d+ex)^3 (f+gx+hx^2) (a+b\arcsin(cx))\,dx$

### 3.97.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 859, normalized size of antiderivative = 1.68

$$\int (d+ex)^3 (f+gx+hx^2) (a+b\arcsin(cx))\,dx = \frac{1}{6}ae^3hx^6 + \frac{1}{5}ae^3gx^5 + \frac{3}{5}ade^2hx^5 + \frac{1}{4}ae^3fx^4 + \frac{3}{4}ade^2gx^4 + \frac{3}{4}ad^2ehx^4 + ade^2fx^3 + ad^2egx^3 + \frac{1}{3}ad^3hx^3 + \frac{3}{2}ad^2efx^2 + \frac{1}{2}ad^3gx^2 + \frac{3}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2ef + \frac{1}{3}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bde^2f + \frac{1}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^3f + \frac{1}{4}\left(2x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^3g + \frac{1}{3}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2eg + \frac{3}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bde^2g + \frac{1}{75}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^3g + \frac{1}{9}\left(3x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^3h + \frac{3}{32}\left(8x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bd^2eh + \frac{1}{25}\left(15x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bde^2h + \frac{1}{288}\left(48x^6\arcsin(cx) + \left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2} + \frac{10\sqrt{-c^2x^2+1}x^3}{c^4} + \frac{15\sqrt{-c^2x^2+1}x}{c^6} - \frac{15\arcsin(cx)}{c^7}\right)\right. + ad^3fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^3f}{c}$$

input
```
integrate((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/6*a*e^3*h*x^6 + 1/5*a*e^3*g*x^5 + 3/5*a*d*e^2*h*x^5 + 1/4*a*e^3*f*x^4 +
3/4*a*d*e^2*g*x^4 + 3/4*a*d^2*e*h*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 + 1/
3*a*d^3*h*x^3 + 3/2*a*d^2*e*f*x^2 + 1/2*a*d^3*g*x^2 + 3/4*(2*x^2*arcsin(c*
x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e*f + 1/3*(3*x^
3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))
*b*d*e^2*f + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*s
qrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3*f + 1/4*(2*x^2*arcsi
n(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3*g + 1/3*(3*
x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4
))*b*d^2*e*g + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3
*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e^2*g + 1/75*(15*x^5
*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^
4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^3*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqr
t(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^3*h + 3/32*(8*x^4
*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4
- 3*arcsin(c*x)/c^5)*c)*b*d^2*e*h + 1/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^
2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c
^6)*c)*b*d*e^2*h + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c
^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcs
in(c*x)/c^7)*c)*b*e^3*h + a*d^3*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 ...
```

### 3.97.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1337 vs. 2(477) = 954.

Time = 0.34 (sec) , antiderivative size = 1337, normalized size of antiderivative = 2.61

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/6*a*e^3*h*x^6 + 1/5*a*e^3*g*x^5 + 3/5*a*d*e^2*h*x^5 + 1/4*a*e^3*f*x^4 +
3/4*a*d*e^2*g*x^4 + 3/4*a*d^2*e*h*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 + 1/
3*a*d^3*h*x^3 + b*d^3*f*x*arcsin(c*x) + a*d^3*f*x + (c^2*x^2 - 1)*b*d*e^2*
f*x*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/3*(c^2
*x^2 - 1)*b*d^3*h*x*arcsin(c*x)/c^2 + 3/4*sqrt(-c^2*x^2 + 1)*b*d^2*e*f*x/c
 + 1/4*sqrt(-c^2*x^2 + 1)*b*d^3*g*x/c + 3/2*(c^2*x^2 - 1)*b*d^2*e*f*arcsin
(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^3*g*arcsin(c*x)/c^2 + b*d*e^2*f*x*arcsin
(c*x)/c^2 + b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e^3*g*x*ar
csin(c*x)/c^4 + 1/3*b*d^3*h*x*arcsin(c*x)/c^2 + 3/5*(c^2*x^2 - 1)^2*b*d*e^
2*h*x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^3*f/c - 1/16*(-c^2*x^2 + 1)
^(3/2)*b*e^3*f*x/c^3 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*g*x/c^3 - 3/16*(-
c^2*x^2 + 1)^(3/2)*b*d^2*e*h*x/c^3 + 3/2*(c^2*x^2 - 1)*a*d^2*e*f/c^2 + 1/2
*(c^2*x^2 - 1)*a*d^3*g/c^2 + 3/4*b*d^2*e*f*arcsin(c*x)/c^2 + 1/4*(c^2*x^2
- 1)^2*b*e^3*f*arcsin(c*x)/c^4 + 1/4*b*d^3*g*arcsin(c*x)/c^2 + 3/4*(c^2*x^
2 - 1)^2*b*d*e^2*g*arcsin(c*x)/c^4 + 3/4*(c^2*x^2 - 1)^2*b*d^2*e*h*arcsin(
c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e^3*g*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)
*b*d*e^2*h*x*arcsin(c*x)/c^4 - 1/3*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*f/c^3 - 1/
3*(-c^2*x^2 + 1)^(3/2)*b*d^2*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d^3*h/c^
3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e^3*f*x/c^3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d*e
^2*g*x/c^3 + 15/32*sqrt(-c^2*x^2 + 1)*b*d^2*e*h*x/c^3 + 1/36*(c^2*x^2 -...
```

### 3.97.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)^3\left(h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2), x)
```

# 3.98 $\int (d+ex)^2 (f+gx+hx^2) (a+b\arcsin(cx))\,dx$



## 3.98.1 Optimal result

Integrand size = 26, antiderivative size = 361

$$\int (d+ex)^2 (f+gx+hx^2) (a+b\arcsin(cx))\,dx$$
$$= \frac{b(12e^2h+25c^2(e^2f+2deg+d^2h))\,x^2\sqrt{1-c^2x^2}}{225c^3}$$
$$+\frac{be(eg+2dh)x^3\sqrt{1-c^2x^2}}{16c}+\frac{be^2hx^4\sqrt{1-c^2x^2}}{25c}$$
$$+\frac{b(32(225c^4d^2f+24e^2h+50c^2(e^2f+2deg+d^2h))+225c^2(8c^2d(2ef+dg)+3e(eg+2dh))\,x)\sqrt{1-c^2}}{7200c^5}$$
$$-\frac{b(8c^2d(2ef+dg)+3e(eg+2dh))\arcsin(cx)}{32c^4}+d^2fx(a+b\arcsin(cx))$$
$$+\frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx))+\frac{1}{3}(e^2f+2deg+d^2h)\,x^3(a+b\arcsin(cx))$$
$$+\frac{1}{4}e(eg+2dh)x^4(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

output
```
-1/32*b*(8*c^2*d*(d*g+2*e*f)+3*e*(2*d*h+e*g))*arcsin(c*x)/c^4+d^2*f*x*(a+b
*arcsin(c*x))+1/2*d*(d*g+2*e*f)*x^2*(a+b*arcsin(c*x))+1/3*(d^2*h+2*d*e*g+e
^2*f)*x^3*(a+b*arcsin(c*x))+1/4*e*(2*d*h+e*g)*x^4*(a+b*arcsin(c*x))+1/5*e^
2*h*x^5*(a+b*arcsin(c*x))+1/225*b*(12*e^2*h+25*c^2*(d^2*h+2*d*e*g+e^2*f))*
x^2*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*e*(2*d*h+e*g)*x^3*(-c^2*x^2+1)^(1/2)/c+1
/25*b*e^2*h*x^4*(-c^2*x^2+1)^(1/2)/c+1/7200*b*(7200*c^4*d^2*f+768*e^2*h+16
00*c^2*(d^2*h+2*d*e*g+e^2*f)+225*c^2*(8*c^2*d*(d*g+2*e*f)+3*e*(2*d*h+e*g))
*x)*(-c^2*x^2+1)^(1/2)/c^5
```

### 3.98.2 Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 307, normalized size of antiderivative = 0.85

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx)) \, dx$$
$$= \frac{120ac^5x(10d^2(6f+x(3g+2hx))+10dex(6f+x(4g+3hx))+e^2x^2(20f+3x(5g+4hx)))+b\sqrt{1-c^2x}}{}$$

input
```
Integrate[(d + e*x)^2*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
(120*a*c^5*x*(10*d^2*(6*f + x*(3*g + 2*h*x)) + 10*d*e*x*(6*f + x*(4*g + 3*
h*x)) + e^2*x^2*(20*f + 3*x*(5*g + 4*h*x))) + b*Sqrt[1 - c^2*x^2]*(768*e^2
*h + c^2*(1600*d^2*h + 50*d*e*(64*g + 27*h*x) + e^2*(1600*f + 675*g*x + 38
4*h*x^2)) + 2*c^4*(100*d^2*(36*f + x*(9*g + 4*h*x)) + 50*d*e*x*(36*f + x*(
16*g + 9*h*x)) + e^2*x^2*(400*f + 9*x*(25*g + 16*h*x)))) + 15*b*c*(-120*c^
2*d*(2*e*f + d*g) - 45*e*(e*g + 2*d*h) + 8*c^4*x*(10*d^2*(6*f + x*(3*g + 2
*h*x)) + 10*d*e*x*(6*f + x*(4*g + 3*h*x)) + e^2*x^2*(20*f + 3*x*(5*g + 4*h
*x))))*ArcSin[c*x])/(7200*c^5)
```

### 3.98.3 Rubi [A] (verified)

Time = 1.36 (sec) , antiderivative size = 389, normalized size of antiderivative = 1.08, number of steps used = 13, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5248, 27, 2340, 25, 2340, 25, 2340, 25, 27, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx)) \, dx$$

$$\Big\downarrow \text{ 5248}$$

$$-bc\int \frac{x\left(12e^2hx^4+15e(eg+2dh)x^3+20\left(hd^2+2egd+e^2f\right)x^2+30d(2ef+dg)x+60d^2f\right)}{60\sqrt{1-c^2x^2}}dx+\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{1}{60}bc\int \frac{x\left(12e^2hx^4+15e(eg+2dh)x^3+20\left(hd^2+2egd+e^2f\right)x^2+30d(2ef+dg)x+60d^2f\right)}{\sqrt{1-c^2x^2}}dx+\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(-\frac{\int -\frac{x\left(75c^2e(eg+2dh)x^3+4\left(25\left(hd^2+2egd+e^2f\right)c^2+12e^2h\right)x^2+150c^2d(2ef+dg)x+300c^2d^2f\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{12e^2hx^4\sqrt{1-c^2x^2}}{5c^2}\right)+\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{60}bc\left(\frac{\int \frac{x\left(75c^2e(eg+2dh)x^3+4\left(25\left(hd^2+2egd+e^2f\right)c^2+12e^2h\right)x^2+150c^2d(2ef+dg)x+300c^2d^2f\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{12e^2hx^4\sqrt{1-c^2x^2}}{5c^2}\right)+\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(\frac{-\frac{\int -\frac{x\left(1200d^2fc^4+16\left(25\left(hd^2+2egd+e^2f\right)c^2+12e^2h\right)x^2c^2+75\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{75}{4}ex^3\sqrt{1-c^2x^2}(2dh+eg)}{5c^2} - \right.$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{60}bc\left(\frac{\frac{\int \frac{x\left(1200d^2fc^4+16\left(25\left(hd^2+2egd+e^2f\right)c^2+12e^2h\right)x^2c^2+75\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{75}{4}ex^3\sqrt{1-c^2x^2}(2dh+eg)}{5c^2} - 1 \right.$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

---

3.98. $\int (d+ex)^2\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$

$$\Big\downarrow \text{2340}$$

$$-\frac{1}{60}bc\left(\frac{\frac{-\frac{\int -\frac{c^2x\left(225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2+16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2\left(d^2h+2deg+e^2f\right)+12\right.}{4c^2}}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \text{25}$$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{\int \frac{c^2x\left(225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2+16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2\left(d^2h+2deg+e^2f\right)+12e^2h\right.}{4c^2}}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\int \frac{x\left(225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)xc^2+16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2\left(d^2h+2deg+e^2f\right)+12e^2h\right.}{4c^2}}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \text{533}$$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{\int \frac{c^2\left(225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)+32\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)x\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2d(dg+2ef)+3e(2dh+eg)\right)\right.}{4c^2}}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

---

3.98. $\int (d+ex)^2\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$

$$\Big\downarrow \; 27$$

$$-\frac{1}{60}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{1}{2}\int \frac{225\left(8d(2ef+dg)c^2+3e(eg+2dh)\right)+32\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e^2h\right)x}{\sqrt{1-c^2x^2}}dx-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2d(dg+2ef)+3e(2dh+eg)\right)}{4c^2}\right.}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 455$$

$$-\frac{1}{60}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{1}{2}\left(225\left(8c^2d(dg+2ef)+3e(2dh+eg)\right)\int \frac{1}{\sqrt{1-c^2x^2}}dx-\frac{32\sqrt{1-c^2x^2}\left(225c^4d^2f+50c^2\left(d^2h+2deg+e^2f\right)+24e^2h\right)}{c^2}\right)-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2d(d\right.}{4c^2}\right.}{5c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))$$

$$\Big\downarrow \; 223$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{4}ex^4(2dh+eg)(a+b\arcsin(cx))+\frac{1}{5}e^2hx^5(a+b\arcsin(cx))-$$

$$\frac{1}{60}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{1}{2}\left(\frac{225\arcsin(cx)\left(8c^2d(dg+2ef)+3e(2dh+eg)\right)}{c}-\frac{32\sqrt{1-c^2x^2}\left(225c^4d^2f+50c^2\left(d^2h+2deg+e^2f\right)+24e^2h\right)}{c^2}\right)-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2d(dg+2ef)+3\right.}{4c^2}\right.}{5c^2}\right.$$

input

```
Int[(d + e*x)^2*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

3.98. $\int (d+ex)^2\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$

output
```
d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2
+ ((e^2*f + 2*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + (e*(e*g + 2*d*h)
*x^4*(a + b*ArcSin[c*x]))/4 + (e^2*h*x^5*(a + b*ArcSin[c*x]))/5 - (b*c*((-
12*e^2*h*x^4*Sqrt[1 - c^2*x^2])/(5*c^2) + ((-75*e*(e*g + 2*d*h)*x^3*Sqrt[1
 - c^2*x^2])/4 + ((-16*(12*e^2*h + 25*c^2*(e^2*f + 2*d*e*g + d^2*h))*x^2*S
qrt[1 - c^2*x^2])/3 + ((-225*(8*c^2*d*(2*e*f + d*g) + 3*e*(e*g + 2*d*h))*x
*Sqrt[1 - c^2*x^2])/2 + ((-32*(225*c^4*d^2*f + 24*e^2*h + 50*c^2*(e^2*f +
2*d*e*g + d^2*h))*Sqrt[1 - c^2*x^2])/c^2 + (225*(8*c^2*d*(2*e*f + d*g) + 3
*e*(e*g + 2*d*h))*ArcSin[c*x])/c)/2)/3)/(4*c^2))/(5*c^2)))/60
```

#### 3.98.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

## 3.98.4 Maple [A] (verified)

Time = 0.38 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.24

| method | result |
|---|---|
| parts | $a\left(\frac{e^2h\,x^5}{5}+\frac{(2deh+e^2g)x^4}{4}+\frac{(d^2h+2deg+e^2f)x^3}{3}+\frac{(d^2g+2def)x^2}{2}+d^2fx\right)+\frac{b\left(\frac{c\arcsin(cx)e^2h\,x^5}{5}+\frac{c\arcsin \cdots\right.}{\cdots}$ |
| derivativedivides | $\frac{a\left(\frac{e^2h\,c^5x^5}{5}+\frac{(2dceh+e^2cg)c^4x^4}{4}+\frac{(c^2d^2h+2d\,c^2eg+e^2c^2f)c^3x^3}{3}+\frac{(c^3d^2g+2d\,c^3ef)c^2x^2}{2}+d^2c^5fx\right)+\frac{b\left(\frac{\arcsin(cx)e^2h\,c^5x^5}{5}+\cdots\right.}{\cdots}}{c^4}$ |
| default | $\frac{a\left(\frac{e^2h\,c^5x^5}{5}+\frac{(2dceh+e^2cg)c^4x^4}{4}+\frac{(c^2d^2h+2d\,c^2eg+e^2c^2f)c^3x^3}{3}+\frac{(c^3d^2g+2d\,c^3ef)c^2x^2}{2}+d^2c^5fx\right)+\frac{b\left(\frac{\arcsin(cx)e^2h\,c^5x^5}{5}+\cdots\right.}{\cdots}}{c^4}$ |

input
```
int((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/5*e^2*h*x^5+1/4*(2*d*e*h+e^2*g)*x^4+1/3*(d^2*h+2*d*e*g+e^2*f)*x^3+1/2
*(d^2*g+2*d*e*f)*x^2+d^2*f*x)+b/c*(1/5*c*arcsin(c*x)*e^2*h*x^5+1/2*c*arcsi
n(c*x)*x^4*d*e*h+1/4*c*arcsin(c*x)*e^2*g*x^4+1/3*c*arcsin(c*x)*x^3*d^2*h+2
/3*c*arcsin(c*x)*x^3*d*e*g+1/3*c*arcsin(c*x)*x^3*e^2*f+1/2*c*arcsin(c*x)*x
^2*d^2*g+c*arcsin(c*x)*x^2*d*e*f+arcsin(c*x)*d^2*f*c*x-1/60/c^4*(12*e^2*h*
(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^
2*x^2+1)^(1/2))-60*d^2*c^4*f*(-c^2*x^2+1)^(1/2)+(30*c*d*e*h+15*c*e^2*g)*(-
1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))
+(30*c^3*d^2*g+60*c^3*d*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))
+(20*c^2*d^2*h+40*c^2*d*e*g+20*c^2*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)
-2/3*(-c^2*x^2+1)^(1/2))))
```

### 3.98.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.24

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{1440\,ac^5e^2hx^5 + 7200\,ac^5d^2fx + 1800\,(ac^5e^2g + 2\,ac^5deh)x^4 + 2400\,(ac^5e^2f + 2\,ac^5deg + ac^5d^2h)x^3 + 36}{}$$

input
```
integrate((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/7200*(1440*a*c^5*e^2*h*x^5 + 7200*a*c^5*d^2*f*x + 1800*(a*c^5*e^2*g + 2*
a*c^5*d*e*h)*x^4 + 2400*(a*c^5*e^2*f + 2*a*c^5*d*e*g + a*c^5*d^2*h)*x^3 +
3600*(2*a*c^5*d*e*f + a*c^5*d^2*g)*x^2 + 15*(96*b*c^5*e^2*h*x^5 + 480*b*c^
5*d^2*f*x - 240*b*c^3*d*e*f - 90*b*c*d*e*h + 120*(b*c^5*e^2*g + 2*b*c^5*d*
e*h)*x^4 + 160*(b*c^5*e^2*f + 2*b*c^5*d*e*g + b*c^5*d^2*h)*x^3 + 240*(2*b*
c^5*d*e*f + b*c^5*d^2*g)*x^2 - 15*(8*b*c^3*d^2 + 3*b*c*e^2)*g)*arcsin(c*x)
 + (288*b*c^4*e^2*h*x^4 + 3200*b*c^2*d*e*g + 450*(b*c^4*e^2*g + 2*b*c^4*d*
e*h)*x^3 + 32*(25*b*c^4*e^2*f + 50*b*c^4*d*e*g + (25*b*c^4*d^2 + 12*b*c^2*
e^2)*h)*x^2 + 800*(9*b*c^4*d^2 + 2*b*c^2*e^2)*f + 64*(25*b*c^2*d^2 + 12*b*
e^2)*h + 225*(16*b*c^4*d*e*f + 6*b*c^2*d*e*h + (8*b*c^4*d^2 + 3*b*c^2*e^2)
*g)*x)*sqrt(-c^2*x^2 + 1))/c^5
```

### 3.98.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 821 vs. $2(352) = 704$.

Time = 0.51 (sec) , antiderivative size = 821, normalized size of antiderivative = 2.27

$$\int (d+ex)^2 (f+gx+hx^2) (a+b\arcsin(cx))\,dx$$
$$= \begin{cases} ad^2fx + \frac{ad^2gx^2}{2} + \frac{ad^2hx^3}{3} + adefx^2 + \frac{2adegx^3}{3} + \frac{adehx^4}{2} + \frac{ae^2fx^3}{3} + \frac{ae^2gx^4}{4} + \frac{ae^2hx^5}{5} + bd^2fx\operatorname{asin}(cx) + \frac{bd^2gx}{} \\ a\left(d^2fx + \frac{d^2gx^2}{2} + \frac{d^2hx^3}{3} + defx^2 + \frac{2degx^3}{3} + \frac{dehx^4}{2} + \frac{e^2fx^3}{3} + \frac{e^2gx^4}{4} + \frac{e^2hx^5}{5}\right) \end{cases}$$

input
```
integrate((e*x+d)**2*(h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**2*f*x + a*d**2*g*x**2/2 + a*d**2*h*x**3/3 + a*d*e*f*x**2 +
 2*a*d*e*g*x**3/3 + a*d*e*h*x**4/2 + a*e**2*f*x**3/3 + a*e**2*g*x**4/4 + a
*e**2*h*x**5/5 + b*d**2*f*x*asin(c*x) + b*d**2*g*x**2*asin(c*x)/2 + b*d**2
*h*x**3*asin(c*x)/3 + b*d*e*f*x**2*asin(c*x) + 2*b*d*e*g*x**3*asin(c*x)/3
+ b*d*e*h*x**4*asin(c*x)/2 + b*e**2*f*x**3*asin(c*x)/3 + b*e**2*g*x**4*asi
n(c*x)/4 + b*e**2*h*x**5*asin(c*x)/5 + b*d**2*f*sqrt(-c**2*x**2 + 1)/c + b
*d**2*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**2*h*x**2*sqrt(-c**2*x**2 + 1)/
(9*c) + b*d*e*f*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*b*d*e*g*x**2*sqrt(-c**2*x
**2 + 1)/(9*c) + b*d*e*h*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + b*e**2*f*x**2*s
qrt(-c**2*x**2 + 1)/(9*c) + b*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*
e**2*h*x**4*sqrt(-c**2*x**2 + 1)/(25*c) - b*d**2*g*asin(c*x)/(4*c**2) - b*
d*e*f*asin(c*x)/(2*c**2) + 2*b*d**2*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 4*b*
d*e*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d*e*h*x*sqrt(-c**2*x**2 + 1)/(16
*c**3) + 2*b*e**2*f*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e**2*g*x*sqrt(-c**
2*x**2 + 1)/(32*c**3) + 4*b*e**2*h*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) - 3
*b*d*e*h*asin(c*x)/(16*c**4) - 3*b*e**2*g*asin(c*x)/(32*c**4) + 8*b*e**2*h
*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d**2*f*x + d**2*g*x**2/2 +
 d**2*h*x**3/3 + d*e*f*x**2 + 2*d*e*g*x**3/3 + d*e*h*x**4/2 + e**2*f*x**3/
3 + e**2*g*x**4/4 + e**2*h*x**5/5), True))
```

### 3.98.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 581, normalized size of antiderivative = 1.61

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{1}{5}\,ae^2hx^5 + \frac{1}{4}\,ae^2gx^4 + \frac{1}{2}\,adehx^4 + \frac{1}{3}\,ae^2fx^3 + \frac{2}{3}\,adegx^3 + \frac{1}{3}\,ad^2hx^3 + adefx^2$$
$$+ \frac{1}{2}\,ad^2gx^2 + \frac{1}{2}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bdef$$
$$+ \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2f$$
$$+ \frac{1}{4}\left(2\,x^2\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin(cx)}{c^3}\right)\right)bd^2g$$
$$+ \frac{2}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdeg$$
$$+ \frac{1}{32}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)be^2g$$
$$+ \frac{1}{9}\left(3\,x^3\arcsin(cx) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2h$$
$$+ \frac{1}{16}\left(8\,x^4\arcsin(cx) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin(cx)}{c^5}\right)c\right)bdeh$$
$$+ \frac{1}{75}\left(15\,x^5\arcsin(cx) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^2h$$
$$+ ad^2fx + \frac{\left(cx\arcsin(cx) + \sqrt{-c^2x^2+1}\right)bd^2f}{c}$$

input
```
integrate((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/5*a*e^2*h*x^5 + 1/4*a*e^2*g*x^4 + 1/2*a*d*e*h*x^4 + 1/3*a*e^2*f*x^3 + 2/
3*a*d*e*g*x^3 + 1/3*a*d^2*h*x^3 + a*d*e*f*x^2 + 1/2*a*d^2*g*x^2 + 1/2*(2*x
^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*e*f +
 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
+ 1)/c^4))*b*e^2*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2
- arcsin(c*x)/c^3))*b*d^2*g + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 +
1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*e*g + 1/32*(8*x^4*arcsin(c*x)
+ (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*
x)/c^5)*c)*b*e^2*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^
2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^2*h + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt
(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c
)*b*d*e*h + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*s
qrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^2*h + a*d^2*f
*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^2*f/c
```

### 3.98.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 847 vs. $2(332) = 664$.

Time = 0.33 (sec) , antiderivative size = 847, normalized size of antiderivative = 2.35

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{1}{5}ae^2hx^5 + \frac{1}{4}ae^2gx^4 + \frac{1}{2}adehx^4 + \frac{1}{3}ae^2fx^3 + \frac{2}{3}adegx^3 + \frac{1}{3}ad^2hx^3 + bd^2fx\arcsin(cx) + ad^2fx + \frac{(c^2x^2-1)be^2fx\arcsin(cx)}{3c^2} + \frac{2(c^2x^2-1)bdegx\arcsin(cx)}{3c^2} + \frac{(c^2x^2-1)bd^2hx\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}bdefx}{2c} + \frac{\sqrt{-c^2x^2+1}bd^2gx}{4c} + \frac{(c^2x^2-1)bdef\arcsin(cx)}{c^2} + \frac{(c^2x^2-1)bd^2g\arcsin(cx)}{2c^2} + \frac{be^2fx\arcsin(cx)}{3c^2} + \frac{2bdegx\arcsin(cx)}{3c^2} + \frac{bd^2hx\arcsin(cx)}{3c^2} + \frac{(c^2x^2-1)^2be^2hx\arcsin(cx)}{5c^4} + \frac{\sqrt{-c^2x^2+1}bd^2f}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2gx}{16c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdehx}{8c^3} + \frac{(c^2x^2-1)adef}{c^2} + \frac{(c^2x^2-1)ad^2g}{2c^2} + \frac{bdef\arcsin(cx)}{2c^2} + \frac{bd^2g\arcsin(cx)}{4c^2} + \frac{(c^2x^2-1)^2be^2g\arcsin(cx)}{4c^4} + \frac{(c^2x^2-1)^2bdeh\arcsin(cx)}{2c^4} + \frac{2(c^2x^2-1)be^2hx\arcsin(cx)}{5c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}}be^2f}{9c^3} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}bdeg}{9c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bd^2h}{9c^3} + \frac{5\sqrt{-c^2x^2+1}be^2gx}{32c^3} + \frac{5\sqrt{-c^2x^2+1}bdehx}{16c^3} + \frac{(c^2x^2-1)be^2g\arcsin(cx)}{2c^4} + \frac{(c^2x^2-1)bdeh\arcsin(cx)}{c^4} + \frac{be^2hx\arcsin(cx)}{5c^4} + \frac{\sqrt{-c^2x^2+1}be^2f}{3c^3} + \frac{2\sqrt{-c^2x^2+1}bdeg}{3c^3} + \frac{\sqrt{-c^2x^2+1}bd^2h}{3c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}be^2h}{25c^5} + \frac{5be^2g\arcsin(cx)}{32c^4} + \frac{5bdeh\arcsin(cx)}{16c^4} - \frac{2(-c^2x^2+1)^{\frac{3}{2}}be^2h}{15c^5} + \frac{\sqrt{-c^2x^2+1}be^2h}{5c^5}$$

input
```
integrate((e*x+d)^2*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

3.98. $\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx$

output
```
1/5*a*e^2*h*x^5 + 1/4*a*e^2*g*x^4 + 1/2*a*d*e*h*x^4 + 1/3*a*e^2*f*x^3 + 2/
3*a*d*e*g*x^3 + 1/3*a*d^2*h*x^3 + b*d^2*f*x*arcsin(c*x) + a*d^2*f*x + 1/3*
(c^2*x^2 - 1)*b*e^2*f*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 - 1)*b*d*e*g*x*arcs
in(c*x)/c^2 + 1/3*(c^2*x^2 - 1)*b*d^2*h*x*arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*
x^2 + 1)*b*d*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d^2*g*x/c + (c^2*x^2 - 1)*
b*d*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^2*g*arcsin(c*x)/c^2 + 1/3*
b*e^2*f*x*arcsin(c*x)/c^2 + 2/3*b*d*e*g*x*arcsin(c*x)/c^2 + 1/3*b*d^2*h*x*
arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e^2*h*x*arcsin(c*x)/c^4 + sqrt(-c^
2*x^2 + 1)*b*d^2*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e^2*g*x/c^3 - 1/8*(-c^2
*x^2 + 1)^(3/2)*b*d*e*h*x/c^3 + (c^2*x^2 - 1)*a*d*e*f/c^2 + 1/2*(c^2*x^2 -
 1)*a*d^2*g/c^2 + 1/2*b*d*e*f*arcsin(c*x)/c^2 + 1/4*b*d^2*g*arcsin(c*x)/c^
2 + 1/4*(c^2*x^2 - 1)^2*b*e^2*g*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*d*
e*h*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e^2*h*x*arcsin(c*x)/c^4 - 1/9*(-
c^2*x^2 + 1)^(3/2)*b*e^2*f/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*d*e*g/c^3 - 1/
9*(-c^2*x^2 + 1)^(3/2)*b*d^2*h/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e^2*g*x/c^3
 + 5/16*sqrt(-c^2*x^2 + 1)*b*d*e*h*x/c^3 + 1/2*(c^2*x^2 - 1)*b*e^2*g*arcsi
n(c*x)/c^4 + (c^2*x^2 - 1)*b*d*e*h*arcsin(c*x)/c^4 + 1/5*b*e^2*h*x*arcsin(
c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*e^2*f/c^3 + 2/3*sqrt(-c^2*x^2 + 1)*b*d
*e*g/c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*d^2*h/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(
-c^2*x^2 + 1)*b*e^2*h/c^5 + 5/32*b*e^2*g*arcsin(c*x)/c^4 + 5/16*b*d*e*h...
```

### 3.98.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2 \left(f+gx+hx^2\right) (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)^2\,\left(h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2), x)
```

# 3.99 $\int (d+ex) (f+gx+hx^2) (a+b\arcsin(cx)) \, dx$



## 3.99.1 Optimal result

Integrand size = 24, antiderivative size = 223

$$\begin{aligned}\int (d+ex) (f+gx+hx^2) (a+b\arcsin(cx)) \, dx &= \frac{b(eg+dh)x^2\sqrt{1-c^2x^2}}{9c} + \frac{behx^3\sqrt{1-c^2x^2}}{16c} \\ &+ \frac{b(32(9c^2df+2eg+2dh)+9(8c^2(ef+dg)+3eh)x)\sqrt{1-c^2x^2}}{288c^3} \\ &- \frac{b(8c^2(ef+dg)+3eh)\arcsin(cx)}{32c^4} + dfx(a+b\arcsin(cx)) \\ &+ \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) + \frac{1}{4}ehx^4(a+b\arcsin(cx))\end{aligned}$$

output
```
-1/32*b*(8*c^2*(d*g+e*f)+3*e*h)*arcsin(c*x)/c^4+d*f*x*(a+b*arcsin(c*x))+1/
2*(d*g+e*f)*x^2*(a+b*arcsin(c*x))+1/3*(d*h+e*g)*x^3*(a+b*arcsin(c*x))+1/4*
e*h*x^4*(a+b*arcsin(c*x))+1/9*b*(d*h+e*g)*x^2*(-c^2*x^2+1)^(1/2)/c+1/16*b*
e*h*x^3*(-c^2*x^2+1)^(1/2)/c+1/288*b*(288*c^2*d*f+64*d*h+64*e*g+9*(8*c^2*(
d*g+e*f)+3*e*h)*x)*(-c^2*x^2+1)^(1/2)/c^3
```

### 3.99.2 Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.83

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{24ac^4x(2d(6f+x(3g+2hx))+ex(6f+x(4g+3hx)))+bc\sqrt{1-c^2x^2}(64eg+64dh+27ehx+2c^2(4d(3\ldots}{}$$

input
```
Integrate[(d + e*x)*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
(24*a*c^4*x*(2*d*(6*f + x*(3*g + 2*h*x)) + e*x*(6*f + x*(4*g + 3*h*x))) +
b*c*Sqrt[1 - c^2*x^2]*(64*e*g + 64*d*h + 27*e*h*x + 2*c^2*(4*d*(36*f + 9*g
*x + 4*h*x^2) + e*x*(36*f + 16*g*x + 9*h*x^2))) + 3*b*(-24*c^2*(e*f + d*g)
 - 9*e*h + 8*c^4*x*(2*d*(6*f + 3*g*x + 2*h*x^2) + e*x*(6*f + 4*g*x + 3*h*x
^2)))*ArcSin[c*x])/(288*c^4)
```

### 3.99.3 Rubi [A] (verified)

Time = 0.73 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.12, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.417$, Rules used = {5248, 27, 2340, 25, 2340, 25, 27, 533, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$

$$\Big\downarrow \; 5248$$

$$-bc\int \frac{x\left(3ehx^3+4(eg+dh)x^2+6(ef+dg)x+12df\right)}{12\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{12}bc\int \frac{x\left(3ehx^3+4(eg+dh)x^2+6(ef+dg)x+12df\right)}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{12}bc\left(-\frac{\int -\frac{x(16(eg+dh)x^2c^2+48dfc^2+3(8(ef+dg)c^2+3eh)x)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{1}{12}bc\left(\frac{\int \frac{x(16(eg+dh)x^2c^2+48dfc^2+3(8(ef+dg)c^2+3eh)x)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 2340}$$

$$-\frac{1}{12}bc\left(\frac{-\frac{\int -\frac{c^2x\left(16\left(9dfc^2+2eg+2dh\right)+9\left(8(ef+dg)c^2+3eh\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}(dh+eg)}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{1}{12}bc\left(\frac{\frac{\int \frac{c^2x\left(16\left(9dfc^2+2eg+2dh\right)+9\left(8(ef+dg)c^2+3eh\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}(dh+eg)}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\int \frac{x(16(9dfc^2+2eg+2dh)+9(8(ef+dg)c^2+3eh)x)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}x^2\sqrt{1-c^2x^2}(dh+eg)}{4c^2}-\frac{3ehx^3\sqrt{1-c^2x^2}}{4c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{ 533}$$

3.99. $\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{\int \frac{32\left(9dfc^2+2eg+2dh\right)xc^2+9\left(8(ef+dg)c^2+3eh\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3eh}{c^2}+8dg+8ef\right)\right)-\frac{16}{3}x^2\sqrt{1-c^2x^2}(dh+eg)}{4c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{455}$$

$$-\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{9\left(8c^2(dg+ef)+3eh\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-32\sqrt{1-c^2x^2}\left(9c^2df+2dh+2eg\right)}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3eh}{c^2}+8dg+8ef\right)\right)-\frac{16}{3}x^2\sqrt{1-}}{4c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))$$

$$\Big\downarrow \text{223}$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{4}ehx^4(a+b\arcsin(cx))-$$

$$\frac{1}{12}bc\left(\frac{\frac{1}{3}\left(\frac{\frac{9\arcsin(cx)\left(8c^2(dg+ef)+3eh\right)}{c}-32\sqrt{1-c^2x^2}\left(9c^2df+2dh+2eg\right)}{2c^2}-\frac{9}{2}x\sqrt{1-c^2x^2}\left(\frac{3eh}{c^2}+8dg+8ef\right)\right)-\frac{16}{3}x^2\sqrt{1-c^2x^2}(}{4c^2}\right.$$

input
```
Int[(d + e*x)*(f + g*x + h*x^2)*(a + b*ArcSin[c*x]),x]
```

output
```
d*f*x*(a + b*ArcSin[c*x]) + ((e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + ((e*
g + d*h)*x^3*(a + b*ArcSin[c*x]))/3 + (e*h*x^4*(a + b*ArcSin[c*x]))/4 - (b
*c*((-3*e*h*x^3*Sqrt[1 - c^2*x^2])/(4*c^2) + ((-16*(e*g + d*h)*x^2*Sqrt[1
- c^2*x^2])/3 + ((-9*(8*e*f + 8*d*g + (3*e*h)/c^2)*x*Sqrt[1 - c^2*x^2])/2
+ (-32*(9*c^2*d*f + 2*e*g + 2*d*h)*Sqrt[1 - c^2*x^2] + (9*(8*c^2*(e*f + d*
g) + 3*e*h)*ArcSin[c*x])/c)/(2*c^2))/3)/(4*c^2)))/12
```

## 3.99. $\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$

### 3.99.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

## 3.99.4 Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.22

| method | result |
|---|---|
| parts | $a\left(\frac{eh\,x^4}{4}+\frac{(dh+eg)x^3}{3}+\frac{(dg+ef)x^2}{2}+dfx\right)+\frac{b\left(\frac{c\arcsin(cx)eh\,x^4}{4}+\frac{c\arcsin(cx)x^3dh}{3}+\frac{c\arcsin(cx)eg\,x^3}{3}+\frac{c\arcsin(\cdots}{\cdots}\right.}{\cdots}$ |
| derivativedivides | $\frac{a\left(\frac{eh\,c^4x^4}{4}+\frac{(dch+ecg)c^3x^3}{3}+\frac{\left(d\,c^2g+e\,c^2f\right)c^2x^2}{2}+d\,c^4fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)eh\,c^4x^4}{4}+\frac{\arcsin(cx)c^4dh\,x^3}{3}+\frac{\arcsin(cx)c^4eg\,x^3}{3}+\arcsin\cdots\right.}{\cdots}$ |
| default | $\frac{a\left(\frac{eh\,c^4x^4}{4}+\frac{(dch+ecg)c^3x^3}{3}+\frac{\left(d\,c^2g+e\,c^2f\right)c^2x^2}{2}+d\,c^4fx\right)}{c^3}+\frac{b\left(\frac{\arcsin(cx)eh\,c^4x^4}{4}+\frac{\arcsin(cx)c^4dh\,x^3}{3}+\frac{\arcsin(cx)c^4eg\,x^3}{3}+\arcsin\cdots\right.}{\cdots}$ |

input
```
int((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/4*e*h*x^4+1/3*(d*h+e*g)*x^3+1/2*(d*g+e*f)*x^2+d*f*x)+b/c*(1/4*c*arcsi
n(c*x)*e*h*x^4+1/3*c*arcsin(c*x)*x^3*d*h+1/3*c*arcsin(c*x)*e*g*x^3+1/2*c*a
rcsin(c*x)*x^2*d*g+1/2*c*arcsin(c*x)*x^2*e*f+arcsin(c*x)*d*f*c*x-1/12/c^3*
(3*e*h*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arc
sin(c*x))-12*d*c^3*f*(-c^2*x^2+1)^(1/2)+(4*c*d*h+4*c*e*g)*(-1/3*c^2*x^2*(-
c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+(6*c^2*d*g+6*c^2*e*f)*(-1/2*c*x*(
-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))
```

## 3.99.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.10

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$=\frac{72\,ac^4ehx^4+288\,ac^4dfx+96\,(ac^4eg+ac^4dh)x^3+144\,(ac^4ef+ac^4dg)x^2+3\,(24\,bc^4ehx^4+96\,bc^4dfx-\cdots}{\cdots}$$

input
```
integrate((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fricas")
```

output
```
1/288*(72*a*c^4*e*h*x^4 + 288*a*c^4*d*f*x + 96*(a*c^4*e*g + a*c^4*d*h)*x^3
 + 144*(a*c^4*e*f + a*c^4*d*g)*x^2 + 3*(24*b*c^4*e*h*x^4 + 96*b*c^4*d*f*x
- 24*b*c^2*e*f - 24*b*c^2*d*g + 32*(b*c^4*e*g + b*c^4*d*h)*x^3 - 9*b*e*h +
 48*(b*c^4*e*f + b*c^4*d*g)*x^2)*arcsin(c*x) + (18*b*c^3*e*h*x^3 + 288*b*c
^3*d*f + 64*b*c*e*g + 64*b*c*d*h + 32*(b*c^3*e*g + b*c^3*d*h)*x^2 + 9*(8*b
*c^3*e*f + 8*b*c^3*d*g + 3*b*c*e*h)*x)*sqrt(-c^2*x^2 + 1))/c^4
```

### 3.99.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 449 vs. $2(209) = 418$.

Time = 0.34 (sec) , antiderivative size = 449, normalized size of antiderivative = 2.01

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$=\begin{cases} adfx+\frac{adgx^2}{2}+\frac{adhx^3}{3}+\frac{aefx^2}{2}+\frac{aegx^3}{3}+\frac{aehx^4}{4}+bdfx\operatorname{asin}(cx)+\frac{bdgx^2\operatorname{asin}(cx)}{2}+\frac{bdhx^3\operatorname{asin}(cx)}{3}+\frac{befx^2\operatorname{asin}(cx)}{2} \\ a\left(dfx+\frac{dgx^2}{2}+\frac{dhx^3}{3}+\frac{efx^2}{2}+\frac{egx^3}{3}+\frac{ehx^4}{4}\right) \end{cases}$$

input
```
integrate((e*x+d)*(h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d*f*x + a*d*g*x**2/2 + a*d*h*x**3/3 + a*e*f*x**2/2 + a*e*g*x*
*3/3 + a*e*h*x**4/4 + b*d*f*x*asin(c*x) + b*d*g*x**2*asin(c*x)/2 + b*d*h*x
**3*asin(c*x)/3 + b*e*f*x**2*asin(c*x)/2 + b*e*g*x**3*asin(c*x)/3 + b*e*h*
x**4*asin(c*x)/4 + b*d*f*sqrt(-c**2*x**2 + 1)/c + b*d*g*x*sqrt(-c**2*x**2
+ 1)/(4*c) + b*d*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e*f*x*sqrt(-c**2*x*
*2 + 1)/(4*c) + b*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e*h*x**3*sqrt(-c
**2*x**2 + 1)/(16*c) - b*d*g*asin(c*x)/(4*c**2) - b*e*f*asin(c*x)/(4*c**2)
 + 2*b*d*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 2*b*e*g*sqrt(-c**2*x**2 + 1)/(9
*c**3) + 3*b*e*h*x*sqrt(-c**2*x**2 + 1)/(32*c**3) - 3*b*e*h*asin(c*x)/(32*
c**4), Ne(c, 0)), (a*(d*f*x + d*g*x**2/2 + d*h*x**3/3 + e*f*x**2/2 + e*g*x
**3/3 + e*h*x**4/4), True))
```

### 3.99.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 334, normalized size of antiderivative = 1.50

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{4}\,aehx^4 + \frac{1}{3}\,aegx^3 + \frac{1}{3}\,adhx^3 + \frac{1}{2}\,aefx^2 + \frac{1}{2}\,adgx^2$$
$$+ \frac{1}{4}\left(2\,x^2\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin\left(cx\right)}{c^3}\right)\right)bef$$
$$+ \frac{1}{4}\left(2\,x^2\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin\left(cx\right)}{c^3}\right)\right)bdg$$
$$+ \frac{1}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)beg$$
$$+ \frac{1}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdh$$
$$+ \frac{1}{32}\left(8\,x^4\arcsin\left(cx\right) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin\left(cx\right)}{c^5}\right)c\right)beh$$
$$+ adfx + \frac{\left(cx\arcsin\left(cx\right) + \sqrt{-c^2x^2+1}\right)bdf}{c}$$

input
```
integrate((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxima")
```

output
```
1/4*a*e*h*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*x^3 + 1/2*a*e*f*x^2 + 1/2*a*d*g*
x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c
^3))*b*e*f + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin
(c*x)/c^3))*b*d*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2
 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e*g + 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^
2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d*h + 1/32*(8*x^4*arcsin
(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arc
sin(c*x)/c^5)*c)*b*e*h + a*d*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*
b*d*f/c
```

### 3.99.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 448 vs. $2(200) = 400$.

Time = 0.30 (sec) , antiderivative size = 448, normalized size of antiderivative = 2.01

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{4}aehx^4 + \frac{1}{3}aegx^3 + \frac{1}{3}adhx^3 + bdfx\arcsin(cx) + adfx + \frac{(c^2x^2-1)begx\arcsin(cx)}{3c^2} + \frac{(c^2x^2-1)bdhx\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}befx}{4c} + \frac{\sqrt{-c^2x^2+1}bdgx}{4c} + \frac{(c^2x^2-1)bef\arcsin(cx)}{2c^2} + \frac{(c^2x^2-1)bdg\arcsin(cx)}{2c^2} + \frac{begx\arcsin(cx)}{3c^2} + \frac{bdhx\arcsin(cx)}{3c^2} + \frac{\sqrt{-c^2x^2+1}bdf}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}behx}{16c^3} + \frac{(c^2x^2-1)aef}{2c^2} + \frac{(c^2x^2-1)adg}{2c^2} + \frac{bef\arcsin(cx)}{4c^2} + \frac{bdg\arcsin(cx)}{4c^2} + \frac{(c^2x^2-1)^2beh\arcsin(cx)}{4c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}}beg}{9c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdh}{9c^3} + \frac{5\sqrt{-c^2x^2+1}behx}{32c^3} + \frac{(c^2x^2-1)beh\arcsin(cx)}{2c^4} + \frac{\sqrt{-c^2x^2+1}beg}{3c^3} + \frac{\sqrt{-c^2x^2+1}bdh}{3c^3} + \frac{5beh\arcsin(cx)}{32c^4}$$

input
```
integrate((e*x+d)*(h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac")
```

output
```
1/4*a*e*h*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*x^3 + b*d*f*x*arcsin(c*x) + a*d*
f*x + 1/3*(c^2*x^2 - 1)*b*e*g*x*arcsin(c*x)/c^2 + 1/3*(c^2*x^2 - 1)*b*d*h*
x*arcsin(c*x)/c^2 + 1/4*sqrt(-c^2*x^2 + 1)*b*e*f*x/c + 1/4*sqrt(-c^2*x^2 +
 1)*b*d*g*x/c + 1/2*(c^2*x^2 - 1)*b*e*f*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1
)*b*d*g*arcsin(c*x)/c^2 + 1/3*b*e*g*x*arcsin(c*x)/c^2 + 1/3*b*d*h*x*arcsin
(c*x)/c^2 + sqrt(-c^2*x^2 + 1)*b*d*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e*h*x
/c^3 + 1/2*(c^2*x^2 - 1)*a*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d*g/c^2 + 1/4*b*e
*f*arcsin(c*x)/c^2 + 1/4*b*d*g*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e*h
*arcsin(c*x)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*e*g/c^3 - 1/9*(-c^2*x^2 + 1)
^(3/2)*b*d*h/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*e*h*x/c^3 + 1/2*(c^2*x^2 - 1)
*b*e*h*arcsin(c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*e*g/c^3 + 1/3*sqrt(-c^2*
x^2 + 1)*b*d*h/c^3 + 5/32*b*e*h*arcsin(c*x)/c^4
```

### 3.99.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex)\left(f+gx+hx^2\right)(a+b\arcsin(cx))\,dx$$
$$=\int (a+b\,\mathrm{asin}(c\,x))\ (d+e\,x)\ \left(h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2), x)
```

# 3.100 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx$



## 3.100.1 Optimal result

Integrand size = 26, antiderivative size = 459

$$\begin{aligned}
&\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx \\
&= \frac{b(4(eg-dh)+ehx)\sqrt{1-c^2x^2}}{4ce^2} - \frac{bh\arcsin(cx)}{4c^2e} - \frac{ib(e^2f-deg+d^2h)\arcsin(cx)^2}{2e^3} \\
&\quad + \frac{(eg-dh)x(a+b\arcsin(cx))}{e^2} + \frac{hx^2(a+b\arcsin(cx))}{2e} \\
&\quad + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad + \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad - \frac{b(e^2f-deg+d^2h)\arcsin(cx)\log(d+ex)}{e^3} \\
&\quad + \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))\log(d+ex)}{e^3} \\
&\quad - \frac{ib(e^2f-deg+d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad - \frac{ib(e^2f-deg+d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}
\end{aligned}$$

output
```
-1/4*b*h*arcsin(c*x)/c^2/e-1/2*I*b*(d^2*h-d*e*g+e^2*f)*arcsin(c*x)^2/e^3+(
-d*h+e*g)*x*(a+b*arcsin(c*x))/e^2+1/2*h*x^2*(a+b*arcsin(c*x))/e-b*(d^2*h-d
*e*g+e^2*f)*arcsin(c*x)*ln(e*x+d)/e^3+(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x)
)*ln(e*x+d)/e^3+b*(d^2*h-d*e*g+e^2*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^
2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+b*(d^2*h-d*e*g+e^2*f)*arcsin(c*
x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-I*b*
(d^2*h-d*e*g+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2
-e^2)^(1/2)))/e^3-I*b*(d^2*h-d*e*g+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1
)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3+1/4*b*(e*h*x-4*d*h+4*e*g)*(-c^2*x^
2+1)^(1/2)/c/e^2
```

## 3.100.2 Mathematica [A] (verified)

Time = 0.93 (sec) , antiderivative size = 457, normalized size of antiderivative = 1.00

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx$$
$$= \frac{\frac{2be(eg-dh)\sqrt{1-c^2x^2}}{c}+\frac{be^2hx\sqrt{1-c^2x^2}}{2c}-\frac{be^2h\arcsin(cx)}{2c^2}-ib(e^2f-deg+d^2h)\arcsin(cx)^2+2e(eg-dh)x(a+b\,\mathrm{arc}}{}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
((2*b*e*(e*g - d*h)*Sqrt[1 - c^2*x^2])/c + (b*e^2*h*x*Sqrt[1 - c^2*x^2])/(
2*c) - (b*e^2*h*ArcSin[c*x])/(2*c^2) - I*b*(e^2*f - d*e*g + d^2*h)*ArcSin[
c*x]^2 + 2*e*(e*g - d*h)*x*(a + b*ArcSin[c*x]) + e^2*h*x^2*(a + b*ArcSin[c
*x]) + 2*b*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*
x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 2*b*(e^2*f - d*e*g + d^2*h)*ArcSin[
c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - 2*b*(e
^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[d + e*x] + 2*(e^2*f - d*e*g + d^2*h)
*(a + b*ArcSin[c*x])*Log[d + e*x] - (2*I)*b*(e^2*f - d*e*g + d^2*h)*PolyLo
g[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - (2*I)*b*(e^2*f
 - d*e*g + d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 -
 e^2])])/(2*e^3)
```

### 3.100.3 Rubi [A] (verified)

Time = 1.17 (sec) , antiderivative size = 476, normalized size of antiderivative = 1.04, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}dx$$

$$\Big\downarrow \text{ 5252}$$

$$-bc\int \frac{ex(2(eg-dh)+ehx)+2(hd^2-egd+e^2f)\log(d+ex)}{2e^3\sqrt{1-c^2x^2}}dx+\frac{\log(d+ex)(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3}+\frac{x(eg-dh)(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e}$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{bc\int \frac{ex(2(eg-dh)+ehx)+2(hd^2-egd+e^2f)\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{2e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3}+\frac{x(eg-dh)(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e}$$

$$\Big\downarrow \text{ 7293}$$

$$-\frac{bc\int \left(\frac{ex(2eg-2dh+ehx)}{\sqrt{1-c^2x^2}}+\frac{2(hd^2-egd+e^2f)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{2e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3}+\frac{x(eg-dh)(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{\log(d+ex)(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3}+\frac{x(eg-dh)(a+b\arcsin(cx))}{e^2}+\frac{hx^2(a+b\arcsin(cx))}{2e}-$$

$$bc\left(\frac{e^2h\arcsin(cx)}{2c^3}+\frac{2i(d^2h-deg+e^2f)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{2i(d^2h-deg+e^2f)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{2\arcsin(cx)(d^2h-d\ldots}{\ldots}\right.$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
((e*g - d*h)*x*(a + b*ArcSin[c*x]))/e^2 + (h*x^2*(a + b*ArcSin[c*x]))/(2*e
) + ((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x])*Log[d + e*x])/e^3 - (b*c*
((-2*e*(e*g - d*h)*Sqrt[1 - c^2*x^2])/c^2 - (e^2*h*x*Sqrt[1 - c^2*x^2])/(2
*c^2) + (e^2*h*ArcSin[c*x])/(2*c^3) + (I*(e^2*f - d*e*g + d^2*h)*ArcSin[c*
x]^2)/c - (2*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[
c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - (2*(e^2*f - d*e*g + d^2*h)*ArcSin
[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + (2
*(e^2*f - d*e*g + d^2*h)*ArcSin[c*x]*Log[d + e*x])/c + ((2*I)*(e^2*f - d*e
*g + d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])
])/c + ((2*I)*(e^2*f - d*e*g + d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(
c*d + Sqrt[c^2*d^2 - e^2])])/c))/(2*e^3)
```

### 3.100.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.100.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2437 vs. $2(464) = 928$.

Time = 2.26 (sec) , antiderivative size = 2438, normalized size of antiderivative = 5.31

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 2438 |
| derivativedivides | Expression too large to display | 2489 |
| default | Expression too large to display | 2489 |

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

output
```
-I*b*c^2/e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2
*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-I*b*c^2/e*f/(c^2*d^2-e^
2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+
(-c^2*d^2+e^2)^(1/2)))*d^2-I*b*c^2/e^3*h*d^4/(c^2*d^2-e^2)*dilog((I*d*c+(I
*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/
2)))-I*b*c^2/e^3*h*d^4/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2
))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+I*b*c^2/e^2*d^3*g
/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1
/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+a*(1/e^2*(1/2*h*x^2*e-x*d*h+x*e*g)+(d^2
*h-d*e*g+e^2*f)/e^3*ln(e*x+d))+b*g*(-c^2*x^2+1)^(1/2)/c/e+I*b*c^2/e^2*d^3*
g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(
1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c^2/e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln
((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^
2+e^2)^(1/2)))*d^2+b*c^2/e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-
c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^
2-b*c^2/e^2*d^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^
(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*c^2/e^2*d^3
*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*
d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+b*c^2/e^3*h*d^4*arcsin(c*x)/
(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/...
```

### 3.100.5 Fricas [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="fricas")
```

output
```
integral((a*h*x^2 + a*g*x + a*f + (b*h*x^2 + b*g*x + b*f)*arcsin(c*x))/(e*
x + d), x)
```

### 3.100.6 Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx+hx^2)}{d+ex}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x), x)
```

### 3.100.7 Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxima")
```

output
```
a*g*(x/e - d*log(e*x + d)/e^2) + 1/2*a*h*(2*d^2*log(e*x + d)/e^3 + (e*x^2
- 2*d*x)/e^2) + a*f*log(e*x + d)/e + integrate((b*h*x^2 + b*g*x + b*f)*arc
tan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x)
```

### 3.100.8 Giac [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac")
```

output
```
integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d), x)
```

### 3.100.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(h\,x^2+g\,x+f)}{d+e\,x}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x),x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x), x)
```

# 3.101 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$



## 3.101.1 Optimal result

Integrand size = 26, antiderivative size = 460

$$\begin{aligned}\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx &= \frac{bh\sqrt{1-c^2x^2}}{ce^2}-\frac{ib(eg-2dh)\arcsin(cx)^2}{2e^3}\\
&\quad+\frac{hx(a+b\arcsin(cx))}{e^2}\\
&\quad-\frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{e^3(d+ex)}\\
&\quad+\frac{bc(e^2f-deg+d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}\\
&\quad+\frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}\\
&\quad+\frac{b(eg-2dh)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}\\
&\quad-\frac{b(eg-2dh)\arcsin(cx)\log(d+ex)}{e^3}\\
&\quad+\frac{(eg-2dh)(a+b\arcsin(cx))\log(d+ex)}{e^3}\\
&\quad-\frac{ib(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}\\
&\quad-\frac{ib(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}\end{aligned}$$

output
```
-1/2*I*b*(-2*d*h+e*g)*arcsin(c*x)^2/e^3+h*x*(a+b*arcsin(c*x))/e^2-(d^2*h-d
*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)-b*(-2*d*h+e*g)*arcsin(c*x)*ln(e*
x+d)/e^3+(-2*d*h+e*g)*(a+b*arcsin(c*x))*ln(e*x+d)/e^3+b*(-2*d*h+e*g)*arcsi
n(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+
b*(-2*d*h+e*g)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d
^2-e^2)^(1/2)))/e^3-I*b*(-2*d*h+e*g)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/
2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3-I*b*(-2*d*h+e*g)*polylog(2,I*e*(I*c*x+(
-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3+b*c*(d^2*h-d*e*g+e^2*f)*
arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^
2)^(1/2)+b*h*(-c^2*x^2+1)^(1/2)/c/e^2
```

## 3.101.2 Mathematica [A] (verified)

Time = 0.99 (sec) , antiderivative size = 432, normalized size of antiderivative = 0.94

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$

$$= \frac{\frac{beh\sqrt{1-c^2x^2}}{c} - \frac{1}{2}ib(eg-2dh)\arcsin(cx)^2 + ehx(a+b\arcsin(cx)) - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{d+ex} + \frac{bc(e^2f-deg+d^2}{}}{}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
((b*e*h*Sqrt[1 - c^2*x^2])/c - (I/2)*b*(e*g - 2*d*h)*ArcSin[c*x]^2 + e*h*x
*(a + b*ArcSin[c*x]) - ((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(d +
e*x) + (b*c*(e^2*f - d*e*g + d^2*h)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e
^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2] + b*(e*g - 2*d*h)*ArcSin[c*x]
*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + b*(e*g
- 2*d*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 -
 e^2])] - b*(e*g - 2*d*h)*ArcSin[c*x]*Log[d + e*x] + (e*g - 2*d*h)*(a + b*
ArcSin[c*x])*Log[d + e*x] - I*b*(e*g - 2*d*h)*PolyLog[2, (I*e*E^(I*ArcSin[
c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - I*b*(e*g - 2*d*h)*PolyLog[2, (I*e*E^
(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e^3
```

### 3.101.3 Rubi [A] (verified)

Time = 1.19 (sec) , antiderivative size = 457, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int \frac{-\frac{hd^2-egd+e^2f}{d+ex}+ehx+(eg-2dh)\log(d+ex)}{e^3\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3(d+ex)}+\frac{(eg-2dh)\log(d+ex)(a+b\arcsin(cx))}{e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{27}$$

$$-\frac{bc\int \frac{-\frac{hd^2-egd+e^2f}{d+ex}+ehx+(eg-2dh)\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{e^3}-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3(d+ex)}+\frac{(eg-2dh)\log(d+ex)(a+b\arcsin(cx))}{e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int \left(\frac{-hd^2+egd-e^2f}{(d+ex)\sqrt{1-c^2x^2}}+\frac{(eg-2dh)\log(d+ex)}{\sqrt{1-c^2x^2}}+\frac{ehx}{\sqrt{1-c^2x^2}}\right)dx}{e^3}-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3(d+ex)}+\frac{(eg-2dh)\log(d+ex)(a+b\arcsin(cx))}{e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{e^3(d+ex)}+\frac{(eg-2dh)\log(d+ex)(a+b\arcsin(cx))}{e^3}+\frac{hx(a+b\arcsin(cx))}{e^2}-$$

$$bc\left(\frac{i(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{i(eg-2dh)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{\arcsin(cx)(eg-2dh)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}-\text{arcsin}\right.$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
(h*x*(a + b*ArcSin[c*x]))/e^2 - ((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x
]))/(e^3*(d + e*x)) + ((e*g - 2*d*h)*(a + b*ArcSin[c*x])*Log[d + e*x])/e^3
 - (b*c*(-((e*h*Sqrt[1 - c^2*x^2])/c^2) + ((I/2)*(e*g - 2*d*h)*ArcSin[c*x]
^2)/c - ((e^2*f - d*e*g + d^2*h)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]
*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2] - ((e*g - 2*d*h)*ArcSin[c*x]*Log
[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - ((e*g - 2*d
*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2]
)])/c + ((e*g - 2*d*h)*ArcSin[c*x]*Log[d + e*x])/c + (I*(e*g - 2*d*h)*Poly
Log[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c + (I*(e*g -
 2*d*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c
))/e^3
```

### 3.101.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

## 3.101.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1858 vs. $2(467) = 934$.

Time = 4.20 (sec) , antiderivative size = 1859, normalized size of antiderivative = 4.04

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 1859 |
| derivativedivides | Expression too large to display | 1900 |
| default | Expression too large to display | 1900 |

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

output
```
a*(1/e^2*h*x-1/e^3*(d^2*h-d*e*g+e^2*f)/(e*x+d)+(-2*d*h+e*g)/e^3*ln(e*x+d))
+b/c*(2/e*c*h*d*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1
/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*c*g/(c^2*d^2-
e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*
c+(-c^2*d^2+e^2)^(1/2)))+1/e^2*c^3*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-
(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^
(1/2)))*d^2+2*I/e^3*c^3*h*d^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+
1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-1/2*I*c*ar
csin(c*x)^2*g/e^2-I/e^2*c^3*g/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2
+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+1/2*
(-I*(-c^2*x^2+1)^(1/2)+c*x)*h*(arcsin(c*x)+I)/e^2+I*c*arcsin(c*x)^2/e^3*d*
h+1/2*(c*x+I*(-c^2*x^2+1)^(1/2))*h*(arcsin(c*x)-I)/e^2-c*g*arcsin(c*x)/(c^
2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I
*d*c+(-c^2*d^2+e^2)^(1/2)))+2/e*c^2*f/(c^2*d^2-e^2)^(1/2)*arctan(1/2*(2*(I
*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-2*I/e*c*h*d/(c^2*
d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(
I*d*c+(-c^2*d^2+e^2)^(1/2)))-2/e^3*c^3*h*d^3*arcsin(c*x)/(c^2*d^2-e^2)*ln(
(-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d
^2+e^2)^(1/2)))-2/e^3*c^3*h*d^3*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x
+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2...
```

### 3.101.5 Fricas [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^2}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fricas")
```

output
```
integral((a*h*x^2 + a*g*x + a*f + (b*h*x^2 + b*g*x + b*f)*arcsin(c*x))/(e^
2*x^2 + 2*d*e*x + d^2), x)
```

### 3.101.6 Sympy [F]

$$\int \frac{(f + gx + hx^2)(a + b \arcsin(cx))}{(d + ex)^2} \, dx = \int \frac{(a + b \operatorname{asin}(cx))(f + gx + hx^2)}{(d + ex)^2} \, dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**2, x)
```

### 3.101.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(f + gx + hx^2)(a + b \arcsin(cx))}{(d + ex)^2} \, dx = \text{Exception raised: ValueError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.101.8 Giac [F]

$$\int \frac{(f + gx + hx^2)(a + b \arcsin(cx))}{(d + ex)^2} \, dx = \int \frac{(hx^2 + gx + f)(b \arcsin(cx) + a)}{(ex + d)^2} \, dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="giac")
```

output
```
integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^2, x)
```

### 3.101.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(h\,x^2+g\,x+f\right)}{\left(d+e\,x\right)^2}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^2,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^2, x)
```

# 3.102 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$



## 3.102.1 Optimal result

Integrand size = 26, antiderivative size = 488

$$
\begin{aligned}
&\int \frac{(f+gx+hx^2)\,(a+b\arcsin(cx))}{(d+ex)^3}\,dx \\
&= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{2e^2\,(c^2d^2-e^2)\,(d+ex)} - \frac{ibh\arcsin(cx)^2}{2e^3} \\
&\quad - \frac{(e^2f-deg+d^2h)\,(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)} \\
&\quad - \frac{bc(2e^2(eg-2dh)-c^2d(e^2f+deg-3d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3\,(c^2d^2-e^2)^{3/2}} \\
&\quad + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{bh\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3} \\
&\quad - \frac{bh\arcsin(cx)\log(d+ex)}{e^3} + \frac{h(a+b\arcsin(cx))\log(d+ex)}{e^3} \\
&\quad - \frac{ibh\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3} - \frac{ibh\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}
\end{aligned}
$$

output
```
-1/2*I*b*h*arcsin(c*x)^2/e^3-1/2*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3
/(e*x+d)^2-(-2*d*h+e*g)*(a+b*arcsin(c*x))/e^3/(e*x+d)-1/2*b*c*(2*e^2*(-2*d
*h+e*g)-c^2*d*(-3*d^2*h+d*e*g+e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/
2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(3/2)-b*h*arcsin(c*x)*ln(e*x+d)/e
^3+h*(a+b*arcsin(c*x))*ln(e*x+d)/e^3+b*h*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2
*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+b*h*arcsin(c*x)*ln(1-I*e*(I*
c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-I*b*h*polylog(2,I*e
*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3-I*b*h*polylog(2
,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3+1/2*b*c*(d^
2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)
```

### 3.102.2 Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 6 vs. order 4 in optimal.

Time = 7.06 (sec) , antiderivative size = 996, normalized size of antiderivative = 2.04

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \frac{-ae^2f+adeg-ad^2h}{2e^3(d+ex)^2} + \frac{-aeg+2adh}{e^3(d+ex)} + bf\left(-\frac{c\sqrt{1+\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}}\sqrt{1+\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex}}\operatorname{AppellF1}\left(2,\frac{1}{2},\frac{1}{2},3,-\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex},-\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}\right)}{4e^2(d+ex)\sqrt{1-c^2x^2}} - \frac{\arcsin(cx)}{2e(d+ex)^2}\right) + \frac{ah\log(d+ex)}{e^3} + bg\left(\frac{-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}}{e^2} - \frac{d\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)} - \frac{\arcsin(cx)}{e(d+ex)^2} - \frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{2e}\right) + bh\Bigg(-\frac{2d\left(-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}\right)}{e^3} + \frac{d^2\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)} - \frac{\arcsin(cx)}{e(d+ex)^2} - \frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{2e^2} + \frac{-\frac{i\arcsin(cx)^2}{2e} + \frac{\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e} + \frac{\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e} - \frac{i\operatorname{PolyLog}\left(2,-\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)}{e} - i\,\mathrm{Poly}}{e^2}$$

3.102. $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
(-(a*e^2*f) + a*d*e*g - a*d^2*h)/(2*e^3*(d + e*x)^2) + (-(a*e*g) + 2*a*d*h
)/(e^3*(d + e*x)) + b*f*(-1/4*(c*Sqrt[1 + (-d - Sqrt[c^(-2)]*e)/(d + e*x)]
*Sqrt[1 + (-d + Sqrt[c^(-2)]*e)/(d + e*x)]*AppellF1[2, 1/2, 1/2, 3, -((-d
+ Sqrt[c^(-2)]*e)/(d + e*x)), -((-d - Sqrt[c^(-2)]*e)/(d + e*x))]])/(e^2*(d
 + e*x)*Sqrt[1 - c^2*x^2]) - ArcSin[c*x]/(2*e*(d + e*x)^2)) + (a*h*Log[d +
 e*x])/e^3 + b*g*((-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqr
t[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e^2 - (d*((c*Sq
rt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2)
 - (I*c^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt
[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d
 + e)*Sqrt[c^2*d^2 - e^2])))/(2*e)) + b*h*((-2*d*(-(ArcSin[c*x]/(d + e*x))
 + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[
c^2*d^2 - e^2]))/e^3 + (d^2*((c*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e
*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*
d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3
*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 - e^2])))/(2*e^2) + (
((-1/2*I)*ArcSin[c*x]^2)/e + (ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/
(c*d - Sqrt[c^2*d^2 - e^2])])/e + (ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*
x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/e - (I*PolyLog[2, ((-I)*e*E^(I*ArcSin[c
*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])])/e - (I*PolyLog[2, (I*e*E^(I*ArcS...
```

### 3.102.3 Rubi [A] (verified)

Time = 1.50 (sec) , antiderivative size = 478, normalized size of antiderivative = 0.98, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(f+gx+hx^2\right)(a+b\arcsin(cx))}{(d+ex)^3}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int \frac{3hd^2-e(g-4hx)d-e^2(f+2gx)+2h(d+ex)^2\log(d+ex)}{2e^3(d+ex)^2\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{2e^3(d+ex)^2}-\frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{h\log(d+ex)(a+b\arcsin(cx))}{e^3}$$

$\Big\downarrow$ 27

$$-\frac{bc\int \frac{3hd^2-e(g-4hx)d-e^2(f+2gx)+2h(d+ex)^2\log(d+ex)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{2e^3(d+ex)^2}-\frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{h\log(d+ex)(a+b\arcsin(cx))}{e^3}$$

$\Big\downarrow$ 7293

$$-\frac{bc\int \left(\frac{3hd^2-egd-e^2f-2e(eg-2dh)x}{(d+ex)^2\sqrt{1-c^2x^2}}+\frac{2h\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{2e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{2e^3(d+ex)^2}-\frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{h\log(d+ex)(a+b\arcsin(cx))}{e^3}$$

$\Big\downarrow$ 2009

$$-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{2e^3(d+ex)^2}-\frac{(eg-2dh)(a+b\arcsin(cx))}{e^3(d+ex)}+\frac{h\log(d+ex)(a+b\arcsin(cx))}{e^3}-$$
$$\frac{bc\left(\frac{2ih\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{2ih\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{2h\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{2h\arcsin(cx)\log\left(1-\frac{iee^{i a}}{\sqrt{c^2d^2}}\right.}{c}\right.}{}$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
-1/2*((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)^2) - ((e
*g - 2*d*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)) + (h*(a + b*ArcSin[c*x])*
Log[d + e*x])/e^3 - (b*c*(-((e*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x^2])/
((c^2*d^2 - e^2)*(d + e*x))) + (I*h*ArcSin[c*x]^2)/c + ((2*e^2*(e*g - 2*d*
h) - c^2*d*(e^2*f + d*e*g - 3*d^2*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 -
 e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2) - (2*h*ArcSin[c*x]*Log[1
- (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - (2*h*ArcSin[c*
x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + (2*h*
ArcSin[c*x]*Log[d + e*x])/c + ((2*I)*h*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/
(c*d - Sqrt[c^2*d^2 - e^2])])/c + ((2*I)*h*PolyLog[2, (I*e*E^(I*ArcSin[c*x
]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/(2*e^3)
```

3.102. $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

### 3.102.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

## 3.102.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2026 vs. 2(489) = 978.

Time = 7.00 (sec) , antiderivative size = 2027, normalized size of antiderivative = 4.15

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 2027 |
| derivativedivides | Expression too large to display | 2038 |
| default | Expression too large to display | 2038 |

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
a*(-(-2*d*h+e*g)/e^3/(e*x+d)-1/2*(d^2*h-d*e*g+e^2*f)/e^3/(e*x+d)^2+h/e^3*l
n(e*x+d))+b/c*(-I/e^3/(c^2*d^2-e^2)*c^3*h*d^2*arcsin(c*x)^2+1/2*c^2*(4*arc
sin(c*x)*c^3*d^3*e*h*x-2*arcsin(c*x)*c^3*d^2*e^2*g*x+I*c^3*d*e^3*g*x^2+(-c
^2*x^2+1)^(1/2)*c^2*d^2*e^2*h*x-(-c^2*x^2+1)^(1/2)*c^2*d*e^3*g*x-2*I*c^3*d
^3*e*h*x+2*I*c^3*d^2*e^2*g*x-2*I*c^3*d*e^3*f*x-I*c^3*d^2*e^2*h*x^2-4*arcsi
n(c*x)*d*e^3*h*c*x-e^2*c^3*d^2*f*arcsin(c*x)-e*c^3*d^3*g*arcsin(c*x)+e^3*c
*g*arcsin(c*x)*d-3*e^2*c*d^2*h*arcsin(c*x)-I*c^3*d^2*e^2*f+I*c^3*d^3*e*g+(
-c^2*x^2+1)^(1/2)*c^2*d^3*e*h-(-c^2*x^2+1)^(1/2)*c^2*d^2*e^2*g+(-c^2*x^2+1
)^(1/2)*c^2*d*e^3*f+2*arcsin(c*x)*e^4*g*c*x+e^4*c*f*arcsin(c*x)+3*c^3*d^4*
h*arcsin(c*x)-I*c^3*d^4*h-I*c^3*e^4*f*x^2+(-c^2*x^2+1)^(1/2)*c^2*e^4*f*x)/
(c*e*x+c*d)^2/(c^2*d^2-e^2)/e^3+I/e/(c^2*d^2-e^2)*c*h*arcsin(c*x)^2+2*I/e/
(c^2*d^2-e^2)^2*c^3*h*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+
e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-2/(c^2*d^2-e^2)^(3/2)*c^2*g*
arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))-3
/e^3/(c^2*d^2-e^2)^(3/2)*c^4*d^3*h*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2)
)*e+2*I*c*d)/(c^2*d^2-e^2)^(1/2))+e/(c^2*d^2-e^2)^2*c*h*arcsin(c*x)*ln((I*
d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^
2)^(1/2)))+e/(c^2*d^2-e^2)^2*c*h*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)
^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I/e^3/(c^2*d
^2-e^2)^2*c^5*h*d^4*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2...
```

### 3.102.5 Fricas [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\int \frac{(hx^2+gx+f)(b\arcsin{(cx)}+a)}{(ex+d)^3}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fricas")
```

output
```
integral((a*h*x^2 + a*g*x + a*f + (b*h*x^2 + b*g*x + b*f)*arcsin(c*x))/(e^
3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

### 3.102.6 Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx+hx^2)}{(d+ex)^3}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**3, x)
```

### 3.102.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.102.8 Giac [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^3}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="giac")
```

output
```
integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^3, x)
```

### 3.102.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(h\,x^2+g\,x+f\right)}{{\left(d+e\,x\right)}^3}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^3,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^3, x)
```

# 3.103 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$



## 3.103.1 Optimal result

Integrand size = 26, antiderivative size = 349

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{6e^2(c^2d^2-e^2)(d+ex)^2} - \frac{bc(e^2(eg-2dh)-c^2(de^2f-d^3h))\sqrt{1-c^2x^2}}{2e^2(c^2d^2-e^2)^2(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{h(a+b\arcsin(cx))}{e^3(d+ex)} + \frac{bc(6e^4h+c^2e^2(e^2f-4deg-5d^2h)+c^4d^2(2e^2f+deg+2d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{6e^3(c^2d^2-e^2)^{5/2}}$$

output
```
-1/3*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)^3-1/2*(-2*d*h+e*g)*
(a+b*arcsin(c*x))/e^3/(e*x+d)^2-h*(a+b*arcsin(c*x))/e^3/(e*x+d)+1/6*b*c*(6
*e^4*h+c^2*e^2*(-5*d^2*h-4*d*e*g+e^2*f)+c^4*d^2*(2*d^2*h+d*e*g+2*e^2*f))*a
rctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2
)^(5/2)+1/6*b*c*(d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(
e*x+d)^2-1/2*b*c*(e^2*(-2*d*h+e*g)-c^2*(-d^3*h+d*e^2*f))*(-c^2*x^2+1)^(1/2
)/e^2/(c^2*d^2-e^2)^2/(e*x+d)
```

### 3.103.2 Mathematica [A] (verified)

Time = 2.07 (sec) , antiderivative size = 442, normalized size of antiderivative = 1.27

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx =$$

$$-\frac{\frac{2a(e^2f-deg+d^2h)}{(d+ex)^3}+\frac{3a(eg-2dh)}{(d+ex)^2}+\frac{6ah}{d+ex}+\frac{bce\sqrt{1-c^2x^2}\left(e^2\left(-5d^2h+e^2(f+3gx)+2de(g-3hx)\right)+c^2d\left(-4de^2f+2d^3h-3e^3fx+d^2e(g+3\right.\right.}{(-c^2d^2+e^2)^2(d+ex)^2}}{}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
-1/6*((2*a*(e^2*f - d*e*g + d^2*h))/(d + e*x)^3 + (3*a*(e*g - 2*d*h))/(d +
 e*x)^2 + (6*a*h)/(d + e*x) + (b*c*e*Sqrt[1 - c^2*x^2]*(e^2*(-5*d^2*h + e^
2*(f + 3*g*x) + 2*d*e*(g - 3*h*x)) + c^2*d*(-4*d*e^2*f + 2*d^3*h - 3*e^3*f
*x + d^2*e*(g + 3*h*x))))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) + (b*(2*d^2*h
 + d*e*(g + 6*h*x) + e^2*(2*f + 3*x*(g + 2*h*x)))*ArcSin[c*x])/(d + e*x)^3
 - (b*c*(6*e^4*h + c^2*e^2*(e^2*f - 4*d*e*g - 5*d^2*h) + c^4*d^2*(2*e^2*f
+ d*e*g + 2*d^2*h))*Log[d + e*x])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d
^2) + e^2]) + (b*c*(6*e^4*h + c^2*e^2*(e^2*f - 4*d*e*g - 5*d^2*h) + c^4*d^
2*(2*e^2*f + d*e*g + 2*d^2*h))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sq
rt[1 - c^2*x^2]])/((-(c*d) + e)^2*(c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]))/e^3
```

### 3.103.3 Rubi [A] (verified)

Time = 0.75 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.02, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {5252, 27, 2182, 27, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}dx$$

$$\Big\downarrow \; 5252$$

$$-bc\int -\frac{2hd^2+egd+6e^2hx^2+2e^2f+3e(eg+2dh)x}{6e^3(d+ex)^3\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))(d^2h-deg+e^2f)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\downarrow 27$$

$$\frac{bc\int \frac{2hd^2+egd+6e^2hx^2+2e^2f+3e(eg+2dh)x}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{6e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\downarrow 2182$$

$$\frac{bc\left(\frac{\int -\frac{2\left(3ge^3+\left(\left(-5hd^2-egd+e^2f\right)c^2+6e^2h\right)xe-c^2d\left(2hd^2+egd+2e^2f\right)\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}\right)}{6e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\downarrow 27$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\int \frac{3ge^3+\left(\left(-5hd^2-egd+e^2f\right)c^2+6e^2h\right)xe-c^2d\left(2hd^2+egd+2e^2f\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{6e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\downarrow 679$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\frac{3\sqrt{1-c^2x^2}\left(e^3(eg-2dh)-c^2\left(de^3f-d^3eh\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{\left(c^4d^2\left(2d^2h+deg+2e^2f\right)+c^2e^2\left(-5d^2h-4deg+e^2f\right)+6e^4h\right)\int \frac{1}{(d+ex)\sqrt{1-\ldots}}}{c^2d^2-e^2}}{c^2d^2-e^2}\ldots\right)}{6e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\downarrow 488$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\frac{\left(c^4d^2\left(2d^2h+deg+2e^2f\right)+c^2e^2\left(-5d^2h-4deg+e^2f\right)+6e^4h\right)\int \frac{1}{-c^2d^2+e^2-\frac{\left(dxc^2+e\right)^2}{1-c^2x^2}}d\frac{dxc^2+e}{\sqrt{1-c^2x^2}}}{c^2d^2-e^2}+\frac{3\sqrt{1-c^2x^2}\left(e^3(eg\ldots\right.}{\left(c^2d^2\ldots\right.}}{c^2d^2-e^2}\ldots\right)}{6e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}$$

$$\downarrow 217$$

---

3.103. $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

$$-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{3e^3(d+ex)^3}-\frac{(eg-2dh)(a+b\arcsin(cx))}{2e^3(d+ex)^2}-\frac{h(a+b\arcsin(cx))}{e^3(d+ex)}+$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^2}-\frac{\frac{3\sqrt{1-c^2x^2}\left(e^3(eg-2dh)-c^2\left(de^3f-d^3eh\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)\left(c^4d^2\left(2d^2h+deg+2e^2f\right)+c^2e^2\left(-5d^2h-4c\right.\right.}{\left(c^2d^2-e^2\right)^{3/2}}}{c^2d^2-e^2}\right.}{6e^3}$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
-1/3*((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)^3) - ((e
*g - 2*d*h)*(a + b*ArcSin[c*x]))/(2*e^3*(d + e*x)^2) - (h*(a + b*ArcSin[c*
x]))/(e^3*(d + e*x)) + (b*c*((e*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x^2])
/((c^2*d^2 - e^2)*(d + e*x)^2) - ((3*(e^3*(e*g - 2*d*h) - c^2*(d*e^3*f - d
^3*e*h))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ((6*e^4*h + c^2*
e^2*(e^2*f - 4*d*e*g - 5*d^2*h) + c^4*d^2*(2*e^2*f + d*e*g + 2*d^2*h))*Arc
Tan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2
)^(3/2))/(c^2*d^2 - e^2)))/(6*e^3)
```

### 3.103.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 2182
```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Qx = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
 d + e*x, x]}, Simp[e*R*(d + e*x)^(m + 1)*((a + b*x^2)^(p + 1)/((m + 1)*(b*
d^2 + a*e^2))), x] + Simp[1/((m + 1)*(b*d^2 + a*e^2))   Int[(d + e*x)^(m +
1)*(a + b*x^2)^p*ExpandToSum[(m + 1)*(b*d^2 + a*e^2)*Qx + b*d*R*(m + 1) - b
*e*R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, d, e, p}, x] && PolyQ[Pq,
 x] && NeQ[b*d^2 + a*e^2, 0] && LtQ[m, -1]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

### 3.103.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1176 vs. $2(329) = 658$.

Time = 4.63 (sec) , antiderivative size = 1177, normalized size of antiderivative = 3.37

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 1177 |
| derivativedivides | Expression too large to display | 1188 |
| default | Expression too large to display | 1188 |

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/e^3*h/(e*x+d)-1/2*(-2*d*h+e*g)/e^3/(e*x+d)^2-1/3*(d^2*h-d*e*g+e^2*f)
/e^3/(e*x+d)^3)+b/c*(-c^2*arcsin(c*x)/e^3*h/(c*e*x+c*d)-1/3*c^4*arcsin(c*x
)/e^3/(c*e*x+c*d)^3*d^2*h+1/3*c^4*arcsin(c*x)/e^2/(c*e*x+c*d)^3*d*g-1/3*c^
4*arcsin(c*x)/e/(c*e*x+c*d)^3*f+c^3*arcsin(c*x)/e^3/(c*e*x+c*d)^2*d*h-1/2*
c^3*arcsin(c*x)*g/e^2/(c*e*x+c*d)^2+1/6*c^2/e^3*(-6*h/e/(-(c^2*d^2-e^2)/e^
2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^
2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*
x+d*c/e))-3*c*(2*d*h-e*g)/e^2*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/
e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c
^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c
^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e
^2)^(1/2))/(c*x+d*c/e)))+2*c^2*(d^2*h-d*e*g+e^2*f)/e^3*(1/2/(c^2*d^2-e^2)*
e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(
1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e
)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^
2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^
2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^
2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*l
n((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(
-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e...
```

### 3.103.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1488 vs. $2(329) = 658$.

Time = 72.26 (sec) , antiderivative size = 3003, normalized size of antiderivative = 8.60

$$\int \frac{(f + gx + hx^2)(a + b\arcsin(cx))}{(d + ex)^4} \, dx = \text{Too large to display}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fricas")
```

output
```
[-1/12*(12*(a*c^6*d^6*e^2 - 3*a*c^4*d^4*e^4 + 3*a*c^2*d^2*e^6 - a*e^8)*h*x
^2 + sqrt(-c^2*d^2 + e^2)*(((2*b*c^5*d^2*e^5 + b*c^3*e^7)*f + (b*c^5*d^3*e
^4 - 4*b*c^3*d*e^6)*g + (2*b*c^5*d^4*e^3 - 5*b*c^3*d^2*e^5 + 6*b*c*e^7)*h)
*x^3 + 3*((2*b*c^5*d^3*e^4 + b*c^3*d*e^6)*f + (b*c^5*d^4*e^3 - 4*b*c^3*d^2
*e^5)*g + (2*b*c^5*d^5*e^2 - 5*b*c^3*d^3*e^4 + 6*b*c*d*e^6)*h)*x^2 + (2*b*
c^5*d^5*e^2 + b*c^3*d^3*e^4)*f + (b*c^5*d^6*e - 4*b*c^3*d^4*e^3)*g + (2*b*
c^5*d^7 - 5*b*c^3*d^5*e^2 + 6*b*c*d^3*e^4)*h + 3*((2*b*c^5*d^4*e^3 + b*c^3
*d^2*e^5)*f + (b*c^5*d^5*e^2 - 4*b*c^3*d^3*e^4)*g + (2*b*c^5*d^6*e - 5*b*c
^3*d^4*e^3 + 6*b*c*d^2*e^5)*h)*x)*log((2*c^2*d*e*x - c^2*d^2 + (2*c^4*d^2
- c^2*e^2)*x^2 - 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2 + 1) +
 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 4*(a*c^6*d^6*e^2 - 3*a*c^4*d^4*e^4 +
3*a*c^2*d^2*e^6 - a*e^8)*f + 2*(a*c^6*d^7*e - 3*a*c^4*d^5*e^3 + 3*a*c^2*d^
3*e^5 - a*d*e^7)*g + 4*(a*c^6*d^8 - 3*a*c^4*d^6*e^2 + 3*a*c^2*d^4*e^4 - a*
d^2*e^6)*h + 6*((a*c^6*d^6*e^2 - 3*a*c^4*d^4*e^4 + 3*a*c^2*d^2*e^6 - a*e^8
)*g + 2*(a*c^6*d^7*e - 3*a*c^4*d^5*e^3 + 3*a*c^2*d^3*e^5 - a*d*e^7)*h)*x +
 2*(6*(b*c^6*d^6*e^2 - 3*b*c^4*d^4*e^4 + 3*b*c^2*d^2*e^6 - b*e^8)*h*x^2 +
2*(b*c^6*d^6*e^2 - 3*b*c^4*d^4*e^4 + 3*b*c^2*d^2*e^6 - b*e^8)*f + (b*c^6*d
^7*e - 3*b*c^4*d^5*e^3 + 3*b*c^2*d^3*e^5 - b*d*e^7)*g + 2*(b*c^6*d^8 - 3*b
*c^4*d^6*e^2 + 3*b*c^2*d^4*e^4 - b*d^2*e^6)*h + 3*((b*c^6*d^6*e^2 - 3*b*c^
4*d^4*e^4 + 3*b*c^2*d^2*e^6 - b*e^8)*g + 2*(b*c^6*d^7*e - 3*b*c^4*d^5*e...
```

## 3.103.6 Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^4}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**4,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**4, x)
```

### 3.103.7 Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx=\int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="maxima")
```

output
```
-1/6*(3*e*x + d)*a*g/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/3
*(3*e^2*x^2 + 3*d*e*x + d^2)*a*h/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^
3*e^3) - 1/3*a*f/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e) - 1/6*((6*b
*e^2*h*x^2 + 2*b*e^2*f + b*d*e*g + 2*b*d^2*h + 3*(b*e^2*g + 2*b*d*e*h)*x)*
arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)) + 6*(e^6*x^3 + 3*d*e^5*x^2 + 3*
d^2*e^4*x + d^3*e^3)*integrate(1/6*(6*b*c*e^2*h*x^2 + 2*b*c*e^2*f + b*c*d*
e*g + 2*b*c*d^2*h + 3*(b*c*e^2*g + 2*b*c*d*e*h)*x)*e^(1/2*log(c*x + 1) + 1
/2*log(-c*x + 1))/(c^4*e^6*x^7 + 3*c^4*d*e^5*x^6 - 3*c^2*d^2*e^4*x^3 - c^2
*d^3*e^3*x^2 + (3*c^4*d^2*e^4 - c^2*e^6)*x^5 + (c^4*d^3*e^3 - 3*c^2*d*e^5)
*x^4 + (c^2*e^6*x^5 + 3*c^2*d*e^5*x^4 - 3*d^2*e^4*x - d^3*e^3 + (3*c^2*d^2
*e^4 - e^6)*x^3 + (c^2*d^3*e^3 - 3*d*e^5)*x^2)*e^(log(c*x + 1) + log(-c*x
+ 1))), x))/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3)
```

### 3.103.8 Giac [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^4}\,dx=\int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^4}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="giac")
```

output
```
integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^4, x)
```

### 3.103.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)\,(a+b\arcsin(cx))}{(d+ex)^4}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(h\,x^2+g\,x+f\right)}{{\left(d+e\,x\right)}^4}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^4,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^4, x)
```

# 3.104 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$



## 3.104.1 Optimal result

Integrand size = 26, antiderivative size = 470

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^3} - \frac{bc(4e^2(eg-2dh)-c^2d(5e^2f-deg-3d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^2(d+ex)^2} + \frac{bc(12e^4h+c^4d^2(11e^2f+deg-d^2h)+4c^2e^2(e^2f-4deg+d^2h))\sqrt{1-c^2x^2}}{24e^2(c^2d^2-e^2)^3(d+ex)} - \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3} - \frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2} - \frac{bc^3(4e^4(eg-5dh)-c^2de^2(9e^2f-13deg-7d^2h)-2c^4d^3(3e^2f+deg+d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{24e^3(c^2d^2-e^2)^{7/2}}$$

output

```
-1/4*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)^4-1/3*(-2*d*h+e*g)*
(a+b*arcsin(c*x))/e^3/(e*x+d)^3-1/2*h*(a+b*arcsin(c*x))/e^3/(e*x+d)^2-1/24
*b*c^3*(4*e^4*(-5*d*h+e*g)-c^2*d*e^2*(-7*d^2*h-13*d*e*g+9*e^2*f)-2*c^4*d^3
*(d^2*h+d*e*g+3*e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1
)^(1/2))/e^3/(c^2*d^2-e^2)^(7/2)+1/12*b*c*(d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)
^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)^3-1/24*b*c*(4*e^2*(-2*d*h+e*g)-c^2*d*(-3*
d^2*h-d*e*g+5*e^2*f))*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)^2/(e*x+d)^2+1/2
4*b*c*(12*e^4*h+c^4*d^2*(-d^2*h+d*e*g+11*e^2*f)+4*c^2*e^2*(d^2*h-4*d*e*g+e
^2*f))*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)^3/(e*x+d)
```

## 3.104.2 Mathematica [A] (verified)

Time = 3.06 (sec) , antiderivative size = 575, normalized size of antiderivative = 1.22

$$\int \frac{(f + gx + hx^2)(a + b\arcsin(cx))}{(d + ex)^5} dx =$$

$$-\frac{\frac{6a(e^2f-deg+d^2h)}{(d+ex)^4} + \frac{8a(eg-2dh)}{(d+ex)^3} + \frac{12ah}{(d+ex)^2} + \frac{bce\sqrt{1-c^2x^2}(c^4d^2(-2d^4h+11e^4fx^2+de^3x(27f+gx)-d^3e(2g+5hx)+d^2e^2(18f+x(g-h}{}}{}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

output
```
-1/24*((6*a*(e^2*f - d*e*g + d^2*h))/(d + e*x)^4 + (8*a*(e*g - 2*d*h))/(d
+ e*x)^3 + (12*a*h)/(d + e*x)^2 + (b*c*e*Sqrt[1 - c^2*x^2]*(c^4*d^2*(-2*d^
4*h + 11*e^4*f*x^2 + d*e^3*x*(27*f + g*x) - d^3*e*(2*g + 5*h*x) + d^2*e^2*
(18*f + x*(g - h*x))) + 2*e^4*(3*d^2*h + d*e*(g + 8*h*x) + e^2*(f + 2*x*(g
 + 3*h*x))) + c^2*e^2*(11*d^4*h + 4*e^4*f*x^2 + d*e^3*x*(3*f - 16*g*x) + d
^3*e*(-15*g + 19*h*x) + d^2*e^2*(-5*f + x*(-35*g + 4*h*x)))))/((-(c^2*d^2)
 + e^2)^3*(d + e*x)^3) + (2*b*(d^2*h + d*e*(g + 4*h*x) + e^2*(3*f + 4*g*x
+ 6*h*x^2))*ArcSin[c*x])/(d + e*x)^4 - (b*c^3*(-4*e^4*(e*g - 5*d*h) + c^2*
d*e^2*(9*e^2*f - 13*d*e*g - 7*d^2*h) + 2*c^4*d^3*(3*e^2*f + d*e*g + d^2*h)
)*Log[d + e*x])/((c*d - e)^3*(c*d + e)^3*Sqrt[-(c^2*d^2) + e^2]) + (b*c^3*
(-4*e^4*(e*g - 5*d*h) + c^2*d*e^2*(9*e^2*f - 13*d*e*g - 7*d^2*h) + 2*c^4*d
^3*(3*e^2*f + d*e*g + d^2*h))*Log[e + c^2*d*x + Sqrt[-(c^2*d^2) + e^2]*Sqr
t[1 - c^2*x^2]])/((c*d - e)^3*(c*d + e)^3*Sqrt[-(c^2*d^2) + e^2]))/e^3
```

## 3.104.3 Rubi [A] (verified)

Time = 1.00 (sec) , antiderivative size = 494, normalized size of antiderivative = 1.05, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.346, Rules used = {5252, 27, 2182, 27, 688, 25, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f + gx + hx^2)(a + b\arcsin(cx))}{(d + ex)^5} dx$$

$$\Big\downarrow \; 5252$$

$$-bc\int -\frac{hd^2+egd+6e^2hx^2+3e^2f+4e(eg+dh)x}{12e^3(d+ex)^4\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{bc\int \frac{hd^2+egd+6e^2hx^2+3e^2f+4e(eg+dh)x}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{12e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \text{ 2182}$$

$$\frac{bc\left(\frac{\int -\frac{3\left(-d\left(hd^2+egd+3e^2f\right)c^2+2e^2(2eg-dh)+2e\left(\left(-2hd^2-egd+e^2f\right)c^2+3e^2h\right)x\right)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{3(c^2d^2-e^2)}+\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}\right)}{12e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\int \frac{-d\left(hd^2+egd+3e^2f\right)c^2+2e^2(2eg-dh)+2e\left(\left(-2hd^2-egd+e^2f\right)c^2+3e^2h\right)x}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{12e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \text{ 688}$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{\int -\frac{e\left(4e^2(eg-2dh)-c^2d\left(-3hd^2-egd+5e^2f\right)\right)xc^2+2\left(d^2\left(hd^2+egd+3e^2f\right)c^4+2e^2\left(-hd^2-3egd+e^2f\right)c^2+6e^4h\right)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2\left(c^2d^2-e^2\right)}+ e\sqrt{\ldots}}{c^2d^2-e^2}\right)}{12e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\Big\downarrow \text{ 25}$$

---

3.104. $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}dx$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2(eg-2dh)-c^2d\left(-3d^2h-deg+5e^2f\right)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\int\frac{e\left(4e^2(eg-2dh)-c^2d\left(-3hd^2-egd+5e^2f\right)\right)xc^2+2\left(d^2\left(hd^2+eg\cdots\right.\right.}{(d+ex)^2\sqrt{1-c^2x^2}}\cdots}{2\left(c^2d^2-e^2\right)}}{c^2d^2-e^2}\cdots\right)}{12e^3}$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\downarrow 679$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2(eg-2dh)-c^2d\left(-3d^2h-deg+5e^2f\right)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(d^2(-h)+deg+11e^2f\right)+4c^2e^2\left(d^2h-4deg+e^2f\cdots\right.\right.}{\left(c^2d^2-e^2\right)(d+ex)}\cdots}{\cdots}}{c^2d^2-e^2\cdots}\cdots\right)}{12e^3}$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\downarrow 488$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2(eg-2dh)-c^2d\left(-3d^2h-deg+5e^2f\right)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\frac{c^2\left(-2c^4d^3\left(d^2h+deg+3e^2f\right)-c^2de^2\left(-7d^2h-13deg+9e^2f\right)+4e\cdots\right.}{\cdots}}{c^2d^2-e^2\cdots}}{c\cdots}\cdots\right)}{12e^3}$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}$$

$$\downarrow 217$$

$$-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{4e^3(d+ex)^4}-\frac{(eg-2dh)(a+b\arcsin(cx))}{3e^3(d+ex)^3}-\frac{h(a+b\arcsin(cx))}{2e^3(d+ex)^2}+$$

$$\frac{bc\left(\frac{e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(4e^2(eg-2dh)-c^2d\left(-3d^2h-deg+5e^2f\right)\right)}{2\left(c^2d^2-e^2\right)(d+ex)^2}-\frac{\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(d^2(-h)+deg+11e^2f\right)+4c^2e^2\left(d^2h-4deg+e^2f\cdots\right.\right.}{\left(c^2d^2-e^2\right)(d+ex)}\cdots}{\cdots}}{c^2d^2\cdots}\cdots\right)}{12e^3}$$

3.104. $\int\frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^5,x]
```

output
```
-1/4*((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)^4) - ((e
*g - 2*d*h)*(a + b*ArcSin[c*x]))/(3*e^3*(d + e*x)^3) - (h*(a + b*ArcSin[c*
x]))/(2*e^3*(d + e*x)^2) + (b*c*((e*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2*x
^2])/((c^2*d^2 - e^2)*(d + e*x)^3) - ((e*(4*e^2*(e*g - 2*d*h) - c^2*d*(5*e
^2*f - d*e*g - 3*d^2*h))*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2
) - ((e*(12*e^4*h + c^4*d^2*(11*e^2*f + d*e*g - d^2*h) + 4*c^2*e^2*(e^2*f
- 4*d*e*g + d^2*h))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - (c^2*
(4*e^4*(e*g - 5*d*h) - c^2*d*e^2*(9*e^2*f - 13*d*e*g - 7*d^2*h) - 2*c^4*d^
3*(3*e^2*f + d*e*g + d^2*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqr
t[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2))/(2*(c^2*d^2 - e^2)))/(c^2*d^2 - e
^2)))/(12*e^3)
```

### 3.104.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 2182
```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Qx = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
 d + e*x, x]}, Simp[e*R*(d + e*x)^(m + 1)*((a + b*x^2)^(p + 1)/((m + 1)*(b*
d^2 + a*e^2))), x] + Simp[1/((m + 1)*(b*d^2 + a*e^2))   Int[(d + e*x)^(m +
1)*(a + b*x^2)^p*ExpandToSum[(m + 1)*(b*d^2 + a*e^2)*Qx + b*d*R*(m + 1) - b
*e*R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, d, e, p}, x] && PolyQ[Pq,
 x] && NeQ[b*d^2 + a*e^2, 0] && LtQ[m, -1]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

### 3.104.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1923 vs. $2(444) = 888$.

Time = 4.60 (sec) , antiderivative size = 1924, normalized size of antiderivative = 4.09

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 1924 |
| derivativedivides | Expression too large to display | 1935 |
| default | Expression too large to display | 1935 |

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/4*(d^2*h-d*e*g+e^2*f)/e^3/(e*x+d)^4-1/3*(-2*d*h+e*g)/e^3/(e*x+d)^3-1
/2/e^3*h/(e*x+d)^2)+b/c*(2/3*c^4*arcsin(c*x)/e^3/(c*e*x+c*d)^3*d*h-1/3*c^4
*arcsin(c*x)*g/e^2/(c*e*x+c*d)^3-1/2*c^3*arcsin(c*x)/e^3*h/(c*e*x+c*d)^2-1
/4*c^5*arcsin(c*x)/e^3/(c*e*x+c*d)^4*d^2*h+1/4*c^5*arcsin(c*x)/e^2/(c*e*x+
c*d)^4*d*g-1/4*c^5*arcsin(c*x)/e/(c*e*x+c*d)^4*f+1/12*c^3/e^3*(6*h/e^2*(1/
(c^2*d^2-e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2
-e^2)/e^2)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^
2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c
/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))-4*c*(2*d
*h-e*g)/e^3*(1/2/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(
c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^
2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^
(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/
e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c
/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e
^2/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)
+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2
-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+3*c^2*(d^2*h-d*e*g+e^2*f)/e^4*(1/3/(c^2*d^
2-e^2)*e^2/(c*x+d*c/e)^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)
/e^2)^(1/2)+5/3*d*c*e/(c^2*d^2-e^2)*(1/2/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^...
```

### 3.104.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2145 vs. $2(442) = 884$.

Time = 246.85 (sec) , antiderivative size = 4316, normalized size of antiderivative = 9.18

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Too large to display}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="fricas")
```

output
```
[-1/48*(24*(a*c^8*d^8*e^2 - 4*a*c^6*d^6*e^4 + 6*a*c^4*d^4*e^6 - 4*a*c^2*d^
2*e^8 + a*e^10)*h*x^2 - ((3*(2*b*c^7*d^3*e^6 + 3*b*c^5*d*e^8)*f + (2*b*c^7
*d^4*e^5 - 13*b*c^5*d^2*e^7 - 4*b*c^3*e^9)*g + (2*b*c^7*d^5*e^4 - 7*b*c^5*
d^3*e^6 + 20*b*c^3*d*e^8)*h)*x^4 + 4*(3*(2*b*c^7*d^4*e^5 + 3*b*c^5*d^2*e^7
)*f + (2*b*c^7*d^5*e^4 - 13*b*c^5*d^3*e^6 - 4*b*c^3*d*e^8)*g + (2*b*c^7*d^
6*e^3 - 7*b*c^5*d^4*e^5 + 20*b*c^3*d^2*e^7)*h)*x^3 + 6*(3*(2*b*c^7*d^5*e^4
 + 3*b*c^5*d^3*e^6)*f + (2*b*c^7*d^6*e^3 - 13*b*c^5*d^4*e^5 - 4*b*c^3*d^2*
e^7)*g + (2*b*c^7*d^7*e^2 - 7*b*c^5*d^5*e^4 + 20*b*c^3*d^3*e^6)*h)*x^2 + 3
*(2*b*c^7*d^7*e^2 + 3*b*c^5*d^5*e^4)*f + (2*b*c^7*d^8*e - 13*b*c^5*d^6*e^3
 - 4*b*c^3*d^4*e^5)*g + (2*b*c^7*d^9 - 7*b*c^5*d^7*e^2 + 20*b*c^3*d^5*e^4)
*h + 4*(3*(2*b*c^7*d^6*e^3 + 3*b*c^5*d^4*e^5)*f + (2*b*c^7*d^7*e^2 - 13*b*
c^5*d^5*e^4 - 4*b*c^3*d^3*e^6)*g + (2*b*c^7*d^8*e - 7*b*c^5*d^6*e^3 + 20*b
*c^3*d^4*e^5)*h)*x)*sqrt(-c^2*d^2 + e^2)*log((2*c^2*d*e*x - c^2*d^2 + (2*c
^4*d^2 - c^2*e^2)*x^2 + 2*sqrt(-c^2*d^2 + e^2)*(c^2*d*x + e)*sqrt(-c^2*x^2
 + 1) + 2*e^2)/(e^2*x^2 + 2*d*e*x + d^2)) + 12*(a*c^8*d^8*e^2 - 4*a*c^6*d^
6*e^4 + 6*a*c^4*d^4*e^6 - 4*a*c^2*d^2*e^8 + a*e^10)*f + 4*(a*c^8*d^9*e - 4
*a*c^6*d^7*e^3 + 6*a*c^4*d^5*e^5 - 4*a*c^2*d^3*e^7 + a*d*e^9)*g + 4*(a*c^8
*d^10 - 4*a*c^6*d^8*e^2 + 6*a*c^4*d^6*e^4 - 4*a*c^2*d^4*e^6 + a*d^2*e^8)*h
 + 16*((a*c^8*d^8*e^2 - 4*a*c^6*d^6*e^4 + 6*a*c^4*d^4*e^6 - 4*a*c^2*d^2*e^
8 + a*e^10)*g + (a*c^8*d^9*e - 4*a*c^6*d^7*e^3 + 6*a*c^4*d^5*e^5 - 4*a*...
```

## 3.104.6 Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^5}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**5,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**5, x)
```

### 3.104.7 Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^5}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="maxima")
```

output
```
-1/12*(4*e*x + d)*a*g/(e^6*x^4 + 4*d*e^5*x^3 + 6*d^2*e^4*x^2 + 4*d^3*e^3*x
 + d^4*e^2) - 1/12*(6*e^2*x^2 + 4*d*e*x + d^2)*a*h/(e^7*x^4 + 4*d*e^6*x^3
+ 6*d^2*e^5*x^2 + 4*d^3*e^4*x + d^4*e^3) - 1/4*a*f/(e^5*x^4 + 4*d*e^4*x^3
+ 6*d^2*e^3*x^2 + 4*d^3*e^2*x + d^4*e) - 1/12*((6*b*e^2*h*x^2 + 3*b*e^2*f
+ b*d*e*g + b*d^2*h + 4*(b*e^2*g + b*d*e*h)*x)*arctan2(c*x, sqrt(c*x + 1)*
sqrt(-c*x + 1)) + 12*(e^7*x^4 + 4*d*e^6*x^3 + 6*d^2*e^5*x^2 + 4*d^3*e^4*x
+ d^4*e^3)*integrate(1/12*(6*b*c*e^2*h*x^2 + 3*b*c*e^2*f + b*c*d*e*g + b*c
*d^2*h + 4*(b*c*e^2*g + b*c*d*e*h)*x)*e^(1/2*log(c*x + 1) + 1/2*log(-c*x +
 1))/(c^4*e^7*x^8 + 4*c^4*d*e^6*x^7 - 4*c^2*d^3*e^4*x^3 - c^2*d^4*e^3*x^2
+ (6*c^4*d^2*e^5 - c^2*e^7)*x^6 + 4*(c^4*d^3*e^4 - c^2*d*e^6)*x^5 + (c^4*d
^4*e^3 - 6*c^2*d^2*e^5)*x^4 + (c^2*e^7*x^6 + 4*c^2*d*e^6*x^5 - 4*d^3*e^4*x
 - d^4*e^3 + (6*c^2*d^2*e^5 - e^7)*x^4 + 4*(c^2*d^3*e^4 - d*e^6)*x^3 + (c^
2*d^4*e^3 - 6*d^2*e^5)*x^2)*e^(log(c*x + 1) + log(-c*x + 1))), x))/(e^7*x^
4 + 4*d*e^6*x^3 + 6*d^2*e^5*x^2 + 4*d^3*e^4*x + d^4*e^3)
```

### 3.104.8 Giac [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^5,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const ve
cteur & l) Error: Bad Argument Value
```

### 3.104.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^5}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(h\,x^2+g\,x+f\right)}{(d+e\,x)^5}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^5,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^5, x)
```

# 3.105 $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$



## 3.105.1 Optimal result

Integrand size = 26, antiderivative size = 593

$$
\begin{aligned}
\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx &= \frac{bc(e^2f-deg+d^2h)\sqrt{1-c^2x^2}}{20e^2(c^2d^2-e^2)(d+ex)^4} \\
&- \frac{bc(5e^2(eg-2dh)-c^2d(7e^2f-2deg-3d^2h))\sqrt{1-c^2x^2}}{60e^2(c^2d^2-e^2)^2(d+ex)^3} \\
&+ \frac{bc(20e^4h+c^4d^2(26e^2f-deg-4d^2h)+c^2e^2(9e^2f-34deg+19d^2h))\sqrt{1-c^2x^2}}{120e^2(c^2d^2-e^2)^3(d+ex)^2} \\
&+ \frac{bc^3(c^4d^3(10ef+dg)-4e^3(eg-5dh)+c^2de(11e^2f-18deg+d^2h))\sqrt{1-c^2x^2}}{24e(c^2d^2-e^2)^4(d+ex)} \\
&- \frac{(e^2f-deg+d^2h)(a+b\arcsin(cx))}{5e^3(d+ex)^5} \\
&- \frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4} - \frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3} \\
&+ \frac{bc^3(20e^6h+3c^4d^2e^2(24e^2f-19deg-6d^2h)+2c^6d^4(12e^2f+3deg+2d^2h)+9c^2e^4(e^2f-6deg+11d^2}{120e^3(c^2d^2-e^2)^{9/2}}
\end{aligned}
$$

output
```
-1/5*(d^2*h-d*e*g+e^2*f)*(a+b*arcsin(c*x))/e^3/(e*x+d)^5-1/4*(-2*d*h+e*g)*
(a+b*arcsin(c*x))/e^3/(e*x+d)^4-1/3*h*(a+b*arcsin(c*x))/e^3/(e*x+d)^3+1/12
0*b*c^3*(20*e^6*h+3*c^4*d^2*e^2*(-6*d^2*h-19*d*e*g+24*e^2*f)+2*c^6*d^4*(2*
d^2*h+3*d*e*g+12*e^2*f)+9*c^2*e^4*(11*d^2*h-6*d*e*g+e^2*f))*arctan((c^2*d*
x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(9/2)+1/20*
b*c*(d^2*h-d*e*g+e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2*d^2-e^2)/(e*x+d)^4-1/6
0*b*c*(5*e^2*(-2*d*h+e*g)-c^2*d*(-3*d^2*h-2*d*e*g+7*e^2*f))*(-c^2*x^2+1)^(
1/2)/e^2/(c^2*d^2-e^2)^2/(e*x+d)^3+1/120*b*c*(20*e^4*h+c^4*d^2*(-4*d^2*h-d
*e*g+26*e^2*f)+c^2*e^2*(19*d^2*h-34*d*e*g+9*e^2*f))*(-c^2*x^2+1)^(1/2)/e^2
/(c^2*d^2-e^2)^3/(e*x+d)^2+1/24*b*c^3*(c^4*d^3*(d*g+10*e*f)-4*e^3*(-5*d*h+
e*g)+c^2*d*e*(d^2*h-18*d*e*g+11*e^2*f))*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)
^4/(e*x+d)
```

### 3.105.2 Mathematica [A] (verified)

Time = 2.86 (sec) , antiderivative size = 682, normalized size of antiderivative = 1.15

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx =$$

$$-\frac{\frac{24a(e^2f-deg+d^2h)}{(d+ex)^5}+\frac{30a(eg-2dh)}{(d+ex)^4}+\frac{40ah}{(d+ex)^3}-\frac{bce\sqrt{1-c^2x^2}\left(6(c^2d^2-e^2)^3(e^2f-deg+d^2h)-2(-c^2d^2+e^2)^2(5e^2(eg-2dh)+c^2d(-7e\cdots\right.}{\cdots}}{\cdots}$$

input
```
Integrate[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

output
```
-1/120*((24*a*(e^2*f - d*e*g + d^2*h))/(d + e*x)^5 + (30*a*(e*g - 2*d*h))/
(d + e*x)^4 + (40*a*h)/(d + e*x)^3 - (b*c*e*Sqrt[1 - c^2*x^2]*(6*(c^2*d^2
- e^2)^3*(e^2*f - d*e*g + d^2*h) - 2*(-(c^2*d^2) + e^2)^2*(5*e^2*(e*g - 2*
d*h) + c^2*d*(-7*e^2*f + 2*d*e*g + 3*d^2*h))*(d + e*x) - (-(c^2*d^2) + e^2
)*(20*e^4*h - c^4*d^2*(-26*e^2*f + d*e*g + 4*d^2*h) + c^2*e^2*(9*e^2*f - 3
4*d*e*g + 19*d^2*h))*(d + e*x)^2 + 5*c^2*e*(c^4*d^3*(10*e*f + d*g) - 4*e^3
*(e*g - 5*d*h) + c^2*d*e*(11*e^2*f - 18*d*e*g + d^2*h))*(d + e*x)^3))/((-(
c^2*d^2) + e^2)^4*(d + e*x)^4) + (2*b*(2*d^2*h + d*e*(3*g + 10*h*x) + e^2*
(12*f + 5*x*(3*g + 4*h*x)))*ArcSin[c*x])/(d + e*x)^5 - (b*c^3*(20*e^6*h +
2*c^6*d^4*(12*e^2*f + 3*d*e*g + 2*d^2*h) - 3*c^4*d^2*e^2*(-24*e^2*f + 19*d
*e*g + 6*d^2*h) + 9*c^2*e^4*(e^2*f - 6*d*e*g + 11*d^2*h))*Log[d + e*x])/((
-(c*d) + e)^4*(c*d + e)^4*Sqrt[-(c^2*d^2) + e^2]) + (b*c^3*(20*e^6*h + 2*c
^6*d^4*(12*e^2*f + 3*d*e*g + 2*d^2*h) - 3*c^4*d^2*e^2*(-24*e^2*f + 19*d*e*
g + 6*d^2*h) + 9*c^2*e^4*(e^2*f - 6*d*e*g + 11*d^2*h))*Log[e + c^2*d*x + S
qrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/((-(c*d) + e)^4*(c*d + e)^4*Sqrt
[-(c^2*d^2) + e^2]))/e^3
```

### 3.105.3 Rubi [A] (verified)

Time = 1.25 (sec) , antiderivative size = 630, normalized size of antiderivative = 1.06, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462, Rules used = {5252, 27, 2182, 27, 688, 27, 688, 25, 27, 679, 488, 217}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int -\frac{2hd^2+3egd+20e^2hx^2+12e^2f+5e(3eg+2dh)x}{60e^3(d+ex)^5\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{2hd^2+3egd+20e^2hx^2+12e^2f+5e(3eg+2dh)x}{(d+ex)^5\sqrt{1-c^2x^2}}dx}{60e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \text{2182}$$

$$\frac{bc\left(\frac{\int -\frac{4\left(-d\left(2hd^2+3egd+12e^2f\right)c^2+5e^2(3eg-2dh)+e\left(\left(-11hd^2-9egd+9e^2f\right)c^2+20e^2h\right)x\right)}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{4(c^2d^2-e^2)}+\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}\right)}{60e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\int \frac{-d\left(2hd^2+3egd+12e^2f\right)c^2+5e^2(3eg-2dh)+e\left(\left(-11hd^2-9egd+9e^2f\right)c^2+20e^2h\right)x}{(d+ex)^4\sqrt{1-c^2x^2}}dx}{c^2d^2-e^2}\right)}{60e^3}-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \text{688}$$

$$\frac{bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{\int -\frac{3\left(d^2\left(2hd^2+3egd+12e^2f\right)c^4+e^2\left(-hd^2-24egd+9e^2f\right)c^2+2e\left(5e^2(eg-2dh)-c^2d\left(-3hd^2-2egd+7e^2f\right)\right)xc^2+20e^4h\cdots\right)}{(d+ex)^3\sqrt{1-c^2x^2}}}{3\left(c^2d^2-e^2\right)}\cdots}{c^2d^2-e^2}\cdots\right.}{60e^3}$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \; 27$$

$$\frac{bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\int\frac{d^2\left(2hd^2+3egd+12e^2f\right)c^4+e^2\left(-hd^2-24egd+9e^2f\right)c^2+2e\left(\cdots\right.}{(d+ex)^3\sqrt{1-\cdots}}}{c^2d^2-e\cdots}}{c^2d^2-e^2}\cdots\right.}{60e^3}$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \; 688$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\int -\frac{c^2\left(2\left(-d^3\left(2hd^2+3egd+12e^2f\right)c^4-de^2\left(-7hd^2-28egd+2\cdots\right.\right.\right.}{\cdots}}{\cdots}}{\cdots}\cdots\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \; 25$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2\left(19d^2h-34deg+\cdots\right.\right.}{2\left(c^2d^2-e^2\right)(d+ex)^2}\cdots}{\cdots}}{\cdots}\cdots\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \; 27$$

---

3.105. $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2\left(19d^2h-34deg+\right.\right.}{2\left(c^2d^2-e^2\right)(d+ex)^2}}{}\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \; 679$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2\left(19d^2h-34deg+\right.\right.}{2\left(c^2d^2-e^2\right)(d+ex)^2}}{}\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \; 488$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2\left(19d^2h-34deg+\right.\right.}{2\left(c^2d^2-e^2\right)(d+ex)^2}}{}\right.$$

$$\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}$$

$$\Big\downarrow \; 217$$

---

3.105. $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$

$$-\frac{(a+b\arcsin(cx))\left(d^2h-deg+e^2f\right)}{5e^3(d+ex)^5}-\frac{(eg-2dh)(a+b\arcsin(cx))}{4e^3(d+ex)^4}-\frac{h(a+b\arcsin(cx))}{3e^3(d+ex)^3}+$$

$$bc\left(\frac{3e\sqrt{1-c^2x^2}(d^2h-deg+e^2f)}{(c^2d^2-e^2)(d+ex)^4}-\frac{\frac{e\sqrt{1-c^2x^2}\left(5e^2(eg-2dh)-c^2d\left(-3d^2h-2deg+7e^2f\right)\right)}{\left(c^2d^2-e^2\right)(d+ex)^3}-\frac{e\sqrt{1-c^2x^2}\left(c^4d^2\left(-4d^2h-deg+26e^2f\right)+c^2e^2\left(19d^2h-34deg+\right.\right.}{2\left(c^2d^2-e^2\right)(d+ex)^2}}{}\right.$$

input
```
Int[((f + g*x + h*x^2)*(a + b*ArcSin[c*x]))/(d + e*x)^6,x]
```

output
```
-1/5*((e^2*f - d*e*g + d^2*h)*(a + b*ArcSin[c*x]))/(e^3*(d + e*x)^5) - ((e
*g - 2*d*h)*(a + b*ArcSin[c*x]))/(4*e^3*(d + e*x)^4) - (h*(a + b*ArcSin[c*
x]))/(3*e^3*(d + e*x)^3) + (b*c*((3*e*(e^2*f - d*e*g + d^2*h)*Sqrt[1 - c^2
*x^2])/((c^2*d^2 - e^2)*(d + e*x)^4) - ((e*(5*e^2*(e*g - 2*d*h) - c^2*d*(7
*e^2*f - 2*d*e*g - 3*d^2*h))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)
^3) - ((e*(20*e^4*h + c^4*d^2*(26*e^2*f - d*e*g - 4*d^2*h) + c^2*e^2*(9*e^
2*f - 34*d*e*g + 19*d^2*h))*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x
)^2) - (c^2*((-5*e^2*(c^4*d^3*(10*e*f + d*g) - 4*e^3*(e*g - 5*d*h) + c^2*d
*e*(11*e^2*f - 18*d*e*g + d^2*h))*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d +
 e*x)) - ((20*e^6*h + 3*c^4*d^2*e^2*(24*e^2*f - 19*d*e*g - 6*d^2*h) + 2*c^
6*d^4*(12*e^2*f + 3*d*e*g + 2*d^2*h) + 9*c^2*e^4*(e^2*f - 6*d*e*g + 11*d^2
*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d
^2 - e^2)^(3/2)))/(2*(c^2*d^2 - e^2)))/(c^2*d^2 - e^2))/(c^2*d^2 - e^2)))/
(60*e^3)
```

### 3.105.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 217
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(-(Rt[-a, 2]*Rt[-b, 2])^(
-1))*ArcTan[Rt[-b, 2]*(x/Rt[-a, 2])], x] /; FreeQ[{a, b}, x] && PosQ[a/b] &
& (LtQ[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 2182
```
Int[(Pq_)*((d_) + (e_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 With[{Qx = PolynomialQuotient[Pq, d + e*x, x], R = PolynomialRemainder[Pq,
 d + e*x, x]}, Simp[e*R*(d + e*x)^(m + 1)*((a + b*x^2)^(p + 1)/((m + 1)*(b*
d^2 + a*e^2))), x] + Simp[1/((m + 1)*(b*d^2 + a*e^2))   Int[(d + e*x)^(m +
1)*(a + b*x^2)^p*ExpandToSum[(m + 1)*(b*d^2 + a*e^2)*Qx + b*d*R*(m + 1) - b
*e*R*(m + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, d, e, p}, x] && PolyQ[Pq,
 x] && NeQ[b*d^2 + a*e^2, 0] && LtQ[m, -1]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

## 3.105. $\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx$

### 3.105.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 3207 vs. $2(563) = 1126$.

Time = 5.45 (sec) , antiderivative size = 3208, normalized size of antiderivative = 5.41

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 3208 |
| derivativedivides | Expression too large to display | 3219 |
| default | Expression too large to display | 3219 |

input
```
int((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

output
```
a*(-1/3/e^3*h/(e*x+d)^3-1/4*(-2*d*h+e*g)/e^3/(e*x+d)^4-1/5*(d^2*h-d*e*g+e^
2*f)/e^3/(e*x+d)^5)+b/c*(-1/3*c^4*arcsin(c*x)/e^3*h/(c*e*x+c*d)^3+1/2*c^5*
arcsin(c*x)/e^3/(c*e*x+c*d)^4*d*h-1/4*c^5*arcsin(c*x)/e^2/(c*e*x+c*d)^4*g-
1/5*c^6*arcsin(c*x)/e^3/(c*e*x+c*d)^5*d^2*h+1/5*c^6*arcsin(c*x)/e^2/(c*e*x
+c*d)^5*d*g-1/5*c^6*arcsin(c*x)/e/(c*e*x+c*d)^5*f+1/60*c^4/e^3*(20*h/e^3*(
1/2/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c
^2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-e^2)*e^2/(c*x+d
*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)-d*c*e/(
c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(
c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e
)-(c^2*d^2-e^2)/e^2)^(1/2))/(c*x+d*c/e)))+1/2/(c^2*d^2-e^2)*e^2/(-(c^2*d^2
-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2
-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1
/2))/(c*x+d*c/e)))-15*c*(2*d*h-e*g)/e^4*(1/3/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)
^3*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+5/3*d*c*e/
(c^2*d^2-e^2)*(1/2/(c^2*d^2-e^2)*e^2/(c*x+d*c/e)^2*(-(c*x+d*c/e)^2+2*d*c/e
*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2)^(1/2)+3/2*d*c*e/(c^2*d^2-e^2)*(1/(c^2*d^2-
e^2)*e^2/(c*x+d*c/e)*(-(c*x+d*c/e)^2+2*d*c/e*(c*x+d*c/e)-(c^2*d^2-e^2)/e^2
)^(1/2)-d*c*e/(c^2*d^2-e^2)/(-(c^2*d^2-e^2)/e^2)^(1/2)*ln((-2*(c^2*d^2-e^2
)/e^2+2*d*c/e*(c*x+d*c/e)+2*(-(c^2*d^2-e^2)/e^2)^(1/2)*(-(c*x+d*c/e)^2+...
```

### 3.105.5 Fricas [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \text{Timed out}$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="fricas")
```

output
```
Timed out
```

### 3.105.6 Sympy [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))\,(f+gx+hx^2)}{(d+ex)^6}\,dx$$

input
```
integrate((h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**6,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2)/(d + e*x)**6, x)
```

### 3.105.7 Maxima [F]

$$\int \frac{(f+gx+hx^2)(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^6}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="maxima")
```

output
```
-1/20*(5*e*x + d)*a*g/(e^7*x^5 + 5*d*e^6*x^4 + 10*d^2*e^5*x^3 + 10*d^3*e^4
*x^2 + 5*d^4*e^3*x + d^5*e^2) - 1/30*(10*e^2*x^2 + 5*d*e*x + d^2)*a*h/(e^8
*x^5 + 5*d*e^7*x^4 + 10*d^2*e^6*x^3 + 10*d^3*e^5*x^2 + 5*d^4*e^4*x + d^5*e
^3) - 1/5*a*f/(e^6*x^5 + 5*d*e^5*x^4 + 10*d^2*e^4*x^3 + 10*d^3*e^3*x^2 + 5
*d^4*e^2*x + d^5*e) - 1/60*((20*b*e^2*h*x^2 + 12*b*e^2*f + 3*b*d*e*g + 2*b
*d^2*h + 5*(3*b*e^2*g + 2*b*d*e*h)*x)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x
 + 1)) + 60*(e^8*x^5 + 5*d*e^7*x^4 + 10*d^2*e^6*x^3 + 10*d^3*e^5*x^2 + 5*d
^4*e^4*x + d^5*e^3)*integrate(1/60*(20*b*c*e^2*h*x^2 + 12*b*c*e^2*f + 3*b*
c*d*e*g + 2*b*c*d^2*h + 5*(3*b*c*e^2*g + 2*b*c*d*e*h)*x)*e^(1/2*log(c*x +
1) + 1/2*log(-c*x + 1))/(c^4*e^8*x^9 + 5*c^4*d*e^7*x^8 - 5*c^2*d^4*e^4*x^3
 - c^2*d^5*e^3*x^2 + (10*c^4*d^2*e^6 - c^2*e^8)*x^7 + 5*(2*c^4*d^3*e^5 - c
^2*d*e^7)*x^6 + 5*(c^4*d^4*e^4 - 2*c^2*d^2*e^6)*x^5 + (c^4*d^5*e^3 - 10*c^
2*d^3*e^5)*x^4 + (c^2*e^8*x^7 + 5*c^2*d*e^7*x^6 - 5*d^4*e^4*x - d^5*e^3 +
(10*c^2*d^2*e^6 - e^8)*x^5 + 5*(2*c^2*d^3*e^5 - d*e^7)*x^4 + 5*(c^2*d^4*e^
4 - 2*d^2*e^6)*x^3 + (c^2*d^5*e^3 - 10*d^3*e^5)*x^2)*e^(log(c*x + 1) + log
(-c*x + 1))), x))/(e^8*x^5 + 5*d*e^7*x^4 + 10*d^2*e^6*x^3 + 10*d^3*e^5*x^2
 + 5*d^4*e^4*x + d^5*e^3)
```

### 3.105.8 Giac [F]

$$\int \frac{(f+gx+hx^2)\,(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(hx^2+gx+f)(b\arcsin{(cx)}+a)}{(ex+d)^6}\,dx$$

input
```
integrate((h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^6,x, algorithm="giac")
```

output
```
integrate((h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^6, x)
```

### 3.105.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2)\,(a+b\arcsin(cx))}{(d+ex)^6}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(h\,x^2+g\,x+f\right)}{(d+e\,x)^6}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^6,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2))/(d + e*x)^6, x)
```

# 3.106 $\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$



## 3.106.1 Optimal result

Integrand size = 31, antiderivative size = 684

$$\begin{aligned}
&\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx \\
&= \frac{b(1225c^4d(3e^2f+3deg+d^2h)+360e^3i+588c^2e(e^2g+3deh+3d^2i))\,x^2\sqrt{1-c^2x^2}}{11025c^5} \\
&\quad + \frac{b(5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\,x^3\sqrt{1-c^2x^2}}{144c^3} \\
&\quad + \frac{be(30e^2i+49c^2(e^2g+3deh+3d^2i))\,x^4\sqrt{1-c^2x^2}}{1225c^3} \\
&\quad + \frac{be^2(eh+3di)x^5\sqrt{1-c^2x^2}}{36c} + \frac{be^3ix^6\sqrt{1-c^2x^2}}{49c} \\
&\quad + \frac{b(32(11025c^6d^3f+2450c^4d(3e^2f+3deg+d^2h)+720e^3i+1176c^2e(e^2g+3deh+3d^2i))+3675c^2(24c}{352800c^7} \\
&\quad - \frac{b(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\arcsin(cx)}{96c^6} \\
&\quad + d^3fx(a+b\arcsin(cx)) + \frac{1}{2}d^2(3ef+dg)x^2(a+b\arcsin(cx)) \\
&\quad + \frac{1}{3}d\left(3e^2f+3deg+d^2h\right)x^3(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4(a+b\arcsin(cx)) \\
&\quad + \frac{1}{5}e\left(e^2g+3deh+3d^2i\right)x^5(a+b\arcsin(cx)) \\
&\quad + \frac{1}{6}e^2(eh+3di)x^6(a+b\arcsin(cx)) + \frac{1}{7}e^3ix^7(a+b\arcsin(cx))
\end{aligned}$$

output
```
-1/96*b*(24*c^4*d^2*(d*g+3*e*f)+5*e^2*(3*d*i+e*h)+9*c^2*(d^3*i+3*d^2*e*h+3
*d*e^2*g+e^3*f))*arcsin(c*x)/c^6+d^3*f*x*(a+b*arcsin(c*x))+1/2*d^2*(d*g+3*
e*f)*x^2*(a+b*arcsin(c*x))+1/3*d*(d^2*h+3*d*e*g+3*e^2*f)*x^3*(a+b*arcsin(c
*x))+1/4*(d^3*i+3*d^2*e*h+3*d*e^2*g+e^3*f)*x^4*(a+b*arcsin(c*x))+1/5*e*(3*
d^2*i+3*d*e*h+e^2*g)*x^5*(a+b*arcsin(c*x))+1/6*e^2*(3*d*i+e*h)*x^6*(a+b*ar
csin(c*x))+1/7*e^3*i*x^7*(a+b*arcsin(c*x))+1/11025*b*(1225*c^4*d*(d^2*h+3*
d*e*g+3*e^2*f)+360*e^3*i+588*c^2*e*(3*d^2*i+3*d*e*h+e^2*g))*x^2*(-c^2*x^2+
1)^(1/2)/c^5+1/144*b*(5*e^2*(3*d*i+e*h)+9*c^2*(d^3*i+3*d^2*e*h+3*d*e^2*g+e
^3*f))*x^3*(-c^2*x^2+1)^(1/2)/c^3+1/1225*b*e*(30*e^2*i+49*c^2*(3*d^2*i+3*d
*e*h+e^2*g))*x^4*(-c^2*x^2+1)^(1/2)/c^3+1/36*b*e^2*(3*d*i+e*h)*x^5*(-c^2*x
^2+1)^(1/2)/c+1/49*b*e^3*i*x^6*(-c^2*x^2+1)^(1/2)/c+1/352800*b*(352800*c^6
*d^3*f+78400*c^4*d*(d^2*h+3*d*e*g+3*e^2*f)+23040*e^3*i+37632*c^2*e*(3*d^2*
i+3*d*e*h+e^2*g)+3675*c^2*(24*c^4*d^2*(d*g+3*e*f)+5*e^2*(3*d*i+e*h)+9*c^2*
(d^3*i+3*d^2*e*h+3*d*e^2*g+e^3*f))*x)*(-c^2*x^2+1)^(1/2)/c^7
```

### 3.106.2 Mathematica [A] (verified)

Time = 0.92 (sec) , antiderivative size = 619, normalized size of antiderivative = 0.90

$$\int (d+ex)^3\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= ad^3fx+\frac{1}{2}ad^2(3ef+dg)x^2+\frac{1}{3}ad\left(3e^2f+3deg+d^2h\right)x^3+\frac{1}{4}a\left(e^3f+3de^2g+3d^2eh+d^3i\right)x^4$$
$$+\frac{1}{5}ae\left(e^2g+3deh+3d^2i\right)x^5+\frac{1}{6}ae^2(eh+3di)x^6+\frac{1}{7}ae^3ix^7$$
$$+\frac{b\sqrt{1-c^2x^2}(23040e^3i+3c^2e(37632d^2i+147de(256h+125ix)+e^2(12544g+5x(1225h+768ix)))+c}{}$$
$$-\frac{b(24c^4d^2(3ef+dg)+5e^2(eh+3di)+9c^2(e^3f+3de^2g+3d^2eh+d^3i))\arcsin(cx)}{96c^6}$$
$$+\frac{1}{420}bx\left(35d^3(12f+x(6g+x(4h+3ix)))+21d^2ex(30f+x(20g+3x(5h+4ix)))\right.$$
$$\left.+21de^2x^2(20f+x(15g+2x(6h+5ix)))+e^3x^3(105f+2x(42g+5x(7h+6ix)))\right)\arcsin(cx)$$

input
```
Integrate[(d + e*x)^3*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
a*d^3*f*x + (a*d^2*(3*e*f + d*g)*x^2)/2 + (a*d*(3*e^2*f + 3*d*e*g + d^2*h)
*x^3)/3 + (a*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i)*x^4)/4 + (a*e*(e^2*g
+ 3*d*e*h + 3*d^2*i)*x^5)/5 + (a*e^2*(e*h + 3*d*i)*x^6)/6 + (a*e^3*i*x^7)/
7 + (b*Sqrt[1 - c^2*x^2]*(23040*e^3*i + 3*c^2*e*(37632*d^2*i + 147*d*e*(25
6*h + 125*i*x) + e^2*(12544*g + 5*x*(1225*h + 768*i*x))) + c^4*(1225*d^3*(
64*h + 27*i*x) + 147*d^2*e*(1600*g + 675*h*x + 384*i*x^2) + 147*d*e^2*(160
0*f + x*(675*g + 384*h*x + 250*i*x^2)) + e^3*x*(33075*f + 2*x*(9408*g + 61
25*h*x + 4320*i*x^2))) + 2*c^6*(1225*d^3*(144*f + x*(36*g + x*(16*h + 9*i*
x))) + 147*d^2*e*x*(900*f + x*(400*g + 9*x*(25*h + 16*i*x))) + 147*d*e^2*x
^2*(400*f + x*(225*g + 4*x*(36*h + 25*i*x))) + e^3*x^3*(11025*f + 4*x*(176
4*g + 25*x*(49*h + 36*i*x))))))/(352800*c^7) - (b*(24*c^4*d^2*(3*e*f + d*g
) + 5*e^2*(e*h + 3*d*i) + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))*A
rcSin[c*x])/(96*c^6) + (b*x*(35*d^3*(12*f + x*(6*g + x*(4*h + 3*i*x))) + 2
1*d^2*e*x*(30*f + x*(20*g + 3*x*(5*h + 4*i*x))) + 21*d*e^2*x^2*(20*f + x*(
15*g + 2*x*(6*h + 5*i*x))) + e^3*x^3*(105*f + 2*x*(42*g + 5*x*(7*h + 6*i*x
))))*ArcSin[c*x])/420
```

### 3.106.3 Rubi [A] (verified)

Time = 3.81 (sec) , antiderivative size = 729, normalized size of antiderivative = 1.07, number of steps used = 17, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.548, Rules used = {5248, 27, 2340, 25, 2340, 27, 2340, 25, 2340, 27, 2340, 25, 27, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^3(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)\,dx$$

$$\Big\downarrow \; 5248$$

$$-bc\int \frac{x\left(35(12f+x(6g+x(4h+3ix)))d^3+21ex(30f+x(20g+3x(5h+4ix)))d^2+21e^2x^2(20f+x(15g+2x(\right.}{420\sqrt{1-c^2x^2}}$$
$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{420}bc\int \frac{x(35(12f+x(6g+x(4h+3ix)))d^3+21ex(30f+x(20g+3x(5h+4ix)))d^2+21e^2x^2(20f+x(15g+}{\sqrt{1-c^2x^2}}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{420}bc\left(-\frac{\int -\frac{x\left(490c^2e^2(eh+3di)x^5+12e\left(49\left(3id^2+3ehd+e^2g\right)c^2+30e^2i\right)x^4+735c^2\left(id^3+3ehd^2+3e^2gd+e^3f\right)x^3+980c^2d\left(hd^2+3egd+3e^2f\right)}{\sqrt{1-c^2x^2}}}{7c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$\downarrow$ 25

$$-\frac{1}{420}bc\left(\frac{\int \frac{x\left(490c^2e^2(eh+3di)x^5+12e\left(49\left(3id^2+3ehd+e^2g\right)c^2+30e^2i\right)x^4+735c^2\left(id^3+3ehd^2+3e^2gd+e^3f\right)x^3+980c^2d\left(hd^2+3egd+3e^2f\right)x^2+}{\sqrt{1-c^2x^2}}}{7c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{420}bc\left(-\frac{\frac{\int -\frac{2x\left(2940d\left(hd^2+3egd+3e^2f\right)x^2c^4+8820d^3fc^4+4410d^2(3ef+dg)xc^4+36e\left(49\left(3id^2+3ehd+e^2g\right)c^2+30e^2i\right)x^4c^2+245\left(9\left(id^3+3ehd^2+3e^2gd+e\right.\right.\right.}{\sqrt{1-c^2x^2}}}{6c^2}}{7c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

---

3.106. $\int (d+ex)^3\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$\Big\downarrow \; 27$$

$$-\frac{1}{420}bc\left(\frac{\frac{\int \frac{x\left(2940d\left(hd^2+3egd+3e^2f\right)x^2c^4+8820d^3fc^4+4410d^2(3ef+dg)xc^4+36e\left(49\left(3id^2+3ehd+e^2g\right)c^2+30e^2i\right)x^4c^2+245\left(9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2\right.\right.}{\sqrt{1-c^2x^2}}}{3c^2}}{7c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+ b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+ b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+ b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{420}bc\left(\frac{\frac{-\frac{\int -\frac{x\left(44100d^3fc^6+22050d^2(3ef+dg)xc^6+1225\left(9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)x^3c^4+12\left(1225d\left(hd^2+3egd+3e^2f\right)c^4+588e\left(3id^2+\right.\right.\right.}{\sqrt{1-c^2x^2}}}{5c^2}}{3c^2}}{7c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+ b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+ b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+ b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{\int \frac{x\left(44100d^3fc^6+22050d^2(3ef+dg)xc^6+1225\left(9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)x^3c^4+12\left(1225d\left(hd^2+3egd+3e^2f\right)c^4+588e\left(3id^2+3eh\right.\right.\right.}{\sqrt{1-c^2x^2}}}{5c^2}}{3c^2}}{7c^2}\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+ b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+ b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+ b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

---

3.106. $\int (d+ex)^3\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{-\frac{\int -\frac{3x\left(58800d^3fc^8+16\left(1225d\left(hd^2+3egd+3e^2f\right)c^4+588e\left(3id^2+3ehd+e^2g\right)c^2+360e^3i\right)x^2c^4+1225\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\cdots}{\sqrt{1-c^2x^2}}}{4c^2}}{5c^2}}{\cdots}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$\Big\downarrow$ 27

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{3\int \frac{x\left(58800d^3fc^8+16\left(1225d\left(hd^2+3egd+3e^2f\right)c^4+588e\left(3id^2+3ehd+e^2g\right)c^2+360e^3i\right)x^2c^4+1225\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c\cdots}{\sqrt{1-c^2x^2}}}{4c^2}}{5c^2}}{3\cdots}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$\Big\downarrow$ 2340

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{3\left(-\frac{\int -\frac{c^4x\left(3675\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)xc^2+16\left(11025d^3fc^6+2450d\left(hd^2+3egd+3e^2f\right)c^4+1176e\left(3id^2+\cdots\right.\right.}{\sqrt{1-c^2x^2}}}{3c^2}\cdots\right)}{4c^2}}{\cdots}}{\cdots}\cdots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

---

3.106. $\int (d+ex)^3\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$\Big\downarrow \; 25$$

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{3\left(\frac{\int \frac{c^4x\left(3675\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)xc^2+16\left(11025d^3fc^6+2450d\left(hd^2+3egd+3e^2f\right)c^4+1176e\left(3id^2+3e\ldots\right.\right.\right.}{\sqrt{1-c^2x^2}}}{3c^2}\ldots\right.}{4c^2}\ldots}{}}{}\ldots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{420}bc\left(\frac{\frac{\frac{3\left(\frac{1}{3}c^2\int \frac{x\left(3675\left(24d^2(3ef+dg)c^4+9\left(id^3+3ehd^2+3e^2gd+e^3f\right)c^2+5e^2(eh+3di)\right)xc^2+16\left(11025d^3fc^6+2450d\left(hd^2+3egd+3e^2f\right)c^4+1176e\left(3id^2+3\ldots\right.\right.\right.}{\sqrt{1-c^2x^2}}\ldots\right.}{4c^2}\ldots}{}}{}\ldots\right.$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$$\Big\downarrow \; 533$$

---

3.106. $\int (d+ex)^3\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$-\frac{1}{420}bc\Bigg(\frac{3\Big(\frac{1}{3}c^2\Big(\frac{\int \frac{c^2(3675(24d^2(3ef+dg)c^4+9(id^3+3ehd^2+3e^2gd+e^3f)c^2+5e^2(eh+3di))+32(11025d^3fc^6+2450d(hd^2+3egd+3e^2f)c^4+1176e(3id^2+3e}{\sqrt{1-c^2x^2}}}{2c^2}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$\Big\downarrow$ 27

$$-\frac{1}{420}bc\Bigg(\frac{3\Big(\frac{1}{3}c^2\Big(\frac{1}{2}\int \frac{3675(24d^2(3ef+dg)c^4+9(id^3+3ehd^2+3e^2gd+e^3f)c^2+5e^2(eh+3di))+32(11025d^3fc^6+2450d(hd^2+3egd+3e^2f)c^4+1176e(3id^2+3eh}{\sqrt{1-c^2x^2}}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

$\Big\downarrow$ 455

$$-\frac{1}{420}bc\Bigg(\frac{3\Big(\frac{1}{3}c^2\Big(\frac{1}{2}\Big(3675\left(24c^4d^2(dg+3ef)+9c^2\left(d^3i+3d^2eh+3de^2g+e^3f\right)+5e^2(3di+eh)\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-\frac{32\sqrt{1-c^2x^2}(11025c^6d^3f+2450c^4d(d^2h+3deg+}{c^2}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))$$

---

3.106. $\int (d+ex)^3\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$\Big\downarrow \text{223}$$

$$d^3fx(a+b\arcsin(cx))+\frac{1}{3}dx^3(a+b\arcsin(cx))\left(d^2h+3deg+3e^2f\right)+\frac{1}{5}ex^5(a+b\arcsin(cx))\left(3d^2i+3deh+e^2g\right)+\frac{1}{2}d^2x^2(dg+3ef)(a+b\arcsin(cx))+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^3i+3d^2eh+3de^2g+e^3f\right)+\frac{1}{6}e^2x^6(3di+eh)(a+b\arcsin(cx))+\frac{1}{7}e^3ix^7(a+b\arcsin(cx))-$$

$$\frac{1}{420}bc\left(\frac{\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{1}{2}\left(\frac{3675\arcsin(cx)\left(24c^4d^2(dg+3ef)+9c^2\left(d^3i+3d^2eh+3de^2g+e^3f\right)+5e^2(3di+eh)\right)}{c}-\frac{32\sqrt{1-c^2x^2}\left(11025c^6d^3f+2450c^4d\left(d^2h+3deg+3e^2f\right)\right.}{c^2}\right.\right.\right.}{}}{}}{}\right.$$

input

```
Int[(d + e*x)^3*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output

```
d^3*f*x*(a + b*ArcSin[c*x]) + (d^2*(3*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/
2 + (d*(3*e^2*f + 3*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e^3*f +
3*d*e^2*g + 3*d^2*e*h + d^3*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*(e^2*g + 3*
d*e*h + 3*d^2*i)*x^5*(a + b*ArcSin[c*x]))/5 + (e^2*(e*h + 3*d*i)*x^6*(a +
b*ArcSin[c*x]))/6 + (e^3*i*x^7*(a + b*ArcSin[c*x]))/7 - (b*c*((-60*e^3*i*x
^6*Sqrt[1 - c^2*x^2])/(7*c^2) + ((-245*e^2*(e*h + 3*d*i)*x^5*Sqrt[1 - c^2*
x^2])/3 + ((-36*e*(30*e^2*i + 49*c^2*(e^2*g + 3*d*e*h + 3*d^2*i))*x^4*Sqrt
[1 - c^2*x^2])/5 + ((-1225*c^2*(5*e^2*(e*h + 3*d*i) + 9*c^2*(e^3*f + 3*d*e
^2*g + 3*d^2*e*h + d^3*i))*x^3*Sqrt[1 - c^2*x^2])/4 + (3*((-16*c^2*(1225*c
^4*d*(3*e^2*f + 3*d*e*g + d^2*h) + 360*e^3*i + 588*c^2*e*(e^2*g + 3*d*e*h
+ 3*d^2*i))*x^2*Sqrt[1 - c^2*x^2])/3 + (c^2*((-3675*(24*c^4*d^2*(3*e*f + d
*g) + 5*e^2*(e*h + 3*d*i) + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))
*x*Sqrt[1 - c^2*x^2])/2 + ((-32*(11025*c^6*d^3*f + 2450*c^4*d*(3*e^2*f + 3
*d*e*g + d^2*h) + 720*e^3*i + 1176*c^2*e*(e^2*g + 3*d*e*h + 3*d^2*i))*Sqrt
[1 - c^2*x^2])/c^2 + (3675*(24*c^4*d^2*(3*e*f + d*g) + 5*e^2*(e*h + 3*d*i)
 + 9*c^2*(e^3*f + 3*d*e^2*g + 3*d^2*e*h + d^3*i))*ArcSin[c*x])/c)/2))/3))/
(4*c^2))/(5*c^2))/(3*c^2))/(7*c^2)))/420
```

## 3.106. $\int (d+ex)^3\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

### 3.106.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

### 3.106.4 Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 836, normalized size of antiderivative = 1.22

| method | result |
|---|---|
| parts | $a(\frac{e^{3} i\,x^{7}}{7}+\frac{(3d\,e^{2} i+e^{3} h)x^{6}}{6}+\frac{(3d^{2} e i+3d\,e^{2} h+e^{3} g)x^{5}}{5}+\frac{(d^{3} i+3d^{2} e h+3d\,e^{2} g+e^{3} f)x^{4}}{4}+\frac{(d^{3} h+3d^{2} e g+3d\,e^{2} f)}{3}$ |
| derivativedivides | $\frac{a(\frac{e^{3} i\,c^{7} x^{7}}{7}+\frac{(3dc\,e^{2} i+e^{3} c h)c^{6} x^{6}}{6}+\frac{(3c^{2} d^{2} e i+3d\,c^{2} e^{2} h+e^{3} c^{2} g)c^{5} x^{5}}{5}+\frac{(c^{3} d^{3} i+3c^{3} d^{2} e h+3d\,c^{3} e^{2} g+e^{3} f\,c^{3})c^{4} x^{4}}{4}+(c^{4} d^{3} h+3c^{4} d^{2}}{c^{6}}$ |
| default | $\frac{a(\frac{e^{3} i\,c^{7} x^{7}}{7}+\frac{(3dc\,e^{2} i+e^{3} c h)c^{6} x^{6}}{6}+\frac{(3c^{2} d^{2} e i+3d\,c^{2} e^{2} h+e^{3} c^{2} g)c^{5} x^{5}}{5}+\frac{(c^{3} d^{3} i+3c^{3} d^{2} e h+3d\,c^{3} e^{2} g+e^{3} f\,c^{3})c^{4} x^{4}}{4}+(c^{4} d^{3} h+3c^{4} d^{2}}{c^{6}}$ |

input
```
int((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOS
E)
```

output
```
a*(1/7*e^3*i*x^7+1/6*(3*d*e^2*i+e^3*h)*x^6+1/5*(3*d^2*e*i+3*d*e^2*h+e^3*g)
*x^5+1/4*(d^3*i+3*d^2*e*h+3*d*e^2*g+e^3*f)*x^4+1/3*(d^3*h+3*d^2*e*g+3*d*e^
2*f)*x^3+1/2*(d^3*g+3*d^2*e*f)*x^2+d^3*f*x)+b/c*(1/7*c*arcsin(c*x)*e^3*i*x
^7+1/2*c*arcsin(c*x)*x^6*d*e^2*i+1/6*c*arcsin(c*x)*e^3*h*x^6+3/5*c*arcsin(
c*x)*x^5*d^2*e*i+3/5*c*arcsin(c*x)*x^5*d*e^2*h+1/5*c*arcsin(c*x)*e^3*g*x^5
+1/4*c*arcsin(c*x)*x^4*d^3*i+3/4*c*arcsin(c*x)*x^4*d^2*e*h+3/4*c*arcsin(c*
x)*x^4*d*e^2*g+1/4*c*arcsin(c*x)*x^4*e^3*f+1/3*c*arcsin(c*x)*x^3*d^3*h+c*a
rcsin(c*x)*x^3*d^2*e*g+c*arcsin(c*x)*x^3*d*e^2*f+1/2*c*arcsin(c*x)*x^2*d^3
*g+3/2*c*arcsin(c*x)*x^2*d^2*e*f+arcsin(c*x)*d^3*f*c*x-1/420/c^6*(60*e^3*i
*(-1/7*c^6*x^6*(-c^2*x^2+1)^(1/2)-6/35*c^4*x^4*(-c^2*x^2+1)^(1/2)-8/35*c^2
*x^2*(-c^2*x^2+1)^(1/2)-16/35*(-c^2*x^2+1)^(1/2))-420*d^3*c^6*f*(-c^2*x^2+
1)^(1/2)+(210*c*d*e^2*i+70*c*e^3*h)*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5/24*
c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x))+(
210*c^5*d^3*g+630*c^5*d^2*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x
))+(252*c^2*d^2*e*i+252*c^2*d*e^2*h+84*c^2*e^3*g)*(-1/5*c^4*x^4*(-c^2*x^2+
1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))+(140*c^4
*d^3*h+420*c^4*d^2*e*g+420*c^4*d*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2
/3*(-c^2*x^2+1)^(1/2))+(105*c^3*d^3*i+315*c^3*d^2*e*h+315*c^3*d*e^2*g+105*
c^3*e^3*f)*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8
*arcsin(c*x))))
```

### 3.106.5 Fricas [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 936, normalized size of antiderivative = 1.37

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$$
$$= \frac{50400\,ac^7e^3ix^7 + 352800\,ac^7d^3fx + 58800\,(ac^7e^3h + 3\,ac^7de^2i)x^6 + 70560\,(ac^7e^3g + 3\,ac^7de^2h + 3\,ac^7d^2e}{}$$

input
```
integrate((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fr
icas")
```

output
```
1/352800*(50400*a*c^7*e^3*i*x^7 + 352800*a*c^7*d^3*f*x + 58800*(a*c^7*e^3*
h + 3*a*c^7*d*e^2*i)*x^6 + 70560*(a*c^7*e^3*g + 3*a*c^7*d*e^2*h + 3*a*c^7*
d^2*e*i)*x^5 + 88200*(a*c^7*e^3*f + 3*a*c^7*d*e^2*g + 3*a*c^7*d^2*e*h + a*
c^7*d^3*i)*x^4 + 117600*(3*a*c^7*d*e^2*f + 3*a*c^7*d^2*e*g + a*c^7*d^3*h)*
x^3 + 176400*(3*a*c^7*d^2*e*f + a*c^7*d^3*g)*x^2 + 105*(480*b*c^7*e^3*i*x^
7 + 3360*b*c^7*d^3*f*x + 560*(b*c^7*e^3*h + 3*b*c^7*d*e^2*i)*x^6 + 672*(b*
c^7*e^3*g + 3*b*c^7*d*e^2*h + 3*b*c^7*d^2*e*i)*x^5 + 840*(b*c^7*e^3*f + 3*
b*c^7*d*e^2*g + 3*b*c^7*d^2*e*h + b*c^7*d^3*i)*x^4 + 1120*(3*b*c^7*d*e^2*f
 + 3*b*c^7*d^2*e*g + b*c^7*d^3*h)*x^3 + 1680*(3*b*c^7*d^2*e*f + b*c^7*d^3*
g)*x^2 - 315*(8*b*c^5*d^2*e + b*c^3*e^3)*f - 105*(8*b*c^5*d^3 + 9*b*c^3*d*
e^2)*g - 35*(27*b*c^3*d^2*e + 5*b*c*e^3)*h - 105*(3*b*c^3*d^3 + 5*b*c*d*e^
2)*i)*arcsin(c*x) + (7200*b*c^6*e^3*i*x^6 + 9800*(b*c^6*e^3*h + 3*b*c^6*d*
e^2*i)*x^5 + 288*(49*b*c^6*e^3*g + 147*b*c^6*d*e^2*h + 3*(49*b*c^6*d^2*e +
 10*b*c^4*e^3)*i)*x^4 + 2450*(9*b*c^6*e^3*f + 27*b*c^6*d*e^2*g + (27*b*c^6
*d^2*e + 5*b*c^4*e^3)*h + 3*(3*b*c^6*d^3 + 5*b*c^4*d*e^2)*i)*x^3 + 32*(367
5*b*c^6*d*e^2*f + 147*(25*b*c^6*d^2*e + 4*b*c^4*e^3)*g + 49*(25*b*c^6*d^3
+ 36*b*c^4*d*e^2)*h + 36*(49*b*c^4*d^2*e + 10*b*c^2*e^3)*i)*x^2 + 117600*(
3*b*c^6*d^3 + 2*b*c^4*d*e^2)*f + 9408*(25*b*c^4*d^2*e + 4*b*c^2*e^3)*g + 3
136*(25*b*c^4*d^3 + 36*b*c^2*d*e^2)*h + 2304*(49*b*c^2*d^2*e + 10*b*e^3)*i
 + 3675*(9*(8*b*c^6*d^2*e + b*c^4*e^3)*f + 3*(8*b*c^6*d^3 + 9*b*c^4*d*e...
```

### 3.106.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1809 vs. $2(688) = 1376$.

Time = 0.93 (sec) , antiderivative size = 1809, normalized size of antiderivative = 2.64

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)**3*(i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**3*f*x + a*d**3*g*x**2/2 + a*d**3*h*x**3/3 + a*d**3*i*x**4/
4 + 3*a*d**2*e*f*x**2/2 + a*d**2*e*g*x**3 + 3*a*d**2*e*h*x**4/4 + 3*a*d**2
*e*i*x**5/5 + a*d*e**2*f*x**3 + 3*a*d*e**2*g*x**4/4 + 3*a*d*e**2*h*x**5/5
+ a*d*e**2*i*x**6/2 + a*e**3*f*x**4/4 + a*e**3*g*x**5/5 + a*e**3*h*x**6/6
+ a*e**3*i*x**7/7 + b*d**3*f*x*asin(c*x) + b*d**3*g*x**2*asin(c*x)/2 + b*d
**3*h*x**3*asin(c*x)/3 + b*d**3*i*x**4*asin(c*x)/4 + 3*b*d**2*e*f*x**2*asi
n(c*x)/2 + b*d**2*e*g*x**3*asin(c*x) + 3*b*d**2*e*h*x**4*asin(c*x)/4 + 3*b
*d**2*e*i*x**5*asin(c*x)/5 + b*d*e**2*f*x**3*asin(c*x) + 3*b*d*e**2*g*x**4
*asin(c*x)/4 + 3*b*d*e**2*h*x**5*asin(c*x)/5 + b*d*e**2*i*x**6*asin(c*x)/2
 + b*e**3*f*x**4*asin(c*x)/4 + b*e**3*g*x**5*asin(c*x)/5 + b*e**3*h*x**6*a
sin(c*x)/6 + b*e**3*i*x**7*asin(c*x)/7 + b*d**3*f*sqrt(-c**2*x**2 + 1)/c +
 b*d**3*g*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**3*h*x**2*sqrt(-c**2*x**2 + 1
)/(9*c) + b*d**3*i*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d**2*e*f*x*sqrt(
-c**2*x**2 + 1)/(4*c) + b*d**2*e*g*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d
**2*e*h*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d**2*e*i*x**4*sqrt(-c**2*x*
*2 + 1)/(25*c) + b*d*e**2*f*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*b*d*e**2*g
*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + 3*b*d*e**2*h*x**4*sqrt(-c**2*x**2 + 1)
/(25*c) + b*d*e**2*i*x**5*sqrt(-c**2*x**2 + 1)/(12*c) + b*e**3*f*x**3*sqrt
(-c**2*x**2 + 1)/(16*c) + b*e**3*g*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e*
*3*h*x**5*sqrt(-c**2*x**2 + 1)/(36*c) + b*e**3*i*x**6*sqrt(-c**2*x**2 +...
```

### 3.106.7 Maxima [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 1231, normalized size of antiderivative = 1.80

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="ma
xima")
```

output
```
1/7*a*e^3*i*x^7 + 1/6*a*e^3*h*x^6 + 1/2*a*d*e^2*i*x^6 + 1/5*a*e^3*g*x^5 +
3/5*a*d*e^2*h*x^5 + 3/5*a*d^2*e*i*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^
4 + 3/4*a*d^2*e*h*x^4 + 1/4*a*d^3*i*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 +
1/3*a*d^3*h*x^3 + 3/2*a*d^2*e*f*x^2 + 1/2*a*d^3*g*x^2 + 3/4*(2*x^2*arcsin(
c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^2*e*f + 1/3*(3*
x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4
))*b*d*e^2*f + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3
*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^3*f + 1/4*(2*x^2*arc
sin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d^3*g + 1/3*(
3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c
^4))*b*d^2*e*g + 3/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 +
 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e^2*g + 1/75*(15*x
^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/
c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^3*g + 1/9*(3*x^3*arcsin(c*x) + c*(s
qrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*d^3*h + 3/32*(8*x
^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^
4 - 3*arcsin(c*x)/c^5)*c)*b*d^2*e*h + 1/25*(15*x^5*arcsin(c*x) + (3*sqrt(-
c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)
/c^6)*c)*b*d*e^2*h + 1/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5
/c^2 + 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15...
```

### 3.106.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2010 vs. $2(643) = 1286$.

Time = 0.33 (sec) , antiderivative size = 2010, normalized size of antiderivative = 2.94

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^3*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="gi
ac")
```

output
```
1/7*a*e^3*i*x^7 + 1/6*a*e^3*h*x^6 + 1/2*a*d*e^2*i*x^6 + 1/5*a*e^3*g*x^5 +
3/5*a*d*e^2*h*x^5 + 3/5*a*d^2*e*i*x^5 + 1/4*a*e^3*f*x^4 + 3/4*a*d*e^2*g*x^
4 + 3/4*a*d^2*e*h*x^4 + 1/4*a*d^3*i*x^4 + a*d*e^2*f*x^3 + a*d^2*e*g*x^3 +
1/3*a*d^3*h*x^3 + b*d^3*f*x*arcsin(c*x) + a*d^3*f*x + (c^2*x^2 - 1)*b*d*e^
2*f*x*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/3*(c
^2*x^2 - 1)*b*d^3*h*x*arcsin(c*x)/c^2 + 3/4*sqrt(-c^2*x^2 + 1)*b*d^2*e*f*x
/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d^3*g*x/c + 3/2*(c^2*x^2 - 1)*b*d^2*e*f*arcs
in(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d^3*g*arcsin(c*x)/c^2 + b*d*e^2*f*x*arcs
in(c*x)/c^2 + b*d^2*e*g*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e^3*g*x*
arcsin(c*x)/c^4 + 1/3*b*d^3*h*x*arcsin(c*x)/c^2 + 3/5*(c^2*x^2 - 1)^2*b*d*
e^2*h*x*arcsin(c*x)/c^4 + 3/5*(c^2*x^2 - 1)^2*b*d^2*e*i*x*arcsin(c*x)/c^4
+ sqrt(-c^2*x^2 + 1)*b*d^3*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e^3*f*x/c^3 -
 3/16*(-c^2*x^2 + 1)^(3/2)*b*d*e^2*g*x/c^3 - 3/16*(-c^2*x^2 + 1)^(3/2)*b*d
^2*e*h*x/c^3 - 1/16*(-c^2*x^2 + 1)^(3/2)*b*d^3*i*x/c^3 + 3/2*(c^2*x^2 - 1)
*a*d^2*e*f/c^2 + 1/2*(c^2*x^2 - 1)*a*d^3*g/c^2 + 3/4*b*d^2*e*f*arcsin(c*x)
/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e^3*f*arcsin(c*x)/c^4 + 1/4*b*d^3*g*arcsin(c*
x)/c^2 + 3/4*(c^2*x^2 - 1)^2*b*d*e^2*g*arcsin(c*x)/c^4 + 3/4*(c^2*x^2 - 1)
^2*b*d^2*e*h*arcsin(c*x)/c^4 + 1/4*(c^2*x^2 - 1)^2*b*d^3*i*arcsin(c*x)/c^4
 + 2/5*(c^2*x^2 - 1)*b*e^3*g*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b*d*e^2
*h*x*arcsin(c*x)/c^4 + 6/5*(c^2*x^2 - 1)*b*d^2*e*i*x*arcsin(c*x)/c^4 + ...
```

### 3.106.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex)^3 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$$
$$=\int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)^3\,\left(i\,x^3+h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2 + i*x^3),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^3*(f + g*x + h*x^2 + i*x^3), x)
```

# 3.107 $\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$



## 3.107.1 Optimal result

Integrand size = 31, antiderivative size = 484

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$$

$$= \frac{b(25c^2(e^2f+2deg+d^2h)+12e(eh+2di))\,x^2\sqrt{1-c^2x^2}}{225c^3}$$

$$+ \frac{b(5e^2i+9c^2(e^2g+2deh+d^2i))\,x^3\sqrt{1-c^2x^2}}{144c^3}$$

$$+ \frac{be(eh+2di)x^4\sqrt{1-c^2x^2}}{25c} + \frac{be^2ix^5\sqrt{1-c^2x^2}}{36c}$$

$$+ \frac{b(32(225c^4d^2f+50c^2(e^2f+2deg+d^2h)+24e(eh+2di))+75(24c^4d(2ef+dg)+5e^2i+9c^2(e^2g+2}{7200c^5}$$

$$- \frac{b(24c^4d(2ef+dg)+5e^2i+9c^2(e^2g+2deh+d^2i))\arcsin(cx)}{96c^6}$$

$$+ d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx))$$

$$+ \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin(cx))$$

$$+ \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

output
```
-1/96*b*(24*c^4*d*(d*g+2*e*f)+5*e^2*i+9*c^2*(d^2*i+2*d*e*h+e^2*g))*arcsin(
c*x)/c^6+d^2*f*x*(a+b*arcsin(c*x))+1/2*d*(d*g+2*e*f)*x^2*(a+b*arcsin(c*x))
+1/3*(d^2*h+2*d*e*g+e^2*f)*x^3*(a+b*arcsin(c*x))+1/4*(d^2*i+2*d*e*h+e^2*g)
*x^4*(a+b*arcsin(c*x))+1/5*e*(2*d*i+e*h)*x^5*(a+b*arcsin(c*x))+1/6*e^2*i*x
^6*(a+b*arcsin(c*x))+1/225*b*(25*c^2*(d^2*h+2*d*e*g+e^2*f)+12*e*(2*d*i+e*h
))*x^2*(-c^2*x^2+1)^(1/2)/c^3+1/144*b*(5*e^2*i+9*c^2*(d^2*i+2*d*e*h+e^2*g)
)*x^3*(-c^2*x^2+1)^(1/2)/c^3+1/25*b*e*(2*d*i+e*h)*x^4*(-c^2*x^2+1)^(1/2)/c
+1/36*b*e^2*i*x^5*(-c^2*x^2+1)^(1/2)/c+1/7200*b*(7200*c^4*d^2*f+1600*c^2*(
d^2*h+2*d*e*g+e^2*f)+768*e*(2*d*i+e*h)+75*(24*c^4*d*(d*g+2*e*f)+5*e^2*i+9*
c^2*(d^2*i+2*d*e*h+e^2*g))*x)*(-c^2*x^2+1)^(1/2)/c^5
```

### 3.107.2 Mathematica [A] (verified)

Time = 0.91 (sec) , antiderivative size = 380, normalized size of antiderivative = 0.79

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$$
$$= d^2fx(a+b\arcsin(cx)) + \frac{1}{2}d(2ef+dg)x^2(a+b\arcsin(cx))$$
$$+ \frac{1}{3}\left(e^2f+2deg+d^2h\right)x^3(a+b\arcsin(cx)) + \frac{1}{4}\left(e^2g+2deh+d^2i\right)x^4(a+b\arcsin(cx))$$
$$+ \frac{1}{5}e(eh+2di)x^5(a+b\arcsin(cx)) + \frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$
$$+ \frac{b(c\sqrt{1-c^2x^2}(3e(256eh+512di+125eix)+c^2(25d^2(64h+27ix)+2de(1600g+675hx+384ix^2)+e$$

input
```
Integrate[(d + e*x)^2*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2
+ ((e^2*f + 2*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e^2*g + 2*d*e*
h + d^2*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*(e*h + 2*d*i)*x^5*(a + b*ArcSin
[c*x]))/5 + (e^2*i*x^6*(a + b*ArcSin[c*x]))/6 + (b*(c*Sqrt[1 - c^2*x^2]*(3
*e*(256*e*h + 512*d*i + 125*e*i*x) + c^2*(25*d^2*(64*h + 27*i*x) + 2*d*e*(
1600*g + 675*h*x + 384*i*x^2) + e^2*(1600*f + x*(675*g + 384*h*x + 250*i*x
^2))) + 2*c^4*(25*d^2*(144*f + x*(36*g + x*(16*h + 9*i*x))) + 2*d*e*x*(900
*f + x*(400*g + 9*x*(25*h + 16*i*x))) + e^2*x^2*(400*f + x*(225*g + 4*x*(3
6*h + 25*i*x))))) - 75*(24*c^4*d*(2*e*f + d*g) + 5*e^2*i + 9*c^2*(e^2*g +
2*d*e*h + d^2*i))*ArcSin[c*x]))/(7200*c^6)
```

### 3.107.3 Rubi [A] (verified)

Time = 2.23 (sec) , antiderivative size = 528, normalized size of antiderivative = 1.09, number of steps used = 14, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.452, Rules used = {5248, 27, 2340, 27, 2340, 25, 2340, 27, 2340, 25, 27, 533, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)^2(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)\,dx$$

$$\Big\downarrow \; 5248$$

$$-bc\int \frac{x\left(5(12f+x(6g+x(4h+3ix)))d^2+2ex(30f+x(20g+3x(5h+4ix)))d+e^2x^2(20f+x(15g+2x(6h+5\right.}{60\sqrt{1-c^2x^2}}$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{60}bc\int \frac{x\left(5(12f+x(6g+x(4h+3ix)))d^2+2ex(30f+x(20g+3x(5h+4ix)))d+e^2x^2(20f+x(15g+2x(6h\right.}{\sqrt{1-c^2x^2}}$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(-\frac{\int -\frac{2x\left(36c^2e(eh+2di)x^4+5\left(9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x^3+60c^2\left(hd^2+2egd+e^2f\right)x^2+90c^2d(2ef+dg)x+180c^2d^2f\right)}{\sqrt{1-c^2x^2}}dx}{6c^2}-\frac{5e^2ix\right.$$
$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

$$-\frac{1}{60}bc\left(\frac{\int \frac{x\left(36c^2e(eh+2di)x^4+5\left(9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x^3+60c^2\left(hd^2+2egd+e^2f\right)x^2+90c^2d(2ef+dg)x+180c^2d^2f\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{5e^2ix^5\sqrt{1}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(\frac{-\frac{\int -\frac{x\left(900d^2fc^4+450d(2ef+dg)xc^4+25\left(9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x^3c^2+12\left(25\left(hd^2+2egd+e^2f\right)c^2+12e(eh+2di)\right)x^2c^2\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{36}{5}ex^4\sqrt{1-}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 25$$

$$-\frac{1}{60}bc\left(\frac{\frac{\int \frac{x\left(900d^2fc^4+450d(2ef+dg)xc^4+25\left(9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x^3c^2+12\left(25\left(hd^2+2egd+e^2f\right)c^2+12e(eh+2di)\right)x^2c^2\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{36}{5}ex^4\sqrt{1-c^2}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 2340$$

$$-\frac{1}{60}bc\left(\frac{\frac{-\frac{\int -\frac{3x\left(1200d^2fc^6+16\left(25\left(hd^2+2egd+e^2f\right)c^2+12e(eh+2di)\right)x^2c^4+25\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}x^3\sqrt{1-c^2x^2}(9c}{5c^2}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 27$$

3.107. $\int (d+ex)^2\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\int \frac{x\left(1200d^2fc^6+16\left(25\left(hd^2+2egd+e^2f\right)c^2+12e(eh+2di)\right)x^2c^4+25\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{25}{4}x^3\sqrt{1-c^2x^2}\left(9c^2\left(d\right.\right.}{5c^2}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$\downarrow$ 2340

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(-\frac{\int -\frac{c^4x\left(16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e(eh+2di)\right)+75\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}c^2x^2\sqrt{1-c^2x^2}\left(25c^2\left(\right.\right.\right.}{4c^2}}{5c^2}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$\downarrow$ 25

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(\frac{\int \frac{c^4x\left(16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e(eh+2di)\right)+75\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}c^2x^2\sqrt{1-c^2x^2}\left(25c^2\left(d^2\right.\right.\right.}{4c^2}}{5c^2}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$\downarrow$ 27

3.107. $\int (d+ex)^2\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{3\left(\frac{1}{3}c^2\int\frac{x\left(16\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e(eh+2di)\right)+75\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)x\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}c^2x^2\sqrt{1-c^2x^2}\left(25c^2\left(d\right.\right.\right.}{4c^2}}{5c^2}}{3c^2}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 533$$

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{\int\frac{32\left(225d^2fc^4+50\left(hd^2+2egd+e^2f\right)c^2+24e(eh+2di)\right)xc^2+75\left(24d(2ef+dg)c^4+9\left(id^2+2ehd+e^2g\right)c^2+5e^2i\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{75x\sqrt{1-c^2x^2}\left(24c^4d(dg+\right.}{}\right.\right.}{4c^2}}{5c}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 455$$

$$-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{75\left(24c^4d(dg+2ef)+9c^2\left(d^2i+2deh+e^2g\right)+5e^2i\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-32\sqrt{1-c^2x^2}\left(225c^4d^2f+50c^2\left(d^2h+2deg+e^2f\right)+24e(2di+eh)\right)}{2c^2}-\frac{75x\sqrt{1-\right.}{}\right.\right.}{4c^2}}{}\right.$$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))$$

$$\Big\downarrow \; 223$$

---

3.107. $\int (d+ex)^2\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$\frac{1}{3}x^3(a+b\arcsin(cx))\left(d^2h+2deg+e^2f\right)+\frac{1}{4}x^4(a+b\arcsin(cx))\left(d^2i+2deh+e^2g\right)+d^2fx(a+b\arcsin(cx))+\frac{1}{2}dx^2(dg+2ef)(a+b\arcsin(cx))+\frac{1}{5}ex^5(2di+eh)(a+b\arcsin(cx))+\frac{1}{6}e^2ix^6(a+b\arcsin(cx))-\frac{1}{60}bc\left(\frac{\frac{3\left(\frac{1}{3}c^2\left(\frac{\frac{75\arcsin(cx)\left(24c^4d(dg+2ef)+9c^2\left(d^2i+2deh+e^2g\right)+5e^2i\right)}{c}-32\sqrt{1-c^2x^2}\left(225c^4d^2f+50c^2\left(d^2h+2deg+e^2f\right)+24e(2di+eh)\right)}{2c^2}-\frac{75x\sqrt{1-c^2x^2}\left(2\right.}{}\right.\right.}{4c^2}}{}\right.$$

input
```
Int[(d + e*x)^2*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
d^2*f*x*(a + b*ArcSin[c*x]) + (d*(2*e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2
+ ((e^2*f + 2*d*e*g + d^2*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e^2*g + 2*d*e*
h + d^2*i)*x^4*(a + b*ArcSin[c*x]))/4 + (e*(e*h + 2*d*i)*x^5*(a + b*ArcSin
[c*x]))/5 + (e^2*i*x^6*(a + b*ArcSin[c*x]))/6 - (b*c*((-5*e^2*i*x^5*Sqrt[1
 - c^2*x^2])/(3*c^2) + ((-36*e*(e*h + 2*d*i)*x^4*Sqrt[1 - c^2*x^2])/5 + ((
-25*(5*e^2*i + 9*c^2*(e^2*g + 2*d*e*h + d^2*i))*x^3*Sqrt[1 - c^2*x^2])/4 +
 (3*((-16*c^2*(25*c^2*(e^2*f + 2*d*e*g + d^2*h) + 12*e*(e*h + 2*d*i))*x^2*
Sqrt[1 - c^2*x^2])/3 + (c^2*((-75*(24*c^4*d*(2*e*f + d*g) + 5*e^2*i + 9*c^
2*(e^2*g + 2*d*e*h + d^2*i))*x*Sqrt[1 - c^2*x^2])/(2*c^2) + (-32*(225*c^4*
d^2*f + 50*c^2*(e^2*f + 2*d*e*g + d^2*h) + 24*e*(e*h + 2*d*i))*Sqrt[1 - c^
2*x^2] + (75*(24*c^4*d*(2*e*f + d*g) + 5*e^2*i + 9*c^2*(e^2*g + 2*d*e*h +
d^2*i))*ArcSin[c*x])/c)/(2*c^2)))/3))/(4*c^2))/(5*c^2))/(3*c^2)))/60
```

### 3.107.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

## 3.107.4 Maple [A] (verified)

Time = 0.25 (sec) , antiderivative size = 602, normalized size of antiderivative = 1.24

| method | result |
|---|---|
| parts | $a\left(\frac{e^{2} i\, x^{6}}{6}+\frac{\left(2 d e i+e^{2} h\right) x^{5}}{5}+\frac{\left(d^{2} i+2 d e h+e^{2} g\right) x^{4}}{4}+\frac{\left(d^{2} h+2 d e g+e^{2} f\right) x^{3}}{3}+\frac{\left(d^{2} g+2 d e f\right) x^{2}}{2}+d^{2} f x\right)+\frac{b\left(\cdots\right.}{\cdots}$ |
| derivativedivides | $\frac{a\left(\frac{e^{2} i\, c^{6} x^{6}}{6}+\frac{\left(2 d c e i+e^{2} c h\right) c^{5} x^{5}}{5}+\frac{\left(c^{2} d^{2} i+2 d\, c^{2} e h+e^{2} c^{2} g\right) c^{4} x^{4}}{4}+\frac{\left(c^{3} d^{2} h+2 d\, c^{3} e g+e^{2} f\, c^{3}\right) c^{3} x^{3}}{3}+\frac{\left(c^{4} d^{2} g+2 d\, c^{4} e f\right) c^{2} x^{2}}{2}+d^{2} c^{6} f \cdots\right.}{c^{5}}$ |
| default | $\frac{a\left(\frac{e^{2} i\, c^{6} x^{6}}{6}+\frac{\left(2 d c e i+e^{2} c h\right) c^{5} x^{5}}{5}+\frac{\left(c^{2} d^{2} i+2 d\, c^{2} e h+e^{2} c^{2} g\right) c^{4} x^{4}}{4}+\frac{\left(c^{3} d^{2} h+2 d\, c^{3} e g+e^{2} f\, c^{3}\right) c^{3} x^{3}}{3}+\frac{\left(c^{4} d^{2} g+2 d\, c^{4} e f\right) c^{2} x^{2}}{2}+d^{2} c^{6} f \cdots\right.}{c^{5}}$ |

input
```
int((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOS
E)
```

output
```
a*(1/6*e^2*i*x^6+1/5*(2*d*e*i+e^2*h)*x^5+1/4*(d^2*i+2*d*e*h+e^2*g)*x^4+1/3
*(d^2*h+2*d*e*g+e^2*f)*x^3+1/2*(d^2*g+2*d*e*f)*x^2+d^2*f*x)+b/c*(1/6*c*arc
sin(c*x)*e^2*i*x^6+2/5*c*arcsin(c*x)*x^5*d*e*i+1/5*c*arcsin(c*x)*e^2*h*x^5
+1/4*c*arcsin(c*x)*x^4*d^2*i+1/2*c*arcsin(c*x)*x^4*d*e*h+1/4*c*arcsin(c*x)
*e^2*g*x^4+1/3*c*arcsin(c*x)*x^3*d^2*h+2/3*c*arcsin(c*x)*x^3*d*e*g+1/3*c*a
rcsin(c*x)*x^3*e^2*f+1/2*c*arcsin(c*x)*x^2*d^2*g+c*arcsin(c*x)*x^2*d*e*f+a
rcsin(c*x)*d^2*f*c*x-1/60/c^5*(10*e^2*i*(-1/6*c^5*x^5*(-c^2*x^2+1)^(1/2)-5
/24*c^3*x^3*(-c^2*x^2+1)^(1/2)-5/16*c*x*(-c^2*x^2+1)^(1/2)+5/16*arcsin(c*x
))-60*d^2*c^5*f*(-c^2*x^2+1)^(1/2)+(24*c*d*e*i+12*c*e^2*h)*(-1/5*c^4*x^4*(
-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*(-c^2*x^2+1)^(1/2))
+(30*c^4*d^2*g+60*c^4*d*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))
+(15*c^2*d^2*i+30*c^2*d*e*h+15*c^2*e^2*g)*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)
-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+(20*c^3*d^2*h+40*c^3*d*e*g+20
*c^3*e^2*f)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))))
```

### 3.107.5 Fricas [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 621, normalized size of antiderivative = 1.28

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$$

$$= \frac{1200\,ac^6e^2ix^6+7200\,ac^6d^2fx+1440\,(ac^6e^2h+2\,ac^6dei)x^5+1800\,(ac^6e^2g+2\,ac^6deh+ac^6d^2i)x^4+240}{}$$

input
```
integrate((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fr
icas")
```

output
```
1/7200*(1200*a*c^6*e^2*i*x^6 + 7200*a*c^6*d^2*f*x + 1440*(a*c^6*e^2*h + 2*
a*c^6*d*e*i)*x^5 + 1800*(a*c^6*e^2*g + 2*a*c^6*d*e*h + a*c^6*d^2*i)*x^4 +
2400*(a*c^6*e^2*f + 2*a*c^6*d*e*g + a*c^6*d^2*h)*x^3 + 3600*(2*a*c^6*d*e*f
 + a*c^6*d^2*g)*x^2 + 15*(80*b*c^6*e^2*i*x^6 + 480*b*c^6*d^2*f*x - 240*b*c
^4*d*e*f - 90*b*c^2*d*e*h + 96*(b*c^6*e^2*h + 2*b*c^6*d*e*i)*x^5 + 120*(b*
c^6*e^2*g + 2*b*c^6*d*e*h + b*c^6*d^2*i)*x^4 + 160*(b*c^6*e^2*f + 2*b*c^6*
d*e*g + b*c^6*d^2*h)*x^3 + 240*(2*b*c^6*d*e*f + b*c^6*d^2*g)*x^2 - 15*(8*b
*c^4*d^2 + 3*b*c^2*e^2)*g - 5*(9*b*c^2*d^2 + 5*b*e^2)*i)*arcsin(c*x) + (20
0*b*c^5*e^2*i*x^5 + 3200*b*c^3*d*e*g + 1536*b*c*d*e*i + 288*(b*c^5*e^2*h +
 2*b*c^5*d*e*i)*x^4 + 50*(9*b*c^5*e^2*g + 18*b*c^5*d*e*h + (9*b*c^5*d^2 +
5*b*c^3*e^2)*i)*x^3 + 32*(25*b*c^5*e^2*f + 50*b*c^5*d*e*g + 24*b*c^3*d*e*i
 + (25*b*c^5*d^2 + 12*b*c^3*e^2)*h)*x^2 + 800*(9*b*c^5*d^2 + 2*b*c^3*e^2)*
f + 64*(25*b*c^3*d^2 + 12*b*c*e^2)*h + 75*(48*b*c^5*d*e*f + 18*b*c^3*d*e*h
 + 3*(8*b*c^5*d^2 + 3*b*c^3*e^2)*g + (9*b*c^3*d^2 + 5*b*c*e^2)*i)*x)*sqrt(
-c^2*x^2 + 1))/c^6
```

### 3.107.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1197 vs. $2(474) = 948$.

Time = 0.68 (sec) , antiderivative size = 1197, normalized size of antiderivative = 2.47

$$\int (d+ex)^2\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)**2*(i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d**2*f*x + a*d**2*g*x**2/2 + a*d**2*h*x**3/3 + a*d**2*i*x**4/
4 + a*d*e*f*x**2 + 2*a*d*e*g*x**3/3 + a*d*e*h*x**4/2 + 2*a*d*e*i*x**5/5 +
a*e**2*f*x**3/3 + a*e**2*g*x**4/4 + a*e**2*h*x**5/5 + a*e**2*i*x**6/6 + b*
d**2*f*x*asin(c*x) + b*d**2*g*x**2*asin(c*x)/2 + b*d**2*h*x**3*asin(c*x)/3
 + b*d**2*i*x**4*asin(c*x)/4 + b*d*e*f*x**2*asin(c*x) + 2*b*d*e*g*x**3*asi
n(c*x)/3 + b*d*e*h*x**4*asin(c*x)/2 + 2*b*d*e*i*x**5*asin(c*x)/5 + b*e**2*
f*x**3*asin(c*x)/3 + b*e**2*g*x**4*asin(c*x)/4 + b*e**2*h*x**5*asin(c*x)/5
 + b*e**2*i*x**6*asin(c*x)/6 + b*d**2*f*sqrt(-c**2*x**2 + 1)/c + b*d**2*g*
x*sqrt(-c**2*x**2 + 1)/(4*c) + b*d**2*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) +
b*d**2*i*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*d*e*f*x*sqrt(-c**2*x**2 + 1)
/(2*c) + 2*b*d*e*g*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*d*e*h*x**3*sqrt(-c*
*2*x**2 + 1)/(8*c) + 2*b*d*e*i*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e**2*f
*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*e**2*g*x**3*sqrt(-c**2*x**2 + 1)/(16*
c) + b*e**2*h*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + b*e**2*i*x**5*sqrt(-c**2*
x**2 + 1)/(36*c) - b*d**2*g*asin(c*x)/(4*c**2) - b*d*e*f*asin(c*x)/(2*c**2
) + 2*b*d**2*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d**2*i*x*sqrt(-c**2*x**
2 + 1)/(32*c**3) + 4*b*d*e*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d*e*h*x*s
qrt(-c**2*x**2 + 1)/(16*c**3) + 8*b*d*e*i*x**2*sqrt(-c**2*x**2 + 1)/(75*c*
*3) + 2*b*e**2*f*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e**2*g*x*sqrt(-c**2*x
**2 + 1)/(32*c**3) + 4*b*e**2*h*x**2*sqrt(-c**2*x**2 + 1)/(75*c**3) + 5...
```

3.107. $\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx$

### 3.107.7 Maxima [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 840, normalized size of antiderivative = 1.74

$$\int (d+ex)^2\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx=\frac{1}{6}\,ae^2ix^6+\frac{1}{5}\,ae^2hx^5+\frac{2}{5}\,adeix^5$$
$$+\frac{1}{4}\,ae^2gx^4+\frac{1}{2}\,adehx^4+\frac{1}{4}\,ad^2ix^4+\frac{1}{3}\,ae^2fx^3+\frac{2}{3}\,adegx^3+\frac{1}{3}\,ad^2hx^3+adefx^2$$
$$+\frac{1}{2}\,ad^2gx^2+\frac{1}{2}\left(2\,x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin(cx)}{c^3}\right)\right)bdef$$
$$+\frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)be^2f$$
$$+\frac{1}{4}\left(2\,x^2\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2}-\frac{\arcsin(cx)}{c^3}\right)\right)bd^2g$$
$$+\frac{2}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdeg$$
$$+\frac{1}{32}\left(8\,x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\,\arcsin(cx)}{c^5}\right)c\right)be^2g$$
$$+\frac{1}{9}\left(3\,x^3\arcsin(cx)+c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2}+\frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bd^2h$$
$$+\frac{1}{16}\left(8\,x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\,\arcsin(cx)}{c^5}\right)c\right)bdeh$$
$$+\frac{1}{75}\left(15\,x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)be^2h$$
$$+\frac{1}{32}\left(8\,x^4\arcsin(cx)+\left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2}+\frac{3\sqrt{-c^2x^2+1}x}{c^4}-\frac{3\,\arcsin(cx)}{c^5}\right)c\right)bd^2i$$
$$+\frac{2}{75}\left(15\,x^5\arcsin(cx)+\left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2}+\frac{4\sqrt{-c^2x^2+1}x^2}{c^4}+\frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bdei$$
$$+\frac{1}{288}\left(48\,x^6\arcsin(cx)+\left(\frac{8\sqrt{-c^2x^2+1}x^5}{c^2}+\frac{10\sqrt{-c^2x^2+1}x^3}{c^4}+\frac{15\sqrt{-c^2x^2+1}x}{c^6}-\frac{15\,\arcsin(cx)}{c^7}\right)\right.$$
$$+ad^2fx+\frac{\left(cx\arcsin(cx)+\sqrt{-c^2x^2+1}\right)bd^2f}{c}$$

input
```
integrate((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="ma
xima")
```

output
```
1/6*a*e^2*i*x^6 + 1/5*a*e^2*h*x^5 + 2/5*a*d*e*i*x^5 + 1/4*a*e^2*g*x^4 + 1/
2*a*d*e*h*x^4 + 1/4*a*d^2*i*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + 1/3*
a*d^2*h*x^3 + a*d*e*f*x^2 + 1/2*a*d^2*g*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(
sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*e*f + 1/9*(3*x^3*arcsin(c
*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e^2*f +
 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*
b*d^2*g + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(
-c^2*x^2 + 1)/c^4))*b*d*e*g + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 +
 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e^2*g +
 1/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
+ 1)/c^4))*b*d^2*h + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c
^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*d*e*h + 1/75*(15
*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^
2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e^2*h + 1/32*(8*x^4*arcsin(c*x) + (
2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/
c^5)*c)*b*d^2*i + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2
 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*d*e*i + 1
/288*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 + 10*sqrt(-c^2*x^
2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsin(c*x)/c^7)*c)*b*e^
2*i + a*d^2*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d^2*f/c
```

### 3.107.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1287 vs. $2(449) = 898$.

Time = 0.34 (sec) , antiderivative size = 1287, normalized size of antiderivative = 2.66

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \text{Too large to display}$$

input
```
integrate((e*x+d)^2*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="gi
ac")
```

output
```
1/6*a*e^2*i*x^6 + 1/5*a*e^2*h*x^5 + 2/5*a*d*e*i*x^5 + 1/4*a*e^2*g*x^4 + 1/
2*a*d*e*h*x^4 + 1/4*a*d^2*i*x^4 + 1/3*a*e^2*f*x^3 + 2/3*a*d*e*g*x^3 + 1/3*
a*d^2*h*x^3 + b*d^2*f*x*arcsin(c*x) + a*d^2*f*x + 1/3*(c^2*x^2 - 1)*b*e^2*
f*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 - 1)*b*d*e*g*x*arcsin(c*x)/c^2 + 1/3*(c
^2*x^2 - 1)*b*d^2*h*x*arcsin(c*x)/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b*d*e*f*x/c
 + 1/4*sqrt(-c^2*x^2 + 1)*b*d^2*g*x/c + (c^2*x^2 - 1)*b*d*e*f*arcsin(c*x)/
c^2 + 1/2*(c^2*x^2 - 1)*b*d^2*g*arcsin(c*x)/c^2 + 1/3*b*e^2*f*x*arcsin(c*x
)/c^2 + 2/3*b*d*e*g*x*arcsin(c*x)/c^2 + 1/3*b*d^2*h*x*arcsin(c*x)/c^2 + 1/
5*(c^2*x^2 - 1)^2*b*e^2*h*x*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)^2*b*d*e*i*
x*arcsin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d^2*f/c - 1/16*(-c^2*x^2 + 1)^(3/
2)*b*e^2*g*x/c^3 - 1/8*(-c^2*x^2 + 1)^(3/2)*b*d*e*h*x/c^3 - 1/16*(-c^2*x^2
 + 1)^(3/2)*b*d^2*i*x/c^3 + (c^2*x^2 - 1)*a*d*e*f/c^2 + 1/2*(c^2*x^2 - 1)*
a*d^2*g/c^2 + 1/2*b*d*e*f*arcsin(c*x)/c^2 + 1/4*b*d^2*g*arcsin(c*x)/c^2 +
1/4*(c^2*x^2 - 1)^2*b*e^2*g*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)^2*b*d*e*h*
arcsin(c*x)/c^4 + 1/4*(c^2*x^2 - 1)^2*b*d^2*i*arcsin(c*x)/c^4 + 2/5*(c^2*x
^2 - 1)*b*e^2*h*x*arcsin(c*x)/c^4 + 4/5*(c^2*x^2 - 1)*b*d*e*i*x*arcsin(c*x
)/c^4 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*e^2*f/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b*
d*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d^2*h/c^3 + 5/32*sqrt(-c^2*x^2 + 1)
*b*e^2*g*x/c^3 + 5/16*sqrt(-c^2*x^2 + 1)*b*d*e*h*x/c^3 + 5/32*sqrt(-c^2*x^
2 + 1)*b*d^2*i*x/c^3 + 1/36*(c^2*x^2 - 1)^2*sqrt(-c^2*x^2 + 1)*b*e^2*i*...
```

### 3.107.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex)^2 \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,(d+e\,x)^2\,\left(i\,x^3+h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2 + i*x^3),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)^2*(f + g*x + h*x^2 + i*x^3), x)
```

# 3.108 $\int (d+ex) (f+gx+hx^2+ix^3) (a+b\arcsin(cx))\,dx$



## 3.108.1 Optimal result

Integrand size = 29, antiderivative size = 308

$$\begin{aligned}
&\int (d+ex) (f+gx+hx^2+ix^3) (a+b\arcsin(cx))\,dx \\
&= \frac{b(25c^2(eg+dh)+12ei)\,x^2\sqrt{1-c^2x^2}}{225c^3} + \frac{b(eh+di)x^3\sqrt{1-c^2x^2}}{16c} + \frac{beix^4\sqrt{1-c^2x^2}}{25c} \\
&\quad + \frac{b(32(225c^4df+50c^2(eg+dh)+24ei)+225c^2(8c^2(ef+dg)+3(eh+di))\,x)\,\sqrt{1-c^2x^2}}{7200c^5} \\
&\quad - \frac{b(8c^2(ef+dg)+3(eh+di))\arcsin(cx)}{32c^4} + dfx(a+b\arcsin(cx)) \\
&\quad + \frac{1}{2}(ef+dg)x^2(a+b\arcsin(cx)) + \frac{1}{3}(eg+dh)x^3(a+b\arcsin(cx)) \\
&\quad + \frac{1}{4}(eh+di)x^4(a+b\arcsin(cx)) + \frac{1}{5}eix^5(a+b\arcsin(cx))
\end{aligned}$$

output

```
-1/32*b*(8*c^2*(d*g+e*f)+3*d*i+3*e*h)*arcsin(c*x)/c^4+d*f*x*(a+b*arcsin(c*
x))+1/2*(d*g+e*f)*x^2*(a+b*arcsin(c*x))+1/3*(d*h+e*g)*x^3*(a+b*arcsin(c*x)
)+1/4*(d*i+e*h)*x^4*(a+b*arcsin(c*x))+1/5*e*i*x^5*(a+b*arcsin(c*x))+1/225*
b*(25*c^2*(d*h+e*g)+12*e*i)*x^2*(-c^2*x^2+1)^(1/2)/c^3+1/16*b*(d*i+e*h)*x^
3*(-c^2*x^2+1)^(1/2)/c+1/25*b*e*i*x^4*(-c^2*x^2+1)^(1/2)/c+1/7200*b*(7200*
c^4*d*f+1600*c^2*(d*h+e*g)+768*e*i+225*c^2*(8*c^2*(d*g+e*f)+3*d*i+3*e*h)*x
)*(-c^2*x^2+1)^(1/2)/c^5
```

### 3.108.2 Mathematica [A] (verified)

Time = 0.47 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.82

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{120ac^5x(5d(12f+x(6g+x(4h+3ix)))+ex(30f+x(20g+3x(5h+4ix))))+b\sqrt{1-c^2x^2}(768ei+c^2(2}{}$$

input
```
Integrate[(d + e*x)*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
(120*a*c^5*x*(5*d*(12*f + x*(6*g + x*(4*h + 3*i*x))) + e*x*(30*f + x*(20*g
 + 3*x*(5*h + 4*i*x)))) + b*Sqrt[1 - c^2*x^2]*(768*e*i + c^2*(25*d*(64*h +
 27*i*x) + e*(1600*g + 675*h*x + 384*i*x^2)) + 2*c^4*(25*d*(144*f + x*(36*
g + x*(16*h + 9*i*x))) + e*x*(900*f + x*(400*g + 9*x*(25*h + 16*i*x))))) +
 15*b*c*(-120*c^2*(e*f + d*g) - 45*(e*h + d*i) + 8*c^4*x*(5*d*(12*f + x*(6
*g + x*(4*h + 3*i*x))) + e*x*(30*f + x*(20*g + 3*x*(5*h + 4*i*x)))))*ArcSi
n[c*x])/(7200*c^5)
```

### 3.108.3 Rubi [A] (verified)

Time = 1.19 (sec) , antiderivative size = 336, normalized size of antiderivative = 1.09, number of steps used = 13, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.448$, Rules used = {5248, 27, 2340, 25, 2340, 25, 2340, 25, 27, 533, 27, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (d+ex)(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)\,dx$$

$$\Big\downarrow \ 5248$$

$$-bc\int \frac{x\left(12eix^4+15(eh+di)x^3+20(eg+dh)x^2+30(ef+dg)x+60df\right)}{60\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \ 27$$

$$-\frac{1}{60}bc\int \frac{x\left(12eix^4+15(eh+di)x^3+20(eg+dh)x^2+30(ef+dg)x+60df\right)}{\sqrt{1-c^2x^2}}dx+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \color{blue}{2340}$$

$$-\frac{1}{60}bc\left(-\frac{\int -\frac{x\left(75c^2(eh+di)x^3+4\left(25(eg+dh)c^2+12ei\right)x^2+150c^2(ef+dg)x+300c^2df\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{12eix^4\sqrt{1-c^2x^2}}{5c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \color{blue}{25}$$

$$-\frac{1}{60}bc\left(\frac{\int \frac{x\left(75c^2(eh+di)x^3+4\left(25(eg+dh)c^2+12ei\right)x^2+150c^2(ef+dg)x+300c^2df\right)}{\sqrt{1-c^2x^2}}dx}{5c^2}-\frac{12eix^4\sqrt{1-c^2x^2}}{5c^2}\right)+\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \color{blue}{2340}$$

$$-\frac{1}{60}bc\left(\frac{-\frac{\int -\frac{x\left(1200dfc^4+16\left(25(eg+dh)c^2+12ei\right)x^2c^2+75\left(8(ef+dg)c^2+3(eh+di)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{75}{4}x^3\sqrt{1-c^2x^2}(di+eh)}{5c^2}-\frac{12eix^4\sqrt{1-c}}{5c^2}\right.$$
$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \color{blue}{25}$$

$$-\frac{1}{60}bc\left(\frac{\frac{\int \frac{x\left(1200dfc^4+16\left(25(eg+dh)c^2+12ei\right)x^2c^2+75\left(8(ef+dg)c^2+3(eh+di)\right)xc^2\right)}{\sqrt{1-c^2x^2}}dx}{4c^2}-\frac{75}{4}x^3\sqrt{1-c^2x^2}(di+eh)}{5c^2}-\frac{12eix^4\sqrt{1-c^2x^2}}{5c^2}\right.$$
$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \color{blue}{2340}$$

3.108. $\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$-\frac{1}{60}bc\left(\frac{\frac{-\frac{\int -\frac{c^2x\left(225\left(8(ef+dg)c^2+3(eh+di)\right)xc^2+16\left(225dfc^4+50(eg+dh)c^2+24ei\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2(dh+eg)+12ei\right)}{4c^2}-\frac{75}{4}x^3\sqrt{1-c^2x}}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\Big\downarrow$ 25

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{\int \frac{c^2x\left(225\left(8(ef+dg)c^2+3(eh+di)\right)xc^2+16\left(225dfc^4+50(eg+dh)c^2+24ei\right)\right)}{\sqrt{1-c^2x^2}}dx}{3c^2}-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2(dh+eg)+12ei\right)}{4c^2}-\frac{75}{4}x^3\sqrt{1-c^2x^2}(a}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\Big\downarrow$ 27

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\int \frac{x\left(225\left(8(ef+dg)c^2+3(eh+di)\right)xc^2+16\left(225dfc^4+50(eg+dh)c^2+24ei\right)\right)}{\sqrt{1-c^2x^2}}dx-\frac{16}{3}x^2\sqrt{1-c^2x^2}\left(25c^2(dh+eg)+12ei\right)}{4c^2}-\frac{75}{4}x^3\sqrt{1-c^2x^2}(a}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\Big\downarrow$ 533

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{\int \frac{c^2\left(225\left(8(ef+dg)c^2+3(eh+di)\right)+32\left(225dfc^4+50(eg+dh)c^2+24ei\right)x\right)}{\sqrt{1-c^2x^2}}dx}{2c^2}-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2(dg+ef)+3(di+eh)\right)\right)-\frac{16}{3}x^2\sqrt{1-c^2x^2}(25}{4c^2}}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$\Big\downarrow$ 27

3.108. $\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\int\frac{225\left(8(ef+dg)c^2+3(eh+di)\right)+32\left(225dfc^4+50(eg+dh)c^2+24ei\right)x}{\sqrt{1-c^2x^2}}dx-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2(dg+ef)+3(di+eh)\right)\right)-\frac{16}{3}x^2\sqrt{1-c^2x^2}(25c^2}{4c^2}}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \text{455}$$

$$-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\left(225\left(8c^2(dg+ef)+3(di+eh)\right)\int\frac{1}{\sqrt{1-c^2x^2}}dx-\frac{32\sqrt{1-c^2x^2}\left(225c^4df+50c^2(dh+eg)+24ei\right)}{c^2}\right)-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2(dg+ef)+3(di+eh)\right)}{4c^2}}{5c^2}\right.$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))$$

$$\Big\downarrow \text{223}$$

$$\frac{1}{2}x^2(dg+ef)(a+b\arcsin(cx))+\frac{1}{3}x^3(dh+eg)(a+b\arcsin(cx))+\frac{1}{4}x^4(di+eh)(a+b\arcsin(cx))+dfx(a+b\arcsin(cx))+\frac{1}{5}eix^5(a+b\arcsin(cx))-\frac{1}{60}bc\left(\frac{\frac{\frac{1}{3}\left(\frac{1}{2}\left(\frac{225\arcsin(cx)\left(8c^2(dg+ef)+3(di+eh)\right)}{c}-\frac{32\sqrt{1-c^2x^2}\left(225c^4df+50c^2(dh+eg)+24ei\right)}{c^2}\right)-\frac{225}{2}x\sqrt{1-c^2x^2}\left(8c^2(dg+ef)+3(di+eh)\right)\right)-\frac{16}{3}x^2}{4c^2}}{5c^2}\right.$$

input
```
Int[(d + e*x)*(f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]),x]
```

output
```
d*f*x*(a + b*ArcSin[c*x]) + ((e*f + d*g)*x^2*(a + b*ArcSin[c*x]))/2 + ((e*
g + d*h)*x^3*(a + b*ArcSin[c*x]))/3 + ((e*h + d*i)*x^4*(a + b*ArcSin[c*x])
)/4 + (e*i*x^5*(a + b*ArcSin[c*x]))/5 - (b*c*((-12*e*i*x^4*Sqrt[1 - c^2*x^
2])/(5*c^2) + ((-75*(e*h + d*i)*x^3*Sqrt[1 - c^2*x^2])/4 + ((-16*(25*c^2*(
e*g + d*h) + 12*e*i)*x^2*Sqrt[1 - c^2*x^2])/3 + ((-225*(8*c^2*(e*f + d*g)
+ 3*(e*h + d*i))*x*Sqrt[1 - c^2*x^2])/2 + ((-32*(225*c^4*d*f + 50*c^2*(e*g
 + d*h) + 24*e*i)*Sqrt[1 - c^2*x^2])/c^2 + (225*(8*c^2*(e*f + d*g) + 3*(e*
h + d*i))*ArcSin[c*x])/c)/2)/3)/(4*c^2))/(5*c^2)))/60
```

## 3.108. $\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

### 3.108.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 533
```
Int[(x_)^(m_.)*((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :>
 Simp[d*x^m*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 2))), x] - Simp[1/(b*(m + 2*
p + 2))   Int[x^(m - 1)*(a + b*x^2)^p*Simp[a*d*m - b*c*(m + 2*p + 2)*x, x],
 x], x] /; FreeQ[{a, b, c, d, p}, x] && IGtQ[m, 0] && GtQ[p, -1] && Integer
Q[2*p]
```

rule 2340
```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Expon[Pq, x], f = Coeff[Pq, x, Expon[Pq, x]]}, Simp[f*(c*x)^(m + q - 1
)*((a + b*x^2)^(p + 1)/(b*c^(q - 1)*(m + q + 2*p + 1))), x] + Simp[1/(b*(m
+ q + 2*p + 1))   Int[(c*x)^m*(a + b*x^2)^p*ExpandToSum[b*(m + q + 2*p + 1)
*Pq - b*f*(m + q + 2*p + 1)*x^q - a*f*(m + q - 1)*x^(q - 2), x], x], x] /;
GtQ[q, 1] && NeQ[m + q + 2*p + 1, 0]] /; FreeQ[{a, b, c, m, p}, x] && PolyQ
[Pq, x] && ( !IGtQ[m, 0] || IGtQ[p + 1/2, -1])
```

rule 5248
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_), x_Symbol] :> With[{u = IntHid
e[ExpandExpression[Px, x], x]}, Simp[(a + b*ArcSin[c*x])   u, x] - Simp[b*c
   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]] /; FreeQ[{a, b, c
}, x] && PolynomialQ[Px, x]
```

## 3.108.4 Maple [A] (verified)

Time = 0.09 (sec) , antiderivative size = 380, normalized size of antiderivative = 1.23

| method | result |
|---|---|
| parts | $a\left(\frac{ei\,x^5}{5}+\frac{(di+eh)x^4}{4}+\frac{(dh+eg)x^3}{3}+\frac{(dg+ef)x^2}{2}+dfx\right)+\frac{b\left(\frac{c\arcsin(cx)ei\,x^5}{5}+\frac{c\arcsin(cx)x^4di}{4}+\frac{c\arcsin(cx)e}{4}\right.}{}$ |
| derivativedivides | $\frac{a\left(\frac{ei\,c^5x^5}{5}+\frac{(dci+ech)c^4x^4}{4}+\frac{(d\,c^2h+e\,c^2g)c^3x^3}{3}+\frac{(d\,c^3g+ef\,c^3)c^2x^2}{2}+d\,c^5fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)ei\,c^5x^5}{5}+\frac{\arcsin(cx)c^5di\,x^4}{4}+\arcsin\right.}{}$ |
| default | $\frac{a\left(\frac{ei\,c^5x^5}{5}+\frac{(dci+ech)c^4x^4}{4}+\frac{(d\,c^2h+e\,c^2g)c^3x^3}{3}+\frac{(d\,c^3g+ef\,c^3)c^2x^2}{2}+d\,c^5fx\right)}{c^4}+\frac{b\left(\frac{\arcsin(cx)ei\,c^5x^5}{5}+\frac{\arcsin(cx)c^5di\,x^4}{4}+\arcsin\right.}{}$ |

input
```
int((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x,method=_RETURNVERBOSE)
```

output
```
a*(1/5*e*i*x^5+1/4*(d*i+e*h)*x^4+1/3*(d*h+e*g)*x^3+1/2*(d*g+e*f)*x^2+d*f*x
)+b/c*(1/5*c*arcsin(c*x)*e*i*x^5+1/4*c*arcsin(c*x)*x^4*d*i+1/4*c*arcsin(c*
x)*e*h*x^4+1/3*c*arcsin(c*x)*x^3*d*h+1/3*c*arcsin(c*x)*e*g*x^3+1/2*c*arcsi
n(c*x)*x^2*d*g+1/2*c*arcsin(c*x)*x^2*e*f+arcsin(c*x)*d*f*c*x-1/60/c^4*(12*
e*i*(-1/5*c^4*x^4*(-c^2*x^2+1)^(1/2)-4/15*c^2*x^2*(-c^2*x^2+1)^(1/2)-8/15*
(-c^2*x^2+1)^(1/2))-60*d*c^4*f*(-c^2*x^2+1)^(1/2)+(15*c*d*i+15*c*e*h)*(-1/
4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))+(
20*c^2*d*h+20*c^2*e*g)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(
1/2))+(30*c^3*d*g+30*c^3*e*f)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x)
)))
```

## 3.108.5 Fricas [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.11

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$=\frac{1440\,ac^5eix^5+7200\,ac^5dfx+1800\,(ac^5eh+ac^5di)x^4+2400\,(ac^5eg+ac^5dh)x^3+3600\,(ac^5ef+ac^5dg)x}{}$$

input
```
integrate((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="fric
as")
```

output
```
1/7200*(1440*a*c^5*e*i*x^5 + 7200*a*c^5*d*f*x + 1800*(a*c^5*e*h + a*c^5*d*
i)*x^4 + 2400*(a*c^5*e*g + a*c^5*d*h)*x^3 + 3600*(a*c^5*e*f + a*c^5*d*g)*x
^2 + 15*(96*b*c^5*e*i*x^5 + 480*b*c^5*d*f*x - 120*b*c^3*e*f - 120*b*c^3*d*
g + 120*(b*c^5*e*h + b*c^5*d*i)*x^4 - 45*b*c*e*h - 45*b*c*d*i + 160*(b*c^5
*e*g + b*c^5*d*h)*x^3 + 240*(b*c^5*e*f + b*c^5*d*g)*x^2)*arcsin(c*x) + (28
8*b*c^4*e*i*x^4 + 7200*b*c^4*d*f + 1600*b*c^2*e*g + 1600*b*c^2*d*h + 450*(
b*c^4*e*h + b*c^4*d*i)*x^3 + 768*b*e*i + 32*(25*b*c^4*e*g + 25*b*c^4*d*h +
 12*b*c^2*e*i)*x^2 + 225*(8*b*c^4*e*f + 8*b*c^4*d*g + 3*b*c^2*e*h + 3*b*c^
2*d*i)*x)*sqrt(-c^2*x^2 + 1))/c^5
```

### 3.108.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 658 vs. $2(292) = 584$.

Time = 0.46 (sec) , antiderivative size = 658, normalized size of antiderivative = 2.14

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= \begin{cases} adfx + \frac{adgx^2}{2} + \frac{adhx^3}{3} + \frac{adix^4}{4} + \frac{aefx^2}{2} + \frac{aegx^3}{3} + \frac{aehx^4}{4} + \frac{aeix^5}{5} + bdfx\operatorname{asin}(cx) + \frac{bdgx^2\operatorname{asin}(cx)}{2} + \frac{bdhx^3\operatorname{asin}(cx)}{3} \\ a\left(dfx + \frac{dgx^2}{2} + \frac{dhx^3}{3} + \frac{dix^4}{4} + \frac{efx^2}{2} + \frac{egx^3}{3} + \frac{ehx^4}{4} + \frac{eix^5}{5}\right) \end{cases}$$

input
```
integrate((e*x+d)*(i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x)),x)
```

output
```
Piecewise((a*d*f*x + a*d*g*x**2/2 + a*d*h*x**3/3 + a*d*i*x**4/4 + a*e*f*x*
*2/2 + a*e*g*x**3/3 + a*e*h*x**4/4 + a*e*i*x**5/5 + b*d*f*x*asin(c*x) + b*
d*g*x**2*asin(c*x)/2 + b*d*h*x**3*asin(c*x)/3 + b*d*i*x**4*asin(c*x)/4 + b
*e*f*x**2*asin(c*x)/2 + b*e*g*x**3*asin(c*x)/3 + b*e*h*x**4*asin(c*x)/4 +
b*e*i*x**5*asin(c*x)/5 + b*d*f*sqrt(-c**2*x**2 + 1)/c + b*d*g*x*sqrt(-c**2
*x**2 + 1)/(4*c) + b*d*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + b*d*i*x**3*sqrt
(-c**2*x**2 + 1)/(16*c) + b*e*f*x*sqrt(-c**2*x**2 + 1)/(4*c) + b*e*g*x**2*
sqrt(-c**2*x**2 + 1)/(9*c) + b*e*h*x**3*sqrt(-c**2*x**2 + 1)/(16*c) + b*e*
i*x**4*sqrt(-c**2*x**2 + 1)/(25*c) - b*d*g*asin(c*x)/(4*c**2) - b*e*f*asin
(c*x)/(4*c**2) + 2*b*d*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*d*i*x*sqrt(-c
**2*x**2 + 1)/(32*c**3) + 2*b*e*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*b*e*h*
x*sqrt(-c**2*x**2 + 1)/(32*c**3) + 4*b*e*i*x**2*sqrt(-c**2*x**2 + 1)/(75*c
**3) - 3*b*d*i*asin(c*x)/(32*c**4) - 3*b*e*h*asin(c*x)/(32*c**4) + 8*b*e*i
*sqrt(-c**2*x**2 + 1)/(75*c**5), Ne(c, 0)), (a*(d*f*x + d*g*x**2/2 + d*h*x
**3/3 + d*i*x**4/4 + e*f*x**2/2 + e*g*x**3/3 + e*h*x**4/4 + e*i*x**5/5), T
rue))
```

### 3.108.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 490, normalized size of antiderivative = 1.59

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{5}\,aeix^5 + \frac{1}{4}\,aehx^4 + \frac{1}{4}\,adix^4 + \frac{1}{3}\,aegx^3 + \frac{1}{3}\,adhx^3 + \frac{1}{2}\,aefx^2 + \frac{1}{2}\,adgx^2$$
$$+ \frac{1}{4}\left(2\,x^2\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin\left(cx\right)}{c^3}\right)\right)bef$$
$$+ \frac{1}{4}\left(2\,x^2\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x}{c^2} - \frac{\arcsin\left(cx\right)}{c^3}\right)\right)bdg$$
$$+ \frac{1}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)beg$$
$$+ \frac{1}{9}\left(3\,x^3\arcsin\left(cx\right) + c\left(\frac{\sqrt{-c^2x^2+1}x^2}{c^2} + \frac{2\sqrt{-c^2x^2+1}}{c^4}\right)\right)bdh$$
$$+ \frac{1}{32}\left(8\,x^4\arcsin\left(cx\right) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin\left(cx\right)}{c^5}\right)c\right)beh$$
$$+ \frac{1}{32}\left(8\,x^4\arcsin\left(cx\right) + \left(\frac{2\sqrt{-c^2x^2+1}x^3}{c^2} + \frac{3\sqrt{-c^2x^2+1}x}{c^4} - \frac{3\arcsin\left(cx\right)}{c^5}\right)c\right)bdi$$
$$+ \frac{1}{75}\left(15\,x^5\arcsin\left(cx\right) + \left(\frac{3\sqrt{-c^2x^2+1}x^4}{c^2} + \frac{4\sqrt{-c^2x^2+1}x^2}{c^4} + \frac{8\sqrt{-c^2x^2+1}}{c^6}\right)c\right)bei$$
$$+ adfx + \frac{\left(cx\arcsin\left(cx\right) + \sqrt{-c^2x^2+1}\right)bdf}{c}$$

input
```
integrate((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="maxi
ma")
```

output
```
1/5*a*e*i*x^5 + 1/4*a*e*h*x^4 + 1/4*a*d*i*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*
x^3 + 1/2*a*e*f*x^2 + 1/2*a*d*g*x^2 + 1/4*(2*x^2*arcsin(c*x) + c*(sqrt(-c^
2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*e*f + 1/4*(2*x^2*arcsin(c*x) + c*(s
qrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*b*d*g + 1/9*(3*x^3*arcsin(c*x)
 + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*b*e*g + 1/9*
(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/
c^4))*b*d*h + 1/32*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*
sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*b*e*h + 1/32*(8*x^4*arcsi
n(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*ar
csin(c*x)/c^5)*c)*b*d*i + 1/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)
*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*b*e
*i + a*d*f*x + (c*x*arcsin(c*x) + sqrt(-c^2*x^2 + 1))*b*d*f/c
```

### 3.108.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 692 vs. $2(277) = 554$.

Time = 0.29 (sec) , antiderivative size = 692, normalized size of antiderivative = 2.25

$$\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$$
$$= \frac{1}{5}aeix^5 + \frac{1}{4}aehx^4 + \frac{1}{4}adix^4 + \frac{1}{3}aegx^3 + \frac{1}{3}adhx^3 + bdfx\arcsin(cx) + adfx + \frac{(c^2x^2-1)begx\arcsin(cx)}{3\,c^2} + \frac{(c^2x^2-1)bdhx\arcsin(cx)}{3\,c^2} + \frac{\sqrt{-c^2x^2+1}befx}{4\,c} + \frac{\sqrt{-c^2x^2+1}bdgx}{4\,c} + \frac{(c^2x^2-1)bef\arcsin(cx)}{2\,c^2} + \frac{(c^2x^2-1)bdg\arcsin(cx)}{2\,c^2} + \frac{begx\arcsin(cx)}{3\,c^2} + \frac{bdhx\arcsin(cx)}{3\,c^2} + \frac{(c^2x^2-1)^2beix\arcsin(cx)}{5\,c^4} + \frac{\sqrt{-c^2x^2+1}bdf}{c} - \frac{(-c^2x^2+1)^{\frac{3}{2}}behx}{16\,c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdix}{16\,c^3} + \frac{(c^2x^2-1)aef}{2\,c^2} + \frac{(c^2x^2-1)adg}{2\,c^2} + \frac{bef\arcsin(cx)}{4\,c^2} + \frac{bdg\arcsin(cx)}{4\,c^2} + \frac{(c^2x^2-1)^2beh\arcsin(cx)}{4\,c^4} + \frac{(c^2x^2-1)^2bdi\arcsin(cx)}{4\,c^4} + \frac{2\,(c^2x^2-1)beix\arcsin(cx)}{5\,c^4} - \frac{(-c^2x^2+1)^{\frac{3}{2}}beg}{9\,c^3} - \frac{(-c^2x^2+1)^{\frac{3}{2}}bdh}{9\,c^3} + \frac{5\sqrt{-c^2x^2+1}behx}{32\,c^3} + \frac{5\sqrt{-c^2x^2+1}bdix}{32\,c^3} + \frac{(c^2x^2-1)beh\arcsin(cx)}{2\,c^4} + \frac{(c^2x^2-1)bdi\arcsin(cx)}{2\,c^4} + \frac{beix\arcsin(cx)}{5\,c^4} + \frac{\sqrt{-c^2x^2+1}beg}{3\,c^3} + \frac{\sqrt{-c^2x^2+1}bdh}{3\,c^3} + \frac{(c^2x^2-1)^2\sqrt{-c^2x^2+1}bei}{25\,c^5} + \frac{5\,beh\arcsin(cx)}{32\,c^4} + \frac{5\,bdi\arcsin(cx)}{32\,c^4} - \frac{2\,(-c^2x^2+1)^{\frac{3}{2}}bei}{15\,c^5} + \frac{\sqrt{-c^2x^2+1}bei}{5\,c^5}$$

input
```
integrate((e*x+d)*(i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x)),x, algorithm="giac
")
```

3.108. $\int (d+ex)\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))\,dx$

output
```
1/5*a*e*i*x^5 + 1/4*a*e*h*x^4 + 1/4*a*d*i*x^4 + 1/3*a*e*g*x^3 + 1/3*a*d*h*
x^3 + b*d*f*x*arcsin(c*x) + a*d*f*x + 1/3*(c^2*x^2 - 1)*b*e*g*x*arcsin(c*x
)/c^2 + 1/3*(c^2*x^2 - 1)*b*d*h*x*arcsin(c*x)/c^2 + 1/4*sqrt(-c^2*x^2 + 1)
*b*e*f*x/c + 1/4*sqrt(-c^2*x^2 + 1)*b*d*g*x/c + 1/2*(c^2*x^2 - 1)*b*e*f*ar
csin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b*d*g*arcsin(c*x)/c^2 + 1/3*b*e*g*x*arcs
in(c*x)/c^2 + 1/3*b*d*h*x*arcsin(c*x)/c^2 + 1/5*(c^2*x^2 - 1)^2*b*e*i*x*ar
csin(c*x)/c^4 + sqrt(-c^2*x^2 + 1)*b*d*f/c - 1/16*(-c^2*x^2 + 1)^(3/2)*b*e
*h*x/c^3 - 1/16*(-c^2*x^2 + 1)^(3/2)*b*d*i*x/c^3 + 1/2*(c^2*x^2 - 1)*a*e*f
/c^2 + 1/2*(c^2*x^2 - 1)*a*d*g/c^2 + 1/4*b*e*f*arcsin(c*x)/c^2 + 1/4*b*d*g
*arcsin(c*x)/c^2 + 1/4*(c^2*x^2 - 1)^2*b*e*h*arcsin(c*x)/c^4 + 1/4*(c^2*x^
2 - 1)^2*b*d*i*arcsin(c*x)/c^4 + 2/5*(c^2*x^2 - 1)*b*e*i*x*arcsin(c*x)/c^4
 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*e*g/c^3 - 1/9*(-c^2*x^2 + 1)^(3/2)*b*d*h/c^3
 + 5/32*sqrt(-c^2*x^2 + 1)*b*e*h*x/c^3 + 5/32*sqrt(-c^2*x^2 + 1)*b*d*i*x/c
^3 + 1/2*(c^2*x^2 - 1)*b*e*h*arcsin(c*x)/c^4 + 1/2*(c^2*x^2 - 1)*b*d*i*arc
sin(c*x)/c^4 + 1/5*b*e*i*x*arcsin(c*x)/c^4 + 1/3*sqrt(-c^2*x^2 + 1)*b*e*g/
c^3 + 1/3*sqrt(-c^2*x^2 + 1)*b*d*h/c^3 + 1/25*(c^2*x^2 - 1)^2*sqrt(-c^2*x^
2 + 1)*b*e*i/c^5 + 5/32*b*e*h*arcsin(c*x)/c^4 + 5/32*b*d*i*arcsin(c*x)/c^4
 - 2/15*(-c^2*x^2 + 1)^(3/2)*b*e*i/c^5 + 1/5*sqrt(-c^2*x^2 + 1)*b*e*i/c^5
```

### 3.108.9 Mupad [F(-1)]

Timed out.

$$\int (d+ex) \left(f+gx+hx^2+ix^3\right) (a+b\arcsin(cx))\,dx = \int (a+b\,\mathrm{asin}(c\,x))\,\left(d+e\,x\right)\,\left(i\,x^3+h\,x^2+g\,x+f\right)\,dx$$

input
```
int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2 + i*x^3),x)
```

output
```
int((a + b*asin(c*x))*(d + e*x)*(f + g*x + h*x^2 + i*x^3), x)
```

# 3.109 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx$



## 3.109.1 Optimal result

Integrand size = 31, antiderivative size = 623

$$\begin{aligned}
&\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx \\
&= \frac{bix^2\sqrt{1-c^2x^2}}{9ce}+\frac{b(4(2e^2i+9c^2(e^2g-deh+d^2i))+9c^2e(eh-di)x)\sqrt{1-c^2x^2}}{36c^3e^3} \\
&\quad -\frac{b(eh-di)\arcsin(cx)}{4c^2e^2}-\frac{ib(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)^2}{2e^4} \\
&\quad +\frac{(e^2g-deh+d^2i)\,x(a+b\arcsin(cx))}{e^3}+\frac{(eh-di)x^2(a+b\arcsin(cx))}{2e^2} \\
&\quad +\frac{ix^3(a+b\arcsin(cx))}{3e}+\frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad +\frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad -\frac{b(e^3f-de^2g+d^2eh-d^3i)\arcsin(cx)\log(d+ex)}{e^4} \\
&\quad +\frac{(e^3f-de^2g+d^2eh-d^3i)\,(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad -\frac{ib(e^3f-de^2g+d^2eh-d^3i)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad -\frac{ib(e^3f-de^2g+d^2eh-d^3i)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}
\end{aligned}$$

output
```
-1/4*b*(-d*i+e*h)*arcsin(c*x)/c^2/e^2-1/2*I*b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*
f)*arcsin(c*x)^2/e^4+(d^2*i-d*e*h+e^2*g)*x*(a+b*arcsin(c*x))/e^3+1/2*(-d*i
+e*h)*x^2*(a+b*arcsin(c*x))/e^2+1/3*i*x^3*(a+b*arcsin(c*x))/e-b*(-d^3*i+d^
2*e*h-d*e^2*g+e^3*f)*arcsin(c*x)*ln(e*x+d)/e^4+(-d^3*i+d^2*e*h-d*e^2*g+e^3
*f)*(a+b*arcsin(c*x))*ln(e*x+d)/e^4+b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*arcsi
n(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4+
b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^
(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4-I*b*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*p
olylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4-I*b
*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(
c*d+(c^2*d^2-e^2)^(1/2)))/e^4+1/9*b*i*x^2*(-c^2*x^2+1)^(1/2)/c/e+1/36*b*(8
*e^2*i+36*c^2*(d^2*i-d*e*h+e^2*g)+9*c^2*e*(-d*i+e*h)*x)*(-c^2*x^2+1)^(1/2)
/c^3/e^3
```

## 3.109.2 Mathematica [A] (verified)

Time = 0.87 (sec) , antiderivative size = 610, normalized size of antiderivative = 0.98

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{d + ex}\,dx$$
$$= \frac{\frac{6be(e^2g-deh+d^2i)\sqrt{1-c^2x^2}}{c} + \frac{3be^2(eh-di)x\sqrt{1-c^2x^2}}{2c} + \frac{2be^3i\sqrt{1-c^2x^2}(2+c^2x^2)}{3c^3} - \frac{3be^2(eh-di)\arcsin(cx)}{2c^2} - 3ib(e^3f - de^2g + d}{}$$

input
```
Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
((6*b*e*(e^2*g - d*e*h + d^2*i)*Sqrt[1 - c^2*x^2])/c + (3*b*e^2*(e*h - d*i
)*x*Sqrt[1 - c^2*x^2])/(2*c) + (2*b*e^3*i*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2))
/(3*c^3) - (3*b*e^2*(e*h - d*i)*ArcSin[c*x])/(2*c^2) - (3*I)*b*(e^3*f - d*
e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]^2 + 6*e*(e^2*g - d*e*h + d^2*i)*x*(a
+ b*ArcSin[c*x]) + 3*e^2*(e*h - d*i)*x^2*(a + b*ArcSin[c*x]) + 2*e^3*i*x^3
*(a + b*ArcSin[c*x]) + 6*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]
*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] + 6*b*(e^
3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]
))/(c*d + Sqrt[c^2*d^2 - e^2])] - 6*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*
ArcSin[c*x]*Log[d + e*x] + 6*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*Ar
cSin[c*x])*Log[d + e*x] - (6*I)*b*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*Poly
Log[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - (6*I)*b*(e^3
*f - d*e^2*g + d^2*e*h - d^3*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d +
Sqrt[c^2*d^2 - e^2])])/(6*e^4)
```

### 3.109.3 Rubi [A] (verified)

Time = 1.57 (sec) , antiderivative size = 636, normalized size of antiderivative = 1.02, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)}{d+ex}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int \frac{ex\left(6id^2-3e(2h+ix)d+e^2\left(2ix^2+3hx+6g\right)\right)+6\left(-id^3+ehd^2-e^2gd+e^3f\right)\log(d+ex)}{6e^4\sqrt{1-c^2x^2}}dx+\frac{x(a+b\arcsin(cx))\left(d^2i-deh+e^2g\right)}{e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4}+\frac{x^2(eh-di)(a+b\arcsin(cx))}{2e^2}+\frac{ix^3(a+b\arcsin(cx))}{3e}$$

$$\Big\downarrow \text{27}$$

$$-\frac{bc\int \frac{ex\left(6id^2-3e(2h+ix)d+e^2\left(2ix^2+3hx+6g\right)\right)+6\left(-id^3+ehd^2-e^2gd+e^3f\right)\log(d+ex)}{\sqrt{1-c^2x^2}}dx}{6e^4}+\frac{x(a+b\arcsin(cx))\left(d^2i-deh+e^2g\right)}{e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4}+\frac{x^2(eh-di)(a+b\arcsin(cx))}{2e^2}+\frac{ix^3(a+b\arcsin(cx))}{3e}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int \left(\frac{ex\left(2e^2ix^2+3e(eh-di)x+6\left(id^2-ehd+e^2g\right)\right)}{\sqrt{1-c^2x^2}}+\frac{6\left(-id^3+ehd^2-e^2gd+e^3f\right)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{6e^4}+\frac{x(a+b\arcsin(cx))\left(d^2i-deh+e^2g\right)}{e^3}+\frac{\log(d+ex)(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4}+\frac{x^2(eh-di)(a+b\arcsin(cx))}{2e^2}+\frac{ix^3(a+b\arcsin(cx))}{3e}$$

$$\Big\downarrow \text{2009}$$

$$\frac{x(a+b\arcsin(cx))\left(d^2i-deh+e^2g\right)}{e^3}+$$
$$\frac{\log(d+ex)(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4}+\frac{x^2(eh-di)(a+b\arcsin(cx))}{2e^2}+$$
$$\frac{ix^3(a+b\arcsin(cx))}{3e}-$$
$$bc\left(\frac{3e^2\arcsin(cx)(eh-di)}{2c^3}+\frac{6i\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{c}+\frac{6i\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\left(d^3(-i)+d^2eh-de^2g\right.}{c}\right.$$

input
```
Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x),x]
```

output
```
((e^2*g - d*e*h + d^2*i)*x*(a + b*ArcSin[c*x]))/e^3 + ((e*h - d*i)*x^2*(a
+ b*ArcSin[c*x]))/(2*e^2) + (i*x^3*(a + b*ArcSin[c*x]))/(3*e) + ((e^3*f -
d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x])*Log[d + e*x])/e^4 - (b*c*((
2*e*(9*d*e*h - 9*d^2*i - e^2*(9*g + (2*i)/c^2))*Sqrt[1 - c^2*x^2])/(3*c^2)
 - (3*e^2*(e*h - d*i)*x*Sqrt[1 - c^2*x^2])/(2*c^2) - (2*e^3*i*x^2*Sqrt[1 -
 c^2*x^2])/(3*c^2) + (3*e^2*(e*h - d*i)*ArcSin[c*x])/(2*c^3) + ((3*I)*(e^3
*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]^2)/c - (6*(e^3*f - d*e^2*g + d
^2*e*h - d^3*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^
2*d^2 - e^2])])/c - (6*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log
[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + (6*(e^3*f -
 d*e^2*g + d^2*e*h - d^3*i)*ArcSin[c*x]*Log[d + e*x])/c + ((6*I)*(e^3*f -
d*e^2*g + d^2*e*h - d^3*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[
c^2*d^2 - e^2])])/c + ((6*I)*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*PolyLog[2
, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/(6*e^4)
```

### 3.109.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.109.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3400 vs. $2(621) = 1242$.

Time = 2.56 (sec) , antiderivative size = 3401, normalized size of antiderivative = 5.46

| method | result | size |
|---|---|---|
| derivativedivides | Expression too large to display | 3401 |
| default | Expression too large to display | 3401 |
| parts | Expression too large to display | 3403 |

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x,method=_RETURNVERBOSE)
```

output
```
1/c*(a/c^2*(1/e^3*(c^3*d^2*i*x-c^3*d*e*h*x+c^3*e^2*g*x-1/2*c^3*d*e*i*x^2+1
/2*c^3*e^2*h*x^2+1/3*i*c^3*x^3*e^2)-c^3*(d^3*i-d^2*e*h+d*e^2*g-e^3*f)/e^4*
ln(c*e*x+c*d))-1/4*b/c/e*arcsin(c*x)*cos(2*arcsin(c*x))*h-1/12*b/c^2*i*arc
sin(c*x)/e*sin(3*arcsin(c*x))-1/2*I*b*c*arcsin(c*x)^2/e*f+b*arcsin(c*x)/e*
g*c*x-I*b*c*d*g/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(
-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))-1/2*I*b*c*arcsin(c*x)^
2/e^3*d^2*h+1/2*I*b*c*arcsin(c*x)^2/e^4*d^3*i+1/2*I*b*c*arcsin(c*x)^2/e^2*
d*g-I*b*c*d*g/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^
2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-1/8*b/c/e^2*sin(2*arcsin(c
*x))*d*i+1/4*b/c^2/e*(-c^2*x^2+1)^(1/2)*i+b/e^3*(-c^2*x^2+1)^(1/2)*d^2*i-b
/e^2*(-c^2*x^2+1)^(1/2)*d*h-1/36*b/c^2*i/e*cos(3*arcsin(c*x))+1/8*b/c/e*si
n(2*arcsin(c*x))*h+1/4*b/c/e*arcsin(c*x)*i*x+b*arcsin(c*x)/e^3*d^2*i*c*x-b
*arcsin(c*x)/e^2*d*h*c*x-b*c*e*f*arcsin(c*x)/(c^2*d^2-e^2)*ln((-I*d*c-(I*c
*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2
)))+b*c*d*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))
*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-b*c*e*f*arcsin(c*x)
/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2)
)/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+I*b*c*e*f/(c^2*d^2-e^2)*dilog((-I*d*c-(I*c
*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2
)))+I*b*c*e*f/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(...
```

### 3.109.5 Fricas [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="fric
as")
```

output
```
integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arcsin(c*x))/(e*x + d), x)
```

### 3.109.6 Sympy [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\,\mathrm{asin}(cx))(f+gx+hx^2+ix^3)}{d+ex}\,dx$$

input
```
integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d),x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x), x)
```

### 3.109.7 Maxima [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="maxi
ma")
```

output
```
a*g*(x/e - d*log(e*x + d)/e^2) - 1/6*a*i*(6*d^3*log(e*x + d)/e^4 - (2*e^2*
x^3 - 3*d*e*x^2 + 6*d^2*x)/e^3) + 1/2*a*h*(2*d^2*log(e*x + d)/e^3 + (e*x^2
 - 2*d*x)/e^2) + a*f*log(e*x + d)/e + integrate((b*i*x^3 + b*h*x^2 + b*g*x
 + b*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e*x + d), x)
```

### 3.109.8 Giac [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{ex+d}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d),x, algorithm="giac
")
```

output
```
integrate((i*x^3 + h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d), x)
```

### 3.109.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{d+ex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(i\,x^3+h\,x^2+g\,x+f)}{d+e\,x}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x),x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x), x)
```

# 3.110 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$



## 3.110.1 Optimal result

Integrand size = 31, antiderivative size = 617

$$
\begin{aligned}
&\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx \\
&= \frac{b(eh-2di)\sqrt{1-c^2x^2}}{ce^3}+\frac{bix\sqrt{1-c^2x^2}}{4ce^2}-\frac{bi\arcsin(cx)}{4c^2e^2} \\
&\quad -\frac{ib(e^2g-2deh+3d^2i)\arcsin(cx)^2}{2e^4}+\frac{(eh-2di)x(a+b\arcsin(cx))}{e^3} \\
&\quad +\frac{ix^2(a+b\arcsin(cx))}{2e^2}-\frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{e^4(d+ex)} \\
&\quad +\frac{bc(e^3f-de^2g+d^2eh-d^3i)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^4\sqrt{c^2d^2-e^2}} \\
&\quad +\frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad +\frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad -\frac{b(e^2g-2deh+3d^2i)\arcsin(cx)\log(d+ex)}{e^4} \\
&\quad +\frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))\log(d+ex)}{e^4} \\
&\quad -\frac{ib(e^2g-2deh+3d^2i)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} \\
&\quad -\frac{ib(e^2g-2deh+3d^2i)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}
\end{aligned}
$$

output
```
-1/4*b*i*arcsin(c*x)/c^2/e^2-1/2*I*b*(3*d^2*i-2*d*e*h+e^2*g)*arcsin(c*x)^2
/e^4+(-2*d*i+e*h)*x*(a+b*arcsin(c*x))/e^3+1/2*i*x^2*(a+b*arcsin(c*x))/e^2-
(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*(a+b*arcsin(c*x))/e^4/(e*x+d)-b*(3*d^2*i-2*
d*e*h+e^2*g)*arcsin(c*x)*ln(e*x+d)/e^4+(3*d^2*i-2*d*e*h+e^2*g)*(a+b*arcsin
(c*x))*ln(e*x+d)/e^4+b*(3*d^2*i-2*d*e*h+e^2*g)*arcsin(c*x)*ln(1-I*e*(I*c*x
+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4+b*(3*d^2*i-2*d*e*h+e^2
*g)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/
2)))/e^4-I*b*(3*d^2*i-2*d*e*h+e^2*g)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/
2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4-I*b*(3*d^2*i-2*d*e*h+e^2*g)*polylog(2,I
*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4+b*c*(-d^3*i+d
^2*e*h-d*e^2*g+e^3*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^
(1/2))/e^4/(c^2*d^2-e^2)^(1/2)+b*(-2*d*i+e*h)*(-c^2*x^2+1)^(1/2)/c/e^3+1/4
*b*i*x*(-c^2*x^2+1)^(1/2)/c/e^2
```

### 3.110.2 Mathematica [A] (verified)

Time = 1.50 (sec) , antiderivative size = 593, normalized size of antiderivative = 0.96

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx$$

$$= \frac{\frac{2be(eh-2di)\sqrt{1-c^2x^2}}{c}+\frac{be^2ix\sqrt{1-c^2x^2}}{2c}-\frac{be^2i\arcsin(cx)}{2c^2}-ib(e^2g-2deh+3d^2i)\arcsin(cx)^2+2e(eh-2di)x(a+b\ldots}{}$$

input
```
Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
((2*b*e*(e*h - 2*d*i)*Sqrt[1 - c^2*x^2])/c + (b*e^2*i*x*Sqrt[1 - c^2*x^2])
/(2*c) - (b*e^2*i*ArcSin[c*x])/(2*c^2) - I*b*(e^2*g - 2*d*e*h + 3*d^2*i)*A
rcSin[c*x]^2 + 2*e*(e*h - 2*d*i)*x*(a + b*ArcSin[c*x]) + e^2*i*x^2*(a + b*
ArcSin[c*x]) - (2*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x]))
/(d + e*x) + (2*b*c*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcTan[(e + c^2*d*
x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2] + 2*b*(e^
2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*
d) + Sqrt[c^2*d^2 - e^2])] + 2*b*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*L
og[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - 2*b*(e^2*g -
 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[d + e*x] + 2*(e^2*g - 2*d*e*h + 3*d^2*
i)*(a + b*ArcSin[c*x])*Log[d + e*x] - (2*I)*b*(e^2*g - 2*d*e*h + 3*d^2*i)*
PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - (2*I)*b*
(e^2*g - 2*d*e*h + 3*d^2*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt
[c^2*d^2 - e^2])])/(2*e^4)
```

### 3.110.3 Rubi [A] (verified)

Time = 1.78 (sec) , antiderivative size = 613, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)}{(d+ex)^2}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int \frac{e^2ix^2+2e(eh-2di)x+2\left(3id^2-2ehd+e^2g\right)\log(d+ex)-\frac{2\left(-id^3+ehd^2-e^2gd+e^3f\right)}{d+ex}}{2e^4\sqrt{1-c^2x^2}}dx+\frac{\log(d+ex)(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4(d+ex)}+\frac{x(eh-2di)(a+b\arcsin(cx))}{e^3}+\frac{ix^2(a+b\arcsin(cx))}{2e^2}$$

$$\Big\downarrow \text{27}$$

$$-\frac{bc\int \frac{e^2ix^2+2e(eh-2di)x+2\left(3id^2-2ehd+e^2g\right)\log(d+ex)-\frac{2\left(-id^3+ehd^2-e^2gd+e^3f\right)}{d+ex}}{\sqrt{1-c^2x^2}}dx}{2e^4}+\frac{\log(d+ex)(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4(d+ex)}+\frac{x(eh-2di)(a+b\arcsin(cx))}{e^3}+\frac{ix^2(a+b\arcsin(cx))}{2e^2}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int \left(\frac{e^2ix^2}{\sqrt{1-c^2x^2}}+\frac{2e(eh-2di)x}{\sqrt{1-c^2x^2}}+\frac{2\left(3id^2-2ehd+e^2g\right)\log(d+ex)}{\sqrt{1-c^2x^2}}-\frac{2\left(-id^3+ehd^2-e^2gd+e^3f\right)}{(d+ex)\sqrt{1-c^2x^2}}\right)dx}{2e^4}+\frac{\log(d+ex)(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4(d+ex)}+\frac{x(eh-2di)(a+b\arcsin(cx))}{e^3}+\frac{ix^2(a+b\arcsin(cx))}{2e^2}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\log(d+ex)(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4}-$$
$$\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{e^4(d+ex)}+\frac{x(eh-2di)(a+b\arcsin(cx))}{e^3}+$$
$$\frac{ix^2(a+b\arcsin(cx))}{2e^2}-$$
$$bc\left(\frac{e^2i\arcsin(cx)}{2c^3}+\frac{2i(3d^2i-2deh+e^2g)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{c}+\frac{2i(3d^2i-2deh+e^2g)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{c}-\frac{2\arcsin(cx)(3d^2\right.$$

input
```
Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^2,x]
```

output
```
((e*h - 2*d*i)*x*(a + b*ArcSin[c*x]))/e^3 + (i*x^2*(a + b*ArcSin[c*x]))/(2
*e^2) - ((e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x]))/(e^4*(d
+ e*x)) + ((e^2*g - 2*d*e*h + 3*d^2*i)*(a + b*ArcSin[c*x])*Log[d + e*x])/e
^4 - (b*c*((-2*e*(e*h - 2*d*i)*Sqrt[1 - c^2*x^2])/c^2 - (e^2*i*x*Sqrt[1 -
c^2*x^2])/(2*c^2) + (e^2*i*ArcSin[c*x])/(2*c^3) + (I*(e^2*g - 2*d*e*h + 3*
d^2*i)*ArcSin[c*x]^2)/c - (2*(e^3*f - d*e^2*g + d^2*e*h - d^3*i)*ArcTan[(e
 + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2]
- (2*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]
))/(c*d - Sqrt[c^2*d^2 - e^2])])/c - (2*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin
[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c + (2
*(e^2*g - 2*d*e*h + 3*d^2*i)*ArcSin[c*x]*Log[d + e*x])/c + ((2*I)*(e^2*g -
 2*d*e*h + 3*d^2*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2
 - e^2])])/c + ((2*I)*(e^2*g - 2*d*e*h + 3*d^2*i)*PolyLog[2, (I*e*E^(I*Arc
Sin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/c))/(2*e^4)
```

### 3.110.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.110.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2872 vs. $2(616) = 1232$.

Time = 3.09 (sec) , antiderivative size = 2873, normalized size of antiderivative = 4.66

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 2873 |
| derivativedivides | Expression too large to display | 2934 |
| default | Expression too large to display | 2934 |

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x,method=_RETURNVERBOS
E)
```

output
```
b*c^2/e^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))
*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2-2*b*c^2/e^3*h*d
^3*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*
d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-2*b*c^2/e^3*h*d^3*arcsin(c*x
)/(c^2*d^2-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2
))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+b*c^2/e^2*g*arcsin(c*x)/(c^2*d^2-e^2)*ln(
(I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2
+e^2)^(1/2)))*d^2+2*I*b*c^2/e^3*h*d^3/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-
c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-3*
I*b*c^2/e^4*i*d^4/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+
(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-3*I*b*c^2/e^4*i*d^4/(c
^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2)
)/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-I*b*c^2/e^2*g/(c^2*d^2-e^2)*dilog((I*d*c+(
I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1
/2)))*d^2+I*b*arcsin(c*x)^2/e^3*d*h-2*b/e^3*arcsin(c*x)*x*d*i-3/2*I*b*arcs
in(c*x)^2/e^4*d^2*i-b*c*arcsin(c*x)/e/(c*e*x+c*d)*f+2*b*c/e*f/(c^2*d^2-e^2
)^(1/2)*arctan(1/2*(2*(I*c*x+(-c^2*x^2+1)^(1/2))*e+2*I*c*d)/(c^2*d^2-e^2)^
(1/2))-2*b/c/e^3*(-c^2*x^2+1)^(1/2)*d*i-3*b/e^2*i*d^2*arcsin(c*x)/(c^2*d^2
-e^2)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-
(-c^2*d^2+e^2)^(1/2)))-3*b/e^2*i*d^2*arcsin(c*x)/(c^2*d^2-e^2)*ln((I*d*...
```

### 3.110.5 Fricas [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^2}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="fr
icas")
```

output
```
integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arcsin(c*x))/(e^2*x^2 + 2*d*e*x + d^2), x)
```

### 3.110.6 Sympy [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\operatorname{asin}(cx))(f+gx+hx^2+ix^3)}{(d+ex)^2}\,dx$$

input
```
integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x)**2, x)
```

### 3.110.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="ma
xima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.110.8 Giac [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^2}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^2,x, algorithm="gi
ac")
```

output
```
integrate((i*x^3 + h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^2, x)
```

### 3.110.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,(i\,x^3+h\,x^2+g\,x+f)}{(d+e\,x)^2}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^2,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^2, x)
```

# 3.111 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

### 3.111.1 Optimal result

Integrand size = 31, antiderivative size = 1016

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$
$$= \frac{bi\sqrt{1-c^2x^2}}{ce^3} + \frac{5bcd^3i\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} - \frac{bcd^2(3eh+4di)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$+ \frac{bcd(e^2g+4deh-4d^2i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)} + \frac{bc(e^3f-2de^2g+2d^3i)\sqrt{1-c^2x^2}}{2e^3(c^2d^2-e^2)(d+ex)}$$
$$- \frac{ib(eh-3di)\arcsin(cx)^2}{2e^4} + \frac{ix(a+b\arcsin(cx))}{e^3}$$
$$- \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{e^4(d+ex)}$$
$$+ \frac{5bc^3d^4i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}} - \frac{bcd^2(3c^2dh+4ei)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^3(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{bcd(4e^2(eh-2di)+c^2(de^2g+4d^3i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$- \frac{bc(2e^4g-6d^2e^2i-c^2(de^3f-4d^4i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{2e^4(c^2d^2-e^2)^{3/2}}$$
$$+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$+ \frac{b(eh-3di)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$- \frac{b(eh-3di)\arcsin(cx)\log(d+ex)}{e^4} + \frac{(eh-3di)(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$- \frac{ib(eh-3di)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ib(eh-3di)\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$

output
```
-1/2*I*b*(-3*d*i+e*h)*arcsin(c*x)^2/e^4+i*x*(a+b*arcsin(c*x))/e^3-1/2*(-d^
3*i+d^2*e*h-d*e^2*g+e^3*f)*(a+b*arcsin(c*x))/e^4/(e*x+d)^2-(3*d^2*i-2*d*e*
h+e^2*g)*(a+b*arcsin(c*x))/e^4/(e*x+d)+5/2*b*c^3*d^4*i*arctan((c^2*d*x+e)/
(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d^2-e^2)^(3/2)-1/2*b*c*d^
2*(3*c^2*d*h+4*e*i)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1
/2))/e^3/(c^2*d^2-e^2)^(3/2)+1/2*b*c*d*(4*e^2*(-2*d*i+e*h)+c^2*(4*d^3*i+d*
e^2*g))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^
2*d^2-e^2)^(3/2)-1/2*b*c*(2*e^4*g-6*d^2*e^2*i-c^2*(-4*d^4*i+d*e^3*f))*arct
an((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*d^2-e^2)^(
3/2)-b*(-3*d*i+e*h)*arcsin(c*x)*ln(e*x+d)/e^4+(-3*d*i+e*h)*(a+b*arcsin(c*x
))*ln(e*x+d)/e^4+b*(-3*d*i+e*h)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(
1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4+b*(-3*d*i+e*h)*arcsin(c*x)*ln(1-I*e*(
I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4-I*b*(-3*d*i+e*h)*
polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^4-I*
b*(-3*d*i+e*h)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)
^(1/2)))/e^4+b*i*(-c^2*x^2+1)^(1/2)/c/e^3+5/2*b*c*d^3*i*(-c^2*x^2+1)^(1/2)
/e^3/(c^2*d^2-e^2)/(e*x+d)-1/2*b*c*d^2*(4*d*i+3*e*h)*(-c^2*x^2+1)^(1/2)/e^
3/(c^2*d^2-e^2)/(e*x+d)+1/2*b*c*d*(-4*d^2*i+4*d*e*h+e^2*g)*(-c^2*x^2+1)^(1
/2)/e^3/(c^2*d^2-e^2)/(e*x+d)+1/2*b*c*(2*d^3*i-2*d*e^2*g+e^3*f)*(-c^2*x^2+
1)^(1/2)/e^3/(c^2*d^2-e^2)/(e*x+d)
```

### 3.111.2 Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 6 vs. order 4 in optimal.

Time = 11.06 (sec) , antiderivative size = 1556, normalized size of antiderivative = 1.53

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^3}\,dx$$

$$= \frac{aix}{e^3} + \frac{-ae^3f+ade^2g-ad^2eh+ad^3i}{2e^4(d+ex)^2} + \frac{-ae^2g+2adeh-3ad^2i}{e^4(d+ex)}$$

$$+ bf\left(-\frac{c\sqrt{1+\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}}\sqrt{1+\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex}}\,\text{AppellF1}\left(2,\frac{1}{2},\frac{1}{2},3,-\frac{-d+\sqrt{\frac{1}{c^2}}e}{d+ex},-\frac{-d-\sqrt{\frac{1}{c^2}}e}{d+ex}\right)}{4e^2(d+ex)\sqrt{1-c^2x^2}}\right.$$

$$\left.-\frac{\arcsin(cx)}{2e(d+ex)^2}\right) + \frac{(aeh-3adi)\log(d+ex)}{e^4} + bg\left(\frac{-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}}{e^2}\right.$$

$$\left.-\frac{d\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{2e}\right)$$

$$+ bi\left(\frac{\sqrt{1-c^2x^2}+cx\arcsin(cx)}{ce^3}+\frac{3d^2\left(-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}\right)}{e^4}\right.$$

$$-\frac{d^3\left(\frac{c\sqrt{1-c^2x^2}}{(c^2d^2-e^2)(d+ex)}-\frac{\arcsin(cx)}{e(d+ex)^2}-\frac{ic^3d\left(\log(4)+\log\left(\frac{e^2\sqrt{c^2d^2-e^2}\left(ie+ic^2dx+\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}\right)}{c^3d(d+ex)}\right)\right)}{(cd-e)e(cd+e)\sqrt{c^2d^2-e^2}}\right)}{2e^3}$$

$$-\frac{3d\left(-\frac{i\arcsin(cx)^2}{2e}+\frac{\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e}+\frac{\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e}-\frac{i\,\text{PolyLog}\left(2,-\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)}{e}-\right.}{e^3}$$

$$+ bh\left(-\frac{2d\left(-\frac{\arcsin(cx)}{d+ex}+\frac{c\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{\sqrt{c^2d^2-e^2}}\right)}{e^3}\right.$$

3.111. $\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

input
```
Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

output
```
(a*i*x)/e^3 + (-(a*e^3*f) + a*d*e^2*g - a*d^2*e*h + a*d^3*i)/(2*e^4*(d + e
*x)^2) + (-(a*e^2*g) + 2*a*d*e*h - 3*a*d^2*i)/(e^4*(d + e*x)) + b*f*(-1/4*
(c*Sqrt[1 + (-d - Sqrt[c^(-2)]*e)/(d + e*x)]*Sqrt[1 + (-d + Sqrt[c^(-2)]*e
)/(d + e*x)]*AppellF1[2, 1/2, 1/2, 3, -((-d + Sqrt[c^(-2)]*e)/(d + e*x)),
-((-d - Sqrt[c^(-2)]*e)/(d + e*x))])/(e^2*(d + e*x)*Sqrt[1 - c^2*x^2]) - A
rcSin[c*x]/(2*e*(d + e*x)^2)) + ((a*e*h - 3*a*d*i)*Log[d + e*x])/e^4 + b*g
*((-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]
*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e^2 - (d*((c*Sqrt[1 - c^2*x^2])
/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log
[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*
Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d
^2 - e^2])))/(2*e)) + b*i*((Sqrt[1 - c^2*x^2] + c*x*ArcSin[c*x])/(c*e^3) +
 (3*d^2*(-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2
- e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2]))/e^4 - (d^3*((c*Sqrt[1 -
c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c
^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^
2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*S
qrt[c^2*d^2 - e^2])))/(2*e^3) - (3*d*(((-1/2*I)*ArcSin[c*x]^2)/e + (ArcSin
[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e + (A
rcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]...
```

### 3.111.3 Rubi [A] (verified)

Time = 2.78 (sec) , antiderivative size = 965, normalized size of antiderivative = 0.95, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)}{(d+ex)^3}dx$$

$$\Big\downarrow \; 5252$$

$$-bc\int -\frac{5id^3-e(3h-4ix)d^2+e^2(g-4x(h+ix))d+e^3\left(-2ix^3+2gx+f\right)-2(eh-3di)(d+ex)^2\log(d+ex)}{2e^4(d+ex)^2\sqrt{1-c^2x^2}}d$$
$$\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4(d+ex)}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{2e^4(d+ex)^2}+\frac{(eh-3di)\log(d+ex)(a+b\arcsin(cx))}{e^4}+\frac{ix(a+b\arcsin(cx))}{e^3}$$

$\downarrow$ 27

$$\frac{bc\int \frac{5id^3-e(3h-4ix)d^2+e^2(g-4x(h+ix))d+e^3\left(-2ix^3+2gx+f\right)-2(eh-3di)(d+ex)^2\log(d+ex)}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{2e^4}-\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4(d+ex)}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{2e^4(d+ex)^2}+\frac{(eh-3di)\log(d+ex)(a+b\arcsin(cx))}{e^4}+\frac{ix(a+b\arcsin(cx))}{e^3}$$

$\downarrow$ 7293

$$\frac{bc\int \left(\frac{5id^3}{(d+ex)^2\sqrt{1-c^2x^2}}+\frac{e(4ix-3h)d^2}{(d+ex)^2\sqrt{1-c^2x^2}}-\frac{e^2\left(4ix^2+4hx-g\right)d}{(d+ex)^2\sqrt{1-c^2x^2}}-\frac{e^3\left(2ix^3-2gx-f\right)}{(d+ex)^2\sqrt{1-c^2x^2}}-\frac{2(eh-3di)\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{2e^4}-\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{e^4(d+ex)}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{2e^4(d+ex)^2}+\frac{(eh-3di)\log(d+ex)(a+b\arcsin(cx))}{e^4}+\frac{ix(a+b\arcsin(cx))}{e^3}$$

$\downarrow$ 2009

$$\frac{ix(a+b\arcsin(cx))}{e^3}+\frac{(eh-3di)\log(d+ex)(a+b\arcsin(cx))}{e^4}-\frac{\left(3id^2-2ehd+e^2g\right)(a+b\arcsin(cx))}{e^4(d+ex)}-\frac{\left(-id^3+ehd^2-e^2gd+e^3f\right)(a+b\arcsin(cx))}{2e^4(d+ex)^2}+$$
$$bc\left(\frac{5c^2i\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^4}{\left(c^2d^2-e^2\right)^{3/2}}+\frac{5ei\sqrt{1-c^2x^2}d^3}{\left(c^2d^2-e^2\right)(d+ex)}-\frac{e\left(3dhc^2+4ei\right)\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^2}{\left(c^2d^2-e^2\right)^{3/2}}-\frac{e(3eh+4di)\sqrt{1-c^2x^2}d^2}{\left(c^2d^2-e^2\right)(d+ex)}+\right.$$

input
```
Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^3,x]
```

3.111. $\int \frac{\left(f+gx+hx^2+ix^3\right)(a+b\arcsin(cx))}{(d+ex)^3}\,dx$

output
```
(i*x*(a + b*ArcSin[c*x]))/e^3 - ((e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a +
b*ArcSin[c*x]))/(2*e^4*(d + e*x)^2) - ((e^2*g - 2*d*e*h + 3*d^2*i)*(a + b*
ArcSin[c*x]))/(e^4*(d + e*x)) + ((e*h - 3*d*i)*(a + b*ArcSin[c*x])*Log[d +
 e*x])/e^4 + (b*c*((2*e*i*Sqrt[1 - c^2*x^2])/c^2 + (5*d^3*e*i*Sqrt[1 - c^2
*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - (d^2*e*(3*e*h + 4*d*i)*Sqrt[1 - c^2*x
^2])/((c^2*d^2 - e^2)*(d + e*x)) + (d*e*(e^2*g + 4*d*e*h - 4*d^2*i)*Sqrt[1
 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) + (e*(e^3*f - 2*d*e^2*g + 2*d^3*i
)*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - (I*(e*h - 3*d*i)*ArcSin
[c*x]^2)/c + (5*c^2*d^4*i*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1
 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2) - (d^2*e*(3*c^2*d*h + 4*e*i)*ArcTan[(
e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/
2) + (d*(4*e^2*(e*h - 2*d*i) + c^2*(d*e^2*g + 4*d^3*i))*ArcTan[(e + c^2*d*
x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2) - ((2*e
^4*g - 6*d^2*e^2*i - c^2*(d*e^3*f - 4*d^4*i))*ArcTan[(e + c^2*d*x)/(Sqrt[c
^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(c^2*d^2 - e^2)^(3/2) + (2*(e*h - 3*d*i
)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])]
)/c + (2*(e*h - 3*d*i)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d +
Sqrt[c^2*d^2 - e^2])])/c - (2*(e*h - 3*d*i)*ArcSin[c*x]*Log[d + e*x])/c -
((2*I)*(e*h - 3*d*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^
2 - e^2])])/c - ((2*I)*(e*h - 3*d*i)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))...
```

### 3.111.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.111.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3609 vs. 2(979) = 1958.

Time = 7.05 (sec) , antiderivative size = 3610, normalized size of antiderivative = 3.55

| method | result | size |
|---|---|---|
| derivativedivides | Expression too large to display | 3610 |
| default | Expression too large to display | 3610 |
| parts | Expression too large to display | 3617 |

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x,method=_RETURNVERBOS
E)
```

output
```
1/c*(a*(i/e^3*c*x+1/2*c^3*(d^3*i-d^2*e*h+d*e^2*g-e^3*f)/e^4/(c*e*x+c*d)^2-
c^2/e^4*(3*d^2*i-2*d*e*h+e^2*g)/(c*e*x+c*d)-c/e^4*(3*d*i-e*h)*ln(c*e*x+c*d
))+b*(2*I/(c^2*d^2-e^2)^(3/2)*c^2*g*arctanh(1/2*(2*I*e*(I*c*x+(-c^2*x^2+1)
^(1/2))-2*d*c)/(c^2*d^2-e^2)^(1/2))-1/2*c^2*(-(-c^2*x^2+1)^(1/2)*c^2*d*e^4
*f-e^4*c*g*arcsin(c*x)*d+3*e^3*c*d^2*h*arcsin(c*x)-5*e^2*c*d^3*i*arcsin(c*
x)-3*e*c^3*d^4*h*arcsin(c*x)+e^2*c^3*d^3*g*arcsin(c*x)+e^3*c^3*d^2*f*arcsi
n(c*x)-2*arcsin(c*x)*e^5*g*c*x-I*c^3*d^3*e^2*g+I*c^3*d^4*e*h+I*c^3*d^2*e^3
*f+(-c^2*x^2+1)^(1/2)*c^2*d^4*e*i-(-c^2*x^2+1)^(1/2)*c^2*d^3*e^2*h+(-c^2*x
^2+1)^(1/2)*c^2*d^2*e^3*g+I*c^3*d^2*e^3*h*x^2+(-c^2*x^2+1)^(1/2)*c^2*d^3*e
^2*i*x-(-c^2*x^2+1)^(1/2)*c^2*d^2*e^3*h*x+(-c^2*x^2+1)^(1/2)*c^2*d*e^4*g*x
+I*c^3*e^5*f*x^2-(-c^2*x^2+1)^(1/2)*c^2*e^5*f*x-6*arcsin(c*x)*d^2*e^3*i*c*
x+4*arcsin(c*x)*d*e^4*h*c*x-I*c^3*d^5*i-e^5*c*f*arcsin(c*x)+5*c^3*d^5*i*ar
csin(c*x)+2*I*c^3*d^3*e^2*h*x-2*I*c^3*d^2*e^3*g*x+2*I*c^3*d*e^4*f*x-I*c^3*
d^3*e^2*i*x^2-I*c^3*d*e^4*g*x^2-2*I*c^3*d^4*e*i*x+6*arcsin(c*x)*c^3*d^4*e*
i*x-4*arcsin(c*x)*c^3*d^3*e^2*h*x+2*arcsin(c*x)*c^3*d^2*e^3*g*x)/(c^2*d^2-
e^2)/(c*e*x+c*d)^2/e^4-I/e^3/(c^2*d^2-e^2)^2*c^5*h*d^4*dilog((-I*d*c-(I*c*
x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)
))-I/e^3/(c^2*d^2-e^2)*c^3*h*d^2*arcsin(c*x)^2-I/e^3/(c^2*d^2-e^2)^2*c^5*h
*d^4*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*
c+(-c^2*d^2+e^2)^(1/2)))+2*I/e/(c^2*d^2-e^2)^2*c^3*h*dilog((I*d*c+(I*c*...
```

### 3.111.5 Fricas [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^3}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="fr
icas")
```

output
```
integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arcsin(c*x))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

### 3.111.6 Sympy [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\int \frac{(a+b\,\mathrm{asin}(cx))(f+gx+hx^2+ix^3)}{(d+ex)^3}\,dx$$

input
```
integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x)**3, x)
```

### 3.111.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="ma
xima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.111.8 Giac [F]

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\int \frac{(ix^3+hx^2+gx+f)(b\arcsin(cx)+a)}{(ex+d)^3}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^3,x, algorithm="gi
ac")
```

output
```
integrate((i*x^3 + h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^3, x)
```

### 3.111.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^3}\,dx=\int \frac{(a+b\,\mathrm{asin}(c\,x))\,(i\,x^3+h\,x^2+g\,x+f)}{(d+e\,x)^3}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^3,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^3, x)
```

# 3.112 $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

### 3.112.1 Optimal result

Integrand size = 31, antiderivative size = 1278

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$$
$$= \frac{bc(2e^2f-3deg+6d^2h)\sqrt{1-c^2x^2}}{12e^2(c^2d^2-e^2)(d+ex)^2} - \frac{11bcd^3i\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2}$$
$$+ \frac{bcd^2(2eh+27di)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2} + \frac{bcd(e^2g-6deh-18d^2i)\sqrt{1-c^2x^2}}{12e^3(c^2d^2-e^2)(d+ex)^2}$$
$$- \frac{bc(2e^2(eg-4dh)-c^2d(2e^2f-deg-2d^2h))\sqrt{1-c^2x^2}}{4e^2(c^2d^2-e^2)^2(d+ex)}$$
$$- \frac{11bc^3d^4i\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)} + \frac{bcd^2(18e^2i+c^2d(2eh+9di))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)}$$
$$- \frac{bcd(4e^2(eh+6di)-c^2d(e^2g-2deh+6d^2i))\sqrt{1-c^2x^2}}{4e^3(c^2d^2-e^2)^2(d+ex)}$$
$$- \frac{ibi\arcsin(cx)^2}{2e^4} - \frac{(e^3f-de^2g+d^2eh-d^3i)(a+b\arcsin(cx))}{3e^4(d+ex)^3}$$
$$- \frac{(e^2g-2deh+3d^2i)(a+b\arcsin(cx))}{2e^4(d+ex)^2} - \frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}$$
$$+ \frac{bc(4c^4d^2f+12e^2h+c^2(2e^2f-9deg+6d^2h))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e(c^2d^2-e^2)^{5/2}}$$
$$- \frac{11bc^3d^3(2c^2d^2+e^2)\,i\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^4(c^2d^2-e^2)^{5/2}}$$
$$+ \frac{bc^3d^2(4c^2d^2h+e(2eh+81di))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^3(c^2d^2-e^2)^{5/2}}$$
$$+ \frac{bcd(2c^4d^2g-36e^2i+c^2(e^2g-18deh-18d^2i))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{12e^2(c^2d^2-e^2)^{5/2}}$$
$$+ \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} + \frac{bi\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$
$$- \frac{bi\arcsin(cx)\log(d+ex)}{e^4} + \frac{i(a+b\arcsin(cx))\log(d+ex)}{e^4}$$
$$- \frac{ibi\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^4} - \frac{ibi\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^4}$$

output
```
-1/2*I*b*i*arcsin(c*x)^2/e^4-1/3*(-d^3*i+d^2*e*h-d*e^2*g+e^3*f)*(a+b*arcsi
n(c*x))/e^4/(e*x+d)^3-1/2*(3*d^2*i-2*d*e*h+e^2*g)*(a+b*arcsin(c*x))/e^4/(e
*x+d)^2-(-3*d*i+e*h)*(a+b*arcsin(c*x))/e^4/(e*x+d)+1/12*b*c*(4*c^4*d^2*f+1
2*e^2*h+c^2*(6*d^2*h-9*d*e*g+2*e^2*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1
/2)/(-c^2*x^2+1)^(1/2))/e/(c^2*d^2-e^2)^(5/2)-11/12*b*c^3*d^3*(2*c^2*d^2+e
^2)*i*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^4/(c^2*
d^2-e^2)^(5/2)+1/12*b*c^3*d^2*(4*c^2*d^2*h+e*(81*d*i+2*e*h))*arctan((c^2*d
*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(5/2)+1/12
*b*c*d*(2*c^4*d^2*g-36*e^2*i+c^2*(-18*d^2*i-18*d*e*h+e^2*g))*arctan((c^2*d
*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(5/2)-b*i*
arcsin(c*x)*ln(e*x+d)/e^4+i*(a+b*arcsin(c*x))*ln(e*x+d)/e^4+b*i*arcsin(c*x
)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^4+b*i*a
rcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/
e^4-I*b*i*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2
)))/e^4-I*b*i*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^
(1/2)))/e^4+1/12*b*c*(6*d^2*h-3*d*e*g+2*e^2*f)*(-c^2*x^2+1)^(1/2)/e^2/(c^2
*d^2-e^2)/(e*x+d)^2-11/12*b*c*d^3*i*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)/(
e*x+d)^2+1/12*b*c*d^2*(27*d*i+2*e*h)*(-c^2*x^2+1)^(1/2)/e^3/(c^2*d^2-e^2)/
(e*x+d)^2+1/12*b*c*d*(-18*d^2*i-6*d*e*h+e^2*g)*(-c^2*x^2+1)^(1/2)/e^3/(c^2
*d^2-e^2)/(e*x+d)^2-1/4*b*c*(2*e^2*(-4*d*h+e*g)-c^2*d*(-2*d^2*h-d*e*g+2...
```

### 3.112.2 Mathematica [C] (warning: unable to verify)

Result contains higher order function than in optimal. Order 6 vs. order 4 in optimal.

Time = 8.96 (sec) , antiderivative size = 1921, normalized size of antiderivative = 1.50

$$\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
Integrate[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

output
```
(-(a*e^3*f) + a*d*e^2*g - a*d^2*e*h + a*d^3*i)/(3*e^4*(d + e*x)^3) + (-(a*
e^2*g) + 2*a*d*e*h - 3*a*d^2*i)/(2*e^4*(d + e*x)^2) + (-(a*e*h) + 3*a*d*i)
/(e^4*(d + e*x)) + b*f*(-1/9*(c*Sqrt[1 + (-d - Sqrt[c^(-2)]*e)/(d + e*x)]*
Sqrt[1 + (-d + Sqrt[c^(-2)]*e)/(d + e*x)]*AppellF1[3, 1/2, 1/2, 4, -((-d +
 Sqrt[c^(-2)]*e)/(d + e*x)), -((-d - Sqrt[c^(-2)]*e)/(d + e*x))])/(e^2*(d
+ e*x)^2*Sqrt[1 - c^2*x^2]) - ArcSin[c*x]/(3*e*(d + e*x)^3)) + (a*i*Log[d
+ e*x])/e^4 + b*h*((-(ArcSin[c*x]/(d + e*x)) + (c*ArcTan[(e + c^2*d*x)/(Sq
rt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/Sqrt[c^2*d^2 - e^2])/e^3 - (d*((c*S
qrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2
) - (I*c^3*d*(Log[4] + Log[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqr
t[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*
d + e)*Sqrt[c^2*d^2 - e^2])))/e^2 + (d^2*((Sqrt[1 - c^2*x^2]*(-(c*e^2) + c
^3*d*(4*d + 3*e*x)))/((-(c^2*d^2) + e^2)^2*(d + e*x)^2) - (2*ArcSin[c*x])/
(e*(d + e*x)^3) + (c^3*(2*c^2*d^2 + e^2)*Log[d + e*x])/(e*(-(c*d) + e)^2*(
c*d + e)^2*Sqrt[-(c^2*d^2) + e^2]) - (c^3*(2*c^2*d^2 + e^2)*Log[e + c^2*d*
x + Sqrt[-(c^2*d^2) + e^2]*Sqrt[1 - c^2*x^2]])/(e*(-(c*d) + e)^2*(c*d + e)
^2*Sqrt[-(c^2*d^2) + e^2])))/(6*e^2)) + b*g*(((c*Sqrt[1 - c^2*x^2])/((c^2*
d^2 - e^2)*(d + e*x)) - ArcSin[c*x]/(e*(d + e*x)^2) - (I*c^3*d*(Log[4] + L
og[(e^2*Sqrt[c^2*d^2 - e^2]*(I*e + I*c^2*d*x + Sqrt[c^2*d^2 - e^2]*Sqrt[1
- c^2*x^2]))/(c^3*d*(d + e*x))]))/((c*d - e)*e*(c*d + e)*Sqrt[c^2*d^2 -...
```

### 3.112.3 Rubi [A] (verified)

Time = 2.86 (sec) , antiderivative size = 1244, normalized size of antiderivative = 0.97, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {5252, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))\left(f+gx+hx^2+ix^3\right)}{(d+ex)^4}dx$$

$$\Big\downarrow \text{5252}$$

$$-bc\int \frac{11id^3-e(2h-27ix)d^2-e^2(g+6x(h-3ix))d-e^3(2f+3x(g+2hx))+6i(d+ex)^3\log(d+ex)}{6e^4(d+ex)^3\sqrt{1-c^2x^2}}dx-\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{2e^4(d+ex)^2}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{3e^4(d+ex)^3}-\frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}+\frac{i\log(d+ex)(a+b\arcsin(cx))}{e^4}$$

$$\Big\downarrow \text{27}$$

$$-\frac{bc\int \frac{11id^3-e(2h-27ix)d^2-e^2(g+6x(h-3ix))d-e^3(2f+3x(g+2hx))+6i(d+ex)^3\log(d+ex)}{(d+ex)^3\sqrt{1-c^2x^2}}dx}{6e^4}-\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{2e^4(d+ex)^2}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{3e^4(d+ex)^3}-\frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}+\frac{i\log(d+ex)(a+b\arcsin(cx))}{e^4}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{bc\int \left(\frac{11id^3}{(d+ex)^3\sqrt{1-c^2x^2}}+\frac{e(27ix-2h)d^2}{(d+ex)^3\sqrt{1-c^2x^2}}+\frac{e^2(18ix^2-6hx-g)d}{(d+ex)^3\sqrt{1-c^2x^2}}-\frac{e^3(6hx^2+3gx+2f)}{(d+ex)^3\sqrt{1-c^2x^2}}+\frac{6i\log(d+ex)}{\sqrt{1-c^2x^2}}\right)dx}{6e^4}-\frac{(a+b\arcsin(cx))\left(3d^2i-2deh+e^2g\right)}{2e^4(d+ex)^2}-\frac{(a+b\arcsin(cx))\left(d^3(-i)+d^2eh-de^2g+e^3f\right)}{3e^4(d+ex)^3}-\frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}+\frac{i\log(d+ex)(a+b\arcsin(cx))}{e^4}$$

$$\Big\downarrow \text{2009}$$

$$\frac{i\log(d+ex)(a+b\arcsin(cx))}{e^4}-\frac{(eh-3di)(a+b\arcsin(cx))}{e^4(d+ex)}-\frac{\left(3id^2-2ehd+e^2g\right)(a+b\arcsin(cx))}{2e^4(d+ex)^2}-\frac{\left(-id^3+ehd^2-e^2gd+e^3f\right)(a+b\arcsin(cx))}{3e^4(d+ex)^3}-\frac{bc\left(\frac{33c^2ei\sqrt{1-c^2x^2}d^4}{2(c^2d^2-e^2)^2(d+ex)}+\frac{11c^2(2c^2d^2+e^2)i\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)d^3}{2(c^2d^2-e^2)^{5/2}}+\frac{11ei\sqrt{1-c^2x^2}d^3}{2(c^2d^2-e^2)(d+ex)^2}-\frac{c^2e(4c^2hd^2+e(2eh+81di))\arctan\left(\frac{}{\sqrt{}}\right.}{2(c^2d^2-e^2)^{5/2}}\right.}{}$$

input
```
Int[((f + g*x + h*x^2 + i*x^3)*(a + b*ArcSin[c*x]))/(d + e*x)^4,x]
```

3.112. $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

output
```
-1/3*((e^3*f - d*e^2*g + d^2*e*h - d^3*i)*(a + b*ArcSin[c*x]))/(e^4*(d + e
*x)^3) - ((e^2*g - 2*d*e*h + 3*d^2*i)*(a + b*ArcSin[c*x]))/(2*e^4*(d + e*x
)^2) - ((e*h - 3*d*i)*(a + b*ArcSin[c*x]))/(e^4*(d + e*x)) + (i*(a + b*Arc
Sin[c*x])*Log[d + e*x])/e^4 - (b*c*(-1/2*(e^2*(2*e^2*f - 3*d*e*g + 6*d^2*h
)*Sqrt[1 - c^2*x^2])/((c^2*d^2 - e^2)*(d + e*x)^2) + (11*d^3*e*i*Sqrt[1 -
c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2) - (d^2*e*(2*e*h + 27*d*i)*Sqrt[1
 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2) - (d*e*(e^2*g - 6*d*e*h - 18*
d^2*i)*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^2)*(d + e*x)^2) + (3*e^2*(2*e^2*
(e*g - 4*d*h) - c^2*d*(2*e^2*f - d*e*g - 2*d^2*h))*Sqrt[1 - c^2*x^2])/(2*(
c^2*d^2 - e^2)^2*(d + e*x)) + (33*c^2*d^4*e*i*Sqrt[1 - c^2*x^2])/(2*(c^2*d
^2 - e^2)^2*(d + e*x)) - (3*d^2*e*(18*e^2*i + c^2*d*(2*e*h + 9*d*i))*Sqrt[
1 - c^2*x^2])/(2*(c^2*d^2 - e^2)^2*(d + e*x)) + (3*d*e*(4*e^2*(e*h + 6*d*i
) - c^2*d*(e^2*g - 2*d*e*h + 6*d^2*i))*Sqrt[1 - c^2*x^2])/(2*(c^2*d^2 - e^
2)^2*(d + e*x)) + ((3*I)*i*ArcSin[c*x]^2)/c - (e^3*(4*c^4*d^2*f + 12*e^2*h
 + c^2*(2*e^2*f - 9*d*e*g + 6*d^2*h))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 -
 e^2]*Sqrt[1 - c^2*x^2])])/(2*(c^2*d^2 - e^2)^(5/2)) + (11*c^2*d^3*(2*c^2*
d^2 + e^2)*i*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])]
)/(2*(c^2*d^2 - e^2)^(5/2)) - (c^2*d^2*e*(4*c^2*d^2*h + e*(2*e*h + 81*d*i)
)*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(2*(c^2*d
^2 - e^2)^(5/2)) - (d*e^2*(2*c^4*d^2*g - 36*e^2*i + c^2*(e^2*g - 18*d*e...
```

### 3.112.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5252
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*(Px_)*((d_.) + (e_.)*(x_))^(m_.), x_
Symbol] :> With[{u = IntHide[Px*(d + e*x)^m, x]}, Simp[(a + b*ArcSin[c*x])
  u, x] - Simp[b*c   Int[SimplifyIntegrand[u/Sqrt[1 - c^2*x^2], x], x], x]]
 /; FreeQ[{a, b, c, d, e, m}, x] && PolynomialQ[Px, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

3.112. $\int \frac{(f+gx+hx^2+ix^3)(a+b\arcsin(cx))}{(d+ex)^4}\,dx$

### 3.112.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 3756 vs. 2(1225) = 2450.

Time = 11.16 (sec) , antiderivative size = 3757, normalized size of antiderivative = 2.94

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 3757 |
| derivativedivides | Expression too large to display | 3777 |
| default | Expression too large to display | 3777 |

input
```
int((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x,method=_RETURNVERBOS
E)
```

output
```
a*(i/e^4*ln(e*x+d)-(-3*d*i+e*h)/e^4/(e*x+d)-1/3*(-d^3*i+d^2*e*h-d*e^2*g+e^
3*f)/e^4/(e*x+d)^3-1/2*(3*d^2*i-2*d*e*h+e^2*g)/e^4/(e*x+d)^2)+b/c*(-I/e^4/
(c^2*d^2-e^2)^3*c^7*i*d^6*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*
d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+2*I/e^2/(c^2*d^2-e^2)^2*c^3*
i*d^2*arcsin(c*x)^2-I/e^4/(c^2*d^2-e^2)^2*c^5*i*d^4*arcsin(c*x)^2+3*I/e^2/
(c^2*d^2-e^2)^3*c^5*i*d^4*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*
d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+1/e^4/(c^2*d^2-e^2)^3*c^7*i*
d^6*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2
))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+1/e^4/(c^2*d^2-e^2)^3*c^7*i*d^6*arcsin(c*
x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c
^2*d^2+e^2)^(1/2)))-3/e^2/(c^2*d^2-e^2)^3*c^5*i*d^4*arcsin(c*x)*ln((I*d*c+
(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(
1/2)))-3/e^2/(c^2*d^2-e^2)^3*c^5*i*d^4*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*
x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+3*I/e^
2/(c^2*d^2-e^2)^3*c^5*i*d^4*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^
2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))+3/(c^2*d^2-e^2)^3*c^3*i*ar
csin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*
d*c+(-c^2*d^2+e^2)^(1/2)))*d^2+I*e^2/(c^2*d^2-e^2)^3*c*i*dilog((I*d*c+(I*c
*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)
))+I*e^2/(c^2*d^2-e^2)^3*c*i*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-...
```

### 3.112.5 Fricas [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^4}\,dx = \int \frac{(ix^3 + hx^2 + gx + f)(b\arcsin(cx) + a)}{(ex + d)^4}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="fr
icas")
```

output
```
integral((a*i*x^3 + a*h*x^2 + a*g*x + a*f + (b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arcsin(c*x))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4)
, x)
```

### 3.112.6 Sympy [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^4}\,dx = \int \frac{(a + b\,\mathrm{asin}(cx))(f + gx + hx^2 + ix^3)}{(d + ex)^4}\,dx$$

input
```
integrate((i*x**3+h*x**2+g*x+f)*(a+b*asin(c*x))/(e*x+d)**4,x)
```

output
```
Integral((a + b*asin(c*x))*(f + g*x + h*x**2 + i*x**3)/(d + e*x)**4, x)
```

### 3.112.7 Maxima [F]

$$\int \frac{(f + gx + hx^2 + ix^3)(a + b\arcsin(cx))}{(d + ex)^4}\,dx = \int \frac{(ix^3 + hx^2 + gx + f)(b\arcsin(cx) + a)}{(ex + d)^4}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="ma
xima")
```

output
```
1/6*a*i*((18*d*e^2*x^2 + 27*d^2*e*x + 11*d^3)/(e^7*x^3 + 3*d*e^6*x^2 + 3*d
^2*e^5*x + d^3*e^4) + 6*log(e*x + d)/e^4) - 1/6*(3*e*x + d)*a*g/(e^5*x^3 +
 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/3*(3*e^2*x^2 + 3*d*e*x + d^2)*a*
h/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3) - 1/3*a*f/(e^4*x^3 + 3*d
*e^3*x^2 + 3*d^2*e^2*x + d^3*e) + integrate((b*i*x^3 + b*h*x^2 + b*g*x + b
*f)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(e^4*x^4 + 4*d*e^3*x^3 + 6*
d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

### 3.112.8 Giac [F]

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(ix^3+hx^2+gx+f)(b\arcsin{(cx)}+a)}{(ex+d)^4}\,dx$$

input
```
integrate((i*x^3+h*x^2+g*x+f)*(a+b*arcsin(c*x))/(e*x+d)^4,x, algorithm="gi
ac")
```

output
```
integrate((i*x^3 + h*x^2 + g*x + f)*(b*arcsin(c*x) + a)/(e*x + d)^4, x)
```

### 3.112.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx+hx^2+ix^3)\,(a+b\arcsin(cx))}{(d+ex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))\,\left(i\,x^3+h\,x^2+g\,x+f\right)}{{(d+e\,x)}^4}\,dx$$

input
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^4,x)
```

output
```
int(((a + b*asin(c*x))*(f + g*x + h*x^2 + i*x^3))/(d + e*x)^4, x)
```

# 3.113 $\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

### 3.113.1 Optimal result

Integrand size = 23, antiderivative size = 935

$$
\begin{aligned}
\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx &= \frac{abc(ef-dg)\sqrt{1-c^2x^2}}{e(c^2d^2-e^2)(d+ex)}+\frac{abg^2\arcsin(cx)}{e^2(ef-dg)} \\
&+\frac{b^2c(ef-dg)\sqrt{1-c^2x^2}\arcsin(cx)}{e(c^2d^2-e^2)(d+ex)} \\
&+\frac{b^2g^2\arcsin(cx)^2}{2e^2(ef-dg)}-\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2} \\
&-\frac{abc(2e^2g-c^2d(ef+dg))\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}} \\
&-\frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&-\frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}} \\
&+\frac{2ib^2cg\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&+\frac{ib^2c^3d(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}} \\
&-\frac{b^2c^2(ef-dg)\log(d+ex)}{e^2(c^2d^2-e^2)} \\
&-\frac{2b^2cg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&-\frac{b^2c^3d(ef-dg)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}} \\
&+\frac{2b^2cg\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}} \\
&+\frac{b^2c^3d(ef-dg)\,\mathrm{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2(c^2d^2-e^2)^{3/2}}
\end{aligned}
$$

output
```
a*b*g^2*arcsin(c*x)/e^2/(-d*g+e*f)+1/2*b^2*g^2*arcsin(c*x)^2/e^2/(-d*g+e*f
)-1/2*(g*x+f)^2*(a+b*arcsin(c*x))^2/(-d*g+e*f)/(e*x+d)^2-a*b*c*(2*e^2*g-c^
2*d*(d*g+e*f))*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/
e^2/(c^2*d^2-e^2)^(3/2)-b^2*c^2*(-d*g+e*f)*ln(e*x+d)/e^2/(c^2*d^2-e^2)-I*b
^2*c^3*d*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(
c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(3/2)+I*b^2*c^3*d*(-d*g+e*f)*arcsin
(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(
c^2*d^2-e^2)^(3/2)-b^2*c^3*d*(-d*g+e*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^
(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(3/2)+b^2*c^3*d*(-d*g+
e*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e
^2/(c^2*d^2-e^2)^(3/2)-2*I*b^2*c*g*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1
)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+2*I*b^2*c*g*ar
csin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e
^2/(c^2*d^2-e^2)^(1/2)-2*b^2*c*g*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/
(c*d-(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+2*b^2*c*g*polylog(2,I*e
*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(
1/2)+a*b*c*(-d*g+e*f)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)+b^2*c*(-d
*g+e*f)*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/e/(c^2*d^2-e^2)/(e*x+d)
```

### 3.113.2 Mathematica [A] (verified)

Time = 1.81 (sec) , antiderivative size = 574, normalized size of antiderivative = 0.61

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$= \frac{-\frac{(ef-dg)(a+b\arcsin(cx))^2}{(d+ex)^2}-\frac{2g(a+b\arcsin(cx))^2}{d+ex}+\frac{4bcg\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)-b\,\mathrm{Pol}}{\sqrt{c^2d^2-e^2}}}{}$$

input
```
Integrate[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

output
```
(-(((e*f - d*g)*(a + b*ArcSin[c*x])^2)/(d + e*x)^2) - (2*g*(a + b*ArcSin[c
*x])^2)/(d + e*x) + (4*b*c*g*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*
ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c
*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))
/(c*d - Sqrt[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d
+ Sqrt[c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e^2] + (2*b*c*(e*f - d*g)*(e*Sqrt
[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]) - b*c*Sqrt[c^2*d^2 -
 e^2]*(d + e*x)*Log[d + e*x] - I*c^2*d*(d + e*x)*((a + b*ArcSin[c*x])*(Log
[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*
e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) - I*b*PolyLog[2, (I*e*E
^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] + I*b*PolyLog[2, (I*e*E^(I*
ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])))/((c^2*d^2 - e^2)^(3/2)*(d +
e*x)))/(2*e^2)
```

### 3.113.3 Rubi [A] (verified)

Time = 2.76 (sec) , antiderivative size = 955, normalized size of antiderivative = 1.02, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {5254, 27, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}dx$$

$$\Big\downarrow \text{5254}$$

$$-2bc\int -\frac{(f+gx)^2(a+b\arcsin(cx))}{2(ef-dg)(d+ex)^2\sqrt{1-c^2x^2}}dx-\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{27}$$

$$\frac{bc\int \frac{(f+gx)^2(a+b\arcsin(cx))}{(d+ex)^2\sqrt{1-c^2x^2}}dx}{ef-dg}-\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{5298}$$

$$\frac{bc\int \left(\frac{b\arcsin(cx)(f+gx)^2}{(d+ex)^2\sqrt{1-c^2x^2}}+\frac{a(f+gx)^2}{(d+ex)^2\sqrt{1-c^2x^2}}\right)dx}{ef-dg}-\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(d+ex)^2(ef-dg)}$$

$$\Big\downarrow \text{2009}$$

$$\frac{bc\left(\frac{b\arcsin(cx)^2g^2}{2ce^2}+\frac{a\arcsin(cx)g^2}{ce^2}-\frac{2ib(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)g}{e^2\sqrt{c^2d^2-e^2}}+\frac{2ib(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)g}{e^2\sqrt{c^2d^2-e^2}}-\right.}{}$$

$$\frac{(f+gx)^2(a+b\arcsin(cx))^2}{2(ef-dg)(d+ex)^2}$$

input
```
Int[((f + g*x)*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

output
```
-1/2*((f + g*x)^2*(a + b*ArcSin[c*x])^2)/((e*f - d*g)*(d + e*x)^2) + (b*c*
((a*(e*f - d*g)^2*Sqrt[1 - c^2*x^2])/(e*(c^2*d^2 - e^2)*(d + e*x)) + (a*g^
2*ArcSin[c*x])/(c*e^2) + (b*(e*f - d*g)^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(
e*(c^2*d^2 - e^2)*(d + e*x)) + (b*g^2*ArcSin[c*x]^2)/(2*c*e^2) - (a*(e*f -
 d*g)*(2*e^2*g - c^2*d*(e*f + d*g))*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e
^2]*Sqrt[1 - c^2*x^2])])/(e^2*(c^2*d^2 - e^2)^(3/2)) - ((2*I)*b*g*(e*f - d
*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2]
)])/(e^2*Sqrt[c^2*d^2 - e^2]) - (I*b*c^2*d*(e*f - d*g)^2*ArcSin[c*x]*Log[1
 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*(c^2*d^2 - e
^2)^(3/2)) + ((2*I)*b*g*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c
*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) + (I*b*c^2*d
*(e*f - d*g)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2
*d^2 - e^2])])/(e^2*(c^2*d^2 - e^2)^(3/2)) - (b*c*(e*f - d*g)^2*Log[d + e*
x])/(e^2*(c^2*d^2 - e^2)) - (2*b*g*(e*f - d*g)*PolyLog[2, (I*e*E^(I*ArcSin
[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) - (b*c^2*d
*(e*f - d*g)^2*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^
2])])/(e^2*(c^2*d^2 - e^2)^(3/2)) + (2*b*g*(e*f - d*g)*PolyLog[2, (I*e*E^(
I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) +
(b*c^2*d*(e*f - d*g)^2*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*
d^2 - e^2])])/(e^2*(c^2*d^2 - e^2)^(3/2))))/(e*f - d*g)
```

#### 3.113.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5254
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_)*((f_.)
 + (g_.)*(x_))^(p_.), x_Symbol] :> With[{u = IntHide[(f + g*x)^p*(d + e*x)^
m, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c*n   Int[SimplifyInteg
rand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x], x]] /; Free
Q[{a, b, c, d, e, f, g}, x] && IGtQ[n, 0] && IGtQ[p, 0] && ILtQ[m, 0] && Lt
Q[m + p + 1, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

### 3.113.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2320 vs. 2(941) = 1882.

Time = 4.98 (sec) , antiderivative size = 2321, normalized size of antiderivative = 2.48

| method | result | size |
|---|---|---|
| derivativedivides | Expression too large to display | 2321 |
| default | Expression too large to display | 2321 |
| parts | Expression too large to display | 2336 |

input
```
int((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
1/c*(a^2*c^2*(1/2*c*(d*g-e*f)/e^2/(c*e*x+c*d)^2-g/e^2/(c*e*x+c*d))+b^2*c^2
*(-1/2*arcsin(c*x)*(2*(-c^2*x^2+1)^(1/2)*c^2*d^2*e*g-2*(-c^2*x^2+1)^(1/2)*
c^2*d*e^2*f-2*(-c^2*x^2+1)^(1/2)*c^2*e^3*f*x+2*I*c^3*d^2*e*f+4*I*c^3*d*e^2
*f*x+2*arcsin(c*x)*c^3*d^2*e*g*x-2*I*c^3*d*e^2*g*x^2+2*I*c^3*e^3*f*x^2-2*a
rcsin(c*x)*e^3*g*c*x-4*I*c^3*d^2*e*g*x-e^2*c*d*g*arcsin(c*x)-2*I*c^3*d^3*g
+2*(-c^2*x^2+1)^(1/2)*c^2*d*e^2*g*x+c^3*d^3*g*arcsin(c*x)+e*c^3*d^2*f*arcs
in(c*x)-e^3*c*f*arcsin(c*x))/(c^2*d^2-e^2)/(c*e*x+c*d)^2/e^2+2/e/(c^2*d^2-
e^2)*c*f*ln(I*c*x+(-c^2*x^2+1)^(1/2))-1/e/(c^2*d^2-e^2)*c*f*ln(I*e*(I*c*x+
(-c^2*x^2+1)^(1/2))^2-2*d*c*(I*c*x+(-c^2*x^2+1)^(1/2))-I*e)-2/e^2/(c^2*d^2
-e^2)*c*d*g*ln(I*c*x+(-c^2*x^2+1)^(1/2))+1/e^2/(c^2*d^2-e^2)*c*d*g*ln(I*e*
(I*c*x+(-c^2*x^2+1)^(1/2))^2-2*d*c*(I*c*x+(-c^2*x^2+1)^(1/2))-I*e)+2*(-c^2
*d^2+e^2)^(1/2)/(c^2*d^2-e^2)^2*g*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1
)^(1/2))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))-2*(-c^2*d^2
+e^2)^(1/2)/(c^2*d^2-e^2)^2*g*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1
/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-I/e*(-c^2*d^2+e
^2)^(1/2)/(c^2*d^2-e^2)^2*c^2*d*f*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*
e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))+2*I*(-c^2*d^2+e^2)^(
1/2)/(c^2*d^2-e^2)^2*g*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2
+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))-1/e^2*(-c^2*d^2+e^2)^(1/2)/(c^2
*d^2-e^2)^2*c^2*d^2*g*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*...
```

## 3.113.5 Fricas [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(gx+f)(b\arcsin{(cx)}+a)^2}{(ex+d)^3}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="fricas")
```

output
```
integral((a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*arcsin(c*x)^2 + 2*(a*b*g*x +
 a*b*f)*arcsin(c*x))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

### 3.113.6 Sympy [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2\,(f+gx)}{(d+ex)^3}\,dx$$

input
```
integrate((g*x+f)*(a+b*asin(c*x))**2/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)/(d + e*x)**3, x)
```

### 3.113.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.113.8 Giac [F]

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(gx+f)(b\arcsin(cx)+a)^2}{(ex+d)^3}\,dx$$

input
```
integrate((g*x+f)*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="giac")
```

output
```
integrate((g*x + f)*(b*arcsin(c*x) + a)^2/(e*x + d)^3, x)
```

### 3.113.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx=\int \frac{(f+g\,x)\ \left(a+b\,\mathrm{asin}(c\,x)\right)^2}{\left(d+e\,x\right)^3}\,dx$$

input
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d + e*x)^3,x)
```

output
```
int(((f + g*x)*(a + b*asin(c*x))^2)/(d + e*x)^3, x)
```

# 3.114 $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3} dx$



## 3.114.1 Optimal result

Integrand size = 25, antiderivative size = 1678

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3} dx = \text{Too large to display}$$

output
```
a^2*g^2*ln(e*x+d)/e^3+4*I*b^2*c*g*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(
-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)-2*b^
2*g*(-d*g+e*f)*arcsin(c*x)^2/e^3/(e*x+d)+2*a*b*g^2*arcsin(c*x)*ln(1-I*e*(I
*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3+2*a*b*g^2*arcsin(c
*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-I*a
*b*g^2*arcsin(c*x)^2/e^3-2*I*a*b*g^2*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/
2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3-2*I*b^2*g^2*arcsin(c*x)*polylog(2,I*e*(
I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3-2*I*a*b*g^2*polyl
og(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3-2*I*b^2
*g^2*arcsin(c*x)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^
2)^(1/2)))/e^3-I*b^2*c^3*d*(-d*g+e*f)^2*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*
x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(3/2)-4*I*b^2*c
*g*(-d*g+e*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^
2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)-a*b*(-d*g+e*f)^2*arcsin(c*x)/e^3/(e
*x+d)^2-b^2*c^3*d*(-d*g+e*f)^2*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c
*d-(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(3/2)+b^2*c^3*d*(-d*g+e*f)^2*po
lylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3/(c^2
*d^2-e^2)^(3/2)+b^2*c*(-d*g+e*f)^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/e^2/(c^2
*d^2-e^2)/(e*x+d)-a*b*c*(-d*g+e*f)*(4*e^2*g-c^2*d*(3*d*g+e*f))*arctan((c^2
*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)^(3/2)...
```

### 3.114.2 Mathematica [A] (verified)

Time = 4.54 (sec) , antiderivative size = 903, normalized size of antiderivative = 0.54

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$= \frac{-\frac{3(ef-dg)^2(a+b\arcsin(cx))^2}{(d+ex)^2}+\frac{12g(-ef+dg)(a+b\arcsin(cx))^2}{d+ex}-\frac{2ig^2(a+b\arcsin(cx))^3}{b}+6g^2(a+b\arcsin(cx))^2\log\left(1+\frac{i}{-c}\right.}{}$$

input
```
Integrate[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

output
```
((-3*(e*f - d*g)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^2 + (12*g*(-(e*f) + d*
g)*(a + b*ArcSin[c*x])^2)/(d + e*x) - ((2*I)*g^2*(a + b*ArcSin[c*x])^3)/b
+ 6*g^2*(a + b*ArcSin[c*x])^2*Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sq
rt[c^2*d^2 - e^2])] + 6*g^2*(a + b*ArcSin[c*x])^2*Log[1 - (I*e*E^(I*ArcSin
[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] + (24*b*c*g*(-(e*f) + d*g)*(I*(a + b*
ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2
])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) + b*Po
lyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] - b*PolyLog[
2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e
^2] + (6*b*c^2*(e*f - d*g)^2*((e*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(c
*d + c*e*x) - b*Log[d + e*x] + (c*d*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*
e*E^(I*ArcSin[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*A
rcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin
[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x])
)/(c*d + Sqrt[c^2*d^2 - e^2])]))/Sqrt[c^2*d^2 - e^2]))/(c^2*d^2 - e^2) - 1
2*b*g^2*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - S
qrt[c^2*d^2 - e^2])] - b*PolyLog[3, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^
2*d^2 - e^2])]) - 12*b*g^2*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*e*E^(I*Arc
Sin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])] - b*PolyLog[3, (I*e*E^(I*ArcSin[c*
x]))/(c*d + Sqrt[c^2*d^2 - e^2])]))/(6*e^3)
```

### 3.114.3 Rubi [A] (verified)

Time = 3.94 (sec) , antiderivative size = 1678, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {5258, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$$

$$\Big\downarrow \text{5258}$$

$$\int \left(\frac{a^2(f+gx)^2}{(d+ex)^3}+\frac{2ab\arcsin(cx)(f+gx)^2}{(d+ex)^3}+\frac{b^2\arcsin(cx)^2(f+gx)^2}{(d+ex)^3}\right)dx$$

$$\Big\downarrow \text{2009}$$

$$-\frac{ib^2d(ef-dg)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}+\frac{ib^2d(ef-dg)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}-\frac{b^2d(ef-dg)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}+\frac{b^2d(ef-dg)^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c^3}{e^3\left(c^2d^2-e^2\right)^{3/2}}-\frac{b^2(ef-dg)^2\log(d+ex)c^2}{e^3\left(c^2d^2-e^2\right)}+\frac{b^2(ef-dg)^2\sqrt{1-c^2x^2}\arcsin(cx)c}{e^2\left(c^2d^2-e^2\right)(d+ex)}-\frac{ab(ef-dg)\left(4e^2g-c^2d(ef+3dg)\right)\arctan\left(\frac{dxc^2+e}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)c}{e^3\left(c^2d^2-e^2\right)^{3/2}}-\frac{4ib^2g(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}+\frac{4ib^2g(ef-dg)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}-\frac{4b^2g(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}+\frac{4b^2g(ef-dg)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)c}{e^3\sqrt{c^2d^2-e^2}}+\frac{ab(ef-dg)^2\sqrt{1-c^2x^2}c}{e^2\left(c^2d^2-e^2\right)(d+ex)}-\frac{ib^2g^2\arcsin(cx)^3}{3e^3}-\frac{iabg^2\arcsin(cx)^2}{e^3}-\frac{2b^2g(ef-dg)\arcsin(cx)^2}{e^3(d+ex)}-\frac{b^2(ef-dg)^2\arcsin(cx)^2}{2e^3(d+ex)^2}-\frac{4abg(ef-dg)\arcsin(cx)}{e^3(d+ex)}-\frac{ab(ef-dg)^2\arcsin(cx)}{e^3(d+ex)^2}+\frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2abg^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{b^2g^2\arcsin(cx)^2\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2abg^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{a^2g^2\log(d+ex)}{e^3}-\frac{2iabg^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2iabg^2\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2ib^2g^2\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2b^2g^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3}+\frac{2b^2g^2\operatorname{PolyLog}\left(3,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3}-\frac{2a^2g(ef-dg)}{e^3(d+ex)}-\frac{a^2(ef-dg)^2}{2e^3(d+ex)^2}$$

input
```
Int[((f + g*x)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^3,x]
```

3.114. $\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx$

output
```
-1/2*(a^2*(e*f - d*g)^2)/(e^3*(d + e*x)^2) - (2*a^2*g*(e*f - d*g))/(e^3*(d
 + e*x)) + (a*b*c*(e*f - d*g)^2*Sqrt[1 - c^2*x^2])/(e^2*(c^2*d^2 - e^2)*(d
 + e*x)) - (a*b*(e*f - d*g)^2*ArcSin[c*x])/(e^3*(d + e*x)^2) - (4*a*b*g*(e
*f - d*g)*ArcSin[c*x])/(e^3*(d + e*x)) + (b^2*c*(e*f - d*g)^2*Sqrt[1 - c^2
*x^2]*ArcSin[c*x])/(e^2*(c^2*d^2 - e^2)*(d + e*x)) - (I*a*b*g^2*ArcSin[c*x
]^2)/e^3 - (b^2*(e*f - d*g)^2*ArcSin[c*x]^2)/(2*e^3*(d + e*x)^2) - (2*b^2*
g*(e*f - d*g)*ArcSin[c*x]^2)/(e^3*(d + e*x)) - ((I/3)*b^2*g^2*ArcSin[c*x]^
3)/e^3 - (a*b*c*(e*f - d*g)*(4*e^2*g - c^2*d*(e*f + 3*d*g))*ArcTan[(e + c^
2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e^3*(c^2*d^2 - e^2)^(3/2
)) + (2*a*b*g^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^
2*d^2 - e^2])])/e^3 - ((4*I)*b^2*c*g*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*
E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2*d^2 - e^2])
 - (I*b^2*c^3*d*(e*f - d*g)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/
(c*d - Sqrt[c^2*d^2 - e^2])])/(e^3*(c^2*d^2 - e^2)^(3/2)) + (b^2*g^2*ArcSi
n[c*x]^2*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/e^3
 + (2*a*b*g^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*
d^2 - e^2])])/e^3 + ((4*I)*b^2*c*g*(e*f - d*g)*ArcSin[c*x]*Log[1 - (I*e*E^
(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(e^3*Sqrt[c^2*d^2 - e^2]) +
 (I*b^2*c^3*d*(e*f - d*g)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c
*d + Sqrt[c^2*d^2 - e^2])])/(e^3*(c^2*d^2 - e^2)^(3/2)) + (b^2*g^2*ArcS...
```

### 3.114.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5258
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_)*((d_) + (e_.)*(x_))^(m_.)
, x_Symbol] :> Int[ExpandIntegrand[Px*(d + e*x)^m*(a + b*ArcSin[c*x])^n, x]
, x] /; FreeQ[{a, b, c, d, e}, x] && PolynomialQ[Px, x] && IGtQ[n, 0] && In
tegerQ[m]
```

## 3.114.4 Maple [F]

$$\int \frac{(gx+f)^2 (a+b\arcsin(cx))^2}{(ex+d)^3}dx$$

input
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x)
```

output
```
int((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x)
```

### 3.114.5 Fricas [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(ex+d)^3}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="fricas")
```

output
```
integral((a^2*g^2*x^2 + 2*a^2*f*g*x + a^2*f^2 + (b^2*g^2*x^2 + 2*b^2*f*g*x
 + b^2*f^2)*arcsin(c*x)^2 + 2*(a*b*g^2*x^2 + 2*a*b*f*g*x + a*b*f^2)*arcsin
(c*x))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

### 3.114.6 Sympy [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(cx))^2(f+gx)^2}{(d+ex)^3}\,dx$$

input
```
integrate((g*x+f)**2*(a+b*asin(c*x))**2/(e*x+d)**3,x)
```

output
```
Integral((a + b*asin(c*x))**2*(f + g*x)**2/(d + e*x)**3, x)
```

### 3.114.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.114.8 Giac [F]

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx=\int \frac{(gx+f)^2(b\arcsin(cx)+a)^2}{(ex+d)^3}\,dx$$

input
```
integrate((g*x+f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^3,x, algorithm="giac")
```

output
```
integrate((g*x + f)^2*(b*arcsin(c*x) + a)^2/(e*x + d)^3, x)
```

### 3.114.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(f+gx)^2(a+b\arcsin(cx))^2}{(d+ex)^3}\,dx=\int \frac{(f+g\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2}{(d+e\,x)^3}\,dx$$

input
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d + e*x)^3,x)
```

output
```
int(((f + g*x)^2*(a + b*asin(c*x))^2)/(d + e*x)^3, x)
```

# 3.115 $\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx$

### 3.115.1 Optimal result

Integrand size = 28, antiderivative size = 1016

$$\int (g+hx)^3\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$= -2b^2dg^3x-\frac{16b^2h^2(3fg+eh)x}{75c^4}-\frac{4b^2g(fg^2+3h(eg+dh))\,x}{9c^2}-\frac{5b^2fh^3x^2}{96c^4}-\frac{1}{4}b^2g^2(eg+3dh)x^2-\frac{3b^2h(3fg^2+h(3eg+dh))\,x^2}{32c^2}-\frac{8b^2h^2(3fg+eh)x^3}{225c^2}-\frac{2}{27}b^2g\left(fg^2+3h(eg+dh)\right)x^3-\frac{5b^2fh^3x^4}{288c^2}-\frac{1}{32}b^2h\left(3fg^2+h(3eg+dh)\right)x^4-\frac{2}{125}b^2h^2(3fg+eh)x^5-\frac{1}{108}b^2fh^3x^6+\frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{16bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5}+\frac{4bg(fg^2+3h(eg+dh))\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}+\frac{5bfh^3x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{48c^5}+\frac{bg^2(eg+3dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c}+\frac{3bh(3fg^2+h(3eg+dh))\,x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}+\frac{8bh^2(3fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3}+\frac{2bg(fg^2+3h(eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}+\frac{5bfh^3x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{72c^3}+\frac{bh(3fg^2+h(3eg+dh))\,x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}+\frac{2bh^2(3fg+eh)x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c}+\frac{bfh^3x^5\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{18c}-\frac{5fh^3(a+b\arcsin(cx))^2}{96c^6}-\frac{g^2(eg+3dh)(a+b\arcsin(cx))^2}{4c^2}-\frac{3h(3fg^2+h(3eg+dh))\,(a+b\arcsin(cx))^2}{32c^4}+dg^3x(a+b\arcsin(cx))^2+\frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2+\frac{1}{3}g\left(fg^2+3h(eg+dh)\right)x^3(a+b\arcsin(cx))^2+\frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)x^4(a+b\arcsin(cx))^2+\frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2+\frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2$$

output

```
2*b*d*g^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+16/75*b*h^2*(e*h+3*f*g)*(
a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^5+4/9*b*g*(f*g^2+3*h*(d*h+e*g))*(a+b
*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3-16/75*b^2*h^2*(e*h+3*f*g)*x/c^4-4/9*b
^2*g*(f*g^2+3*h*(d*h+e*g))*x/c^2-5/96*b^2*f*h^3*x^2/c^4-3/32*b^2*h*(3*f*g^
2+h*(d*h+3*e*g))*x^2/c^2-8/225*b^2*h^2*(e*h+3*f*g)*x^3/c^2-5/288*b^2*f*h^3
*x^4/c^2+5/72*b*f*h^3*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+1/8*b*h
*(3*f*g^2+h*(d*h+3*e*g))*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+2/25*b
*h^2*(e*h+3*f*g)*x^4*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+1/18*b*f*h^3*x
^5*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+5/48*b*f*h^3*x*(a+b*arcsin(c*x))
*(-c^2*x^2+1)^(1/2)/c^5+1/2*b*g^2*(3*d*h+e*g)*x*(a+b*arcsin(c*x))*(-c^2*x^
2+1)^(1/2)/c+3/16*b*h*(3*f*g^2+h*(d*h+3*e*g))*x*(a+b*arcsin(c*x))*(-c^2*x^
2+1)^(1/2)/c^3+8/75*b*h^2*(e*h+3*f*g)*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(
1/2)/c^3+2/9*b*g*(f*g^2+3*h*(d*h+e*g))*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^
(1/2)/c+d*g^3*x*(a+b*arcsin(c*x))^2-2*b^2*d*g^3*x-1/4*b^2*g^2*(3*d*h+e*g)*
x^2-2/27*b^2*g*(f*g^2+3*h*(d*h+e*g))*x^3-1/32*b^2*h*(3*f*g^2+h*(d*h+3*e*g)
)*x^4-2/125*b^2*h^2*(e*h+3*f*g)*x^5-1/108*b^2*f*h^3*x^6-5/96*f*h^3*(a+b*ar
csin(c*x))^2/c^6-1/4*g^2*(3*d*h+e*g)*(a+b*arcsin(c*x))^2/c^2-3/32*h*(3*f*g
^2+h*(d*h+3*e*g))*(a+b*arcsin(c*x))^2/c^4+1/2*g^2*(3*d*h+e*g)*x^2*(a+b*arc
sin(c*x))^2+1/3*g*(f*g^2+3*h*(d*h+e*g))*x^3*(a+b*arcsin(c*x))^2+1/4*h*(3*f
*g^2+h*(d*h+3*e*g))*x^4*(a+b*arcsin(c*x))^2+1/5*h^2*(e*h+3*f*g)*x^5*(a+...
```

3.115. $\int (g+hx)^3 (d+ex+fx^2) (a+b\arcsin(cx))^2 \, dx$

### 3.115.2 Mathematica [A] (verified)

Time = 1.09 (sec) , antiderivative size = 734, normalized size of antiderivative = 0.72

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = dg^3x(a+b\arcsin(cx))^2$$
$$+\frac{1}{2}g^2(eg+3dh)x^2(a+b\arcsin(cx))^2+\frac{1}{3}g\left(fg^2+3h(eg+dh)\right)x^3(a+b\arcsin(cx))^2$$
$$+\frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)x^4(a+b\arcsin(cx))^2$$
$$+\frac{1}{5}h^2(3fg+eh)x^5(a+b\arcsin(cx))^2+\frac{1}{6}fh^3x^6(a+b\arcsin(cx))^2$$
$$-\frac{2bg(fg^2+3h(eg+dh))\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx\right.}{27c^3}$$
$$-\frac{2bh^2(3fg+eh)\left(-15a\sqrt{1-c^2x^2}(8+4c^2x^2+3c^4x^4)+bcx(120+20c^2x^2+9c^4x^4)-15b\sqrt{1-c^2x^2}(8+\right.}{1125c^5}$$
$$-\frac{fh^3\left(45a^2-6abcx\sqrt{1-c^2x^2}(15+10c^2x^2+8c^4x^4)+b^2c^2x^2(45+15c^2x^2+8c^4x^4)-6b\left(-15a+bcx\sqrt{1}\right.\right.}{864c^6}$$
$$-2bdg^3\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)$$
$$-\frac{1}{32}bh\left(3fg^2+h(3eg+dh)\right)\left(\frac{3bx^2}{c^2}+bx^4-\frac{6x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3}\right.$$
$$\left.-\frac{4x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{3(a+b\arcsin(cx))^2}{bc^4}\right)$$
$$-\frac{1}{4}bg^2(eg+3dh)\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)$$

input
```
Integrate[(g + h*x)^3*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
d*g^3*x*(a + b*ArcSin[c*x])^2 + (g^2*(e*g + 3*d*h)*x^2*(a + b*ArcSin[c*x])
^2)/2 + (g*(f*g^2 + 3*h*(e*g + d*h))*x^3*(a + b*ArcSin[c*x])^2)/3 + (h*(3*
f*g^2 + h*(3*e*g + d*h))*x^4*(a + b*ArcSin[c*x])^2)/4 + (h^2*(3*f*g + e*h)
*x^5*(a + b*ArcSin[c*x])^2)/5 + (f*h^3*x^6*(a + b*ArcSin[c*x])^2)/6 - (2*b
*g*(f*g^2 + 3*h*(e*g + d*h))*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x
*(6 + c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(27*c^3
) - (2*b*h^2*(3*f*g + e*h)*(-15*a*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4
*x^4) + b*c*x*(120 + 20*c^2*x^2 + 9*c^4*x^4) - 15*b*Sqrt[1 - c^2*x^2]*(8 +
 4*c^2*x^2 + 3*c^4*x^4)*ArcSin[c*x]))/(1125*c^5) - (f*h^3*(45*a^2 - 6*a*b*
c*x*Sqrt[1 - c^2*x^2]*(15 + 10*c^2*x^2 + 8*c^4*x^4) + b^2*c^2*x^2*(45 + 15
*c^2*x^2 + 8*c^4*x^4) - 6*b*(-15*a + b*c*x*Sqrt[1 - c^2*x^2]*(15 + 10*c^2*
x^2 + 8*c^4*x^4))*ArcSin[c*x] + 45*b^2*ArcSin[c*x]^2))/(864*c^6) - 2*b*d*g
^3*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - (b*h*(3*f*g^2 + h*(
3*e*g + d*h))*((3*b*x^2)/c^2 + b*x^4 - (6*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSi
n[c*x]))/c^3 - (4*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (3*(a + b
*ArcSin[c*x])^2)/(b*c^4)))/32 - (b*g^2*(e*g + 3*d*h)*(b*x^2 - (2*x*Sqrt[1
- c^2*x^2]*(a + b*ArcSin[c*x]))/c + (a + b*ArcSin[c*x])^2/(b*c^2)))/4
```

### 3.115.3 Rubi [A] (verified)

Time = 1.79 (sec) , antiderivative size = 1016, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {5250, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx$$

$$\Big\downarrow \; 5250$$

$$\int \left(hx^3(a+b\arcsin(cx))^2 \left(h(dh+3eg)+3fg^2\right)+gx^2(a+b\arcsin(cx))^2 \left(3h(dh+eg)+fg^2\right)+g^2x(3dh+eg)(a$$

$$\Big\downarrow \; 2009$$

$$-\frac{1}{108}b^2fh^3x^6+\frac{1}{6}fh^3(a+b\arcsin(cx))^2x^6+\frac{1}{5}h^2(3fg+eh)(a+b\arcsin(cx))^2x^5-\frac{2}{125}b^2h^2(3fg+eh)x^5+\frac{bfh^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^5}{18c}-\frac{5b^2fh^3x^4}{288c^2}+\frac{1}{4}h\left(3fg^2+h(3eg+dh)\right)(a+b\arcsin(cx))^2x^4-\frac{1}{32}b^2h\left(3fg^2+h(3eg+dh)\right)x^4+\frac{2bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^4}{25c}+\frac{1}{3}g\left(fg^2+3h(eg+dh)\right)(a+b\arcsin(cx))^2x^3-\frac{8b^2h^2(3fg+eh)x^3}{225c^2}-\frac{2}{27}b^2g\left(fg^2+3h(eg+dh)\right)x^3+\frac{5bfh^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^3}{72c^3}+\frac{bh\left(3fg^2+h(3eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^3}{8c}-\frac{5b^2fh^3x^2}{96c^4}+\frac{1}{2}g^2(eg+3dh)(a+b\arcsin(cx))^2x^2-\frac{1}{4}b^2g^2(eg+3dh)x^2-\frac{3b^2h\left(3fg^2+h(3eg+dh)\right)x^2}{32c^2}+\frac{8bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^2}{75c^3}+\frac{2bg\left(fg^2+3h(eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x^2}{9c}-2b^2dg^3x+dg^3(a+b\arcsin(cx))^2x-\frac{16b^2h^2(3fg+eh)x}{75c^4}-\frac{4b^2g\left(fg^2+3h(eg+dh)\right)x}{9c^2}+\frac{5bfh^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))x}{48c^5}+\frac{bg^2(eg+3dh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x}{2c}+\frac{3bh\left(3fg^2+h(3eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))x}{16c^3}-\frac{5fh^3(a+b\arcsin(cx))^2}{96c^6}-\frac{g^2(eg+3dh)(a+b\arcsin(cx))^2}{4c^2}-\frac{3h\left(3fg^2+h(3eg+dh)\right)(a+b\arcsin(cx))^2}{32c^4}+\frac{2bdg^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{16bh^2(3fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5}+\frac{4bg\left(fg^2+3h(eg+dh)\right)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3}$$

input
```
Int[(g + h*x)^3*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

3.115. $\int (g+hx)^3\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$

output
```
-2*b^2*d*g^3*x - (16*b^2*h^2*(3*f*g + e*h)*x)/(75*c^4) - (4*b^2*g*(f*g^2 +
 3*h*(e*g + d*h))*x)/(9*c^2) - (5*b^2*f*h^3*x^2)/(96*c^4) - (b^2*g^2*(e*g
+ 3*d*h)*x^2)/4 - (3*b^2*h*(3*f*g^2 + h*(3*e*g + d*h))*x^2)/(32*c^2) - (8*
b^2*h^2*(3*f*g + e*h)*x^3)/(225*c^2) - (2*b^2*g*(f*g^2 + 3*h*(e*g + d*h))*
x^3)/27 - (5*b^2*f*h^3*x^4)/(288*c^2) - (b^2*h*(3*f*g^2 + h*(3*e*g + d*h))
*x^4)/32 - (2*b^2*h^2*(3*f*g + e*h)*x^5)/125 - (b^2*f*h^3*x^6)/108 + (2*b*
d*g^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (16*b*h^2*(3*f*g + e*h)*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^5) + (4*b*g*(f*g^2 + 3*h*(e*g
+ d*h))*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c^3) + (5*b*f*h^3*x*Sqrt
[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(48*c^5) + (b*g^2*(e*g + 3*d*h)*x*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(2*c) + (3*b*h*(3*f*g^2 + h*(3*e*g + d*h
))*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(16*c^3) + (8*b*h^2*(3*f*g + e
*h)*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(75*c^3) + (2*b*g*(f*g^2 +
3*h*(e*g + d*h))*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c) + (5*b*f
*h^3*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(72*c^3) + (b*h*(3*f*g^2 +
 h*(3*e*g + d*h))*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) + (2*b*
h^2*(3*f*g + e*h)*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(25*c) + (b*f
*h^3*x^5*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(18*c) - (5*f*h^3*(a + b*A
rcSin[c*x])^2)/(96*c^6) - (g^2*(e*g + 3*d*h)*(a + b*ArcSin[c*x])^2)/(4*c^2
) - (3*h*(3*f*g^2 + h*(3*e*g + d*h))*(a + b*ArcSin[c*x])^2)/(32*c^4) + ...
```

### 3.115.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5250
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_), x_Symbol] :> Int[ExpandI
ntegrand[Px*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, n}, x] && Poly
nomialQ[Px, x]
```

## 3.115.4 Maple [A] (verified)

Time = 3.22 (sec) , antiderivative size = 1734, normalized size of antiderivative = 1.71

| method | result | size |
|---|---|---|
| derivativedivides | Expression too large to display | 1734 |
| default | Expression too large to display | 1734 |
| parts | Expression too large to display | 1927 |

input
```
int((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(a^2/c^5*(1/6*h^3*f*c^6*x^6+1/5*(c*e*h^3+3*c*f*g*h^2)*c^5*x^5+1/4*(c^2
*d*h^3+3*c^2*e*g*h^2+3*c^2*f*g^2*h)*c^4*x^4+1/3*(3*c^3*d*g*h^2+3*c^3*e*g^2
*h+c^3*f*g^3)*c^3*x^3+1/2*(3*c^4*d*g^2*h+c^4*e*g^3)*c^2*x^2+g^3*c^6*d*x)+b
^2/c^5*(c^5*d*g^3*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2
))+1/4*c^4*g^3*e*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)
*x*c-arcsin(c*x)^2-c^2*x^2)+1/27*c^3*f*g^3*(9*c^3*x^3*arcsin(c*x)^2+6*(-c^
2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)-12*c*x)+3/4*g^2*c^4*h*d*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)
*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2)+1/9*c^3*e*g^2*h*(9*c^3*x^3*arcsin(
c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(
-c^2*x^2+1)^(1/2)-12*c*x)+3/128*c^2*f*g^2*h*(32*arcsin(c*x)^2*x^4*c^4+16*(
-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*arcs
in(c*x)*x*c-12*arcsin(c*x)^2-12*c^2*x^2-9)+1/9*c^3*d*g*h^2*(9*c^3*x^3*arcs
in(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)-12*c*x)+3/128*c^2*e*g*h^2*(32*arcsin(c*x)^2*x^4*c^4+1
6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*a
rcsin(c*x)*x*c-12*arcsin(c*x)^2-12*c^2*x^2-9)+1/375*c*f*g*h^2*(225*arcsin(
c*x)^2*c^5*x^5+90*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*c^4-18*c^5*x^5+120*(-
c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-40*c^3*x^3+240*arcsin(c*x)*(-c^2*x^2+
1)^(1/2)-240*c*x)+1/128*h^3*d*c^2*(32*arcsin(c*x)^2*x^4*c^4+16*(-c^2*x^...
```

### 3.115.5 Fricas [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 1537, normalized size of antiderivative = 1.51

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

output
```
1/108000*(1000*(18*a^2 - b^2)*c^6*f*h^3*x^6 + 864*(3*(25*a^2 - 2*b^2)*c^6*
f*g*h^2 + (25*a^2 - 2*b^2)*c^6*e*h^3)*x^5 + 375*(27*(8*a^2 - b^2)*c^6*f*g^
2*h + 27*(8*a^2 - b^2)*c^6*e*g*h^2 + (9*(8*a^2 - b^2)*c^6*d - 5*b^2*c^4*f)
*h^3)*x^4 + 160*(25*(9*a^2 - 2*b^2)*c^6*f*g^3 + 75*(9*a^2 - 2*b^2)*c^6*e*g
^2*h - 24*b^2*c^4*e*h^3 + 3*(25*(9*a^2 - 2*b^2)*c^6*d - 24*b^2*c^4*f)*g*h^
2)*x^3 + 1125*(24*(2*a^2 - b^2)*c^6*e*g^3 - 27*b^2*c^4*e*g*h^2 + 9*(8*(2*a
^2 - b^2)*c^6*d - 3*b^2*c^4*f)*g^2*h - (9*b^2*c^4*d + 5*b^2*c^2*f)*h^3)*x^
2 + 225*(80*b^2*c^6*f*h^3*x^6 + 480*b^2*c^6*d*g^3*x - 120*b^2*c^4*e*g^3 -
135*b^2*c^2*e*g*h^2 + 96*(3*b^2*c^6*f*g*h^2 + b^2*c^6*e*h^3)*x^5 + 120*(3*
b^2*c^6*f*g^2*h + 3*b^2*c^6*e*g*h^2 + b^2*c^6*d*h^3)*x^4 - 45*(8*b^2*c^4*d
 + 3*b^2*c^2*f)*g^2*h - 5*(9*b^2*c^2*d + 5*b^2*f)*h^3 + 160*(b^2*c^6*f*g^3
 + 3*b^2*c^6*e*g^2*h + 3*b^2*c^6*d*g*h^2)*x^3 + 240*(b^2*c^6*e*g^3 + 3*b^2
*c^6*d*g^2*h)*x^2)*arcsin(c*x)^2 - 480*(300*b^2*c^4*e*g^2*h + 48*b^2*c^2*e
*h^3 - 25*(9*(a^2 - 2*b^2)*c^6*d - 4*b^2*c^4*f)*g^3 + 12*(25*b^2*c^4*d + 1
2*b^2*c^2*f)*g*h^2)*x + 450*(80*a*b*c^6*f*h^3*x^6 + 480*a*b*c^6*d*g^3*x -
120*a*b*c^4*e*g^3 - 135*a*b*c^2*e*g*h^2 + 96*(3*a*b*c^6*f*g*h^2 + a*b*c^6*
e*h^3)*x^5 + 120*(3*a*b*c^6*f*g^2*h + 3*a*b*c^6*e*g*h^2 + a*b*c^6*d*h^3)*x
^4 - 45*(8*a*b*c^4*d + 3*a*b*c^2*f)*g^2*h - 5*(9*a*b*c^2*d + 5*a*b*f)*h^3
+ 160*(a*b*c^6*f*g^3 + 3*a*b*c^6*e*g^2*h + 3*a*b*c^6*d*g*h^2)*x^3 + 240*(a
*b*c^6*e*g^3 + 3*a*b*c^6*d*g^2*h)*x^2)*arcsin(c*x) + 30*(200*a*b*c^5*f*...
```

### 3.115.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2992 vs. $2(1006) = 2012$.

Time = 1.11 (sec) , antiderivative size = 2992, normalized size of antiderivative = 2.94

$$\int (g+hx)^3\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((h*x+g)**3*(f*x**2+e*x+d)*(a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*d*g**3*x + 3*a**2*d*g**2*h*x**2/2 + a**2*d*g*h**2*x**3 + a
**2*d*h**3*x**4/4 + a**2*e*g**3*x**2/2 + a**2*e*g**2*h*x**3 + 3*a**2*e*g*h
**2*x**4/4 + a**2*e*h**3*x**5/5 + a**2*f*g**3*x**3/3 + 3*a**2*f*g**2*h*x**
4/4 + 3*a**2*f*g*h**2*x**5/5 + a**2*f*h**3*x**6/6 + 2*a*b*d*g**3*x*asin(c*
x) + 3*a*b*d*g**2*h*x**2*asin(c*x) + 2*a*b*d*g*h**2*x**3*asin(c*x) + a*b*d
*h**3*x**4*asin(c*x)/2 + a*b*e*g**3*x**2*asin(c*x) + 2*a*b*e*g**2*h*x**3*a
sin(c*x) + 3*a*b*e*g*h**2*x**4*asin(c*x)/2 + 2*a*b*e*h**3*x**5*asin(c*x)/5
 + 2*a*b*f*g**3*x**3*asin(c*x)/3 + 3*a*b*f*g**2*h*x**4*asin(c*x)/2 + 6*a*b
*f*g*h**2*x**5*asin(c*x)/5 + a*b*f*h**3*x**6*asin(c*x)/3 + 2*a*b*d*g**3*sq
rt(-c**2*x**2 + 1)/c + 3*a*b*d*g**2*h*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*a*b
*d*g*h**2*x**2*sqrt(-c**2*x**2 + 1)/(3*c) + a*b*d*h**3*x**3*sqrt(-c**2*x**
2 + 1)/(8*c) + a*b*e*g**3*x*sqrt(-c**2*x**2 + 1)/(2*c) + 2*a*b*e*g**2*h*x*
*2*sqrt(-c**2*x**2 + 1)/(3*c) + 3*a*b*e*g*h**2*x**3*sqrt(-c**2*x**2 + 1)/(
8*c) + 2*a*b*e*h**3*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + 2*a*b*f*g**3*x**2*s
qrt(-c**2*x**2 + 1)/(9*c) + 3*a*b*f*g**2*h*x**3*sqrt(-c**2*x**2 + 1)/(8*c)
 + 6*a*b*f*g*h**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) + a*b*f*h**3*x**5*sqrt(
-c**2*x**2 + 1)/(18*c) - 3*a*b*d*g**2*h*asin(c*x)/(2*c**2) - a*b*e*g**3*as
in(c*x)/(2*c**2) + 4*a*b*d*g*h**2*sqrt(-c**2*x**2 + 1)/(3*c**3) + 3*a*b*d*
h**3*x*sqrt(-c**2*x**2 + 1)/(16*c**3) + 4*a*b*e*g**2*h*sqrt(-c**2*x**2 + 1
)/(3*c**3) + 9*a*b*e*g*h**2*x*sqrt(-c**2*x**2 + 1)/(16*c**3) + 8*a*b*e*...
```

## 3.115.7 Maxima [F]

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx$$
$$= \int \left(fx^2+ex+d\right)(hx+g)^3 (b\arcsin(cx)+a)^2 \, dx$$

input
```
integrate((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

output
```
1/6*a^2*f*h^3*x^6 + 3/5*a^2*f*g*h^2*x^5 + 1/5*a^2*e*h^3*x^5 + 3/4*a^2*f*g^
2*h*x^4 + 3/4*a^2*e*g*h^2*x^4 + 1/4*a^2*d*h^3*x^4 + 1/3*a^2*f*g^3*x^3 + a^
2*e*g^2*h*x^3 + a^2*d*g*h^2*x^3 + b^2*d*g^3*x*arcsin(c*x)^2 + 1/2*a^2*e*g^
3*x^2 + 3/2*a^2*d*g^2*h*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 +
1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e*g^3 + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(
-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*f*g^3 + 3/2*(2*x^2*
arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d*g^2*h
+ 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
 + 1)/c^4))*a*b*e*g^2*h + 3/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*
x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*f*g^2*h +
 2/3*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
+ 1)/c^4))*a*b*d*g*h^2 + 3/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x
^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*e*g*h^2 +
2/25*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2
 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*f*g*h^2 + 1/16*(8*x^4*arc
sin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*
arcsin(c*x)/c^5)*c)*a*b*d*h^3 + 2/75*(15*x^5*arcsin(c*x) + (3*sqrt(-c^2*x^
2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*
c)*a*b*e*h^3 + 1/144*(48*x^6*arcsin(c*x) + (8*sqrt(-c^2*x^2 + 1)*x^5/c^2 +
 10*sqrt(-c^2*x^2 + 1)*x^3/c^4 + 15*sqrt(-c^2*x^2 + 1)*x/c^6 - 15*arcsi...
```

### 3.115.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3444 vs. 2(932) = 1864.

Time = 0.39 (sec) , antiderivative size = 3444, normalized size of antiderivative = 3.39

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

input
```
integrate((h*x+g)^3*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
1/6*a^2*f*h^3*x^6 + 3/5*a^2*f*g*h^2*x^5 + 1/5*a^2*e*h^3*x^5 + 3/4*a^2*f*g^
2*h*x^4 + 3/4*a^2*e*g*h^2*x^4 + 1/4*a^2*d*h^3*x^4 + 1/3*a^2*f*g^3*x^3 + a^
2*e*g^2*h*x^3 + a^2*d*g*h^2*x^3 + b^2*d*g^3*x*arcsin(c*x)^2 + 2*a*b*d*g^3*
x*arcsin(c*x) + 1/3*(c^2*x^2 - 1)*b^2*f*g^3*x*arcsin(c*x)^2/c^2 + (c^2*x^2
 - 1)*b^2*e*g^2*h*x*arcsin(c*x)^2/c^2 + (c^2*x^2 - 1)*b^2*d*g*h^2*x*arcsin
(c*x)^2/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b^2*e*g^3*x*arcsin(c*x)/c + 3/2*sqrt(
-c^2*x^2 + 1)*b^2*d*g^2*h*x*arcsin(c*x)/c + a^2*d*g^3*x - 2*b^2*d*g^3*x +
2/3*(c^2*x^2 - 1)*a*b*f*g^3*x*arcsin(c*x)/c^2 + 2*(c^2*x^2 - 1)*a*b*e*g^2*
h*x*arcsin(c*x)/c^2 + 2*(c^2*x^2 - 1)*a*b*d*g*h^2*x*arcsin(c*x)/c^2 + 1/2*
(c^2*x^2 - 1)*b^2*e*g^3*arcsin(c*x)^2/c^2 + 3/2*(c^2*x^2 - 1)*b^2*d*g^2*h*
arcsin(c*x)^2/c^2 + 1/3*b^2*f*g^3*x*arcsin(c*x)^2/c^2 + b^2*e*g^2*h*x*arcs
in(c*x)^2/c^2 + b^2*d*g*h^2*x*arcsin(c*x)^2/c^2 + 3/5*(c^2*x^2 - 1)^2*b^2*
f*g*h^2*x*arcsin(c*x)^2/c^4 + 1/5*(c^2*x^2 - 1)^2*b^2*e*h^3*x*arcsin(c*x)^
2/c^4 + 1/2*sqrt(-c^2*x^2 + 1)*a*b*e*g^3*x/c + 3/2*sqrt(-c^2*x^2 + 1)*a*b*
d*g^2*h*x/c + 2*sqrt(-c^2*x^2 + 1)*b^2*d*g^3*arcsin(c*x)/c - 3/8*(-c^2*x^2
 + 1)^(3/2)*b^2*f*g^2*h*x*arcsin(c*x)/c^3 - 3/8*(-c^2*x^2 + 1)^(3/2)*b^2*e
*g*h^2*x*arcsin(c*x)/c^3 - 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*d*h^3*x*arcsin(c*x
)/c^3 - 2/27*(c^2*x^2 - 1)*b^2*f*g^3*x/c^2 - 2/9*(c^2*x^2 - 1)*b^2*e*g^2*h
*x/c^2 - 2/9*(c^2*x^2 - 1)*b^2*d*g*h^2*x/c^2 + (c^2*x^2 - 1)*a*b*e*g^3*arc
sin(c*x)/c^2 + 3*(c^2*x^2 - 1)*a*b*d*g^2*h*arcsin(c*x)/c^2 + 2/3*a*b*f*...
```

## 3.115.9 Mupad [F(-1)]

Timed out.

$$\int (g+hx)^3 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \int (g+h\,x)^3\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(f\,x^2+e\,x+d\right)\,dx$$

input
```
int((g + h*x)^3*(a + b*asin(c*x))^2*(d + e*x + f*x^2),x)
```

output
```
int((g + h*x)^3*(a + b*asin(c*x))^2*(d + e*x + f*x^2), x)
```

# 3.116 $\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b \arcsin(cx))^2 \, dx$



## 3.116.1 Optimal result

Integrand size = 28, antiderivative size = 701

$$\begin{aligned}
&\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b \arcsin(cx))^2 \, dx \\
&= -2b^2dg^2x - \frac{16b^2fh^2x}{75c^4} - \frac{4b^2(fg^2+h(2eg+dh))\,x}{9c^2} - \frac{1}{4}b^2g(eg+2dh)x^2 \\
&\quad - \frac{3b^2h(2fg+eh)x^2}{32c^2} - \frac{8b^2fh^2x^3}{225c^2} - \frac{2}{27}b^2\left(fg^2+h(2eg+dh)\right)x^3 - \frac{1}{32}b^2h(2fg+eh)x^4 \\
&\quad - \frac{2}{125}b^2fh^2x^5 + \frac{2bdg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c} + \frac{16bfh^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5} \\
&\quad + \frac{4b(fg^2+h(2eg+dh))\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&\quad + \frac{bg(eg+2dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad + \frac{3bh(2fg+eh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3} + \frac{8bfh^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3} \\
&\quad + \frac{2b(fg^2+h(2eg+dh))\,x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c} \\
&\quad + \frac{bh(2fg+eh)x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} + \frac{2bfh^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c} \\
&\quad - \frac{g(eg+2dh)(a+b\arcsin(cx))^2}{4c^2} - \frac{3h(2fg+eh)(a+b\arcsin(cx))^2}{32c^4} \\
&\quad + dg^2x(a+b\arcsin(cx))^2 + \frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2 \\
&\quad + \frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2 + \frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2
\end{aligned}$$

output
```
2*b*d*g^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+16/75*b*f*h^2*(a+b*arcsin
(c*x))*(-c^2*x^2+1)^(1/2)/c^5+2/9*b*(f*g^2+h*(d*h+2*e*g))*x^2*(a+b*arcsin(
c*x))*(-c^2*x^2+1)^(1/2)/c+4/9*b*(f*g^2+h*(d*h+2*e*g))*(a+b*arcsin(c*x))*(
-c^2*x^2+1)^(1/2)/c^3-16/75*b^2*f*h^2*x/c^4-3/32*b^2*h*(e*h+2*f*g)*x^2/c^2
-8/225*b^2*f*h^2*x^3/c^2+1/2*b*g*(2*d*h+e*g)*x*(a+b*arcsin(c*x))*(-c^2*x^2
+1)^(1/2)/c+3/16*b*h*(e*h+2*f*g)*x*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^
3+8/75*b*f*h^2*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+1/8*b*h*(e*h+2
*f*g)*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c+2/25*b*f*h^2*x^4*(a+b*arc
sin(c*x))*(-c^2*x^2+1)^(1/2)/c+d*g^2*x*(a+b*arcsin(c*x))^2-2/27*b^2*(f*g^2
+h*(d*h+2*e*g))*x^3+1/3*(f*g^2+h*(d*h+2*e*g))*x^3*(a+b*arcsin(c*x))^2+1/2*
g*(2*d*h+e*g)*x^2*(a+b*arcsin(c*x))^2+1/4*h*(e*h+2*f*g)*x^4*(a+b*arcsin(c*
x))^2+1/5*f*h^2*x^5*(a+b*arcsin(c*x))^2-2*b^2*d*g^2*x-4/9*b^2*(f*g^2+h*(d*
h+2*e*g))*x/c^2-1/4*b^2*g*(2*d*h+e*g)*x^2-1/32*b^2*h*(e*h+2*f*g)*x^4-2/125
*b^2*f*h^2*x^5-1/4*g*(2*d*h+e*g)*(a+b*arcsin(c*x))^2/c^2-3/32*h*(e*h+2*f*g
)*(a+b*arcsin(c*x))^2/c^4
```

### 3.116.2 Mathematica [A] (verified)

Time = 0.55 (sec) , antiderivative size = 534, normalized size of antiderivative = 0.76

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = dg^2x(a+b\arcsin(cx))^2$$
$$+\frac{1}{2}g(eg+2dh)x^2(a+b\arcsin(cx))^2+\frac{1}{3}\left(fg^2+h(2eg+dh)\right)x^3(a+b\arcsin(cx))^2$$
$$+\frac{1}{4}h(2fg+eh)x^4(a+b\arcsin(cx))^2+\frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2$$
$$-\frac{2b(fg^2+h(2eg+dh))\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{27c^3}$$
$$-\frac{2bfh^2\left(-15a\sqrt{1-c^2x^2}(8+4c^2x^2+3c^4x^4)+bcx(120+20c^2x^2+9c^4x^4)-15b\sqrt{1-c^2x^2}(8+4c^2x^2+3\right.}{1125c^5}$$
$$-2bdg^2\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)$$
$$-\frac{1}{32}bh(2fg+eh)\left(\frac{3bx^2}{c^2}+bx^4-\frac{6x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3}\right.$$
$$\left.-\frac{4x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{3(a+b\arcsin(cx))^2}{bc^4}\right)$$
$$-\frac{1}{4}bg(eg+2dh)\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)$$

input
```
Integrate[(g + h*x)^2*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
d*g^2*x*(a + b*ArcSin[c*x])^2 + (g*(e*g + 2*d*h)*x^2*(a + b*ArcSin[c*x])^2
)/2 + ((f*g^2 + h*(2*e*g + d*h))*x^3*(a + b*ArcSin[c*x])^2)/3 + (h*(2*f*g
+ e*h)*x^4*(a + b*ArcSin[c*x])^2)/4 + (f*h^2*x^5*(a + b*ArcSin[c*x])^2)/5
- (2*b*(f*g^2 + h*(2*e*g + d*h))*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b
*c*x*(6 + c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(27
*c^3) - (2*b*f*h^2*(-15*a*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x^2 + 3*c^4*x^4) +
b*c*x*(120 + 20*c^2*x^2 + 9*c^4*x^4) - 15*b*Sqrt[1 - c^2*x^2]*(8 + 4*c^2*x
^2 + 3*c^4*x^4)*ArcSin[c*x]))/(1125*c^5) - 2*b*d*g^2*(b*x - (Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/c) - (b*h*(2*f*g + e*h)*((3*b*x^2)/c^2 + b*x^4 -
 (6*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^3 - (4*x^3*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x]))/c + (3*(a + b*ArcSin[c*x])^2)/(b*c^4)))/32 - (b*g*(
e*g + 2*d*h)*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (a +
 b*ArcSin[c*x])^2/(b*c^2)))/4
```

### 3.116.3 Rubi [A] (verified)

Time = 1.37 (sec) , antiderivative size = 701, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {5250, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx$$

$$\Big\downarrow \text{ 5250}$$

$$\int \left(x^2(a+b\arcsin(cx))^2 \left(h(dh+2eg)+fg^2\right)+gx(2dh+eg)(a+b\arcsin(cx))^2+dg^2(a+b\arcsin(cx))^2+hx^3(\right.$$

$$\Big\downarrow \text{ 2009}$$

$$-\frac{3h(eh+2fg)(a+b\arcsin(cx))^2}{32c^4}+\frac{2bx^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))\left(h(dh+2eg)+fg^2\right)}{9c}+\frac{bgx\sqrt{1-c^2x^2}(2dh+eg)(a+b\arcsin(cx))}{2c}-\frac{g(2dh+eg)(a+b\arcsin(cx))^2}{4c^2}+\frac{2bdg^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{bhx^3\sqrt{1-c^2x^2}(eh+2fg)(a+b\arcsin(cx))}{8c}+\frac{2bfh^2x^4\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{25c}+\frac{16bfh^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^5}+\frac{4b\sqrt{1-c^2x^2}(a+b\arcsin(cx))\left(h(dh+2eg)+fg^2\right)}{9c^3}+\frac{3bhx\sqrt{1-c^2x^2}(eh+2fg)(a+b\arcsin(cx))}{16c^3}+\frac{8bfh^2x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{75c^3}+\frac{1}{3}x^3(a+b\arcsin(cx))^2\left(h(dh+2eg)+fg^2\right)+\frac{1}{2}gx^2(2dh+eg)(a+b\arcsin(cx))^2+dg^2x(a+b\arcsin(cx))^2+\frac{1}{4}hx^4(eh+2fg)(a+b\arcsin(cx))^2+\frac{1}{5}fh^2x^5(a+b\arcsin(cx))^2-\frac{16b^2fh^2x}{75c^4}-\frac{4b^2x\left(h(dh+2eg)+fg^2\right)}{9c^2}-\frac{3b^2hx^2(eh+2fg)}{32c^2}-\frac{8b^2fh^2x^3}{225c^2}-\frac{2}{27}b^2x^3\left(h(dh+2eg)+fg^2\right)-\frac{1}{4}b^2gx^2(2dh+eg)-2b^2dg^2x-\frac{1}{32}b^2hx^4(eh+2fg)-\frac{2}{125}b^2fh^2x^5$$

input
```
Int[(g + h*x)^2*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
-2*b^2*d*g^2*x - (16*b^2*f*h^2*x)/(75*c^4) - (4*b^2*(f*g^2 + h*(2*e*g + d*
h))*x)/(9*c^2) - (b^2*g*(e*g + 2*d*h)*x^2)/4 - (3*b^2*h*(2*f*g + e*h)*x^2)
/(32*c^2) - (8*b^2*f*h^2*x^3)/(225*c^2) - (2*b^2*(f*g^2 + h*(2*e*g + d*h))
*x^3)/27 - (b^2*h*(2*f*g + e*h)*x^4)/32 - (2*b^2*f*h^2*x^5)/125 + (2*b*d*g
^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (16*b*f*h^2*Sqrt[1 - c^2*x^2
]*(a + b*ArcSin[c*x]))/(75*c^5) + (4*b*(f*g^2 + h*(2*e*g + d*h))*Sqrt[1 -
c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c^3) + (b*g*(e*g + 2*d*h)*x*Sqrt[1 - c^2*
x^2]*(a + b*ArcSin[c*x]))/(2*c) + (3*b*h*(2*f*g + e*h)*x*Sqrt[1 - c^2*x^2]
*(a + b*ArcSin[c*x]))/(16*c^3) + (8*b*f*h^2*x^2*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x]))/(75*c^3) + (2*b*(f*g^2 + h*(2*e*g + d*h))*x^2*Sqrt[1 - c^2*x^
2]*(a + b*ArcSin[c*x]))/(9*c) + (b*h*(2*f*g + e*h)*x^3*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x]))/(8*c) + (2*b*f*h^2*x^4*Sqrt[1 - c^2*x^2]*(a + b*ArcSin
[c*x]))/(25*c) - (g*(e*g + 2*d*h)*(a + b*ArcSin[c*x])^2)/(4*c^2) - (3*h*(2
*f*g + e*h)*(a + b*ArcSin[c*x])^2)/(32*c^4) + d*g^2*x*(a + b*ArcSin[c*x])^
2 + (g*(e*g + 2*d*h)*x^2*(a + b*ArcSin[c*x])^2)/2 + ((f*g^2 + h*(2*e*g + d
*h))*x^3*(a + b*ArcSin[c*x])^2)/3 + (h*(2*f*g + e*h)*x^4*(a + b*ArcSin[c*x
])^2)/4 + (f*h^2*x^5*(a + b*ArcSin[c*x])^2)/5
```

3.116. $\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$

### 3.116.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5250
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_), x_Symbol] :> Int[ExpandI
ntegrand[Px*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, n}, x] && Poly
nomialQ[Px, x]
```

## 3.116.4 Maple [A] (verified)

Time = 2.19 (sec) , antiderivative size = 1194, normalized size of antiderivative = 1.70

| method | result | size |
|---|---|---|
| derivativedivides | Expression too large to display | 1194 |
| default | Expression too large to display | 1194 |
| parts | Expression too large to display | 1278 |

input
```
int((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
1/c*(a^2/c^4*(1/5*f*h^2*c^5*x^5+1/4*(c*e*h^2+2*c*f*g*h)*c^4*x^4+1/3*(c^2*d
*h^2+2*c^2*e*g*h+c^2*f*g^2)*c^3*x^3+1/2*(2*c^3*d*g*h+c^3*e*g^2)*c^2*x^2+g^
2*c^5*d*x)+b^2/c^4*(c^4*d*g^2*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2
*x^2+1)^(1/2))+1/4*c^3*g^2*e*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)
*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2)+1/27*c^2*f*g^2*(9*c^3*x^3*arcsin(c
*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-
c^2*x^2+1)^(1/2)-12*c*x)+1/2*c^3*g*h*d*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^
2+1)^(1/2)*arcsin(c*x)*x*c-arcsin(c*x)^2-c^2*x^2)+2/27*c^2*e*g*h*(9*c^3*x^
3*arcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)+1/64*c*f*g*h*(32*arcsin(c*x)^2*x^4*c^4+
16*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*
arcsin(c*x)*x*c-12*arcsin(c*x)^2-12*c^2*x^2-9)+1/27*c^2*d*h^2*(9*c^3*x^3*a
rcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-2*c^3*x^3+12*arcsin(
c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)+1/128*c*e*h^2*(32*arcsin(c*x)^2*x^4*c^4+16
*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-4*c^4*x^4+24*(-c^2*x^2+1)^(1/2)*ar
csin(c*x)*x*c-12*arcsin(c*x)^2-12*c^2*x^2-9)+1/1125*f*h^2*(225*arcsin(c*x)
^2*c^5*x^5+90*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x^4*c^4-18*c^5*x^5+120*(-c^2*
x^2+1)^(1/2)*arcsin(c*x)*x^2*c^2-40*c^3*x^3+240*arcsin(c*x)*(-c^2*x^2+1)^(
1/2)-240*c*x))+2*a*b/c^4*(1/5*arcsin(c*x)*f*h^2*c^5*x^5+1/4*arcsin(c*x)*c^
5*e*h^2*x^4+1/2*arcsin(c*x)*c^5*f*g*h*x^4+1/3*arcsin(c*x)*c^5*d*h^2*x^3...
```

### 3.116.5 Fricas [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 1029, normalized size of antiderivative = 1.47

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$=\frac{864\,(25\,a^2-2\,b^2)c^5fh^2x^5+3375\,(2\,(8\,a^2-b^2)c^5fgh+(8\,a^2-b^2)c^5eh^2)x^4+160\,(25\,(9\,a^2-2\,b^2)c^5fg^2+}{}$$

input
```
integrate((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas
")
```

output
```
1/108000*(864*(25*a^2 - 2*b^2)*c^5*f*h^2*x^5 + 3375*(2*(8*a^2 - b^2)*c^5*f
*g*h + (8*a^2 - b^2)*c^5*e*h^2)*x^4 + 160*(25*(9*a^2 - 2*b^2)*c^5*f*g^2 +
50*(9*a^2 - 2*b^2)*c^5*e*g*h + (25*(9*a^2 - 2*b^2)*c^5*d - 24*b^2*c^3*f)*h
^2)*x^3 + 3375*(8*(2*a^2 - b^2)*c^5*e*g^2 - 3*b^2*c^3*e*h^2 + 2*(8*(2*a^2
- b^2)*c^5*d - 3*b^2*c^3*f)*g*h)*x^2 + 225*(96*b^2*c^5*f*h^2*x^5 + 480*b^2
*c^5*d*g^2*x - 120*b^2*c^3*e*g^2 - 45*b^2*c*e*h^2 + 120*(2*b^2*c^5*f*g*h +
 b^2*c^5*e*h^2)*x^4 + 160*(b^2*c^5*f*g^2 + 2*b^2*c^5*e*g*h + b^2*c^5*d*h^2
)*x^3 - 30*(8*b^2*c^3*d + 3*b^2*c*f)*g*h + 240*(b^2*c^5*e*g^2 + 2*b^2*c^5*
d*g*h)*x^2)*arcsin(c*x)^2 - 480*(200*b^2*c^3*e*g*h - 25*(9*(a^2 - 2*b^2)*c
^5*d - 4*b^2*c^3*f)*g^2 + 4*(25*b^2*c^3*d + 12*b^2*c*f)*h^2)*x + 450*(96*a
*b*c^5*f*h^2*x^5 + 480*a*b*c^5*d*g^2*x - 120*a*b*c^3*e*g^2 - 45*a*b*c*e*h^
2 + 120*(2*a*b*c^5*f*g*h + a*b*c^5*e*h^2)*x^4 + 160*(a*b*c^5*f*g^2 + 2*a*b
*c^5*e*g*h + a*b*c^5*d*h^2)*x^3 - 30*(8*a*b*c^3*d + 3*a*b*c*f)*g*h + 240*(
a*b*c^5*e*g^2 + 2*a*b*c^5*d*g*h)*x^2)*arcsin(c*x) + 30*(288*a*b*c^4*f*h^2*
x^4 + 3200*a*b*c^2*e*g*h + 450*(2*a*b*c^4*f*g*h + a*b*c^4*e*h^2)*x^3 + 800
*(9*a*b*c^4*d + 2*a*b*c^2*f)*g^2 + 64*(25*a*b*c^2*d + 12*a*b*f)*h^2 + 32*(
25*a*b*c^4*f*g^2 + 50*a*b*c^4*e*g*h + (25*a*b*c^4*d + 12*a*b*c^2*f)*h^2)*x
^2 + 225*(8*a*b*c^4*e*g^2 + 3*a*b*c^2*e*h^2 + 2*(8*a*b*c^4*d + 3*a*b*c^2*f
)*g*h)*x + (288*b^2*c^4*f*h^2*x^4 + 3200*b^2*c^2*e*g*h + 450*(2*b^2*c^4*f*
g*h + b^2*c^4*e*h^2)*x^3 + 800*(9*b^2*c^4*d + 2*b^2*c^2*f)*g^2 + 64*(25...
```

### 3.116.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1935 vs. 2(694) = 1388.

Time = 0.78 (sec) , antiderivative size = 1935, normalized size of antiderivative = 2.76

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx = \text{Too large to display}$$

input
```
integrate((h*x+g)**2*(f*x**2+e*x+d)*(a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*d*g**2*x + a**2*d*g*h*x**2 + a**2*d*h**2*x**3/3 + a**2*e*g
**2*x**2/2 + 2*a**2*e*g*h*x**3/3 + a**2*e*h**2*x**4/4 + a**2*f*g**2*x**3/3
 + a**2*f*g*h*x**4/2 + a**2*f*h**2*x**5/5 + 2*a*b*d*g**2*x*asin(c*x) + 2*a
*b*d*g*h*x**2*asin(c*x) + 2*a*b*d*h**2*x**3*asin(c*x)/3 + a*b*e*g**2*x**2*
asin(c*x) + 4*a*b*e*g*h*x**3*asin(c*x)/3 + a*b*e*h**2*x**4*asin(c*x)/2 + 2
*a*b*f*g**2*x**3*asin(c*x)/3 + a*b*f*g*h*x**4*asin(c*x) + 2*a*b*f*h**2*x**
5*asin(c*x)/5 + 2*a*b*d*g**2*sqrt(-c**2*x**2 + 1)/c + a*b*d*g*h*x*sqrt(-c*
*2*x**2 + 1)/c + 2*a*b*d*h**2*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + a*b*e*g**2
*x*sqrt(-c**2*x**2 + 1)/(2*c) + 4*a*b*e*g*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c
) + a*b*e*h**2*x**3*sqrt(-c**2*x**2 + 1)/(8*c) + 2*a*b*f*g**2*x**2*sqrt(-c
**2*x**2 + 1)/(9*c) + a*b*f*g*h*x**3*sqrt(-c**2*x**2 + 1)/(4*c) + 2*a*b*f*
h**2*x**4*sqrt(-c**2*x**2 + 1)/(25*c) - a*b*d*g*h*asin(c*x)/c**2 - a*b*e*g
**2*asin(c*x)/(2*c**2) + 4*a*b*d*h**2*sqrt(-c**2*x**2 + 1)/(9*c**3) + 8*a*
b*e*g*h*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*a*b*e*h**2*x*sqrt(-c**2*x**2 + 1
)/(16*c**3) + 4*a*b*f*g**2*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*a*b*f*g*h*x*s
qrt(-c**2*x**2 + 1)/(8*c**3) + 8*a*b*f*h**2*x**2*sqrt(-c**2*x**2 + 1)/(75*
c**3) - 3*a*b*e*h**2*asin(c*x)/(16*c**4) - 3*a*b*f*g*h*asin(c*x)/(8*c**4)
+ 16*a*b*f*h**2*sqrt(-c**2*x**2 + 1)/(75*c**5) + b**2*d*g**2*x*asin(c*x)**
2 - 2*b**2*d*g**2*x + b**2*d*g*h*x**2*asin(c*x)**2 - b**2*d*g*h*x**2/2 + b
**2*d*h**2*x**3*asin(c*x)**2/3 - 2*b**2*d*h**2*x**3/27 + b**2*e*g**2*x*...
```

### 3.116.7 Maxima [F]

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2 \, dx = \int \left(fx^2+ex+d\right)(hx+g)^2(b\arcsin(cx)+a)^2 \, dx$$

input
```
integrate((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima
")
```

output
```
1/5*a^2*f*h^2*x^5 + 1/2*a^2*f*g*h*x^4 + 1/4*a^2*e*h^2*x^4 + 1/3*a^2*f*g^2*
x^3 + 2/3*a^2*e*g*h*x^3 + 1/3*a^2*d*h^2*x^3 + b^2*d*g^2*x*arcsin(c*x)^2 +
1/2*a^2*e*g^2*x^2 + a^2*d*g*h*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*
x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e*g^2 + 2/9*(3*x^3*arcsin(c*x) + c*
(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*f*g^2 + (2*x^
2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*d*g*h
+ 4/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2
 + 1)/c^4))*a*b*e*g*h + 1/8*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3
/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*f*g*h + 2/9*
(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/
c^4))*a*b*d*h^2 + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*x^3/c^2
+ 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*e*h^2 + 2/75*(15*
x^5*arcsin(c*x) + (3*sqrt(-c^2*x^2 + 1)*x^4/c^2 + 4*sqrt(-c^2*x^2 + 1)*x^2
/c^4 + 8*sqrt(-c^2*x^2 + 1)/c^6)*c)*a*b*f*h^2 - 2*b^2*d*g^2*(x - sqrt(-c^2
*x^2 + 1)*arcsin(c*x)/c) + a^2*d*g^2*x + 2*(c*x*arcsin(c*x) + sqrt(-c^2*x^
2 + 1))*a*b*d*g^2/c + 1/60*(12*b^2*f*h^2*x^5 + 15*(2*b^2*f*g*h + b^2*e*h^2
)*x^4 + 20*(b^2*f*g^2 + 2*b^2*e*g*h + b^2*d*h^2)*x^3 + 30*(b^2*e*g^2 + 2*b
^2*d*g*h)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + integrate(1/
30*(12*b^2*c*f*h^2*x^5 + 15*(2*b^2*c*f*g*h + b^2*c*e*h^2)*x^4 + 20*(b^2*c*
f*g^2 + 2*b^2*c*e*g*h + b^2*c*d*h^2)*x^3 + 30*(b^2*c*e*g^2 + 2*b^2*c*d*...
```

### 3.116.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2166 vs. 2(639) = 1278.

Time = 0.35 (sec) , antiderivative size = 2166, normalized size of antiderivative = 3.09

$$\int (g+hx)^2\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((h*x+g)^2*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
1/5*a^2*f*h^2*x^5 + 1/2*a^2*f*g*h*x^4 + 1/4*a^2*e*h^2*x^4 + 1/3*a^2*f*g^2*
x^3 + 2/3*a^2*e*g*h*x^3 + 1/3*a^2*d*h^2*x^3 + b^2*d*g^2*x*arcsin(c*x)^2 +
2*a*b*d*g^2*x*arcsin(c*x) + 1/3*(c^2*x^2 - 1)*b^2*f*g^2*x*arcsin(c*x)^2/c^
2 + 2/3*(c^2*x^2 - 1)*b^2*e*g*h*x*arcsin(c*x)^2/c^2 + 1/3*(c^2*x^2 - 1)*b^
2*d*h^2*x*arcsin(c*x)^2/c^2 + 1/2*sqrt(-c^2*x^2 + 1)*b^2*e*g^2*x*arcsin(c*
x)/c + sqrt(-c^2*x^2 + 1)*b^2*d*g*h*x*arcsin(c*x)/c + a^2*d*g^2*x - 2*b^2*
d*g^2*x + 2/3*(c^2*x^2 - 1)*a*b*f*g^2*x*arcsin(c*x)/c^2 + 4/3*(c^2*x^2 - 1
)*a*b*e*g*h*x*arcsin(c*x)/c^2 + 2/3*(c^2*x^2 - 1)*a*b*d*h^2*x*arcsin(c*x)/
c^2 + 1/2*(c^2*x^2 - 1)*b^2*e*g^2*arcsin(c*x)^2/c^2 + (c^2*x^2 - 1)*b^2*d*
g*h*arcsin(c*x)^2/c^2 + 1/3*b^2*f*g^2*x*arcsin(c*x)^2/c^2 + 2/3*b^2*e*g*h*
x*arcsin(c*x)^2/c^2 + 1/3*b^2*d*h^2*x*arcsin(c*x)^2/c^2 + 1/5*(c^2*x^2 - 1
)^2*b^2*f*h^2*x*arcsin(c*x)^2/c^4 + 1/2*sqrt(-c^2*x^2 + 1)*a*b*e*g^2*x/c +
 sqrt(-c^2*x^2 + 1)*a*b*d*g*h*x/c + 2*sqrt(-c^2*x^2 + 1)*b^2*d*g^2*arcsin(
c*x)/c - 1/4*(-c^2*x^2 + 1)^(3/2)*b^2*f*g*h*x*arcsin(c*x)/c^3 - 1/8*(-c^2*
x^2 + 1)^(3/2)*b^2*e*h^2*x*arcsin(c*x)/c^3 - 2/27*(c^2*x^2 - 1)*b^2*f*g^2*
x/c^2 - 4/27*(c^2*x^2 - 1)*b^2*e*g*h*x/c^2 - 2/27*(c^2*x^2 - 1)*b^2*d*h^2*
x/c^2 + (c^2*x^2 - 1)*a*b*e*g^2*arcsin(c*x)/c^2 + 2*(c^2*x^2 - 1)*a*b*d*g*
h*arcsin(c*x)/c^2 + 2/3*a*b*f*g^2*x*arcsin(c*x)/c^2 + 4/3*a*b*e*g*h*x*arcs
in(c*x)/c^2 + 2/3*a*b*d*h^2*x*arcsin(c*x)/c^2 + 2/5*(c^2*x^2 - 1)^2*a*b*f*
h^2*x*arcsin(c*x)/c^4 + 1/4*b^2*e*g^2*arcsin(c*x)^2/c^2 + 1/2*b^2*d*g*h...
```

## 3.116.9 Mupad [F(-1)]

Timed out.

$$\int (g+hx)^2 \left(d+ex+fx^2\right) (a+b\arcsin(cx))^2\,dx = \int (g+h\,x)^2\,(a+b\,\mathrm{asin}(c\,x))^2\,\left(f\,x^2+e\,x+d\right)\,dx$$

input
```
int((g + h*x)^2*(a + b*asin(c*x))^2*(d + e*x + f*x^2),x)
```

output
```
int((g + h*x)^2*(a + b*asin(c*x))^2*(d + e*x + f*x^2), x)
```

# 3.117 $\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$



## 3.117.1 Optimal result

Integrand size = 26, antiderivative size = 425

$$\begin{aligned}
&\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx \\
&= -2b^2dgx-\frac{4b^2(fg+eh)x}{9c^2}-\frac{3b^2fhx^2}{32c^2}-\frac{1}{4}b^2(eg+dh)x^2-\frac{2}{27}b^2(fg+eh)x^3-\frac{1}{32}b^2fhx^4 \\
&\quad+\frac{2bdg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{4b(fg+eh)\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c^3} \\
&\quad+\frac{3bfhx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}+\frac{b(eg+dh)x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{2c} \\
&\quad+\frac{2b(fg+eh)x^2\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{9c}+\frac{bfhx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c} \\
&\quad-\frac{3fh(a+b\arcsin(cx))^2}{32c^4}-\frac{(eg+dh)(a+b\arcsin(cx))^2}{4c^2} \\
&\quad+dgx(a+b\arcsin(cx))^2+\frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2
\end{aligned}$$

output
```
-2*b^2*d*g*x-4/9*b^2*(e*h+f*g)*x/c^2-3/32*b^2*f*h*x^2/c^2-1/4*b^2*(d*h+e*g
)*x^2-2/27*b^2*(e*h+f*g)*x^3-1/32*b^2*f*h*x^4-3/32*f*h*(a+b*arcsin(c*x))^2
/c^4-1/4*(d*h+e*g)*(a+b*arcsin(c*x))^2/c^2+d*g*x*(a+b*arcsin(c*x))^2+1/2*(
d*h+e*g)*x^2*(a+b*arcsin(c*x))^2+1/3*(e*h+f*g)*x^3*(a+b*arcsin(c*x))^2+1/4
*f*h*x^4*(a+b*arcsin(c*x))^2+2*b*d*g*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/
c+4/9*b*(e*h+f*g)*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+3/16*b*f*h*x*(a
+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c^3+1/2*b*(d*h+e*g)*x*(a+b*arcsin(c*x))
*(-c^2*x^2+1)^(1/2)/c+2/9*b*(e*h+f*g)*x^2*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(
1/2)/c+1/8*b*f*h*x^3*(a+b*arcsin(c*x))*(-c^2*x^2+1)^(1/2)/c
```

### 3.117.2 Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 364, normalized size of antiderivative = 0.86

$$\begin{aligned}
&\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx \\
&= dgx(a+b\arcsin(cx))^2+\frac{1}{2}(eg+dh)x^2(a+b\arcsin(cx))^2 \\
&\quad+\frac{1}{3}(fg+eh)x^3(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2 \\
&\quad-\frac{2b(fg+eh)\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{27c^3} \\
&\quad-2bdg\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right) \\
&\quad-\frac{1}{32}bfh\left(\frac{3bx^2}{c^2}+bx^4-\frac{6x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c^3}-\frac{4x^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right. \\
&\qquad\left.+\frac{3(a+b\arcsin(cx))^2}{bc^4}\right) \\
&\quad-\frac{1}{4}b(eg+dh)\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)
\end{aligned}$$

input
```
Integrate[(g + h*x)*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
d*g*x*(a + b*ArcSin[c*x])^2 + ((e*g + d*h)*x^2*(a + b*ArcSin[c*x])^2)/2 +
((f*g + e*h)*x^3*(a + b*ArcSin[c*x])^2)/3 + (f*h*x^4*(a + b*ArcSin[c*x])^2
)/4 - (2*b*(f*g + e*h)*(-3*a*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2) + b*c*x*(6 +
c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*ArcSin[c*x]))/(27*c^3) - 2*
b*d*g*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - (b*f*h*((3*b*x^2
)/c^2 + b*x^4 - (6*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c^3 - (4*x^3*S
qrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (3*(a + b*ArcSin[c*x])^2)/(b*c^4
)))/32 - (b*(e*g + d*h)*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]
))/c + (a + b*ArcSin[c*x])^2/(b*c^2)))/4
```

## 3.117.3 Rubi [A] (verified)

Time = 0.92 (sec) , antiderivative size = 425, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {5250, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$

$$\Big\downarrow \text{5250}$$

$$\int \left(x(dh+eg)(a+b\arcsin(cx))^2+dg(a+b\arcsin(cx))^2+x^2(eh+fg)(a+b\arcsin(cx))^2+fhx^3(a+b\arcsin(c$$

$$\Big\downarrow \text{2009}$$

$$-\frac{3fh(a+b\arcsin(cx))^2}{32c^4}+\frac{bx\sqrt{1-c^2x^2}(dh+eg)(a+b\arcsin(cx))}{2c}-\frac{(dh+eg)(a+b\arcsin(cx))^2}{4c^2}+\frac{2bdg\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{2bx^2\sqrt{1-c^2x^2}(eh+fg)(a+b\arcsin(cx))}{9c}+\frac{bfhx^3\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{8c}+\frac{4b\sqrt{1-c^2x^2}(eh+fg)(a+b\arcsin(cx))}{9c^3}+\frac{3bfhx\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{16c^3}+\frac{1}{2}x^2(dh+eg)(a+b\arcsin(cx))^2+dgx(a+b\arcsin(cx))^2+\frac{1}{3}x^3(eh+fg)(a+b\arcsin(cx))^2+\frac{1}{4}fhx^4(a+b\arcsin(cx))^2-\frac{4b^2x(eh+fg)}{9c^2}-\frac{3b^2fhx^2}{32c^2}-\frac{1}{4}b^2x^2(dh+eg)-2b^2dgx-\frac{2}{27}b^2x^3(eh+fg)-\frac{1}{32}b^2fhx^4$$

input
```
Int[(g + h*x)*(d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2,x]
```

output
```
-2*b^2*d*g*x - (4*b^2*(f*g + e*h)*x)/(9*c^2) - (3*b^2*f*h*x^2)/(32*c^2) -
(b^2*(e*g + d*h)*x^2)/4 - (2*b^2*(f*g + e*h)*x^3)/27 - (b^2*f*h*x^4)/32 +
(2*b*d*g*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (4*b*(f*g + e*h)*Sqrt[
1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(9*c^3) + (3*b*f*h*x*Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x]))/(16*c^3) + (b*(e*g + d*h)*x*Sqrt[1 - c^2*x^2]*(a + b*A
rcSin[c*x]))/(2*c) + (2*b*(f*g + e*h)*x^2*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[
c*x]))/(9*c) + (b*f*h*x^3*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/(8*c) - (
3*f*h*(a + b*ArcSin[c*x])^2)/(32*c^4) - ((e*g + d*h)*(a + b*ArcSin[c*x])^2
)/(4*c^2) + d*g*x*(a + b*ArcSin[c*x])^2 + ((e*g + d*h)*x^2*(a + b*ArcSin[c
*x])^2)/2 + ((f*g + e*h)*x^3*(a + b*ArcSin[c*x])^2)/3 + (f*h*x^4*(a + b*Ar
cSin[c*x])^2)/4
```

### 3.117.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5250
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_), x_Symbol] :> Int[ExpandI
ntegrand[Px*(a + b*ArcSin[c*x])^n, x], x] /; FreeQ[{a, b, c, n}, x] && Poly
nomialQ[Px, x]
```

## 3.117.4 Maple [A] (verified)

Time = 2.00 (sec) , antiderivative size = 679, normalized size of antiderivative = 1.60

| method | result |
|---|---|
| parts | $a^{2}\left(\frac{h f \,x^{4}}{4}+\frac{\left(e h +f g \right) x^{3}}{3}+\frac{\left(d h +e g \right) x^{2}}{2}+d g x \right)+\frac{b^{2}\left(\frac{h f \left(32 \arcsin \left(c x \right)^{2} x^{4} c^{4}+16 \sqrt{-c^{2} x^{2}+1}\, \arcsin \left(c x \right) c^{3} x^{3}-4 c^{4} x^{4}+\cdots\right.}{128 c^{3}}\cdots}{\cdots}$ |
| derivativedivides | $\frac{a^{2}\left(\frac{h f \,c^{4} x^{4}}{4}+\frac{\left(e c h +c f g \right) c^{3} x^{3}}{3}+\frac{\left(d \,c^{2} h +e \,c^{2} g \right) c^{2} x^{2}}{2}+g \,c^{4} d x \right)}{c^{3}}+\frac{b^{2}\left(c^{3} d g \left(c x \arcsin \left(c x \right)^{2}-2 c x +2 \arcsin \left(c x \right) \sqrt{-c^{2} x^{2}+1}\right)+\frac{c^{2} e g \left(2 \mathrm{ar}\cdots\right.}{\cdots}\cdots}{\cdots}$ |
| default | $\frac{a^{2}\left(\frac{h f \,c^{4} x^{4}}{4}+\frac{\left(e c h +c f g \right) c^{3} x^{3}}{3}+\frac{\left(d \,c^{2} h +e \,c^{2} g \right) c^{2} x^{2}}{2}+g \,c^{4} d x \right)}{c^{3}}+\frac{b^{2}\left(c^{3} d g \left(c x \arcsin \left(c x \right)^{2}-2 c x +2 \arcsin \left(c x \right) \sqrt{-c^{2} x^{2}+1}\right)+\frac{c^{2} e g \left(2 \mathrm{ar}\cdots\right.}{\cdots}\cdots}{\cdots}$ |

input
```
int((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x,method=_RETURNVERBOSE)
```

output
```
a^2*(1/4*h*f*x^4+1/3*(e*h+f*g)*x^3+1/2*(d*h+e*g)*x^2+d*g*x)+b^2/c*(1/128*h
*f*(32*arcsin(c*x)^2*x^4*c^4+16*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*c^3*x^3-4*c
^4*x^4+24*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-12*arcsin(c*x)^2-12*c^2*x^2-9
)/c^3+1/27*h*e*(9*c^3*x^3*arcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x
^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)/c^2+1/4*h*d*(2*
arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-arcsin(c*x)^2-c
^2*x^2)/c+1/27*g*f*(9*c^3*x^3*arcsin(c*x)^2+6*(-c^2*x^2+1)^(1/2)*arcsin(c*
x)*x^2*c^2-2*c^3*x^3+12*arcsin(c*x)*(-c^2*x^2+1)^(1/2)-12*c*x)/c^2+1/4*g*e
*(2*arcsin(c*x)^2*x^2*c^2+2*(-c^2*x^2+1)^(1/2)*arcsin(c*x)*x*c-arcsin(c*x)
^2-c^2*x^2)/c+d*g*(c*x*arcsin(c*x)^2-2*c*x+2*arcsin(c*x)*(-c^2*x^2+1)^(1/2
)))+2*a*b/c*(1/4*c*arcsin(c*x)*h*f*x^4+1/3*c*arcsin(c*x)*e*h*x^3+1/3*c*arc
sin(c*x)*x^3*f*g+1/2*c*arcsin(c*x)*x^2*d*h+1/2*c*arcsin(c*x)*e*g*x^2+c*arc
sin(c*x)*x*d*g-1/12/c^3*(3*h*f*(-1/4*c^3*x^3*(-c^2*x^2+1)^(1/2)-3/8*c*x*(-
c^2*x^2+1)^(1/2)+3/8*arcsin(c*x))-12*g*c^3*d*(-c^2*x^2+1)^(1/2)+(4*c*e*h+4
*c*f*g)*(-1/3*c^2*x^2*(-c^2*x^2+1)^(1/2)-2/3*(-c^2*x^2+1)^(1/2))+(6*c^2*d*
h+6*c^2*e*g)*(-1/2*c*x*(-c^2*x^2+1)^(1/2)+1/2*arcsin(c*x))))
```

## 3.117.5 Fricas [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 579, normalized size of antiderivative = 1.36

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx$$
$$= \frac{27\,(8\,a^2-b^2)c^4fhx^4+32\,((9\,a^2-2\,b^2)c^4fg+(9\,a^2-2\,b^2)c^4eh)x^3+27\,(8\,(2\,a^2-b^2)c^4eg+(8\,(2\,a^2-b^2)}{}$$

input
```
integrate((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="fricas")
```

output
```
1/864*(27*(8*a^2 - b^2)*c^4*f*h*x^4 + 32*((9*a^2 - 2*b^2)*c^4*f*g + (9*a^2
 - 2*b^2)*c^4*e*h)*x^3 + 27*(8*(2*a^2 - b^2)*c^4*e*g + (8*(2*a^2 - b^2)*c^
4*d - 3*b^2*c^2*f)*h)*x^2 + 9*(24*b^2*c^4*f*h*x^4 + 96*b^2*c^4*d*g*x - 24*
b^2*c^2*e*g + 32*(b^2*c^4*f*g + b^2*c^4*e*h)*x^3 + 48*(b^2*c^4*e*g + b^2*c
^4*d*h)*x^2 - 3*(8*b^2*c^2*d + 3*b^2*f)*h)*arcsin(c*x)^2 - 96*(4*b^2*c^2*e
*h - (9*(a^2 - 2*b^2)*c^4*d - 4*b^2*c^2*f)*g)*x + 18*(24*a*b*c^4*f*h*x^4 +
 96*a*b*c^4*d*g*x - 24*a*b*c^2*e*g + 32*(a*b*c^4*f*g + a*b*c^4*e*h)*x^3 +
48*(a*b*c^4*e*g + a*b*c^4*d*h)*x^2 - 3*(8*a*b*c^2*d + 3*a*b*f)*h)*arcsin(c
*x) + 6*(18*a*b*c^3*f*h*x^3 + 64*a*b*c*e*h + 32*(a*b*c^3*f*g + a*b*c^3*e*h
)*x^2 + 32*(9*a*b*c^3*d + 2*a*b*c*f)*g + 9*(8*a*b*c^3*e*g + (8*a*b*c^3*d +
 3*a*b*c*f)*h)*x + (18*b^2*c^3*f*h*x^3 + 64*b^2*c*e*h + 32*(b^2*c^3*f*g +
b^2*c^3*e*h)*x^2 + 32*(9*b^2*c^3*d + 2*b^2*c*f)*g + 9*(8*b^2*c^3*e*g + (8*
b^2*c^3*d + 3*b^2*c*f)*h)*x)*arcsin(c*x))*sqrt(-c^2*x^2 + 1))/c^4
```

### 3.117.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1059 vs. $2(416) = 832$.

Time = 0.51 (sec) , antiderivative size = 1059, normalized size of antiderivative = 2.49

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((h*x+g)*(f*x**2+e*x+d)*(a+b*asin(c*x))**2,x)
```

output
```
Piecewise((a**2*d*g*x + a**2*d*h*x**2/2 + a**2*e*g*x**2/2 + a**2*e*h*x**3/
3 + a**2*f*g*x**3/3 + a**2*f*h*x**4/4 + 2*a*b*d*g*x*asin(c*x) + a*b*d*h*x*
*2*asin(c*x) + a*b*e*g*x**2*asin(c*x) + 2*a*b*e*h*x**3*asin(c*x)/3 + 2*a*b
*f*g*x**3*asin(c*x)/3 + a*b*f*h*x**4*asin(c*x)/2 + 2*a*b*d*g*sqrt(-c**2*x*
*2 + 1)/c + a*b*d*h*x*sqrt(-c**2*x**2 + 1)/(2*c) + a*b*e*g*x*sqrt(-c**2*x*
*2 + 1)/(2*c) + 2*a*b*e*h*x**2*sqrt(-c**2*x**2 + 1)/(9*c) + 2*a*b*f*g*x**2
*sqrt(-c**2*x**2 + 1)/(9*c) + a*b*f*h*x**3*sqrt(-c**2*x**2 + 1)/(8*c) - a*
b*d*h*asin(c*x)/(2*c**2) - a*b*e*g*asin(c*x)/(2*c**2) + 4*a*b*e*h*sqrt(-c*
*2*x**2 + 1)/(9*c**3) + 4*a*b*f*g*sqrt(-c**2*x**2 + 1)/(9*c**3) + 3*a*b*f*
h*x*sqrt(-c**2*x**2 + 1)/(16*c**3) - 3*a*b*f*h*asin(c*x)/(16*c**4) + b**2*
d*g*x*asin(c*x)**2 - 2*b**2*d*g*x + b**2*d*h*x**2*asin(c*x)**2/2 - b**2*d*
h*x**2/4 + b**2*e*g*x**2*asin(c*x)**2/2 - b**2*e*g*x**2/4 + b**2*e*h*x**3*
asin(c*x)**2/3 - 2*b**2*e*h*x**3/27 + b**2*f*g*x**3*asin(c*x)**2/3 - 2*b**
2*f*g*x**3/27 + b**2*f*h*x**4*asin(c*x)**2/4 - b**2*f*h*x**4/32 + 2*b**2*d
*g*sqrt(-c**2*x**2 + 1)*asin(c*x)/c + b**2*d*h*x*sqrt(-c**2*x**2 + 1)*asin
(c*x)/(2*c) + b**2*e*g*x*sqrt(-c**2*x**2 + 1)*asin(c*x)/(2*c) + 2*b**2*e*h
*x**2*sqrt(-c**2*x**2 + 1)*asin(c*x)/(9*c) + 2*b**2*f*g*x**2*sqrt(-c**2*x*
*2 + 1)*asin(c*x)/(9*c) + b**2*f*h*x**3*sqrt(-c**2*x**2 + 1)*asin(c*x)/(8*
c) - b**2*d*h*asin(c*x)**2/(4*c**2) - b**2*e*g*asin(c*x)**2/(4*c**2) - 4*b
**2*e*h*x/(9*c**2) - 4*b**2*f*g*x/(9*c**2) - 3*b**2*f*h*x**2/(32*c**2) ...
```

### 3.117.7 Maxima [F]

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \int (fx^2+ex+d)(hx+g)(b\arcsin(cx)+a)^2\,dx$$

input
```
integrate((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="maxima")
```

output
```
1/4*a^2*f*h*x^4 + 1/3*a^2*f*g*x^3 + 1/3*a^2*e*h*x^3 + b^2*d*g*x*arcsin(c*x
)^2 + 1/2*a^2*e*g*x^2 + 1/2*a^2*d*h*x^2 + 1/2*(2*x^2*arcsin(c*x) + c*(sqrt
(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*e*g + 2/9*(3*x^3*arcsin(c*x)
+ c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2*x^2 + 1)/c^4))*a*b*f*g + 1/2
*(2*x^2*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x/c^2 - arcsin(c*x)/c^3))*a*b*
d*h + 2/9*(3*x^3*arcsin(c*x) + c*(sqrt(-c^2*x^2 + 1)*x^2/c^2 + 2*sqrt(-c^2
*x^2 + 1)/c^4))*a*b*e*h + 1/16*(8*x^4*arcsin(c*x) + (2*sqrt(-c^2*x^2 + 1)*
x^3/c^2 + 3*sqrt(-c^2*x^2 + 1)*x/c^4 - 3*arcsin(c*x)/c^5)*c)*a*b*f*h - 2*b
^2*d*g*(x - sqrt(-c^2*x^2 + 1)*arcsin(c*x)/c) + a^2*d*g*x + 2*(c*x*arcsin(
c*x) + sqrt(-c^2*x^2 + 1))*a*b*d*g/c + 1/12*(3*b^2*f*h*x^4 + 4*(b^2*f*g +
b^2*e*h)*x^3 + 6*(b^2*e*g + b^2*d*h)*x^2)*arctan2(c*x, sqrt(c*x + 1)*sqrt(
-c*x + 1))^2 + integrate(1/6*(3*b^2*c*f*h*x^4 + 4*(b^2*c*f*g + b^2*c*e*h)*
x^3 + 6*(b^2*c*e*g + b^2*c*d*h)*x^2)*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan2(
c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))/(c^2*x^2 - 1), x)
```

### 3.117.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1145 vs. $2(383) = 766$.

Time = 0.33 (sec) , antiderivative size = 1145, normalized size of antiderivative = 2.69

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \text{Too large to display}$$

input
```
integrate((h*x+g)*(f*x^2+e*x+d)*(a+b*arcsin(c*x))^2,x, algorithm="giac")
```

output
```
1/4*a^2*f*h*x^4 + 1/3*a^2*f*g*x^3 + 1/3*a^2*e*h*x^3 + b^2*d*g*x*arcsin(c*x
)^2 + 2*a*b*d*g*x*arcsin(c*x) + 1/3*(c^2*x^2 - 1)*b^2*f*g*x*arcsin(c*x)^2/
c^2 + 1/3*(c^2*x^2 - 1)*b^2*e*h*x*arcsin(c*x)^2/c^2 + 1/2*sqrt(-c^2*x^2 +
1)*b^2*e*g*x*arcsin(c*x)/c + 1/2*sqrt(-c^2*x^2 + 1)*b^2*d*h*x*arcsin(c*x)/
c + a^2*d*g*x - 2*b^2*d*g*x + 2/3*(c^2*x^2 - 1)*a*b*f*g*x*arcsin(c*x)/c^2
+ 2/3*(c^2*x^2 - 1)*a*b*e*h*x*arcsin(c*x)/c^2 + 1/2*(c^2*x^2 - 1)*b^2*e*g*
arcsin(c*x)^2/c^2 + 1/2*(c^2*x^2 - 1)*b^2*d*h*arcsin(c*x)^2/c^2 + 1/3*b^2*
f*g*x*arcsin(c*x)^2/c^2 + 1/3*b^2*e*h*x*arcsin(c*x)^2/c^2 + 1/2*sqrt(-c^2*
x^2 + 1)*a*b*e*g*x/c + 1/2*sqrt(-c^2*x^2 + 1)*a*b*d*h*x/c + 2*sqrt(-c^2*x^
2 + 1)*b^2*d*g*arcsin(c*x)/c - 1/8*(-c^2*x^2 + 1)^(3/2)*b^2*f*h*x*arcsin(c
*x)/c^3 - 2/27*(c^2*x^2 - 1)*b^2*f*g*x/c^2 - 2/27*(c^2*x^2 - 1)*b^2*e*h*x/
c^2 + (c^2*x^2 - 1)*a*b*e*g*arcsin(c*x)/c^2 + (c^2*x^2 - 1)*a*b*d*h*arcsin
(c*x)/c^2 + 2/3*a*b*f*g*x*arcsin(c*x)/c^2 + 2/3*a*b*e*h*x*arcsin(c*x)/c^2
+ 1/4*b^2*e*g*arcsin(c*x)^2/c^2 + 1/4*b^2*d*h*arcsin(c*x)^2/c^2 + 1/4*(c^2
*x^2 - 1)^2*b^2*f*h*arcsin(c*x)^2/c^4 + 2*sqrt(-c^2*x^2 + 1)*a*b*d*g/c - 1
/8*(-c^2*x^2 + 1)^(3/2)*a*b*f*h*x/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*f*g*a
rcsin(c*x)/c^3 - 2/9*(-c^2*x^2 + 1)^(3/2)*b^2*e*h*arcsin(c*x)/c^3 + 5/16*s
qrt(-c^2*x^2 + 1)*b^2*f*h*x*arcsin(c*x)/c^3 + 1/2*(c^2*x^2 - 1)*a^2*e*g/c^
2 - 1/4*(c^2*x^2 - 1)*b^2*e*g/c^2 + 1/2*(c^2*x^2 - 1)*a^2*d*h/c^2 - 1/4*(c
^2*x^2 - 1)*b^2*d*h/c^2 - 14/27*b^2*f*g*x/c^2 - 14/27*b^2*e*h*x/c^2 + 1...
```

### 3.117.9 Mupad [F(-1)]

Timed out.

$$\int (g+hx)\left(d+ex+fx^2\right)(a+b\arcsin(cx))^2\,dx = \int (g+h\,x)\,\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(f\,x^2+e\,x+d\right)\,dx$$

input
```
int((g + h*x)*(a + b*asin(c*x))^2*(d + e*x + f*x^2),x)
```

output
```
int((g + h*x)*(a + b*asin(c*x))^2*(d + e*x + f*x^2), x)
```

# 3.118 $\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$

### 3.118.1 Optimal result

Integrand size = 28, antiderivative size = 1067

$$
\begin{aligned}
&\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx \\
&= -\frac{a^2(fg-eh)x}{h^2}+\frac{2b^2(fg-eh)x}{h^2}+\frac{a^2fx^2}{2h}-\frac{b^2fx^2}{4h}-\frac{ab(4(fg-eh)-fhx)\sqrt{1-c^2x^2}}{2ch^2} \\
&-\frac{abf\arcsin(cx)}{2c^2h}-\frac{2ab(fg-eh)x\arcsin(cx)}{h^2}+\frac{abfx^2\arcsin(cx)}{h} \\
&-\frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}+\frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch} \\
&-\frac{b^2f\arcsin(cx)^2}{4c^2h}-\frac{iab(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3}-\frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2} \\
&+\frac{b^2fx^2\arcsin(cx)^2}{2h}-\frac{ib^2(fg^2-egh+dh^2)\arcsin(cx)^3}{3h^3} \\
&+\frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+\frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+\frac{2ab(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+\frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+\frac{a^2(fg^2-egh+dh^2)\log(g+hx)}{h^3}-\frac{2iab(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&-\frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&-\frac{2iab(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&-\frac{2ib^2(fg^2-egh+dh^2)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+\frac{2b^2(fg^2-egh+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3} \\
&+\frac{2b^2(fg^2-egh+dh^2)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}
\end{aligned}
$$

output
```
-a^2*(-e*h+f*g)*x/h^2-1/2*a*b*f*arcsin(c*x)/c^2/h-2*a*b*(-e*h+f*g)*x*arcsi
n(c*x)/h^2+2*a*b*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1
)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+2*a*b*(d*h^2-e*g*h+f*g^2)*arcsin
(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3-1
/2*a*b*(-f*h*x-4*e*h+4*f*g)*(-c^2*x^2+1)^(1/2)/c/h^2-2*b^2*(-e*h+f*g)*arcs
in(c*x)*(-c^2*x^2+1)^(1/2)/c/h^2-I*a*b*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)^2/h
^3-2*I*a*b*(d*h^2-e*g*h+f*g^2)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c
*g-(c^2*g^2-h^2)^(1/2)))/h^3+a^2*(d*h^2-e*g*h+f*g^2)*ln(h*x+g)/h^3+b^2*(d*
h^2-e*g*h+f*g^2)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c
^2*g^2-h^2)^(1/2)))/h^3+b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)^2*ln(1-I*(I*c*
x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3-1/4*b^2*f*arcsin(c*
x)^2/c^2/h+1/2*b^2*f*x^2*arcsin(c*x)^2/h-1/3*I*b^2*(d*h^2-e*g*h+f*g^2)*arc
sin(c*x)^3/h^3-b^2*(-e*h+f*g)*x*arcsin(c*x)^2/h^2+a*b*f*x^2*arcsin(c*x)/h+
1/2*b^2*f*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c/h+2*b^2*(d*h^2-e*g*h+f*g^2)*p
olylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+2*b
^2*(d*h^2-e*g*h+f*g^2)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*
g^2-h^2)^(1/2)))/h^3+2*b^2*(-e*h+f*g)*x/h^2+1/2*a^2*f*x^2/h-1/4*b^2*f*x^2/
h-2*I*b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^
(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3-2*I*a*b*(d*h^2-e*g*h+f*g^2)*polylo
g(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3-2*I*b...
```

### 3.118.2 Mathematica [A] (verified)

Time = 0.78 (sec) , antiderivative size = 556, normalized size of antiderivative = 0.52

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$$
$$= \frac{12h(-fg+eh)x(a+b\arcsin(cx))^2+6fh^2x^2(a+b\arcsin(cx))^2-\frac{4i(fg^2+h(-eg+dh))(a+b\arcsin(cx))^3}{b}+24bh(\ldots}{\ldots}$$

input
```
Integrate[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x),x]
```

output
```
(12*h*(-(f*g) + e*h)*x*(a + b*ArcSin[c*x])^2 + 6*f*h^2*x^2*(a + b*ArcSin[c
*x])^2 - ((4*I)*(f*g^2 + h*(-(e*g) + d*h))*(a + b*ArcSin[c*x])^3)/b + 24*b
*h*(f*g - e*h)*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - 3*b*f*h
^2*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c + (a + b*ArcSin[
c*x])^2/(b*c^2)) + 12*(f*g^2 + h*(-(e*g) + d*h))*(a + b*ArcSin[c*x])^2*Log
[1 + (I*E^(I*ArcSin[c*x])*h)/(-(c*g) + Sqrt[c^2*g^2 - h^2])] + 12*(f*g^2 +
 h*(-(e*g) + d*h))*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(
c*g + Sqrt[c^2*g^2 - h^2])] - 24*b*(f*g^2 + h*(-(e*g) + d*h))*(I*(a + b*Ar
cSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])]
 - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])]) - 24
*b*(f*g^2 + h*(-(e*g) + d*h))*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(I*Ar
cSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])] - b*PolyLog[3, (I*E^(I*ArcSin[c
*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]))/(12*h^3)
```

### 3.118.3 Rubi [A] (verified)

Time = 2.31 (sec) , antiderivative size = 1085, normalized size of antiderivative = 1.02, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {5258, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$$

$$\Big\downarrow \text{5258}$$

$$\int \left(\frac{a^2(d+ex+fx^2)}{g+hx}+\frac{2ab\arcsin(cx)(d+ex+fx^2)}{g+hx}+\frac{b^2\arcsin(cx)^2(d+ex+fx^2)}{g+hx}\right)dx$$

$$\Big\downarrow \text{2009}$$

$$-\frac{ib^2(fg^2-ehg+dh^2)\arcsin(cx)^3}{3h^3}+\frac{b^2fx^2\arcsin(cx)^2}{2h}-\frac{iab(fg^2-ehg+dh^2)\arcsin(cx)^2}{h^3}-\frac{b^2(fg-eh)x\arcsin(cx)^2}{h^2}+\frac{b^2(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}+\frac{b^2(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}-\frac{b^2f\arcsin(cx)^2}{4c^2h}+\frac{abfx^2\arcsin(cx)}{h}-\frac{2ab(fg-eh)x\arcsin(cx)}{h^2}+\frac{2ab(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}+\frac{2ab(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}-\frac{2ib^2(fg^2-ehg+dh^2)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}-\frac{2ib^2(fg^2-ehg+dh^2)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}-\frac{2b^2(fg-eh)\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}+\frac{b^2fx\sqrt{1-c^2x^2}\arcsin(cx)}{2ch}-\frac{abf\arcsin(cx)}{2c^2h}+\frac{a^2fx^2}{2h}-\frac{b^2fx^2}{4h}-\frac{a^2(fg-eh)x}{h^2}+\frac{2b^2(fg-eh)x}{h^2}+\frac{a^2(fg^2-ehg+dh^2)\log(g+hx)}{h^3}-\frac{2iab(fg^2-ehg+dh^2)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{2iab(fg^2-ehg+dh^2)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}+\frac{2b^2(fg^2-ehg+dh^2)\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}+\frac{2b^2(fg^2-ehg+dh^2)\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{2ab(fg-eh)\sqrt{1-c^2x^2}}{ch^2}+\frac{abfx\sqrt{1-c^2x^2}}{2ch}$$

input
```
Int[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x),x]
```

3.118. $\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx$

output
```
-((a^2*(f*g - e*h)*x)/h^2) + (2*b^2*(f*g - e*h)*x)/h^2 + (a^2*f*x^2)/(2*h)
 - (b^2*f*x^2)/(4*h) - (2*a*b*(f*g - e*h)*Sqrt[1 - c^2*x^2])/(c*h^2) + (a*
b*f*x*Sqrt[1 - c^2*x^2])/(2*c*h) - (a*b*f*ArcSin[c*x])/(2*c^2*h) - (2*a*b*
(f*g - e*h)*x*ArcSin[c*x])/h^2 + (a*b*f*x^2*ArcSin[c*x])/h - (2*b^2*(f*g -
 e*h)*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c*h^2) + (b^2*f*x*Sqrt[1 - c^2*x^2]*
ArcSin[c*x])/(2*c*h) - (b^2*f*ArcSin[c*x]^2)/(4*c^2*h) - (I*a*b*(f*g^2 - e
*g*h + d*h^2)*ArcSin[c*x]^2)/h^3 - (b^2*(f*g - e*h)*x*ArcSin[c*x]^2)/h^2 +
 (b^2*f*x^2*ArcSin[c*x]^2)/(2*h) - ((I/3)*b^2*(f*g^2 - e*g*h + d*h^2)*ArcS
in[c*x]^3)/h^3 + (2*a*b*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(
I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 + (b^2*(f*g^2 - e*g*h
+ d*h^2)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2
 - h^2])])/h^3 + (2*a*b*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(
I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 + (b^2*(f*g^2 - e*g*h
+ d*h^2)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2
 - h^2])])/h^3 + (a^2*(f*g^2 - e*g*h + d*h^2)*Log[g + h*x])/h^3 - ((2*I)*a
*b*(f*g^2 - e*g*h + d*h^2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[
c^2*g^2 - h^2])])/h^3 - ((2*I)*b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]*Pol
yLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 - ((2*I)
*a*b*(f*g^2 - e*g*h + d*h^2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqr
t[c^2*g^2 - h^2])])/h^3 - ((2*I)*b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x...
```

#### 3.118.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5258
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_)*((d_) + (e_.)*(x_))^(m_.)
, x_Symbol] :> Int[ExpandIntegrand[Px*(d + e*x)^m*(a + b*ArcSin[c*x])^n, x]
, x] /; FreeQ[{a, b, c, d, e}, x] && PolynomialQ[Px, x] && IGtQ[n, 0] && In
tegerQ[m]
```

### 3.118.4 Maple [F]

$$\int \frac{(f\,x^2 + ex + d)\,(a + b\arcsin(cx))^2}{hx + g}dx$$

input
```
int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x)
```

output
```
int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x)
```

### 3.118.5 Fricas [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{hx+g}\,dx$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x, algorithm="fricas")
```

output
```
integral((a^2*f*x^2 + a^2*e*x + a^2*d + (b^2*f*x^2 + b^2*e*x + b^2*d)*arcs
in(c*x)^2 + 2*(a*b*f*x^2 + a*b*e*x + a*b*d)*arcsin(c*x))/(h*x + g), x)
```

### 3.118.6 Sympy [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(cx))^2\,(d+ex+fx^2)}{g+hx}\,dx$$

input
```
integrate((f*x**2+e*x+d)*(a+b*asin(c*x))**2/(h*x+g),x)
```

output
```
Integral((a + b*asin(c*x))**2*(d + e*x + f*x**2)/(g + h*x), x)
```

### 3.118.7 Maxima [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{hx+g}\,dx$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x, algorithm="maxima")
```

output
```
a^2*e*(x/h - g*log(h*x + g)/h^2) + 1/2*a^2*f*(2*g^2*log(h*x + g)/h^3 + (h*
x^2 - 2*g*x)/h^2) + a^2*d*log(h*x + g)/h + integrate(((b^2*f*x^2 + b^2*e*x
 + b^2*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1))^2 + 2*(a*b*f*x^2 + a*
b*e*x + a*b*d)*arctan2(c*x, sqrt(c*x + 1)*sqrt(-c*x + 1)))/(h*x + g), x)
```

### 3.118.8 Giac [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{hx+g}\,dx$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g),x, algorithm="giac")
```

output
```
integrate((f*x^2 + e*x + d)*(b*arcsin(c*x) + a)^2/(h*x + g), x)
```

### 3.118.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{g+hx}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(f\,x^2+e\,x+d)}{g+h\,x}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x),x)
```

output
```
int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x), x)
```

# 3.119 $\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx$

## 3.119.1 Optimal result

Integrand size = 28, antiderivative size = 1323

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx$$

$$= \frac{a^2fx}{h^2} - \frac{2b^2fx}{h^2} - \frac{a^2(fg^2-egh+dh^2)}{h^3(g+hx)} + \frac{2abf\sqrt{1-c^2x^2}}{ch^2} + \frac{2abfx\arcsin(cx)}{h^2}$$

$$- \frac{2ab(fg^2-egh+dh^2)\arcsin(cx)}{h^3(g+hx)} + \frac{2b^2f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}$$

$$+ \frac{iab(2fg-eh)\arcsin(cx)^2}{h^3} + \frac{b^2fx\arcsin(cx)^2}{h^2} - \frac{b^2(fg^2-egh+dh^2)\arcsin(cx)^2}{h^3(g+hx)}$$

$$+ \frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3} + \frac{2abc(fg^2-egh+dh^2)\arctan\left(\frac{h+c^2gx}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$

$$- \frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

$$- \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$

$$- \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

$$- \frac{2ab(2fg-eh)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

$$+ \frac{2ib^2c(fg^2-egh+dh^2)\arcsin(cx)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$

$$- \frac{b^2(2fg-eh)\arcsin(cx)^2\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

$$- \frac{a^2(2fg-eh)\log(g+hx)}{h^3} + \frac{2iab(2fg-eh)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

$$- \frac{2b^2c(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$

$$+ \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

$$+ \frac{2iab(2fg-eh)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

$$+ \frac{2b^2c(fg^2-egh+dh^2)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}$$

$$+ \frac{2ib^2(2fg-eh)\arcsin(cx)\operatorname{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}$$

$$- \frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{\phantom{h^3}} - \frac{2b^2(2fg-eh)\operatorname{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{\phantom{h^3}}$$

output
```
-2*I*b^2*c*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2
))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3/(c^2*g^2-h^2)^(1/2)-b^2*(-e*h+2*f*g)*a
rcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2))
)/h^3-b^2*(-e*h+2*f*g)*arcsin(c*x)^2*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(
c*g+(c^2*g^2-h^2)^(1/2)))/h^3+I*a*b*(-e*h+2*f*g)*arcsin(c*x)^2/h^3+b^2*f*x
*arcsin(c*x)^2/h^2+2*a*b*c*(d*h^2-e*g*h+f*g^2)*arctan((c^2*g*x+h)/(c^2*g^2
-h^2)^(1/2)/(-c^2*x^2+1)^(1/2))/h^3/(c^2*g^2-h^2)^(1/2)+2*I*a*b*(-e*h+2*f*
g)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3
+2*I*b^2*(-e*h+2*f*g)*arcsin(c*x)*polylog(2,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h
/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3+2*I*a*b*(-e*h+2*f*g)*polylog(2,I*(I*c*x+(-
c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3-2*b^2*(-e*h+2*f*g)*poly
log(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g-(c^2*g^2-h^2)^(1/2)))/h^3-2*b^2*
(-e*h+2*f*g)*polylog(3,I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(
1/2)))/h^3-2*b^2*f*x/h^2+2*I*b^2*(-e*h+2*f*g)*arcsin(c*x)*polylog(2,I*(I*c
*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-h^2)^(1/2)))/h^3+2*I*b^2*c*(d*h^2-e
*g*h+f*g^2)*arcsin(c*x)*ln(1-I*(I*c*x+(-c^2*x^2+1)^(1/2))*h/(c*g+(c^2*g^2-
h^2)^(1/2)))/h^3/(c^2*g^2-h^2)^(1/2)+1/3*I*b^2*(-e*h+2*f*g)*arcsin(c*x)^3/
h^3-b^2*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)^2/h^3/(h*x+g)+2*a*b*f*x*arcsin(c*x
)/h^2-2*a*b*(d*h^2-e*g*h+f*g^2)*arcsin(c*x)/h^3/(h*x+g)+2*b^2*f*arcsin(c*x
)*(-c^2*x^2+1)^(1/2)/c/h^2-2*a*b*(-e*h+2*f*g)*arcsin(c*x)*ln(1-I*(I*c*x...
```

### 3.119.2 Mathematica [A] (verified)

Time = 1.35 (sec) , antiderivative size = 688, normalized size of antiderivative = 0.52

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx$$

$$= \frac{3fhx(a+b\arcsin(cx))^2 - \frac{3(fg^2+h(-eg+dh))(a+b\arcsin(cx))^2}{g+hx} + \frac{i(2fg-eh)(a+b\arcsin(cx))^3}{b} - 6bfh\Big(bx - \frac{\sqrt{1-c^2x^2}(a+b}{c}$$

input
```
Integrate[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x)^2,x]
```

output
```
(3*f*h*x*(a + b*ArcSin[c*x])^2 - (3*(f*g^2 + h*(-(e*g) + d*h))*(a + b*ArcS
in[c*x])^2)/(g + h*x) + (I*(2*f*g - e*h)*(a + b*ArcSin[c*x])^3)/b - 6*b*f*
h*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c) - 3*(2*f*g - e*h)*(a +
 b*ArcSin[c*x])^2*Log[1 + (I*E^(I*ArcSin[c*x])*h)/(-(c*g) + Sqrt[c^2*g^2 -
 h^2])] - 3*(2*f*g - e*h)*(a + b*ArcSin[c*x])^2*Log[1 - (I*E^(I*ArcSin[c*x
])*h)/(c*g + Sqrt[c^2*g^2 - h^2])] + (6*b*c*(f*g^2 + h*(-(e*g) + d*h))*((-
I)*(a + b*ArcSin[c*x])*(Log[1 + (I*E^(I*ArcSin[c*x])*h)/(-(c*g) + Sqrt[c^2
*g^2 - h^2])] - Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2]
)]) - b*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])] +
b*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]))/Sqrt[c
^2*g^2 - h^2] + 6*b*(2*f*g - e*h)*(I*(a + b*ArcSin[c*x])*PolyLog[2, (I*E^(
I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])] - b*PolyLog[3, (I*E^(I*ArcS
in[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])]) + 6*b*(2*f*g - e*h)*(I*(a + b*Ar
cSin[c*x])*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]
 - b*PolyLog[3, (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])]))/(3*
h^3)
```

### 3.119.3 Rubi [A] (verified)

Time = 2.93 (sec) , antiderivative size = 1323, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {5258, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}dx$$

$$\Big\downarrow \text{5258}$$

$$\int \left(\frac{a^2(d+ex+fx^2)}{(g+hx)^2}+\frac{2ab\arcsin(cx)(d+ex+fx^2)}{(g+hx)^2}+\frac{b^2\arcsin(cx)^2(d+ex+fx^2)}{(g+hx)^2}\right)dx$$

$$\Big\downarrow \text{2009}$$

$$\frac{ib^2(2fg-eh)\arcsin(cx)^3}{3h^3}+\frac{iab(2fg-eh)\arcsin(cx)^2}{h^3}+\frac{b^2fx\arcsin(cx)^2}{h^2}-\frac{b^2(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}-\frac{b^2(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)^2}{h^3}-\frac{b^2(fg^2-ehg+dh^2)\arcsin(cx)^2}{h^3(g+hx)}+\frac{2abfx\arcsin(cx)}{h^2}-\frac{2ab(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}-\frac{2ib^2c(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3\sqrt{c^2g^2-h^2}}-\frac{2ab(2fg-eh)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}+\frac{2ib^2c(fg^2-ehg+dh^2)\log\left(1-\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3\sqrt{c^2g^2-h^2}}+\frac{2ib^2(2fg-eh)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}+\frac{2ib^2(2fg-eh)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)\arcsin(cx)}{h^3}+\frac{2b^2f\sqrt{1-c^2x^2}\arcsin(cx)}{ch^2}-\frac{2ab(fg^2-ehg+dh^2)\arcsin(cx)}{h^3(g+hx)}+\frac{a^2fx}{h^2}-\frac{2b^2fx}{h^2}+\frac{2abc(fg^2-ehg+dh^2)\arctan\left(\frac{gxc^2+h}{\sqrt{c^2g^2-h^2}\sqrt{1-c^2x^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}-\frac{a^2(2fg-eh)\log(g+hx)}{h^3}+\frac{2iab(2fg-eh)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{2b^2c(fg^2-ehg+dh^2)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}+\frac{2iab(2fg-eh)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}+\frac{2b^2c(fg^2-ehg+dh^2)\text{PolyLog}\left(2,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3\sqrt{c^2g^2-h^2}}-\frac{2b^2(2fg-eh)\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg-\sqrt{c^2g^2-h^2}}\right)}{h^3}-\frac{2b^2(2fg-eh)\text{PolyLog}\left(3,\frac{ie^{i\arcsin(cx)}h}{cg+\sqrt{c^2g^2-h^2}}\right)}{h^3}+\frac{2abf\sqrt{1-c^2x^2}}{ch^2}-\frac{a^2(fg^2-ehg+dh^2)}{h^3(g+hx)}$$

input
```
Int[((d + e*x + f*x^2)*(a + b*ArcSin[c*x])^2)/(g + h*x)^2,x]
```

3.119. $\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx$

output
```
(a^2*f*x)/h^2 - (2*b^2*f*x)/h^2 - (a^2*(f*g^2 - e*g*h + d*h^2))/(h^3*(g +
h*x)) + (2*a*b*f*Sqrt[1 - c^2*x^2])/(c*h^2) + (2*a*b*f*x*ArcSin[c*x])/h^2
- (2*a*b*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x])/(h^3*(g + h*x)) + (2*b^2*f*S
qrt[1 - c^2*x^2]*ArcSin[c*x])/(c*h^2) + (I*a*b*(2*f*g - e*h)*ArcSin[c*x]^2
)/h^3 + (b^2*f*x*ArcSin[c*x]^2)/h^2 - (b^2*(f*g^2 - e*g*h + d*h^2)*ArcSin[
c*x]^2)/(h^3*(g + h*x)) + ((I/3)*b^2*(2*f*g - e*h)*ArcSin[c*x]^3)/h^3 + (2
*a*b*c*(f*g^2 - e*g*h + d*h^2)*ArcTan[(h + c^2*g*x)/(Sqrt[c^2*g^2 - h^2]*S
qrt[1 - c^2*x^2])])/(h^3*Sqrt[c^2*g^2 - h^2]) - (2*a*b*(2*f*g - e*h)*ArcSi
n[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 -
 ((2*I)*b^2*c*(f*g^2 - e*g*h + d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c
*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/(h^3*Sqrt[c^2*g^2 - h^2]) - (b^2*(2*
f*g - e*h)*ArcSin[c*x]^2*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g
^2 - h^2])])/h^3 - (2*a*b*(2*f*g - e*h)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin
[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 + ((2*I)*b^2*c*(f*g^2 - e*g*h
+ d*h^2)*ArcSin[c*x]*Log[1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 -
 h^2])])/(h^3*Sqrt[c^2*g^2 - h^2]) - (b^2*(2*f*g - e*h)*ArcSin[c*x]^2*Log[
1 - (I*E^(I*ArcSin[c*x])*h)/(c*g + Sqrt[c^2*g^2 - h^2])])/h^3 - (a^2*(2*f*
g - e*h)*Log[g + h*x])/h^3 + ((2*I)*a*b*(2*f*g - e*h)*PolyLog[2, (I*E^(I*A
rcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2])])/h^3 - (2*b^2*c*(f*g^2 - e*g*h
 + d*h^2)*PolyLog[2, (I*E^(I*ArcSin[c*x])*h)/(c*g - Sqrt[c^2*g^2 - h^2]...
```

### 3.119.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5258
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(Px_)*((d_) + (e_.)*(x_))^(m_.)
, x_Symbol] :> Int[ExpandIntegrand[Px*(d + e*x)^m*(a + b*ArcSin[c*x])^n, x]
, x] /; FreeQ[{a, b, c, d, e}, x] && PolynomialQ[Px, x] && IGtQ[n, 0] && In
tegerQ[m]
```

## 3.119.4 Maple [F]

$$\int \frac{(f\,x^2+ex+d)\,(a+b\arcsin{(cx)})^2}{(hx+g)^2}dx$$

input
```
int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x)
```

output
```
int((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x)
```

### 3.119.5 Fricas [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{(hx+g)^2}\,dx$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x, algorithm="fricas
")
```

output
```
integral((a^2*f*x^2 + a^2*e*x + a^2*d + (b^2*f*x^2 + b^2*e*x + b^2*d)*arcs
in(c*x)^2 + 2*(a*b*f*x^2 + a*b*e*x + a*b*d)*arcsin(c*x))/(h^2*x^2 + 2*g*h*
x + g^2), x)
```

### 3.119.6 Sympy [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(a+b\operatorname{asin}(cx))^2(d+ex+fx^2)}{(g+hx)^2}\,dx$$

input
```
integrate((f*x**2+e*x+d)*(a+b*asin(c*x))**2/(h*x+g)**2,x)
```

output
```
Integral((a + b*asin(c*x))**2*(d + e*x + f*x**2)/(g + h*x)**2, x)
```

### 3.119.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x, algorithm="maxima
")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(h-c*g>0)', see `assume?` for mor
e details)
```

### 3.119.8 Giac [F]

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(fx^2+ex+d)(b\arcsin(cx)+a)^2}{(hx+g)^2}\,dx$$

input
```
integrate((f*x^2+e*x+d)*(a+b*arcsin(c*x))^2/(h*x+g)^2,x, algorithm="giac")
```

output
```
integrate((f*x^2 + e*x + d)*(b*arcsin(c*x) + a)^2/(h*x + g)^2, x)
```

### 3.119.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(d+ex+fx^2)(a+b\arcsin(cx))^2}{(g+hx)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(f\,x^2+e\,x+d)}{(g+h\,x)^2}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x)^2,x)
```

output
```
int(((a + b*asin(c*x))^2*(d + e*x + f*x^2))/(g + h*x)^2, x)
```

# 3.120 $\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$



## 3.120.1 Optimal result

Integrand size = 33, antiderivative size = 520

$$\begin{aligned}
&\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx\\
&= -\frac{2b^2hx}{e}+\frac{2abh\sqrt{1-c^2x^2}}{ce}+\frac{2b^2h\sqrt{1-c^2x^2}\arcsin(cx)}{ce}+\frac{hx(a+b\arcsin(cx))^2}{e}\\
&\quad-\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{2abc(e^2f-d^2h)\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}\\
&\quad-\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}\\
&\quad+\frac{2ib^2c(e^2f-d^2h)\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}\\
&\quad-\frac{2b^2c(e^2f-d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}+\frac{2b^2c(e^2f-d^2h)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}
\end{aligned}$$

output
```
-2*b^2*h*x/e+h*x*(a+b*arcsin(c*x))^2/e-(f-d^2*h/e^2)*(a+b*arcsin(c*x))^2/(
e*x+d)+2*a*b*c*(-d^2*h+e^2*f)*arctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2
*x^2+1)^(1/2))/e^2/(c^2*d^2-e^2)^(1/2)-2*I*b^2*c*(-d^2*h+e^2*f)*arcsin(c*x
)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*
d^2-e^2)^(1/2)+2*I*b^2*c*(-d^2*h+e^2*f)*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*
x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)-2*b^2*c*(
-d^2*h+e^2*f)*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^
(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+2*b^2*c*(-d^2*h+e^2*f)*polylog(2,I*e*(I*c*
x+(-c^2*x^2+1)^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^2/(c^2*d^2-e^2)^(1/2)+2
*a*b*h*(-c^2*x^2+1)^(1/2)/c/e+2*b^2*h*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c/e
```

## 3.120.2 Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 307, normalized size of antiderivative = 0.59

$$\int \frac{(ef+2dhx+ehx^2)\,(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$$
$$= \frac{hx(a+b\arcsin(cx))^2}{e} - \frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex} - \frac{2bh\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)}{e} + \frac{2bc(e^2f-d^2h)\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)-b\,\mathrm{PolyLog}\left(2\right.}{e^2\sqrt{c^2d^2-e^2}}$$

input
```
Integrate[((e*f + 2*d*h*x + e*h*x^2)*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,x]
```

output
```
(h*x*(a + b*ArcSin[c*x])^2)/e - ((f - (d^2*h)/e^2)*(a + b*ArcSin[c*x])^2)/
(d + e*x) - (2*b*h*(b*x - (Sqrt[1 - c^2*x^2]*(a + b*ArcSin[c*x]))/c))/e +
(2*b*c*(e^2*f - d^2*h)*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcSin
[c*x]))/(-(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))/
(c*d + Sqrt[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d
- Sqrt[c^2*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt
[c^2*d^2 - e^2])]))/(e^2*Sqrt[c^2*d^2 - e^2])
```

### 3.120.3 Rubi [A] (verified)

Time = 1.86 (sec) , antiderivative size = 507, normalized size of antiderivative = 0.98, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5256, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2\left(2dhx+ef+ehx^2\right)}{(d+ex)^2}dx$$

$$\Big\downarrow \text{5256}$$

$$-2bc\int \frac{\left(\frac{hx}{e}-\frac{f-\frac{d^2h}{e^2}}{d+ex}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx-\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{hx(a+b\arcsin(cx))^2}{e}$$

$$\Big\downarrow \text{5298}$$

$$-2bc\int \left(\frac{b\arcsin(cx)\left(hd^2+ehxd+e^2hx^2-e^2f\right)}{e^2(d+ex)\sqrt{1-c^2x^2}}+\frac{a\left(hd^2+ehxd+e^2hx^2-e^2f\right)}{e^2(d+ex)\sqrt{1-c^2x^2}}\right)dx-\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{hx(a+b\arcsin(cx))^2}{e}$$

$$\Big\downarrow \text{2009}$$

$$-2bc\left(-\frac{a\left(e^2f-d^2h\right)\arctan\left(\frac{c^2dx+e}{\sqrt{1-c^2x^2}\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}-\frac{ah\sqrt{1-c^2x^2}}{c^2e}+\frac{b\left(e^2f-d^2h\right)\operatorname{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^2\sqrt{c^2d^2-e^2}}-\frac{b(\ldots}{}\right.$$
$$-\frac{\left(f-\frac{d^2h}{e^2}\right)(a+b\arcsin(cx))^2}{d+ex}+\frac{hx(a+b\arcsin(cx))^2}{e}$$

input
```
Int[((e*f + 2*d*h*x + e*h*x^2)*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,x]
```

output
```
(h*x*(a + b*ArcSin[c*x])^2)/e - ((f - (d^2*h)/e^2)*(a + b*ArcSin[c*x])^2)/
(d + e*x) - 2*b*c*((b*h*x)/(c*e) - (a*h*Sqrt[1 - c^2*x^2])/(c^2*e) - (b*h*
Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(c^2*e) - (a*(e^2*f - d^2*h)*ArcTan[(e + c^
2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1 - c^2*x^2])])/(e^2*Sqrt[c^2*d^2 - e^2])
 + (I*b*(e^2*f - d^2*h)*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d -
 Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) - (I*b*(e^2*f - d^2*h)*A
rcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/(
e^2*Sqrt[c^2*d^2 - e^2]) + (b*(e^2*f - d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[
c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/(e^2*Sqrt[c^2*d^2 - e^2]) - (b*(e^2*f
 - d^2*h)*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])
/(e^2*Sqrt[c^2*d^2 - e^2]))
```

### 3.120.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5256
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c
*n   Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[
p, 0] && EqQ[e*g - 2*d*h, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

## 3.120.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1250 vs. 2(520) = 1040.

Time = 3.86 (sec) , antiderivative size = 1251, normalized size of antiderivative = 2.41

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 1251 |
| derivativedivides | Expression too large to display | 1277 |
| default | Expression too large to display | 1277 |

input
```
int((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x,method=_RETURNVE
RBOSE)
```

output
```
a^2*(h/e*x-(-d^2*h+e^2*f)/e^2/(e*x+d))+2*b^2*h*arcsin(c*x)*(-c^2*x^2+1)^(1
/2)/c/e+b^2*h/e*arcsin(c*x)^2*x-2*b^2*h*x/e+b^2*c*arcsin(c*x)^2/e^2/(c*e*x
+c*d)*d^2*h-b^2*c*arcsin(c*x)^2/(c*e*x+c*d)*f+2*b^2*c*(-c^2*d^2+e^2)^(1/2)
/e^2/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-(-c^
2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*d^2*h-2*b^2*c*(-c^2*d^2+e^
2)^(1/2)/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e-
(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*f-2*b^2*c*(-c^2*d^2+e^
2)^(1/2)/e^2/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2)
)*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2*h+2*b^2*c*(-c^
2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(
1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f-2*I*b^2*c*(-
c^2*d^2+e^2)^(1/2)/e^2/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2
))*e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*h*d^2+2*I*b^2*c*(
-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*
e-(-c^2*d^2+e^2)^(1/2))/(I*d*c-(-c^2*d^2+e^2)^(1/2)))*f+2*I*b^2*c*(-c^2*d^
2+e^2)^(1/2)/e^2/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(
-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*h*d^2-2*I*b^2*c*(-c^2*d
^2+e^2)^(1/2)/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^
2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f+2*a*b/c*(arcsin(c*x)*h/e
*c*x+arcsin(c*x)*c^2/e^2/(c*e*x+c*d)*d^2*h-arcsin(c*x)*c^2/(c*e*x+c*d)*...
```

### 3.120.5 Fricas [F]

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \int \frac{(ehx^2+2\,dhx+ef)(b\arcsin(cx)+a)^2}{(ex+d)^2}\,dx$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm
="fricas")
```

output
```
integral((a^2*e*h*x^2 + 2*a^2*d*h*x + a^2*e*f + (b^2*e*h*x^2 + 2*b^2*d*h*x
 + b^2*e*f)*arcsin(c*x)^2 + 2*(a*b*e*h*x^2 + 2*a*b*d*h*x + a*b*e*f)*arcsin
(c*x))/(e^2*x^2 + 2*d*e*x + d^2), x)
```

### 3.120.6 Sympy [F]

$$\int \frac{(ef + 2dhx + ehx^2)(a + b\arcsin(cx))^2}{(d + ex)^2}\,dx = \int \frac{(a + b\operatorname{asin}(cx))^2 \cdot (2dhx + ef + ehx^2)}{(d + ex)^2}\,dx$$

input
```
integrate((e*h*x**2+2*d*h*x+e*f)*(a+b*asin(c*x))**2/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))**2*(2*d*h*x + e*f + e*h*x**2)/(d + e*x)**2, x)
```

### 3.120.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(ef + 2dhx + ehx^2)(a + b\arcsin(cx))^2}{(d + ex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm
="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.120.8 Giac [F]

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx=\int \frac{(ehx^2+2\,dhx+ef)(b\arcsin{(cx)}+a)^2}{(ex+d)^2}\,dx$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorithm
="giac")
```

output
```
integrate((e*h*x^2 + 2*d*h*x + e*f)*(b*arcsin(c*x) + a)^2/(e*x + d)^2, x)
```

### 3.120.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ef+2dhx+ehx^2)(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$$
$$=\int \frac{(a+b\,\mathrm{asin}(c\,x))^2\,(e\,h\,x^2+2\,d\,h\,x+e\,f)}{(d+e\,x)^2}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x))/(d + e*x)^2,x)
```

output
```
int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x))/(d + e*x)^2, x)
```

# 3.121 $\int \frac{(ef+2dhx+ehx^2)^2(a+b\arcsin(cx))^2}{(d+ex)^2} dx$

### 3.121.1 Optimal result

Integrand size = 35, antiderivative size = 920

$$\int \frac{(ef+2dhx+ehx^2)^2(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$$

$$\begin{aligned}
&= -\frac{4b^2h^2x}{9c^2} - \frac{2b^2h(2e^2f-d^2h)\,x}{e^2} - \frac{b^2dh^2x^2}{2e} - \frac{2}{27}b^2h^2x^3 \\
&+ \frac{abh(4e^2h+c^2(36e^2f-25d^2h))\sqrt{1-c^2x^2}}{9c^3e^2} + \frac{5abdh^2(d+ex)\sqrt{1-c^2x^2}}{9ce^2} \\
&+ \frac{2abh^2(d+ex)^2\sqrt{1-c^2x^2}}{9ce^2} - \frac{abd(2c^2d^2+3e^2)\,h^2\arcsin(cx)}{3c^2e^3} \\
&+ \frac{4b^2h^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c^3} + \frac{2b^2h(2e^2f-d^2h)\sqrt{1-c^2x^2}\arcsin(cx)}{ce^2} \\
&+ \frac{b^2dh^2x\sqrt{1-c^2x^2}\arcsin(cx)}{ce} + \frac{2b^2h^2x^2\sqrt{1-c^2x^2}\arcsin(cx)}{9c} \\
&- \frac{b^2d^3h^2\arcsin(cx)^2}{3e^3} - \frac{b^2dh^2\arcsin(cx)^2}{2c^2e} + \frac{2h(e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} \\
&- \frac{(e^2f-d^2h)^2(a+b\arcsin(cx))^2}{e^3(d+ex)} + \frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3} \\
&+ \frac{2abc(e^2f-d^2h)^2\arctan\left(\frac{e+c^2dx}{\sqrt{c^2d^2-e^2}\sqrt{1-c^2x^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&- \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&+ \frac{2ib^2c(e^2f-d^2h)^2\arcsin(cx)\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&- \frac{2b^2c(e^2f-d^2h)^2\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd-\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}} \\
&+ \frac{2b^2c(e^2f-d^2h)^2\,\text{PolyLog}\left(2,\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)}{e^3\sqrt{c^2d^2-e^2}}
\end{aligned}$$

output
```
-4/9*b^2*h^2*x/c^2-2*b^2*h*(-d^2*h+2*e^2*f)*x/e^2-1/2*b^2*d*h^2*x^2/e-2/27
*b^2*h^2*x^3-1/3*a*b*d*(2*c^2*d^2+3*e^2)*h^2*arcsin(c*x)/c^2/e^3-1/3*b^2*d
^3*h^2*arcsin(c*x)^2/e^3-1/2*b^2*d*h^2*arcsin(c*x)^2/c^2/e+2*h*(-d^2*h+e^2
*f)*x*(a+b*arcsin(c*x))^2/e^2-(-d^2*h+e^2*f)^2*(a+b*arcsin(c*x))^2/e^3/(e*
x+d)+1/3*h^2*(e*x+d)^3*(a+b*arcsin(c*x))^2/e^3+2*a*b*c*(-d^2*h+e^2*f)^2*ar
ctan((c^2*d*x+e)/(c^2*d^2-e^2)^(1/2)/(-c^2*x^2+1)^(1/2))/e^3/(c^2*d^2-e^2)
^(1/2)+2*I*b^2*c*(-d^2*h+e^2*f)^2*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)
^(1/2))/(c*d+(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)-2*I*b^2*c*(-d^2
*h+e^2*f)^2*arcsin(c*x)*ln(1-I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-
e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)-2*b^2*c*(-d^2*h+e^2*f)^2*polylog(2,I*
e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c*d-(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^
(1/2)+2*b^2*c*(-d^2*h+e^2*f)^2*polylog(2,I*e*(I*c*x+(-c^2*x^2+1)^(1/2))/(c
*d+(c^2*d^2-e^2)^(1/2)))/e^3/(c^2*d^2-e^2)^(1/2)+1/9*a*b*h*(4*e^2*h+c^2*(-
25*d^2*h+36*e^2*f))*(-c^2*x^2+1)^(1/2)/c^3/e^2+5/9*a*b*d*h^2*(e*x+d)*(-c^2
*x^2+1)^(1/2)/c/e^2+2/9*a*b*h^2*(e*x+d)^2*(-c^2*x^2+1)^(1/2)/c/e^2+4/9*b^2
*h^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c^3+2*b^2*h*(-d^2*h+2*e^2*f)*arcsin(c*
x)*(-c^2*x^2+1)^(1/2)/c/e^2+b^2*d*h^2*x*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c/e
+2/9*b^2*h^2*x^2*arcsin(c*x)*(-c^2*x^2+1)^(1/2)/c
```

### 3.121.2 Mathematica [A] (verified)

Time = 0.95 (sec) , antiderivative size = 526, normalized size of antiderivative = 0.57

$$\int \frac{(ef+2dhx+ehx^2)^2(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \frac{h(2e^2f-d^2h)\,x(a+b\arcsin(cx))^2}{e^2} + \frac{dh^2x^2(a+b\arcsin(cx))^2}{e} + \frac{1}{3}h^2x^3(a+b\arcsin(cx))^2 - \frac{(e^2f-d^2h)^2(a+b\arcsin(cx))^2}{e^3(d+ex)} - \frac{2bh^2\left(-3a\sqrt{1-c^2x^2}(2+c^2x^2)+bcx(6+c^2x^2)-3b\sqrt{1-c^2x^2}(2+c^2x^2)\arcsin(cx)\right)}{27c^3} - \frac{2bh(2e^2f-d^2h)\left(bx-\frac{\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}\right)}{e^2} - \frac{bdh^2\left(bx^2-\frac{2x\sqrt{1-c^2x^2}(a+b\arcsin(cx))}{c}+\frac{(a+b\arcsin(cx))^2}{bc^2}\right)}{2e} + \frac{2bc(e^2f-d^2h)^2\left(-i(a+b\arcsin(cx))\left(\log\left(1+\frac{iee^{i\arcsin(cx)}}{-cd+\sqrt{c^2d^2-e^2}}\right)-\log\left(1-\frac{iee^{i\arcsin(cx)}}{cd+\sqrt{c^2d^2-e^2}}\right)\right)-b\,\mathrm{PolyLog}\left(\right.\right.}{e^3\sqrt{c^2d^2-e^2}}$$

input
```
Integrate[((e*f + 2*d*h*x + e*h*x^2)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,
x]
```

output
```
(h*(2*e^2*f - d^2*h)*x*(a + b*ArcSin[c*x])^2)/e^2 + (d*h^2*x^2*(a + b*ArcS
in[c*x])^2)/e + (h^2*x^3*(a + b*ArcSin[c*x])^2)/3 - ((e^2*f - d^2*h)^2*(a
+ b*ArcSin[c*x])^2)/(e^3*(d + e*x)) - (2*b*h^2*(-3*a*Sqrt[1 - c^2*x^2]*(2
+ c^2*x^2) + b*c*x*(6 + c^2*x^2) - 3*b*Sqrt[1 - c^2*x^2]*(2 + c^2*x^2)*Arc
Sin[c*x]))/(27*c^3) - (2*b*h*(2*e^2*f - d^2*h)*(b*x - (Sqrt[1 - c^2*x^2]*(
a + b*ArcSin[c*x]))/c))/e^2 - (b*d*h^2*(b*x^2 - (2*x*Sqrt[1 - c^2*x^2]*(a
+ b*ArcSin[c*x]))/c + (a + b*ArcSin[c*x])^2/(b*c^2)))/(2*e) + (2*b*c*(e^2*
f - d^2*h)^2*((-I)*(a + b*ArcSin[c*x])*(Log[1 + (I*e*E^(I*ArcSin[c*x]))/(-
(c*d) + Sqrt[c^2*d^2 - e^2])] - Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqr
t[c^2*d^2 - e^2])]) - b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2
*d^2 - e^2])] + b*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d + Sqrt[c^2*d^2 -
 e^2])]))/(e^3*Sqrt[c^2*d^2 - e^2])
```

## 3.121.3 Rubi [A] (verified)

Time = 4.01 (sec) , antiderivative size = 888, normalized size of antiderivative = 0.97, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.114$, Rules used = {5256, 27, 5298, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(cx))^2 \left(2dhx+ef+ehx^2\right)^2}{(d+ex)^2}dx$$

$$\Big\downarrow \text{ 5256}$$

$$-2bc\int \frac{\left(h^2(d+ex)^3+6eh\left(e^2f-d^2h\right)x-\frac{3\left(e^2f-d^2h\right)^2}{d+ex}\right)(a+b\arcsin(cx))}{3e^3\sqrt{1-c^2x^2}}dx+\frac{2hx\left(e^2f-d^2h\right)(a+b\arcsin(cx))^2}{e^2}-\frac{\left(e^2f-d^2h\right)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}+\frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3}$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{2bc\int \frac{\left(h^2(d+ex)^3+6eh\left(e^2f-d^2h\right)x-\frac{3\left(e^2f-d^2h\right)^2}{d+ex}\right)(a+b\arcsin(cx))}{\sqrt{1-c^2x^2}}dx}{3e^3}+\frac{2hx\left(e^2f-d^2h\right)(a+b\arcsin(cx))^2}{e^2}-\frac{\left(e^2f-d^2h\right)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}+\frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3}$$

$\downarrow$ 5298

$$-\frac{2bc\int\left(\frac{b\arcsin(cx)\left(-2h^2d^4+6e^2fhd^2+4e^3h^2x^3d+2eh\left(3e^2f-d^2h\right)xd+e^4h^2x^4-3e^4f^2+6e^4fhx^2\right)}{(d+ex)\sqrt{1-c^2x^2}}+\frac{a\left(-2h^2d^4+6e^2fhd^2+4e^3h^2x^3d+2eh(\ldots\right.}{(d+ex)\ldots}\right.}{3e^3}$$
$$\frac{2hx\left(e^2f-d^2h\right)(a+b\arcsin(cx))^2}{e^2}-\frac{\left(e^2f-d^2h\right)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}+$$
$$\frac{h^2(d+ex)^3(a+b\arcsin(cx))^2}{3e^3}$$

$\downarrow$ 2009

$$\frac{h^2(a+b\arcsin(cx))^2(d+ex)^3}{3e^3}+\frac{2h\left(e^2f-d^2h\right)x(a+b\arcsin(cx))^2}{e^2}-$$
$$\frac{2bc\left(\frac{bh^2\arcsin(cx)^2d^3}{2c}+\frac{3be^2h^2x^2d}{4c}+\frac{3be^2h^2\arcsin(cx)^2d}{4c^3}+\frac{a\left(2c^2d^2+3e^2\right)h^2\arcsin(cx)d}{2c^3}-\frac{3be^2h^2x\sqrt{1-c^2x^2}\arcsin(cx)d}{2c^2}-\frac{5aeh^2(d+e\ldots}{\ldots}\right.}{}$$
$$\frac{\left(e^2f-d^2h\right)^2(a+b\arcsin(cx))^2}{e^3(d+ex)}$$

input
```
Int[((e*f + 2*d*h*x + e*h*x^2)^2*(a + b*ArcSin[c*x])^2)/(d + e*x)^2,x]
```

output
```
(2*h*(e^2*f - d^2*h)*x*(a + b*ArcSin[c*x])^2)/e^2 - ((e^2*f - d^2*h)^2*(a
+ b*ArcSin[c*x])^2)/(e^3*(d + e*x)) + (h^2*(d + e*x)^3*(a + b*ArcSin[c*x])
^2)/(3*e^3) - (2*b*c*((2*b*e^3*h^2*x)/(3*c^3) + (3*b*e*h*(2*e^2*f - d^2*h)
*x)/c + (3*b*d*e^2*h^2*x^2)/(4*c) + (b*e^3*h^2*x^3)/(9*c) - (a*e*h*(4*e^2*
h + c^2*(36*e^2*f - 25*d^2*h))*Sqrt[1 - c^2*x^2])/(6*c^4) - (5*a*d*e*h^2*(
d + e*x)*Sqrt[1 - c^2*x^2])/(6*c^2) - (a*e*h^2*(d + e*x)^2*Sqrt[1 - c^2*x^
2])/(3*c^2) + (a*d*(2*c^2*d^2 + 3*e^2)*h^2*ArcSin[c*x])/(2*c^3) - (2*b*e^3
*h^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^4) - (3*b*e*h*(2*e^2*f - d^2*h)*S
qrt[1 - c^2*x^2]*ArcSin[c*x])/c^2 - (3*b*d*e^2*h^2*x*Sqrt[1 - c^2*x^2]*Arc
Sin[c*x])/(2*c^2) - (b*e^3*h^2*x^2*Sqrt[1 - c^2*x^2]*ArcSin[c*x])/(3*c^2)
+ (b*d^3*h^2*ArcSin[c*x]^2)/(2*c) + (3*b*d*e^2*h^2*ArcSin[c*x]^2)/(4*c^3)
- (3*a*(e^2*f - d^2*h)^2*ArcTan[(e + c^2*d*x)/(Sqrt[c^2*d^2 - e^2]*Sqrt[1
- c^2*x^2])])/Sqrt[c^2*d^2 - e^2] + ((3*I)*b*(e^2*f - d^2*h)^2*ArcSin[c*x]
*Log[1 - (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/Sqrt[c^2*d^
2 - e^2] - ((3*I)*b*(e^2*f - d^2*h)^2*ArcSin[c*x]*Log[1 - (I*e*E^(I*ArcSin
[c*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/Sqrt[c^2*d^2 - e^2] + (3*b*(e^2*f -
d^2*h)^2*PolyLog[2, (I*e*E^(I*ArcSin[c*x]))/(c*d - Sqrt[c^2*d^2 - e^2])])/
Sqrt[c^2*d^2 - e^2] - (3*b*(e^2*f - d^2*h)^2*PolyLog[2, (I*e*E^(I*ArcSin[c
*x]))/(c*d + Sqrt[c^2*d^2 - e^2])])/Sqrt[c^2*d^2 - e^2]))/(3*e^3)
```

## 3.121. $\int \frac{\left(ef+2dhx+ehx^2\right)^2(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx$

### 3.121.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5256
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.) + (g_.)*(x_) + (h_.)*(x
_)^2)^(p_.))/((d_) + (e_.)*(x_))^2, x_Symbol] :> With[{u = IntHide[(f + g*x
 + h*x^2)^p/(d + e*x)^2, x]}, Simp[(a + b*ArcSin[c*x])^n   u, x] - Simp[b*c
*n   Int[SimplifyIntegrand[u*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g, h}, x] && IGtQ[n, 0] && IGtQ[
p, 0] && EqQ[e*g - 2*d*h, 0]
```

rule 5298
```
Int[(ArcSin[(c_.)*(x_)]*(b_.) + (a_))^(n_.)*(RFx_)*((d_) + (e_.)*(x_)^2)^(p
_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p, RFx*(a + b*ArcSin[c*x])
^n, x], x] /; FreeQ[{a, b, c, d, e}, x] && RationalFunctionQ[RFx, x] && IGt
Q[n, 0] && EqQ[c^2*d + e, 0] && IntegerQ[p - 1/2]
```

## 3.121.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 2173 vs. $2(886) = 1772$.

Time = 3.88 (sec) , antiderivative size = 2174, normalized size of antiderivative = 2.36

| method | result | size |
|---|---|---|
| parts | Expression too large to display | 2174 |
| derivativedivides | Expression too large to display | 2208 |
| default | Expression too large to display | 2208 |

input
```
int((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x,method=_RETURN
VERBOSE)
```

output
```
a^2*(h/e^2*(1/3*x^3*e^2*h+x^2*d*e*h-d^2*h*x+2*e^2*f*x)-(d^4*h^2-2*d^2*e^2*
f*h+e^4*f^2)/e^3/(e*x+d))+b^2/c*(1/8/c*d*h^2*(2*I*arcsin(c*x)+2*arcsin(c*x
)^2-1)/e*(2*c^2*x^2-2*I*c*x*(-c^2*x^2+1)^(1/2)-1)-1/8*(c*x+I*(-c^2*x^2+1)^
(1/2))*h*(4*c^2*d^2*h-8*c^2*e^2*f-e^2*h)*(arcsin(c*x)^2-2-2*I*arcsin(c*x))
/c^2/e^2+4*I*(-c^2*d^2+e^2)^(1/2)/e/(c^2*d^2-e^2)*dilog((I*d*c+(I*c*x+(-c^
2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*f*h*
c^2*d^2+1/8*(2*I*c*x*(-c^2*x^2+1)^(1/2)+2*c^2*x^2-1)*d*h^2*(-2*I*arcsin(c*
x)+2*arcsin(c*x)^2-1)/c/e-(d^4*h^2-2*d^2*e^2*f*h+e^4*f^2)*arcsin(c*x)^2*c^
2/e^3/(c*e*x+c*d)-2*(-c^2*d^2+e^2)^(1/2)/e^3/(c^2*d^2-e^2)*c^2*arcsin(c*x)
*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I*d*c+(-c
^2*d^2+e^2)^(1/2)))*d^4*h^2+4*(-c^2*d^2+e^2)^(1/2)/e/(c^2*d^2-e^2)*c^2*arc
sin(c*x)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1/2))/(-I
*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2*f*h-2*(-c^2*d^2+e^2)^(1/2)/(c^2*d^2-e^2)*e
*c^2*arcsin(c*x)*ln((-I*d*c-(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^2)^(1
/2))/(-I*d*c+(-c^2*d^2+e^2)^(1/2)))*f^2+2*(-c^2*d^2+e^2)^(1/2)/e^3/(c^2*d^
2-e^2)*c^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*d^2+e^
2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^4*h^2-4*(-c^2*d^2+e^2)^(1/2)/e/(
c^2*d^2-e^2)*c^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))*e+(-c^2*
d^2+e^2)^(1/2))/(I*d*c+(-c^2*d^2+e^2)^(1/2)))*d^2*f*h+2*(-c^2*d^2+e^2)^(1/
2)/(c^2*d^2-e^2)*e*c^2*arcsin(c*x)*ln((I*d*c+(I*c*x+(-c^2*x^2+1)^(1/2))...
```

### 3.121.5 Fricas [F]

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b\arcsin(cx))^2}{(d + ex)^2} dx$$
$$= \int \frac{(ehx^2 + 2\,dhx + ef)^2 (b\arcsin(cx) + a)^2}{(ex + d)^2} dx$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorit
hm="fricas")
```

output
```
integral((a^2*e^2*h^2*x^4 + 4*a^2*d*e*h^2*x^3 + 4*a^2*d*e*f*h*x + a^2*e^2*
f^2 + 2*(a^2*e^2*f*h + 2*a^2*d^2*h^2)*x^2 + (b^2*e^2*h^2*x^4 + 4*b^2*d*e*h
^2*x^3 + 4*b^2*d*e*f*h*x + b^2*e^2*f^2 + 2*(b^2*e^2*f*h + 2*b^2*d^2*h^2)*x
^2)*arcsin(c*x)^2 + 2*(a*b*e^2*h^2*x^4 + 4*a*b*d*e*h^2*x^3 + 4*a*b*d*e*f*h
*x + a*b*e^2*f^2 + 2*(a*b*e^2*f*h + 2*a*b*d^2*h^2)*x^2)*arcsin(c*x))/(e^2*
x^2 + 2*d*e*x + d^2), x)
```

### 3.121.6 Sympy [F]

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b \arcsin(cx))^2}{(d + ex)^2} dx = \int \frac{(a + b \operatorname{asin}(cx))^2 (2dhx + ef + ehx^2)^2}{(d + ex)^2} dx$$

input
```
integrate((e*h*x**2+2*d*h*x+e*f)**2*(a+b*asin(c*x))**2/(e*x+d)**2,x)
```

output
```
Integral((a + b*asin(c*x))**2*(2*d*h*x + e*f + e*h*x**2)**2/(d + e*x)**2,
x)
```

### 3.121.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b \arcsin(cx))^2}{(d + ex)^2} dx = \text{Exception raised: ValueError}$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorit
hm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((e-c*d)*(e+c*d)>0)', see `assume
?` for mor
```

### 3.121.8 Giac [F]

$$\int \frac{(ef + 2dhx + ehx^2)^2 (a + b \arcsin(cx))^2}{(d + ex)^2} dx$$
$$= \int \frac{(ehx^2 + 2\,dhx + ef)^2 (b \arcsin(cx) + a)^2}{(ex + d)^2} dx$$

input
```
integrate((e*h*x^2+2*d*h*x+e*f)^2*(a+b*arcsin(c*x))^2/(e*x+d)^2,x, algorit
hm="giac")
```

output
```
integrate((e*h*x^2 + 2*d*h*x + e*f)^2*(b*arcsin(c*x) + a)^2/(e*x + d)^2, x
)
```

### 3.121.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\left(ef+2dhx+ehx^2\right)^2(a+b\arcsin(cx))^2}{(d+ex)^2}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c\,x)\right)^2\,\left(e\,h\,x^2+2\,d\,h\,x+e\,f\right)^2}{\left(d+e\,x\right)^2}\,dx$$

input
```
int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x)^2)/(d + e*x)^2,x)
```

output
```
int(((a + b*asin(c*x))^2*(e*f + e*h*x^2 + 2*d*h*x)^2)/(d + e*x)^2, x)
```

# 3.122 $\int x^3 \arcsin(a+bx)\,dx$



## 3.122.1 Optimal result

Integrand size = 10, antiderivative size = 137

$$\int x^3 \arcsin(a+bx)\,dx = -\frac{7ax^2\sqrt{1-(a+bx)^2}}{48b^2}+\frac{x^3\sqrt{1-(a+bx)^2}}{16b} - \frac{(4a(16+19a^2)-(9+26a^2)(a+bx))\sqrt{1-(a+bx)^2}}{96b^4} - \frac{(3+24a^2+8a^4)\arcsin(a+bx)}{32b^4}+\frac{1}{4}x^4\arcsin(a+bx)$$

output
```
-1/32*(8*a^4+24*a^2+3)*arcsin(b*x+a)/b^4+1/4*x^4*arcsin(b*x+a)-7/48*a*x^2*
(1-(b*x+a)^2)^(1/2)/b^2+1/16*x^3*(1-(b*x+a)^2)^(1/2)/b-1/96*(4*a*(19*a^2+1
6)-(26*a^2+9)*(b*x+a))*(1-(b*x+a)^2)^(1/2)/b^4
```

## 3.122.2 Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.72

$$\int x^3 \arcsin(a+bx)\,dx = \frac{\sqrt{1-a^2-2abx-b^2x^2}(-50a^3+9bx+26a^2bx+6b^3x^3-a(55+14b^2x^2))-3(3+24a^2+8a^4-8b^4x^4)\,a}{96b^4}$$

input
```
Integrate[x^3*ArcSin[a + b*x],x]
```

output
```
(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-50*a^3 + 9*b*x + 26*a^2*b*x + 6*b^3*x
^3 - a*(55 + 14*b^2*x^2)) - 3*(3 + 24*a^2 + 8*a^4 - 8*b^4*x^4)*ArcSin[a +
b*x])/(96*b^4)
```

## 3.122.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.21, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5304, 25, 27, 5242, 497, 25, 687, 25, 676, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3 \arcsin(a+bx)\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int x^3 \arcsin(a+bx)d(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -x^3 \arcsin(a+bx)d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\frac{\int -b^3x^3 \arcsin(a+bx)d(a+bx)}{b^4}$$

$$\Big\downarrow \text{5242}$$

$$-\frac{\frac{1}{4}\int \frac{b^4x^4}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{4}b^4x^4\arcsin(a+bx)}{b^4}$$

$$\Big\downarrow \text{497}$$

$$-\frac{\frac{1}{4}\left(-\frac{1}{4}\int -\frac{b^2x^2(4a^2-7(a+bx)a+3)}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{4}b^3x^3\sqrt{1-(a+bx)^2}\right)-\frac{1}{4}b^4x^4\arcsin(a+bx)}{b^4}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\frac{1}{4}\left(\frac{1}{4}\int \frac{b^2x^2(4a^2-7(a+bx)a+3)}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{4}b^3x^3\sqrt{1-(a+bx)^2}\right)-\frac{1}{4}b^4x^4\arcsin(a+bx)}{b^4}$$

$$\Big\downarrow \text{687}$$

$$-\frac{\frac{1}{4}\left(\frac{1}{4}\left(\frac{7}{3}ab^2x^2\sqrt{1-(a+bx)^2}-\frac{1}{3}\int\frac{bx\left(a\left(12a^2+23\right)-\left(26a^2+9\right)(a+bx)\right)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)-\frac{1}{4}b^3x^3\sqrt{1-(a+bx)^2}\right)-\frac{1}{4}b^4x^4\text{ ar}}{b^4}$$

$\big\downarrow$ 25

$$-\frac{\frac{1}{4}\left(\frac{1}{4}\left(\frac{1}{3}\int-\frac{bx\left(a\left(12a^2+23\right)-\left(26a^2+9\right)(a+bx)\right)}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{7}{3}ab^2x^2\sqrt{1-(a+bx)^2}\right)-\frac{1}{4}b^3x^3\sqrt{1-(a+bx)^2}\right)-\frac{1}{4}b^4x^4\text{ a}}{b^4}$$

$\big\downarrow$ 676

$$-\frac{\frac{1}{4}\left(\frac{1}{4}\left(\frac{1}{3}\left(\frac{3}{2}\left(8a^4+24a^2+3\right)\int\frac{1}{\sqrt{1-(a+bx)^2}}d(a+bx)+2a\left(19a^2+16\right)\sqrt{1-(a+bx)^2}-\frac{1}{2}\left(26a^2+9\right)(a+bx)\sqrt{1}\right.\right.\right.}{b^4}$$

$\big\downarrow$ 223

$$-\frac{\frac{1}{4}\left(\frac{1}{4}\left(\frac{1}{3}\left(2a\left(19a^2+16\right)\sqrt{1-(a+bx)^2}-\frac{1}{2}\left(26a^2+9\right)(a+bx)\sqrt{1-(a+bx)^2}+\frac{3}{2}\left(8a^4+24a^2+3\right)\arcsin(a+\right.\right.\right.}{b^4}$$

input
```
Int[x^3*ArcSin[a + b*x],x]
```

output
```
-((-1/4*(b^4*x^4*ArcSin[a + b*x]) + (-1/4*(b^3*x^3*Sqrt[1 - (a + b*x)^2])
+ ((7*a*b^2*x^2*Sqrt[1 - (a + b*x)^2])/3 + (2*a*(16 + 19*a^2)*Sqrt[1 - (a
+ b*x)^2] - ((9 + 26*a^2)*(a + b*x)*Sqrt[1 - (a + b*x)^2])/2 + (3*(3 + 24*
a^2 + 8*a^4)*ArcSin[a + b*x])/2)/3)/4)/4)/b^4)
```

### 3.122.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 497
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n - 1)*((a + b*x^2)^(p + 1)/(b*(n + 2*p + 1))), x] + Simp[1/(b
*(n + 2*p + 1))   Int[(c + d*x)^(n - 2)*(a + b*x^2)^p*Simp[b*c^2*(n + 2*p +
 1) - a*d^2*(n - 1) + 2*b*c*d*(n + p)*x, x], x], x] /; FreeQ[{a, b, c, d, n
, p}, x] && If[RationalQ[n], GtQ[n, 1], SumSimplerQ[n, -2]] && NeQ[n + 2*p
+ 1, 0] && IntQuadraticQ[a, 0, b, c, d, n, p, x]
```

rule 676
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(e*f + d*g)*((a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + (Sim
p[e*g*x*((a + c*x^2)^(p + 1)/(c*(2*p + 3))), x] - Simp[(a*e*g - c*d*f*(2*p
+ 3))/(c*(2*p + 3))   Int[(a + c*x^2)^p, x], x]) /; FreeQ[{a, c, d, e, f, g
, p}, x] &&  !LeQ[p, -1]
```

rule 687
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + c*x^2)^(p + 1)/(c*(m + 2*p + 2))
), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1)*(a + c*x^2)^p*Simp
[c*d*f*(m + 2*p + 2) - a*e*g*m + c*(e*f*(m + 2*p + 2) + d*g*m)*x, x], x], x
] /; FreeQ[{a, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] &&
 (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && Eq
Q[f, 0])
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.122. $\int x^3 \arcsin(a+bx)\,dx$

### 3.122.4 Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 213, normalized size of antiderivative = 1.55

| method | result |
|---|---|
| derivativedivides | $\frac{-\arcsin(bx+a)a^3(bx+a)+\frac{3\arcsin(bx+a)a^2(bx+a)^2}{2}-\arcsin(bx+a)a(bx+a)^3+\frac{\arcsin(bx+a)(bx+a)^4}{4}+\frac{(bx+a)^3\sqrt{1-(bx+a)^2}}{16}}{}$ |
| default | $\frac{-\arcsin(bx+a)a^3(bx+a)+\frac{3\arcsin(bx+a)a^2(bx+a)^2}{2}-\arcsin(bx+a)a(bx+a)^3+\frac{\arcsin(bx+a)(bx+a)^4}{4}+\frac{(bx+a)^3\sqrt{1-(bx+a)^2}}{16}}{}$ |
| parts | $\frac{x^4\arcsin(bx+a)}{4}-\frac{b\left(-\frac{x^3\sqrt{-b^2x^2-2abx-a^2+1}}{4b^2}-\frac{7a\left(-\frac{x^2\sqrt{-b^2x^2-2abx-a^2+1}}{3b^2}-\frac{5a\left(-\frac{x\sqrt{-b^2x^2-2abx-a^2+1}}{2b^2}-\frac{3a\left(-\frac{\sqrt{-}}{}\right.}{}\right.}{}\right.}{}\right.}{}$ |

input
```
int(x^3*arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
1/b^4*(-arcsin(b*x+a)*a^3*(b*x+a)+3/2*arcsin(b*x+a)*a^2*(b*x+a)^2-arcsin(b
*x+a)*a*(b*x+a)^3+1/4*arcsin(b*x+a)*(b*x+a)^4+1/16*(b*x+a)^3*(1-(b*x+a)^2)
^(1/2)+3/32*(b*x+a)*(1-(b*x+a)^2)^(1/2)-3/32*arcsin(b*x+a)-a^3*(1-(b*x+a)^
2)^(1/2)-3/2*a^2*(-1/2*(b*x+a)*(1-(b*x+a)^2)^(1/2)+1/2*arcsin(b*x+a))+a*(-
1/3*(b*x+a)^2*(1-(b*x+a)^2)^(1/2)-2/3*(1-(b*x+a)^2)^(1/2)))
```

### 3.122.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.68

$$\int x^3 \arcsin(a+bx)\,dx$$
$$= \frac{3\,(8\,b^4x^4 - 8\,a^4 - 24\,a^2 - 3)\arcsin\left(bx+a\right) + (6\,b^3x^3 - 14\,ab^2x^2 - 50\,a^3 + (26\,a^2+9)bx - 55\,a)\sqrt{-b^2x^2 \cdots}}{96\,b^4}$$

input
```
integrate(x^3*arcsin(b*x+a),x, algorithm="fricas")
```

output
```
1/96*(3*(8*b^4*x^4 - 8*a^4 - 24*a^2 - 3)*arcsin(b*x + a) + (6*b^3*x^3 - 14
*a*b^2*x^2 - 50*a^3 + (26*a^2 + 9)*b*x - 55*a)*sqrt(-b^2*x^2 - 2*a*b*x - a
^2 + 1))/b^4
```

### 3.122.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 255 vs. 2(119) = 238.

Time = 0.33 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.86

$$\int x^3 \arcsin(a+bx)\,dx$$
$$= \begin{cases} -\frac{a^4 \operatorname{asin}(a+bx)}{4b^4} - \frac{25a^3\sqrt{-a^2-2abx-b^2x^2+1}}{48b^4} + \frac{13a^2x\sqrt{-a^2-2abx-b^2x^2+1}}{48b^3} - \frac{3a^2 \operatorname{asin}(a+bx)}{4b^4} - \frac{7ax^2\sqrt{-a^2-2abx-b^2x^2+1}}{48b^2} - \frac{55a \cdots}{} \\ \frac{x^4 \operatorname{asin}(a)}{4} \end{cases}$$

input
```
integrate(x**3*asin(b*x+a),x)
```

output
```
Piecewise((-a**4*asin(a + b*x)/(4*b**4) - 25*a**3*sqrt(-a**2 - 2*a*b*x - b
**2*x**2 + 1)/(48*b**4) + 13*a**2*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/
(48*b**3) - 3*a**2*asin(a + b*x)/(4*b**4) - 7*a*x**2*sqrt(-a**2 - 2*a*b*x
- b**2*x**2 + 1)/(48*b**2) - 55*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(9
6*b**4) + x**4*asin(a + b*x)/4 + x**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1
)/(16*b) + 3*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(32*b**3) - 3*asin(a
+ b*x)/(32*b**4), Ne(b, 0)), (x**4*asin(a)/4, True))
```

### 3.122.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 333 vs. $2(120) = 240$.

Time = 0.28 (sec) , antiderivative size = 333, normalized size of antiderivative = 2.43

$$\int x^3 \arcsin(a+bx)\,dx = \frac{1}{4}x^4 \arcsin(bx+a) + \frac{1}{96}\left(\frac{6\sqrt{-b^2x^2-2\,abx-a^2+1}x^3}{b^2} - \frac{14\sqrt{-b^2x^2-2\,abx-a^2+1}ax^2}{b^3} + \frac{105\,a^4\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^5}\right.$$

input
```
integrate(x^3*arcsin(b*x+a),x, algorithm="maxima")
```

output
```
1/4*x^4*arcsin(b*x + a) + 1/96*(6*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*x^3/b
^2 - 14*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*a*x^2/b^3 + 105*a^4*arcsin(-(b^
2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^5 + 35*sqrt(-b^2*x^2 - 2*a*b*x
 - a^2 + 1)*a^2*x/b^4 - 90*(a^2 - 1)*a^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^
2 - (a^2 - 1)*b^2))/b^5 - 105*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*a^3/b^5 -
 9*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a^2 - 1)*x/b^4 + 9*(a^2 - 1)^2*arcs
in(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^5 + 55*sqrt(-b^2*x^2 -
2*a*b*x - a^2 + 1)*(a^2 - 1)*a/b^5)*b
```

### 3.122.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 284 vs. $2(120) = 240$.

Time = 0.30 (sec) , antiderivative size = 284, normalized size of antiderivative = 2.07

$$\int x^3 \arcsin(a+bx)\,dx = -\frac{(bx+a)a^3 \arcsin(bx+a)}{b^4} - \frac{\left((bx+a)^2-1\right)(bx+a)a \arcsin(bx+a)}{b^4} + \frac{3\left((bx+a)^2-1\right)a^2 \arcsin(bx+a)}{2\,b^4} + \frac{3\sqrt{-(bx+a)^2+1}(bx+a)a^2}{4\,b^4} - \frac{\sqrt{-(bx+a)^2+1}a^3}{b^4} + \frac{\left((bx+a)^2-1\right)^2 \arcsin(bx+a)}{4\,b^4} - \frac{(bx+a)a \arcsin(bx+a)}{b^4} + \frac{3\,a^2 \arcsin(bx+a)}{4\,b^4} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}(bx+a)}{16\,b^4} + \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}a}{3\,b^4} + \frac{\left((bx+a)^2-1\right)\arcsin(bx+a)}{2\,b^4} + \frac{5\sqrt{-(bx+a)^2+1}(bx+a)}{32\,b^4} - \frac{\sqrt{-(bx+a)^2+1}a}{b^4} + \frac{5\,\arcsin(bx+a)}{32\,b^4}$$

input
```
integrate(x^3*arcsin(b*x+a),x, algorithm="giac")
```

output
```
-(b*x + a)*a^3*arcsin(b*x + a)/b^4 - ((b*x + a)^2 - 1)*(b*x + a)*a*arcsin(
b*x + a)/b^4 + 3/2*((b*x + a)^2 - 1)*a^2*arcsin(b*x + a)/b^4 + 3/4*sqrt(-(
b*x + a)^2 + 1)*(b*x + a)*a^2/b^4 - sqrt(-(b*x + a)^2 + 1)*a^3/b^4 + 1/4*(
(b*x + a)^2 - 1)^2*arcsin(b*x + a)/b^4 - (b*x + a)*a*arcsin(b*x + a)/b^4 +
 3/4*a^2*arcsin(b*x + a)/b^4 - 1/16*(-(b*x + a)^2 + 1)^(3/2)*(b*x + a)/b^4
 + 1/3*(-(b*x + a)^2 + 1)^(3/2)*a/b^4 + 1/2*((b*x + a)^2 - 1)*arcsin(b*x +
 a)/b^4 + 5/32*sqrt(-(b*x + a)^2 + 1)*(b*x + a)/b^4 - sqrt(-(b*x + a)^2 +
1)*a/b^4 + 5/32*arcsin(b*x + a)/b^4
```

3.122. $\int x^3 \arcsin(a+bx)\,dx$

### 3.122.9 Mupad [F(-1)]

Timed out.

$$\int x^3 \arcsin(a+bx)\,dx = \int x^3\,\mathrm{asin}(a+b\,x)\;dx$$

input
```
int(x^3*asin(a + b*x),x)
```

output
```
int(x^3*asin(a + b*x), x)
```

# 3.123 $\int x^2 \arcsin(a+bx)\,dx$



## 3.123.1 Optimal result

Integrand size = 10, antiderivative size = 94

$$\int x^2 \arcsin(a+bx)\,dx = \frac{x^2\sqrt{1-(a+bx)^2}}{9b} + \frac{(4+11a^2-5abx)\sqrt{1-(a+bx)^2}}{18b^3} + \frac{a(3+2a^2)\arcsin(a+bx)}{6b^3} + \frac{1}{3}x^3\arcsin(a+bx)$$

output
```
1/6*a*(2*a^2+3)*arcsin(b*x+a)/b^3+1/3*x^3*arcsin(b*x+a)+1/9*x^2*(1-(b*x+a)
^2)^(1/2)/b+1/18*(-5*a*b*x+11*a^2+4)*(1-(b*x+a)^2)^(1/2)/b^3
```

## 3.123.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.82

$$\int x^2 \arcsin(a+bx)\,dx = \frac{\sqrt{1-a^2-2abx-b^2x^2}(4+11a^2-5abx+2b^2x^2)+(9a+6a^3+6b^3x^3)\arcsin(a+bx)}{18b^3}$$

input
```
Integrate[x^2*ArcSin[a + b*x],x]
```

output
```
(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(4 + 11*a^2 - 5*a*b*x + 2*b^2*x^2) + (9
*a + 6*a^3 + 6*b^3*x^3)*ArcSin[a + b*x])/(18*b^3)
```

### 3.123.3 Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.31, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.700, Rules used = {5304, 27, 5242, 497, 25, 676, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2 \arcsin(a+bx)\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int x^2 \arcsin(a+bx)d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int b^2x^2 \arcsin(a+bx)d(a+bx)}{b^3}$$

$$\Big\downarrow \text{5242}$$

$$\frac{\frac{1}{3}\int -\frac{b^3x^3}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{3}b^3x^3\arcsin(a+bx)}{b^3}$$

$$\Big\downarrow \text{497}$$

$$\frac{\frac{1}{3}\left(\frac{1}{3}b^2x^2\sqrt{1-(a+bx)^2}-\frac{1}{3}\int \frac{bx(3a^2-5(a+bx)a+2)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)+\frac{1}{3}b^3x^3\arcsin(a+bx)}{b^3}$$

$$\Big\downarrow \text{25}$$

$$\frac{\frac{1}{3}\left(\frac{1}{3}\int -\frac{bx(3a^2-5(a+bx)a+2)}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{3}b^2x^2\sqrt{1-(a+bx)^2}\right)+\frac{1}{3}b^3x^3\arcsin(a+bx)}{b^3}$$

$$\Big\downarrow \text{676}$$

$$\frac{\frac{1}{3}\left(\frac{1}{3}\left(\frac{3}{2}a(2a^2+3)\int \frac{1}{\sqrt{1-(a+bx)^2}}d(a+bx)+2(4a^2+1)\sqrt{1-(a+bx)^2}-\frac{5}{2}a(a+bx)\sqrt{1-(a+bx)^2}\right)+\frac{1}{3}b^2x^2\sqrt{\right.}{b^3}$$

$$\Big\downarrow \text{223}$$

$$\frac{\frac{1}{3}\left(\frac{1}{3}\left(\frac{3}{2}a(2a^2+3)\arcsin(a+bx)+2(4a^2+1)\sqrt{1-(a+bx)^2}-\frac{5}{2}a(a+bx)\sqrt{1-(a+bx)^2}\right)+\frac{1}{3}b^2x^2\sqrt{1-(a+\right.}{b^3}$$

input
```
Int[x^2*ArcSin[a + b*x],x]
```

output
```
((b^3*x^3*ArcSin[a + b*x])/3 + ((b^2*x^2*Sqrt[1 - (a + b*x)^2])/3 + (2*(1
+ 4*a^2)*Sqrt[1 - (a + b*x)^2] - (5*a*(a + b*x)*Sqrt[1 - (a + b*x)^2])/2 +
 (3*a*(3 + 2*a^2)*ArcSin[a + b*x])/2)/3)/3)/b^3
```

### 3.123.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 497
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n - 1)*((a + b*x^2)^(p + 1)/(b*(n + 2*p + 1))), x] + Simp[1/(b
*(n + 2*p + 1))   Int[(c + d*x)^(n - 2)*(a + b*x^2)^p*Simp[b*c^2*(n + 2*p +
 1) - a*d^2*(n - 1) + 2*b*c*d*(n + p)*x, x], x], x] /; FreeQ[{a, b, c, d, n
, p}, x] && If[RationalQ[n], GtQ[n, 1], SumSimplerQ[n, -2]] && NeQ[n + 2*p
+ 1, 0] && IntQuadraticQ[a, 0, b, c, d, n, p, x]
```

rule 676
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(e*f + d*g)*((a + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + (Sim
p[e*g*x*((a + c*x^2)^(p + 1)/(c*(2*p + 3))), x] - Simp[(a*e*g - c*d*f*(2*p
+ 3))/(c*(2*p + 3))   Int[(a + c*x^2)^p, x], x]) /; FreeQ[{a, c, d, e, f, g
, p}, x] &&  !LeQ[p, -1]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.123.4 Maple [A] (verified)

Time = 0.04 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.46

| method | result |
|---|---|
| derivativedivides | $\frac{\arcsin(bx+a)a^2(bx+a)-\arcsin(bx+a)a(bx+a)^2+\frac{\arcsin(bx+a)(bx+a)^3}{3}+\frac{(bx+a)^2\sqrt{1-(bx+a)^2}}{9}+\frac{2\sqrt{1-(bx+a)^2}}{9}+a^2\sqrt{1-(bx}{b^3}$ |
| default | $\frac{\arcsin(bx+a)a^2(bx+a)-\arcsin(bx+a)a(bx+a)^2+\frac{\arcsin(bx+a)(bx+a)^3}{3}+\frac{(bx+a)^2\sqrt{1-(bx+a)^2}}{9}+\frac{2\sqrt{1-(bx+a)^2}}{9}+a^2\sqrt{1-(bx}{b^3}$ |
| parts | $\frac{x^3\arcsin(bx+a)}{3}-\frac{b\left(-\frac{x^2\sqrt{-b^2x^2-2abx-a^2+1}}{3b^2}-\frac{5a\left(-\frac{x\sqrt{-b^2x^2-2abx-a^2+1}}{2b^2}-\frac{3a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{b^2}-\frac{a\arctan\left(\frac{}{\sqrt{}}\right.}{}\right.}{2b}\right.}{3b}\right.}{}$ |

input
```
int(x^2*arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
1/b^3*(arcsin(b*x+a)*a^2*(b*x+a)-arcsin(b*x+a)*a*(b*x+a)^2+1/3*arcsin(b*x+
a)*(b*x+a)^3+1/9*(b*x+a)^2*(1-(b*x+a)^2)^(1/2)+2/9*(1-(b*x+a)^2)^(1/2)+a^2
*(1-(b*x+a)^2)^(1/2)+a*(-1/2*(b*x+a)*(1-(b*x+a)^2)^(1/2)+1/2*arcsin(b*x+a)
))
```

### 3.123.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.79

$$\int x^2 \arcsin(a+bx)\,dx$$
$$= \frac{3\,(2\,b^3x^3+2\,a^3+3\,a)\arcsin\left(bx+a\right)+(2\,b^2x^2-5\,abx+11\,a^2+4)\sqrt{-b^2x^2-2\,abx-a^2+1}}{18\,b^3}$$

input
```
integrate(x^2*arcsin(b*x+a),x, algorithm="fricas")
```

output
```
1/18*(3*(2*b^3*x^3 + 2*a^3 + 3*a)*arcsin(b*x + a) + (2*b^2*x^2 - 5*a*b*x +
 11*a^2 + 4)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))/b^3
```

### 3.123.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 170 vs. 2(83) = 166.

Time = 0.24 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.81

$$\int x^2 \arcsin(a+bx)\,dx$$
$$= \begin{cases} \frac{a^3 \operatorname{asin}(a+bx)}{3b^3} + \frac{11a^2\sqrt{-a^2-2abx-b^2x^2+1}}{18b^3} - \frac{5ax\sqrt{-a^2-2abx-b^2x^2+1}}{18b^2} + \frac{a \operatorname{asin}(a+bx)}{2b^3} + \frac{x^3 \operatorname{asin}(a+bx)}{3} + \frac{x^2\sqrt{-a^2-2abx-b^2x^2+1}}{9b} \\ \frac{x^3 \operatorname{asin}(a)}{3} \end{cases}$$

input
```
integrate(x**2*asin(b*x+a),x)
```

output
```
Piecewise((a**3*asin(a + b*x)/(3*b**3) + 11*a**2*sqrt(-a**2 - 2*a*b*x - b*
*2*x**2 + 1)/(18*b**3) - 5*a*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(18*b
**2) + a*asin(a + b*x)/(2*b**3) + x**3*asin(a + b*x)/3 + x**2*sqrt(-a**2 -
 2*a*b*x - b**2*x**2 + 1)/(9*b) + 2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/
(9*b**3), Ne(b, 0)), (x**3*asin(a)/3, True))
```

### 3.123.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 220 vs. 2(82) = 164.

Time = 0.27 (sec) , antiderivative size = 220, normalized size of antiderivative = 2.34

$$\int x^2 \arcsin(a+bx)\,dx = \frac{1}{3}x^3\arcsin(bx+a) + \frac{1}{18}b\left(\frac{2\sqrt{-b^2x^2-2abx-a^2+1}x^2}{b^2} - \frac{15a^3\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^4} - \frac{5\sqrt{-b^2x^2-2abx-a^2+1}ax}{b^3}\right.$$

input
```
integrate(x^2*arcsin(b*x+a),x, algorithm="maxima")
```

output
```
1/3*x^3*arcsin(b*x + a) + 1/18*b*(2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*x^2
/b^2 - 15*a^3*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^4 - 5
*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*a*x/b^3 + 9*(a^2 - 1)*a*arcsin(-(b^2*x
 + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^4 + 15*sqrt(-b^2*x^2 - 2*a*b*x -
a^2 + 1)*a^2/b^4 - 4*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a^2 - 1)/b^4)
```

### 3.123.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 173 vs. 2(82) = 164.

Time = 0.29 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.84

$$\begin{aligned}\int x^2 \arcsin(a+bx)\,dx &= \frac{(bx+a)a^2\arcsin(bx+a)}{b^3} \\ &+ \frac{\left((bx+a)^2-1\right)(bx+a)\arcsin(bx+a)}{3b^3} \\ &- \frac{\left((bx+a)^2-1\right)a\arcsin(bx+a)}{b^3} - \frac{\sqrt{-(bx+a)^2+1}(bx+a)a}{2b^3} \\ &+ \frac{\sqrt{-(bx+a)^2+1}a^2}{b^3} + \frac{(bx+a)\arcsin(bx+a)}{3b^3} \\ &- \frac{a\arcsin(bx+a)}{2b^3} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}}{9b^3} + \frac{\sqrt{-(bx+a)^2+1}}{3b^3}\end{aligned}$$

input
```
integrate(x^2*arcsin(b*x+a),x, algorithm="giac")
```

output
```
(b*x + a)*a^2*arcsin(b*x + a)/b^3 + 1/3*((b*x + a)^2 - 1)*(b*x + a)*arcsin
(b*x + a)/b^3 - ((b*x + a)^2 - 1)*a*arcsin(b*x + a)/b^3 - 1/2*sqrt(-(b*x +
 a)^2 + 1)*(b*x + a)*a/b^3 + sqrt(-(b*x + a)^2 + 1)*a^2/b^3 + 1/3*(b*x + a
)*arcsin(b*x + a)/b^3 - 1/2*a*arcsin(b*x + a)/b^3 - 1/9*(-(b*x + a)^2 + 1)
^(3/2)/b^3 + 1/3*sqrt(-(b*x + a)^2 + 1)/b^3
```

### 3.123.9 Mupad [F(-1)]

Timed out.

$$\int x^2 \arcsin(a+bx)\,dx = \int x^2\,\mathrm{asin}(a+b\,x)\;dx$$

input
```
int(x^2*asin(a + b*x),x)
```

output
```
int(x^2*asin(a + b*x), x)
```

# 3.124 $\int x \arcsin(a+bx)\,dx$



## 3.124.1 Optimal result

Integrand size = 8, antiderivative size = 80

$$\int x\arcsin(a+bx)\,dx=-\frac{3a\sqrt{1-(a+bx)^2}}{4b^2}+\frac{x\sqrt{1-(a+bx)^2}}{4b}-\frac{(1+2a^2)\arcsin(a+bx)}{4b^2}+\frac{1}{2}x^2\arcsin(a+bx)$$

output
```
-1/4*(2*a^2+1)*arcsin(b*x+a)/b^2+1/2*x^2*arcsin(b*x+a)-3/4*a*(1-(b*x+a)^2)
^(1/2)/b^2+1/4*x*(1-(b*x+a)^2)^(1/2)/b
```

## 3.124.2 Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 62, normalized size of antiderivative = 0.78

$$\int x\arcsin(a+bx)\,dx=\frac{(-3a+bx)\sqrt{1-a^2-2abx-b^2x^2}+(-1-2a^2+2b^2x^2)\arcsin(a+bx)}{4b^2}$$

input
```
Integrate[x*ArcSin[a + b*x],x]
```

output
```
((-3*a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + (-1 - 2*a^2 + 2*b^2*x^2)
*ArcSin[a + b*x])/(4*b^2)
```

### 3.124.3 Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.06, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 1.000$, Rules used = {5304, 25, 27, 5242, 497, 25, 455, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x \arcsin(a+bx)\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int x \arcsin(a+bx)d(a+bx)}{b}$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{\int -x \arcsin(a+bx)d(a+bx)}{b}$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{\int -bx \arcsin(a+bx)d(a+bx)}{b^2}$$

$$\Big\downarrow \text{ 5242}$$

$$-\frac{\frac{1}{2}\int \frac{b^2x^2}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}b^2x^2\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \text{ 497}$$

$$-\frac{\frac{1}{2}\left(-\frac{1}{2}\int -\frac{2a^2-3(a+bx)a+1}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}bx\sqrt{1-(a+bx)^2}\right)-\frac{1}{2}b^2x^2\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{\frac{1}{2}\left(\frac{1}{2}\int \frac{2a^2-3(a+bx)a+1}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}bx\sqrt{1-(a+bx)^2}\right)-\frac{1}{2}b^2x^2\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \text{ 455}$$

$$-\frac{\frac{1}{2}\left(\frac{1}{2}\left((2a^2+1)\int \frac{1}{\sqrt{1-(a+bx)^2}}d(a+bx)+3a\sqrt{1-(a+bx)^2}\right)-\frac{1}{2}bx\sqrt{1-(a+bx)^2}\right)-\frac{1}{2}b^2x^2\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \text{ 223}$$

$$-\frac{\frac{1}{2}\left(\frac{1}{2}\left((2a^2+1)\arcsin(a+bx)+3a\sqrt{1-(a+bx)^2}\right)-\frac{1}{2}bx\sqrt{1-(a+bx)^2}\right)-\frac{1}{2}b^2x^2\arcsin(a+bx)}{b^2}$$

input
```
Int[x*ArcSin[a + b*x],x]
```

output
```
-((-1/2*(b^2*x^2*ArcSin[a + b*x]) + (-1/2*(b*x*Sqrt[1 - (a + b*x)^2]) + (3
*a*Sqrt[1 - (a + b*x)^2] + (1 + 2*a^2)*ArcSin[a + b*x])/2)/2)/b^2)
```

### 3.124.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 455
```
Int[((c_) + (d_.)*(x_))*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[d*((
a + b*x^2)^(p + 1)/(2*b*(p + 1))), x] + Simp[c   Int[(a + b*x^2)^p, x], x]
/; FreeQ[{a, b, c, d, p}, x] &&  !LeQ[p, -1]
```

rule 497
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n - 1)*((a + b*x^2)^(p + 1)/(b*(n + 2*p + 1))), x] + Simp[1/(b
*(n + 2*p + 1))   Int[(c + d*x)^(n - 2)*(a + b*x^2)^p*Simp[b*c^2*(n + 2*p +
 1) - a*d^2*(n - 1) + 2*b*c*d*(n + p)*x, x], x], x] /; FreeQ[{a, b, c, d, n
, p}, x] && If[RationalQ[n], GtQ[n, 1], SumSimplerQ[n, -2]] && NeQ[n + 2*p
+ 1, 0] && IntQuadraticQ[a, 0, b, c, d, n, p, x]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.124.4 Maple [A] (verified)

Time = 0.05 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.99

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{\arcsin(bx+a)(bx+a)^2}{2}-\arcsin(bx+a)a(bx+a)+\frac{(bx+a)\sqrt{1-(bx+a)^2}}{4}-\frac{\arcsin(bx+a)}{4}-a\sqrt{1-(bx+a)^2}}{b^2}$ |
| default | $\frac{\frac{\arcsin(bx+a)(bx+a)^2}{2}-\arcsin(bx+a)a(bx+a)+\frac{(bx+a)\sqrt{1-(bx+a)^2}}{4}-\frac{\arcsin(bx+a)}{4}-a\sqrt{1-(bx+a)^2}}{b^2}$ |
| parts | $\frac{x^2\arcsin(bx+a)}{2}-\frac{b\left(-\frac{x\sqrt{-b^2x^2-2abx-a^2+1}}{2b^2}-\frac{3a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{b^2}-\frac{a\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{b\sqrt{b^2}}\right)}{2b}+\frac{(-a^2}{}\right.}{2}$ |

input
```
int(x*arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
1/b^2*(1/2*arcsin(b*x+a)*(b*x+a)^2-arcsin(b*x+a)*a*(b*x+a)+1/4*(b*x+a)*(1-
(b*x+a)^2)^(1/2)-1/4*arcsin(b*x+a)-a*(1-(b*x+a)^2)^(1/2))
```

## 3.124.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.72

$$\int x\arcsin(a+bx)\,dx$$
$$=\frac{(2\,b^2x^2-2\,a^2-1)\arcsin{(bx+a)}+\sqrt{-b^2x^2-2\,abx-a^2+1}(bx-3\,a)}{4\,b^2}$$

input
```
integrate(x*arcsin(b*x+a),x, algorithm="fricas")
```

output
```
1/4*((2*b^2*x^2 - 2*a^2 - 1)*arcsin(b*x + a) + sqrt(-b^2*x^2 - 2*a*b*x - a
^2 + 1)*(b*x - 3*a))/b^2
```

### 3.124.6 Sympy [A] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.30

$$\int x\arcsin(a+bx)\,dx = \begin{cases} -\frac{a^2 \operatorname{asin}(a+bx)}{2b^2} - \frac{3a\sqrt{-a^2-2abx-b^2x^2+1}}{4b^2} + \frac{x^2\operatorname{asin}(a+bx)}{2} + \frac{x\sqrt{-a^2-2abx-b^2x^2+1}}{4b} - \frac{\operatorname{asin}(a+bx)}{4b^2} & \text{for } b\neq 0 \\ \frac{x^2\operatorname{asin}(a)}{2} & \text{otherwise} \end{cases}$$

input
```
integrate(x*asin(b*x+a),x)
```

output
```
Piecewise((-a**2*asin(a + b*x)/(2*b**2) - 3*a*sqrt(-a**2 - 2*a*b*x - b**2*
x**2 + 1)/(4*b**2) + x**2*asin(a + b*x)/2 + x*sqrt(-a**2 - 2*a*b*x - b**2*
x**2 + 1)/(4*b) - asin(a + b*x)/(4*b**2), Ne(b, 0)), (x**2*asin(a)/2, True
))
```

### 3.124.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 153 vs. $2(68) = 136$.

Time = 0.27 (sec) , antiderivative size = 153, normalized size of antiderivative = 1.91

$$\int x\arcsin(a+bx)\,dx = \frac{1}{2}x^2\arcsin(bx+a) + \frac{1}{4}b\left(\frac{3a^2\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^3} + \frac{\sqrt{-b^2x^2-2abx-a^2+1}x}{b^2} - \frac{(a^2-1)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^3} -\right.$$

input
```
integrate(x*arcsin(b*x+a),x, algorithm="maxima")
```

output
```
1/2*x^2*arcsin(b*x + a) + 1/4*b*(3*a^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2
- (a^2 - 1)*b^2))/b^3 + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*x/b^2 - (a^2 -
1)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^3 - 3*sqrt(-b^2*
x^2 - 2*a*b*x - a^2 + 1)*a/b^3)
```

### 3.124.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.14

$$\int x\arcsin(a+bx)\,dx = -\frac{(bx+a)a\arcsin(bx+a)}{b^2} + \frac{\left((bx+a)^2-1\right)\arcsin(bx+a)}{2\,b^2} + \frac{\sqrt{-(bx+a)^2+1}(bx+a)}{4\,b^2} - \frac{\sqrt{-(bx+a)^2+1}a}{b^2} + \frac{\arcsin(bx+a)}{4\,b^2}$$

input
```
integrate(x*arcsin(b*x+a),x, algorithm="giac")
```

output
```
-(b*x + a)*a*arcsin(b*x + a)/b^2 + 1/2*((b*x + a)^2 - 1)*arcsin(b*x + a)/b
^2 + 1/4*sqrt(-(b*x + a)^2 + 1)*(b*x + a)/b^2 - sqrt(-(b*x + a)^2 + 1)*a/b
^2 + 1/4*arcsin(b*x + a)/b^2
```

### 3.124.9 Mupad [F(-1)]

Timed out.

$$\int x\arcsin(a+bx)\,dx = \int x\,\mathrm{asin}(a+b\,x)\;dx$$

input
```
int(x*asin(a + b*x),x)
```

output
```
int(x*asin(a + b*x), x)
```

# 3.125 $\int \arcsin(a+bx)\,dx$



## 3.125.1 Optimal result

Integrand size = 6, antiderivative size = 35

$$\int \arcsin(a+bx)\,dx=\frac{\sqrt{1-(a+bx)^2}}{b}+\frac{(a+bx)\arcsin(a+bx)}{b}$$

output
```
(b*x+a)*arcsin(b*x+a)/b+(1-(b*x+a)^2)^(1/2)/b
```

## 3.125.2 Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 154 vs. $2(35) = 70$.

Time = 0.36 (sec) , antiderivative size = 154, normalized size of antiderivative = 4.40

$$\int \arcsin(a+bx)\,dx=x\arcsin(a+bx)$$
$$+\frac{2b\sqrt{1-a^2-2abx-b^2x^2}+2ab\arctan\left(\frac{\sqrt{-b^2}x-\sqrt{1-a^2-2abx-b^2x^2}}{a}\right)+a\sqrt{-b^2}\log\left(-1+2abx+2b^2x^2+2\right.}{2b^2}$$

input
```
Integrate[ArcSin[a + b*x],x]
```

output
```
x*ArcSin[a + b*x] + (2*b*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + 2*a*b*ArcTan[
(Sqrt[-b^2]*x - Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])/a] + a*Sqrt[-b^2]*Log[-
1 + 2*a*b*x + 2*b^2*x^2 + 2*Sqrt[-b^2]*x*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]
])/(2*b^2)
```

## 3.125.3 Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.91, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5302, 5130, 241}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \arcsin(a+bx)\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \arcsin(a+bx)d(a+bx)}{b}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(a+bx)\arcsin(a+bx)-\int \frac{a+bx}{\sqrt{1-(a+bx)^2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{241}$$

$$\frac{(a+bx)\arcsin(a+bx)+\sqrt{1-(a+bx)^2}}{b}$$

input
```
Int[ArcSin[a + b*x],x]
```

output
```
(Sqrt[1 - (a + b*x)^2] + (a + b*x)*ArcSin[a + b*x])/b
```

### 3.125.3.1 Defintions of rubi rules used

rule 241
```
Int[(x_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(a + b*x^2)^(p + 1)/
(2*b*(p + 1)), x] /; FreeQ[{a, b, p}, x] && NeQ[p, -1]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.125.4 Maple [A] (verified)

Time = 0.04 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.89

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{(bx+a)\arcsin(bx+a)+\sqrt{1-(bx+a)^2}}{b}$ | 31 |
| default | $\frac{(bx+a)\arcsin(bx+a)+\sqrt{1-(bx+a)^2}}{b}$ | 31 |
| parts | $x\arcsin(bx+a)-b\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{b^2}-\frac{a\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{b\sqrt{b^2}}\right)$ | 88 |

input
```
int(arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
1/b*((b*x+a)*arcsin(b*x+a)+(1-(b*x+a)^2)^(1/2))
```

### 3.125.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.11

$$\int \arcsin(a+bx)\,dx = \frac{(bx+a)\arcsin(bx+a)+\sqrt{-b^2x^2-2\,abx-a^2+1}}{b}$$

input
```
integrate(arcsin(b*x+a),x, algorithm="fricas")
```

output
```
((b*x + a)*arcsin(b*x + a) + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))/b
```

### 3.125.6 Sympy [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.31

$$\int \arcsin(a+bx)\,dx = \begin{cases} \frac{a \operatorname{asin}(a+bx)}{b} + x \operatorname{asin}(a+bx) + \frac{\sqrt{-a^2-2abx-b^2x^2+1}}{b} & \text{for } b \neq 0 \\ x \operatorname{asin}(a) & \text{otherwise} \end{cases}$$

input
```
integrate(asin(b*x+a),x)
```

output
```
Piecewise((a*asin(a + b*x)/b + x*asin(a + b*x) + sqrt(-a**2 - 2*a*b*x - b*
*2*x**2 + 1)/b, Ne(b, 0)), (x*asin(a), True))
```

### 3.125.7 Maxima [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.86

$$\int \arcsin(a+bx)\,dx = \frac{(bx+a)\arcsin(bx+a) + \sqrt{-(bx+a)^2+1}}{b}$$

input
```
integrate(arcsin(b*x+a),x, algorithm="maxima")
```

output
```
((b*x + a)*arcsin(b*x + a) + sqrt(-(b*x + a)^2 + 1))/b
```

### 3.125.8 Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.86

$$\int \arcsin(a+bx)\,dx = \frac{(bx+a)\arcsin(bx+a) + \sqrt{-(bx+a)^2+1}}{b}$$

input
```
integrate(arcsin(b*x+a),x, algorithm="giac")
```

output
```
((b*x + a)*arcsin(b*x + a) + sqrt(-(b*x + a)^2 + 1))/b
```

### 3.125.9 Mupad [B] (verification not implemented)

Time = 0.57 (sec) , antiderivative size = 86, normalized size of antiderivative = 2.46

$$\int \arcsin(a+bx)\,dx = x\,\mathrm{asin}(a+b\,x)+\frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{b} + \frac{a\,\ln\left(\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}-\frac{x\,b^2+a\,b}{\sqrt{-b^2}}\right)}{\sqrt{-b^2}}$$

input
```
int(asin(a + b*x),x)
```

output
```
x*asin(a + b*x) + (1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/b + (a*log((1 - b^2*
x^2 - 2*a*b*x - a^2)^(1/2) - (a*b + b^2*x)/(-b^2)^(1/2)))/(-b^2)^(1/2)
```

# 3.126 $\int \frac{\arcsin(a+bx)}{x}\,dx$



## 3.126.1 Optimal result

Integrand size = 10, antiderivative size = 181

$$\int \frac{\arcsin(a+bx)}{x}\,dx = -\frac{1}{2}i\arcsin(a+bx)^2 + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right) - i\,\mathrm{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) - i\,\mathrm{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

output
```
-1/2*I*arcsin(b*x+a)^2+arcsin(b*x+a)*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/
(I*a-(-a^2+1)^(1/2)))+arcsin(b*x+a)*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(
I*a+(-a^2+1)^(1/2)))-I*polylog(2,(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a-(-a^
2+1)^(1/2)))-I*polylog(2,(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/
2)))
```

### 3.126.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.09

$$\int \frac{\arcsin(a+bx)}{x}\,dx = -\frac{1}{2}i\arcsin(a+bx)^2 + \arcsin(a+bx)\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right) + \arcsin(a+bx)\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right) - i\,\text{PolyLog}\left(2,-\frac{e^{i\arcsin(a+bx)}}{-ia+\sqrt{1-a^2}}\right) - i\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

input
```
Integrate[ArcSin[a + b*x]/x,x]
```

output
```
(-1/2*I)*ArcSin[a + b*x]^2 + ArcSin[a + b*x]*Log[1 + E^(I*ArcSin[a + b*x])
/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b)] + ArcSin[a + b*x]*Log[1 + E^(I*ArcSin
[a + b*x])/((((-I)*a)/b + Sqrt[1 - a^2]/b)*b)] - I*PolyLog[2, -(E^(I*ArcSi
n[a + b*x])/((-I)*a + Sqrt[1 - a^2]))] - I*PolyLog[2, E^(I*ArcSin[a + b*x]
)/(I*a + Sqrt[1 - a^2])]
```

### 3.126.3 Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.04, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.800, Rules used = {5304, 25, 27, 5240, 5032, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)}{x}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{\arcsin(a+bx)}{x}d(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{\arcsin(a+bx)}{x}d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\int -\frac{\arcsin(a+bx)}{bx}d(a+bx)$$

$$\Big\downarrow \text{5240}$$

$$-\int -\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{bx}d\arcsin(a+bx)$$

$$\Big\downarrow \text{5032}$$

$$-i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{ia-e^{i\arcsin(a+bx)}-\sqrt{1-a^2}}d\arcsin(a+bx)-i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{ia-e^{i\arcsin(a+bx)}+\sqrt{1-a^2}}d\arcsin(a+bx)-\frac{1}{2}i\arcsin(a+bx)^2$$

$$\Big\downarrow \text{2620}$$

$$-i\left(i\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-i\int \log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)d\arcsin(a+bx)\right)-i\left(i\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-i\int \log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)d\arcsin(a+bx)\right)-\frac{1}{2}i\arcsin(a+bx)^2$$

$$\Big\downarrow \text{2715}$$

$$-i\left(i\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-\int e^{-i\arcsin(a+bx)}\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)de^{i\arcsin(a+bx)}\right)-i\left(i\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-\int e^{-i\arcsin(a+bx)}\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)de^{i\arcsin(a+bx)}\right)-\frac{1}{2}i\arcsin(a+bx)^2$$

$$\Big\downarrow \text{2838}$$

$$-i\left(\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)+i\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)\right)-i\left(\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)+i\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)\right)-\frac{1}{2}i\arcsin(a+bx)^2$$

input
```
Int[ArcSin[a + b*x]/x,x]
```

3.126. $\int \frac{\arcsin(a+bx)}{x}\,dx$

output
```
(-1/2*I)*ArcSin[a + b*x]^2 - I*(I*ArcSin[a + b*x]*Log[1 - E^(I*ArcSin[a +
b*x])/(I*a - Sqrt[1 - a^2])] + PolyLog[2, E^(I*ArcSin[a + b*x])/(I*a - Sqr
t[1 - a^2])]) - I*(I*ArcSin[a + b*x]*Log[1 - E^(I*ArcSin[a + b*x])/(I*a +
Sqrt[1 - a^2])] + PolyLog[2, E^(I*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2])])
```

### 3.126.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 5032
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Simp[I   Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2,
2] + b*E^(I*(c + d*x)))), x], x] + Simp[I   Int[(e + f*x)^m*(E^(I*(c + d*x)
)/(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c
, d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.126.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 578 vs. $2(204) = 408$.

Time = 0.80 (sec) , antiderivative size = 579, normalized size of antiderivative = 3.20

| method | result |
|---|---|
| derivativedivides | $-\frac{i \operatorname{dilog}\left(\frac{ia+\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia+\sqrt{-a^2+1}}\right)a^2}{a^2-1}-\frac{i\arcsin(bx+a)^2}{2}-\frac{i \operatorname{dilog}\left(\frac{ia-\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia-\sqrt{-a^2+1}}\right)}{a^2-1}$ |
| default | $-\frac{i \operatorname{dilog}\left(\frac{ia+\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia+\sqrt{-a^2+1}}\right)a^2}{a^2-1}-\frac{i\arcsin(bx+a)^2}{2}-\frac{i \operatorname{dilog}\left(\frac{ia-\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia-\sqrt{-a^2+1}}\right)}{a^2-1}$ |

input
```
int(arcsin(b*x+a)/x,x,method=_RETURNVERBOSE)
```

output
```
-I/(a^2-1)*dilog((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a+(
-a^2+1)^(1/2)))*a^2-1/2*I*arcsin(b*x+a)^2-I/(a^2-1)*dilog((I*a-(-a^2+1)^(1
/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))*a^2+I/(a^2-1)*dil
og((I*a-(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2))
)+I/(a^2-1)*dilog((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a+
(-a^2+1)^(1/2)))+arcsin(b*x+a)/(a^2-1)*ln((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1
-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))*a^2+arcsin(b*x+a)/(a^2-1)*ln((I*a
-(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))*a^2-a
rcsin(b*x+a)/(a^2-1)*ln((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))
/(I*a+(-a^2+1)^(1/2)))-arcsin(b*x+a)/(a^2-1)*ln((I*a-(-a^2+1)^(1/2)-I*(b*x
+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))
```

### 3.126.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\arcsin(bx+a)}{x}\,dx$$

input
```
integrate(arcsin(b*x+a)/x,x, algorithm="fricas")
```

output
```
integral(arcsin(b*x + a)/x, x)
```

### 3.126.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\operatorname{asin}(a+bx)}{x}\,dx$$

input
```
integrate(asin(b*x+a)/x,x)
```

output
```
Integral(asin(a + b*x)/x, x)
```

### 3.126.7 Maxima [F]

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\arcsin(bx+a)}{x}\,dx$$

input
```
integrate(arcsin(b*x+a)/x,x, algorithm="maxima")
```

output
```
integrate(arcsin(b*x + a)/x, x)
```

### 3.126.8 Giac [F]

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\arcsin{(bx+a)}}{x}\,dx$$

input
```
integrate(arcsin(b*x+a)/x,x, algorithm="giac")
```

output
```
integrate(arcsin(b*x + a)/x, x)
```

### 3.126.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{x}\,dx$$

input
```
int(asin(a + b*x)/x,x)
```

output
```
int(asin(a + b*x)/x, x)
```

# 3.127 $\int \frac{\arcsin(a+bx)}{x^2}\,dx$



## 3.127.1 Optimal result

Integrand size = 10, antiderivative size = 64

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = -\frac{\arcsin(a+bx)}{x} - \frac{b\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{\sqrt{1-a^2}}$$

output
```
-arcsin(b*x+a)/x-b*arctanh((1-a*(b*x+a))/(-a^2+1)^(1/2)/(1-(b*x+a)^2)^(1/2
))/(-a^2+1)^(1/2)
```

## 3.127.2 Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.03

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = -\frac{\arcsin(a+bx)}{x} - \frac{b\operatorname{arctanh}\left(\frac{1-a^2-abx}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{\sqrt{1-a^2}}$$

input
```
Integrate[ArcSin[a + b*x]/x^2,x]
```

output
```
-(ArcSin[a + b*x]/x) - (b*ArcTanh[(1 - a^2 - a*b*x)/(Sqrt[1 - a^2]*Sqrt[1
- (a + b*x)^2])])/Sqrt[1 - a^2]
```

### 3.127.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.03, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5304, 27, 5242, 488, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)}{x^2} \, dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{\arcsin(a+bx)}{x^2}d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$b \int \frac{\arcsin(a+bx)}{b^2x^2}d(a+bx)$$

$$\Big\downarrow \text{5242}$$

$$b \left(-\int -\frac{1}{bx\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{\arcsin(a+bx)}{bx}\right)$$

$$\Big\downarrow \text{488}$$

$$b \left(\int \frac{1}{-a^2-\frac{(a(a+bx)-1)^2}{1-(a+bx)^2}+1}d\frac{a(a+bx)-1}{\sqrt{1-(a+bx)^2}}-\frac{\arcsin(a+bx)}{bx}\right)$$

$$\Big\downarrow \text{219}$$

$$b \left(\frac{\text{arctanh}\left(\frac{a(a+bx)-1}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{\sqrt{1-a^2}}-\frac{\arcsin(a+bx)}{bx}\right)$$

input
```
Int[ArcSin[a + b*x]/x^2,x]
```

output
```
b*(-(ArcSin[a + b*x]/(b*x)) + ArcTanh[(-1 + a*(a + b*x))/(Sqrt[1 - a^2]*Sq
rt[1 - (a + b*x)^2])]/Sqrt[1 - a^2])
```

### 3.127.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.127.4 Maple [A] (verified)

Time = 0.39 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.17

| method | result | size |
|---|---|---|
| parts | $-\frac{\arcsin(bx+a)}{x}-\frac{b\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2abx-a^2+1}}{x}\right)}{\sqrt{-a^2+1}}$ | 75 |
| derivativedivides | $b\left(-\frac{\arcsin(bx+a)}{bx}-\frac{\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2abx-a^2+1}}{bx}\right)}{\sqrt{-a^2+1}}\right)$ | 82 |
| default | $b\left(-\frac{\arcsin(bx+a)}{bx}-\frac{\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2abx-a^2+1}}{bx}\right)}{\sqrt{-a^2+1}}\right)$ | 82 |

input
```
int(arcsin(b*x+a)/x^2,x,method=_RETURNVERBOSE)
```

output
```
-arcsin(b*x+a)/x-b/(-a^2+1)^(1/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-
b^2*x^2-2*a*b*x-a^2+1)^(1/2))/x)
```

### 3.127.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 233, normalized size of antiderivative = 3.64

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx$$
$$= \left[-\frac{\sqrt{-a^2+1}bx\log\left(\frac{(2a^2-1)b^2x^2+2a^4+4(a^3-a)bx+2\sqrt{-b^2x^2-2abx-a^2+1}(abx+a^2-1)\sqrt{-a^2+1}-4a^2+2}{x^2}\right)+2(a^2-1)\,\mathrm{arcs}}{2(a^2-1)x}\right.$$

input
```
integrate(arcsin(b*x+a)/x^2,x, algorithm="fricas")
```

output
```
[-1/2*(sqrt(-a^2 + 1)*b*x*log(((2*a^2 - 1)*b^2*x^2 + 2*a^4 + 4*(a^3 - a)*b
*x + 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 - 1)*sqrt(-a^2 + 1)
 - 4*a^2 + 2)/x^2) + 2*(a^2 - 1)*arcsin(b*x + a))/((a^2 - 1)*x), (sqrt(a^2
 - 1)*b*x*arctan(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 - 1)*sqrt
(a^2 - 1)/((a^2 - 1)*b^2*x^2 + a^4 + 2*(a^3 - a)*b*x - 2*a^2 + 1)) - (a^2
- 1)*arcsin(b*x + a))/((a^2 - 1)*x)]
```

### 3.127.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = \int \frac{\operatorname{asin}(a+bx)}{x^2}\,dx$$

input
```
integrate(asin(b*x+a)/x**2,x)
```

output
```
Integral(asin(a + b*x)/x**2, x)
```

### 3.127.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate(arcsin(b*x+a)/x^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(a-1>0)', see `assume?` for more
details)Is
```

### 3.127.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.23

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = \frac{2\,b^2\arctan\left(\frac{\frac{\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)a}{b^2x+ab}-1}{\sqrt{a^2-1}}\right)}{\sqrt{a^2-1}|b|} - \frac{\arcsin\left(bx+a\right)}{x}$$

input
```
integrate(arcsin(b*x+a)/x^2,x, algorithm="giac")
```

output
```
2*b^2*arctan(((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*a/(b^2*x + a
*b) - 1)/sqrt(a^2 - 1))/(sqrt(a^2 - 1)*abs(b)) - arcsin(b*x + a)/x
```

### 3.127.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x^2}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{x^2}\,dx$$

input
```
int(asin(a + b*x)/x^2,x)
```

output
```
int(asin(a + b*x)/x^2, x)
```

# 3.128 $\int \frac{\arcsin(a+bx)}{x^3} dx$



## 3.128.1 Optimal result

Integrand size = 10, antiderivative size = 103

$$\int \frac{\arcsin(a+bx)}{x^3} dx = -\frac{b\sqrt{1-(a+bx)^2}}{2(1-a^2)x} - \frac{\arcsin(a+bx)}{2x^2} - \frac{ab^2\text{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{2(1-a^2)^{3/2}}$$

output
```
-1/2*arcsin(b*x+a)/x^2-1/2*a*b^2*arctanh((1-a*(b*x+a))/(-a^2+1)^(1/2)/(1-(
b*x+a)^2)^(1/2))/(-a^2+1)^(3/2)-1/2*b*(1-(b*x+a)^2)^(1/2)/(-a^2+1)/x
```

## 3.128.2 Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.21

$$\int \frac{\arcsin(a+bx)}{x^3} dx = -\frac{\arcsin(a+bx) + \frac{bx\left(\sqrt{1-a^2}\sqrt{1-a^2-2abx-b^2x^2}-abx\log(x)+abx\log\left(1-a^2-abx+\sqrt{1-a^2}\sqrt{1-a^2-2abx-b^2x^2}\right)\right)}{(1-a^2)^{3/2}}}{2x^2}$$

input
```
Integrate[ArcSin[a + b*x]/x^3,x]
```

output
```
-1/2*(ArcSin[a + b*x] + (b*x*(Sqrt[1 - a^2]*Sqrt[1 - a^2 - 2*a*b*x - b^2*x
^2] - a*b*x*Log[x] + a*b*x*Log[1 - a^2 - a*b*x + Sqrt[1 - a^2]*Sqrt[1 - a^
2 - 2*a*b*x - b^2*x^2]]))/(1 - a^2)^(3/2))/x^2
```

### 3.128.3 Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.06, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.700, Rules used = {5304, 25, 27, 5242, 491, 488, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int \frac{\arcsin(a+bx)}{x^3}d(a+bx)}{b}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{\arcsin(a+bx)}{x^3}d(a+bx)}{b}$$

$$\Big\downarrow \ 27$$

$$-b^2\int -\frac{\arcsin(a+bx)}{b^3x^3}d(a+bx)$$

$$\Big\downarrow \ 5242$$

$$-b^2\left(\frac{\arcsin(a+bx)}{2b^2x^2}-\frac{1}{2}\int \frac{1}{b^2x^2\sqrt{1-(a+bx)^2}}d(a+bx)\right)$$

$$\Big\downarrow \ 491$$

$$-b^2\left(\frac{1}{2}\left(\frac{a\int -\frac{1}{bx\sqrt{1-(a+bx)^2}}d(a+bx)}{1-a^2}+\frac{\sqrt{1-(a+bx)^2}}{(1-a^2)\,bx}\right)+\frac{\arcsin(a+bx)}{2b^2x^2}\right)$$

$$\Big\downarrow \ 488$$

$$-b^2\left(\frac{1}{2}\left(\frac{\sqrt{1-(a+bx)^2}}{(1-a^2)\,bx}-\frac{a\int \frac{1}{-a^2-\frac{(a(a+bx)-1)^2}{1-(a+bx)^2}+1}d\frac{a(a+bx)-1}{\sqrt{1-(a+bx)^2}}}{1-a^2}\right)+\frac{\arcsin(a+bx)}{2b^2x^2}\right)$$

$$\Big\downarrow \ 219$$

$$-b^2\left(\frac{1}{2}\left(\frac{\sqrt{1-(a+bx)^2}}{(1-a^2)\,bx}-\frac{a\,\text{arctanh}\left(\frac{a(a+bx)-1}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{(1-a^2)^{3/2}}\right)+\frac{\arcsin(a+bx)}{2b^2x^2}\right)$$

input
```
Int[ArcSin[a + b*x]/x^3,x]
```

output
```
-(b^2*(ArcSin[a + b*x]/(2*b^2*x^2) + (Sqrt[1 - (a + b*x)^2]/((1 - a^2)*b*x
) - (a*ArcTanh[(-1 + a*(a + b*x))/(Sqrt[1 - a^2]*Sqrt[1 - (a + b*x)^2])])/
(1 - a^2)^(3/2))/2))
```

### 3.128.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 491
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n + 1)*((a + b*x^2)^(p + 1)/((n + 1)*(b*c^2 + a*d^2))), x] + S
imp[b*(c/(b*c^2 + a*d^2))   Int[(c + d*x)^(n + 1)*(a + b*x^2)^p, x], x] /;
FreeQ[{a, b, c, d, n, p}, x] && EqQ[n + 2*p + 3, 0]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.128.4 Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.13

| method | result | size |
|---|---|---|
| parts | $-\frac{\arcsin(bx+a)}{2x^2}+\frac{b\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{(-a^2+1)x}-\frac{ab\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\sqrt{-b^2x^2-2abx-a^2+1}}{x}\right)}{(-a^2+1)^{\frac{3}{2}}}\right)}{2}$ | 116 |
| derivativedivides | $b^2\left(-\frac{\arcsin(bx+a)}{2b^2x^2}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2(-a^2+1)bx}-\frac{a\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\sqrt{-b^2x^2-2abx-a^2+1}}{bx}\right)}{2(-a^2+1)^{\frac{3}{2}}}\right)$ | 124 |
| default | $b^2\left(-\frac{\arcsin(bx+a)}{2b^2x^2}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2(-a^2+1)bx}-\frac{a\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\sqrt{-b^2x^2-2abx-a^2+1}}{bx}\right)}{2(-a^2+1)^{\frac{3}{2}}}\right)$ | 124 |

input
```
int(arcsin(b*x+a)/x^3,x,method=_RETURNVERBOSE)
```

output
```
-1/2*arcsin(b*x+a)/x^2+1/2*b*(-1/(-a^2+1)/x*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)
-a*b/(-a^2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^2*x^2-2*a*b*
x-a^2+1)^(1/2))/x))
```

### 3.128.5 Fricas [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 325, normalized size of antiderivative = 3.16

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx$$

$$= \left[-\frac{\sqrt{-a^2+1}ab^2x^2\log\left(\frac{(2a^2-1)b^2x^2+2a^4+4(a^3-a)bx-2\sqrt{-b^2x^2-2abx-a^2+1}(abx+a^2-1)\sqrt{-a^2+1}-4a^2+2}{x^2}\right)-2\sqrt{-b^2x^2}}{4(a^4-2a^2+1)x^2}\right.$$

$$-\frac{\sqrt{a^2-1}ab^2x^2\arctan\left(\frac{\sqrt{-b^2x^2-2abx-a^2+1}(abx+a^2-1)\sqrt{a^2-1}}{(a^2-1)b^2x^2+a^4+2(a^3-a)bx-2a^2+1}\right)-\sqrt{-b^2x^2-2abx-a^2+1}(a^2-1)bx+(a^4-}{2(a^4-2a^2+1)x^2}$$

input
```
integrate(arcsin(b*x+a)/x^3,x, algorithm="fricas")
```

output
```
[-1/4*(sqrt(-a^2 + 1)*a*b^2*x^2*log(((2*a^2 - 1)*b^2*x^2 + 2*a^4 + 4*(a^3
- a)*b*x - 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 - 1)*sqrt(-a^
2 + 1) - 4*a^2 + 2)/x^2) - 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a^2 - 1)*
b*x + 2*(a^4 - 2*a^2 + 1)*arcsin(b*x + a))/((a^4 - 2*a^2 + 1)*x^2), -1/2*(
sqrt(a^2 - 1)*a*b^2*x^2*arctan(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x +
 a^2 - 1)*sqrt(a^2 - 1)/((a^2 - 1)*b^2*x^2 + a^4 + 2*(a^3 - a)*b*x - 2*a^2
 + 1)) - sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a^2 - 1)*b*x + (a^4 - 2*a^2 +
 1)*arcsin(b*x + a))/((a^4 - 2*a^2 + 1)*x^2)]
```

### 3.128.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx = \int \frac{\operatorname{asin}{(a+bx)}}{x^3}\,dx$$

input
```
integrate(asin(b*x+a)/x**3,x)
```

output
```
Integral(asin(a + b*x)/x**3, x)
```

### 3.128.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate(arcsin(b*x+a)/x^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(a-1>0)', see `assume?` for more
details)Is
```

### 3.128.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 243 vs. $2(87) = 174$.

Time = 0.30 (sec) , antiderivative size = 243, normalized size of antiderivative = 2.36

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx = -\left(\frac{ab^2\arctan\left(\frac{\frac{\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)a}{b^2x+ab}-1}{\sqrt{a^2-1}}\right)}{(a^2|b|-|b|)\sqrt{a^2-1}} - \frac{ab^2-\frac{\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)b^2}{b^2x+ab}}{(a^3|b|-a|b|)\left(\frac{\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)^2a}{(b^2x+ab)^2}+a-\frac{2\left(\sqrt{-b^2x^2-2\,abx-a^2+1}|b|+b\right)}{b^2x+ab}\right)}\right)b - \frac{\arcsin(bx+a)}{2\,x^2}$$

input
```
integrate(arcsin(b*x+a)/x^3,x, algorithm="giac")
```

output
```
-(a*b^2*arctan(((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*a/(b^2*x +
 a*b) - 1)/sqrt(a^2 - 1))/((a^2*abs(b) - abs(b))*sqrt(a^2 - 1)) - (a*b^2 -
 (sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*b^2/(b^2*x + a*b))/((a^3*
abs(b) - a*abs(b))*((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^2*a/(b
^2*x + a*b)^2 + a - 2*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)/(b^2
*x + a*b))))*b - 1/2*arcsin(b*x + a)/x^2
```

### 3.128.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x^3}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{x^3}\,dx$$

input
```
int(asin(a + b*x)/x^3,x)
```

output
```
int(asin(a + b*x)/x^3, x)
```

# 3.129 $\int \frac{\arcsin(a+bx)}{x^4} dx$



## 3.129.1 Optimal result

Integrand size = 10, antiderivative size = 144

$$\int \frac{\arcsin(a+bx)}{x^4} dx = -\frac{b\sqrt{1-(a+bx)^2}}{6(1-a^2)x^2} - \frac{ab^2\sqrt{1-(a+bx)^2}}{2(1-a^2)^2 x} - \frac{\arcsin(a+bx)}{3x^3} - \frac{(1+2a^2)b^3\text{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{6(1-a^2)^{5/2}}$$

output
```
-1/3*arcsin(b*x+a)/x^3-1/6*(2*a^2+1)*b^3*arctanh((1-a*(b*x+a))/(-a^2+1)^(1
/2)/(1-(b*x+a)^2)^(1/2))/(-a^2+1)^(5/2)-1/6*b*(1-(b*x+a)^2)^(1/2)/(-a^2+1)
/x^2-1/2*a*b^2*(1-(b*x+a)^2)^(1/2)/(-a^2+1)^2/x
```

## 3.129.2 Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.15

$$\int \frac{\arcsin(a+bx)}{x^4} dx = \frac{\sqrt{1-a^2}bx(-1+a^2-3abx)\sqrt{1-a^2-2abx-b^2x^2} - 2(1-a^2)^{5/2}\arcsin(a+bx) + (1+2a^2)b^3x^3\log(x)}{6(1-a^2)^{5/2}x^3}$$

input
```
Integrate[ArcSin[a + b*x]/x^4,x]
```

output
```
(Sqrt[1 - a^2]*b*x*(-1 + a^2 - 3*a*b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]
- 2*(1 - a^2)^(5/2)*ArcSin[a + b*x] + (1 + 2*a^2)*b^3*x^3*Log[x] - (1 + 2*
a^2)*b^3*x^3*Log[1 - a^2 - a*b*x + Sqrt[1 - a^2]*Sqrt[1 - a^2 - 2*a*b*x -
b^2*x^2]])/(6*(1 - a^2)^(5/2)*x^3)
```

### 3.129.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.13, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.800, Rules used = {5304, 27, 5242, 498, 25, 679, 488, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)}{x^4} \, dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{\arcsin(a+bx)}{x^4}d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$b^3 \int \frac{\arcsin(a+bx)}{b^4x^4}d(a+bx)$$

$$\Big\downarrow \text{5242}$$

$$b^3 \left(-\frac{1}{3} \int -\frac{1}{b^3x^3\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{\arcsin(a+bx)}{3b^3x^3}\right)$$

$$\Big\downarrow \text{498}$$

$$b^3 \left(\frac{1}{3} \left(-\frac{\int -\frac{3a+bx}{b^2x^2\sqrt{1-(a+bx)^2}}d(a+bx)}{2(1-a^2)}-\frac{\sqrt{1-(a+bx)^2}}{2(1-a^2)b^2x^2}\right)-\frac{\arcsin(a+bx)}{3b^3x^3}\right)$$

$$\Big\downarrow \text{25}$$

$$b^3 \left(\frac{1}{3} \left(\frac{\int \frac{3a+bx}{b^2x^2\sqrt{1-(a+bx)^2}}d(a+bx)}{2(1-a^2)}-\frac{\sqrt{1-(a+bx)^2}}{2(1-a^2)b^2x^2}\right)-\frac{\arcsin(a+bx)}{3b^3x^3}\right)$$

$$\Big\downarrow \text{679}$$

$$b^3\left(\frac{1}{3}\left(\frac{-\frac{(2a^2+1)\int -\frac{1}{bx\sqrt{1-(a+bx)^2}}d(a+bx)}{1-a^2}-\frac{3a\sqrt{1-(a+bx)^2}}{(1-a^2)bx}}{2\,(1-a^2)}-\frac{\sqrt{1-(a+bx)^2}}{2\,(1-a^2)\,b^2x^2}\right)-\frac{\arcsin(a+bx)}{3b^3x^3}\right)$$

$$\Big\downarrow \; 488$$

$$b^3\left(\frac{1}{3}\left(\frac{\frac{(2a^2+1)\int \frac{1}{-a^2-\frac{(a(a+bx)-1)^2}{1-(a+bx)^2}+1}d\frac{a(a+bx)-1}{\sqrt{1-(a+bx)^2}}}{1-a^2}-\frac{3a\sqrt{1-(a+bx)^2}}{(1-a^2)bx}}{2\,(1-a^2)}-\frac{\sqrt{1-(a+bx)^2}}{2\,(1-a^2)\,b^2x^2}\right)-\frac{\arcsin(a+bx)}{3b^3x^3}\right)$$

$$\Big\downarrow \; 219$$

$$b^3\left(\frac{1}{3}\left(\frac{\frac{(2a^2+1)\text{arctanh}\left(\frac{a(a+bx)-1}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{(1-a^2)^{3/2}}-\frac{3a\sqrt{1-(a+bx)^2}}{(1-a^2)bx}}{2\,(1-a^2)}-\frac{\sqrt{1-(a+bx)^2}}{2\,(1-a^2)\,b^2x^2}\right)-\frac{\arcsin(a+bx)}{3b^3x^3}\right)$$

input
```
Int[ArcSin[a + b*x]/x^4,x]
```

output
```
b^3*(-1/3*ArcSin[a + b*x]/(b^3*x^3) + (-1/2*Sqrt[1 - (a + b*x)^2]/((1 - a^
2)*b^2*x^2) + ((-3*a*Sqrt[1 - (a + b*x)^2])/((1 - a^2)*b*x) + ((1 + 2*a^2)
*ArcTanh[(-1 + a*(a + b*x))/(Sqrt[1 - a^2]*Sqrt[1 - (a + b*x)^2])])/(1 - a
^2)^(3/2))/(2*(1 - a^2)))/3)
```

### 3.129.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 498
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n + 1)*((a + b*x^2)^(p + 1)/((n + 1)*(b*c^2 + a*d^2))), x] + S
imp[b/((n + 1)*(b*c^2 + a*d^2))   Int[(c + d*x)^(n + 1)*(a + b*x^2)^p*(c*(n
 + 1) - d*(n + 2*p + 3)*x), x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[n
, -1] && ((LtQ[n, -1] && IntQuadraticQ[a, 0, b, c, d, n, p, x]) || (SumSimp
lerQ[n, 1] && IntegerQ[p]) || ILtQ[Simplify[n + 2*p + 3], 0])
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.129. $\int \frac{\arcsin(a+bx)}{x^4} dx$

### 3.129.4 Maple [A] (verified)

Time = 0.35 (sec) , antiderivative size = 230, normalized size of antiderivative = 1.60

| method | result |
|---|---|
| parts | $-\frac{\arcsin(bx+a)}{3x^3}+\frac{b\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2(-a^2+1)x^2}+\frac{3ab\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{(-a^2+1)x}-\frac{ab\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2-2a}}{x}\right.}{(-a^2+1)^{\frac{3}{2}}}\right.}{2(-a^2+1)}\right.}{3}$ |
| derivativedivides | $b^3\left(-\frac{\arcsin(bx+a)}{3b^3x^3}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{6(-a^2+1)b^2x^2}+\frac{a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{(-a^2+1)bx}-\frac{a\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2}}{bx}\right.}{(-a^2+1)^{\frac{3}{2}}}\right.}{-2a^2+2}\right.$ |
| default | $b^3\left(-\frac{\arcsin(bx+a)}{3b^3x^3}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{6(-a^2+1)b^2x^2}+\frac{a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{(-a^2+1)bx}-\frac{a\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\,\sqrt{-b^2x^2}}{bx}\right.}{(-a^2+1)^{\frac{3}{2}}}\right.}{-2a^2+2}\right.$ |

input
```
int(arcsin(b*x+a)/x^4,x,method=_RETURNVERBOSE)
```

output
```
-1/3*arcsin(b*x+a)/x^3+1/3*b*(-1/2/(-a^2+1)/x^2*(-b^2*x^2-2*a*b*x-a^2+1)^(
1/2)+3/2*a*b/(-a^2+1)*(-1/(-a^2+1)/x*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)-a*b/(-
a^2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^2*x^2-2*a*b*x-a^2+1
)^(1/2))/x))-1/2*b^2/(-a^2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*
(-b^2*x^2-2*a*b*x-a^2+1)^(1/2))/x))
```

### 3.129.5 Fricas [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 404, normalized size of antiderivative = 2.81

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \left[-\frac{(2\,a^2+1)\sqrt{-a^2+1}b^3x^3\log\left(\frac{(2\,a^2-1)b^2x^2+2\,a^4+4\,(a^3-a)bx+2\,\sqrt{-b^2x^2-2\,abx-a^2+1}(abx+a^2-1)\sqrt{-a^2+1}-4\,a^2+2}{x^2}\right)+4\,(}{12\,(a^6-3\,a^4}\right.$$

input
```
integrate(arcsin(b*x+a)/x^4,x, algorithm="fricas")
```

output
```
[-1/12*((2*a^2 + 1)*sqrt(-a^2 + 1)*b^3*x^3*log(((2*a^2 - 1)*b^2*x^2 + 2*a^
4 + 4*(a^3 - a)*b*x + 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 -
1)*sqrt(-a^2 + 1) - 4*a^2 + 2)/x^2) + 4*(a^6 - 3*a^4 + 3*a^2 - 1)*arcsin(b
*x + a) + 2*(3*(a^3 - a)*b^2*x^2 - (a^4 - 2*a^2 + 1)*b*x)*sqrt(-b^2*x^2 -
2*a*b*x - a^2 + 1))/((a^6 - 3*a^4 + 3*a^2 - 1)*x^3), 1/6*((2*a^2 + 1)*sqrt
(a^2 - 1)*b^3*x^3*arctan(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2 -
 1)*sqrt(a^2 - 1)/((a^2 - 1)*b^2*x^2 + a^4 + 2*(a^3 - a)*b*x - 2*a^2 + 1))
 - 2*(a^6 - 3*a^4 + 3*a^2 - 1)*arcsin(b*x + a) - (3*(a^3 - a)*b^2*x^2 - (a
^4 - 2*a^2 + 1)*b*x)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))/((a^6 - 3*a^4 + 3
*a^2 - 1)*x^3)]
```

### 3.129.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \int \frac{\operatorname{asin}(a+bx)}{x^4}\,dx$$

input
```
integrate(asin(b*x+a)/x**4,x)
```

output
```
Integral(asin(a + b*x)/x**4, x)
```

### 3.129.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate(arcsin(b*x+a)/x^4,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(a-1>0)', see `assume?` for more
details)Is
```

### 3.129.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 557 vs. $2(122) = 244$.

Time = 0.30 (sec) , antiderivative size = 557, normalized size of antiderivative = 3.87

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \frac{1}{3}b\left(\frac{(2a^2b^3+b^3)\arctan\left(\frac{\frac{\left(\sqrt{-b^2x^2-2abx-a^2+1}|b|+b\right)a}{b^2x+ab}-1}{\sqrt{a^2-1}}\right)}{(a^4|b|-2a^2|b|+|b|)\sqrt{a^2-1}} - \frac{\frac{4\left(\sqrt{-b^2x^2-2abx-a^2+1}|b|+b\right)^2a^4b^3}{(b^2x+ab)^2}+4a^4b^3-\frac{11\left(\sqrt{-b^2x^2\cdots}\right.}{\cdots}}{\cdots}\right) - \frac{\arcsin(bx+a)}{3x^3}$$

input
```
integrate(arcsin(b*x+a)/x^4,x, algorithm="giac")
```

output
```
1/3*b*((2*a^2*b^3 + b^3)*arctan(((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b
) + b)*a/(b^2*x + a*b) - 1)/sqrt(a^2 - 1))/((a^4*abs(b) - 2*a^2*abs(b) + a
bs(b))*sqrt(a^2 - 1)) - (4*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)
^2*a^4*b^3/(b^2*x + a*b)^2 + 4*a^4*b^3 - 11*(sqrt(-b^2*x^2 - 2*a*b*x - a^2
 + 1)*abs(b) + b)*a^3*b^3/(b^2*x + a*b) - 5*(sqrt(-b^2*x^2 - 2*a*b*x - a^2
 + 1)*abs(b) + b)^3*a^3*b^3/(b^2*x + a*b)^3 + 7*(sqrt(-b^2*x^2 - 2*a*b*x -
 a^2 + 1)*abs(b) + b)^2*a^2*b^3/(b^2*x + a*b)^2 - a^2*b^3 + 2*(sqrt(-b^2*x
^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*a*b^3/(b^2*x + a*b) + 2*(sqrt(-b^2*x^2
 - 2*a*b*x - a^2 + 1)*abs(b) + b)^3*a*b^3/(b^2*x + a*b)^3 - 2*(sqrt(-b^2*x
^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^2*b^3/(b^2*x + a*b)^2)/((a^6*abs(b) -
2*a^4*abs(b) + a^2*abs(b))*((sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b
)^2*a/(b^2*x + a*b)^2 + a - 2*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) +
 b)/(b^2*x + a*b))^2)) - 1/3*arcsin(b*x + a)/x^3
```

### 3.129.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x^4}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{x^4}\,dx$$

input
```
int(asin(a + b*x)/x^4,x)
```

output
```
int(asin(a + b*x)/x^4, x)
```

# 3.130 $\int \frac{\arcsin(a+bx)}{x^5} dx$



## 3.130.1 Optimal result

Integrand size = 10, antiderivative size = 186

$$\int \frac{\arcsin(a+bx)}{x^5} dx = -\frac{b\sqrt{1-(a+bx)^2}}{12(1-a^2)x^3} - \frac{5ab^2\sqrt{1-(a+bx)^2}}{24(1-a^2)^2x^2} - \frac{(4+11a^2)b^3\sqrt{1-(a+bx)^2}}{24(1-a^2)^3x} - \frac{\arcsin(a+bx)}{4x^4} - \frac{a(3+2a^2)b^4\operatorname{arctanh}\left(\frac{1-a(a+bx)}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{8(1-a^2)^{7/2}}$$

output
```
-1/4*arcsin(b*x+a)/x^4-1/8*a*(2*a^2+3)*b^4*arctanh((1-a*(b*x+a))/(-a^2+1)^
(1/2)/(1-(b*x+a)^2)^(1/2))/(-a^2+1)^(7/2)-1/12*b*(1-(b*x+a)^2)^(1/2)/(-a^2
+1)/x^3-5/24*a*b^2*(1-(b*x+a)^2)^(1/2)/(-a^2+1)^2/x^2-1/24*(11*a^2+4)*b^3*
(1-(b*x+a)^2)^(1/2)/(-a^2+1)^3/x
```

### 3.130.2 Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.04

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx = \frac{1}{8}\left(\frac{b\sqrt{1-a^2-2abx-b^2x^2}(2+2a^4+5abx-5a^3bx+4b^2x^2+a^2(-4+11b^2x^2))}{3\left(-1+a^2\right)^3x^3} - \frac{2\arcsin(a+bx)}{x^4} + \frac{a(3+2a^2)\,b^4\log(x)}{\left(1-a^2\right)^{7/2}} - \frac{a(3+2a^2)\,b^4\log\left(1-a^2-abx+\sqrt{1-a^2}\sqrt{1-a^2-2abx-b^2x^2}\right)}{\left(1-a^2\right)^{7/2}}\right)$$

input
```
Integrate[ArcSin[a + b*x]/x^5,x]
```

output
```
((b*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(2 + 2*a^4 + 5*a*b*x - 5*a^3*b*x + 4
*b^2*x^2 + a^2*(-4 + 11*b^2*x^2)))/(3*(-1 + a^2)^3*x^3) - (2*ArcSin[a + b*
x])/x^4 + (a*(3 + 2*a^2)*b^4*Log[x])/(1 - a^2)^(7/2) - (a*(3 + 2*a^2)*b^4*
Log[1 - a^2 - a*b*x + Sqrt[1 - a^2]*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]])/(1
 - a^2)^(7/2))/8
```

### 3.130.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.19, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5304, 25, 27, 5242, 498, 25, 688, 679, 488, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{\arcsin(a+bx)}{x^5}d(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{\arcsin(a+bx)}{x^5}d(a+bx)}{b}$$

$$\Big\downarrow \; 27$$

$$-b^4\int -\frac{\arcsin(a+bx)}{b^5x^5}d(a+bx)$$

$$\Big\downarrow \; 5242$$

$$-b^4\left(\frac{\arcsin(a+bx)}{4b^4x^4}-\frac{1}{4}\int \frac{1}{b^4x^4\sqrt{1-(a+bx)^2}}d(a+bx)\right)$$

$$\Big\downarrow \; 498$$

$$-b^4\left(\frac{1}{4}\left(\frac{\sqrt{1-(a+bx)^2}}{3(1-a^2)b^3x^3}-\frac{\int \frac{3a+2(a+bx)}{b^3x^3\sqrt{1-(a+bx)^2}}d(a+bx)}{3(1-a^2)}\right)+\frac{\arcsin(a+bx)}{4b^4x^4}\right)$$

$$\Big\downarrow \; 25$$

$$-b^4\left(\frac{1}{4}\left(\frac{\int -\frac{3a+2(a+bx)}{b^3x^3\sqrt{1-(a+bx)^2}}d(a+bx)}{3(1-a^2)}+\frac{\sqrt{1-(a+bx)^2}}{3(1-a^2)b^3x^3}\right)+\frac{\arcsin(a+bx)}{4b^4x^4}\right)$$

$$\Big\downarrow \; 688$$

$$-b^4\left(\frac{1}{4}\left(\frac{\frac{5a\sqrt{1-(a+bx)^2}}{2(1-a^2)b^2x^2}-\frac{\int \frac{2\left(3a^2+2\right)+5a(a+bx)}{b^2x^2\sqrt{1-(a+bx)^2}}d(a+bx)}{2(1-a^2)}}{3(1-a^2)}+\frac{\sqrt{1-(a+bx)^2}}{3(1-a^2)b^3x^3}\right)+\frac{\arcsin(a+bx)}{4b^4x^4}\right)$$

$$\Big\downarrow \; 679$$

$$-b^4\left(\frac{1}{4}\left(\frac{\frac{5a\sqrt{1-(a+bx)^2}}{2(1-a^2)b^2x^2}-\frac{-\frac{3a\left(2a^2+3\right)\int -\frac{1}{bx\sqrt{1-(a+bx)^2}}d(a+bx)}{1-a^2}-\frac{\left(11a^2+4\right)\sqrt{1-(a+bx)^2}}{\left(1-a^2\right)bx}}{2(1-a^2)}}{3(1-a^2)}+\frac{\sqrt{1-(a+bx)^2}}{3(1-a^2)b^3x^3}\right)+\frac{\arcsin(a+bx)}{4b^4x^4}\right)$$

$$\Big\downarrow \; 488$$

$$-b^4\left(\frac{1}{4}\left(\frac{\frac{5a\sqrt{1-(a+bx)^2}}{2(1-a^2)b^2x^2}-\frac{\frac{3a\left(2a^2+3\right)\int \frac{1}{-a^2-\frac{(a(a+bx)-1)^2}{1-(a+bx)^2}+1}d\frac{a(a+bx)-1}{\sqrt{1-(a+bx)^2}}}{1-a^2}-\frac{\left(11a^2+4\right)\sqrt{1-(a+bx)^2}}{\left(1-a^2\right)bx}}{2(1-a^2)}}{3(1-a^2)}+\frac{\sqrt{1-(a+bx)^2}}{3(1-a^2)b^3x^3}\right)+\frac{\arcsin(a+bx)}{4b^4x^4}\right)$$

$$\Big\downarrow \; 219$$

3.130. $\int \frac{\arcsin(a+bx)}{x^5}\,dx$

$$-b^4\left(\frac{1}{4}\left(\frac{\frac{5a\sqrt{1-(a+bx)^2}}{2(1-a^2)b^2x^2}-\frac{\frac{3a(2a^2+3)\text{arctanh}\left(\frac{a(a+bx)-1}{\sqrt{1-a^2}\sqrt{1-(a+bx)^2}}\right)}{(1-a^2)^{3/2}}-\frac{(11a^2+4)\sqrt{1-(a+bx)^2}}{(1-a^2)bx}}{2(1-a^2)}}{3(1-a^2)}+\frac{\sqrt{1-(a+bx)^2}}{3(1-a^2)b^3x^3}\right)+\frac{\arcsin(a+}{4b^4x^4}$$

input
```
Int[ArcSin[a + b*x]/x^5,x]
```

output
```
-(b^4*(ArcSin[a + b*x]/(4*b^4*x^4) + (Sqrt[1 - (a + b*x)^2]/(3*(1 - a^2)*b
^3*x^3) + ((5*a*Sqrt[1 - (a + b*x)^2])/(2*(1 - a^2)*b^2*x^2) - (-(((4 + 11
*a^2)*Sqrt[1 - (a + b*x)^2])/((1 - a^2)*b*x)) + (3*a*(3 + 2*a^2)*ArcTanh[(
-1 + a*(a + b*x))/(Sqrt[1 - a^2]*Sqrt[1 - (a + b*x)^2])])/(1 - a^2)^(3/2))
/(2*(1 - a^2)))/(3*(1 - a^2)))/4))
```

### 3.130.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 488
```
Int[1/(((c_) + (d_.)*(x_))*Sqrt[(a_) + (b_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(b*c^2 + a*d^2 - x^2), x], x, (a*d - b*c*x)/Sqrt[a + b*x^2]] /; FreeQ
[{a, b, c, d}, x]
```

rule 498
```
Int[((c_) + (d_.)*(x_))^(n_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
d*(c + d*x)^(n + 1)*((a + b*x^2)^(p + 1)/((n + 1)*(b*c^2 + a*d^2))), x] + S
imp[b/((n + 1)*(b*c^2 + a*d^2))   Int[(c + d*x)^(n + 1)*(a + b*x^2)^p*(c*(n
 + 1) - d*(n + 2*p + 3)*x), x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[n
, -1] && ((LtQ[n, -1] && IntQuadraticQ[a, 0, b, c, d, n, p, x]) || (SumSimp
lerQ[n, 1] && IntegerQ[p]) || ILtQ[Simplify[n + 2*p + 3], 0])
```

rule 679
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1
)/(2*(p + 1)*(c*d^2 + a*e^2))), x] + Simp[(c*d*f + a*e*g)/(c*d^2 + a*e^2)
 Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m,
 p}, x] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 688
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + c*x^2)^(p + 1)/(
(m + 1)*(c*d^2 + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 + a*e^2))   Int[(d +
 e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
 + 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && LtQ[m, -1]
&& (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.130. $\int \frac{\arcsin(a+bx)}{x^5}\,dx$

### 3.130.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 393 vs. $2(164) = 328$.

Time = 0.33 (sec) , antiderivative size = 394, normalized size of antiderivative = 2.12

| method | result |
|---|---|
| parts | $-\frac{\arcsin(bx+a)}{4x^4}+\frac{b\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{3\left(-a^2+1\right)x^3}+\frac{5ab\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2\left(-a^2+1\right)x^2}+\frac{3ab\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{\left(-a^2+1\right)x}-\frac{ab\ln\left(\frac{-2a^2+\cdots}{\cdots}\right.}{\cdots}\right.}{2\left(-a\cdots\right.}}{\cdots}\right.}{\cdots}$ |
| derivativedivides | $b^4\left(-\frac{\arcsin(bx+a)}{4b^4x^4}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{12(-a^2+1)b^3x^3}+\frac{5a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2\left(-a^2+1\right)b^2x^2}+\frac{3a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{\left(-a^2+1\right)bx}-\frac{a\ln\left(\frac{-2a\cdots}{\cdots}\right.}{\cdots}\right.}{2\cdots}\right.}{\cdots}\right.$ |
| default | $b^4\left(-\frac{\arcsin(bx+a)}{4b^4x^4}-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{12(-a^2+1)b^3x^3}+\frac{5a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{2\left(-a^2+1\right)b^2x^2}+\frac{3a\left(-\frac{\sqrt{-b^2x^2-2abx-a^2+1}}{\left(-a^2+1\right)bx}-\frac{a\ln\left(\frac{-2a\cdots}{\cdots}\right.}{\cdots}\right.}{2\cdots}\right.}{\cdots}\right.$ |

input
```
int(arcsin(b*x+a)/x^5,x,method=_RETURNVERBOSE)
```

output
```
-1/4*arcsin(b*x+a)/x^4+1/4*b*(-1/3/(-a^2+1)/x^3*(-b^2*x^2-2*a*b*x-a^2+1)^(
1/2)+5/3*a*b/(-a^2+1)*(-1/2/(-a^2+1)/x^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+3/
2*a*b/(-a^2+1)*(-1/(-a^2+1)/x*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)-a*b/(-a^2+1)^
(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)
)/x))-1/2*b^2/(-a^2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)*(-b^2*x
^2-2*a*b*x-a^2+1)^(1/2))/x))+2/3*b^2/(-a^2+1)*(-1/(-a^2+1)/x*(-b^2*x^2-2*a
*b*x-a^2+1)^(1/2)-a*b/(-a^2+1)^(3/2)*ln((-2*a^2+2-2*a*b*x+2*(-a^2+1)^(1/2)
*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2))/x)))
```

### 3.130.5 Fricas [A] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 484, normalized size of antiderivative = 2.60

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx$$

$$= \left[-\frac{3\,(2\,a^3+3\,a)\sqrt{-a^2+1}b^4x^4\log\left(\frac{(2\,a^2-1)b^2x^2+2\,a^4+4\,(a^3-a)bx-2\,\sqrt{-b^2x^2-2\,abx-a^2+1}(abx+a^2-1)\sqrt{-a^2+1}-4\,a^2+2}{x^2}\right)+\cdots}{\cdots}\right.$$

$$-\frac{3\,(2\,a^3+3\,a)\sqrt{a^2-1}b^4x^4\arctan\left(\frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(abx+a^2-1)\sqrt{a^2-1}}{(a^2-1)b^2x^2+a^4+2\,(a^3-a)bx-2\,a^2+1}\right)+6\,(a^8-4\,a^6+6\,a^4-4\,a^2+1)\,\mathrm{ar}\cdots}{24\,(a^8-\cdots}$$

input
```
integrate(arcsin(b*x+a)/x^5,x, algorithm="fricas")
```

output
```
[-1/48*(3*(2*a^3 + 3*a)*sqrt(-a^2 + 1)*b^4*x^4*log(((2*a^2 - 1)*b^2*x^2 +
2*a^4 + 4*(a^3 - a)*b*x - 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^
2 - 1)*sqrt(-a^2 + 1) - 4*a^2 + 2)/x^2) + 12*(a^8 - 4*a^6 + 6*a^4 - 4*a^2
+ 1)*arcsin(b*x + a) - 2*((11*a^4 - 7*a^2 - 4)*b^3*x^3 - 5*(a^5 - 2*a^3 +
a)*b^2*x^2 + 2*(a^6 - 3*a^4 + 3*a^2 - 1)*b*x)*sqrt(-b^2*x^2 - 2*a*b*x - a^
2 + 1))/((a^8 - 4*a^6 + 6*a^4 - 4*a^2 + 1)*x^4), -1/24*(3*(2*a^3 + 3*a)*sq
rt(a^2 - 1)*b^4*x^4*arctan(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(a*b*x + a^2
 - 1)*sqrt(a^2 - 1)/((a^2 - 1)*b^2*x^2 + a^4 + 2*(a^3 - a)*b*x - 2*a^2 + 1
)) + 6*(a^8 - 4*a^6 + 6*a^4 - 4*a^2 + 1)*arcsin(b*x + a) - ((11*a^4 - 7*a^
2 - 4)*b^3*x^3 - 5*(a^5 - 2*a^3 + a)*b^2*x^2 + 2*(a^6 - 3*a^4 + 3*a^2 - 1)
*b*x)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))/((a^8 - 4*a^6 + 6*a^4 - 4*a^2 +
1)*x^4)]
```

### 3.130.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx = \int \frac{\operatorname{asin}(a+bx)}{x^5}\,dx$$

input
```
integrate(asin(b*x+a)/x**5,x)
```

output
```
Integral(asin(a + b*x)/x**5, x)
```

### 3.130.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate(arcsin(b*x+a)/x^5,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(a-1>0)', see `assume?` for more
details)Is
```

### 3.130.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1112 vs. $2(158) = 316$.

Time = 0.37 (sec) , antiderivative size = 1112, normalized size of antiderivative = 5.98

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx = \text{Too large to display}$$

input
```
integrate(arcsin(b*x+a)/x^5,x, algorithm="giac")
```

output
```
-1/12*b*(3*(2*a^3*b^4 + 3*a*b^4)*arctan(((sqrt(-b^2*x^2 - 2*a*b*x - a^2 +
1)*abs(b) + b)*a/(b^2*x + a*b) - 1)/sqrt(a^2 - 1))/((a^6*abs(b) - 3*a^4*ab
s(b) + 3*a^2*abs(b) - abs(b))*sqrt(a^2 - 1)) - (36*(sqrt(-b^2*x^2 - 2*a*b*
x - a^2 + 1)*abs(b) + b)^2*a^7*b^4/(b^2*x + a*b)^2 + 18*(sqrt(-b^2*x^2 - 2
*a*b*x - a^2 + 1)*abs(b) + b)^4*a^7*b^4/(b^2*x + a*b)^4 + 18*a^7*b^4 - 81*
(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*a^6*b^4/(b^2*x + a*b) - 10
8*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^3*a^6*b^4/(b^2*x + a*b)^
3 - 27*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^5*a^6*b^4/(b^2*x +
a*b)^5 + 120*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^2*a^5*b^4/(b^
2*x + a*b)^2 + 81*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^4*a^5*b^
4/(b^2*x + a*b)^4 - 5*a^5*b^4 + 12*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs
(b) + b)*a^4*b^4/(b^2*x + a*b) - 42*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*ab
s(b) + b)^3*a^4*b^4/(b^2*x + a*b)^3 + 18*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 +
1)*abs(b) + b)^5*a^4*b^4/(b^2*x + a*b)^5 - 18*(sqrt(-b^2*x^2 - 2*a*b*x - a
^2 + 1)*abs(b) + b)^2*a^3*b^4/(b^2*x + a*b)^2 - 36*(sqrt(-b^2*x^2 - 2*a*b*
x - a^2 + 1)*abs(b) + b)^4*a^3*b^4/(b^2*x + a*b)^4 + 2*a^3*b^4 - 6*(sqrt(-
b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)*a^2*b^4/(b^2*x + a*b) + 8*(sqrt(-
b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^3*a^2*b^4/(b^2*x + a*b)^3 - 6*(sq
rt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^5*a^2*b^4/(b^2*x + a*b)^5 + 1
2*(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*abs(b) + b)^2*a*b^4/(b^2*x + a*b)...
```

## 3.130.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{x^5}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{x^5}\,dx$$

input
```
int(asin(a + b*x)/x^5,x)
```

output
```
int(asin(a + b*x)/x^5, x)
```

# 3.131 $\int x^3 \arcsin(a+bx)^2 \, dx$



## 3.131.1 Optimal result

Integrand size = 12, antiderivative size = 343

$$\begin{aligned}\int x^3 \arcsin(a+bx)^2 \, dx = {} & \frac{4ax}{3b^3} + \frac{2a^3x}{b^3} - \frac{3(a+bx)^2}{32b^4} - \frac{3a^2(a+bx)^2}{4b^4} + \frac{2a(a+bx)^3}{9b^4} \\ & - \frac{(a+bx)^4}{32b^4} - \frac{4a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} \\ & - \frac{2a^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^4} \\ & + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{16b^4} \\ & + \frac{3a^2(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^4} \\ & - \frac{2a(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{3b^4} \\ & + \frac{(a+bx)^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b^4} - \frac{3\arcsin(a+bx)^2}{32b^4} \\ & - \frac{3a^2\arcsin(a+bx)^2}{4b^4} - \frac{a^4\arcsin(a+bx)^2}{4b^4} + \frac{1}{4}x^4\arcsin(a+bx)^2\end{aligned}$$

output
```
4/3*a*x/b^3+2*a^3*x/b^3-3/32*(b*x+a)^2/b^4-3/4*a^2*(b*x+a)^2/b^4+2/9*a*(b*
x+a)^3/b^4-1/32*(b*x+a)^4/b^4-3/32*arcsin(b*x+a)^2/b^4-3/4*a^2*arcsin(b*x+
a)^2/b^4-1/4*a^4*arcsin(b*x+a)^2/b^4+1/4*x^4*arcsin(b*x+a)^2-4/3*a*arcsin(
b*x+a)*(1-(b*x+a)^2)^(1/2)/b^4-2*a^3*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^4
+3/16*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^4+3/2*a^2*(b*x+a)*arcsin
(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^4-2/3*a*(b*x+a)^2*arcsin(b*x+a)*(1-(b*x+a)^2
)^(1/2)/b^4+1/8*(b*x+a)^3*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^4
```

### 3.131.2 Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.43

$$\int x^3 \arcsin(a+bx)^2\,dx$$
$$= \frac{bx(300a^3-78a^2bx-9bx(3+b^2x^2)+a(330+28b^2x^2))-6\sqrt{1-a^2-2abx-b^2x^2}(55a+50a^3-9bx-2}{288b^4}$$

input
```
Integrate[x^3*ArcSin[a + b*x]^2,x]
```

output
```
(b*x*(300*a^3 - 78*a^2*b*x - 9*b*x*(3 + b^2*x^2) + a*(330 + 28*b^2*x^2)) -
 6*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(55*a + 50*a^3 - 9*b*x - 26*a^2*b*x +
 14*a*b^2*x^2 - 6*b^3*x^3)*ArcSin[a + b*x] - 9*(3 + 24*a^2 + 8*a^4 - 8*b^4
*x^4)*ArcSin[a + b*x]^2)/(288*b^4)
```

### 3.131.3 Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 317, normalized size of antiderivative = 0.92, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5304, 25, 27, 5242, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3 \arcsin(a+bx)^2\,dx$$
$$\Big\downarrow \text{ 5304}$$
$$\frac{\int x^3 \arcsin(a+bx)^2 d(a+bx)}{b}$$
$$\Big\downarrow \text{ 25}$$
$$-\frac{\int -x^3 \arcsin(a+bx)^2 d(a+bx)}{b}$$
$$\Big\downarrow \text{ 27}$$
$$-\frac{\int -b^3x^3 \arcsin(a+bx)^2 d(a+bx)}{b^4}$$
$$\Big\downarrow \text{ 5242}$$

$$-\frac{\frac{1}{2}\int \frac{b^4x^4\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{4}b^4x^4\arcsin(a+bx)^2}{b^4}$$

$$\Big\downarrow \text{5262}$$

$$-\frac{\frac{1}{2}\int \left(\frac{\arcsin(a+bx)a^4}{\sqrt{1-(a+bx)^2}}-\frac{4(a+bx)\arcsin(a+bx)a^3}{\sqrt{1-(a+bx)^2}}+\frac{6(a+bx)^2\arcsin(a+bx)a^2}{\sqrt{1-(a+bx)^2}}-\frac{4(a+bx)^3\arcsin(a+bx)a}{\sqrt{1-(a+bx)^2}}+\frac{(a+bx)^4\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}\right)d(a}{b^4}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{\frac{1}{2}\left(\frac{1}{2}a^4\arcsin(a+bx)^2+4a^3\sqrt{1-(a+bx)^2}\arcsin(a+bx)-4a^3(a+bx)+\frac{3}{2}a^2\arcsin(a+bx)^2-3a^2(a+bx)\right.}{}$$

input
```
Int[x^3*ArcSin[a + b*x]^2,x]
```

output
```
-((-1/4*(b^4*x^4*ArcSin[a + b*x]^2) + ((-8*a*(a + b*x))/3 - 4*a^3*(a + b*x
) + (3*(a + b*x)^2)/16 + (3*a^2*(a + b*x)^2)/2 - (4*a*(a + b*x)^3)/9 + (a
+ b*x)^4/16 + (8*a*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/3 + 4*a^3*Sqrt[1
 - (a + b*x)^2]*ArcSin[a + b*x] - (3*(a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSi
n[a + b*x])/8 - 3*a^2*(a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x] + (4
*a*(a + b*x)^2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/3 - ((a + b*x)^3*Sqr
t[1 - (a + b*x)^2]*ArcSin[a + b*x])/4 + (3*ArcSin[a + b*x]^2)/16 + (3*a^2*
ArcSin[a + b*x]^2)/2 + (a^4*ArcSin[a + b*x]^2)/2)/2)/b^4)
```

### 3.131.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.131.4 Maple [A] (verified)

Time = 1.04 (sec) , antiderivative size = 309, normalized size of antiderivative = 0.90

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{\arcsin(bx+a)^2(bx+a)^4}{4}-\frac{\arcsin(bx+a)\left(-2(bx+a)^3\sqrt{1-(bx+a)^2}-3(bx+a)\sqrt{1-(bx+a)^2}+3\arcsin(bx+a)\right)}{16}+\frac{3\arcsin(bx+a)^2}{32}-\frac{\left(2(bx\right.}{}}{}$ |
| default | $\frac{\frac{\arcsin(bx+a)^2(bx+a)^4}{4}-\frac{\arcsin(bx+a)\left(-2(bx+a)^3\sqrt{1-(bx+a)^2}-3(bx+a)\sqrt{1-(bx+a)^2}+3\arcsin(bx+a)\right)}{16}+\frac{3\arcsin(bx+a)^2}{32}-\frac{\left(2(bx\right.}{}}{}$ |

input
```
int(x^3*arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

output
```
1/b^4*(1/4*arcsin(b*x+a)^2*(b*x+a)^4-1/16*arcsin(b*x+a)*(-2*(b*x+a)^3*(1-(
b*x+a)^2)^(1/2)-3*(b*x+a)*(1-(b*x+a)^2)^(1/2)+3*arcsin(b*x+a))+3/32*arcsin
(b*x+a)^2-1/128*(2*(b*x+a)^2+3)^2-1/9*a*(9*(b*x+a)^3*arcsin(b*x+a)^2+6*arc
sin(b*x+a)*(1-(b*x+a)^2)^(1/2)*(b*x+a)^2-2*(b*x+a)^3+12*arcsin(b*x+a)*(1-(
b*x+a)^2)^(1/2)-12*b*x-12*a)+3/4*a^2*(2*arcsin(b*x+a)^2*(b*x+a)^2+2*arcsin
(b*x+a)*(1-(b*x+a)^2)^(1/2)*(b*x+a)-arcsin(b*x+a)^2-(b*x+a)^2)-a^3*(arcsin
(b*x+a)^2*(b*x+a)-2*b*x-2*a+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)))
```

### 3.131.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 147, normalized size of antiderivative = 0.43

$$\int x^3 \arcsin(a+bx)^2\,dx =$$
$$-\frac{9\,b^4x^4 - 28\,ab^3x^3 + 3\,(26\,a^2+9)b^2x^2 - 30\,(10\,a^3+11\,a)bx - 9\,(8\,b^4x^4 - 8\,a^4 - 24\,a^2 - 3)\arcsin\,(bx + \cdots}{288\,b \cdots}$$

input
```
integrate(x^3*arcsin(b*x+a)^2,x, algorithm="fricas")
```

output
```
-1/288*(9*b^4*x^4 - 28*a*b^3*x^3 + 3*(26*a^2 + 9)*b^2*x^2 - 30*(10*a^3 + 1
1*a)*b*x - 9*(8*b^4*x^4 - 8*a^4 - 24*a^2 - 3)*arcsin(b*x + a)^2 - 6*(6*b^3
*x^3 - 14*a*b^2*x^2 - 50*a^3 + (26*a^2 + 9)*b*x - 55*a)*sqrt(-b^2*x^2 - 2*
a*b*x - a^2 + 1)*arcsin(b*x + a))/b^4
```

### 3.131.6 Sympy [A] (verification not implemented)

Time = 0.46 (sec) , antiderivative size = 366, normalized size of antiderivative = 1.07

$$\int x^3 \arcsin(a+bx)^2\,dx$$
$$= \begin{cases} -\frac{a^4\operatorname{asin}^2(a+bx)}{4b^4} + \frac{25a^3x}{24b^3} - \frac{25a^3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{24b^4} - \frac{13a^2x^2}{48b^2} + \frac{13a^2x\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{24b^3} - \frac{3a^2\operatorname{asin}\cdots}{\cdots} \\ \frac{x^4\operatorname{asin}^2(a)}{4} \end{cases}$$

input
```
integrate(x**3*asin(b*x+a)**2,x)
```

output
```
Piecewise((-a**4*asin(a + b*x)**2/(4*b**4) + 25*a**3*x/(24*b**3) - 25*a**3
*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(24*b**4) - 13*a**2*x
**2/(48*b**2) + 13*a**2*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b
*x)/(24*b**3) - 3*a**2*asin(a + b*x)**2/(4*b**4) + 7*a*x**3/(72*b) - 7*a*x
**2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(24*b**2) + 55*a*x
/(48*b**3) - 55*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(48*
b**4) + x**4*asin(a + b*x)**2/4 - x**4/32 + x**3*sqrt(-a**2 - 2*a*b*x - b*
*2*x**2 + 1)*asin(a + b*x)/(8*b) - 3*x**2/(32*b**2) + 3*x*sqrt(-a**2 - 2*a
*b*x - b**2*x**2 + 1)*asin(a + b*x)/(16*b**3) - 3*asin(a + b*x)**2/(32*b**
4), Ne(b, 0)), (x**4*asin(a)**2/4, True))
```

### 3.131.7 Maxima [F]

$$\int x^3 \arcsin(a+bx)^2\,dx = \int x^3 \arcsin\left(bx+a\right)^2\,dx$$

input
```
integrate(x^3*arcsin(b*x+a)^2,x, algorithm="maxima")
```

output
```
1/4*x^4*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2 + b*integ
rate(1/2*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^4*arctan2(b*x + a, sqrt(b*
x + a + 1)*sqrt(-b*x - a + 1))/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

### 3.131.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 440, normalized size of antiderivative = 1.28

$$\int x^3 \arcsin(a+bx)^2\,dx = -\frac{(bx+a)a^3\arcsin(bx+a)^2}{b^4} - \frac{\left((bx+a)^2-1\right)(bx+a)a\arcsin(bx+a)^2}{b^4} + \frac{3\left((bx+a)^2-1\right)a^2\arcsin(bx+a)^2}{2\,b^4} + \frac{3\sqrt{-(bx+a)^2+1}(bx+a)a^2\arcsin(bx+a)}{2\,b^4} - \frac{2\sqrt{-(bx+a)^2+1}a^3\arcsin(bx+a)}{b^4} + \frac{2\,(bx+a)a^3}{b^4} + \frac{\left((bx+a)^2-1\right)^2\arcsin(bx+a)^2}{4\,b^4} - \frac{(bx+a)a\arcsin(bx+a)^2}{b^4} + \frac{3\,a^2\arcsin(bx+a)^2}{4\,b^4} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}(bx+a)\arcsin(bx+a)}{8\,b^4} + \frac{2\left(-(bx+a)^2+1\right)^{\frac{3}{2}}a\arcsin(bx+a)}{3\,b^4} + \frac{2\left((bx+a)^2-1\right)(bx+a)a}{9\,b^4} - \frac{3\left((bx+a)^2-1\right)a^2}{4\,b^4} + \frac{\left((bx+a)^2-1\right)\arcsin(bx+a)^2}{2\,b^4} + \frac{5\sqrt{-(bx+a)^2+1}(bx+a)\arcsin(bx+a)}{16\,b^4} - \frac{2\sqrt{-(bx+a)^2+1}a\arcsin(bx+a)}{b^4} - \frac{\left((bx+a)^2-1\right)^2}{32\,b^4} + \frac{14\,(bx+a)a}{9\,b^4} - \frac{3\,a^2}{8\,b^4} + \frac{5\,\arcsin(bx+a)^2}{32\,b^4} - \frac{5\left((bx+a)^2-1\right)}{32\,b^4} - \frac{17}{256\,b^4}$$

input
```
integrate(x^3*arcsin(b*x+a)^2,x, algorithm="giac")
```

output
```
-(b*x + a)*a^3*arcsin(b*x + a)^2/b^4 - ((b*x + a)^2 - 1)*(b*x + a)*a*arcsi
n(b*x + a)^2/b^4 + 3/2*((b*x + a)^2 - 1)*a^2*arcsin(b*x + a)^2/b^4 + 3/2*s
qrt(-(b*x + a)^2 + 1)*(b*x + a)*a^2*arcsin(b*x + a)/b^4 - 2*sqrt(-(b*x + a
)^2 + 1)*a^3*arcsin(b*x + a)/b^4 + 2*(b*x + a)*a^3/b^4 + 1/4*((b*x + a)^2
- 1)^2*arcsin(b*x + a)^2/b^4 - (b*x + a)*a*arcsin(b*x + a)^2/b^4 + 3/4*a^2
*arcsin(b*x + a)^2/b^4 - 1/8*(-(b*x + a)^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x
 + a)/b^4 + 2/3*(-(b*x + a)^2 + 1)^(3/2)*a*arcsin(b*x + a)/b^4 + 2/9*((b*x
 + a)^2 - 1)*(b*x + a)*a/b^4 - 3/4*((b*x + a)^2 - 1)*a^2/b^4 + 1/2*((b*x +
 a)^2 - 1)*arcsin(b*x + a)^2/b^4 + 5/16*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*a
rcsin(b*x + a)/b^4 - 2*sqrt(-(b*x + a)^2 + 1)*a*arcsin(b*x + a)/b^4 - 1/32
*((b*x + a)^2 - 1)^2/b^4 + 14/9*(b*x + a)*a/b^4 - 3/8*a^2/b^4 + 5/32*arcsi
n(b*x + a)^2/b^4 - 5/32*((b*x + a)^2 - 1)/b^4 - 17/256/b^4
```

### 3.131.9 Mupad [F(-1)]

Timed out.

$$\int x^3 \arcsin(a+bx)^2\,dx = \int x^3\,\mathrm{asin}(a+b\,x)^2\,dx$$

input
```
int(x^3*asin(a + b*x)^2,x)
```

output
```
int(x^3*asin(a + b*x)^2, x)
```

# 3.132 $\int x^2 \arcsin(a+bx)^2 \, dx$



## 3.132.1 Optimal result

Integrand size = 12, antiderivative size = 220

$$\int x^2 \arcsin(a+bx)^2 \, dx = -\frac{4x}{9b^2} - \frac{2a^2x}{b^2} + \frac{a(a+bx)^2}{2b^3} - \frac{2(a+bx)^3}{27b^3} + \frac{4\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{9b^3} + \frac{2a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^3} - \frac{a(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^3} + \frac{2(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{9b^3} + \frac{a\arcsin(a+bx)^2}{2b^3} + \frac{a^3\arcsin(a+bx)^2}{3b^3} + \frac{1}{3}x^3\arcsin(a+bx)^2$$

output
```
-4/9*x/b^2-2*a^2*x/b^2+1/2*a*(b*x+a)^2/b^3-2/27*(b*x+a)^3/b^3+1/2*a*arcsin
(b*x+a)^2/b^3+1/3*a^3*arcsin(b*x+a)^2/b^3+1/3*x^3*arcsin(b*x+a)^2+4/9*arcs
in(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^3+2*a^2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/
b^3-a*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^3+2/9*(b*x+a)^2*arcsin(b
*x+a)*(1-(b*x+a)^2)^(1/2)/b^3
```

## 3.132.2 Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.50

$$\int x^2 \arcsin(a+bx)^2 \, dx$$
$$= \frac{-bx(24+66a^2-15abx+4b^2x^2)+6\sqrt{1-a^2-2abx-b^2x^2}(4+11a^2-5abx+2b^2x^2)\arcsin(a+bx)+}{54b^3}$$

input
```
Integrate[x^2*ArcSin[a + b*x]^2,x]
```

output
```
(-(b*x*(24 + 66*a^2 - 15*a*b*x + 4*b^2*x^2)) + 6*Sqrt[1 - a^2 - 2*a*b*x -
b^2*x^2]*(4 + 11*a^2 - 5*a*b*x + 2*b^2*x^2)*ArcSin[a + b*x] + 9*(3*a + 2*a
^3 + 2*b^3*x^3)*ArcSin[a + b*x]^2)/(54*b^3)
```

## 3.132.3 Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 212, normalized size of antiderivative = 0.96, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.417$, Rules used = {5304, 27, 5242, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2 \arcsin(a+bx)^2 \, dx$$
$$\Big\downarrow \ 5304$$
$$\frac{\int x^2 \arcsin(a+bx)^2 d(a+bx)}{b}$$
$$\Big\downarrow \ 27$$
$$\frac{\int b^2x^2 \arcsin(a+bx)^2 d(a+bx)}{b^3}$$
$$\Big\downarrow \ 5242$$
$$\frac{\frac{2}{3}\int -\frac{b^3x^3\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{3}b^3x^3\arcsin(a+bx)^2}{b^3}$$
$$\Big\downarrow \ 5262$$

$$\frac{\frac{2}{3}\int\left(\frac{\arcsin(a+bx)a^3}{\sqrt{1-(a+bx)^2}}-\frac{3(a+bx)\arcsin(a+bx)a^2}{\sqrt{1-(a+bx)^2}}+\frac{3(a+bx)^2\arcsin(a+bx)a}{\sqrt{1-(a+bx)^2}}-\frac{(a+bx)^3\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}\right)d(a+bx)+\frac{1}{3}b^3x^3\arcsin(a+}{b^3}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\frac{2}{3}\left(\frac{1}{2}a^3\arcsin(a+bx)^2+3a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)-3a^2(a+bx)+\frac{3}{4}a\arcsin(a+bx)^2-\frac{3}{2}a(a+bx)\sqrt{1-}\right.}{}$$

input
```
Int[x^2*ArcSin[a + b*x]^2,x]
```

output
```
((b^3*x^3*ArcSin[a + b*x]^2)/3 + (2*((-2*(a + b*x))/3 - 3*a^2*(a + b*x) +
(3*a*(a + b*x)^2)/4 - (a + b*x)^3/9 + (2*Sqrt[1 - (a + b*x)^2]*ArcSin[a +
b*x])/3 + 3*a^2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x] - (3*a*(a + b*x)*Sqr
t[1 - (a + b*x)^2]*ArcSin[a + b*x])/2 + ((a + b*x)^2*Sqrt[1 - (a + b*x)^2]
*ArcSin[a + b*x])/3 + (3*a*ArcSin[a + b*x]^2)/4 + (a^3*ArcSin[a + b*x]^2)/
2))/3)/b^3
```

### 3.132.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.132.4 Maple [A] (verified)

Time = 0.68 (sec) , antiderivative size = 182, normalized size of antiderivative = 0.83

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{(bx+a)^3 \arcsin(bx+a)^2}{3}+\frac{2\arcsin(bx+a)\left((bx+a)^2+2\right)\sqrt{1-(bx+a)^2}}{9}-\frac{2(bx+a)^3}{27}-\frac{4bx}{9}-\frac{4a}{9}-\frac{a\left(2\arcsin(bx+a)^2(bx+a)^2+2\arcsin(b\right.}{}}{b^3}$ |
| default | $\frac{\frac{(bx+a)^3 \arcsin(bx+a)^2}{3}+\frac{2\arcsin(bx+a)\left((bx+a)^2+2\right)\sqrt{1-(bx+a)^2}}{9}-\frac{2(bx+a)^3}{27}-\frac{4bx}{9}-\frac{4a}{9}-\frac{a\left(2\arcsin(bx+a)^2(bx+a)^2+2\arcsin(b\right.}{}}{b^3}$ |

input
```
int(x^2*arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

output
```
1/b^3*(1/3*(b*x+a)^3*arcsin(b*x+a)^2+2/9*arcsin(b*x+a)*((b*x+a)^2+2)*(1-(b
*x+a)^2)^(1/2)-2/27*(b*x+a)^3-4/9*b*x-4/9*a-1/2*a*(2*arcsin(b*x+a)^2*(b*x+
a)^2+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)*(b*x+a)-arcsin(b*x+a)^2-(b*x+a)^2
)+a^2*(arcsin(b*x+a)^2*(b*x+a)-2*b*x-2*a+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/
2)))
```

## 3.132.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.50

$$\int x^2 \arcsin(a+bx)^2 \, dx =$$
$$-\frac{4\,b^3x^3-15\,ab^2x^2+6\,(11\,a^2+4)bx-9\,(2\,b^3x^3+2\,a^3+3\,a)\arcsin\left(bx+a\right)^2-6\,(2\,b^2x^2-5\,abx+11\,a^2}{54\,b^3}$$

input
```
integrate(x^2*arcsin(b*x+a)^2,x, algorithm="fricas")
```

output
```
-1/54*(4*b^3*x^3 - 15*a*b^2*x^2 + 6*(11*a^2 + 4)*b*x - 9*(2*b^3*x^3 + 2*a^
3 + 3*a)*arcsin(b*x + a)^2 - 6*(2*b^2*x^2 - 5*a*b*x + 11*a^2 + 4)*sqrt(-b^
2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a))/b^3
```

### 3.132.6 Sympy [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.10

$$\int x^2 \arcsin(a+bx)^2 \, dx$$
$$= \begin{cases} \frac{a^3 \operatorname{asin}^2(a+bx)}{3b^3} - \frac{11a^2x}{9b^2} + \frac{11a^2\sqrt{-a^2-2abx-b^2x^2+1} \operatorname{asin}(a+bx)}{9b^3} + \frac{5ax^2}{18b} - \frac{5ax\sqrt{-a^2-2abx-b^2x^2+1} \operatorname{asin}(a+bx)}{9b^2} + \frac{a \operatorname{asin}^2(a+bx)}{2b^3} \\ \frac{x^3 \operatorname{asin}^2(a)}{3} \end{cases}$$

input
```
integrate(x**2*asin(b*x+a)**2,x)
```

output
```
Piecewise((a**3*asin(a + b*x)**2/(3*b**3) - 11*a**2*x/(9*b**2) + 11*a**2*s
qrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(9*b**3) + 5*a*x**2/(18
*b) - 5*a*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(9*b**2) +
 a*asin(a + b*x)**2/(2*b**3) + x**3*asin(a + b*x)**2/3 - 2*x**3/27 + 2*x**
2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(9*b) - 4*x/(9*b**2)
 + 4*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(9*b**3), Ne(b, 0
)), (x**3*asin(a)**2/3, True))
```

### 3.132.7 Maxima [F]

$$\int x^2 \arcsin(a+bx)^2 \, dx = \int x^2 \arcsin(bx+a)^2 \, dx$$

input
```
integrate(x^2*arcsin(b*x+a)^2,x, algorithm="maxima")
```

output
```
1/3*x^3*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2 + 2*b*int
egrate(1/3*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^3*arctan2(b*x + a, sqrt(
b*x + a + 1)*sqrt(-b*x - a + 1))/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

### 3.132.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.23

$$\int x^2 \arcsin(a+bx)^2\,dx = \frac{(bx+a)a^2\arcsin(bx+a)^2}{b^3} + \frac{\left((bx+a)^2-1\right)(bx+a)\arcsin(bx+a)^2}{3\,b^3} - \frac{\left((bx+a)^2-1\right)a\arcsin(bx+a)^2}{b^3} - \frac{\sqrt{-(bx+a)^2+1}(bx+a)a\arcsin(bx+a)}{b^3} + \frac{2\sqrt{-(bx+a)^2+1}a^2\arcsin(bx+a)}{b^3} - \frac{2\,(bx+a)a^2}{b^3} + \frac{(bx+a)\arcsin(bx+a)^2}{3\,b^3} - \frac{a\arcsin(bx+a)^2}{2\,b^3} - \frac{2\left(-(bx+a)^2+1\right)^{\frac{3}{2}}\arcsin(bx+a)}{9\,b^3} - \frac{2\left((bx+a)^2-1\right)(bx+a)}{27\,b^3} + \frac{\left((bx+a)^2-1\right)a}{2\,b^3} + \frac{2\sqrt{-(bx+a)^2+1}\arcsin(bx+a)}{3\,b^3} - \frac{14\,(bx+a)}{27\,b^3} + \frac{a}{4\,b^3}$$

input
```
integrate(x^2*arcsin(b*x+a)^2,x, algorithm="giac")
```

output
```
(b*x + a)*a^2*arcsin(b*x + a)^2/b^3 + 1/3*((b*x + a)^2 - 1)*(b*x + a)*arcs
in(b*x + a)^2/b^3 - ((b*x + a)^2 - 1)*a*arcsin(b*x + a)^2/b^3 - sqrt(-(b*x
 + a)^2 + 1)*(b*x + a)*a*arcsin(b*x + a)/b^3 + 2*sqrt(-(b*x + a)^2 + 1)*a^
2*arcsin(b*x + a)/b^3 - 2*(b*x + a)*a^2/b^3 + 1/3*(b*x + a)*arcsin(b*x + a
)^2/b^3 - 1/2*a*arcsin(b*x + a)^2/b^3 - 2/9*(-(b*x + a)^2 + 1)^(3/2)*arcsi
n(b*x + a)/b^3 - 2/27*((b*x + a)^2 - 1)*(b*x + a)/b^3 + 1/2*((b*x + a)^2 -
 1)*a/b^3 + 2/3*sqrt(-(b*x + a)^2 + 1)*arcsin(b*x + a)/b^3 - 14/27*(b*x +
a)/b^3 + 1/4*a/b^3
```

### 3.132.9 Mupad [F(-1)]

Timed out.

$$\int x^2 \arcsin(a+bx)^2 \, dx = \int x^2 \operatorname{asin}(a+b\,x)^2 \, dx$$

input
```
int(x^2*asin(a + b*x)^2,x)
```

output
```
int(x^2*asin(a + b*x)^2, x)
```

# 3.133 $\int x \arcsin(a+bx)^2\,dx$



## 3.133.1 Optimal result

Integrand size = 10, antiderivative size = 130

$$\int x \arcsin(a+bx)^2\,dx = \frac{2ax}{b} - \frac{(a+bx)^2}{4b^2} - \frac{2a\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b^2} + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b^2} - \frac{\arcsin(a+bx)^2}{4b^2} - \frac{a^2\arcsin(a+bx)^2}{2b^2} + \frac{1}{2}x^2\arcsin(a+bx)^2$$

output
```
2*a*x/b-1/4*(b*x+a)^2/b^2-1/4*arcsin(b*x+a)^2/b^2-1/2*a^2*arcsin(b*x+a)^2/
b^2+1/2*x^2*arcsin(b*x+a)^2-2*a*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^2+1/2*
(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^2
```

## 3.133.2 Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 83, normalized size of antiderivative = 0.64

$$\int x \arcsin(a+bx)^2\,dx = \frac{bx(6a-bx) - 2(3a-bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx) + (-1-2a^2+2b^2x^2)\arcsin(a+bx)^2}{4b^2}$$

input
```
Integrate[x*ArcSin[a + b*x]^2,x]
```

output
```
(b*x*(6*a - b*x) - 2*(3*a - b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[
a + b*x] + (-1 - 2*a^2 + 2*b^2*x^2)*ArcSin[a + b*x]^2)/(4*b^2)
```

### 3.133.3 Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.95, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.600$, Rules used = {5304, 25, 27, 5242, 5262, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x \arcsin(a+bx)^2\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int x \arcsin(a+bx)^2 d(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -x \arcsin(a+bx)^2 d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\frac{\int -bx \arcsin(a+bx)^2 d(a+bx)}{b^2}$$

$$\Big\downarrow \text{5242}$$

$$-\frac{\int \frac{b^2x^2 \arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx) - \frac{1}{2}b^2x^2 \arcsin(a+bx)^2}{b^2}$$

$$\Big\downarrow \text{5262}$$

$$-\frac{\int \left(\frac{\arcsin(a+bx)a^2}{\sqrt{1-(a+bx)^2}} - \frac{2(a+bx)\arcsin(a+bx)a}{\sqrt{1-(a+bx)^2}} + \frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}\right)d(a+bx) - \frac{1}{2}b^2x^2 \arcsin(a+bx)^2}{b^2}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{\frac{1}{2}a^2\arcsin(a+bx)^2 - \frac{1}{2}b^2x^2\arcsin(a+bx)^2 - \frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx) + \frac{1}{4}\arcsin(a+bx)^2 + 2a}{b^2}$$

input
```
Int[x*ArcSin[a + b*x]^2,x]
```

output
```
-((-2*a*(a + b*x) + (a + b*x)^2/4 + 2*a*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b
*x] - ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/2 + ArcSin[a + b*x
]^2/4 + (a^2*ArcSin[a + b*x]^2)/2 - (b^2*x^2*ArcSin[a + b*x]^2)/2)/b^2)
```

#### 3.133.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5262
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.)*((d_
) + (e_.)*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^p*(a +
 b*ArcSin[c*x])^n, (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] &
& EqQ[c^2*d + e, 0] && IGtQ[m, 0] && IntegerQ[p + 1/2] && GtQ[d, 0] && IGtQ
[n, 0] && (m == 1 || p > 0 || (n == 1 && p > -1) || (m == 2 && p < -2))
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.133.4 Maple [A] (verified)

Time = 0.39 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.95

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{\left(-1+(bx+a)^2\right)\arcsin(bx+a)^2}{2}+\frac{\arcsin(bx+a)\left((bx+a)\sqrt{1-(bx+a)^2}+\arcsin(bx+a)\right)}{2}-\frac{\arcsin(bx+a)^2}{4}-\frac{(bx+a)^2}{4}-a\left(\arcsin(bx+a\right.}{b^2}$ |
| default | $\frac{\frac{\left(-1+(bx+a)^2\right)\arcsin(bx+a)^2}{2}+\frac{\arcsin(bx+a)\left((bx+a)\sqrt{1-(bx+a)^2}+\arcsin(bx+a)\right)}{2}-\frac{\arcsin(bx+a)^2}{4}-\frac{(bx+a)^2}{4}-a\left(\arcsin(bx+a\right.}{b^2}$ |

input
```
int(x*arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

output
```
1/b^2*(1/2*(-1+(b*x+a)^2)*arcsin(b*x+a)^2+1/2*arcsin(b*x+a)*((b*x+a)*(1-(b
*x+a)^2)^(1/2)+arcsin(b*x+a))-1/4*arcsin(b*x+a)^2-1/4*(b*x+a)^2-a*(arcsin(
b*x+a)^2*(b*x+a)-2*b*x-2*a+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)))
```

### 3.133.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.62

$$\int x\arcsin(a+bx)^2\,dx =$$
$$-\frac{b^2x^2-6\,abx-\left(2\,b^2x^2-2\,a^2-1\right)\arcsin\left(bx+a\right)^2-2\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx-3\,a)\arcsin\left(bx+\right.}{4\,b^2}$$

input
```
integrate(x*arcsin(b*x+a)^2,x, algorithm="fricas")
```

output
```
-1/4*(b^2*x^2 - 6*a*b*x - (2*b^2*x^2 - 2*a^2 - 1)*arcsin(b*x + a)^2 - 2*sq
rt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x - 3*a)*arcsin(b*x + a))/b^2
```

### 3.133.6 Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.06

$$\int x \arcsin(a+bx)^2\,dx$$
$$= \begin{cases} -\frac{a^2 \operatorname{asin}^2(a+bx)}{2b^2} + \frac{3ax}{2b} - \frac{3a\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{2b^2} + \frac{x^2\operatorname{asin}^2(a+bx)}{2} - \frac{x^2}{4} + \frac{x\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a+bx)}{2b} - \text{a} \\ \frac{x^2\operatorname{asin}^2(a)}{2} \end{cases}$$

input
```
integrate(x*asin(b*x+a)**2,x)
```

output
```
Piecewise((-a**2*asin(a + b*x)**2/(2*b**2) + 3*a*x/(2*b) - 3*a*sqrt(-a**2
- 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(2*b**2) + x**2*asin(a + b*x)**2/
2 - x**2/4 + x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(2*b) -
 asin(a + b*x)**2/(4*b**2), Ne(b, 0)), (x**2*asin(a)**2/2, True))
```

### 3.133.7 Maxima [F]

$$\int x \arcsin(a+bx)^2\,dx = \int x \arcsin(bx+a)^2\,dx$$

input
```
integrate(x*arcsin(b*x+a)^2,x, algorithm="maxima")
```

output
```
1/2*x^2*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2 + b*integ
rate(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^2*arctan2(b*x + a, sqrt(b*x +
a + 1)*sqrt(-b*x - a + 1))/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

### 3.133.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.07

$$\int x \arcsin(a+bx)^2\,dx = -\frac{(bx+a)a\arcsin{(bx+a)}^2}{b^2} + \frac{\left((bx+a)^2-1\right)\arcsin{(bx+a)}^2}{2\,b^2} + \frac{\sqrt{-(bx+a)^2+1}(bx+a)\arcsin{(bx+a)}}{2\,b^2} - \frac{2\sqrt{-(bx+a)^2+1}a\arcsin{(bx+a)}}{b^2} + \frac{2\,(bx+a)a}{b^2} + \frac{\arcsin{(bx+a)}^2}{4\,b^2} - \frac{(bx+a)^2-1}{4\,b^2} - \frac{1}{8\,b^2}$$

input
```
integrate(x*arcsin(b*x+a)^2,x, algorithm="giac")
```

output
```
-(b*x + a)*a*arcsin(b*x + a)^2/b^2 + 1/2*((b*x + a)^2 - 1)*arcsin(b*x + a)
^2/b^2 + 1/2*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*arcsin(b*x + a)/b^2 - 2*sqrt
(-(b*x + a)^2 + 1)*a*arcsin(b*x + a)/b^2 + 2*(b*x + a)*a/b^2 + 1/4*arcsin(
b*x + a)^2/b^2 - 1/4*((b*x + a)^2 - 1)/b^2 - 1/8/b^2
```

### 3.133.9 Mupad [F(-1)]

Timed out.

$$\int x \arcsin(a+bx)^2\,dx = \int x\,\mathrm{asin}(a+b\,x)^2\,dx$$

input
```
int(x*asin(a + b*x)^2,x)
```

output
```
int(x*asin(a + b*x)^2, x)
```

# 3.134 $\int \arcsin(a+bx)^2\,dx$



## 3.134.1 Optimal result

Integrand size = 8, antiderivative size = 47

$$\int \arcsin(a+bx)^2\,dx=-2x+\frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b}+\frac{(a+bx)\arcsin(a+bx)^2}{b}$$

output
```
-2*x+(b*x+a)*arcsin(b*x+a)^2/b+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b
```

## 3.134.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.04

$$\int \arcsin(a+bx)^2\,dx =\frac{-2(a+bx)+2\sqrt{1-(a+bx)^2}\arcsin(a+bx)+(a+bx)\arcsin(a+bx)^2}{b}$$

input
```
Integrate[ArcSin[a + b*x]^2,x]
```

output
```
(-2*(a + b*x) + 2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x] + (a + b*x)*ArcSin
[a + b*x]^2)/b
```

### 3.134.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.04, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5302, 5130, 5182, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \arcsin(a+bx)^2\,dx$$

$$\Big\downarrow \ 5302$$

$$\frac{\int \arcsin(a+bx)^2d(a+bx)}{b}$$

$$\Big\downarrow \ 5130$$

$$\frac{(a+bx)\arcsin(a+bx)^2-2\int \frac{(a+bx)\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)}{b}$$

$$\Big\downarrow \ 5182$$

$$\frac{(a+bx)\arcsin(a+bx)^2-2\left(\int 1d(a+bx)-\sqrt{1-(a+bx)^2}\arcsin(a+bx)\right)}{b}$$

$$\Big\downarrow \ 24$$

$$\frac{(a+bx)\arcsin(a+bx)^2-2\left(-\sqrt{1-(a+bx)^2}\arcsin(a+bx)+a+bx\right)}{b}$$

input
```
Int[ArcSin[a + b*x]^2,x]
```

output
```
((a + b*x)*ArcSin[a + b*x]^2 - 2*(a + b*x - Sqrt[1 - (a + b*x)^2]*ArcSin[a
 + b*x]))/b
```

### 3.134.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.134.4 Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.02

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\arcsin(bx+a)^2(bx+a)-2bx-2a+2\arcsin(bx+a)\sqrt{1-(bx+a)^2}}{b}$ | 48 |
| default | $\frac{\arcsin(bx+a)^2(bx+a)-2bx-2a+2\arcsin(bx+a)\sqrt{1-(bx+a)^2}}{b}$ | 48 |

input
```
int(arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

output
```
1/b*(arcsin(b*x+a)^2*(b*x+a)-2*b*x-2*a+2*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)
)
```

### 3.134.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.13

$$\int \arcsin(a+bx)^2\,dx = \frac{(bx+a)\arcsin(bx+a)^2 - 2\,bx + 2\,\sqrt{-b^2x^2 - 2\,abx - a^2 + 1}\arcsin(bx+a)}{b}$$

input
```
integrate(arcsin(b*x+a)^2,x, algorithm="fricas")
```

output
```
((b*x + a)*arcsin(b*x + a)^2 - 2*b*x + 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1
)*arcsin(b*x + a))/b
```

### 3.134.6 Sympy [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.34

$$\int \arcsin(a+bx)^2\,dx = \begin{cases} \frac{a\,\mathrm{asin}^2(a+bx)}{b} + x\,\mathrm{asin}^2(a+bx) - 2x + \frac{2\sqrt{-a^2-2abx-b^2x^2+1}\,\mathrm{asin}(a+bx)}{b} & \text{for } b \neq 0 \\ x\,\mathrm{asin}^2(a) & \text{otherwise} \end{cases}$$

input
```
integrate(asin(b*x+a)**2,x)
```

output
```
Piecewise((a*asin(a + b*x)**2/b + x*asin(a + b*x)**2 - 2*x + 2*sqrt(-a**2
- 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/b, Ne(b, 0)), (x*asin(a)**2, True
))
```

### 3.134.7 Maxima [F]

$$\int \arcsin(a+bx)^2\,dx = \int \arcsin(bx+a)^2\,dx$$

input
```
integrate(arcsin(b*x+a)^2,x, algorithm="maxima")
```

output
```
x*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2 + 2*b*integrate
(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x*arctan2(b*x + a, sqrt(b*x + a + 1)
*sqrt(-b*x - a + 1))/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

## 3.134.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.11

$$\int \arcsin(a+bx)^2\,dx = \frac{(bx+a)\arcsin{(bx+a)}^2}{b} + \frac{2\sqrt{-(bx+a)^2+1}\arcsin{(bx+a)}}{b} - \frac{2\,(bx+a)}{b}$$

input
```
integrate(arcsin(b*x+a)^2,x, algorithm="giac")
```

output
```
(b*x + a)*arcsin(b*x + a)^2/b + 2*sqrt(-(b*x + a)^2 + 1)*arcsin(b*x + a)/b
 - 2*(b*x + a)/b
```

## 3.134.9 Mupad [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.94

$$\int \arcsin(a+bx)^2\,dx = \frac{\left(\mathrm{asin}(a+b\,x)^2-2\right)\,\left(a+b\,x\right)}{b} + \frac{2\,\mathrm{asin}(a+b\,x)\,\sqrt{1-{\left(a+b\,x\right)}^2}}{b}$$

input
```
int(asin(a + b*x)^2,x)
```

output
```
((asin(a + b*x)^2 - 2)*(a + b*x))/b + (2*asin(a + b*x)*(1 - (a + b*x)^2)^(
1/2))/b
```

# 3.135 $\int \frac{\arcsin(a+bx)^2}{x} \, dx$



## 3.135.1 Optimal result

Integrand size = 12, antiderivative size = 271

$$\begin{aligned}\int \frac{\arcsin(a+bx)^2}{x} \, dx = &-\frac{1}{3}i\arcsin(a+bx)^3 + \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ &+\arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ &-2i\arcsin(a+bx)\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ &-2i\arcsin(a+bx)\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ &+2\,\text{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)+2\,\text{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\end{aligned}$$

output
```
-1/3*I*arcsin(b*x+a)^3+arcsin(b*x+a)^2*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2)
)/(I*a-(-a^2+1)^(1/2)))+arcsin(b*x+a)^2*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2
))/(I*a+(-a^2+1)^(1/2)))-2*I*arcsin(b*x+a)*polylog(2,(I*(b*x+a)+(1-(b*x+a)
^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))-2*I*arcsin(b*x+a)*polylog(2,(I*(b*x+a)+(1
-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))+2*polylog(3,(I*(b*x+a)+(1-(b*x+a)
^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))+2*polylog(3,(I*(b*x+a)+(1-(b*x+a)^2)^(1/2
))/(I*a+(-a^2+1)^(1/2)))
```

### 3.135.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 309, normalized size of antiderivative = 1.14

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = -\frac{1}{3}i\arcsin(a+bx)^3 + \arcsin(a+bx)^2\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right) + \arcsin(a+bx)^2\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right) - 2i\arcsin(a+bx)\,\text{PolyLog}\left(2,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right) - 2i\arcsin(a+bx)\,\text{PolyLog}\left(2,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right) + 2\,\text{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right) + 2\,\text{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)$$

input
```
Integrate[ArcSin[a + b*x]^2/x,x]
```

output
```
(-1/3*I)*ArcSin[a + b*x]^3 + ArcSin[a + b*x]^2*Log[1 + E^(I*ArcSin[a + b*x
])/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b)] + ArcSin[a + b*x]^2*Log[1 + E^(I*Ar
cSin[a + b*x])/((((-I)*a)/b + Sqrt[1 - a^2]/b)*b)] - (2*I)*ArcSin[a + b*x]
*PolyLog[2, -(E^(I*ArcSin[a + b*x])/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b))] -
 (2*I)*ArcSin[a + b*x]*PolyLog[2, -(E^(I*ArcSin[a + b*x])/((((-I)*a)/b + S
qrt[1 - a^2]/b)*b))] + 2*PolyLog[3, E^(I*ArcSin[a + b*x])/(I*a - Sqrt[1 -
a^2])] + 2*PolyLog[3, E^(I*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2])]
```

### 3.135.3 Rubi [A] (verified)

Time = 0.89 (sec) , antiderivative size = 297, normalized size of antiderivative = 1.10, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.750$, Rules used = {5304, 25, 27, 5240, 5032, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{\arcsin(a+bx)^2}{x}d(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{\arcsin(a+bx)^2}{x}d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\int -\frac{\arcsin(a+bx)^2}{bx}d(a+bx)$$

$$\Big\downarrow \text{5240}$$

$$-\int -\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{bx}d\arcsin(a+bx)$$

$$\Big\downarrow \text{5032}$$

$$-i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^2}{ia-e^{i\arcsin(a+bx)}-\sqrt{1-a^2}}d\arcsin(a+bx)-i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^2}{ia-e^{i\arcsin(a+bx)}+\sqrt{1-a^2}}d\arcsin(a+bx)-\frac{1}{3}i\arcsin(a+bx)^3$$

$$\Big\downarrow \text{2620}$$

$$-i\left(i\arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-2i\int \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)d\arcsin(a+bx)\right)$$
$$i\left(i\arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-2i\int \arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)d\arcsin(a+bx)\right)-$$
$$\frac{1}{3}i\arcsin(a+bx)^3$$

$$\Big\downarrow \text{3011}$$

$$-i\left(i\arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-2i\left(i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)-i\int \operatorname{PolyLo}\right.\right.$$
$$i\left(i\arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-2i\left(i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)-i\int \operatorname{PolyLog}\left(\right.\right.\right.$$
$$\frac{1}{3}i\arcsin(a+bx)^3$$

$$\Big\downarrow \text{2720}$$

---

3.135. $\int \frac{\arcsin(a+bx)^2}{x}\,dx$

$$-i\left(i \arcsin(a+bx)^2 \log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-2i\left(i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)-\int e^{-i\arcsin(\right.\right.$$
$$i\left(i \arcsin(a+bx)^2 \log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-2i\left(i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)-\int e^{-i\arcsin(a+b\right.\right.$$
$$\frac{1}{3}i\arcsin(a+bx)^3$$

$\downarrow$ 7143

$$-i\left(i \arcsin(a+bx)^2 \log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-2i\left(i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)-\operatorname{PolyLog}\left(3\right.\right.\right.$$
$$i\left(i \arcsin(a+bx)^2 \log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-2i\left(i\arcsin(a+bx)\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)-\operatorname{PolyLog}\left(3,\frac{e^{i}}{ia}\right.\right.\right.$$
$$\frac{1}{3}i\arcsin(a+bx)^3$$

input
```
Int[ArcSin[a + b*x]^2/x,x]
```

output
```
(-1/3*I)*ArcSin[a + b*x]^3 - I*(I*ArcSin[a + b*x]^2*Log[1 - E^(I*ArcSin[a
+ b*x])/(I*a - Sqrt[1 - a^2])] - (2*I)*(I*ArcSin[a + b*x]*PolyLog[2, E^(I*
ArcSin[a + b*x])/(I*a - Sqrt[1 - a^2])] - PolyLog[3, E^(I*ArcSin[a + b*x])
/(I*a - Sqrt[1 - a^2])])) - I*(I*ArcSin[a + b*x]^2*Log[1 - E^(I*ArcSin[a +
 b*x])/(I*a + Sqrt[1 - a^2])] - (2*I)*(I*ArcSin[a + b*x]*PolyLog[2, E^(I*A
rcSin[a + b*x])/(I*a + Sqrt[1 - a^2])] - PolyLog[3, E^(I*ArcSin[a + b*x])/
(I*a + Sqrt[1 - a^2])]))
```

### 3.135.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

3.135. $\int \frac{\arcsin(a+bx)^2}{x}\,dx$

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 5032
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Simp[I   Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2,
2] + b*E^(I*(c + d*x)))), x], x] + Simp[I   Int[(e + f*x)^m*(E^(I*(c + d*x)
)/(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c
, d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

---

## 3.135. $\int \frac{\arcsin(a+bx)^2}{x} \, dx$

### 3.135.4 Maple [F]

$$\int \frac{\arcsin(bx+a)^2}{x}dx$$

input
```
int(arcsin(b*x+a)^2/x,x)
```

output
```
int(arcsin(b*x+a)^2/x,x)
```

### 3.135.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\arcsin(bx+a)^2}{x}\,dx$$

input
```
integrate(arcsin(b*x+a)^2/x,x, algorithm="fricas")
```

output
```
integral(arcsin(b*x + a)^2/x, x)
```

### 3.135.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\operatorname{asin}^2(a+bx)}{x}\,dx$$

input
```
integrate(asin(b*x+a)**2/x,x)
```

output
```
Integral(asin(a + b*x)**2/x, x)
```

### 3.135.7 Maxima [F]

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\arcsin{(bx+a)}^2}{x}\,dx$$

input
```
integrate(arcsin(b*x+a)^2/x,x, algorithm="maxima")
```

output
```
integrate(arcsin(b*x + a)^2/x, x)
```

### 3.135.8 Giac [F]

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\arcsin{(bx+a)}^2}{x}\,dx$$

input
```
integrate(arcsin(b*x+a)^2/x,x, algorithm="giac")
```

output
```
integrate(arcsin(b*x + a)^2/x, x)
```

### 3.135.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^2}{x}\,dx = \int \frac{\mathrm{asin}(a+b\,x)^2}{x}\,dx$$

input
```
int(asin(a + b*x)^2/x,x)
```

output
```
int(asin(a + b*x)^2/x, x)
```

# 3.136 $\int \frac{\arcsin(a+bx)^2}{x^2}\,dx$



## 3.136.1 Optimal result

Integrand size = 12, antiderivative size = 230

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = -\frac{\arcsin(a+bx)^2}{x} - \frac{2b\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)}{\sqrt{1-a^2}} + \frac{2b\arcsin(a+bx)\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)}{\sqrt{1-a^2}} + \frac{2ib\,\mathrm{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)}{\sqrt{1-a^2}} - \frac{2ib\,\mathrm{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)}{\sqrt{1-a^2}}$$

output
```
-arcsin(b*x+a)^2/x-2*b*arcsin(b*x+a)*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/
(I*a-(-a^2+1)^(1/2)))/(-a^2+1)^(1/2)+2*b*arcsin(b*x+a)*ln(1-(I*(b*x+a)+(1-
(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))/(-a^2+1)^(1/2)+2*I*b*polylog(2,(I*
(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))/(-a^2+1)^(1/2)-2*I*b*po
lylog(2,(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))/(-a^2+1)^(1/
2)
```

### 3.136.2 Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 208, normalized size of antiderivative = 0.90

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx$$
$$= \frac{-\sqrt{-1+a^2}\arcsin(a+bx)^2 + 2ibx\arcsin(a+bx)\left(\log\left(\frac{a-\sqrt{-1+a^2}+ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right) - \log\left(\frac{a+\sqrt{-1+a^2}+ie^{i\arcsin(a}{a+\sqrt{-1+a^2}}\right.\right.}{\sqrt{-1+a^2}x}$$

input
```
Integrate[ArcSin[a + b*x]^2/x^2,x]
```

output
```
(-(Sqrt[-1 + a^2]*ArcSin[a + b*x]^2) + (2*I)*b*x*ArcSin[a + b*x]*(Log[(a -
 Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])] - Log[(a
+ Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])]) + 2*b*x
*PolyLog[2, (I*E^(I*ArcSin[a + b*x]))/(-a + Sqrt[-1 + a^2])] - 2*b*x*PolyL
og[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])])/(Sqrt[-1 + a^2]*
x)
```

### 3.136.3 Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 208, normalized size of antiderivative = 0.90, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5304, 27, 5242, 5272, 3042, 3804, 25, 2694, 27, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int \frac{\arcsin(a+bx)^2}{x^2}d(a+bx)}{b}$$

$$\Big\downarrow \; 27$$

$$b\int \frac{\arcsin(a+bx)^2}{b^2x^2}d(a+bx)$$

$$\Big\downarrow \; 5242$$

$$b\left(-2\int -\frac{\arcsin(a+bx)}{bx\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{\arcsin(a+bx)^2}{bx}\right)$$

$\Big\downarrow$ 5272

$$b\left(-2\int -\frac{\arcsin(a+bx)}{bx}d\arcsin(a+bx)-\frac{\arcsin(a+bx)^2}{bx}\right)$$

$\Big\downarrow$ 3042

$$b\left(-2\int \frac{\arcsin(a+bx)}{a-\sin(\arcsin(a+bx))}d\arcsin(a+bx)-\frac{\arcsin(a+bx)^2}{bx}\right)$$

$\Big\downarrow$ 3804

$$b\left(-\frac{\arcsin(a+bx)^2}{bx}-4\int -\frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{-2e^{i\arcsin(a+bx)}a-ie^{2i\arcsin(a+bx)}+i}d\arcsin(a+bx)\right)$$

$\Big\downarrow$ 25

$$b\left(-\frac{\arcsin(a+bx)^2}{bx}+4\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{-2e^{i\arcsin(a+bx)}a-ie^{2i\arcsin(a+bx)}+i}d\arcsin(a+bx)\right)$$

$\Big\downarrow$ 2694

$$b\left(-\frac{\arcsin(a+bx)^2}{bx}+4\left(\frac{i\int -\frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{2\left(a+ie^{i\arcsin(a+bx)}-\sqrt{a^2-1}\right)}d\arcsin(a+bx)}{\sqrt{a^2-1}}-\frac{i\int -\frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{2\left(a+ie^{i\arcsin(a+bx)}+\sqrt{a^2-1}\right)}d\arcsin(}{\sqrt{a^2-1}}\right.\right.$$

$\Big\downarrow$ 27

$$b\left(-\frac{\arcsin(a+bx)^2}{bx}+4\left(\frac{i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{a+ie^{i\arcsin(a+bx)}+\sqrt{a^2-1}}d\arcsin(a+bx)}{2\sqrt{a^2-1}}-\frac{i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{a+ie^{i\arcsin(a+bx)}-\sqrt{a^2-1}}d\arcsin(a+bx)}{2\sqrt{a^2-1}}\right.\right.$$

$\Big\downarrow$ 2620

$$b\left(-\frac{\arcsin(a+bx)^2}{bx}+4\left(\frac{i\left(\int \log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)d\arcsin(a+bx)-\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{\sqrt{a^2-1}+a}\right)\right)}{2\sqrt{a^2-1}}-\right.\right.$$

$\Big\downarrow$ 2715

$$b\left(-\frac{\arcsin(a+bx)^2}{bx}+4\left(\frac{i\left(-i\int e^{-i\arcsin(a+bx)}\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)de^{i\arcsin(a+bx)}-\arcsin(a+bx)\log\left(1+\frac{ie^{i}}{}\right.\right.}{2\sqrt{a^2-1}}\right.\right.$$

---

3.136. $\int \frac{\arcsin(a+bx)^2}{x^2}\,dx$

$$\Big\downarrow \text{2838}$$

$$b\left(-\frac{\arcsin(a+bx)^2}{bx}+4\left(\frac{i\left(i\,\text{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)-\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{\sqrt{a^2-1}+a}\right)\right)}{2\sqrt{a^2-1}}-\frac{i\left(i\,\text{PolyLo}\right.}{}\right.\right.$$

input
```
Int[ArcSin[a + b*x]^2/x^2,x]
```

output
```
b*(-(ArcSin[a + b*x]^2/(b*x)) + 4*(((-1/2*I)*(-(ArcSin[a + b*x]*Log[1 + (I
*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])]) + I*PolyLog[2, ((-I)*E^(I*A
rcSin[a + b*x]))/(a - Sqrt[-1 + a^2])]))/Sqrt[-1 + a^2] + ((I/2)*(-(ArcSin
[a + b*x]*Log[1 + (I*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])]) + I*Pol
yLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])]))/Sqrt[-1 + a^2
]))
```

### 3.136.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.136. $\int \frac{\arcsin(a+bx)^2}{x^2}\,dx$

## 3.136.4 Maple [A] (verified)

Time = 0.91 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.31

| method | result |
|---|---|
| derivativedivides | $b\left(-\frac{\arcsin(bx+a)^2}{bx}-\frac{2\arcsin(bx+a)\sqrt{-a^2+1}\left(\ln\left(\frac{ia+\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia+\sqrt{-a^2+1}}\right)-\ln\left(\frac{-ia+\sqrt{-a^2+1}+i(bx+\cdots}{-ia+\sqrt{-\cdots}}\right.\right.}{a^2-1}\right.$ |
| default | $b\left(-\frac{\arcsin(bx+a)^2}{bx}-\frac{2\arcsin(bx+a)\sqrt{-a^2+1}\left(\ln\left(\frac{ia+\sqrt{-a^2+1}-i(bx+a)-\sqrt{1-(bx+a)^2}}{ia+\sqrt{-a^2+1}}\right)-\ln\left(\frac{-ia+\sqrt{-a^2+1}+i(bx+\cdots}{-ia+\sqrt{-\cdots}}\right.\right.}{a^2-1}\right.$ |

input
```
int(arcsin(b*x+a)^2/x^2,x,method=_RETURNVERBOSE)
```

output
```
b*(-arcsin(b*x+a)^2/b/x-2*arcsin(b*x+a)*(-a^2+1)^(1/2)*(ln((I*a+(-a^2+1)^(
1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))-ln((-I*a+(-a^2+1
)^(1/2)+I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(-I*a+(-a^2+1)^(1/2))))/(a^2-1)+2*I
*(-a^2+1)^(1/2)/(a^2-1)*dilog((I*a+(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^
(1/2))/(I*a+(-a^2+1)^(1/2)))-2*I*(-a^2+1)^(1/2)/(a^2-1)*dilog((-I*a+(-a^2+
1)^(1/2)+I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(-I*a+(-a^2+1)^(1/2))))
```

## 3.136.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx=\int \frac{\arcsin\left(bx+a\right)^2}{x^2}\,dx$$

input
```
integrate(arcsin(b*x+a)^2/x^2,x, algorithm="fricas")
```

output
```
integral(arcsin(b*x + a)^2/x^2, x)
```

### 3.136.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = \int \frac{\operatorname{asin}^2(a+bx)}{x^2}\,dx$$

input
```
integrate(asin(b*x+a)**2/x**2,x)
```

output
```
Integral(asin(a + b*x)**2/x**2, x)
```

### 3.136.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate(arcsin(b*x+a)^2/x^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(a-1>0)', see `assume?` for more
details)Is
```

### 3.136.8 Giac [F]

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = \int \frac{\arcsin(bx+a)^2}{x^2}\,dx$$

input
```
integrate(arcsin(b*x+a)^2/x^2,x, algorithm="giac")
```

output
```
integrate(arcsin(b*x + a)^2/x^2, x)
```

### 3.136.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^2}{x^2}\,dx = \int \frac{\mathrm{asin}(a+b\,x)^2}{x^2}\,dx$$

input
```
int(asin(a + b*x)^2/x^2,x)
```

output
```
int(asin(a + b*x)^2/x^2, x)
```

# 3.137 $\int \frac{\arcsin(a+bx)^2}{x^3}\,dx$



## 3.137.1 Optimal result

Integrand size = 12, antiderivative size = 272

$$\begin{aligned}\int \frac{\arcsin(a+bx)^2}{x^3}\,dx =& -\frac{b\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,x} - \frac{\arcsin(a+bx)^2}{2x^2} \\ & - \frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} \\ & + \frac{iab^2\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} + \frac{b^2\log(x)}{1-a^2} \\ & - \frac{ab^2\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}} + \frac{ab^2\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{(-1+a^2)^{3/2}}\end{aligned}$$

output
```
-1/2*arcsin(b*x+a)^2/x^2+b^2*ln(x)/(-a^2+1)-I*a*b^2*arcsin(b*x+a)*ln(1+I*(
I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a-(a^2-1)^(1/2)))/(a^2-1)^(3/2)+I*a*b^2*ar
csin(b*x+a)*ln(1+I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a+(a^2-1)^(1/2)))/(a^2
-1)^(3/2)-a*b^2*polylog(2,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a-(a^2-1)^(1
/2)))/(a^2-1)^(3/2)+a*b^2*polylog(2,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a+
(a^2-1)^(1/2)))/(a^2-1)^(3/2)-b*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/(-a^2+1)
/x
```

### 3.137.2 Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 314, normalized size of antiderivative = 1.15

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx$$
$$= \frac{2\sqrt{-1+a^2}bx\sqrt{1-(a+bx)^2}\arcsin(a+bx)+\sqrt{-1+a^2}\arcsin(a+bx)^2-a^2\sqrt{-1+a^2}\arcsin(a+bx)^2}{}$$

input
```
Integrate[ArcSin[a + b*x]^2/x^3,x]
```

output
```
(2*Sqrt[-1 + a^2]*b*x*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x] + Sqrt[-1 + a^
2]*ArcSin[a + b*x]^2 - a^2*Sqrt[-1 + a^2]*ArcSin[a + b*x]^2 - (2*I)*a*b^2*
x^2*ArcSin[a + b*x]*Log[(a - Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a
- Sqrt[-1 + a^2])] + (2*I)*a*b^2*x^2*ArcSin[a + b*x]*Log[(a + Sqrt[-1 + a^
2] + I*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])] - 2*Sqrt[-1 + a^2]*b^2
*x^2*Log[x] - 2*a*b^2*x^2*PolyLog[2, (I*E^(I*ArcSin[a + b*x]))/(-a + Sqrt[
-1 + a^2])] + 2*a*b^2*x^2*PolyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a + Sqr
t[-1 + a^2])])/(2*(-1 + a^2)^(3/2)*x^2)
```

### 3.137.3 Rubi [A] (warning: unable to verify)

Time = 1.04 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.03, number of steps used = 18, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.417, Rules used = {5304, 25, 27, 5242, 5272, 3042, 3805, 3042, 3147, 16, 3804, 25, 2694, 27, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int \frac{\arcsin(a+bx)^2}{x^3}d(a+bx)}{b}$$
$$\Big\downarrow \; 25$$
$$-\frac{\int -\frac{\arcsin(a+bx)^2}{x^3}d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-b^2\int -\frac{\arcsin(a+bx)^2}{b^3x^3}d(a+bx)$$

$$\Big\downarrow \text{5242}$$

$$-b^2\left(\frac{\arcsin(a+bx)^2}{2b^2x^2}-\int \frac{\arcsin(a+bx)}{b^2x^2\sqrt{1-(a+bx)^2}}d(a+bx)\right)$$

$$\Big\downarrow \text{5272}$$

$$-b^2\left(\frac{\arcsin(a+bx)^2}{2b^2x^2}-\int \frac{\arcsin(a+bx)}{b^2x^2}d\arcsin(a+bx)\right)$$

$$\Big\downarrow \text{3042}$$

$$-b^2\left(\frac{\arcsin(a+bx)^2}{2b^2x^2}-\int \frac{\arcsin(a+bx)}{(a-\sin(\arcsin(a+bx)))^2}d\arcsin(a+bx)\right)$$

$$\Big\downarrow \text{3805}$$

$$-b^2\left(\frac{\int -\frac{\sqrt{1-(a+bx)^2}}{bx}d\arcsin(a+bx)}{1-a^2}+\frac{a\int -\frac{\arcsin(a+bx)}{bx}d\arcsin(a+bx)}{1-a^2}+\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,bx}+\frac{\text{arcs}}{}\right.$$

$$\Big\downarrow \text{3042}$$

$$-b^2\left(\frac{a\int \frac{\arcsin(a+bx)}{a-\sin(\arcsin(a+bx))}d\arcsin(a+bx)}{1-a^2}+\frac{\int \frac{\cos(\arcsin(a+bx))}{a-\sin(\arcsin(a+bx))}d\arcsin(a+bx)}{1-a^2}+\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx}{(1-a^2)\,bx}\right.$$

$$\Big\downarrow \text{3147}$$

$$-b^2\left(\frac{a\int \frac{\arcsin(a+bx)}{a-\sin(\arcsin(a+bx))}d\arcsin(a+bx)}{1-a^2}-\frac{\int \frac{1}{2a+bx}d(-a-bx)}{1-a^2}+\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,bx}+\frac{\arcsin(a+}{2b^2x^2}\right.$$

$$\Big\downarrow \text{16}$$

$$-b^2\left(\frac{a\int \frac{\arcsin(a+bx)}{a-\sin(\arcsin(a+bx))}d\arcsin(a+bx)}{1-a^2}+\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,bx}-\frac{\log(2a+bx)}{1-a^2}+\frac{\arcsin(a+bx)^2}{2b^2x^2}\right)$$

$$\Big\downarrow \text{3804}$$

---

3.137. $\int \frac{\arcsin(a+bx)^2}{x^3}\,dx$

$$-b^2\left(\frac{2a\int -\frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{-2e^{i\arcsin(a+bx)}a-ie^{2i\arcsin(a+bx)}+i}d\arcsin(a+bx)}{1-a^2}+\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,bx}-\frac{\log(2a+bx)}{1-a^2}+\right.$$

$\downarrow$ 25

$$-b^2\left(-\frac{2a\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{-2e^{i\arcsin(a+bx)}a-ie^{2i\arcsin(a+bx)}+i}d\arcsin(a+bx)}{1-a^2}+\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{(1-a^2)\,bx}-\frac{\log(2a+bx)}{1-a^2}+\right.$$

$\downarrow$ 2694

$$-b^2\left(-\frac{2a\left(\frac{i\int -\frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{2\left(a+ie^{i\arcsin(a+bx)}-\sqrt{a^2-1}\right)}d\arcsin(a+bx)}{\sqrt{a^2-1}}-\frac{i\int -\frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{2\left(a+ie^{i\arcsin(a+bx)}+\sqrt{a^2-1}\right)}d\arcsin(a+bx)}{\sqrt{a^2-1}}\right)}{1-a^2}+\frac{\sqrt{1-(a+bx)^2}}{(1-}\right.$$

$\downarrow$ 27

$$-b^2\left(-\frac{2a\left(\frac{i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{a+ie^{i\arcsin(a+bx)}+\sqrt{a^2-1}}d\arcsin(a+bx)}{2\sqrt{a^2-1}}-\frac{i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)}{a+ie^{i\arcsin(a+bx)}-\sqrt{a^2-1}}d\arcsin(a+bx)}{2\sqrt{a^2-1}}\right)}{1-a^2}+\frac{\sqrt{1-(a+bx)^2}\arcsin(}{(1-a^2)\,bx}\right.$$

$\downarrow$ 2620

$$-b^2\left(-\frac{2a\left(\frac{i\left(\int\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)d\arcsin(a+bx)-\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{\sqrt{a^2-1}+a}\right)\right)}{2\sqrt{a^2-1}}-\frac{i\left(\int\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{a^2-1}}\right)d\arcsin(a-\right.}{2}\right.}{1-a^2}\right.$$

$\downarrow$ 2715

$$-b^2\left(-\frac{2a\left(\frac{i\left(-i\int e^{-i\arcsin(a+bx)}\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)de^{i\arcsin(a+bx)}-\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{\sqrt{a^2-1}+a}\right)\right)}{2\sqrt{a^2-1}}-\frac{i\left(-i\int e^{-i\arcsin(a+b}\right.}{}\right.}{1-a^2}\right.$$

3.137. $\int \frac{\arcsin(a+bx)^2}{x^3}\,dx$

$$\downarrow 2838$$

$$-b^2\left(-\frac{2a\left(\frac{i\left(i\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)-\arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{\sqrt{a^2-1}+a}\right)\right)}{2\sqrt{a^2-1}}-\frac{i\left(i\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{a^2-1}}\right)-\arcsin(a+bx)\right.}{2\sqrt{a^2-1}}\right.}{1-a^2}\right.$$

input
```
Int[ArcSin[a + b*x]^2/x^3,x]
```

output
```
-(b^2*((Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/((1 - a^2)*b*x) + ArcSin[a
+ b*x]^2/(2*b^2*x^2) - Log[2*a + b*x]/(1 - a^2) - (2*a*(((-1/2*I)*(-(ArcSi
n[a + b*x]*Log[1 + (I*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])]) + I*Po
lyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])]))/Sqrt[-1 + a^
2] + ((I/2)*(-(ArcSin[a + b*x]*Log[1 + (I*E^(I*ArcSin[a + b*x]))/(a + Sqrt
[-1 + a^2])]) + I*PolyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a
^2])]))/Sqrt[-1 + a^2]))/(1 - a^2)))
```

### 3.137.3.1 Defintions of rubi rules used

rule 16
```
Int[(c_.)/((a_.) + (b_.)*(x_)), x_Symbol] :> Simp[c*(Log[RemoveContent[a +
b*x, x]]/b), x] /; FreeQ[{a, b, c}, x]
```

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3147
```
Int[cos[(e_.) + (f_.)*(x_)]^(p_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(m
_.), x_Symbol] :> Simp[1/(b^p*f)   Subst[Int[(a + x)^m*(b^2 - x^2)^((p - 1)
/2), x], x, b*Sin[e + f*x]], x] /; FreeQ[{a, b, e, f, m}, x] && IntegerQ[(p
 - 1)/2] && NeQ[a^2 - b^2, 0]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 3805
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^2, x_
Symbol] :> Simp[b*(c + d*x)^m*(Cos[e + f*x]/(f*(a^2 - b^2)*(a + b*Sin[e + f
*x]))), x] + (Simp[a/(a^2 - b^2)   Int[(c + d*x)^m/(a + b*Sin[e + f*x]), x]
, x] - Simp[b*d*(m/(f*(a^2 - b^2)))   Int[(c + d*x)^(m - 1)*(Cos[e + f*x]/(
a + b*Sin[e + f*x])), x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[a^2 -
b^2, 0] && IGtQ[m, 0]
```

## 3.137. $\int \frac{\arcsin(a+bx)^2}{x^3} dx$

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.137.4 Maple [A] (verified)

Time = 1.29 (sec) , antiderivative size = 521, normalized size of antiderivative = 1.92

| method | result |
|---|---|
| derivativedivides | $b^2\left(-\frac{\arcsin(bx+a)\left(-\arcsin(bx+a)+2ia^2-4ia(bx+a)+a^2\arcsin(bx+a)+2a\sqrt{1-(bx+a)^2}+2i(bx+a)^2-2(bx+a)\sqrt{1\right.}{2(a^2-1)b^2x^2}\right.$ |
| default | $b^2\left(-\frac{\arcsin(bx+a)\left(-\arcsin(bx+a)+2ia^2-4ia(bx+a)+a^2\arcsin(bx+a)+2a\sqrt{1-(bx+a)^2}+2i(bx+a)^2-2(bx+a)\sqrt{1\right.}{2(a^2-1)b^2x^2}\right.$ |

input
```
int(arcsin(b*x+a)^2/x^3,x,method=_RETURNVERBOSE)
```

output
```
b^2*(-1/2*arcsin(b*x+a)*(-arcsin(b*x+a)+2*I*a^2-4*I*a*(b*x+a)+a^2*arcsin(b
*x+a)+2*a*(1-(b*x+a)^2)^(1/2)+2*I*(b*x+a)^2-2*(b*x+a)*(1-(b*x+a)^2)^(1/2))
/(a^2-1)/b^2/x^2-1/(a^2-1)*ln(I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2+2*a*(I*(
b*x+a)+(1-(b*x+a)^2)^(1/2))-I)+2/(a^2-1)*ln(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))
+(-a^2+1)^(1/2)/(a^2-1)^2*a*arcsin(b*x+a)*ln((I*a+(-a^2+1)^(1/2)-I*(b*x+a)
-(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))-(-a^2+1)^(1/2)/(a^2-1)^2*a*arc
sin(b*x+a)*ln((I*a-(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^
2+1)^(1/2)))-I*(-a^2+1)^(1/2)/(a^2-1)^2*dilog((I*a+(-a^2+1)^(1/2)-I*(b*x+a
)-(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))*a+I*(-a^2+1)^(1/2)/(a^2-1)^2*
dilog((I*a-(-a^2+1)^(1/2)-I*(b*x+a)-(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/
2)))*a)
```

### 3.137.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx = \int \frac{\arcsin{(bx+a)}^2}{x^3}\,dx$$

input
```
integrate(arcsin(b*x+a)^2/x^3,x, algorithm="fricas")
```

output
```
integral(arcsin(b*x + a)^2/x^3, x)
```

### 3.137.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)^2}{x^3}\,dx = \int \frac{\operatorname{asin}^2{(a+bx)}}{x^3}\,dx$$

input
```
integrate(asin(b*x+a)**2/x**3,x)
```

output
```
Integral(asin(a + b*x)**2/x**3, x)
```

### 3.137.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)^2}{x^3} dx = \text{Exception raised: ValueError}$$

input
```
integrate(arcsin(b*x+a)^2/x^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(a-1>0)', see `assume?` for more
details)Is
```

### 3.137.8 Giac [F]

$$\int \frac{\arcsin(a+bx)^2}{x^3} dx = \int \frac{\arcsin{(bx+a)}^2}{x^3} dx$$

input
```
integrate(arcsin(b*x+a)^2/x^3,x, algorithm="giac")
```

output
```
integrate(arcsin(b*x + a)^2/x^3, x)
```

### 3.137.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^2}{x^3} dx = \int \frac{\mathrm{asin}(a+b\,x)^2}{x^3} dx$$

input
```
int(asin(a + b*x)^2/x^3,x)
```

output
```
int(asin(a + b*x)^2/x^3, x)
```

# 3.138 $\int x^2 \arcsin(a+bx)^3 \, dx$



## 3.138.1 Optimal result

Integrand size = 12, antiderivative size = 371

$$\begin{aligned}\int x^2 \arcsin(a+bx)^3 \, dx = & -\frac{14\sqrt{1-(a+bx)^2}}{9b^3} - \frac{6a^2\sqrt{1-(a+bx)^2}}{b^3} \\ & + \frac{3a(a+bx)\sqrt{1-(a+bx)^2}}{4b^3} + \frac{2(1-(a+bx)^2)^{3/2}}{27b^3} \\ & - \frac{3a\arcsin(a+bx)}{4b^3} - \frac{4(a+bx)\arcsin(a+bx)}{3b^3} \\ & - \frac{6a^2(a+bx)\arcsin(a+bx)}{b^3} + \frac{3a(a+bx)^2\arcsin(a+bx)}{2b^3} \\ & - \frac{2(a+bx)^3\arcsin(a+bx)}{9b^3} + \frac{2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{3b^3} \\ & + \frac{3a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^3} \\ & - \frac{3a(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b^3} \\ & + \frac{(a+bx)^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{3b^3} \\ & + \frac{a\arcsin(a+bx)^3}{2b^3} + \frac{a^3\arcsin(a+bx)^3}{3b^3} + \frac{1}{3}x^3\arcsin(a+bx)^3\end{aligned}$$

output
```
2/27*(1-(b*x+a)^2)^(3/2)/b^3-3/4*a*arcsin(b*x+a)/b^3-4/3*(b*x+a)*arcsin(b*
x+a)/b^3-6*a^2*(b*x+a)*arcsin(b*x+a)/b^3+3/2*a*(b*x+a)^2*arcsin(b*x+a)/b^3
-2/9*(b*x+a)^3*arcsin(b*x+a)/b^3+1/2*a*arcsin(b*x+a)^3/b^3+1/3*a^3*arcsin(
b*x+a)^3/b^3+1/3*x^3*arcsin(b*x+a)^3-14/9*(1-(b*x+a)^2)^(1/2)/b^3-6*a^2*(1
-(b*x+a)^2)^(1/2)/b^3+3/4*a*(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^3+2/3*arcsin(b*x
+a)^2*(1-(b*x+a)^2)^(1/2)/b^3+3*a^2*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b^
3-3/2*a*(b*x+a)*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b^3+1/3*(b*x+a)^2*arcs
in(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b^3
```

### 3.138.2 Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 181, normalized size of antiderivative = 0.49

$$\int x^2 \arcsin(a+bx)^3\,dx$$
$$= \frac{-\sqrt{1-a^2-2abx-b^2x^2}(160+575a^2-65abx+8b^2x^2)-3(170a^3+132a^2bx+a(75-30b^2x^2)+8bx(6}{}$$

input
```
Integrate[x^2*ArcSin[a + b*x]^3,x]
```

output
```
(-(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(160 + 575*a^2 - 65*a*b*x + 8*b^2*x^2
)) - 3*(170*a^3 + 132*a^2*b*x + a*(75 - 30*b^2*x^2) + 8*b*x*(6 + b^2*x^2))
*ArcSin[a + b*x] + 18*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(4 + 11*a^2 - 5*a*
b*x + 2*b^2*x^2)*ArcSin[a + b*x]^2 + 18*(3*a + 2*a^3 + 2*b^3*x^3)*ArcSin[a
 + b*x]^3)/(108*b^3)
```

### 3.138.3 Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 333, normalized size of antiderivative = 0.90, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.583$, Rules used = {5304, 27, 5242, 5272, 3042, 3798, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2 \arcsin(a+bx)^3\,dx$$
$$\Big\downarrow \text{ 5304}$$

$$\frac{\int x^2 \arcsin(a+bx)^3 d(a+bx)}{b}$$

$\Big\downarrow$ 27

$$\frac{\int b^2x^2 \arcsin(a+bx)^3 d(a+bx)}{b^3}$$

$\Big\downarrow$ 5242

$$\frac{\int -\frac{b^3x^3 \arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{3}b^3x^3 \arcsin(a+bx)^3}{b^3}$$

$\Big\downarrow$ 5272

$$\frac{\int -b^3x^3 \arcsin(a+bx)^2 d\arcsin(a+bx)+\frac{1}{3}b^3x^3 \arcsin(a+bx)^3}{b^3}$$

$\Big\downarrow$ 3042

$$\frac{\int \arcsin(a+bx)^2(a-\sin(\arcsin(a+bx)))^3 d\arcsin(a+bx)+\frac{1}{3}b^3x^3 \arcsin(a+bx)^3}{b^3}$$

$\Big\downarrow$ 3798

$$\frac{\int \left(\arcsin(a+bx)^2a^3-3(a+bx)\arcsin(a+bx)^2a^2+3(a+bx)^2\arcsin(a+bx)^2a-(a+bx)^3\arcsin(a+bx)^2\right)d a}{b^3}$$

$\Big\downarrow$ 2009

$$\frac{1}{3}a^3\arcsin(a+bx)^3-6a^2(a+bx)\arcsin(a+bx)+3a^2\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2-6a^2\sqrt{1-(a+bx)^2}+\frac{1}{3}b$$

input
```
Int[x^2*ArcSin[a + b*x]^3,x]
```

output
```
((-14*Sqrt[1 - (a + b*x)^2])/9 - 6*a^2*Sqrt[1 - (a + b*x)^2] + (3*a*(a + b
*x)*Sqrt[1 - (a + b*x)^2])/4 + (2*(1 - (a + b*x)^2)^(3/2))/27 - (3*a*ArcSi
n[a + b*x])/4 - (4*(a + b*x)*ArcSin[a + b*x])/3 - 6*a^2*(a + b*x)*ArcSin[a
 + b*x] + (3*a*(a + b*x)^2*ArcSin[a + b*x])/2 - (2*(a + b*x)^3*ArcSin[a +
b*x])/9 + (2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/3 + 3*a^2*Sqrt[1 - (
a + b*x)^2]*ArcSin[a + b*x]^2 - (3*a*(a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSi
n[a + b*x]^2)/2 + ((a + b*x)^2*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/3
+ (a*ArcSin[a + b*x]^3)/2 + (a^3*ArcSin[a + b*x]^3)/3 + (b^3*x^3*ArcSin[a
+ b*x]^3)/3)/b^3
```

3.138. $\int x^2 \arcsin(a+bx)^3\,dx$

### 3.138.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3798
```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.138.4 Maple [A] (verified)

Time = 0.92 (sec) , antiderivative size = 294, normalized size of antiderivative = 0.79

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{\arcsin(bx+a)^3(bx+a)^3}{3}+\frac{\arcsin(bx+a)^2\left((bx+a)^2+2\right)\sqrt{1-(bx+a)^2}}{3}-\frac{4\sqrt{1-(bx+a)^2}}{3}-\frac{4\arcsin(bx+a)(bx+a)}{3}-\frac{2\arcsin(bx+a)(bx+a)}{9}}{}$ |
| default | $\frac{\frac{\arcsin(bx+a)^3(bx+a)^3}{3}+\frac{\arcsin(bx+a)^2\left((bx+a)^2+2\right)\sqrt{1-(bx+a)^2}}{3}-\frac{4\sqrt{1-(bx+a)^2}}{3}-\frac{4\arcsin(bx+a)(bx+a)}{3}-\frac{2\arcsin(bx+a)(bx+a)}{9}}{}$ |

input
```
int(x^2*arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

output
```
1/b^3*(1/3*arcsin(b*x+a)^3*(b*x+a)^3+1/3*arcsin(b*x+a)^2*((b*x+a)^2+2)*(1-
(b*x+a)^2)^(1/2)-4/3*(1-(b*x+a)^2)^(1/2)-4/3*arcsin(b*x+a)*(b*x+a)-2/9*arc
sin(b*x+a)*(b*x+a)^3-2/27*((b*x+a)^2+2)*(1-(b*x+a)^2)^(1/2)-1/4*a*(4*arcsi
n(b*x+a)^3*(b*x+a)^2+6*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)*(b*x+a)-2*arcsi
n(b*x+a)^3-6*arcsin(b*x+a)*(b*x+a)^2-3*(b*x+a)*(1-(b*x+a)^2)^(1/2)+3*arcsi
n(b*x+a))+a^2*(arcsin(b*x+a)^3*(b*x+a)+3*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/
2)-6*(1-(b*x+a)^2)^(1/2)-6*arcsin(b*x+a)*(b*x+a)))
```

## 3.138.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 152, normalized size of antiderivative = 0.41

$$\int x^2 \arcsin(a+bx)^3\,dx$$
$$= \frac{18\,(2\,b^3x^3+2\,a^3+3\,a)\arcsin\left(bx+a\right)^3-3\,(8\,b^3x^3-30\,ab^2x^2+170\,a^3+12\,(11\,a^2+4)bx+75\,a)\arcsin(}{}$$

input
```
integrate(x^2*arcsin(b*x+a)^3,x, algorithm="fricas")
```

output
```
1/108*(18*(2*b^3*x^3 + 2*a^3 + 3*a)*arcsin(b*x + a)^3 - 3*(8*b^3*x^3 - 30*
a*b^2*x^2 + 170*a^3 + 12*(11*a^2 + 4)*b*x + 75*a)*arcsin(b*x + a) - (8*b^2
*x^2 - 65*a*b*x - 18*(2*b^2*x^2 - 5*a*b*x + 11*a^2 + 4)*arcsin(b*x + a)^2
+ 575*a^2 + 160)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))/b^3
```

### 3.138.6 Sympy [A] (verification not implemented)

Time = 0.44 (sec) , antiderivative size = 432, normalized size of antiderivative = 1.16

$$\int x^2 \arcsin(a+bx)^3\,dx$$
$$= \begin{cases} \frac{a^3 \operatorname{asin}^3(a+bx)}{3b^3} - \frac{85a^3 \operatorname{asin}(a+bx)}{18b^3} - \frac{11a^2 x \operatorname{asin}(a+bx)}{3b^2} + \frac{11a^2\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}^2(a+bx)}{6b^3} - \frac{575a^2\sqrt{-a^2-2abx-b^2x^2+1}}{108b^3} + \\ \frac{x^3 \operatorname{asin}^3(a)}{3} \end{cases}$$

input
```
integrate(x**2*asin(b*x+a)**3,x)
```

output
```
Piecewise((a**3*asin(a + b*x)**3/(3*b**3) - 85*a**3*asin(a + b*x)/(18*b**3
) - 11*a**2*x*asin(a + b*x)/(3*b**2) + 11*a**2*sqrt(-a**2 - 2*a*b*x - b**2
*x**2 + 1)*asin(a + b*x)**2/(6*b**3) - 575*a**2*sqrt(-a**2 - 2*a*b*x - b**
2*x**2 + 1)/(108*b**3) + 5*a*x**2*asin(a + b*x)/(6*b) - 5*a*x*sqrt(-a**2 -
 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(6*b**2) + 65*a*x*sqrt(-a**2 -
2*a*b*x - b**2*x**2 + 1)/(108*b**2) + a*asin(a + b*x)**3/(2*b**3) - 25*a*a
sin(a + b*x)/(12*b**3) + x**3*asin(a + b*x)**3/3 - 2*x**3*asin(a + b*x)/9
+ x**2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(3*b) - 2*x*
*2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(27*b) - 4*x*asin(a + b*x)/(3*b**
2) + 2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(3*b**3) - 4
0*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(27*b**3), Ne(b, 0)), (x**3*asin(a
)**3/3, True))
```

### 3.138.7 Maxima [F]

$$\int x^2 \arcsin(a+bx)^3\,dx = \int x^2 \arcsin(bx+a)^3\,dx$$

input
```
integrate(x^2*arcsin(b*x+a)^3,x, algorithm="maxima")
```

output
```
1/3*x^3*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^3 + b*integ
rate(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^3*arctan2(b*x + a, sqrt(b*x +
a + 1)*sqrt(-b*x - a + 1))^2/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

### 3.138.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 389, normalized size of antiderivative = 1.05

$$\int x^2 \arcsin(a+bx)^3\,dx = \frac{(bx+a)a^2\arcsin(bx+a)^3}{b^3} + \frac{\left((bx+a)^2-1\right)(bx+a)\arcsin(bx+a)^3}{3\,b^3} - \frac{\left((bx+a)^2-1\right)a\arcsin(bx+a)^3}{b^3} - \frac{3\sqrt{-(bx+a)^2+1}(bx+a)a\arcsin(bx+a)^2}{2\,b^3} + \frac{3\sqrt{-(bx+a)^2+1}a^2\arcsin(bx+a)^2}{b^3} - \frac{6\,(bx+a)a^2\arcsin(bx+a)}{b^3} + \frac{(bx+a)\arcsin(bx+a)^3}{3\,b^3} - \frac{a\arcsin(bx+a)^3}{2\,b^3} - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}\arcsin(bx+a)^2}{3\,b^3} - \frac{2\left((bx+a)^2-1\right)(bx+a)\arcsin(bx+a)}{9\,b^3} + \frac{3\left((bx+a)^2-1\right)a\arcsin(bx+a)}{2\,b^3} + \frac{3\sqrt{-(bx+a)^2+1}(bx+a)a}{4\,b^3} - \frac{6\sqrt{-(bx+a)^2+1}a^2}{b^3} + \frac{\sqrt{-(bx+a)^2+1}\arcsin(bx+a)^2}{b^3} - \frac{14\,(bx+a)\arcsin(bx+a)}{9\,b^3} + \frac{3\,a\arcsin(bx+a)}{4\,b^3} + \frac{2\left(-(bx+a)^2+1\right)^{\frac{3}{2}}}{27\,b^3} - \frac{14\sqrt{-(bx+a)^2+1}}{9\,b^3}$$

input
```
integrate(x^2*arcsin(b*x+a)^3,x, algorithm="giac")
```

output
```
(b*x + a)*a^2*arcsin(b*x + a)^3/b^3 + 1/3*((b*x + a)^2 - 1)*(b*x + a)*arcs
in(b*x + a)^3/b^3 - ((b*x + a)^2 - 1)*a*arcsin(b*x + a)^3/b^3 - 3/2*sqrt(-
(b*x + a)^2 + 1)*(b*x + a)*a*arcsin(b*x + a)^2/b^3 + 3*sqrt(-(b*x + a)^2 +
 1)*a^2*arcsin(b*x + a)^2/b^3 - 6*(b*x + a)*a^2*arcsin(b*x + a)/b^3 + 1/3*
(b*x + a)*arcsin(b*x + a)^3/b^3 - 1/2*a*arcsin(b*x + a)^3/b^3 - 1/3*(-(b*x
 + a)^2 + 1)^(3/2)*arcsin(b*x + a)^2/b^3 - 2/9*((b*x + a)^2 - 1)*(b*x + a)
*arcsin(b*x + a)/b^3 + 3/2*((b*x + a)^2 - 1)*a*arcsin(b*x + a)/b^3 + 3/4*s
qrt(-(b*x + a)^2 + 1)*(b*x + a)*a/b^3 - 6*sqrt(-(b*x + a)^2 + 1)*a^2/b^3 +
 sqrt(-(b*x + a)^2 + 1)*arcsin(b*x + a)^2/b^3 - 14/9*(b*x + a)*arcsin(b*x
+ a)/b^3 + 3/4*a*arcsin(b*x + a)/b^3 + 2/27*(-(b*x + a)^2 + 1)^(3/2)/b^3 -
 14/9*sqrt(-(b*x + a)^2 + 1)/b^3
```

### 3.138.9 Mupad [F(-1)]

Timed out.

$$\int x^2 \arcsin(a+bx)^3 \, dx = \int x^2 \operatorname{asin}(a+b\,x)^3 \, dx$$

input
```
int(x^2*asin(a + b*x)^3,x)
```

output
```
int(x^2*asin(a + b*x)^3, x)
```

# 3.139 $\int x \arcsin(a+bx)^3\,dx$



## 3.139.1 Optimal result

Integrand size = 10, antiderivative size = 211

$$\begin{aligned}\int x \arcsin(a+bx)^3\,dx &= \frac{6a\sqrt{1-(a+bx)^2}}{b^2} - \frac{3(a+bx)\sqrt{1-(a+bx)^2}}{8b^2} \\ &+ \frac{3\arcsin(a+bx)}{8b^2} + \frac{6a(a+bx)\arcsin(a+bx)}{b^2} \\ &- \frac{3(a+bx)^2\arcsin(a+bx)}{4b^2} - \frac{3a\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b^2} \\ &+ \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{4b^2} \\ &- \frac{\arcsin(a+bx)^3}{4b^2} - \frac{a^2\arcsin(a+bx)^3}{2b^2} + \frac{1}{2}x^2\arcsin(a+bx)^3\end{aligned}$$

output
```
3/8*arcsin(b*x+a)/b^2+6*a*(b*x+a)*arcsin(b*x+a)/b^2-3/4*(b*x+a)^2*arcsin(b
*x+a)/b^2-1/4*arcsin(b*x+a)^3/b^2-1/2*a^2*arcsin(b*x+a)^3/b^2+1/2*x^2*arcs
in(b*x+a)^3+6*a*(1-(b*x+a)^2)^(1/2)/b^2-3/8*(b*x+a)*(1-(b*x+a)^2)^(1/2)/b^
2-3*a*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b^2+3/4*(b*x+a)*arcsin(b*x+a)^2*
(1-(b*x+a)^2)^(1/2)/b^2
```

### 3.139.2 Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.64

$$\int x \arcsin(a+bx)^3\,dx$$
$$= \frac{3(15a-bx)\sqrt{1-a^2-2abx-b^2x^2}+(3+42a^2+36abx-6b^2x^2)\arcsin(a+bx)-6(3a-bx)\sqrt{1-a^2-}}{8b^2}$$

input
```
Integrate[x*ArcSin[a + b*x]^3,x]
```

output
```
(3*(15*a - b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + (3 + 42*a^2 + 36*a*b*x
 - 6*b^2*x^2)*ArcSin[a + b*x] - 6*(3*a - b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2
*x^2]*ArcSin[a + b*x]^2 + (-2 - 4*a^2 + 4*b^2*x^2)*ArcSin[a + b*x]^3)/(8*b
^2)
```

### 3.139.3 Rubi [A] (warning: unable to verify)

Time = 0.52 (sec) , antiderivative size = 199, normalized size of antiderivative = 0.94, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.800$, Rules used = {5304, 25, 27, 5242, 5272, 3042, 3798, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x \arcsin(a+bx)^3\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int x\arcsin(a+bx)^3d(a+bx)}{b}$$
$$\Big\downarrow \text{25}$$
$$-\frac{\int -x\arcsin(a+bx)^3d(a+bx)}{b}$$
$$\Big\downarrow \text{27}$$
$$-\frac{\int -bx\arcsin(a+bx)^3d(a+bx)}{b^2}$$
$$\Big\downarrow \text{5242}$$

$$-\frac{\frac{3}{2}\int \frac{b^2x^2\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}b^2x^2\arcsin(a+bx)^3}{b^2}$$

$\Big\downarrow$ 5272

$$-\frac{\frac{3}{2}\int b^2x^2\arcsin(a+bx)^2d\arcsin(a+bx)-\frac{1}{2}b^2x^2\arcsin(a+bx)^3}{b^2}$$

$\Big\downarrow$ 3042

$$-\frac{\frac{3}{2}\int \arcsin(a+bx)^2(a-\sin(\arcsin(a+bx)))^2d\arcsin(a+bx)-\frac{1}{2}b^2x^2\arcsin(a+bx)^3}{b^2}$$

$\Big\downarrow$ 3798

$$-\frac{\frac{3}{2}\int \left(a^2\arcsin(a+bx)^2+(a+bx)^2\arcsin(a+bx)^2-2a(a+bx)\arcsin(a+bx)^2\right)d\arcsin(a+bx)-\frac{1}{2}b^2x^2\arcsi}{b^2}$$

$\Big\downarrow$ 2009

$$-\frac{\frac{3}{2}\Big(\frac{1}{3}a^2\arcsin(a+bx)^3+\frac{1}{6}\arcsin(a+bx)^3+2a\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2-\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\arcs}{}$$

input
```
Int[x*ArcSin[a + b*x]^3,x]
```

output
```
-((-1/2*(b^2*x^2*ArcSin[a + b*x]^3) + (3*((-a - b*x)/4 - 4*a*Sqrt[1 - (a +
 b*x)^2] + ((a + b*x)*Sqrt[1 - (a + b*x)^2])/4 - 4*a*(a + b*x)*ArcSin[a +
b*x] + ((a + b*x)^2*ArcSin[a + b*x])/2 + 2*a*Sqrt[1 - (a + b*x)^2]*ArcSin[
a + b*x]^2 - ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/2 + ArcSi
n[a + b*x]^3/6 + (a^2*ArcSin[a + b*x]^3)/3))/2)/b^2)
```

### 3.139.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3798
```
Int[((c_.) + (d_.)*(x_))^(m_.)*((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)])^(n_.)
, x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*Sin[e + f*x])^n, x],
 x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[n, 0] && (EqQ[n, 1] || IGtQ[
m, 0] || NeQ[a^2 - b^2, 0])
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.139.4 Maple [A] (verified)

Time = 0.44 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.88

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{\left(-1+(bx+a)^2\right)\arcsin(bx+a)^3}{2}+\frac{3\arcsin(bx+a)^2\left((bx+a)\sqrt{1-(bx+a)^2}+\arcsin(bx+a)\right)}{4}-\frac{3\left(-1+(bx+a)^2\right)\arcsin(bx+a)}{4}-\frac{3(bx+a)\sqrt{\ldots}}{\ldots}}{\ldots}$ |
| default | $\frac{\frac{\left(-1+(bx+a)^2\right)\arcsin(bx+a)^3}{2}+\frac{3\arcsin(bx+a)^2\left((bx+a)\sqrt{1-(bx+a)^2}+\arcsin(bx+a)\right)}{4}-\frac{3\left(-1+(bx+a)^2\right)\arcsin(bx+a)}{4}-\frac{3(bx+a)\sqrt{\ldots}}{\ldots}}{\ldots}$ |

input
```
int(x*arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

output
```
1/b^2*(1/2*(-1+(b*x+a)^2)*arcsin(b*x+a)^3+3/4*arcsin(b*x+a)^2*((b*x+a)*(1-
(b*x+a)^2)^(1/2)+arcsin(b*x+a))-3/4*(-1+(b*x+a)^2)*arcsin(b*x+a)-3/8*(b*x+
a)*(1-(b*x+a)^2)^(1/2)-3/8*arcsin(b*x+a)-1/2*arcsin(b*x+a)^3-a*(arcsin(b*x
+a)^3*(b*x+a)+3*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)-6*(1-(b*x+a)^2)^(1/2)-
6*arcsin(b*x+a)*(b*x+a)))
```

### 3.139.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.51

$$\int x\arcsin(a+bx)^3\,dx$$
$$= \frac{2\left(2\,b^2x^2 - 2\,a^2 - 1\right)\arcsin\left(bx+a\right)^3 - 3\left(2\,b^2x^2 - 12\,abx - 14\,a^2 - 1\right)\arcsin\left(bx+a\right) + 3\sqrt{-b^2x^2 - 2\,abx}}{8\,b^2}$$

input
```
integrate(x*arcsin(b*x+a)^3,x, algorithm="fricas")
```

output
```
1/8*(2*(2*b^2*x^2 - 2*a^2 - 1)*arcsin(b*x + a)^3 - 3*(2*b^2*x^2 - 12*a*b*x
 - 14*a^2 - 1)*arcsin(b*x + a) + 3*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(2*(
b*x - 3*a)*arcsin(b*x + a)^2 - b*x + 15*a))/b^2
```

### 3.139.6 Sympy [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.18

$$\int x\arcsin(a+bx)^3\,dx$$
$$= \begin{cases} -\frac{a^2\operatorname{asin}^3(a+bx)}{2b^2} + \frac{21a^2\operatorname{asin}(a+bx)}{4b^2} + \frac{9ax\operatorname{asin}(a+bx)}{2b} - \frac{9a\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}^2(a+bx)}{4b^2} + \frac{45a\sqrt{-a^2-2abx-b^2x^2+1}}{8b^2} + \frac{x^2 a}{} \\ \frac{x^2\operatorname{asin}^3(a)}{2} \end{cases}$$

input
```
integrate(x*asin(b*x+a)**3,x)
```

output
```
Piecewise((-a**2*asin(a + b*x)**3/(2*b**2) + 21*a**2*asin(a + b*x)/(4*b**2
) + 9*a*x*asin(a + b*x)/(2*b) - 9*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*
asin(a + b*x)**2/(4*b**2) + 45*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(8*
b**2) + x**2*asin(a + b*x)**3/2 - 3*x**2*asin(a + b*x)/4 + 3*x*sqrt(-a**2
- 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(4*b) - 3*x*sqrt(-a**2 - 2*a*b
*x - b**2*x**2 + 1)/(8*b) - asin(a + b*x)**3/(4*b**2) + 3*asin(a + b*x)/(8
*b**2), Ne(b, 0)), (x**2*asin(a)**3/2, True))
```

## 3.139.7 Maxima [F]

$$\int x \arcsin(a+bx)^3 \, dx = \int x \arcsin(bx+a)^3 \, dx$$

input
```
integrate(x*arcsin(b*x+a)^3,x, algorithm="maxima")
```

output
```
1/2*x^2*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^3 + 3*b*int
egrate(1/2*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^2*arctan2(b*x + a, sqrt(
b*x + a + 1)*sqrt(-b*x - a + 1))^2/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

## 3.139.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 203, normalized size of antiderivative = 0.96

$$\begin{aligned}\int x \arcsin(a+bx)^3 \, dx = & -\frac{(bx+a)a\arcsin(bx+a)^3}{b^2} + \frac{\left((bx+a)^2-1\right)\arcsin(bx+a)^3}{2\,b^2} \\ & + \frac{3\sqrt{-(bx+a)^2+1}(bx+a)\arcsin(bx+a)^2}{4\,b^2} \\ & - \frac{3\sqrt{-(bx+a)^2+1}a\arcsin(bx+a)^2}{b^2} \\ & + \frac{6(bx+a)a\arcsin(bx+a)}{b^2} + \frac{\arcsin(bx+a)^3}{4\,b^2} \\ & - \frac{3\left((bx+a)^2-1\right)\arcsin(bx+a)}{4\,b^2} - \frac{3\sqrt{-(bx+a)^2+1}(bx+a)}{8\,b^2} \\ & + \frac{6\sqrt{-(bx+a)^2+1}a}{b^2} - \frac{3\arcsin(bx+a)}{8\,b^2}\end{aligned}$$

input
```
integrate(x*arcsin(b*x+a)^3,x, algorithm="giac")
```

output
```
-(b*x + a)*a*arcsin(b*x + a)^3/b^2 + 1/2*((b*x + a)^2 - 1)*arcsin(b*x + a)
^3/b^2 + 3/4*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*arcsin(b*x + a)^2/b^2 - 3*sq
rt(-(b*x + a)^2 + 1)*a*arcsin(b*x + a)^2/b^2 + 6*(b*x + a)*a*arcsin(b*x +
a)/b^2 + 1/4*arcsin(b*x + a)^3/b^2 - 3/4*((b*x + a)^2 - 1)*arcsin(b*x + a)
/b^2 - 3/8*sqrt(-(b*x + a)^2 + 1)*(b*x + a)/b^2 + 6*sqrt(-(b*x + a)^2 + 1)
*a/b^2 - 3/8*arcsin(b*x + a)/b^2
```

### 3.139.9 Mupad [F(-1)]

Timed out.

$$\int x \arcsin(a+bx)^3 \, dx = \int x \operatorname{asin}(a+b\,x)^3 \, dx$$

input
```
int(x*asin(a + b*x)^3,x)
```

output
```
int(x*asin(a + b*x)^3, x)
```

# 3.140 $\int \arcsin(a+bx)^3\,dx$



## 3.140.1 Optimal result

Integrand size = 8, antiderivative size = 82

$$\int \arcsin(a+bx)^3\,dx = -\frac{6\sqrt{1-(a+bx)^2}}{b} - \frac{6(a+bx)\arcsin(a+bx)}{b} + \frac{3\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b}$$

output
```
-6*(b*x+a)*arcsin(b*x+a)/b+(b*x+a)*arcsin(b*x+a)^3/b-6*(1-(b*x+a)^2)^(1/2)
/b+3*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b
```

## 3.140.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.90

$$\int \arcsin(a+bx)^3\,dx = \frac{-6\sqrt{1-(a+bx)^2} - 6(a+bx)\arcsin(a+bx) + 3\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2 + (a+bx)\arcsin(a+b}{b}$$

input
```
Integrate[ArcSin[a + b*x]^3,x]
```

output
```
(-6*Sqrt[1 - (a + b*x)^2] - 6*(a + b*x)*ArcSin[a + b*x] + 3*Sqrt[1 - (a +
b*x)^2]*ArcSin[a + b*x]^2 + (a + b*x)*ArcSin[a + b*x]^3)/b
```

### 3.140.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.94, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {5302, 5130, 5182, 5130, 241}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \arcsin(a+bx)^3\,dx$$

$$\Big\downarrow \text{ 5302}$$

$$\frac{\int \arcsin(a+bx)^3d(a+bx)}{b}$$

$$\Big\downarrow \text{ 5130}$$

$$\frac{(a+bx)\arcsin(a+bx)^3-3\int \frac{(a+bx)\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{ 5182}$$

$$\frac{(a+bx)\arcsin(a+bx)^3-3\left(2\int \arcsin(a+bx)d(a+bx)-\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2\right)}{b}$$

$$\Big\downarrow \text{ 5130}$$

$$\frac{(a+bx)\arcsin(a+bx)^3-3\left(2\left((a+bx)\arcsin(a+bx)-\int \frac{a+bx}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)-\sqrt{1-(a+bx)^2}\arcsin(a+b}{b}$$

$$\Big\downarrow \text{ 241}$$

$$\frac{(a+bx)\arcsin(a+bx)^3-3\left(2\left((a+bx)\arcsin(a+bx)+\sqrt{1-(a+bx)^2}\right)-\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2\right)}{b}$$

input
```
Int[ArcSin[a + b*x]^3,x]
```

output
```
((a + b*x)*ArcSin[a + b*x]^3 - 3*(-(Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^
2) + 2*(Sqrt[1 - (a + b*x)^2] + (a + b*x)*ArcSin[a + b*x])))/b
```

### 3.140.3.1 Defintions of rubi rules used

rule 241
```
Int[(x_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(a + b*x^2)^(p + 1)/
(2*b*(p + 1)), x] /; FreeQ[{a, b, p}, x] && NeQ[p, -1]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.140.4 Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.87

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\arcsin(bx+a)^3(bx+a)+3\arcsin(bx+a)^2\sqrt{1-(bx+a)^2}-6\sqrt{1-(bx+a)^2}-6\arcsin(bx+a)(bx+a)}{b}$ | 71 |
| default | $\frac{\arcsin(bx+a)^3(bx+a)+3\arcsin(bx+a)^2\sqrt{1-(bx+a)^2}-6\sqrt{1-(bx+a)^2}-6\arcsin(bx+a)(bx+a)}{b}$ | 71 |

input
```
int(arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

output
```
1/b*(arcsin(b*x+a)^3*(b*x+a)+3*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)-6*(1-(b
*x+a)^2)^(1/2)-6*arcsin(b*x+a)*(b*x+a))
```

### 3.140.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.80

$$\int \arcsin(a+bx)^3\,dx$$
$$=\frac{(bx+a)\arcsin{(bx+a)}^{3}-6\,(bx+a)\arcsin{(bx+a)}+3\,\sqrt{-b^{2}x^{2}-2\,abx-a^{2}+1}\left(\arcsin{(bx+a)}^{2}-2\right)}{b}$$

input
```
integrate(arcsin(b*x+a)^3,x, algorithm="fricas")
```

output
```
((b*x + a)*arcsin(b*x + a)^3 - 6*(b*x + a)*arcsin(b*x + a) + 3*sqrt(-b^2*x
^2 - 2*a*b*x - a^2 + 1)*(arcsin(b*x + a)^2 - 2))/b
```

### 3.140.6 Sympy [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.33

$$\int \arcsin(a+bx)^3\,dx$$
$$=\begin{cases}\frac{a\operatorname{asin}^{3}{(a+bx)}}{b}-\frac{6a\operatorname{asin}{(a+bx)}}{b}+x\operatorname{asin}^{3}{(a+bx)}-6x\operatorname{asin}{(a+bx)}+\frac{3\sqrt{-a^{2}-2abx-b^{2}x^{2}+1}\operatorname{asin}^{2}{(a+bx)}}{b}-\frac{6\sqrt{-a^{2}-2a}}{} \\ x\operatorname{asin}^{3}{(a)}\end{cases}$$

input
```
integrate(asin(b*x+a)**3,x)
```

output
```
Piecewise((a*asin(a + b*x)**3/b - 6*a*asin(a + b*x)/b + x*asin(a + b*x)**3
 - 6*x*asin(a + b*x) + 3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*
x)**2/b - 6*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/b, Ne(b, 0)), (x*asin(a)
**3, True))
```

### 3.140.7 Maxima [F]

$$\int \arcsin(a+bx)^3\,dx = \int \arcsin\left(bx+a\right)^3\,dx$$

input
```
integrate(arcsin(b*x+a)^3,x, algorithm="maxima")
```

output
```
x*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^3 + 3*b*integrate
(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x*arctan2(b*x + a, sqrt(b*x + a + 1)
*sqrt(-b*x - a + 1))^2/(b^2*x^2 + 2*a*b*x + a^2 - 1), x)
```

### 3.140.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.95

$$\int \arcsin(a+bx)^3\,dx = \frac{(bx+a)\arcsin\left(bx+a\right)^3}{b} + \frac{3\sqrt{-(bx+a)^2+1}\arcsin\left(bx+a\right)^2}{b} - \frac{6\,(bx+a)\arcsin\left(bx+a\right)}{b} - \frac{6\sqrt{-(bx+a)^2+1}}{b}$$

input
```
integrate(arcsin(b*x+a)^3,x, algorithm="giac")
```

output
```
(b*x + a)*arcsin(b*x + a)^3/b + 3*sqrt(-(b*x + a)^2 + 1)*arcsin(b*x + a)^2
/b - 6*(b*x + a)*arcsin(b*x + a)/b - 6*sqrt(-(b*x + a)^2 + 1)/b
```

### 3.140.9 Mupad [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.72

$$\int \arcsin(a+bx)^3\,dx = \frac{\left(3\,\mathrm{asin}(a+b\,x)^2-6\right)\,\sqrt{1-(a+b\,x)^2}}{b} - \frac{\left(6\,\mathrm{asin}(a+b\,x)-\mathrm{asin}(a+b\,x)^3\right)\,(a+b\,x)}{b}$$

input
```
int(asin(a + b*x)^3,x)
```

output
```
((3*asin(a + b*x)^2 - 6)*(1 - (a + b*x)^2)^(1/2))/b - ((6*asin(a + b*x) -
asin(a + b*x)^3)*(a + b*x))/b
```

## 3.140. $\int \arcsin(a+bx)^3\,dx$

# 3.141 $\int \frac{\arcsin(a+bx)^3}{x}\,dx$



## 3.141.1 Optimal result

Integrand size = 12, antiderivative size = 365

$$\begin{aligned}\int \frac{\arcsin(a+bx)^3}{x}\,dx = {} & -\frac{1}{4}i\arcsin(a+bx)^4+\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ & +\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ & -3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ & -3i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ & +6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)\\ & +6\arcsin(a+bx)\operatorname{PolyLog}\left(3,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\\ & +6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)+6i\operatorname{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\end{aligned}$$

output
```
-1/4*I*arcsin(b*x+a)^4+arcsin(b*x+a)^3*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2)
)/(I*a-(-a^2+1)^(1/2)))+arcsin(b*x+a)^3*ln(1-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2
))/(I*a+(-a^2+1)^(1/2)))-3*I*arcsin(b*x+a)^2*polylog(2,(I*(b*x+a)+(1-(b*x+
a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))-3*I*arcsin(b*x+a)^2*polylog(2,(I*(b*x+a
)+(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))+6*arcsin(b*x+a)*polylog(3,(I*
(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))+6*arcsin(b*x+a)*polylog
(3,(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))+6*I*polylog(4,(I*
(b*x+a)+(1-(b*x+a)^2)^(1/2))/(I*a-(-a^2+1)^(1/2)))+6*I*polylog(4,(I*(b*x+a
)+(1-(b*x+a)^2)^(1/2))/(I*a+(-a^2+1)^(1/2)))
```

### 3.141.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 424, normalized size of antiderivative = 1.16

$$\begin{aligned}\int \frac{\arcsin(a+bx)^3}{x}\,dx =& -\frac{1}{4}i\arcsin(a+bx)^4+\arcsin(a+bx)^3\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)\\&+\arcsin(a+bx)^3\log\left(1+\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)\\&-3i\arcsin(a+bx)^2\,\text{PolyLog}\left(2,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)\\&-3i\arcsin(a+bx)^2\,\text{PolyLog}\left(2,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)\\&+6\arcsin(a+bx)\,\text{PolyLog}\left(3,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}-\frac{\sqrt{1-a^2}}{b}\right)b}\right)\\&+6\arcsin(a+bx)\,\text{PolyLog}\left(3,-\frac{e^{i\arcsin(a+bx)}}{\left(-\frac{ia}{b}+\frac{\sqrt{1-a^2}}{b}\right)b}\right)\\&+6i\,\text{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)+6i\,\text{PolyLog}\left(4,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)\end{aligned}$$

input
```
Integrate[ArcSin[a + b*x]^3/x,x]
```

output
```
(-1/4*I)*ArcSin[a + b*x]^4 + ArcSin[a + b*x]^3*Log[1 + E^(I*ArcSin[a + b*x
])/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b)] + ArcSin[a + b*x]^3*Log[1 + E^(I*Ar
cSin[a + b*x])/((((-I)*a)/b + Sqrt[1 - a^2]/b)*b)] - (3*I)*ArcSin[a + b*x]
^2*PolyLog[2, -(E^(I*ArcSin[a + b*x])/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b))]
 - (3*I)*ArcSin[a + b*x]^2*PolyLog[2, -(E^(I*ArcSin[a + b*x])/((((-I)*a)/b
 + Sqrt[1 - a^2]/b)*b))] + 6*ArcSin[a + b*x]*PolyLog[3, -(E^(I*ArcSin[a +
b*x])/((((-I)*a)/b - Sqrt[1 - a^2]/b)*b))] + 6*ArcSin[a + b*x]*PolyLog[3,
-(E^(I*ArcSin[a + b*x])/((((-I)*a)/b + Sqrt[1 - a^2]/b)*b))] + (6*I)*PolyL
og[4, E^(I*ArcSin[a + b*x])/(I*a - Sqrt[1 - a^2])] + (6*I)*PolyLog[4, E^(I
*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2])]
```

### 3.141.3 Rubi [A] (verified)

Time = 1.14 (sec) , antiderivative size = 397, normalized size of antiderivative = 1.09, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.833, Rules used = {5304, 25, 27, 5240, 5032, 2620, 3011, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)^3}{x} dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{\arcsin(a+bx)^3}{x} d(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{\arcsin(a+bx)^3}{x} d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\int -\frac{\arcsin(a+bx)^3}{bx} d(a+bx)$$

$$\Big\downarrow \text{5240}$$

$$-\int -\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{bx} d\arcsin(a+bx)$$

$$\Big\downarrow \text{5032}$$

$$-i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^3}{ia-e^{i\arcsin(a+bx)}-\sqrt{1-a^2}}d\arcsin(a+bx)-i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^3}{ia-e^{i\arcsin(a+bx)}+\sqrt{1-a^2}}d\arcsin(a+bx)-\frac{1}{4}i\arcsin(a+bx)^4$$

$\downarrow$ 2620

$$-i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-3i\int \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)d\arcsin(a+bx)\right.$$
$$i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-3i\int \arcsin(a+bx)^2\log\left(1-\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)d\arcsin(a+bx)\right)-$$
$$\frac{1}{4}i\arcsin(a+bx)^4$$

$\downarrow$ 3011

$$-i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-3i\left(i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)-2i\int \operatorname{arcsi}\right.\right.$$
$$i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-3i\left(i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)-2i\int \arcsin(a\right.\right.$$
$$\frac{1}{4}i\arcsin(a+bx)^4$$

$\downarrow$ 7163

$$-i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-3i\left(i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)-2i\left(i\int \operatorname{Po}\right.\right.\right.$$
$$i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-3i\left(i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)-2i\left(i\int \operatorname{PolyL}\right.\right.\right.$$
$$\frac{1}{4}i\arcsin(a+bx)^4$$

$\downarrow$ 2720

$$-i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-3i\left(i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)-2i\left(\int e^{-i}\right.\right.\right.$$
$$i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-3i\left(i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)-2i\left(\int e^{-i\arcsin}\right.\right.\right.$$
$$\frac{1}{4}i\arcsin(a+bx)^4$$

$\downarrow$ 7143

3.141. $\int \frac{\arcsin(a+bx)^3}{x}\,dx$

$$-i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{-\sqrt{1-a^2}+ia}\right)-3i\left(i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia-\sqrt{1-a^2}}\right)-2i\left(\operatorname{PolyLo}\right.\right.\right.$$
$$i\left(i\arcsin(a+bx)^3\log\left(1-\frac{e^{i\arcsin(a+bx)}}{\sqrt{1-a^2}+ia}\right)-3i\left(i\arcsin(a+bx)^2\operatorname{PolyLog}\left(2,\frac{e^{i\arcsin(a+bx)}}{ia+\sqrt{1-a^2}}\right)-2i\left(\operatorname{PolyLog}\left(\right.\right.\right.\right.$$
$$\frac{1}{4}i\arcsin(a+bx)^4$$

input
```
Int[ArcSin[a + b*x]^3/x,x]
```

output
```
(-1/4*I)*ArcSin[a + b*x]^4 - I*(I*ArcSin[a + b*x]^3*Log[1 - E^(I*ArcSin[a
+ b*x])/(I*a - Sqrt[1 - a^2])] - (3*I)*(I*ArcSin[a + b*x]^2*PolyLog[2, E^(
I*ArcSin[a + b*x])/(I*a - Sqrt[1 - a^2])] - (2*I)*((-I)*ArcSin[a + b*x]*Po
lyLog[3, E^(I*ArcSin[a + b*x])/(I*a - Sqrt[1 - a^2])] + PolyLog[4, E^(I*Ar
cSin[a + b*x])/(I*a - Sqrt[1 - a^2])]))) - I*(I*ArcSin[a + b*x]^3*Log[1 -
E^(I*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2])] - (3*I)*(I*ArcSin[a + b*x]^2*
PolyLog[2, E^(I*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2])] - (2*I)*((-I)*ArcS
in[a + b*x]*PolyLog[3, E^(I*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2])] + Poly
Log[4, E^(I*ArcSin[a + b*x])/(I*a + Sqrt[1 - a^2])])))
```

### 3.141.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 5032
```
Int[(Cos[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(m_.))/((a_) + (b_.)*Sin[
(c_.) + (d_.)*(x_)]), x_Symbol] :> Simp[(-I)*((e + f*x)^(m + 1)/(b*f*(m + 1
))), x] + (Simp[I   Int[(e + f*x)^m*(E^(I*(c + d*x))/(I*a - Rt[-a^2 + b^2,
2] + b*E^(I*(c + d*x)))), x], x] + Simp[I   Int[(e + f*x)^m*(E^(I*(c + d*x)
)/(I*a + Rt[-a^2 + b^2, 2] + b*E^(I*(c + d*x)))), x], x]) /; FreeQ[{a, b, c
, d, e, f}, x] && IGtQ[m, 0] && NegQ[a^2 - b^2]
```

rule 5240
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> Subst[Int[(a + b*x)^n*(Cos[x]/(c*d + e*Sin[x])), x], x, ArcSin[c*x]] /;
 FreeQ[{a, b, c, d, e}, x] && IGtQ[n, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

## 3.141. $\int \frac{\arcsin(a+bx)^3}{x}\,dx$

### 3.141.4 Maple [F]

$$\int \frac{\arcsin(bx+a)^3}{x}dx$$

input
```
int(arcsin(b*x+a)^3/x,x)
```

output
```
int(arcsin(b*x+a)^3/x,x)
```

### 3.141.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\arcsin(bx+a)^3}{x}\,dx$$

input
```
integrate(arcsin(b*x+a)^3/x,x, algorithm="fricas")
```

output
```
integral(arcsin(b*x + a)^3/x, x)
```

### 3.141.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\operatorname{asin}^3(a+bx)}{x}\,dx$$

input
```
integrate(asin(b*x+a)**3/x,x)
```

output
```
Integral(asin(a + b*x)**3/x, x)
```

### 3.141.7 Maxima [F]

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)^3}{x}\,dx$$

input
```
integrate(arcsin(b*x+a)^3/x,x, algorithm="maxima")
```

output
```
integrate(arcsin(b*x + a)^3/x, x)
```

### 3.141.8 Giac [F]

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\arcsin\left(bx+a\right)^3}{x}\,dx$$

input
```
integrate(arcsin(b*x+a)^3/x,x, algorithm="giac")
```

output
```
integrate(arcsin(b*x + a)^3/x, x)
```

### 3.141.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^3}{x}\,dx = \int \frac{\mathrm{asin}(a+b\,x)^3}{x}\,dx$$

input
```
int(asin(a + b*x)^3/x,x)
```

output
```
int(asin(a + b*x)^3/x, x)
```

# 3.142 $\int \frac{\arcsin(a+bx)^3}{x^2}\,dx$



## 3.142.1 Optimal result

Integrand size = 12, antiderivative size = 316

$$\begin{aligned}\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = &-\frac{\arcsin(a+bx)^3}{x}+\frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\&-\frac{3ib\arcsin(a+bx)^2\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\&+\frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\&-\frac{6b\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\\&+\frac{6ib\operatorname{PolyLog}\left(3,-\frac{ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}-\frac{6ib\operatorname{PolyLog}\left(3,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{-1+a^2}}\right)}{\sqrt{-1+a^2}}\end{aligned}$$

output
```
-arcsin(b*x+a)^3/x+3*I*b*arcsin(b*x+a)^2*ln(1+I*(I*(b*x+a)+(1-(b*x+a)^2)^(
1/2))/(a-(a^2-1)^(1/2)))/(a^2-1)^(1/2)-3*I*b*arcsin(b*x+a)^2*ln(1+I*(I*(b*
x+a)+(1-(b*x+a)^2)^(1/2))/(a+(a^2-1)^(1/2)))/(a^2-1)^(1/2)+6*b*arcsin(b*x+
a)*polylog(2,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a-(a^2-1)^(1/2)))/(a^2-1)
^(1/2)-6*b*arcsin(b*x+a)*polylog(2,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))/(a+(
a^2-1)^(1/2)))/(a^2-1)^(1/2)+6*I*b*polylog(3,-I*(I*(b*x+a)+(1-(b*x+a)^2)^(
1/2))/(a-(a^2-1)^(1/2)))/(a^2-1)^(1/2)-6*I*b*polylog(3,-I*(I*(b*x+a)+(1-(b
*x+a)^2)^(1/2))/(a+(a^2-1)^(1/2)))/(a^2-1)^(1/2)
```

### 3.142.2 Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 309, normalized size of antiderivative = 0.98

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx =$$
$$-\frac{\sqrt{-1+a^2}\arcsin(a+bx)^3 - 3ibx\arcsin(a+bx)^2\log\left(\frac{a-\sqrt{-1+a^2}+ie^{i\arcsin(a+bx)}}{a-\sqrt{-1+a^2}}\right) + 3ibx\arcsin(a+bx)^2\log}{}$$

input
```
Integrate[ArcSin[a + b*x]^3/x^2,x]
```

output
```
-((Sqrt[-1 + a^2]*ArcSin[a + b*x]^3 - (3*I)*b*x*ArcSin[a + b*x]^2*Log[(a -
 Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])] + (3*I)*b
*x*ArcSin[a + b*x]^2*Log[(a + Sqrt[-1 + a^2] + I*E^(I*ArcSin[a + b*x]))/(a
 + Sqrt[-1 + a^2])] - 6*b*x*ArcSin[a + b*x]*PolyLog[2, (I*E^(I*ArcSin[a +
b*x]))/(-a + Sqrt[-1 + a^2])] + 6*b*x*ArcSin[a + b*x]*PolyLog[2, ((-I)*E^(
I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])] - (6*I)*b*x*PolyLog[3, (I*E^(I*A
rcSin[a + b*x]))/(-a + Sqrt[-1 + a^2])] + (6*I)*b*x*PolyLog[3, ((-I)*E^(I*
ArcSin[a + b*x]))/(a + Sqrt[-1 + a^2])])/(Sqrt[-1 + a^2]*x))
```

### 3.142.3 Rubi [A] (verified)

Time = 1.13 (sec) , antiderivative size = 298, normalized size of antiderivative = 0.94, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 1.083$, Rules used = {5304, 27, 5242, 5272, 3042, 3804, 25, 2694, 27, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int \frac{\arcsin(a+bx)^3}{x^2}d(a+bx)}{b}$$
$$\Big\downarrow \; 27$$
$$b\int \frac{\arcsin(a+bx)^3}{b^2x^2}d(a+bx)$$
$$\Big\downarrow \; 5242$$

$$b\left(-3\int -\frac{\arcsin(a+bx)^2}{bx\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{\arcsin(a+bx)^3}{bx}\right)$$

$\downarrow$ 5272

$$b\left(-3\int -\frac{\arcsin(a+bx)^2}{bx}d\arcsin(a+bx)-\frac{\arcsin(a+bx)^3}{bx}\right)$$

$\downarrow$ 3042

$$b\left(-3\int \frac{\arcsin(a+bx)^2}{a-\sin(\arcsin(a+bx))}d\arcsin(a+bx)-\frac{\arcsin(a+bx)^3}{bx}\right)$$

$\downarrow$ 3804

$$b\left(-\frac{\arcsin(a+bx)^3}{bx}-6\int -\frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^2}{-2e^{i\arcsin(a+bx)}a-ie^{2i\arcsin(a+bx)}+i}d\arcsin(a+bx)\right)$$

$\downarrow$ 25

$$b\left(-\frac{\arcsin(a+bx)^3}{bx}+6\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^2}{-2e^{i\arcsin(a+bx)}a-ie^{2i\arcsin(a+bx)}+i}d\arcsin(a+bx)\right)$$

$\downarrow$ 2694

$$b\left(-\frac{\arcsin(a+bx)^3}{bx}+6\left(\frac{i\int -\frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^2}{2\left(a+ie^{i\arcsin(a+bx)}-\sqrt{a^2-1}\right)}d\arcsin(a+bx)}{\sqrt{a^2-1}}-\frac{i\int -\frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^2}{2\left(a+ie^{i\arcsin(a+bx)}+\sqrt{a^2-1}\right)}d\arcsin(}{\sqrt{a^2-1}}\right.\right.$$

$\downarrow$ 27

$$b\left(-\frac{\arcsin(a+bx)^3}{bx}+6\left(\frac{i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^2}{a+ie^{i\arcsin(a+bx)}+\sqrt{a^2-1}}d\arcsin(a+bx)}{2\sqrt{a^2-1}}-\frac{i\int \frac{e^{i\arcsin(a+bx)}\arcsin(a+bx)^2}{a+ie^{i\arcsin(a+bx)}-\sqrt{a^2-1}}d\arcsin(a+bx}{2\sqrt{a^2-1}}\right.\right.$$

$\downarrow$ 2620

$$b\left(-\frac{\arcsin(a+bx)^3}{bx}+6\left(\frac{i\left(2\int \arcsin(a+bx)\log\left(1+\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)d\arcsin(a+bx)-\arcsin(a+bx)^2\log\left(1+\right.\right.}{2\sqrt{a^2-1}}\right.\right.$$

$\downarrow$ 3011

$$b\left(-\frac{\arcsin(a+bx)^3}{bx}+6\left(\frac{i\left(2\left(i\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)-i\int \operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)d\operatorname{ar}\right.\right.}{2\sqrt{a^2-1}}\right.\right.$$

3.142. $\int \frac{\arcsin(a+bx)^3}{x^2}dx$

$$\Big\downarrow \text{ 2720}$$

$$b\left(-\frac{\arcsin(a+bx)^3}{bx}+6\left(\frac{i\left(2\left(i\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)-\int e^{-i\arcsin(a+bx)}\operatorname{PolyLog}\left(2,-\frac{ie^{i\operatorname{arc}}}{a+}\right.\right.\right.}{2\sqrt{a^2-1}}\right.\right.$$

$$\Big\downarrow \text{ 7143}$$

$$b\left(-\frac{\arcsin(a+bx)^3}{bx}+6\left(\frac{i\left(2\left(i\arcsin(a+bx)\operatorname{PolyLog}\left(2,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)-\operatorname{PolyLog}\left(3,-\frac{ie^{i\arcsin(a+bx)}}{a+\sqrt{a^2-1}}\right)\right)-\operatorname{arc}\right.}{2\sqrt{a^2-1}}\right.\right.$$

input
```
Int[ArcSin[a + b*x]^3/x^2,x]
```

output
```
b*(-(ArcSin[a + b*x]^3/(b*x)) + 6*(((-1/2*I)*(-(ArcSin[a + b*x]^2*Log[1 +
(I*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])]) + 2*(I*ArcSin[a + b*x]*Po
lyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])] - PolyLog[3, (
(-I)*E^(I*ArcSin[a + b*x]))/(a - Sqrt[-1 + a^2])])))/Sqrt[-1 + a^2] + ((I/
2)*(-(ArcSin[a + b*x]^2*Log[1 + (I*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 + a
^2])]) + 2*(I*ArcSin[a + b*x]*PolyLog[2, ((-I)*E^(I*ArcSin[a + b*x]))/(a +
 Sqrt[-1 + a^2])] - PolyLog[3, ((-I)*E^(I*ArcSin[a + b*x]))/(a + Sqrt[-1 +
 a^2])])))/Sqrt[-1 + a^2]))
```

### 3.142.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2694
```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[2*(c/q)   Int
[(f + g*x)^m*(F^u/(b - q + 2*c*F^u)), x], x] - Simp[2*(c/q)   Int[(f + g*x)
^m*(F^u/(b + q + 2*c*F^u)), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[
v, 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3804
```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*sin[(e_.) + (f_.)*(x_)]), x_Sy
mbol] :> Simp[2   Int[(c + d*x)^m*(E^(I*(e + f*x))/(I*b + 2*a*E^(I*(e + f*x
)) - I*b*E^(2*I*(e + f*x)))), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[a^2 - b^2, 0] && IGtQ[m, 0]
```

rule 5242
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(e*(m + 1))), x] -
Simp[b*c*(n/(e*(m + 1)))   Int[(d + e*x)^(m + 1)*((a + b*ArcSin[c*x])^(n -
1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && IGtQ[n, 0]
 && NeQ[m, -1]
```

## 3.142. $\int \frac{\arcsin(a+bx)^3}{x^2} \, dx$

rule 5272
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_) + (g_.)*(x_))^(m_.))/Sq
rt[(d_) + (e_.)*(x_)^2], x_Symbol] :> Simp[1/(c^(m + 1)*Sqrt[d])   Subst[In
t[(a + b*x)^n*(c*f + g*Sin[x])^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c
, d, e, f, g, n}, x] && EqQ[c^2*d + e, 0] && IntegerQ[m] && GtQ[d, 0] && (G
tQ[m, 0] || IGtQ[n, 0])
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

## 3.142.4 Maple [F]

$$\int \frac{\arcsin\left(bx+a\right)^{3}}{x^{2}}dx$$

input
```
int(arcsin(b*x+a)^3/x^2,x)
```

output
```
int(arcsin(b*x+a)^3/x^2,x)
```

## 3.142.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \int \frac{\arcsin\left(bx+a\right)^{3}}{x^{2}}\,dx$$

input
```
integrate(arcsin(b*x+a)^3/x^2,x, algorithm="fricas")
```

output
```
integral(arcsin(b*x + a)^3/x^2, x)
```

### 3.142.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \int \frac{\operatorname{asin}^3(a+bx)}{x^2}\,dx$$

input
```
integrate(asin(b*x+a)**3/x**2,x)
```

output
```
Integral(asin(a + b*x)**3/x**2, x)
```

### 3.142.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate(arcsin(b*x+a)^3/x^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(a-1>0)', see `assume?` for more
details)Is
```

### 3.142.8 Giac [F]

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \int \frac{\arcsin(bx+a)^3}{x^2}\,dx$$

input
```
integrate(arcsin(b*x+a)^3/x^2,x, algorithm="giac")
```

output
```
integrate(arcsin(b*x + a)^3/x^2, x)
```

### 3.142.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^3}{x^2}\,dx = \int \frac{\operatorname{asin}(a+b\,x)^3}{x^2}\,dx$$

input
```
int(asin(a + b*x)^3/x^2,x)
```

output
```
int(asin(a + b*x)^3/x^2, x)
```

# 3.143 $\int \frac{x^2}{\arcsin(a+bx)} dx$



## 3.143.1 Optimal result

Integrand size = 12, antiderivative size = 60

$$\int \frac{x^2}{\arcsin(a+bx)} dx = \frac{\text{CosIntegral}(\arcsin(a+bx))}{4b^3} + \frac{a^2 \text{CosIntegral}(\arcsin(a+bx))}{b^3} - \frac{\text{CosIntegral}(3\arcsin(a+bx))}{4b^3} - \frac{a\text{Si}(2\arcsin(a+bx))}{b^3}$$

output
```
1/4*Ci(arcsin(b*x+a))/b^3+a^2*Ci(arcsin(b*x+a))/b^3-1/4*Ci(3*arcsin(b*x+a)
)/b^3-a*Si(2*arcsin(b*x+a))/b^3
```

## 3.143.2 Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.75

$$\int \frac{x^2}{\arcsin(a+bx)} dx = -\frac{-((1+4a^2)\text{CosIntegral}(\arcsin(a+bx))) + \text{CosIntegral}(3\arcsin(a+bx)) + 4a\text{Si}(2\arcsin(a+bx))}{4b^3}$$

input
```
Integrate[x^2/ArcSin[a + b*x],x]
```

output
```
-1/4*(-((1 + 4*a^2)*CosIntegral[ArcSin[a + b*x]]) + CosIntegral[3*ArcSin[a
 + b*x]] + 4*a*SinIntegral[2*ArcSin[a + b*x]])/b^3
```

### 3.143.3 Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.87, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {5304, 27, 5246, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int \frac{x^2}{\arcsin(a+bx)}d(a+bx)}{b}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{b^2x^2}{\arcsin(a+bx)}d(a+bx)}{b^3}$$

$$\Big\downarrow \; 5246$$

$$\frac{\int \frac{b^2x^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d\arcsin(a+bx)}{b^3}$$

$$\Big\downarrow \; 7293$$

$$\frac{\int \left(\frac{\sqrt{1-(a+bx)^2}a^2}{\arcsin(a+bx)}-\frac{2(a+bx)\sqrt{1-(a+bx)^2}a}{\arcsin(a+bx)}+\frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}\right)d\arcsin(a+bx)}{b^3}$$

$$\Big\downarrow \; 2009$$

$$\frac{a^2\,\text{CosIntegral}(\arcsin(a+bx))+\frac{1}{4}\text{CosIntegral}(\arcsin(a+bx))-\frac{1}{4}\text{CosIntegral}(3\arcsin(a+bx))-a\text{Si}(2\arcsin(}{b^3}$$

input
```
Int[x^2/ArcSin[a + b*x],x]
```

output
```
(CosIntegral[ArcSin[a + b*x]]/4 + a^2*CosIntegral[ArcSin[a + b*x]] - CosIn
tegral[3*ArcSin[a + b*x]]/4 - a*SinIntegral[2*ArcSin[a + b*x]])/b^3
```

#### 3.143.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.143.4 Maple [A] (verified)

Time = 0.59 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.82

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\frac{\operatorname{Ci}(\arcsin(bx+a))}{4}-\frac{\operatorname{Ci}(3\arcsin(bx+a))}{4}-a\operatorname{Si}(2\arcsin(bx+a))+a^2\operatorname{Ci}(\arcsin(bx+a))}{b^3}$ | 49 |
| default | $\frac{\frac{\operatorname{Ci}(\arcsin(bx+a))}{4}-\frac{\operatorname{Ci}(3\arcsin(bx+a))}{4}-a\operatorname{Si}(2\arcsin(bx+a))+a^2\operatorname{Ci}(\arcsin(bx+a))}{b^3}$ | 49 |

input
```
int(x^2/arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
1/b^3*(1/4*Ci(arcsin(b*x+a))-1/4*Ci(3*arcsin(b*x+a))-a*Si(2*arcsin(b*x+a))
+a^2*Ci(arcsin(b*x+a)))
```

### 3.143.5 Fricas [F]

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \int \frac{x^2}{\arcsin\left(bx+a\right)}\,dx$$

input
```
integrate(x^2/arcsin(b*x+a),x, algorithm="fricas")
```

output
```
integral(x^2/arcsin(b*x + a), x)
```

### 3.143.6 Sympy [F]

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \int \frac{x^2}{\operatorname{asin}\left(a+bx\right)}\,dx$$

input
```
integrate(x**2/asin(b*x+a),x)
```

output
```
Integral(x**2/asin(a + b*x), x)
```

### 3.143.7 Maxima [F]

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \int \frac{x^2}{\arcsin\left(bx+a\right)}\,dx$$

input
```
integrate(x^2/arcsin(b*x+a),x, algorithm="maxima")
```

output
```
integrate(x^2/arcsin(b*x + a), x)
```

### 3.143.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.93

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \frac{a^2\,\text{Ci}\left(\arcsin\left(bx+a\right)\right)}{b^3} - \frac{a\,\text{Si}\left(2\,\arcsin\left(bx+a\right)\right)}{b^3} - \frac{\text{Ci}\left(3\,\arcsin\left(bx+a\right)\right)}{4\,b^3} + \frac{\text{Ci}\left(\arcsin\left(bx+a\right)\right)}{4\,b^3}$$

input
```
integrate(x^2/arcsin(b*x+a),x, algorithm="giac")
```

output
```
a^2*cos_integral(arcsin(b*x + a))/b^3 - a*sin_integral(2*arcsin(b*x + a))/
b^3 - 1/4*cos_integral(3*arcsin(b*x + a))/b^3 + 1/4*cos_integral(arcsin(b*
x + a))/b^3
```

### 3.143.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\arcsin(a+bx)}\,dx = \int \frac{x^2}{\text{asin}\left(a+b\,x\right)}\,dx$$

input
```
int(x^2/asin(a + b*x),x)
```

output
```
int(x^2/asin(a + b*x), x)
```

# 3.144 $\int \frac{x}{\arcsin(a+bx)}\,dx$



## 3.144.1 Optimal result

Integrand size = 10, antiderivative size = 30

$$\int \frac{x}{\arcsin(a+bx)}\,dx = -\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2} + \frac{\text{Si}(2\arcsin(a+bx))}{2b^2}$$

output
```
-a*Ci(arcsin(b*x+a))/b^2+1/2*Si(2*arcsin(b*x+a))/b^2
```

## 3.144.2 Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00

$$\int \frac{x}{\arcsin(a+bx)}\,dx = -\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2} + \frac{\text{Si}(2\arcsin(a+bx))}{2b^2}$$

input
```
Integrate[x/ArcSin[a + b*x],x]
```

output
```
-((a*CosIntegral[ArcSin[a + b*x]])/b^2) + SinIntegral[2*ArcSin[a + b*x]]/(
2*b^2)
```

### 3.144.3 Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.93, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {5304, 25, 27, 5246, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x}{\arcsin(a+bx)}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{x}{\arcsin(a+bx)}d(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{x}{\arcsin(a+bx)}d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\frac{\int -\frac{bx}{\arcsin(a+bx)}d(a+bx)}{b^2}$$

$$\Big\downarrow \text{5246}$$

$$-\frac{\int -\frac{bx\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{\int \left(\frac{a\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}-\frac{(a+bx)\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}\right)d\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{a\,\text{CosIntegral}(\arcsin(a+bx))-\frac{1}{2}\text{Si}(2\arcsin(a+bx))}{b^2}$$

input
```
Int[x/ArcSin[a + b*x],x]
```

output
```
-((a*CosIntegral[ArcSin[a + b*x]] - SinIntegral[2*ArcSin[a + b*x]]/2)/b^2)
```

### 3.144.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

## 3.144.4 Maple [A] (verified)

Time = 0.38 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.90

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\frac{\operatorname{Si}(2 \arcsin(bx+a))}{2}-a \operatorname{Ci}(\arcsin(bx+a))}{b^2}$ | 27 |
| default | $\frac{\frac{\operatorname{Si}(2 \arcsin(bx+a))}{2}-a \operatorname{Ci}(\arcsin(bx+a))}{b^2}$ | 27 |

input
```
int(x/arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
1/b^2*(1/2*Si(2*arcsin(b*x+a))-a*Ci(arcsin(b*x+a)))
```

### 3.144.5 Fricas [F]

$$\int \frac{x}{\arcsin(a+bx)}\,dx = \int \frac{x}{\arcsin(bx+a)}\,dx$$

input
```
integrate(x/arcsin(b*x+a),x, algorithm="fricas")
```

output
```
integral(x/arcsin(b*x + a), x)
```

### 3.144.6 Sympy [F]

$$\int \frac{x}{\arcsin(a+bx)}\,dx = \int \frac{x}{\operatorname{asin}(a+bx)}\,dx$$

input
```
integrate(x/asin(b*x+a),x)
```

output
```
Integral(x/asin(a + b*x), x)
```

### 3.144.7 Maxima [F]

$$\int \frac{x}{\arcsin(a+bx)}\,dx = \int \frac{x}{\arcsin(bx+a)}\,dx$$

input
```
integrate(x/arcsin(b*x+a),x, algorithm="maxima")
```

output
```
integrate(x/arcsin(b*x + a), x)
```

### 3.144.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.93

$$\int \frac{x}{\arcsin(a+bx)}\,dx = -\frac{a\,\mathrm{Ci}\left(\arcsin\left(bx+a\right)\right)}{b^2} + \frac{\mathrm{Si}\left(2\arcsin\left(bx+a\right)\right)}{2\,b^2}$$

input
```
integrate(x/arcsin(b*x+a),x, algorithm="giac")
```

output
```
-a*cos_integral(arcsin(b*x + a))/b^2 + 1/2*sin_integral(2*arcsin(b*x + a))
/b^2
```

### 3.144.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\arcsin(a+bx)}\,dx = \int \frac{x}{\mathrm{asin}\left(a+b\,x\right)}\,dx$$

input
```
int(x/asin(a + b*x),x)
```

output
```
int(x/asin(a + b*x), x)
```

# 3.145 $\int \frac{1}{\arcsin(a+bx)} \, dx$



## 3.145.1 Optimal result

Integrand size = 8, antiderivative size = 11

$$\int \frac{1}{\arcsin(a+bx)} \, dx = \frac{\text{CosIntegral}(\arcsin(a+bx))}{b}$$

output
```
Ci(arcsin(b*x+a))/b
```

## 3.145.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00

$$\int \frac{1}{\arcsin(a+bx)} \, dx = \frac{\text{CosIntegral}(\arcsin(a+bx))}{b}$$

input
```
Integrate[ArcSin[a + b*x]^(-1),x]
```

output
```
CosIntegral[ArcSin[a + b*x]]/b
```

### 3.145.3 Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5302, 5134, 3042, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\arcsin(a+bx)}dx$$

$$\Big\downarrow \text{ 5302}$$

$$\frac{\int \frac{1}{\arcsin(a+bx)}d(a+bx)}{b}$$

$$\Big\downarrow \text{ 5134}$$

$$\frac{\int \frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{\int \frac{\sin\left(\arcsin(a+bx)+\frac{\pi}{2}\right)}{\arcsin(a+bx)}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{ 3783}$$

$$\frac{\text{CosIntegral}(\arcsin(a+bx))}{b}$$

input
```
Int[ArcSin[a + b*x]^(-1),x]
```

output
```
CosIntegral[ArcSin[a + b*x]]/b
```

#### 3.145.3.1 Defintions of rubi rules used

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.145.4 Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.09

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\mathrm{Ci}(\arcsin(bx+a))}{b}$ | 12 |
| default | $\frac{\mathrm{Ci}(\arcsin(bx+a))}{b}$ | 12 |

input
```
int(1/arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
Ci(arcsin(b*x+a))/b
```

## 3.145.5 Fricas [F]

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \int \frac{1}{\arcsin(bx+a)}\,dx$$

input
```
integrate(1/arcsin(b*x+a),x, algorithm="fricas")
```

output
```
integral(1/arcsin(b*x + a), x)
```

### 3.145.6 Sympy [F]

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \int \frac{1}{\operatorname{asin}(a+bx)}\,dx$$

input
```
integrate(1/asin(b*x+a),x)
```

output
```
Integral(1/asin(a + b*x), x)
```

### 3.145.7 Maxima [F]

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \int \frac{1}{\arcsin(bx+a)}\,dx$$

input
```
integrate(1/arcsin(b*x+a),x, algorithm="maxima")
```

output
```
integrate(1/arcsin(b*x + a), x)
```

### 3.145.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \frac{\operatorname{Ci}(\arcsin(bx+a))}{b}$$

input
```
integrate(1/arcsin(b*x+a),x, algorithm="giac")
```

output
```
cos_integral(arcsin(b*x + a))/b
```

### 3.145.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\arcsin(a+bx)}\,dx = \int \frac{1}{\mathrm{asin}\left(a+b\,x\right)}\,dx$$

input
```
int(1/asin(a + b*x),x)
```

output
```
int(1/asin(a + b*x), x)
```

# 3.146 $\int \frac{1}{x \arcsin(a+bx)} dx$



## 3.146.1 Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{1}{x \arcsin(a+bx)} dx = \text{Int}\left(\frac{1}{x \arcsin(a+bx)}, x\right)$$

output
```
Unintegrable(1/x/arcsin(b*x+a),x)
```

## 3.146.2 Mathematica [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)} dx = \int \frac{1}{x \arcsin(a+bx)} dx$$

input
```
Integrate[1/(x*ArcSin[a + b*x]),x]
```

output
```
Integrate[1/(x*ArcSin[a + b*x]), x]
```

### 3.146.3 Rubi [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5304, 25, 27, 5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{x \arcsin(a+bx)} \, dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{1}{x \arcsin(a+bx)} d(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{1}{x \arcsin(a+bx)} d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\int -\frac{1}{bx \arcsin(a+bx)} d(a+bx)$$

$$\Big\downarrow \text{5300}$$

$$-\int -\frac{1}{bx \arcsin(a+bx)} d(a+bx)$$

input
```
Int[1/(x*ArcSin[a + b*x]),x]
```

output
```
$Aborted
```

### 3.146.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.146.4 Maple [N/A] (verified)

Not integrable

Time = 6.88 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin (bx+a)}dx$$

input
```
int(1/x/arcsin(b*x+a),x)
```

output
```
int(1/x/arcsin(b*x+a),x)
```

## 3.146.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)}\,dx = \int \frac{1}{x \arcsin (bx+a)}\,dx$$

input
```
integrate(1/x/arcsin(b*x+a),x, algorithm="fricas")
```

output
```
integral(1/(x*arcsin(b*x + a)), x)
```

### 3.146.6 Sympy [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 10, normalized size of antiderivative = 0.83

$$\int \frac{1}{x \arcsin(a+bx)}\,dx = \int \frac{1}{x \operatorname{asin}(a+bx)}\,dx$$

input
```
integrate(1/x/asin(b*x+a),x)
```

output
```
Integral(1/(x*asin(a + b*x)), x)
```

### 3.146.7 Maxima [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)}\,dx = \int \frac{1}{x \arcsin(bx+a)}\,dx$$

input
```
integrate(1/x/arcsin(b*x+a),x, algorithm="maxima")
```

output
```
integrate(1/(x*arcsin(b*x + a)), x)
```

### 3.146.8 Giac [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)}\,dx = \int \frac{1}{x \arcsin(bx+a)}\,dx$$

input
```
integrate(1/x/arcsin(b*x+a),x, algorithm="giac")
```

output
```
integrate(1/(x*arcsin(b*x + a)), x)
```

### 3.146.9 Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)}\, dx = \int \frac{1}{x \operatorname{asin}\left(a+b\, x\right)}\, dx$$

input
```
int(1/(x*asin(a + b*x)),x)
```

output
```
int(1/(x*asin(a + b*x)), x)
```

# 3.147 $\int \frac{x^2}{\arcsin(a+bx)^2}\,dx$



## 3.147.1 Optimal result

Integrand size = 12, antiderivative size = 84

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = -\frac{x^2\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{2a\,\text{CosIntegral}(2\arcsin(a+bx))}{b^3} - \frac{(1+4a^2)\,\text{Si}(\arcsin(a+bx))}{4b^3} + \frac{3\text{Si}(3\arcsin(a+bx))}{4b^3}$$

output
```
-2*a*Ci(2*arcsin(b*x+a))/b^3-1/4*(4*a^2+1)*Si(arcsin(b*x+a))/b^3+3/4*Si(3*
arcsin(b*x+a))/b^3-x^2*(1-(b*x+a)^2)^(1/2)/b/arcsin(b*x+a)
```

## 3.147.2 Mathematica [A] (verified)

Time = 2.24 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.02

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = -\frac{\frac{4b^2x^2\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)} + 8a\,\text{CosIntegral}(2\arcsin(a+bx)) + (1+4a^2)\,\text{Si}(\arcsin(a+bx)) - 3\text{Si}(3\arcsin(a}{4b^3}$$

input
```
Integrate[x^2/ArcSin[a + b*x]^2,x]
```

output
```
-1/4*((4*b^2*x^2*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])/ArcSin[a + b*x] + 8*a*
CosIntegral[2*ArcSin[a + b*x]] + (1 + 4*a^2)*SinIntegral[ArcSin[a + b*x]]
- 3*SinIntegral[3*ArcSin[a + b*x]])/b^3
```

### 3.147.3 Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.71, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5304, 27, 5244, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{x^2}{\arcsin(a+bx)^2}d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{b^2x^2}{\arcsin(a+bx)^2}d(a+bx)}{b^3}$$

$$\Big\downarrow \text{5244}$$

$$\frac{\int \left(\frac{a^2}{\arcsin(a+bx)^2}-\frac{2(a+bx)a}{\arcsin(a+bx)^2}+\frac{(a+bx)^2}{\arcsin(a+bx)^2}\right)d(a+bx)}{b^3}$$

$$\Big\downarrow \text{2009}$$

$$\frac{a^2(-\text{Si}(\arcsin(a+bx)))-\frac{a^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}-2a\,\text{CosIntegral}(2\arcsin(a+bx))-\frac{1}{4}\text{Si}(\arcsin(a+bx))+\frac{3}{4}\text{Si}(3\arcsin(}{b^3}$$

input
```
Int[x^2/ArcSin[a + b*x]^2,x]
```

output
```
(-((a^2*Sqrt[1 - (a + b*x)^2])/ArcSin[a + b*x]) + (2*a*(a + b*x)*Sqrt[1 -
(a + b*x)^2])/ArcSin[a + b*x] - ((a + b*x)^2*Sqrt[1 - (a + b*x)^2])/ArcSin
[a + b*x] - 2*a*CosIntegral[2*ArcSin[a + b*x]] - SinIntegral[ArcSin[a + b*
x]]/4 - a^2*SinIntegral[ArcSin[a + b*x]] + (3*SinIntegral[3*ArcSin[a + b*x
]])/4)/b^3
```

### 3.147.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.147.4 Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.77

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{\sqrt{1-(bx+a)^2}}{4\arcsin(bx+a)}-\frac{\mathrm{Si}(\arcsin(bx+a))}{4}+\frac{\cos(3\arcsin(bx+a))}{4\arcsin(bx+a)}+\frac{3\,\mathrm{Si}(3\arcsin(bx+a))}{4}-\frac{a(2\,\mathrm{Ci}(2\arcsin(bx+a))\arcsin(bx+a)-\sin(2\arcsin}{\arcsin(bx+a)}}{b^3}$ |
| default | $\frac{-\frac{\sqrt{1-(bx+a)^2}}{4\arcsin(bx+a)}-\frac{\mathrm{Si}(\arcsin(bx+a))}{4}+\frac{\cos(3\arcsin(bx+a))}{4\arcsin(bx+a)}+\frac{3\,\mathrm{Si}(3\arcsin(bx+a))}{4}-\frac{a(2\,\mathrm{Ci}(2\arcsin(bx+a))\arcsin(bx+a)-\sin(2\arcsin}{\arcsin(bx+a)}}{b^3}$ |

input
```
int(x^2/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

output
```
1/b^3*(-1/4/arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)-1/4*Si(arcsin(b*x+a))+1/4/ar
csin(b*x+a)*cos(3*arcsin(b*x+a))+3/4*Si(3*arcsin(b*x+a))-a*(2*Ci(2*arcsin(
b*x+a))*arcsin(b*x+a)-sin(2*arcsin(b*x+a)))/arcsin(b*x+a)-a^2*(Si(arcsin(b
*x+a))*arcsin(b*x+a)+(1-(b*x+a)^2)^(1/2))/arcsin(b*x+a))
```

### 3.147.5 Fricas [F]

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = \int \frac{x^2}{\arcsin\left(bx+a\right)^2}\,dx$$

input
```
integrate(x^2/arcsin(b*x+a)^2,x, algorithm="fricas")
```

output
```
integral(x^2/arcsin(b*x + a)^2, x)
```

### 3.147.6 Sympy [F]

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = \int \frac{x^2}{\operatorname{asin}^2\left(a+bx\right)}\,dx$$

input
```
integrate(x**2/asin(b*x+a)**2,x)
```

output
```
Integral(x**2/asin(a + b*x)**2, x)
```

### 3.147.7 Maxima [F]

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = \int \frac{x^2}{\arcsin\left(bx+a\right)^2}\,dx$$

input
```
integrate(x^2/arcsin(b*x+a)^2,x, algorithm="maxima")
```

output
```
-(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x^2 - b*arctan2(b*x + a, sqrt(b*x +
 a + 1)*sqrt(-b*x - a + 1))*integrate((3*b^2*x^3 + 5*a*b*x^2 + 2*(a^2 - 1)
*x)*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)/((b^3*x^2 + 2*a*b^2*x + (a^2 - 1)
*b)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))), x))/(b*arctan
2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))
```

### 3.147.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 169 vs. $2(78) = 156$.

Time = 0.31 (sec) , antiderivative size = 169, normalized size of antiderivative = 2.01

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = -\frac{a^2\operatorname{Si}(\arcsin(bx+a))}{b^3} - \frac{2a\operatorname{Ci}(2\arcsin(bx+a))}{b^3} + \frac{2\sqrt{-(bx+a)^2+1}(bx+a)a}{b^3\arcsin(bx+a)} - \frac{\sqrt{-(bx+a)^2+1}a^2}{b^3\arcsin(bx+a)} + \frac{3\operatorname{Si}(3\arcsin(bx+a))}{4b^3} - \frac{\operatorname{Si}(\arcsin(bx+a))}{4b^3} + \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}}{b^3\arcsin(bx+a)} - \frac{\sqrt{-(bx+a)^2+1}}{b^3\arcsin(bx+a)}$$

input
```
integrate(x^2/arcsin(b*x+a)^2,x, algorithm="giac")
```

output
```
-a^2*sin_integral(arcsin(b*x + a))/b^3 - 2*a*cos_integral(2*arcsin(b*x + a
))/b^3 + 2*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*a/(b^3*arcsin(b*x + a)) - sqrt
(-(b*x + a)^2 + 1)*a^2/(b^3*arcsin(b*x + a)) + 3/4*sin_integral(3*arcsin(b
*x + a))/b^3 - 1/4*sin_integral(arcsin(b*x + a))/b^3 + (-(b*x + a)^2 + 1)^
(3/2)/(b^3*arcsin(b*x + a)) - sqrt(-(b*x + a)^2 + 1)/(b^3*arcsin(b*x + a))
```

### 3.147.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\arcsin(a+bx)^2}\,dx = \int \frac{x^2}{\operatorname{asin}(a+b\,x)^2}\,dx$$

input
```
int(x^2/asin(a + b*x)^2,x)
```

output
```
int(x^2/asin(a + b*x)^2, x)
```

# 3.148 $\int \frac{x}{\arcsin(a+bx)^2}\,dx$



## 3.148.1 Optimal result

Integrand size = 10, antiderivative size = 55

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = -\frac{x\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} + \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b^2} + \frac{a\text{Si}(\arcsin(a+bx))}{b^2}$$

output
```
Ci(2*arcsin(b*x+a))/b^2+a*Si(arcsin(b*x+a))/b^2-x*(1-(b*x+a)^2)^(1/2)/b/ar
csin(b*x+a)
```

## 3.148.2 Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.15

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \frac{-bx\sqrt{1-(a+bx)^2} + \arcsin(a+bx)\,\text{CosIntegral}(2\arcsin(a+bx)) + a\arcsin(a+bx)\text{Si}(\arcsin(a+bx))}{b^2\arcsin(a+bx)}$$

input
```
Integrate[x/ArcSin[a + b*x]^2,x]
```

output
```
(-(b*x*Sqrt[1 - (a + b*x)^2]) + ArcSin[a + b*x]*CosIntegral[2*ArcSin[a + b
*x]] + a*ArcSin[a + b*x]*SinIntegral[ArcSin[a + b*x]])/(b^2*ArcSin[a + b*x
])
```

### 3.148.3 Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.49, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5304, 25, 27, 5244, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x}{\arcsin(a+bx)^2} \, dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int \frac{x}{\arcsin(a+bx)^2}d(a+bx)}{b}$$
$$\Big\downarrow \text{25}$$
$$-\frac{\int -\frac{x}{\arcsin(a+bx)^2}d(a+bx)}{b}$$
$$\Big\downarrow \text{27}$$
$$-\frac{\int -\frac{bx}{\arcsin(a+bx)^2}d(a+bx)}{b^2}$$
$$\Big\downarrow \text{5244}$$
$$-\frac{\int \left(\frac{a}{\arcsin(a+bx)^2}-\frac{a+bx}{\arcsin(a+bx)^2}\right)d(a+bx)}{b^2}$$
$$\Big\downarrow \text{2009}$$
$$-\frac{-\text{CosIntegral}(2\arcsin(a+bx))+a(-\text{Si}(\arcsin(a+bx)))-\frac{a\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}+\frac{(a+bx)\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}}{b^2}$$

input
```
Int[x/ArcSin[a + b*x]^2,x]
```

output
```
-((-((a*Sqrt[1 - (a + b*x)^2])/ArcSin[a + b*x]) + ((a + b*x)*Sqrt[1 - (a +
 b*x)^2])/ArcSin[a + b*x] - CosIntegral[2*ArcSin[a + b*x]] - a*SinIntegral
[ArcSin[a + b*x]])/b^2)
```

### 3.148.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.148.4 Maple [A] (verified)

Time = 0.58 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.31

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{\sin(2\arcsin(bx+a))}{2\arcsin(bx+a)}+\operatorname{Ci}(2\arcsin(bx+a))+\frac{a\left(\operatorname{Si}(\arcsin(bx+a))\arcsin(bx+a)+\sqrt{1-(bx+a)^2}\right)}{\arcsin(bx+a)}}{b^2}$ | 72 |
| default | $\frac{-\frac{\sin(2\arcsin(bx+a))}{2\arcsin(bx+a)}+\operatorname{Ci}(2\arcsin(bx+a))+\frac{a\left(\operatorname{Si}(\arcsin(bx+a))\arcsin(bx+a)+\sqrt{1-(bx+a)^2}\right)}{\arcsin(bx+a)}}{b^2}$ | 72 |

input
```
int(x/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

output
```
1/b^2*(-1/2/arcsin(b*x+a)*sin(2*arcsin(b*x+a))+Ci(2*arcsin(b*x+a))+a*(Si(a
rcsin(b*x+a))*arcsin(b*x+a)+(1-(b*x+a)^2)^(1/2))/arcsin(b*x+a))
```

### 3.148.5 Fricas [F]

$$\int \frac{x}{\arcsin(a+bx)^2} \, dx = \int \frac{x}{\arcsin\left(bx+a\right)^2} \, dx$$

input
```
integrate(x/arcsin(b*x+a)^2,x, algorithm="fricas")
```

output
```
integral(x/arcsin(b*x + a)^2, x)
```

### 3.148.6 Sympy [F]

$$\int \frac{x}{\arcsin(a+bx)^2} \, dx = \int \frac{x}{\operatorname{asin}^2\left(a+bx\right)} \, dx$$

input
```
integrate(x/asin(b*x+a)**2,x)
```

output
```
Integral(x/asin(a + b*x)**2, x)
```

### 3.148.7 Maxima [F]

$$\int \frac{x}{\arcsin(a+bx)^2} \, dx = \int \frac{x}{\arcsin\left(bx+a\right)^2} \, dx$$

input
```
integrate(x/arcsin(b*x+a)^2,x, algorithm="maxima")
```

output
```
(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))*integrate((2*b^2
*x^2 + 3*a*b*x + a^2 - 1)*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)/((b^3*x^2 +
 2*a*b^2*x + (a^2 - 1)*b)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a
 + 1))), x) - sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*x)/(b*arctan2(b*x + a,
sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))
```

### 3.148.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.51

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \frac{a\,\mathrm{Si}\left(\arcsin\left(bx+a\right)\right)}{b^2} + \frac{\mathrm{Ci}\left(2\,\arcsin\left(bx+a\right)\right)}{b^2} - \frac{\sqrt{-(bx+a)^2+1}(bx+a)}{b^2\arcsin\left(bx+a\right)} + \frac{\sqrt{-(bx+a)^2+1}a}{b^2\arcsin\left(bx+a\right)}$$

input
```
integrate(x/arcsin(b*x+a)^2,x, algorithm="giac")
```

output
```
a*sin_integral(arcsin(b*x + a))/b^2 + cos_integral(2*arcsin(b*x + a))/b^2
- sqrt(-(b*x + a)^2 + 1)*(b*x + a)/(b^2*arcsin(b*x + a)) + sqrt(-(b*x + a)
^2 + 1)*a/(b^2*arcsin(b*x + a))
```

### 3.148.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\arcsin(a+bx)^2}\,dx = \int \frac{x}{\mathrm{asin}\left(a+b\,x\right)^2}\,dx$$

input
```
int(x/asin(a + b*x)^2,x)
```

output
```
int(x/asin(a + b*x)^2, x)
```

# 3.149 $\int \frac{1}{\arcsin(a+bx)^2}\,dx$



## 3.149.1 Optimal result

Integrand size = 8, antiderivative size = 41

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx=-\frac{\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)}-\frac{\mathrm{Si}(\arcsin(a+bx))}{b}$$

output
```
-Si(arcsin(b*x+a))/b-(1-(b*x+a)^2)^(1/2)/b/arcsin(b*x+a)
```

## 3.149.2 Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.90

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx=-\frac{\frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}+\mathrm{Si}(\arcsin(a+bx))}{b}$$

input
```
Integrate[ArcSin[a + b*x]^(-2),x]
```

output
```
-((Sqrt[1 - (a + b*x)^2]/ArcSin[a + b*x] + SinIntegral[ArcSin[a + b*x]])/b
)
```

### 3.149.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.95, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {5302, 5132, 5224, 3042, 3780}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\arcsin(a+bx)^2}dx$$

$$\Big\downarrow \text{ 5302}$$

$$\frac{\int \frac{1}{\arcsin(a+bx)^2}d(a+bx)}{b}$$

$$\Big\downarrow \text{ 5132}$$

$$\frac{-\int \frac{a+bx}{\sqrt{1-(a+bx)^2}\arcsin(a+bx)}d(a+bx)-\frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \text{ 5224}$$

$$\frac{-\int \frac{a+bx}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{-\int \frac{\sin(\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \text{ 3780}$$

$$\frac{-\text{Si}(\arcsin(a+bx))-\frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}}{b}$$

input
```
Int[ArcSin[a + b*x]^(-2),x]
```

output
```
(-(Sqrt[1 - (a + b*x)^2]/ArcSin[a + b*x]) - SinIntegral[ArcSin[a + b*x]])/
b
```

### 3.149.3.1 Defintions of rubi rules used

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.149.4 Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.93

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{\sqrt{1-(bx+a)^2}}{\arcsin(bx+a)}-\operatorname{Si}(\arcsin(bx+a))}{b}$ | 38 |
| default | $\frac{-\frac{\sqrt{1-(bx+a)^2}}{\arcsin(bx+a)}-\operatorname{Si}(\arcsin(bx+a))}{b}$ | 38 |

input
```
int(1/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE)
```

output
```
1/b*(-1/arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)-Si(arcsin(b*x+a)))
```

### 3.149.5 Fricas [F]

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx = \int \frac{1}{\arcsin\left(bx+a\right)^2}\,dx$$

input
```
integrate(1/arcsin(b*x+a)^2,x, algorithm="fricas")
```

output
```
integral(arcsin(b*x + a)^(-2), x)
```

### 3.149.6 Sympy [F]

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx = \int \frac{1}{\operatorname{asin}^2\left(a+bx\right)}\,dx$$

input
```
integrate(1/asin(b*x+a)**2,x)
```

output
```
Integral(asin(a + b*x)**(-2), x)
```

### 3.149.7 Maxima [F]

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx = \int \frac{1}{\arcsin\left(bx+a\right)^2}\,dx$$

input
```
integrate(1/arcsin(b*x+a)^2,x, algorithm="maxima")
```

output
```
(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))*integrate(sqrt(b
*x + a + 1)*(b*x + a)*sqrt(-b*x - a + 1)/((b^2*x^2 + 2*a*b*x + a^2 - 1)*ar
ctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))), x) - sqrt(b*x + a +
 1)*sqrt(-b*x - a + 1))/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x -
a + 1)))
```

### 3.149.8 Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.95

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx = -\frac{\operatorname{Si}(\arcsin(bx+a))}{b} - \frac{\sqrt{-(bx+a)^2+1}}{b\arcsin(bx+a)}$$

input
```
integrate(1/arcsin(b*x+a)^2,x, algorithm="giac")
```

output
```
-sin_integral(arcsin(b*x + a))/b - sqrt(-(b*x + a)^2 + 1)/(b*arcsin(b*x +
a))
```

### 3.149.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\arcsin(a+bx)^2}\,dx = \int \frac{1}{\operatorname{asin}(a+b\,x)^2}\,dx$$

input
```
int(1/asin(a + b*x)^2,x)
```

output
```
int(1/asin(a + b*x)^2, x)
```

# 3.150 $\int \frac{1}{x \arcsin(a+bx)^2} dx$



## 3.150.1 Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{1}{x \arcsin(a+bx)^2} dx = \text{Int}\left(\frac{1}{x \arcsin(a+bx)^2}, x\right)$$

output
```
Unintegrable(1/x/arcsin(b*x+a)^2,x)
```

## 3.150.2 Mathematica [N/A]

Not integrable

Time = 5.41 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^2} dx = \int \frac{1}{x \arcsin(a+bx)^2} dx$$

input
```
Integrate[1/(x*ArcSin[a + b*x]^2),x]
```

output
```
Integrate[1/(x*ArcSin[a + b*x]^2), x]
```

### 3.150.3 Rubi [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5304, 25, 27, 5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int \frac{1}{x \arcsin(a+bx)^2} d(a+bx)}{b}$$
$$\Big\downarrow \; 25$$
$$-\frac{\int -\frac{1}{x \arcsin(a+bx)^2} d(a+bx)}{b}$$
$$\Big\downarrow \; 27$$
$$-\int -\frac{1}{bx \arcsin(a+bx)^2} d(a+bx)$$
$$\Big\downarrow \; 5300$$
$$-\int -\frac{1}{bx \arcsin(a+bx)^2} d(a+bx)$$

input
```
Int[1/(x*ArcSin[a + b*x]^2),x]
```

output
```
$Aborted
```

### 3.150.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.150.4 Maple [N/A] (verified)

Not integrable

Time = 11.41 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin\left(bx+a\right)^{2}}dx$$

input
```
int(1/x/arcsin(b*x+a)^2,x)
```

output
```
int(1/x/arcsin(b*x+a)^2,x)
```

## 3.150.5 Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^2}\,dx = \int \frac{1}{x \arcsin\left(bx+a\right)^{2}}\,dx$$

input
```
integrate(1/x/arcsin(b*x+a)^2,x, algorithm="fricas")
```

output
```
integral(1/(x*arcsin(b*x + a)^2), x)
```

### 3.150.6 Sympy [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \operatorname{asin}^2{(a+bx)}} \, dx$$

input
```
integrate(1/x/asin(b*x+a)**2,x)
```

output
```
Integral(1/(x*asin(a + b*x)**2), x)
```

### 3.150.7 Maxima [N/A]

Not integrable

Time = 2.51 (sec) , antiderivative size = 174, normalized size of antiderivative = 14.50

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \arcsin{(bx+a)}^2} \, dx$$

input
```
integrate(1/x/arcsin(b*x+a)^2,x, algorithm="maxima")
```

output
```
-(b*x*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))*integrate((a*
b*x + a^2 - 1)*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)/((b^3*x^4 + 2*a*b^2*x^
3 + (a^2 - 1)*b*x^2)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)
)), x) + sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))/(b*x*arctan2(b*x + a, sqrt(
b*x + a + 1)*sqrt(-b*x - a + 1)))
```

### 3.150.8 Giac [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \arcsin{(bx+a)}^2} \, dx$$

input
```
integrate(1/x/arcsin(b*x+a)^2,x, algorithm="giac")
```

output
```
integrate(1/(x*arcsin(b*x + a)^2), x)
```

### 3.150.9 Mupad [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^2} \, dx = \int \frac{1}{x \operatorname{asin}\left(a+b\,x\right)^2} \, dx$$

input
```
int(1/(x*asin(a + b*x)^2),x)
```

output
```
int(1/(x*asin(a + b*x)^2), x)
```

# 3.151 $\int \frac{x^2}{\arcsin(a+bx)^3}\,dx$



## 3.151.1 Optimal result

Integrand size = 12, antiderivative size = 176

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = -\frac{x^2\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2}+\frac{a^2(a+bx)}{2b^3\arcsin(a+bx)}-\frac{2a(a+bx)^2}{b^3\arcsin(a+bx)}+\frac{9a+bx}{8b^3\arcsin(a+bx)}-\frac{(1+4a^2)\,\mathrm{CosIntegral}(\arcsin(a+bx))}{8b^3}+\frac{9\,\mathrm{CosIntegral}(3\arcsin(a+bx))}{8b^3}-\frac{3\sin(3\arcsin(a+bx))}{8b^3\arcsin(a+bx)}+\frac{2a\mathrm{Si}(2\arcsin(a+bx))}{b^3}$$

output
```
1/2*a^2*(b*x+a)/b^3/arcsin(b*x+a)-2*a*(b*x+a)^2/b^3/arcsin(b*x+a)+1/8*(b*x
+9*a)/b^3/arcsin(b*x+a)-1/8*(4*a^2+1)*Ci(arcsin(b*x+a))/b^3+9/8*Ci(3*arcsi
n(b*x+a))/b^3+2*a*Si(2*arcsin(b*x+a))/b^3-3/8*sin(3*arcsin(b*x+a))/b^3/arc
sin(b*x+a)-1/2*x^2*(1-(b*x+a)^2)^(1/2)/b/arcsin(b*x+a)^2
```

### 3.151.2 Mathematica [A] (verified)

Time = 0.61 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.65

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = \frac{\frac{4bx\left(-bx\sqrt{1-a^2-2abx-b^2x^2}+(-2+2a^2+5abx+3b^2x^2)\arcsin(a+bx)\right)}{\arcsin(a+bx)^2} - (1+4a^2)\,\mathrm{CosIntegral}(\arcsin(a+bx)) + 9\,\mathrm{CosInte}}{8b^3}$$

input
```
Integrate[x^2/ArcSin[a + b*x]^3,x]
```

output
```
((4*b*x*(-(b*x*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]) + (-2 + 2*a^2 + 5*a*b*x
+ 3*b^2*x^2)*ArcSin[a + b*x]))/ArcSin[a + b*x]^2 - (1 + 4*a^2)*CosIntegral
[ArcSin[a + b*x]] + 9*CosIntegral[3*ArcSin[a + b*x]] + 16*a*SinIntegral[2*
ArcSin[a + b*x]])/(8*b^3)
```

### 3.151.3 Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.31, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5304, 27, 5244, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int \frac{x^2}{\arcsin(a+bx)^3}d(a+bx)}{b}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{b^2x^2}{\arcsin(a+bx)^3}d(a+bx)}{b^3}$$

$$\Big\downarrow \; 5244$$

$$\frac{\int \left(\frac{a^2}{\arcsin(a+bx)^3} - \frac{2(a+bx)a}{\arcsin(a+bx)^3} + \frac{(a+bx)^2}{\arcsin(a+bx)^3}\right)d(a+bx)}{b^3}$$

$\downarrow$ 2009

$$-\frac{1}{2}a^2\,\text{CosIntegral}(\arcsin(a+bx))+\frac{a^2(a+bx)}{2\arcsin(a+bx)}-\frac{a^2\sqrt{1-(a+bx)^2}}{2\arcsin(a+bx)^2}-\frac{1}{8}\,\text{CosIntegral}(\arcsin(a+bx))+\frac{9}{8}\,\text{CosIntegra}$$

input
```
Int[x^2/ArcSin[a + b*x]^3,x]
```

output
```
(-1/2*(a^2*Sqrt[1 - (a + b*x)^2])/ArcSin[a + b*x]^2 + (a*(a + b*x)*Sqrt[1
- (a + b*x)^2])/ArcSin[a + b*x]^2 - ((a + b*x)^2*Sqrt[1 - (a + b*x)^2])/(2
*ArcSin[a + b*x]^2) + a/ArcSin[a + b*x] - (a + b*x)/ArcSin[a + b*x] + (a^2
*(a + b*x))/(2*ArcSin[a + b*x]) - (2*a*(a + b*x)^2)/ArcSin[a + b*x] + (3*(
a + b*x)^3)/(2*ArcSin[a + b*x]) - CosIntegral[ArcSin[a + b*x]]/8 - (a^2*Co
sIntegral[ArcSin[a + b*x]])/2 + (9*CosIntegral[3*ArcSin[a + b*x]])/8 + 2*a
*SinIntegral[2*ArcSin[a + b*x]])/b^3
```

### 3.151.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.151.4 Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.22

| method | result |
|---|---|
| derivativedivides | $-\frac{\sqrt{1-(bx+a)^2}}{8\arcsin(bx+a)^2}+\frac{bx+a}{8\arcsin(bx+a)}-\frac{\mathrm{Ci}(\arcsin(bx+a))}{8}+\frac{\cos(3\arcsin(bx+a))}{8\arcsin(bx+a)^2}-\frac{3\sin(3\arcsin(bx+a))}{8\arcsin(bx+a)}+\frac{9\ \mathrm{Ci}(3\arcsin(bx+a))}{8}+\frac{a(4\ \mathrm{Si}}{}$ |
| default | $-\frac{\sqrt{1-(bx+a)^2}}{8\arcsin(bx+a)^2}+\frac{bx+a}{8\arcsin(bx+a)}-\frac{\mathrm{Ci}(\arcsin(bx+a))}{8}+\frac{\cos(3\arcsin(bx+a))}{8\arcsin(bx+a)^2}-\frac{3\sin(3\arcsin(bx+a))}{8\arcsin(bx+a)}+\frac{9\ \mathrm{Ci}(3\arcsin(bx+a))}{8}+\frac{a(4\ \mathrm{Si}}{}$ |

input
```
int(x^2/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

output
```
1/b^3*(-1/8/arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)+1/8*(b*x+a)/arcsin(b*x+a)-
1/8*Ci(arcsin(b*x+a))+1/8/arcsin(b*x+a)^2*cos(3*arcsin(b*x+a))-3/8/arcsin(
b*x+a)*sin(3*arcsin(b*x+a))+9/8*Ci(3*arcsin(b*x+a))+1/2*a*(4*Si(2*arcsin(b
*x+a))*arcsin(b*x+a)^2+2*cos(2*arcsin(b*x+a))*arcsin(b*x+a)+sin(2*arcsin(b
*x+a)))/arcsin(b*x+a)^2-1/2*a^2*(Ci(arcsin(b*x+a))*arcsin(b*x+a)^2-arcsin(
b*x+a)*(b*x+a)+(1-(b*x+a)^2)^(1/2))/arcsin(b*x+a)^2)
```

### 3.151.5 Fricas [F]

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = \int \frac{x^2}{\arcsin(bx+a)^3}\,dx$$

input
```
integrate(x^2/arcsin(b*x+a)^3,x, algorithm="fricas")
```

output
```
integral(x^2/arcsin(b*x + a)^3, x)
```

### 3.151.6 Sympy [F]

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = \int \frac{x^2}{\mathrm{asin}^3(a+bx)}\,dx$$

input
```
integrate(x**2/asin(b*x+a)**3,x)
```

output
```
Integral(x**2/asin(a + b*x)**3, x)
```

### 3.151.7 Maxima [F]

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = \int \frac{x^2}{\arcsin(bx+a)^3}\,dx$$

input
```
integrate(x^2/arcsin(b*x+a)^3,x, algorithm="maxima")
```

output
```
-1/2*(sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*b*x^2 + arctan2(b*x + a, sqrt(b
*x + a + 1)*sqrt(-b*x - a + 1))^2*integrate((9*b^2*x^2 + 10*a*b*x + 2*a^2
- 2)/arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)), x) - (3*b^2*x
^3 + 5*a*b*x^2 + 2*(a^2 - 1)*x)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b
*x - a + 1)))/(b^2*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^
2)
```

### 3.151.8 Giac [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.55

$$\begin{aligned}\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = &-\frac{a^2\operatorname{Ci}(\arcsin(bx+a))}{2\,b^3} + \frac{(bx+a)a^2}{2\,b^3\arcsin(bx+a)} \\ &+ \frac{2\,a\operatorname{Si}(2\arcsin(bx+a))}{b^3} + \frac{3\left((bx+a)^2-1\right)(bx+a)}{2\,b^3\arcsin(bx+a)} \\ &- \frac{2\left((bx+a)^2-1\right)a}{b^3\arcsin(bx+a)} + \frac{9\operatorname{Ci}(3\arcsin(bx+a))}{8\,b^3} \\ &- \frac{\operatorname{Ci}(\arcsin(bx+a))}{8\,b^3} + \frac{\sqrt{-(bx+a)^2+1}(bx+a)a}{b^3\arcsin(bx+a)^2} \\ &- \frac{\sqrt{-(bx+a)^2+1}a^2}{2\,b^3\arcsin(bx+a)^2} + \frac{bx+a}{2\,b^3\arcsin(bx+a)} - \frac{a}{b^3\arcsin(bx+a)} \\ &+ \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}}{2\,b^3\arcsin(bx+a)^2} - \frac{\sqrt{-(bx+a)^2+1}}{2\,b^3\arcsin(bx+a)^2}\end{aligned}$$

input
```
integrate(x^2/arcsin(b*x+a)^3,x, algorithm="giac")
```

output
```
-1/2*a^2*cos_integral(arcsin(b*x + a))/b^3 + 1/2*(b*x + a)*a^2/(b^3*arcsin
(b*x + a)) + 2*a*sin_integral(2*arcsin(b*x + a))/b^3 + 3/2*((b*x + a)^2 -
1)*(b*x + a)/(b^3*arcsin(b*x + a)) - 2*((b*x + a)^2 - 1)*a/(b^3*arcsin(b*x
 + a)) + 9/8*cos_integral(3*arcsin(b*x + a))/b^3 - 1/8*cos_integral(arcsin
(b*x + a))/b^3 + sqrt(-(b*x + a)^2 + 1)*(b*x + a)*a/(b^3*arcsin(b*x + a)^2
) - 1/2*sqrt(-(b*x + a)^2 + 1)*a^2/(b^3*arcsin(b*x + a)^2) + 1/2*(b*x + a)
/(b^3*arcsin(b*x + a)) - a/(b^3*arcsin(b*x + a)) + 1/2*(-(b*x + a)^2 + 1)^
(3/2)/(b^3*arcsin(b*x + a)^2) - 1/2*sqrt(-(b*x + a)^2 + 1)/(b^3*arcsin(b*x
 + a)^2)
```

### 3.151.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\arcsin(a+bx)^3}\,dx = \int \frac{x^2}{\mathrm{asin}\left(a+b\,x\right)^3}\,dx$$

input
```
int(x^2/asin(a + b*x)^3,x)
```

output
```
int(x^2/asin(a + b*x)^3, x)
```

# 3.152 $\int \frac{x}{\arcsin(a+bx)^3}\,dx$



## 3.152.1 Optimal result

Integrand size = 10, antiderivative size = 108

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = -\frac{x\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2} - \frac{a(a+bx)}{2b^2\arcsin(a+bx)} - \frac{1-2(a+bx)^2}{2b^2\arcsin(a+bx)} + \frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{2b^2} - \frac{\text{Si}(2\arcsin(a+bx))}{b^2}$$

output
```
-1/2*a*(b*x+a)/b^2/arcsin(b*x+a)+1/2*(-1+2*(b*x+a)^2)/b^2/arcsin(b*x+a)+1/
2*a*Ci(arcsin(b*x+a))/b^2-Si(2*arcsin(b*x+a))/b^2-1/2*x*(1-(b*x+a)^2)^(1/2
)/b/arcsin(b*x+a)^2
```

## 3.152.2 Mathematica [A] (verified)

Time = 0.22 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.12

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = -\frac{x\sqrt{1-a^2-2abx-b^2x^2}}{2b\arcsin(a+bx)^2} + \frac{-1+a^2+3abx+2b^2x^2}{2b^2\arcsin(a+bx)} - \frac{3a\,\text{CosIntegral}(\arcsin(a+bx))}{2b^2} - 2\left(-\frac{a\,\text{CosIntegral}(\arcsin(a+bx))}{b^2} + \frac{\text{Si}(2\arcsin(a+bx))}{2b^2}\right)$$

input
```
Integrate[x/ArcSin[a + b*x]^3,x]
```

output
```
-1/2*(x*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])/(b*ArcSin[a + b*x]^2) + (-1 + a
^2 + 3*a*b*x + 2*b^2*x^2)/(2*b^2*ArcSin[a + b*x]) - (3*a*CosIntegral[ArcSi
n[a + b*x]])/(2*b^2) - 2*(-((a*CosIntegral[ArcSin[a + b*x]])/b^2) + SinInt
egral[2*ArcSin[a + b*x]]/(2*b^2))
```

### 3.152.3 Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.24, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5304, 25, 27, 5244, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x}{\arcsin(a+bx)^3}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{x}{\arcsin(a+bx)^3}d(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{x}{\arcsin(a+bx)^3}d(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\frac{\int -\frac{bx}{\arcsin(a+bx)^3}d(a+bx)}{b^2}$$

$$\Big\downarrow \text{5244}$$

$$-\frac{\int \left(\frac{a}{\arcsin(a+bx)^3}-\frac{a+bx}{\arcsin(a+bx)^3}\right)d(a+bx)}{b^2}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{-\frac{1}{2}a\,\text{CosIntegral}(\arcsin(a+bx))+\text{Si}(2\arcsin(a+bx))-\frac{(a+bx)^2}{\arcsin(a+bx)}+\frac{a(a+bx)}{2\arcsin(a+bx)}+\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2\arcsin(a+bx)^2}+\frac{}{2\,\text{arcsi}}}{b^2}$$

input
```
Int[x/ArcSin[a + b*x]^3,x]
```

output
```
-((-1/2*(a*Sqrt[1 - (a + b*x)^2])/ArcSin[a + b*x]^2 + ((a + b*x)*Sqrt[1 -
(a + b*x)^2])/(2*ArcSin[a + b*x]^2) + 1/(2*ArcSin[a + b*x]) + (a*(a + b*x)
)/(2*ArcSin[a + b*x]) - (a + b*x)^2/ArcSin[a + b*x] - (a*CosIntegral[ArcSi
n[a + b*x]])/2 + SinIntegral[2*ArcSin[a + b*x]])/b^2)
```

#### 3.152.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.152.4 Maple [A] (verified)

Time = 0.52 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.01

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{\sin(2\arcsin(bx+a))}{4\arcsin(bx+a)^2}-\frac{\cos(2\arcsin(bx+a))}{2\arcsin(bx+a)}-\operatorname{Si}(2\arcsin(bx+a))+\frac{a\left(\operatorname{Ci}(\arcsin(bx+a))\arcsin(bx+a)^2-\arcsin(bx+a)(bx+a)+\sqrt{1-(\right.}{2\arcsin(bx+a)^2}}{b^2}$ |
| default | $\frac{-\frac{\sin(2\arcsin(bx+a))}{4\arcsin(bx+a)^2}-\frac{\cos(2\arcsin(bx+a))}{2\arcsin(bx+a)}-\operatorname{Si}(2\arcsin(bx+a))+\frac{a\left(\operatorname{Ci}(\arcsin(bx+a))\arcsin(bx+a)^2-\arcsin(bx+a)(bx+a)+\sqrt{1-(\right.}{2\arcsin(bx+a)^2}}{b^2}$ |

input
```
int(x/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

output
```
1/b^2*(-1/4/arcsin(b*x+a)^2*sin(2*arcsin(b*x+a))-1/2/arcsin(b*x+a)*cos(2*a
rcsin(b*x+a))-Si(2*arcsin(b*x+a))+1/2*a*(Ci(arcsin(b*x+a))*arcsin(b*x+a)^2
-arcsin(b*x+a)*(b*x+a)+(1-(b*x+a)^2)^(1/2))/arcsin(b*x+a)^2)
```

### 3.152.5 Fricas [F]

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \int \frac{x}{\arcsin\left(bx+a\right)^3}\,dx$$

input
```
integrate(x/arcsin(b*x+a)^3,x, algorithm="fricas")
```

output
```
integral(x/arcsin(b*x + a)^3, x)
```

### 3.152.6 Sympy [F]

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \int \frac{x}{\operatorname{asin}^3\left(a+bx\right)}\,dx$$

input
```
integrate(x/asin(b*x+a)**3,x)
```

output
```
Integral(x/asin(a + b*x)**3, x)
```

### 3.152.7 Maxima [F]

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \int \frac{x}{\arcsin\left(bx+a\right)^3}\,dx$$

input
```
integrate(x/arcsin(b*x+a)^3,x, algorithm="maxima")
```

output
```
-1/2*(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2*integrate
((4*b*x + 3*a)/arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)), x)
+ sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*b*x - (2*b^2*x^2 + 3*a*b*x + a^2 -
1)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))/(b^2*arctan2(b*
x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

### 3.152.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.29

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \frac{a\,\mathrm{Ci}\left(\arcsin\left(bx+a\right)\right)}{2\,b^2} - \frac{(bx+a)a}{2\,b^2\arcsin\left(bx+a\right)} - \frac{\mathrm{Si}\left(2\,\arcsin\left(bx+a\right)\right)}{b^2} + \frac{\left(bx+a\right)^2-1}{b^2\arcsin\left(bx+a\right)} - \frac{\sqrt{-\left(bx+a\right)^2+1}(bx+a)}{2\,b^2\arcsin\left(bx+a\right)^2} + \frac{\sqrt{-\left(bx+a\right)^2+1}a}{2\,b^2\arcsin\left(bx+a\right)^2} + \frac{1}{2\,b^2\arcsin\left(bx+a\right)}$$

input
```
integrate(x/arcsin(b*x+a)^3,x, algorithm="giac")
```

output
```
1/2*a*cos_integral(arcsin(b*x + a))/b^2 - 1/2*(b*x + a)*a/(b^2*arcsin(b*x
+ a)) - sin_integral(2*arcsin(b*x + a))/b^2 + ((b*x + a)^2 - 1)/(b^2*arcsi
n(b*x + a)) - 1/2*sqrt(-(b*x + a)^2 + 1)*(b*x + a)/(b^2*arcsin(b*x + a)^2)
 + 1/2*sqrt(-(b*x + a)^2 + 1)*a/(b^2*arcsin(b*x + a)^2) + 1/2/(b^2*arcsin(
b*x + a))
```

### 3.152.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\arcsin(a+bx)^3}\,dx = \int \frac{x}{\mathrm{asin}\left(a+b\,x\right)^3}\,dx$$

input
```
int(x/asin(a + b*x)^3,x)
```

output
```
int(x/asin(a + b*x)^3, x)
```

# 3.153 $\int \frac{1}{\arcsin(a+bx)^3} dx$



## 3.153.1 Optimal result

Integrand size = 8, antiderivative size = 65

$$\int \frac{1}{\arcsin(a+bx)^3} dx = -\frac{\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2} + \frac{a+bx}{2b\arcsin(a+bx)} - \frac{\text{CosIntegral}(\arcsin(a+bx))}{2b}$$

output
```
1/2*(b*x+a)/b/arcsin(b*x+a)-1/2*Ci(arcsin(b*x+a))/b-1/2*(1-(b*x+a)^2)^(1/2
)/b/arcsin(b*x+a)^2
```

## 3.153.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.00

$$\int \frac{1}{\arcsin(a+bx)^3} dx = -\frac{\sqrt{1-(a+bx)^2}}{2b\arcsin(a+bx)^2} + \frac{a+bx}{2b\arcsin(a+bx)} - \frac{\text{CosIntegral}(\arcsin(a+bx))}{2b}$$

input
```
Integrate[ArcSin[a + b*x]^(-3),x]
```

output
```
-1/2*Sqrt[1 - (a + b*x)^2]/(b*ArcSin[a + b*x]^2) + (a + b*x)/(2*b*ArcSin[a
 + b*x]) - CosIntegral[ArcSin[a + b*x]]/(2*b)
```

### 3.153.3 Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.92, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.750, Rules used = {5302, 5132, 5222, 5134, 3042, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\arcsin (a+b x)^3} \, dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{\arcsin (a+b x)^3}d(a+b x)}{b}$$

$$\Big\downarrow \text{5132}$$

$$\frac{-\frac{1}{2} \int \frac{a+b x}{\sqrt{1-(a+b x)^2} \arcsin (a+b x)^2}d(a+b x)-\frac{\sqrt{1-(a+b x)^2}}{2 \arcsin (a+b x)^2}}{b}$$

$$\Big\downarrow \text{5222}$$

$$\frac{\frac{1}{2} \left(\frac{a+b x}{\arcsin (a+b x)}-\int \frac{1}{\arcsin (a+b x)}d(a+b x)\right)-\frac{\sqrt{1-(a+b x)^2}}{2 \arcsin (a+b x)^2}}{b}$$

$$\Big\downarrow \text{5134}$$

$$\frac{\frac{1}{2} \left(\frac{a+b x}{\arcsin (a+b x)}-\int \frac{\sqrt{1-(a+b x)^2}}{\arcsin (a+b x)}d\arcsin (a+b x)\right)-\frac{\sqrt{1-(a+b x)^2}}{2 \arcsin (a+b x)^2}}{b}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\frac{1}{2} \left(\frac{a+b x}{\arcsin (a+b x)}-\int \frac{\sin \left(\arcsin (a+b x)+\frac{\pi }{2}\right)}{\arcsin (a+b x)}d\arcsin (a+b x)\right)-\frac{\sqrt{1-(a+b x)^2}}{2 \arcsin (a+b x)^2}}{b}$$

$$\Big\downarrow \text{3783}$$

$$\frac{\frac{1}{2} \left(\frac{a+b x}{\arcsin (a+b x)}-\text{CosIntegral}(\arcsin (a+b x))\right)-\frac{\sqrt{1-(a+b x)^2}}{2 \arcsin (a+b x)^2}}{b}$$

input
```
Int[ArcSin[a + b*x]^(-3),x]
```

output
```
(-1/2*Sqrt[1 - (a + b*x)^2]/ArcSin[a + b*x]^2 + ((a + b*x)/ArcSin[a + b*x]
 - CosIntegral[ArcSin[a + b*x]])/2)/b
```

### 3.153.3.1 Defintions of rubi rules used

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.153. $\int \frac{1}{\arcsin(a+bx)^3} \, dx$

### 3.153.4 Maple [A] (verified)

Time = 0.33 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.82

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{\sqrt{1-(bx+a)^2}}{2\arcsin(bx+a)^2}+\frac{bx+a}{2\arcsin(bx+a)}-\frac{\operatorname{Ci}(\arcsin(bx+a))}{2}}{b}$ | 53 |
| default | $\frac{-\frac{\sqrt{1-(bx+a)^2}}{2\arcsin(bx+a)^2}+\frac{bx+a}{2\arcsin(bx+a)}-\frac{\operatorname{Ci}(\arcsin(bx+a))}{2}}{b}$ | 53 |

input
```
int(1/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE)
```

output
```
1/b*(-1/2/arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)+1/2*(b*x+a)/arcsin(b*x+a)-1/
2*Ci(arcsin(b*x+a)))
```

### 3.153.5 Fricas [F]

$$\int \frac{1}{\arcsin(a+bx)^3}\,dx=\int \frac{1}{\arcsin{(bx+a)}^3}\,dx$$

input
```
integrate(1/arcsin(b*x+a)^3,x, algorithm="fricas")
```

output
```
integral(arcsin(b*x + a)^(-3), x)
```

### 3.153.6 Sympy [F]

$$\int \frac{1}{\arcsin(a+bx)^3}\,dx=\int \frac{1}{\operatorname{asin}^3{(a+bx)}}\,dx$$

input
```
integrate(1/asin(b*x+a)**3,x)
```

output
```
Integral(asin(a + b*x)**(-3), x)
```

### 3.153.7 Maxima [F]

$$\int \frac{1}{\arcsin(a+bx)^3}\,dx = \int \frac{1}{\arcsin(bx+a)^3}\,dx$$

input
```
integrate(1/arcsin(b*x+a)^3,x, algorithm="maxima")
```

output
```
-1/2*(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2*integrate
(1/arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)), x) - (b*x + a)*
arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)) + sqrt(b*x + a + 1)
*sqrt(-b*x - a + 1))/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a +
 1))^2)
```

### 3.153.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.88

$$\int \frac{1}{\arcsin(a+bx)^3}\,dx = -\frac{\operatorname{Ci}(\arcsin(bx+a))}{2b} + \frac{bx+a}{2b\arcsin(bx+a)} - \frac{\sqrt{-(bx+a)^2+1}}{2b\arcsin(bx+a)^2}$$

input
```
integrate(1/arcsin(b*x+a)^3,x, algorithm="giac")
```

output
```
-1/2*cos_integral(arcsin(b*x + a))/b + 1/2*(b*x + a)/(b*arcsin(b*x + a)) -
 1/2*sqrt(-(b*x + a)^2 + 1)/(b*arcsin(b*x + a)^2)
```

### 3.153.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\arcsin(a+bx)^3}\,dx = \int \frac{1}{\operatorname{asin}(a+b\,x)^3}\,dx$$

input
```
int(1/asin(a + b*x)^3,x)
```

output
```
int(1/asin(a + b*x)^3, x)
```

# 3.154 $\int \frac{1}{x \arcsin(a+bx)^3} dx$



## 3.154.1 Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{1}{x \arcsin(a+bx)^3} dx = \text{Int}\left(\frac{1}{x \arcsin(a+bx)^3}, x\right)$$

output
```
Unintegrable(1/x/arcsin(b*x+a)^3,x)
```

## 3.154.2 Mathematica [N/A]

Not integrable

Time = 2.87 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^3} dx = \int \frac{1}{x \arcsin(a+bx)^3} dx$$

input
```
Integrate[1/(x*ArcSin[a + b*x]^3),x]
```

output
```
Integrate[1/(x*ArcSin[a + b*x]^3), x]
```

### 3.154.3 Rubi [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 25, 27, 5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{x \arcsin (a+b x)^3} \, dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{1}{x \arcsin (a+b x)^3}d(a+b x)}{b}$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{\int -\frac{1}{x \arcsin (a+b x)^3}d(a+b x)}{b}$$

$$\Big\downarrow \text{ 27}$$

$$-\int -\frac{1}{b x \arcsin (a+b x)^3}d(a+b x)$$

$$\Big\downarrow \text{ 5300}$$

$$-\int -\frac{1}{b x \arcsin (a+b x)^3}d(a+b x)$$

input
```
Int[1/(x*ArcSin[a + b*x]^3),x]
```

output
```
$Aborted
```

#### 3.154.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.154.4 Maple [N/A] (verified)

Not integrable

Time = 9.02 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin\left(bx+a\right)^{3}}dx$$

input
```
int(1/x/arcsin(b*x+a)^3,x)
```

output
```
int(1/x/arcsin(b*x+a)^3,x)
```

### 3.154.5 Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^3}\,dx = \int \frac{1}{x \arcsin\left(bx+a\right)^{3}}\,dx$$

input
```
integrate(1/x/arcsin(b*x+a)^3,x, algorithm="fricas")
```

output
```
integral(1/(x*arcsin(b*x + a)^3), x)
```

### 3.154.6 Sympy [N/A]

Not integrable

Time = 0.48 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \operatorname{asin}^3(a+bx)} \, dx$$

input
```
integrate(1/x/asin(b*x+a)**3,x)
```

output
```
Integral(1/(x*asin(a + b*x)**3), x)
```

### 3.154.7 Maxima [N/A]

Not integrable

Time = 57.49 (sec) , antiderivative size = 172, normalized size of antiderivative = 14.33

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \arcsin(bx+a)^3} \, dx$$

input
```
integrate(1/x/arcsin(b*x+a)^3,x, algorithm="maxima")
```

output
```
-1/2*(x^2*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2*integra
te((a*b*x + 2*a^2 - 2)/(x^3*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x -
 a + 1))), x) + sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)*b*x + (a*b*x + a^2 -
1)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))/(b^2*x^2*arctan
2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

### 3.154.8 Giac [N/A]

Not integrable

Time = 0.33 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \arcsin(bx+a)^3} \, dx$$

input
```
integrate(1/x/arcsin(b*x+a)^3,x, algorithm="giac")
```

output
```
integrate(1/(x*arcsin(b*x + a)^3), x)
```

### 3.154.9 Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{1}{x \arcsin(a+bx)^3} \, dx = \int \frac{1}{x \, \mathrm{asin}\left(a+b\,x\right)^3} \, dx$$

input
```
int(1/(x*asin(a + b*x)^3),x)
```

output
```
int(1/(x*asin(a + b*x)^3), x)
```

# 3.155 $\int x^2 \sqrt{a+b \arcsin(c+dx)}\,dx$

## 3.155.1 Optimal result

Integrand size = 18, antiderivative size = 535

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx = \frac{c^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^3} + \frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d^3} + \frac{c\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{2d^3} - \frac{\sqrt{b}c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4d^3} - \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^3} - \frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^3} + \frac{\sqrt{b}\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d^3} + \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d^3} + \frac{\sqrt{b}c^2\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d^3} - \frac{\sqrt{b}c\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{4d^3} - \frac{\sqrt{b}\sqrt{\frac{\pi}{6}}\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{12d^3}$$

output
```
1/72*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2
))*b^(1/2)*6^(1/2)*Pi^(1/2)/d^3-1/72*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)*6^(1/2)*Pi^(1/2)/d^3-1/8*cos(a/
b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*b^(1/2)*2^
(1/2)*Pi^(1/2)/d^3-1/2*c^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(
d*x+c))^(1/2)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/d^3+1/8*FresnelC(2^(1/2)/P
i^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/
2)/d^3+1/2*c^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)
)*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d^3-1/4*c*cos(2*a/b)*FresnelC(2*(a+b*a
rcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*b^(1/2)*Pi^(1/2)/d^3-1/4*c*FresnelS(
2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*b^(1/2)*Pi^(1/2)/
d^3+c^2*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d^3+1/3*(d*x+c)^3*(a+b*arcsin(d*
x+c))^(1/2)/d^3+1/2*c*cos(2*arcsin(d*x+c))*(a+b*arcsin(d*x+c))^(1/2)/d^3
```

### 3.155.2 Mathematica [A] (verified)

Time = 3.25 (sec) , antiderivative size = 459, normalized size of antiderivative = 0.86

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx$$

$$= \frac{18(c+dx)\sqrt{a+b\arcsin(c+dx)}+72c^2(c+dx)\sqrt{a+b\arcsin(c+dx)}+36c\sqrt{a+b\arcsin(c+dx)}\cos(2}{}$$

input
```
Integrate[x^2*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(18*(c + d*x)*Sqrt[a + b*ArcSin[c + d*x]] + 72*c^2*(c + d*x)*Sqrt[a + b*Ar
cSin[c + d*x]] + 36*c*Sqrt[a + b*ArcSin[c + d*x]]*Cos[2*ArcSin[c + d*x]] -
 18*Sqrt[b]*c*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]
])/(Sqrt[b]*Sqrt[Pi])] - 9*Sqrt[b]*(1 + 4*c^2)*Sqrt[2*Pi]*Cos[a/b]*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + Sqrt[b]*Sqrt[6*Pi]*C
os[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + 9
*Sqrt[b]*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt
[b]]*Sin[a/b] + 36*Sqrt[b]*c^2*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*
ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b] - 18*Sqrt[b]*c*Sqrt[Pi]*FresnelS[(2*Sq
rt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b] - Sqrt[b]*Sqrt
[6*Pi]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a
)/b] - 6*Sqrt[a + b*ArcSin[c + d*x]]*Sin[3*ArcSin[c + d*x]])/(72*d^3)
```

### 3.155.3 Rubi [A] (verified)

Time = 2.01 (sec) , antiderivative size = 569, normalized size of antiderivative = 1.06, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {5304, 27, 5246, 7267, 7292, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int x^2\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int d^2x^2\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d^3}$$

$$\Big\downarrow \text{5246}$$

$$\frac{\int d^2x^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}d\arcsin(c+dx)}{d^3}$$

$$\Big\downarrow \text{7267}$$

$$\frac{2\int d^2x^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))d\sqrt{a+b\arcsin(c+dx)}}{bd^3}$$

$$\Big\downarrow \text{7292}$$

$$\frac{2\int d^2x^2(a+b\arcsin(c+dx))\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd^3}$$

$$\Big\downarrow \text{7293}$$

$$\frac{2\int\left((a+b\arcsin(c+dx))\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)c^2+(a+b\arcsin(c+dx))\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)c+(a\ldots}{bd^3}$$

$$\Big\downarrow \text{2009}$$

$$2\left(\frac{1}{2}\sqrt{\frac{\pi}{2}}b^{3/2}c^2\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{1}{2}\sqrt{\frac{\pi}{2}}b^{3/2}c^2\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\frac{1}{8}\ldots\right.$$

input
```
Int[x^2*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(2*((b*c*Sqrt[a + b*ArcSin[c + d*x]]*Cos[(2*a)/b - (2*(a + b*ArcSin[c + d*
x]))/b])/4 - (b^(3/2)*c*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSi
n[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/8 - (b^(3/2)*Sqrt[Pi/2]*Cos[a/b]*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/8 - (b^(3/2)*c^2*Sqrt
[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]
)/2 + (b^(3/2)*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*Arc
Sin[c + d*x]])/Sqrt[b]])/24 + (b^(3/2)*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqr
t[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/8 + (b^(3/2)*c^2*Sqrt[Pi/2]*F
resnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2 - (b
^(3/2)*c*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[P
i])]*Sin[(2*a)/b])/8 - (b^(3/2)*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b
*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/24 - (b*c^2*Sqrt[a + b*ArcSin[c
+ d*x]]*Sin[a/b - (a + b*ArcSin[c + d*x])/b])/2 - (b*Sqrt[a + b*ArcSin[c +
 d*x]]*Sin[a/b - (a + b*ArcSin[c + d*x])/b]^3)/6))/(b*d^3)
```

### 3.155.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7267
```
Int[u_, x_Symbol] :> With[{lst = SubstForFractionalPowerOfLinear[u, x]}, Si
mp[lst[[2]]*lst[[4]]   Subst[Int[lst[[1]], x], x, lst[[3]]^(1/lst[[2]])], x
] /;  !FalseQ[lst] && SubstForFractionalPowerQ[u, lst[[3]], x]]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.155.4 Maple [A] (verified)

Time = 1.25 (sec) , antiderivative size = 777, normalized size of antiderivative = 1.45

| method | result |
|---|---|
| default | $\frac{36\sqrt{\pi}\,\sqrt{2}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b\,c^{2}+36\sqrt{\pi}\,\sqrt{2}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\mathrm{Fresn}}{}$ |

input
```
int(x^2*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/72/d^3/(a+b*arcsin(d*x+c))^(1/2)*(36*Pi^(1/2)*2^(1/2)*(-1/b)^(1/2)*(a+b*
arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*
arcsin(d*x+c))^(1/2)/b)*b*c^2+36*Pi^(1/2)*2^(1/2)*(-1/b)^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b)*b*c^2-(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^
(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b)*b-(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin
(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
/b)*b+9*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*F
resnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+9*2^(
1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(
1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b-18*Pi^(1/2)*(-1/
b)^(1/2)*cos(2*a/b)*(a+b*arcsin(d*x+c))^(1/2)*FresnelC(2*2^(1/2)/Pi^(1/2)/
(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b*c+18*Pi^(1/2)*(-1/b)^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)/b)*b*c-72*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c)
)/b+a/b)*b*c^2+36*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b*c-72
*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*c^2+6*arcsin(d*x+c)*sin(-3*(a+b*arcsin(
d*x+c))/b+3*a/b)*b-18*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+36*c
os(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*c+6*sin(-3*(a+b*arcsin(d*x+c))/b+3...
```

### 3.155.5 Fricas [F(-2)]

Exception generated.

$$\int x^2 \sqrt{a + b \arcsin(c + dx)}\, dx = \text{Exception raised: TypeError}$$

input
```
integrate(x^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.155.6 Sympy [F]

$$\int x^2 \sqrt{a + b \arcsin(c + dx)}\, dx = \int x^2 \sqrt{a + b \,\mathrm{asin}\,(c + dx)}\, dx$$

input
```
integrate(x**2*(a+b*asin(d*x+c))**(1/2),x)
```

output
```
Integral(x**2*sqrt(a + b*asin(c + d*x)), x)
```

### 3.155.7 Maxima [F]

$$\int x^2 \sqrt{a + b \arcsin(c + dx)}\, dx = \int \sqrt{b \arcsin(dx + c) + a} x^2\, dx$$

input
```
integrate(x^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(b*arcsin(d*x + c) + a)*x^2, x)
```

### 3.155.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.45 (sec) , antiderivative size = 2255, normalized size of antiderivative = 4.21

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Too large to display}$$

input
```
integrate(x^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
1/2*sqrt(2)*sqrt(pi)*a*b^2*c^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)
*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) + 1/4*I*sqrt(2)*s
qrt(pi)*b^3*c^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)
) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*
b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^3) + 1/2*sqrt(2)*sqrt(pi)*a*b^2*c^2
*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*
sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b
)) + b^2*sqrt(abs(b)))*d^3) - 1/4*I*sqrt(2)*sqrt(pi)*b^3*c^2*erf(1/2*I*sqr
t(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(
d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(
abs(b)))*d^3) - sqrt(pi)*a*b*c^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c)
 + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/
b)*e^(I*a/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d^3) -
 sqrt(pi)*a*b*c^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b
)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((
-I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d^3) - 1/2*I*sqrt(pi
)*a*b^(3/2)*c*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d
*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d^3) + 1/8*
sqrt(pi)*b^(5/2)*c*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*...
```

### 3.155.9 Mupad [F(-1)]

Timed out.

$$\int x^2\sqrt{a+b\arcsin(c+dx)}\,dx = \int x^2\,\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}\,dx$$

input
```
int(x^2*(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int(x^2*(a + b*asin(c + d*x))^(1/2), x)
```

# 3.156 $\int x\sqrt{a+b\arcsin(c+dx)}\,dx$



## 3.156.1 Optimal result

Integrand size = 16, antiderivative size = 269

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx = -\frac{c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d^2} - \frac{\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{4d^2} + \frac{\sqrt{b}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d^2} + \frac{\sqrt{b}c\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d^2} - \frac{\sqrt{b}c\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d^2} + \frac{\sqrt{b}\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8d^2}$$

output
```
1/2*c*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)
)*b^(1/2)*2^(1/2)*Pi^(1/2)/d^2-1/2*c*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d^2+1/8*cos(2*a/
b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*b^(1/2)*Pi^(1/2)
/d^2+1/8*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)
*b^(1/2)*Pi^(1/2)/d^2-c*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d^2-1/4*cos(2*ar
csin(d*x+c))*(a+b*arcsin(d*x+c))^(1/2)/d^2
```

### 3.156.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.26 (sec) , antiderivative size = 248, normalized size of antiderivative = 0.92

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx$$

$$= \frac{-2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))+\sqrt{b}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-\frac{4bce^{-\frac{ia}{b}}\left(\sqrt{\right.}}{}}{}$$

input
```
Integrate[x*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(-2*Sqrt[a + b*ArcSin[c + d*x]]*Cos[2*ArcSin[c + d*x]] + Sqrt[b]*Sqrt[Pi]*
Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]
- (4*b*c*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*A
rcSin[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*
Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(E^((I*a)/b)*Sqrt[a + b*ArcSin
[c + d*x]]) + Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(S
qrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/(8*d^2)
```

### 3.156.3 Rubi [A] (verified)

Time = 1.00 (sec) , antiderivative size = 299, normalized size of antiderivative = 1.11, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5304, 25, 27, 5246, 7267, 7292, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int x\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -x\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \; 27$$

$$-\frac{\int -dx\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d^2}$$

$$\Big\downarrow \; 5246$$

$$-\frac{\int -dx\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}d\arcsin(c+dx)}{d^2}$$

$$\Big\downarrow \; 7267$$

$$-\frac{2\int -dx\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))d\sqrt{a+b\arcsin(c+dx)}}{bd^2}$$

$$\Big\downarrow \; 7292$$

$$-\frac{2\int -dx(a+b\arcsin(c+dx))\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd^2}$$

$$\Big\downarrow \; 7293$$

$$-\frac{2\int \left(c(a+b\arcsin(c+dx))\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)+\frac{1}{2}(a+b\arcsin(c+dx))\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)\right)d\sqrt{}}{bd^2}$$

$$\Big\downarrow \; 2009$$

$$-\frac{2\left(\frac{1}{2}\sqrt{\frac{\pi}{2}}b^{3/2}c\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{1}{16}\sqrt{\pi}b^{3/2}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-\frac{1}{16}\sqrt{}\right.}{}$$

input
```
Int[x*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(-2*((b*Sqrt[a + b*ArcSin[c + d*x]]*Cos[(2*a)/b - (2*(a + b*ArcSin[c + d*x
]))/b])/8 - (b^(3/2)*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c
 + d*x]])/(Sqrt[b]*Sqrt[Pi])])/16 - (b^(3/2)*c*Sqrt[Pi/2]*Cos[a/b]*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/2 + (b^(3/2)*c*Sqrt[P
i/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/
2 - (b^(3/2)*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sq
rt[Pi])]*Sin[(2*a)/b])/16 - (b*c*Sqrt[a + b*ArcSin[c + d*x]]*Sin[a/b - (a
+ b*ArcSin[c + d*x])/b])/2))/(b*d^2)
```

## 3.156. $\int x\sqrt{a+b\arcsin(c+dx)}\,dx$

### 3.156.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7267
```
Int[u_, x_Symbol] :> With[{lst = SubstForFractionalPowerOfLinear[u, x]}, Si
mp[lst[[2]]*lst[[4]]   Subst[Int[lst[[1]], x], x, lst[[3]]^(1/lst[[2]])], x
] /;  !FalseQ[lst] && SubstForFractionalPowerQ[u, lst[[3]], x]]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.156.4 Maple [A] (verified)

Time = 1.11 (sec) , antiderivative size = 390, normalized size of antiderivative = 1.45

| method | result |
|---|---|
| default | $-\frac{4\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\ \mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\cos\left(\frac{a}{b}\right)bc+4\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\ \sin\left(\frac{a}{b}\right)\mathrm{Fresne}}{}$ |

input
```
int(x*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/8/d^2/(a+b*arcsin(d*x+c))^(1/2)*(4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x
+c))^(1/2)/b)*cos(a/b)*b*c+4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x
+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x
+c))^(1/2)/b)*b*c-(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/
b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b
+(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(
1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b-8*arcsin(d*x+c)*
sin(-(a+b*arcsin(d*x+c))/b+a/b)*b*c+2*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x
+c))/b+2*a/b)*b-8*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*c+2*cos(-2*(a+b*arcsin
(d*x+c))/b+2*a/b)*a)
```

### 3.156.5 Fricas [F(-2)]

Exception generated.

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.156.6 Sympy [F]

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx=\int x\sqrt{a+b\operatorname{asin}\left(c+dx\right)}\,dx$$

input
```
integrate(x*(a+b*asin(d*x+c))**(1/2),x)
```

output
```
Integral(x*sqrt(a + b*asin(c + d*x)), x)
```

### 3.156.7 Maxima [F]

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx=\int \sqrt{b\arcsin\left(dx+c\right)+a}x\,dx$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(b*arcsin(d*x + c) + a)*x, x)
```

### 3.156.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.00 (sec) , antiderivative size = 1079, normalized size of antiderivative = 4.01

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx=\text{Too large to display}$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
-1/2*sqrt(2)*sqrt(pi)*a*b^2*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) +
a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*
e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^2) - 1/4*I*sqrt(2)*sq
rt(pi)*b^3*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) -
 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3
/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^2) - 1/2*sqrt(2)*sqrt(pi)*a*b^2*c*erf(
1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(
b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) +
b^2*sqrt(abs(b)))*d^2) + 1/4*I*sqrt(2)*sqrt(pi)*b^3*c*erf(1/2*I*sqrt(2)*sq
rt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c
) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))
)*d^2) + sqrt(pi)*a*b*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqr
t(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a
/b)/((I*sqrt(2)*b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d^2) + sqrt(pi)
*a*b*c*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*sqrt(2)*
b^2/sqrt(abs(b)) + sqrt(2)*b*sqrt(abs(b)))*d^2) + 1/4*I*sqrt(pi)*a*b^(3/2)
*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*
sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(b))*d^2) - 1/16*sqrt(pi)*b^(
5/2)*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c...
```

### 3.156.9 Mupad [F(-1)]

Timed out.

$$\int x\sqrt{a+b\arcsin(c+dx)}\,dx=\int x\,\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

input
```
int(x*(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int(x*(a + b*asin(c + d*x))^(1/2), x)
```

# 3.157 $\int \sqrt{a+b\arcsin(c+dx)}\,dx$



## 3.157.1 Optimal result

Integrand size = 14, antiderivative size = 133

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d} - \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d} + \frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d}$$

output
```
-1/2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))
*b^(1/2)*2^(1/2)*Pi^(1/2)/d+1/2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d+(d*x+c)*(a+b*arcsin
(d*x+c))^(1/2)/d
```

## 3.157.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.12 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.97

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \frac{be^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d\sqrt{a+b\arcsin(c+dx)}}$$

input
```
Integrate[Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(b*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[
c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[
3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(2*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c
 + d*x]])
```

### 3.157.3 Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.97, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857, Rules used = {5302, 5130, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}-\frac{1}{2}b\int \frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5224}$$

$$\frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}-\frac{1}{2}\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{d}$$

$$\Big\downarrow \text{25}$$

$$\frac{\frac{1}{2}\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\frac{1}{2}\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d}$$

$$\Big\downarrow \text{3787}$$

$$\frac{\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int-\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)+(}{d}$$

$\downarrow$ 25

$$\frac{\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)+(c}{d}$$

$\downarrow$ 3042

$$\frac{\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)+}{d}$$

$\downarrow$ 3785

$$\frac{\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{d}$$

$\downarrow$ 3786

$$\frac{\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\cos\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+}\right.}{d}$$

$\downarrow$ 3832

$$\frac{\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)+}{d}$$

$\downarrow$ 3833

$$\frac{\frac{1}{2}\left(\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)+(c+dx}{d}$$

input
```
Int[Sqrt[a + b*ArcSin[c + d*x]],x]
```

3.157. $\int\sqrt{a+b\arcsin(c+dx)}\,dx$

output
```
((c + d*x)*Sqrt[a + b*ArcSin[c + d*x]] + (-(Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*Fr
esnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]) + Sqrt[b]*Sqrt[2
*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/
2)/d
```

### 3.157.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.157.4 Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.53

| method | result |
|---|---|
| default | $-\frac{-\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b-\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}}{2d\sqrt{a+b\arcsin(dx+c)}}$ |

input
```
int((a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/2/d/(a+b*arcsin(d*x+c))^(1/2)*(-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)/b)*b-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b)*b+2*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+2*sin(-(a+b*arc
sin(d*x+c))/b+a/b)*a)
```

### 3.157.5 Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >> Error detected within library code: inte
grate: implementation incomplete (constant residues)
```

### 3.157.6 Sympy [F]

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**(1/2),x)
```

output
```
Integral(sqrt(a + b*asin(c + d*x)), x)
```

### 3.157.7 Maxima [F]

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{b\arcsin\,(dx+c)+a}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.157.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.66 (sec) , antiderivative size = 563, normalized size of antiderivative = 4.23

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{\sqrt{2}\sqrt{\pi}ab\,\text{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{2\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$+\frac{i\sqrt{2}\sqrt{\pi}b^2\,\text{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$+\frac{\sqrt{2}\sqrt{\pi}ab\,\text{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{2\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$-\frac{i\sqrt{2}\sqrt{\pi}b^2\,\text{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$-\frac{\sqrt{\pi}a\,\text{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}a\,\text{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{i\sqrt{b\arcsin(dx+c)+a}e^{(i\arcsin(dx+c))}}{2d}+\frac{i\sqrt{b\arcsin(dx+c)+a}e^{(-i\arcsin(dx+c))}}{2d}$$

input
```
integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

3.157. $\int \sqrt{a+b\arcsin(c+dx)}\,dx$

output
```
1/2*sqrt(2)*sqrt(pi)*a*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sq
rt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*
a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 1/4*I*sqrt(2)*sqrt(pi)*b^
2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2
)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b
)) + b*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a*b*erf(1/2*I*sqrt(2)*sqrt(
b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d)
- 1/4*I*sqrt(2)*sqrt(pi)*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^
(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - sqrt(pi)*a*erf(-1/2*
I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt(2)*b/sqrt(abs(b))
+ sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*a*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(
b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) -
 1/2*I*sqrt(b*arcsin(d*x + c) + a)*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*
arcsin(d*x + c) + a)*e^(-I*arcsin(d*x + c))/d
```

## 3.157.9 Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx=\int \sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

input
```
int((a + b*asin(c + d*x))^(1/2),x)
```

output
```
int((a + b*asin(c + d*x))^(1/2), x)
```

# 3.158 $\int x(a+b\arcsin(c+dx))^{3/2}\,dx$



## 3.158.1 Optimal result

Integrand size = 16, antiderivative size = 343

$$\begin{aligned}\int x(a+b\arcsin(c+dx))^{3/2}\,dx &= -\frac{3bc\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d^2} \\ &- \frac{c(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d^2} \\ &- \frac{(a+b\arcsin(c+dx))^{3/2}\cos(2\arcsin(c+dx))}{4d^2} \\ &+ \frac{3b^{3/2}c\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d^2} \\ &- \frac{3b^{3/2}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d^2} \\ &+ \frac{3b^{3/2}c\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2d^2} \\ &+ \frac{3b^{3/2}\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{32d^2} \\ &+ \frac{3b\sqrt{a+b\arcsin(c+dx)}\sin(2\arcsin(c+dx))}{16d^2}\end{aligned}$$

output
```
-c*(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d^2-1/4*(a+b*arcsin(d*x+c))^(3/2)*cos
(2*arcsin(d*x+c))/d^2+3/4*b^(3/2)*c*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d^2+3/4*b^(3/2)*c*Fresnel
S(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^
(1/2)/d^2-3/32*b^(3/2)*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(
1/2)/Pi^(1/2))*Pi^(1/2)/d^2+3/32*b^(3/2)*FresnelC(2*(a+b*arcsin(d*x+c))^(1
/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d^2+3/16*b*sin(2*arcsin(d*x+c))*
(a+b*arcsin(d*x+c))^(1/2)/d^2-3/2*b*c*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/d^2
```

## 3.158.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 8.88 (sec) , antiderivative size = 610, normalized size of antiderivative = 1.78

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx =$$

$$-\frac{abce^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d^2\sqrt{a+b\arcsin(c+dx)}}$$

$$-\frac{\sqrt{b}c\left(2\sqrt{b}\sqrt{a+b\arcsin(c+dx)}\left(3\sqrt{1-(c+dx)^2}+2(c+dx)\arcsin(c+dx)\right)-\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+\cdots}}{\cdots}\right.\right.}{4d\cdots}$$

$$+\frac{a\left(-2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))+\sqrt{b}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\sqrt{b}\sqrt{\pi}\cdots\right.}{8d^2}$$

$$+\frac{\sqrt{b}\left(-\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\left(3b\cos\left(\frac{2a}{b}\right)+4a\sin\left(\frac{2a}{b}\right)\right)-\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)(4a\cos\cdots\right.}{\cdots}$$

input
```
Integrate[x*(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
-1/2*(a*b*c*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a +
b*ArcSin[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/
b]*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(d^2*E^((I*a)/b)*Sqrt[a + b
*ArcSin[c + d*x]]) - (Sqrt[b]*c*(2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(3*
Sqrt[1 - (c + d*x)^2] + 2*(c + d*x)*ArcSin[c + d*x]) - Sqrt[2*Pi]*FresnelC
[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a*Sin
[a/b]) + Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt
[b]]*(2*a*Cos[a/b] - 3*b*Sin[a/b])))/(4*d^2) + (a*(-2*Sqrt[a + b*ArcSin[c
+ d*x]]*Cos[2*ArcSin[c + d*x]] + Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2
*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] + Sqrt[b]*Sqrt[Pi]*Fresn
elS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]))/(8*
d^2) + (Sqrt[b]*(-(Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt
[b]*Sqrt[Pi])]*(3*b*Cos[(2*a)/b] + 4*a*Sin[(2*a)/b])) - Sqrt[Pi]*FresnelC[
(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*(4*a*Cos[(2*a)/b] - 3*
b*Sin[(2*a)/b]) + 2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(-4*ArcSin[c + d*x
]*Cos[2*ArcSin[c + d*x]] + 3*Sin[2*ArcSin[c + d*x]])))/(32*d^2)
```

### 3.158.3 Rubi [A] (verified)

Time = 1.12 (sec) , antiderivative size = 387, normalized size of antiderivative = 1.13, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5304, 25, 27, 5246, 7267, 7292, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int x(a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -x(a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \ 27$$

$$-\frac{\int -dx(a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d^2}$$

$$\Big\downarrow \ 5246$$

$$-\frac{\int -dx\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}d\arcsin(c+dx)}{d^2}$$

$\Big\downarrow$ 7267

$$-\frac{2\int -dx\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2d\sqrt{a+b\arcsin(c+dx)}}{bd^2}$$

$\Big\downarrow$ 7292

$$-\frac{2\int -dx(a+b\arcsin(c+dx))^2\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd^2}$$

$\Big\downarrow$ 7293

$$-\frac{2\int \left(c\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)(a+b\arcsin(c+dx))^2+\frac{1}{2}\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)(a+b\arcsin(c+dx))^2\right)}{bd^2}$$

$\Big\downarrow$ 2009

$$-\frac{2\left(-\frac{3}{64}\sqrt{\pi}b^{5/2}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-\frac{3}{4}\sqrt{\frac{\pi}{2}}b^{5/2}c\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{3}{4}\sqrt{}\right.}{}$$

input
```
Int[x*(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(-2*((b*(a + b*ArcSin[c + d*x])^(3/2)*Cos[(2*a)/b - (2*(a + b*ArcSin[c + d
*x]))/b])/8 + (3*b^2*c*Sqrt[a + b*ArcSin[c + d*x]]*Cos[a/b - (a + b*ArcSin
[c + d*x])/b])/4 - (3*b^(5/2)*c*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*S
qrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/4 + (3*b^(5/2)*Sqrt[Pi]*Cos[(2*a)/b]
*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/64 - (3*b^(
5/2)*c*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b
]]*Sin[a/b])/4 - (3*b^(5/2)*Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x
]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/64 + (3*b^2*Sqrt[a + b*ArcSin[c + d*
x]]*Sin[(2*a)/b - (2*(a + b*ArcSin[c + d*x]))/b])/32 - (b*c*(a + b*ArcSin[
c + d*x])^(3/2)*Sin[a/b - (a + b*ArcSin[c + d*x])/b])/2))/(b*d^2)
```

## 3.158. $\int x(a+b\arcsin(c+dx))^{3/2}\,dx$

### 3.158.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7267
```
Int[u_, x_Symbol] :> With[{lst = SubstForFractionalPowerOfLinear[u, x]}, Si
mp[lst[[2]]*lst[[4]]   Subst[Int[lst[[1]], x], x, lst[[3]]^(1/lst[[2]])], x
] /;  !FalseQ[lst] && SubstForFractionalPowerQ[u, lst[[3]], x]]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.158.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 598 vs. $2(275) = 550$.

Time = 1.27 (sec) , antiderivative size = 599, normalized size of antiderivative = 1.75

| method | result |
|---|---|
| default | $-\frac{-24\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\,\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b^2c+24\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\,\mathrm{I}}{}$ |

input
```
int(x*(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-1/32/d^2/(a+b*arcsin(d*x+c))^(1/2)*(-24*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)/b)*b^2*c+24*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)/b)*b^2*c-3*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^
(1/2)/b)*b^2-3*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*
FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-
32*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^2*c+8*arcsin(d*x+c)^2
*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2-64*arcsin(d*x+c)*sin(-(a+b*arcsin
(d*x+c))/b+a/b)*a*b*c+48*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2
*c+16*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b+6*arcsin(d*x+c
)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2-32*sin(-(a+b*arcsin(d*x+c))/b+a/
b)*a^2*c+48*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b*c+8*cos(-2*(a+b*arcsin(d*x
+c))/b+2*a/b)*a^2+6*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b)
```

### 3.158.5 Fricas [F(-2)]

Exception generated.

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.158.6 Sympy [F]

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx=\int x(a+b\operatorname{asin}{(c+dx)})^{\frac{3}{2}}\,dx$$

input
```
integrate(x*(a+b*asin(d*x+c))**(3/2),x)
```

output
```
Integral(x*(a + b*asin(c + d*x))**(3/2), x)
```

### 3.158.7 Maxima [F]

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx=\int (b\arcsin{(dx+c)}+a)^{\frac{3}{2}}x\,dx$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(3/2)*x, x)
```

### 3.158.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.02 (sec) , antiderivative size = 1987, normalized size of antiderivative = 5.79

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx=\text{Too large to display}$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
-1/2*sqrt(2)*sqrt(pi)*a^2*b^2*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c)
+ a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b
)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^2) - 1/2*I*sqrt(2)*
sqrt(pi)*a*b^3*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b
)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I
*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d^2) - 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*
c*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(
b)) + b^2*sqrt(abs(b)))*d^2) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^3*c*erf(1/2*I*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin
(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt
(abs(b)))*d^2) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*c*erf(-1/2*I*sqrt(2)*sqrt(b*
arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d^2) -
3/8*sqrt(2)*sqrt(pi)*b^3*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/
sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(
I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d^2) - 1/2*I*sqrt(2)*sqrt(pi
)*a*b^2*c*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/s
qrt(abs(b)) + b*sqrt(abs(b)))*d^2) - 3/8*sqrt(2)*sqrt(pi)*b^3*c*erf(1/2...
```

### 3.158.9 Mupad [F(-1)]

Timed out.

$$\int x(a+b\arcsin(c+dx))^{3/2}\,dx=\int x\,(a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

input
```
int(x*(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int(x*(a + b*asin(c + d*x))^(3/2), x)
```

# 3.159 $\int (a+b\arcsin(c+dx))^{3/2}\,dx$



## 3.159.1 Optimal result

Integrand size = 14, antiderivative size = 175

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d}-\frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2d}$$

output
```
(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d-3/4*b^(3/2)*cos(a/b)*FresnelC(2^(1/2)/
Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-3/4*b^(3/2)
*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(
1/2)*Pi^(1/2)/d+3/2*b*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

## 3.159.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.29 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.78

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \frac{abe^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+\right.\right.}{2d\sqrt{a+b\arcsin(c+dx)}}$$
$$+\frac{\sqrt{b}\left(2\sqrt{b}\sqrt{a+b\arcsin(c+dx)}\left(3\sqrt{1-(c+dx)^2}+2(c+dx)\arcsin(c+dx)\right)-\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b}\right.\right.}{4d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(a*b*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSi
n[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamm
a[3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(2*d*E^((I*a)/b)*Sqrt[a + b*ArcSin
[c + d*x]]) + (Sqrt[b]*(2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(3*Sqrt[1 -
(c + d*x)^2] + 2*(c + d*x)*ArcSin[c + d*x]) - Sqrt[2*Pi]*FresnelC[(Sqrt[2/
Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a*Sin[a/b]) +
Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(2*a
*Cos[a/b] - 3*b*Sin[a/b])))/(4*d)
```

### 3.159.3 Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.94, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857, Rules used = {5302, 5130, 5182, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int (a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\int \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$\downarrow$ 5182

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}b\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)-\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}\right)}{d}$$

$\downarrow$ 5134

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sqrt{1-(c+dx)^2}\sqrt{a+b\right.}{d}$$

$\downarrow$ 3042

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sqrt{1-(c+dx)^2}\sqrt{a-\right.}{d}$$

$\downarrow$ 3787

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+\right.\right.}{\sqrt{a+b}}\right.\right.}{d}$$

$\downarrow$ 25

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\,a\right.}{\sqrt{a+b\,ar}}\right.\right.}{d}$$

$\downarrow$ 3042

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\,ar\right.}{\sqrt{a+b}}\right.\right.}{d}$$

$\downarrow$ 3785

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{a}{b}\right)\int \cos\left(\frac{a\right.\right.\right.}{d}$$

3.159. $\int (a+b\arcsin(c+dx))^{3/2}\,dx$

$\Big\downarrow$ 3786

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\Big(\frac{1}{2}\Big(2\sin\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{a}{b}\right)\int \mathrm{co}}{d}$$

$\Big\downarrow$ 3832

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{2\pi}\sqrt{b}\sin\right.\right.}{d}$$

$\Big\downarrow$ 3833

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\mathrm{Fres}\right.\right.}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^(3/2) - (3*b*(-(Sqrt[1 - (c + d*x)^2]*S
qrt[a + b*ArcSin[c + d*x]]) + (Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[
2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + Sqrt[b]*Sqrt[2*Pi]*FresnelS[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2))/2)/d
```

### 3.159.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.159. $\int (a+b \arcsin (c+d x))^{3/2} \, dx$

### 3.159.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 303 vs. $2(139) = 278$.

Time = 0.74 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.74

| method | result |
|---|---|
| default | $-\frac{3\sqrt{a+b\arcsin(dx+c)}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{2}\,b^2-3\sqrt{a+b\arcsin(dx+c)}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b}}{\sqrt{\pi}}\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-1/4/d*(3*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1
/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2-3
*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2+4*arcsin(d
*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+8*arcsin(d*x+c)*sin(-(a+b*arcs
in(d*x+c))/b+a/b)*a*b-6*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+
4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2-6*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*
b)/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.159.5 Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.159.6 Sympy [F]

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\int (a+b\,\mathrm{asin}\,(c+dx))^{\frac{3}{2}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**(3/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(3/2), x)
```

### 3.159.7 Maxima [F]

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\int (b\arcsin(dx+c)+a)^{\frac{3}{2}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.159.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.91 (sec) , antiderivative size = 1061, normalized size of antiderivative = 6.06

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\text{Too large to display}$$

input
```
integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e
^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/2*I*sqrt(2)*sqrt(
pi)*a*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sq
rt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arc
sin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*s
qrt(abs(b)))*d) - 1/2*I*sqrt(2)*sqrt(pi)*a*b^3*erf(1/2*I*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*
sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) -
1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e
^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/8*sqrt(2)*sqrt(pi)*
b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs
(b)) + b*sqrt(abs(b)))*d) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(1/2*I*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)
))*d) + 3/8*sqrt(2)*sqrt(pi)*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + ...
```

### 3.159.9 Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

input
```
int((a + b*asin(c + d*x))^(3/2),x)
```

output
```
int((a + b*asin(c + d*x))^(3/2), x)
```

# 3.160 $\int x(a+b\arcsin(c+dx))^{5/2}\,dx$



## 3.160.1 Optimal result

Integrand size = 16, antiderivative size = 406

$$\begin{aligned}\int x(a+b\arcsin(c+dx))^{5/2}\,dx &= \frac{15b^2c(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d^2} \\ &- \frac{5bc\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d^2} \\ &- \frac{c(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d^2} \\ &+ \frac{15b^2\sqrt{a+b\arcsin(c+dx)}\cos(2\arcsin(c+dx))}{64d^2} \\ &- \frac{(a+b\arcsin(c+dx))^{5/2}\cos(2\arcsin(c+dx))}{4d^2} \\ &- \frac{15b^{5/2}\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d^2} \\ &- \frac{15b^{5/2}c\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d^2} \\ &+ \frac{15b^{5/2}c\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d^2} \\ &- \frac{15b^{5/2}\sqrt{\pi}\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{128d^2} \\ &+ \frac{5b(a+b\arcsin(c+dx))^{3/2}\sin(2\arcsin(c+dx))}{16d^2}\end{aligned}$$

output
```
-c*(d*x+c)*(a+b*arcsin(d*x+c))^(5/2)/d^2-1/4*(a+b*arcsin(d*x+c))^(5/2)*cos
(2*arcsin(d*x+c))/d^2+5/16*b*(a+b*arcsin(d*x+c))^(3/2)*sin(2*arcsin(d*x+c)
)/d^2-15/8*b^(5/2)*c*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d^2+15/8*b^(5/2)*c*FresnelC(2^(1/2)/Pi^(
1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d^2-15/1
28*b^(5/2)*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2
))*Pi^(1/2)/d^2-15/128*b^(5/2)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2
)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d^2-5/2*b*c*(a+b*arcsin(d*x+c))^(3/2)*(1-(
d*x+c)^2)^(1/2)/d^2+15/4*b^2*c*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d^2+15/64
*b^2*cos(2*arcsin(d*x+c))*(a+b*arcsin(d*x+c))^(1/2)/d^2
```

### 3.160.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 11.98 (sec) , antiderivative size = 1043, normalized size of antiderivative = 2.57

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Too large to display}$$

input
```
Integrate[x*(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
-1/2*(a^2*b*c*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a
+ b*ArcSin[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x])
)/b]*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(d^2*E^((I*a)/b)*Sqrt[a +
 b*ArcSin[c + d*x]]) - (a*Sqrt[b]*c*(2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]
*(3*Sqrt[1 - (c + d*x)^2] + 2*(c + d*x)*ArcSin[c + d*x]) - Sqrt[2*Pi]*Fres
nelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a
*Sin[a/b]) + Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/
Sqrt[b]]*(2*a*Cos[a/b] - 3*b*Sin[a/b])))/(2*d^2) - (Sqrt[b]*c*(2*Sqrt[b]*S
qrt[a + b*ArcSin[c + d*x]]*(-2*Sqrt[1 - (c + d*x)^2]*(a - 5*b*ArcSin[c + d
*x]) + b*(c + d*x)*(-15 + 4*ArcSin[c + d*x]^2)) - Sqrt[2*Pi]*FresnelS[(Sqr
t[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*((4*a^2 - 15*b^2)*Cos[a/b] -
 12*a*b*Sin[a/b]) + Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c +
d*x]])/Sqrt[b]]*(12*a*b*Cos[a/b] + (4*a^2 - 15*b^2)*Sin[a/b])))/(8*d^2) +
(a^2*(-2*Sqrt[a + b*ArcSin[c + d*x]]*Cos[2*ArcSin[c + d*x]] + Sqrt[b]*Sqrt
[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[P
i])] + Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*
Sqrt[Pi])]*Sin[(2*a)/b]))/(8*d^2) + (a*Sqrt[b]*(-(Sqrt[Pi]*FresnelS[(2*Sqr
t[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*(3*b*Cos[(2*a)/b] + 4*a*Sin[
(2*a)/b])) - Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sq
rt[Pi])]*(4*a*Cos[(2*a)/b] - 3*b*Sin[(2*a)/b]) + 2*Sqrt[b]*Sqrt[a + b*A...
```

### 3.160.3 Rubi [A] (verified)

Time = 1.25 (sec) , antiderivative size = 475, normalized size of antiderivative = 1.17, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5304, 25, 27, 5246, 7267, 7292, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int x(a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -x(a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$-\frac{\int -dx(a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d^2}$$

$\Big\downarrow$ 5246

$$-\frac{\int -dx\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}d\arcsin(c+dx)}{d^2}$$

$\Big\downarrow$ 7267

$$-\frac{2\int -dx\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3d\sqrt{a+b\arcsin(c+dx)}}{bd^2}$$

$\Big\downarrow$ 7292

$$-\frac{2\int -dx(a+b\arcsin(c+dx))^3\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd^2}$$

$\Big\downarrow$ 7293

$$-\frac{2\int\left(c\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)(a+b\arcsin(c+dx))^3+\frac{1}{2}\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)(a+b\arcsin(c+dx))^3\right)}{bd^2}$$

$\Big\downarrow$ 2009

$$-\frac{2\left(-\frac{15}{8}\sqrt{\frac{\pi}{2}}b^{7/2}c\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\frac{15}{256}\sqrt{\pi}b^{7/2}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\ldots\right.}{}$$

input
```
Int[x*(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
(-2*((-15*b^3*Sqrt[a + b*ArcSin[c + d*x]]*Cos[(2*a)/b - (2*(a + b*ArcSin[c
 + d*x]))/b])/128 + (b*(a + b*ArcSin[c + d*x])^(5/2)*Cos[(2*a)/b - (2*(a +
 b*ArcSin[c + d*x]))/b])/8 + (5*b^2*c*(a + b*ArcSin[c + d*x])^(3/2)*Cos[a/
b - (a + b*ArcSin[c + d*x])/b])/4 + (15*b^(7/2)*Sqrt[Pi]*Cos[(2*a)/b]*Fres
nelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/256 + (15*b^(7/2
)*c*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/
Sqrt[b]])/8 - (15*b^(7/2)*c*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*Arc
Sin[c + d*x]])/Sqrt[b]]*Sin[a/b])/8 + (15*b^(7/2)*Sqrt[Pi]*FresnelS[(2*Sqr
t[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/256 + (5*b^2*(
a + b*ArcSin[c + d*x])^(3/2)*Sin[(2*a)/b - (2*(a + b*ArcSin[c + d*x]))/b])
/32 + (15*b^3*c*Sqrt[a + b*ArcSin[c + d*x]]*Sin[a/b - (a + b*ArcSin[c + d*
x])/b])/8 - (b*c*(a + b*ArcSin[c + d*x])^(5/2)*Sin[a/b - (a + b*ArcSin[c +
 d*x])/b])/2))/(b*d^2)
```

## 3.160. $\int x(a+b\arcsin(c+dx))^{5/2}\,dx$

### 3.160.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7267
```
Int[u_, x_Symbol] :> With[{lst = SubstForFractionalPowerOfLinear[u, x]}, Si
mp[lst[[2]]*lst[[4]]   Subst[Int[lst[[1]], x], x, lst[[3]]^(1/lst[[2]])], x
] /;  !FalseQ[lst] && SubstForFractionalPowerQ[u, lst[[3]], x]]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.160.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 880 vs. $2(330) = 660$.

Time = 1.14 (sec) , antiderivative size = 881, normalized size of antiderivative = 2.17

| method | result | size |
|---|---|---|
| default | Expression too large to display | 881 |

input
```
int(x*(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-1/128/d^2/(a+b*arcsin(d*x+c))^(1/2)*(-240*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)/b)*b^3*c-240*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b)*b^3*c-128*arcsin(d*x+c)^3*sin(-(a+b*arcsin(d*x+c))/
b+a/b)*b^3*c+15*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)
*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^3
-15*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*
2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^3+32*arcsin(d
*x+c)^3*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3-384*arcsin(d*x+c)^2*sin(-(
a+b*arcsin(d*x+c))/b+a/b)*a*b^2*c+320*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x
+c))/b+a/b)*b^3*c+96*arcsin(d*x+c)^2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a
*b^2+40*arcsin(d*x+c)^2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3-384*arcsin
(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b*c+480*arcsin(d*x+c)*sin(-(a+
b*arcsin(d*x+c))/b+a/b)*b^3*c+640*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b
+a/b)*a*b^2*c+96*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b-3
0*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+80*arcsin(d*x+c)*s
in(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2-128*sin(-(a+b*arcsin(d*x+c))/b+a/
b)*a^3*c+480*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^2*c+320*cos(-(a+b*arcsin(
d*x+c))/b+a/b)*a^2*b*c+32*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^3-30*co...
```

### 3.160.5 Fricas [F(-2)]

Exception generated.

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >> Error detected within library code: inte
grate: implementation incomplete (constant residues)
```

### 3.160.6 Sympy [F]

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx=\int x(a+b\operatorname{asin}(c+dx))^{\frac{5}{2}}\,dx$$

input
```
integrate(x*(a+b*asin(d*x+c))**(5/2),x)
```

output
```
Integral(x*(a + b*asin(c + d*x))**(5/2), x)
```

### 3.160.7 Maxima [F]

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx=\int (b\arcsin(dx+c)+a)^{\frac{5}{2}}x\,dx$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(5/2)*x, x)
```

### 3.160.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.47 (sec) , antiderivative size = 2671, normalized size of antiderivative = 6.58

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx=\text{Too large to display}$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
-1/256*(128*sqrt(2)*sqrt(pi)*a^3*b^2*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*
x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(ab
s(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 128*sqrt(2)*s
qrt(pi)*a^3*b^2*c*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b
)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-
I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 384*I*sqrt(2)*sqrt(pi)*a^2*b^2*c*
erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*
sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b))
+ b*sqrt(abs(b))) - 384*I*sqrt(2)*sqrt(pi)*a^2*b^2*c*erf(1/2*I*sqrt(2)*sqr
t(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c)
 + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) -
128*I*sqrt(b*arcsin(d*x + c) + a)*b^2*c*arcsin(d*x + c)^2*e^(I*arcsin(d*x
+ c)) + 128*I*sqrt(b*arcsin(d*x + c) + a)*b^2*c*arcsin(d*x + c)^2*e^(-I*ar
csin(d*x + c)) - 384*I*sqrt(2)*sqrt(pi)*a^2*b*c*erf(-1/2*I*sqrt(2)*sqrt(b*
arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b/sqrt(abs(b)) + sqrt(abs(b))) - 240*I*sqrt
(2)*sqrt(pi)*b^3*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs
(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(
I*b/sqrt(abs(b)) + sqrt(abs(b))) + 384*I*sqrt(2)*sqrt(pi)*a^2*b*c*erf(1/2*
I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b...
```

## 3.160.9 Mupad [F(-1)]

Timed out.

$$\int x(a+b\arcsin(c+dx))^{5/2}\,dx=\int x\,(a+b\,\mathrm{asin}(c+d\,x))^{5/2}\,dx$$

input
```
int(x*(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int(x*(a + b*asin(c + d*x))^(5/2), x)
```

# 3.161 $\int (a+b\arcsin(c+dx))^{5/2}\,dx$



## 3.161.1 Optimal result

Integrand size = 14, antiderivative size = 204

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = -\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d} + \frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d} + \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} - \frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d}$$

output
```
(d*x+c)*(a+b*arcsin(d*x+c))^(5/2)/d+15/8*b^(5/2)*cos(a/b)*FresnelS(2^(1/2)
/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-15/8*b^(5/
2)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2
^(1/2)*Pi^(1/2)/d+5/2*b*(a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d-15
/4*b^2*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.161.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.36 (sec) , antiderivative size = 419, normalized size of antiderivative = 2.05

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \frac{\sqrt{b}e^{-\frac{ia}{b}}\left(i(4a^2+15b^2)\left(-1+e^{\frac{2ia}{b}}\right)\sqrt{2\pi}\sqrt{a+b\arcsin(c+dx)}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right.\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
(Sqrt[b]*(I*(4*a^2 + 15*b^2)*(-1 + E^(((2*I)*a)/b))*Sqrt[2*Pi]*Sqrt[a + b*
ArcSin[c + d*x]]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]
] + (4*a^2 + 15*b^2)*(1 + E^(((2*I)*a)/b))*Sqrt[2*Pi]*Sqrt[a + b*ArcSin[c
+ d*x]]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + 4*Sqr
t[b]*(E^((I*a)/b)*(a + b*ArcSin[c + d*x])*(-15*b*(c + d*x) + 10*a*Sqrt[1 -
 c^2 - 2*c*d*x - d^2*x^2] + 2*(4*a*(c + d*x) + 5*b*Sqrt[1 - c^2 - 2*c*d*x
- d^2*x^2])*ArcSin[c + d*x] + 4*b*(c + d*x)*ArcSin[c + d*x]^2) + 2*a^2*Sqr
t[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c + d*x
]))/b] + 2*a^2*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3
/2, (I*(a + b*ArcSin[c + d*x]))/b])))/(16*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[
c + d*x]])
```

### 3.161.3 Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.94, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5302, 5130, 5182, 5130, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int (a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$\downarrow$ 5130

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\int\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$\downarrow$ 5182

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\int\sqrt{a+b\arcsin(c+dx)}d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+d\ldots\right.}{d}$$

$\downarrow$ 5130

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left((c+dx)\sqrt{a+b\arcsin(c+dx)}-\frac{1}{2}b\int\frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+\ldots\right.\right.}{d}$$

$\downarrow$ 5224

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left((c+dx)\sqrt{a+b\arcsin(c+dx)}-\frac{1}{2}\int-\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\,\mathrm{ar}\ldots\right.\right.}{d}$$

$\downarrow$ 25

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+(c+dx)\sqrt{a+b\,\mathrm{arc}\ldots}\right.\right.}{d}$$

$\downarrow$ 3042

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+(c+dx)\sqrt{a+b\,\mathrm{arc}\ldots}\right.\right.}{d}$$

$\downarrow$ 3787

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int-\ldots\right.\right.\right.}{\ldots}$$

$\downarrow$ 25

3.161. $\int(a+b\arcsin(c+dx))^{5/2}\,dx$

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\right.}{\sqrt{a}}\right.\right.\right.$$

$\downarrow$ 3042

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int\right.\right.\right.$$

$\downarrow$ 3785

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-\cos\left(\frac{a}{b}\right)\right.\right.\right.$$

$\downarrow$ 3786

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\cos\left(\frac{a}{b}\right)\right.\right.\right.$$

$\downarrow$ 3832

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-\sqrt{2\pi}\sqrt{b}\right.\right.\right.$$

$\downarrow$ 3833

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\right.\right.\right.$$

input
```
Int[(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^(5/2) - (5*b*(-(Sqrt[1 - (c + d*x)^2]*(
a + b*ArcSin[c + d*x])^(3/2)) + (3*b*((c + d*x)*Sqrt[a + b*ArcSin[c + d*x]
] + (-(Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]]) + Sqrt[b]*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*
ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2))/2))/2)/d
```

3.161. $\int(a+b\arcsin(c+dx))^{5/2}\,dx$

### 3.161.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.161.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 440 vs. $2(164) = 328$.

Time = 0.79 (sec) , antiderivative size = 441, normalized size of antiderivative = 2.16

| method | result |
|---|---|
| default | $-\frac{15\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sqrt{2}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b^3+15\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sqrt{2}\,\sin\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-1/8/d*(15*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*cos(a/b)*FresnelS(2^
(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3+
15*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi
^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3+8*arcsin
(d*x+c)^3*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3+24*arcsin(d*x+c)^2*sin(-(a+b
*arcsin(d*x+c))/b+a/b)*a*b^2-20*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b
+a/b)*b^3+24*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b-30*arcsin
(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3-40*arcsin(d*x+c)*cos(-(a+b*arc
sin(d*x+c))/b+a/b)*a*b^2+8*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^3-30*sin(-(a+
b*arcsin(d*x+c))/b+a/b)*a*b^2-20*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b)/(a
+b*arcsin(d*x+c))^(1/2)
```

### 3.161.5 Fricas [F(-2)]

Exception generated.

$$\int (a + b\arcsin(c + dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.161.6 Sympy [F]

$$\int (a + b\arcsin(c + dx))^{5/2}\,dx = \int (a + b\,\mathrm{asin}\,(c + dx))^{\frac{5}{2}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**(5/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(5/2), x)
```

### 3.161.7 Maxima [F]

$$\int (a + b\arcsin(c + dx))^{5/2}\,dx = \int (b\arcsin(dx + c) + a)^{\frac{5}{2}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.161.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.27 (sec) , antiderivative size = 1279, normalized size of antiderivative = 6.27

$$\int (a + b \arcsin(c + dx))^{5/2} \, dx = \text{Too large to display}$$

input
```
integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
1/2*sqrt(2)*sqrt(pi)*a^3*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e
^(I*a/b)/((I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi
)*a^3*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^4/s
qrt(abs(b)) + b^3*sqrt(abs(b)))*d) + 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^3*erf(-1
/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2
*sqrt(abs(b)))*d) - 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^3*erf(1/2*I*sqrt(2)*sqrt(
b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d
) - 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b)
)/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 15/16*I*sqrt(2)
*sqrt(pi)*b^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b))
- 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^
2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1
/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b
*sqrt(abs(b)))*d) + 15/16*I*sqrt(2)*sqrt(pi)*b^4*erf(1/2*I*sqrt(2)*sqrt...
```

### 3.161.9 Mupad [F(-1)]

Timed out.

$$\int (a + b \arcsin(c + dx))^{5/2} \, dx = \int (a + b \operatorname{asin}(c + d\,x))^{5/2} \, dx$$

input
```
int((a + b*asin(c + d*x))^(5/2),x)
```

output
```
int((a + b*asin(c + d*x))^(5/2), x)
```

# 3.162 $\int (a+b\arcsin(c+dx))^{7/2}\,dx$



## 3.162.1 Optimal result

Integrand size = 14, antiderivative size = 243

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=-\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d}-\frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d}+\frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d}+\frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d}+\frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8d}$$

output
```
-35/4*b^2*(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d+(d*x+c)*(a+b*arcsin(d*x+c))^
(7/2)/d+105/16*b^(7/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d+105/16*b^(7/2)*FresnelS(2^(1/2)/Pi^(
1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d+7/2*b*
(a+b*arcsin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d-105/8*b^3*(1-(d*x+c)^2)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.162.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 4.85 (sec) , antiderivative size = 545, normalized size of antiderivative = 2.24

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \frac{e^{-\frac{ia}{b}}\left(\sqrt{b}\left(8ia^3\left(-1+e^{\frac{2ia}{b}}\right)+105b^3\left(1+e^{\frac{2ia}{b}}\right)\right)\sqrt{\frac{\pi}{2}}\sqrt{a+b\arcsin(c+dx)}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+\cdots}}{\cdots}\right.\cdots}{\cdots}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
(Sqrt[b]*((8*I)*a^3*(-1 + E^(((2*I)*a)/b)) + 105*b^3*(1 + E^(((2*I)*a)/b))
)*Sqrt[Pi/2]*Sqrt[a + b*ArcSin[c + d*x]]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c + d*x]])/Sqrt[b]] + 2*b*(E^((I*a)/b)*(a + b*ArcSin[c + d*x])*(7*(-
10*a*b*(c + d*x) + 4*a^2*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2] - 15*b^2*Sqrt[1
 - c^2 - 2*c*d*x - d^2*x^2]) + (24*a^2*(c + d*x) - 70*b^2*(c + d*x) + 56*a
*b*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x] + 4*b*(6*a*(c + d*x)
 + 7*b*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x]^2 + 8*b^2*(c + d
*x)*ArcSin[c + d*x]^3) + 4*a^3*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamm
a[3/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + 4*a^3*E^(((2*I)*a)/b)*Sqrt[(I*(
a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b]) + Sq
rt[b]*Sqrt[2*Pi]*Sqrt[a + b*ArcSin[c + d*x]]*FresnelS[(Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c + d*x]])/Sqrt[b]]*(4*a^3*(1 + E^(((2*I)*a)/b)) + 105*b^3*E^((I
*a)/b)*Sin[a/b]))/(16*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.162.3 Rubi [A] (verified)

Time = 1.08 (sec) , antiderivative size = 228, normalized size of antiderivative = 0.94, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 1.000$, Rules used = {5302, 5130, 5182, 5130, 5182, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx$$

$$\Big\downarrow \; 5302$$

$$\frac{\int (a+b\arcsin(c+dx))^{7/2}d(c+dx)}{d}$$

$\downarrow$ 5130

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\int \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$\downarrow$ 5182

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\int (a+b\arcsin(c+dx))^{3/2}d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+\right.}{d}$$

$\downarrow$ 5130

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\int \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+d\right.\right.}{d}$$

$\downarrow$ 5182

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}b\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)\right.\right.\right.}{d}$$

$\downarrow$ 5134

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+\right.\right.\right.}{d}$$

$\downarrow$ 3042

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(\right.\right.\right.}{d}$$

$\downarrow$ 3787

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right.}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.}{}$$

$\downarrow$ 25

3.162. $\int (a+b\arcsin(c+dx))^{7/2}\,dx$

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right.}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.$$

$\downarrow$ 3042

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right.}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.$$

$\downarrow$ 3785

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right.}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.$$

$\downarrow$ 3786

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+d}{b}\right.\right.\right.\right.\right.$$

$\downarrow$ 3832

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c}{b}\right.\right.\right.\right.\right.$$

$\downarrow$ 3833

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\right.\right.\right.\right.\right.$$

input
```
Int[(a + b*ArcSin[c + d*x])^(7/2),x]
```

3.162. $\int(a+b\arcsin(c+dx))^{7/2}\,dx$

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^(7/2) - (7*b*(-(Sqrt[1 - (c + d*x)^2]*(
a + b*ArcSin[c + d*x])^(5/2)) + (5*b*((c + d*x)*(a + b*ArcSin[c + d*x])^(3
/2) - (3*b*(-(Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]]) + (Sqrt[b
]*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sq
rt[b]] + Sqrt[b]*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]]*Sin[a/b])/2))/2))/2))/2)/d
```

### 3.162.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.162.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 615 vs. $2(197) = 394$.

Time = 0.77 (sec) , antiderivative size = 616, normalized size of antiderivative = 2.53

| method | result |
|---|---|
| default | $-\frac{-105\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{-\frac{1}{b}}\,b^4+105\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}}{}$ |

input
```
int((a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
-1/16/d*(-105*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*cos(a/b)*FresnelC(2^(1/2)
/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b
^4+105*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4+16*a
rcsin(d*x+c)^4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4+64*arcsin(d*x+c)^3*sin(
-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3-56*arcsin(d*x+c)^3*cos(-(a+b*arcsin(d*x+
c))/b+a/b)*b^4+96*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-
140*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4-168*arcsin(d*x+c)^
2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3+64*arcsin(d*x+c)*sin(-(a+b*arcsin(
d*x+c))/b+a/b)*a^3*b-280*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b
^3-168*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2+210*arcsin(d*
x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^4+16*sin(-(a+b*arcsin(d*x+c))/b+a/b
)*a^4-140*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-56*cos(-(a+b*arcsin(d*x+
c))/b+a/b)*a^3*b+210*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3)/(a+b*arcsin(d*
x+c))^(1/2)
```

### 3.162.5 Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.162.6 Sympy [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(d*x+c))**(7/2),x)
```

output
```
Timed out
```

### 3.162.7 Maxima [F]

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \int (b\arcsin(dx+c)+a)^{\frac{7}{2}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.162.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.54 (sec) , antiderivative size = 2308, normalized size of antiderivative = 9.50

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \text{Too large to display}$$

input
```
integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
-1/32*(16*sqrt(2)*sqrt(pi)*a^4*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b)
)/b)*e^(I*a/b)/(I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b))) + 16*sqrt(2)*sqrt(p
i)*a^4*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^4/s
qrt(abs(b)) + b^3*sqrt(abs(b))) - 64*sqrt(2)*sqrt(pi)*a^4*b^2*erf(-1/2*I*s
qrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(a
bs(b))) + 32*I*sqrt(2)*sqrt(pi)*a^3*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d
*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(a
bs(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) - 64*sqrt(2)*s
qrt(pi)*a^4*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b))
 - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*
b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) - 32*I*sqrt(2)*sqrt(pi)*a^3*b^3*erf(1
/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^3/sqrt(abs(b)) + b^
2*sqrt(abs(b))) + 16*I*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^3*e
^(I*arcsin(d*x + c)) - 16*I*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c
)^3*e^(-I*arcsin(d*x + c)) + 32*sqrt(2)*sqrt(pi)*a^4*b*erf(-1/2*I*sqrt(2)*
sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*...
```

### 3.162.9 Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \int (a+b\,\mathrm{asin}(c+d\,x))^{7/2}\,dx$$

input
```
int((a + b*asin(c + d*x))^(7/2),x)
```

output
```
int((a + b*asin(c + d*x))^(7/2), x)
```

# 3.163 $\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx$



## 3.163.1 Optimal result

Integrand size = 18, antiderivative size = 440

$$\begin{aligned}\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx =\ & \frac{\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} \\ & + \frac{c^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^3} \\ & - \frac{\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d^3} \\ & - \frac{c\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}d^3} \\ & + \frac{\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2\sqrt{b}d^3} \\ & + \frac{c^2\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d^3} \\ & + \frac{c\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{\sqrt{b}d^3} \\ & - \frac{\sqrt{\frac{\pi}{6}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{2\sqrt{b}d^3}\end{aligned}$$

output
```
-1/12*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/
2))*6^(1/2)*Pi^(1/2)/d^3/b^(1/2)-1/12*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d^3/b^(1/2)+1/4*cos(a
/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*P
i^(1/2)/d^3/b^(1/2)+1/4*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d^3/b^(1/2)-c*cos(2*a/b)*FresnelS(2*(
a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/d^3/b^(1/2)+c*FresnelC
(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d^3/b^(
1/2)+c^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1
/2))*2^(1/2)*Pi^(1/2)/d^3/b^(1/2)+c^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d^3/b^(1/2)
```

### 3.163.2 Mathematica [A] (verified)

Time = 2.34 (sec) , antiderivative size = 319, normalized size of antiderivative = 0.72

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$

$$= \frac{\sqrt{\pi}\left(3\sqrt{2}(1+4c^2)\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{6}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\right.}{}$$

input
```
Integrate[x^2/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(Sqrt[Pi]*(3*Sqrt[2]*(1 + 4*c^2)*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*
ArcSin[c + d*x]])/Sqrt[b]] - Sqrt[6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/Pi]*Sqr
t[a + b*ArcSin[c + d*x]])/Sqrt[b]] - 12*c*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a
+ b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] + 3*Sqrt[2]*FresnelS[(Sqrt[2/Pi]
*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b] + 12*Sqrt[2]*c^2*FresnelS[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b] + 12*c*FresnelC
[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b] - Sqrt[6
]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])
)/(12*Sqrt[b]*d^3)
```

### 3.163.3 Rubi [A] (verified)

Time = 1.07 (sec) , antiderivative size = 433, normalized size of antiderivative = 0.98, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {5304, 27, 5246, 7267, 7292, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{d^2x^2}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d^3}$$

$$\Big\downarrow \text{5246}$$

$$\frac{\int \frac{d^2x^2\sqrt{1-(c+dx)^2}}{\sqrt{a+b\arcsin(c+dx)}}d\arcsin(c+dx)}{d^3}$$

$$\Big\downarrow \text{7267}$$

$$\frac{2\int d^2x^2\sqrt{1-(c+dx)^2}d\sqrt{a+b\arcsin(c+dx)}}{bd^3}$$

$$\Big\downarrow \text{7292}$$

$$\frac{2\int d^2x^2\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd^3}$$

$$\Big\downarrow \text{7293}$$

$$\frac{2\int \left(\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)c^2+\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)c+\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^2\left(\frac{a}{b}-\frac{a+b\arcsin(c-}{b}\right.\right.}{bd^3}$$

$$\Big\downarrow \text{2009}$$

$$2\left(\sqrt{\frac{\pi}{2}}\sqrt{b}c^2\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{\frac{\pi}{2}}\sqrt{b}c^2\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\frac{1}{2}\sqrt{\pi}\sqrt{\right.$$

input
```
Int[x^2/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(2*((Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
+ d*x]])/Sqrt[b]])/4 + Sqrt[b]*c^2*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi
]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] - (Sqrt[b]*Sqrt[Pi/6]*Cos[(3*a)/b]
*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/4 - (Sqrt[b]*
c*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*
Sqrt[Pi])])/2 + (Sqrt[b]*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin
[c + d*x]])/Sqrt[b]]*Sin[a/b])/4 + Sqrt[b]*c^2*Sqrt[Pi/2]*FresnelS[(Sqrt[2
/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b] + (Sqrt[b]*c*Sqrt[Pi]*
FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])
/2 - (Sqrt[b]*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])
/Sqrt[b]]*Sin[(3*a)/b])/4))/(b*d^3)
```

### 3.163.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7267
```
Int[u_, x_Symbol] :> With[{lst = SubstForFractionalPowerOfLinear[u, x]}, Si
mp[lst[[2]]*lst[[4]]   Subst[Int[lst[[1]], x], x, lst[[3]]^(1/lst[[2]])], x
] /;  !FalseQ[lst] && SubstForFractionalPowerQ[u, lst[[3]], x]]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.163.4 Maple [A] (verified)

Time = 1.10 (sec) , antiderivative size = 384, normalized size of antiderivative = 0.87

| method | result |
|---|---|
| default | $\frac{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\left(12\sqrt{2}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c^{2}-12\sqrt{2}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c^{2}+3\sqrt{2}\,\cos\left(\frac{a}{b}\right)\operatorname{Fresn}}{}$ |

input
```
int(x^2/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/12/d^3*Pi^(1/2)*(-1/b)^(1/2)*(12*2^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1
/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c^2-12*2^(1/2)*sin(a/b)*Fres
nelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c^2+3*2^(1
/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b)-3*2^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)/b)+2^(1/2)*(-1/b)^(1/2)*(-3/b)^(1/2)*cos(3*a/b)*FresnelC(
3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b-2^(1/2)*(-1
/b)^(1/2)*(-3/b)^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)/b)*b+12*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/
(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c+12*sin(2*a/b)*FresnelC(2*2^(1/
2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c)
```

### 3.163.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.163.6 Sympy [F]

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{x^2}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx$$

input
```
integrate(x**2/(a+b*asin(d*x+c))**(1/2),x)
```

output
```
Integral(x**2/sqrt(a + b*asin(c + d*x)), x)
```

### 3.163.7 Maxima [F]

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{x^2}{\sqrt{b\arcsin\,(dx+c)+a}}\,dx$$

input
```
integrate(x^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate(x^2/sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.163.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.63 (sec) , antiderivative size = 646, normalized size of antiderivative = 1.47

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$
$$= -\frac{\sqrt{\pi}c^2\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d^3\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}c^2\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d^3\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{i\sqrt{\pi}c\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{2d^3\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)}$$
$$+\frac{i\sqrt{\pi}c\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{2\sqrt{b}d^3\left(\frac{ib}{|b|}+1\right)}$$
$$+\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}-\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}+\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)d^3}$$
$$-\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4d^3\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4d^3\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$+\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}+\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}-\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)d^3}$$

input
```
integrate(x^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
-sqrt(pi)*c^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b))
- 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d^3*(
I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*c^2*erf(1/2*I
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arc
sin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d^3*(-I*sqrt(2)*b/sqrt(abs(b
)) + sqrt(2)*sqrt(abs(b)))) - 1/2*I*sqrt(pi)*c*erf(-sqrt(b*arcsin(d*x + c)
 + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)
/(d^3*(sqrt(b) - I*b^(3/2)/abs(b))) + 1/2*I*sqrt(pi)*c*erf(-sqrt(b*arcsin(
d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2
*I*a/b)/(sqrt(b)*d^3*(I*b/abs(b) + 1)) + 1/4*sqrt(pi)*erf(-1/2*sqrt(6)*sqr
t(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) +
a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b
))*d^3) - 1/4*sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt
(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/
b)/(d^3*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - 1/4*sqrt(pi)*
erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*s
qrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d^3*(-I*sqrt(2)*b/s
qrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/4*sqrt(pi)*erf(-1/2*sqrt(6)*sqrt(
b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)
*sqrt(b)/abs(b))*e^(-3*I*a/b)/((sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs...
```

### 3.163.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{x^2}{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

input
```
int(x^2/(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int(x^2/(a + b*asin(c + d*x))^(1/2), x)
```

# 3.164 $\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx$



## 3.164.1 Optimal result

Integrand size = 16, antiderivative size = 211

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d^2} + \frac{\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d^2} - \frac{c\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d^2} - \frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{2\sqrt{b}d^2}$$

output
```
1/2*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(
1/2)/d^2/b^(1/2)-1/2*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2)
)*sin(2*a/b)*Pi^(1/2)/d^2/b^(1/2)-c*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d^2/b^(1/2)-c*FresnelS(2^
(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2
)/d^2/b^(1/2)
```

### 3.164.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.47 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.03

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\frac{ice^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)-e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{\sqrt{a+b\arcsin(c+dx)}}+\frac{\sqrt{\pi}\left(\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\ldots}}{}\right.\right.}{}}{2d^2}$$

input
```
Integrate[x/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
((I*c*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcS
in[c + d*x]))/b] - E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gam
ma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(E^((I*a)/b)*Sqrt[a + b*ArcSin[c
+ d*x]]) + (Sqrt[Pi]*(Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]]
)/(Sqrt[b]*Sqrt[Pi])] - FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*
Sqrt[Pi])]*Sin[(2*a)/b]))/Sqrt[b])/(2*d^2)
```

### 3.164.3 Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 209, normalized size of antiderivative = 0.99, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5304, 25, 27, 5246, 7267, 7292, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{x}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$-\frac{\int -\frac{dx}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d^2}$$

$$\Big\downarrow \text{5246}$$

$$-\frac{\int -\frac{dx\sqrt{1-(c+dx)^2}}{\sqrt{a+b\arcsin(c+dx)}}d\arcsin(c+dx)}{d^2}$$

$$\Big\downarrow \text{7267}$$

$$-\frac{2\int -dx\sqrt{1-(c+dx)^2}d\sqrt{a+b\arcsin(c+dx)}}{bd^2}$$

$$\Big\downarrow \text{7292}$$

$$-\frac{2\int -dx\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd^2}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{2\int \left(c\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)+\frac{1}{2}\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)\right)d\sqrt{a+b\arcsin(c+dx)}}{bd^2}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{2\left(\frac{1}{4}\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\sqrt{\frac{\pi}{2}}\sqrt{b}c\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{\frac{\pi}{2}}\sqrt{b}c\,\text{s}}{bd^2}$$

input
```
Int[x/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(-2*(Sqrt[b]*c*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]] - (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a +
b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/4 + Sqrt[b]*c*Sqrt[Pi/2]*FresnelS
[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b] + (Sqrt[b]*Sqr
t[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*
a)/b])/4))/(b*d^2)
```

## 3.164. $\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

### 3.164.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7267
```
Int[u_, x_Symbol] :> With[{lst = SubstForFractionalPowerOfLinear[u, x]}, Si
mp[lst[[2]]*lst[[4]]   Subst[Int[lst[[1]], x], x, lst[[3]]^(1/lst[[2]])], x
] /;  !FalseQ[lst] && SubstForFractionalPowerQ[u, lst[[3]], x]]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.164.4 Maple [A] (verified)

Time = 1.00 (sec) , antiderivative size = 179, normalized size of antiderivative = 0.85

| method | result |
|---|---|
| default | $-\frac{\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\left(2\sqrt{2}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c-2\sqrt{2}\,\sin\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c+\cos\left(\frac{2a}{b}\right)\mathrm{FresnelS}\left(\right.}{2d^2}$ |

input
```
int(x/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/2/d^2*(-1/b)^(1/2)*Pi^(1/2)*(2*2^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c-2*2^(1/2)*sin(a/b)*FresnelS
(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*c+cos(2*a/b)*F
resnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+sin(2
*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
))
```

### 3.164.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.164.6 Sympy [F]

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{x}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx$$

input
```
integrate(x/(a+b*asin(d*x+c))**(1/2),x)
```

output
```
Integral(x/sqrt(a + b*asin(c + d*x)), x)
```

### 3.164.7 Maxima [F]

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{x}{\sqrt{b\arcsin{(dx+c)}+a}}\,dx$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate(x/sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.164.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.49 (sec) , antiderivative size = 306, normalized size of antiderivative = 1.45

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\frac{\sqrt{\pi}c\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d^2\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}+\frac{\sqrt{\pi}c\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d^2\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}+\frac{i\sqrt{\pi}\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{4d^2\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)}-\frac{i\sqrt{\pi}\operatorname{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{4\sqrt{b}d^2\left(\frac{ib}{|b|}+1\right)}$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
sqrt(pi)*c*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1
/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d^2*(I*s
qrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + sqrt(pi)*c*erf(1/2*I*sqrt
(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d
*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d^2*(-I*sqrt(2)*b/sqrt(abs(b)) +
sqrt(2)*sqrt(abs(b)))) + 1/4*I*sqrt(pi)*erf(-sqrt(b*arcsin(d*x + c) + a)/s
qrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(d^2*(
sqrt(b) - I*b^(3/2)/abs(b))) - 1/4*I*sqrt(pi)*erf(-sqrt(b*arcsin(d*x + c)
+ a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(
sqrt(b)*d^2*(I*b/abs(b) + 1))
```

### 3.164.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{x}{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

input
```
int(x/(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int(x/(a + b*asin(c + d*x))^(1/2), x)
```

# 3.165 $\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx$



## 3.165.1 Optimal result

Integrand size = 14, antiderivative size = 105

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d}+\frac{\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d}$$

output
```
cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1
/2)*Pi^(1/2)/d/b^(1/2)+FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)
```

## 3.165.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.13 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.25

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\frac{ie^{-\frac{ia}{b}}\left(-\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d\sqrt{a+b\arcsin(c+dx)}}$$

input
```
Integrate[1/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
((I/2)*(-(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*A
rcSin[c + d*x]))/b]) + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]
*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(d*E^((I*a)/b)*Sqrt[a + b*Arc
Sin[c + d*x]])
```

### 3.165.3 Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.01, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.714$, Rules used = {5302, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5134}$$

$$\frac{\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3787}$$

$$\frac{\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{25}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3785}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd}$$

$$\Big\downarrow \text{3786}$$

$$\frac{2\sin\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd}$$

$$\Big\downarrow \text{3832}$$

$$\frac{2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{bd}$$

$$\Big\downarrow \text{3833}$$

$$\frac{\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{bd}$$

input
```
Int[1/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*
x]])/Sqrt[b]] + Sqrt[b]*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]]*Sin[a/b])/(b*d)
```

## 3.165. $\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

### 3.165.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.165. $\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

### 3.165.4 Maple [A] (verified)

Time = 0.53 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.90

| method | result | size |
|---|---|---|
| default | $\frac{\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\left(\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)-\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\right)}{d}$ | 94 |

input
```
int(1/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(
1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b
)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))/d
```

### 3.165.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.165.6 Sympy [F]

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**(1/2),x)
```

output
```
Integral(1/sqrt(a + b*asin(c + d*x)), x)
```

### 3.165.7 Maxima [F]

$$\int \frac{1}{\sqrt{a + b\arcsin(c + dx)}}\,dx = \int \frac{1}{\sqrt{b\arcsin{(dx + c)} + a}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate(1/sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.165.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.38 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.59

$$\int \frac{1}{\sqrt{a + b\arcsin(c + dx)}}\,dx = -\frac{\sqrt{\pi}\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}} - \frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2\,b}\right)e^{\left(\frac{i\,a}{b}\right)}}{d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}} + \sqrt{2}\sqrt{|b|}\right)} - \frac{\sqrt{\pi}\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}} - \frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2\,b}\right)e^{\left(-\frac{i\,a}{b}\right)}}{d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}} + \sqrt{2}\sqrt{|b|}\right)}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
-sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt
(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*erf(1/2*I*sqrt(2)*s
qrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)
*sqrt(abs(b))))
```

### 3.165.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{1}{\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int(1/(a + b*asin(c + d*x))^(1/2), x)
```

# 3.166 $\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx$



## 3.166.1 Optimal result

Integrand size = 16, antiderivative size = 287

$$\begin{aligned}\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx &= \frac{2c\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} \\ &- \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{bd^2\sqrt{a+b\arcsin(c+dx)}} + \frac{2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d^2} \\ &+ \frac{2c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d^2} \\ &- \frac{2c\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d^2} \\ &+ \frac{2\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d^2}\end{aligned}$$

output
```
2*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/
2)/b^(3/2)/d^2+2*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*si
n(2*a/b)*Pi^(1/2)/b^(3/2)/d^2+2*c*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*
arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/d^2-2*c*FresnelC(2^
(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2
)/b^(3/2)/d^2+2*c*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(1/2)-2*(d
*x+c)*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.166.2 Mathematica [A] (verified)

Time = 4.14 (sec) , antiderivative size = 251, normalized size of antiderivative = 0.87

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{\frac{2\sqrt{b}c\sqrt{1-(c+dx)^2}}{\sqrt{a+b\arcsin(c+dx)}} + 2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right) + 2c\sqrt{2\pi}\cos\left(\right.}{}$$

input
```
Integrate[x/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
((2*Sqrt[b]*c*Sqrt[1 - (c + d*x)^2])/Sqrt[a + b*ArcSin[c + d*x]] + 2*Sqrt[
Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi
])] + 2*c*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d
*x]])/Sqrt[b]] - 2*c*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c +
 d*x]])/Sqrt[b]]*Sin[a/b] + 2*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d
*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b] - (Sqrt[b]*Sin[2*ArcSin[c + d*x]])/
Sqrt[a + b*ArcSin[c + d*x]])/(b^(3/2)*d^2)
```

### 3.166.3 Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 274, normalized size of antiderivative = 0.95, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {5304, 25, 27, 5244, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{\int -\frac{x}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{\int -\frac{dx}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d^2}$$

$$\Big\downarrow \; 5244$$

$$-\frac{\int \left(\frac{c}{(a+b\arcsin(c+dx))^{3/2}}-\frac{c+dx}{(a+b\arcsin(c+dx))^{3/2}}\right)d(c+dx)}{d^2}$$

$$\Big\downarrow \; 2009$$

$$-\frac{\frac{2\sqrt{2\pi}c\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}}-\frac{2\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}}-\frac{2\sqrt{\pi}\sin\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right.}{b^{3/2}}}{d^2}$$

input
```
Int[x/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
-(((-2*c*Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) + (2*(c +
d*x)*Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) - (2*Sqrt[Pi]*
Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])
/b^(3/2) - (2*c*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin
[c + d*x]])/Sqrt[b]])/b^(3/2) + (2*c*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[
a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/b^(3/2) - (2*Sqrt[Pi]*FresnelS[
(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/b^(3/2))
/d^2)
```

### 3.166.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.166.4 Maple [A] (verified)

Time = 1.01 (sec) , antiderivative size = 321, normalized size of antiderivative = 1.12

| method | result |
|---|---|
| default | $\frac{-2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\,\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)c-2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\,\mathrm{FresnelC}}{}$ |

input
```
int(x/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/d^2/b/(a+b*arcsin(d*x+c))^(1/2)*(-2*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b)*c-2*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)/b)*c+2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)
*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-2*(
-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/
2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+2*cos(-(a+b*arcsin(d
*x+c))/b+a/b)*c+sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b))
```

## 3.166.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.166.6 Sympy [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{x}{(a+b\operatorname{asin}{(c+dx)})^{\frac{3}{2}}}\,dx$$

input
```
integrate(x/(a+b*asin(d*x+c))**(3/2),x)
```

output
```
Integral(x/(a + b*asin(c + d*x))**(3/2), x)
```

### 3.166.7 Maxima [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{x}{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate(x/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.166.8 Giac [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{x}{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
integrate(x/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.166.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{x}{(a+b\,\mathrm{asin}\,(c+d\,x))^{3/2}}\,dx$$

input
```
int(x/(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int(x/(a + b*asin(c + d*x))^(3/2), x)
```

# 3.167 $\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$



## 3.167.1 Optimal result

Integrand size = 14, antiderivative size = 144

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{2\sqrt{2\pi}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d}$$

output
```
-2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2
^(1/2)*Pi^(1/2)/b^(3/2)/d+2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^
(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d-2*(1-(d*x+c)^2)^(1/2)/b
/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.167.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.23 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.28

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{e^{-\frac{i(a+b\arcsin(c+dx))}{b}}\left(e^{i\arcsin(c+dx)}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\,\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right) \cdots\right.}{bd\sqrt{a \cdots}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-3/2),x]
```

output
```
(E^(I*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, (
(-I)*(a + b*ArcSin[c + d*x]))/b] + E^((I*a)/b)*(-1 - E^((2*I)*ArcSin[c + d
*x]) + E^((I*(a + b*ArcSin[c + d*x]))/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/
b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(b*d*E^((I*(a + b*ArcSin[c
+ d*x]))/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.167.3 Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.857$, Rules used = {5302, 5132, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$$

$$\Big\downarrow \ 5302$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \ 5132$$

$$\frac{-\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$$\Big\downarrow \ 5224$$

$$\frac{-\frac{2\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 25

$$\frac{\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3042

$$\frac{\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3787

$$\frac{-\frac{2\left(-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 25

$$\frac{-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3042

$$\frac{-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3785

$$\frac{-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-2\sin\left(\frac{a}{b}\right)\int \cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3786

---

3.167. $\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

$$-\frac{\frac{2\left(2\cos\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$$\Big\downarrow \text{3832}$$

$$-\frac{\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$$\Big\downarrow \text{3833}$$

$$-\frac{\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-3/2),x]
```

output
```
((-2*Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) - (2*(Sqrt[b]*
Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt
[b]] - Sqrt[b]*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]]
)/Sqrt[b]]*Sin[a/b]))/b^2)/d
```

### 3.167.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.167. $\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

### 3.167.4 Maple [A] (verified)

Time = 0.72 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.18

| method | result |
|---|---|
| default | $-\frac{2\left(-\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b}}{\sqrt{\pi}}\right.\right.}{db\sqrt{a+b\arcsin(dx+c)}}$ |

input
```
int(1/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-2/d/b/(a+b*arcsin(d*x+c))^(1/2)*(-(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*Fres
nelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/
2)*Pi^(1/2)*2^(1/2)-(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi
^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(
1/2)+cos(-(a+b*arcsin(d*x+c))/b+a/b))
```

### 3.167.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.167.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**(3/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(-3/2), x)
```

### 3.167.7 Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-3/2), x)
```

### 3.167.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-3/2), x)
```

### 3.167.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{{(a+b\,\mathrm{asin}\left(c+d\,x\right))}^{3/2}}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int(1/(a + b*asin(c + d*x))^(3/2), x)
```

# 3.168 $\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx$



## 3.168.1 Optimal result

Integrand size = 16, antiderivative size = 384

$$\begin{aligned}\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx &= \frac{2c\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} \\ &- \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{3bd^2(a+b\arcsin(c+dx))^{3/2}} - \frac{4}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} \\ &- \frac{4c(c+dx)}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{8(c+dx)^2}{3b^2d^2\sqrt{a+b\arcsin(c+dx)}} \\ &+ \frac{4c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d^2} \\ &- \frac{8\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d^2} \\ &+ \frac{4c\sqrt{2\pi}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d^2} \\ &+ \frac{8\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{3b^{5/2}d^2}\end{aligned}$$

output
```
-8/3*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^
(1/2)/b^(5/2)/d^2+8/3*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2
))*sin(2*a/b)*Pi^(1/2)/b^(5/2)/d^2+4/3*c*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(5/2)/d^2+4/3*c*Fr
esnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2
)*Pi^(1/2)/b^(5/2)/d^2+2/3*c*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))
^(3/2)-2/3*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(3/2)-4/3
/b^2/d^2/(a+b*arcsin(d*x+c))^(1/2)-4/3*c*(d*x+c)/b^2/d^2/(a+b*arcsin(d*x+c
))^(1/2)+8/3*(d*x+c)^2/b^2/d^2/(a+b*arcsin(d*x+c))^(1/2)
```

## 3.168.2 Mathematica [A] (verified)

Time = 6.29 (sec) , antiderivative size = 388, normalized size of antiderivative = 1.01

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx =$$

$$-\frac{4a\sqrt{b}c^2+4a\sqrt{b}cdx-2b^{3/2}c\sqrt{1-(c+dx)^2}+4b^{3/2}c^2\arcsin(c+dx)+4b^{3/2}cdx\arcsin(c+dx)+4a\sqrt{b}\,\mathrm{co}}{}$$

input
```
Integrate[x/(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
-1/3*(4*a*Sqrt[b]*c^2 + 4*a*Sqrt[b]*c*d*x - 2*b^(3/2)*c*Sqrt[1 - (c + d*x)
^2] + 4*b^(3/2)*c^2*ArcSin[c + d*x] + 4*b^(3/2)*c*d*x*ArcSin[c + d*x] + 4*
a*Sqrt[b]*Cos[2*ArcSin[c + d*x]] + 4*b^(3/2)*ArcSin[c + d*x]*Cos[2*ArcSin[
c + d*x]] - 4*c*Sqrt[2*Pi]*(a + b*ArcSin[c + d*x])^(3/2)*Cos[a/b]*FresnelC
[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + 8*Sqrt[Pi]*(a + b*Arc
Sin[c + d*x])^(3/2)*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/
(Sqrt[b]*Sqrt[Pi])] - 4*c*Sqrt[2*Pi]*(a + b*ArcSin[c + d*x])^(3/2)*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b] - 8*Sqrt[Pi]*
(a + b*ArcSin[c + d*x])^(3/2)*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sq
rt[b]*Sqrt[Pi])]*Sin[(2*a)/b] + b^(3/2)*Sin[2*ArcSin[c + d*x]])/(b^(5/2)*d
^2*(a + b*ArcSin[c + d*x])^(3/2))
```

### 3.168.3 Rubi [A] (verified)

Time = 0.98 (sec) , antiderivative size = 362, normalized size of antiderivative = 0.94, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {5304, 25, 27, 5244, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{x}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$-\frac{\int -\frac{dx}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d^2}$$

$$\Big\downarrow \text{5244}$$

$$-\frac{\int \left(\frac{c}{(a+b\arcsin(c+dx))^{5/2}}-\frac{c+dx}{(a+b\arcsin(c+dx))^{5/2}}\right)d(c+dx)}{d^2}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{-\frac{8\sqrt{\pi}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}}-\frac{4\sqrt{2\pi}c\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}}-\frac{4\sqrt{2\pi}c\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsi}}{\sqrt{b}}\right.}{3b^{5/2}}}{}$$

input

```
Int[x/(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
-(((-2*c*Sqrt[1 - (c + d*x)^2])/(3*b*(a + b*ArcSin[c + d*x])^(3/2)) + (2*(
c + d*x)*Sqrt[1 - (c + d*x)^2])/(3*b*(a + b*ArcSin[c + d*x])^(3/2)) + 4/(3
*b^2*Sqrt[a + b*ArcSin[c + d*x]]) + (4*c*(c + d*x))/(3*b^2*Sqrt[a + b*ArcS
in[c + d*x]]) - (8*(c + d*x)^2)/(3*b^2*Sqrt[a + b*ArcSin[c + d*x]]) - (4*c
*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqr
t[b]])/(3*b^(5/2)) + (8*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSi
n[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/(3*b^(5/2)) - (4*c*Sqrt[2*Pi]*FresnelS[(
Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(3*b^(5/2)) - (
8*Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Si
n[(2*a)/b])/(3*b^(5/2)))/d^2)
```

### 3.168.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.168.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 724 vs. 2(312) = 624.

Time = 1.16 (sec) , antiderivative size = 725, normalized size of antiderivative = 1.89

| method | result |
|---|---|
| default | $\frac{4\arcsin(dx+c)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}\ \mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\cos\left(\frac{a}{b}\right)bc-4\arcsin(dx+c)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,\sqrt{a+b\arc}}{}$ |

input
```
int(x/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/3/d^2/b^2*(4*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x
+c))^(1/2)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)/b)*cos(a/b)*b*c-4*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b)*b*c+4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)
*cos(a/b)*a*c-4*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*si
n(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)
*a*c+8*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2
*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
)*b+8*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*
a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)
*b+8*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelS(2
*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a+8*(-1/b)^(1/
2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/
2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a+4*arcsin(d*x+c)*sin(-(a+b*a
rcsin(d*x+c))/b+a/b)*b*c-4*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/
b)*b+2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b*c+4*sin(-(a+b*arcsin(d*x+c))/b+a/
b)*a*c+sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b-4*cos(-2*(a+b*arcsin(d*x+c))/
b+2*a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

### 3.168.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.168.6 Sympy [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{x}{(a+b\operatorname{asin}(c+dx))^{\frac{5}{2}}}\,dx$$

input
```
integrate(x/(a+b*asin(d*x+c))**(5/2),x)
```

output
```
Integral(x/(a + b*asin(c + d*x))**(5/2), x)
```

### 3.168.7 Maxima [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{x}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate(x/(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.168.8 Giac [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{x}{(b\arcsin{(dx+c)}+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
integrate(x/(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.168.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{x}{(a+b\,\mathrm{asin}\,(c+d\,x))^{5/2}}\,dx$$

input
```
int(x/(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int(x/(a + b*asin(c + d*x))^(5/2), x)
```

# 3.169 $\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$



## 3.169.1 Optimal result

Integrand size = 14, antiderivative size = 179

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{4\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} - \frac{4\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d}$$

output
```
-4/3*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))
*2^(1/2)*Pi^(1/2)/b^(5/2)/d-4/3*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(5/2)/d-2/3*(1-(d*x+c)^2)^(
1/2)/b/d/(a+b*arcsin(d*x+c))^(3/2)+4/3*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(
1/2)
```

## 3.169.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.64 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.33

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{e^{-\frac{i(a+b\arcsin(c+dx))}{b}}\left(-2be^{i\arcsin(c+dx)}\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{3/2}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c}{b}\right.\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-5/2),x]
```

output
```
(-2*b*E^(I*ArcSin[c + d*x])*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma
[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - I*E^((I*a)/b)*(2*a*(-1 + E^((2*I
)*ArcSin[c + d*x])) + b*(-I - 2*ArcSin[c + d*x] + E^((2*I)*ArcSin[c + d*x]
)*(-I + 2*ArcSin[c + d*x])) - (2*I)*b*E^((I*(a + b*ArcSin[c + d*x]))/b)*((
I*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))
/b]))/(3*b^2*d*E^((I*(a + b*ArcSin[c + d*x]))/b)*(a + b*ArcSin[c + d*x])^(
3/2))
```

## 3.169.3 Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.99, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857, Rules used = {5302, 5132, 5222, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$$

$$\Big\downarrow \ 5302$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \ 5132$$

$$\frac{-\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$$\Big\downarrow \ 5222$$

$$\frac{-\frac{2\left(\frac{2\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$\Big\downarrow$ 5134

$$\frac{-\frac{2\left(\frac{2\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$\Big\downarrow$ 3042

$$\frac{-\frac{2\left(\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$\Big\downarrow$ 3787

$$\frac{-\frac{2\left(\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2}{3b(a+}}{d}$$

$\Big\downarrow$ 25

$$\frac{-\frac{2\left(\frac{2\left(\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{}}{3b(a+b}}{d}$$

$\Big\downarrow$ 3042

$$\frac{-\frac{2\left(\frac{2\left(\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b(a-}}{d}$$

$\Big\downarrow$ 3785

---

3.169. $\displaystyle\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$-\frac{\frac{2\left(\frac{2\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{}}{3b(a+b}}{d}$$

$\downarrow$ 3786

$$-\frac{\frac{2\left(\frac{2\left(2\sin\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2}{3b(a+b}}{d}$$

$\downarrow$ 3832

$$-\frac{\frac{2\left(\frac{2\left(2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1}}{3b(a+b\text{ar}}}{d}$$

$\downarrow$ 3833

$$-\frac{\frac{2\left(\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c}}{3b(a+b\arcsin}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-5/2),x]
```

output
```
((-2*Sqrt[1 - (c + d*x)^2])/(3*b*(a + b*ArcSin[c + d*x])^(3/2)) - (2*((-2*
(c + d*x))/(b*Sqrt[a + b*ArcSin[c + d*x]]) + (2*(Sqrt[b]*Sqrt[2*Pi]*Cos[a/
b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + Sqrt[b]*Sq
rt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/
b]))/b^2))/(3*b))/d
```

## 3.169. $\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

### 3.169.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

## 3.169. $\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.169.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 369 vs. 2(145) = 290.

Time = 0.74 (sec) , antiderivative size = 370, normalized size of antiderivative = 2.07

| method | result |
|---|---|
| default | $-\frac{2\left(2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+c)}\,\sqrt{2}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b-2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+}}{}$ |

input
```
int(1/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-2/3/d/b^2*(2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*cos
(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*
(-1/b)^(1/2)*b-2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*
sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*(-1/b)^(1/2)*b+2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*cos(a/b)*Fr
esnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(
1/2)*a-2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1
/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*a+2*ar
csin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+cos(-(a+b*arcsin(d*x+c))/b+a
/b)*b+2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

### 3.169.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.169.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+dx))^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**(5/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(-5/2), x)
```

### 3.169.7 Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\arcsin\,(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-5/2), x)
```

### 3.169.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx=\int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-5/2), x)
```

### 3.169.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}\,(c+d\,x))^{5/2}}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int(1/(a + b*asin(c + d*x))^(5/2), x)
```

# 3.170 $\int \frac{x}{(a+b \arcsin(c+dx))^{7/2}} \, dx$



## 3.170.1 Optimal result

Integrand size = 16, antiderivative size = 468

$$\begin{aligned}
\int \frac{x}{(a+b \arcsin(c+dx))^{7/2}} \, dx &= \frac{2c\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} \\
&- \frac{2(c+dx)\sqrt{1-(c+dx)^2}}{5bd^2(a+b\arcsin(c+dx))^{5/2}} - \frac{4}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} \\
&- \frac{4c(c+dx)}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} + \frac{8(c+dx)^2}{15b^2d^2(a+b\arcsin(c+dx))^{3/2}} \\
&- \frac{8c\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} + \frac{32(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d^2\sqrt{a+b\arcsin(c+dx)}} \\
&- \frac{32\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d^2} \\
&- \frac{8c\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d^2} \\
&+ \frac{8c\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d^2} \\
&- \frac{32\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d^2}
\end{aligned}$$

output
```
-4/15/b^2/d^2/(a+b*arcsin(d*x+c))^(3/2)-4/15*c*(d*x+c)/b^2/d^2/(a+b*arcsin
(d*x+c))^(3/2)+8/15*(d*x+c)^2/b^2/d^2/(a+b*arcsin(d*x+c))^(3/2)-32/15*cos(
2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b^(
7/2)/d^2-32/15*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(
2*a/b)*Pi^(1/2)/b^(7/2)/d^2-8/15*c*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b
*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(7/2)/d^2+8/15*c*Fresnel
C(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^
(1/2)/b^(7/2)/d^2+2/5*c*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(5/2
)-2/5*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d^2/(a+b*arcsin(d*x+c))^(5/2)-8/15*c*(
1-(d*x+c)^2)^(1/2)/b^3/d^2/(a+b*arcsin(d*x+c))^(1/2)+32/15*(d*x+c)*(1-(d*x
+c)^2)^(1/2)/b^3/d^2/(a+b*arcsin(d*x+c))^(1/2)
```

## 3.170.2 Mathematica [A] (verified)

Time = 5.38 (sec) , antiderivative size = 521, normalized size of antiderivative = 1.11

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx =$$

$$-\frac{4ab^{3/2}c(c+dx)+8a^2\sqrt{b}c\sqrt{1-(c+dx)^2}-6b^{5/2}c\sqrt{1-(c+dx)^2}+4b^{5/2}c(c+dx)\arcsin(c+dx)+16ab}{}$$

input
```
Integrate[x/(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
-1/15*(4*a*b^(3/2)*c*(c + d*x) + 8*a^2*Sqrt[b]*c*Sqrt[1 - (c + d*x)^2] - 6
*b^(5/2)*c*Sqrt[1 - (c + d*x)^2] + 4*b^(5/2)*c*(c + d*x)*ArcSin[c + d*x] +
 16*a*b^(3/2)*c*Sqrt[1 - (c + d*x)^2]*ArcSin[c + d*x] + 8*b^(5/2)*c*Sqrt[1
 - (c + d*x)^2]*ArcSin[c + d*x]^2 + 4*a*b^(3/2)*Cos[2*ArcSin[c + d*x]] + 4
*b^(5/2)*ArcSin[c + d*x]*Cos[2*ArcSin[c + d*x]] + 32*Sqrt[Pi]*(a + b*ArcSi
n[c + d*x])^(5/2)*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(S
qrt[b]*Sqrt[Pi])] + 8*c*Sqrt[2*Pi]*(a + b*ArcSin[c + d*x])^(5/2)*Cos[a/b]*
FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] - 8*c*Sqrt[2*Pi
]*(a + b*ArcSin[c + d*x])^(5/2)*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c +
 d*x]])/Sqrt[b]]*Sin[a/b] + 32*Sqrt[Pi]*(a + b*ArcSin[c + d*x])^(5/2)*Fres
nelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b] - 16
*a^2*Sqrt[b]*Sin[2*ArcSin[c + d*x]] + 3*b^(5/2)*Sin[2*ArcSin[c + d*x]] - 3
2*a*b^(3/2)*ArcSin[c + d*x]*Sin[2*ArcSin[c + d*x]] - 16*b^(5/2)*ArcSin[c +
 d*x]^2*Sin[2*ArcSin[c + d*x]])/(b^(7/2)*d^2*(a + b*ArcSin[c + d*x])^(5/2)
)
```

### 3.170.3 Rubi [A] (verified)

Time = 1.10 (sec) , antiderivative size = 440, normalized size of antiderivative = 0.94, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {5304, 25, 27, 5244, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{x}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$-\frac{\int -\frac{dx}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d^2}$$

$$\Big\downarrow \text{5244}$$

$$-\frac{\int \left(\frac{c}{(a+b\arcsin(c+dx))^{7/2}}-\frac{c+dx}{(a+b\arcsin(c+dx))^{7/2}}\right)d(c+dx)}{d^2}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{-\frac{8\sqrt{2\pi}c\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}}+\frac{32\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}}+\frac{32\sqrt{\pi}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(}}{\sqrt{b}\sqrt{\pi}}\right.}{15b^{7/2}}}{}$$

input
```
Int[x/(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
-(((-2*c*Sqrt[1 - (c + d*x)^2])/(5*b*(a + b*ArcSin[c + d*x])^(5/2)) + (2*(
c + d*x)*Sqrt[1 - (c + d*x)^2])/(5*b*(a + b*ArcSin[c + d*x])^(5/2)) + 4/(1
5*b^2*(a + b*ArcSin[c + d*x])^(3/2)) + (4*c*(c + d*x))/(15*b^2*(a + b*ArcS
in[c + d*x])^(3/2)) - (8*(c + d*x)^2)/(15*b^2*(a + b*ArcSin[c + d*x])^(3/2
)) + (8*c*Sqrt[1 - (c + d*x)^2])/(15*b^3*Sqrt[a + b*ArcSin[c + d*x]]) - (3
2*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(15*b^3*Sqrt[a + b*ArcSin[c + d*x]]) +
(32*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b
]*Sqrt[Pi])])/(15*b^(7/2)) + (8*c*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]
*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/(15*b^(7/2)) - (8*c*Sqrt[2*Pi]*Fre
snelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/(15*b^(7
/2)) + (32*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt
[Pi])]*Sin[(2*a)/b])/(15*b^(7/2)))/d^2)
```

### 3.170.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5244
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_))^(m_.), x_Sy
mbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*ArcSin[c*x])^n, x], x] /; F
reeQ[{a, b, c, d, e}, x] && IGtQ[m, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.170.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1237 vs. 2(384) = 768.

Time = 1.18 (sec) , antiderivative size = 1238, normalized size of antiderivative = 2.65

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1238 |

input
```
int(x/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
-1/15/d^2/b^3/(a+b*arcsin(d*x+c))^(5/2)*(-8*arcsin(d*x+c)^2*(-1/b)^(1/2)*P
i^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2*c-8*arcsin(d*x+c)^2*(-1/b
)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/
2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2*c-16*arcsin(d*x+
c)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*Fresne
lS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b*c-16*arc
sin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b
)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b*
c+32*arcsin(d*x+c)^2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2
*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
)*b^2-32*arcsin(d*x+c)^2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*s
in(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)/b)*b^2-8*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(a/
b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a^2
*c-8*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*Fres
nelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a^2*c+64*a
rcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fr
esnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b-64
*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/...
```

### 3.170.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >> Error detected within library code: inte
grate: implementation incomplete (constant residues)
```

### 3.170.6 Sympy [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{x}{(a+b\operatorname{asin}(c+dx))^{\frac{7}{2}}}\,dx$$

input
```
integrate(x/(a+b*asin(d*x+c))**(7/2),x)
```

output
```
Integral(x/(a + b*asin(c + d*x))**(7/2), x)
```

### 3.170.7 Maxima [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{x}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate(x/(b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.170.8 Giac [F]

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{x}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate(x/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
integrate(x/(b*arcsin(d*x + c) + a)^(7/2), x)
```

## 3.170.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{x}{(a+b\,\mathrm{asin}\,(c+d\,x))^{7/2}}\,dx$$

input
```
int(x/(a + b*asin(c + d*x))^(7/2),x)
```

output
```
int(x/(a + b*asin(c + d*x))^(7/2), x)
```

# 3.171 $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$



## 3.171.1 Optimal result

Integrand size = 14, antiderivative size = 218

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} + \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{8\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} - \frac{8\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d}$$

output
```
4/15*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+8/15*cos(a/b)*FresnelS(2^(1/2
)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(7/2)/d-8
/15*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*
2^(1/2)*Pi^(1/2)/b^(7/2)/d-2/5*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
^(5/2)+8/15*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.171.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.38 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.32

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{-6b^2e^{i\arcsin(c+dx)}+4e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))\left(e^{\frac{i(a+b\arcsin(c+dx))}{b}}(2a+b(-\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-7/2),x]
```

output
```
(-6*b^2*E^(I*ArcSin[c + d*x]) + (4*(a + b*ArcSin[c + d*x])*(E^((I*(a + b*A
rcSin[c + d*x]))/b)*(2*a + b*(-I + 2*ArcSin[c + d*x])) - (2*I)*b*(((-I)*(a
 + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/
b]))/E^((I*a)/b) + (8*a^2 + 4*a*b*(I + 4*ArcSin[c + d*x]) + 2*b^2*(-3 + (2
*I)*ArcSin[c + d*x] + 4*ArcSin[c + d*x]^2) - 8*E^((I*(a + b*ArcSin[c + d*x
]))/b)*(a + b*ArcSin[c + d*x])^2*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma
[1/2, (I*(a + b*ArcSin[c + d*x]))/b])/E^(I*ArcSin[c + d*x]))/(30*b^3*d*(a
+ b*ArcSin[c + d*x])^(5/2))
```

### 3.171.3 Rubi [A] (verified)

Time = 1.04 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.02, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5302, 5132, 5222, 5132, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5132}$$

$$\frac{-\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \text{5222}$$

$$\frac{-\frac{2\left(\frac{2\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \text{5132}$$

$$\frac{-\frac{2\left(\frac{2\left(-\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \text{5224}$$

$$\frac{-\frac{2\left(\frac{2\left(-\frac{2\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \text{25}$$

$$\frac{-\frac{2\left(\frac{2\left(\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \text{3042}$$

3.171. $\displaystyle\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$\frac{-\frac{2\left(\frac{2\left(\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$\downarrow$ 3787

$$\frac{-\frac{2\left(\frac{2\left(-\frac{2\left(-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\cdots}{3b(\cdots}\right)}{5b}\cdots}{d}$$

$\downarrow$ 25

$$\frac{-\frac{2\left(\frac{2\left(-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\cdots}{3b(a+b\cdots}\right)}{5b}\cdots}{d}$$

$\downarrow$ 3042

3.171. $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$-\frac{2\left(\frac{2\left(-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\cdots}{3b(\cdots}\cdots\right)}{5b}\cdots}{d}$$

$\big\downarrow$ 3785

$$-\frac{2\left(\frac{2\left(-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-2\sin\left(\frac{a}{b}\right)\int \cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\cdots}{3b(a+\cdots}\cdots\right)}{5b}\cdots}{d}$$

$\big\downarrow$ 3786

$$-\frac{2\left(\frac{2\left(-\frac{2\left(2\cos\left(\frac{a}{b}\right)\int \sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\sin\left(\frac{a}{b}\right)\int \cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\cdots}{3b(a+\cdots}\cdots\right)}{5b}\cdots}{d}$$

$\big\downarrow$ 3832

$$-\frac{2\left(\frac{2\left(-\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-2\sin\left(\frac{a}{b}\right)\int \cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\cdots}{3b(a+b\,\text{a}\cdots}\cdots\right)}{5b}\cdots}{d}$$

$\big\downarrow$ 3833

---

3.171. $\displaystyle\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$-\frac{2\left(\frac{2\left(-\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+}{3b(a+b\arcsi}}{5b}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-7/2),x]
```

output
```
((-2*Sqrt[1 - (c + d*x)^2])/(5*b*(a + b*ArcSin[c + d*x])^(5/2)) - (2*((-2*
(c + d*x))/(3*b*(a + b*ArcSin[c + d*x])^(3/2)) + (2*((-2*Sqrt[1 - (c + d*x
)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) - (2*(Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*Fr
esnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] - Sqrt[b]*Sqrt[2*
Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b]))/
b^2))/(3*b)))/(5*b))/d
```

### 3.171.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

---

## 3.171. $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

### 3.171.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 623 vs. $2(178) = 356$.

Time = 0.78 (sec) , antiderivative size = 624, normalized size of antiderivative = 2.86

| method | result |
|---|---|
| default | $-\frac{\frac{8 \arcsin(dx+c)^2 \sqrt{a+b\arcsin(dx+c)}\, \cos\left(\frac{a}{b}\right) \operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b^2}{15} - \frac{8 \arcsin(dx+c)^2 \sqrt{a+b\arcsin(dx+c)}\, \sin\left(\frac{a}{b}\right) \mathrm{Fres}}{1}}{}$ |

input
```
int(1/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
2/15/d/b^3*(-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS
(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/
2)*(-1/b)^(1/2)*b^2-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*F
resnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)
*Pi^(1/2)*(-1/b)^(1/2)*b^2-8*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*cos(a
/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^
(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a*b-8*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*
sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a*b-4*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*
FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2
)*Pi^(1/2)*(-1/b)^(1/2)*a^2-4*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(
2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2
)*(-1/b)^(1/2)*a^2+4*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+8
*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b-2*arcsin(d*x+c)*sin(-(a
+b*arcsin(d*x+c))/b+a/b)*b^2+4*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2-3*cos(-
(a+b*arcsin(d*x+c))/b+a/b)*b^2-2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b)/(a+b
*arcsin(d*x+c))^(5/2)
```

### 3.171.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >> Error detected within library code: inte
grate: implementation incomplete (constant residues)
```

### 3.171.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**(7/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(-7/2), x)
```

### 3.171.7 Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-7/2), x)
```

### 3.171.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-7/2), x)
```

### 3.171.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{7/2}}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^(7/2),x)
```

output
```
int(1/(a + b*asin(c + d*x))^(7/2), x)
```

# 3.172 $\int x^m(a+b\arcsin(c+dx))^n\,dx$



## 3.172.1 Optimal result

Integrand size = 16, antiderivative size = 16

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\text{Int}(x^m(a+b\arcsin(c+dx))^n,x)$$

output
```
Unintegrable(x^m*(a+b*arcsin(d*x+c))^n,x)
```

## 3.172.2 Mathematica [N/A]

Not integrable

Time = 0.61 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int x^m(a+b\arcsin(c+dx))^n\,dx=\int x^m(a+b\arcsin(c+dx))^n\,dx$$

input
```
Integrate[x^m*(a + b*ArcSin[c + d*x])^n,x]
```

output
```
Integrate[x^m*(a + b*ArcSin[c + d*x])^n, x]
```

### 3.172.3 Rubi [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^m(a+b\arcsin(c+dx))^n\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \left(\frac{c+dx}{d}-\frac{c}{d}\right)^m (a+b\arcsin(c+dx))^n d(c+dx)}{d}$$

$$\Big\downarrow \text{5300}$$

$$\frac{\int \left(\frac{c+dx}{d}-\frac{c}{d}\right)^m (a+b\arcsin(c+dx))^n d(c+dx)}{d}$$

input
```
Int[x^m*(a + b*ArcSin[c + d*x])^n,x]
```

output
```
$Aborted
```

#### 3.172.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.172.4 Maple [N/A] (verified)

Not integrable

Time = 2.49 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int x^m (a + b \arcsin(dx + c))^n \, dx$$

input
```
int(x^m*(a+b*arcsin(d*x+c))^n,x)
```

output
```
int(x^m*(a+b*arcsin(d*x+c))^n,x)
```

### 3.172.5 Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int x^m (a + b \arcsin(c + dx))^n \, dx = \int (b \arcsin(dx + c) + a)^n x^m \, dx$$

input
```
integrate(x^m*(a+b*arcsin(d*x+c))^n,x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x + c) + a)^n*x^m, x)
```

### 3.172.6 Sympy [N/A]

Not integrable

Time = 18.79 (sec) , antiderivative size = 15, normalized size of antiderivative = 0.94

$$\int x^m (a + b \arcsin(c + dx))^n \, dx = \int x^m (a + b \operatorname{asin}(c + dx))^n \, dx$$

input
```
integrate(x**m*(a+b*asin(d*x+c))**n,x)
```

output
```
Integral(x**m*(a + b*asin(c + d*x))**n, x)
```

### 3.172.7 Maxima [N/A]

Not integrable

Time = 1.13 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int x^m (a + b \arcsin(c + dx))^n \, dx = \int (b \arcsin(dx + c) + a)^n x^m \, dx$$

input
```
integrate(x^m*(a+b*arcsin(d*x+c))^n,x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^n*x^m, x)
```

### 3.172.8 Giac [F(-1)]

Timed out.

$$\int x^m (a + b \arcsin(c + dx))^n \, dx = \text{Timed out}$$

input
```
integrate(x^m*(a+b*arcsin(d*x+c))^n,x, algorithm="giac")
```

output
```
Timed out
```

### 3.172.9 Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int x^m (a + b \arcsin(c + dx))^n \, dx = \int x^m (a + b \operatorname{asin}(c + d x))^n \, dx$$

input
```
int(x^m*(a + b*asin(c + d*x))^n,x)
```

output
```
int(x^m*(a + b*asin(c + d*x))^n, x)
```

# 3.173 $\int x^2(a+b\arcsin(c+dx))^n\,dx$



## 3.173.1 Optimal result

Integrand size = 16, antiderivative size = 611

$$\begin{aligned}
&\int x^2(a+b\arcsin(c+dx))^n\,dx\\
&=-\frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}\\
&\quad-\frac{ic^2e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}\\
&\quad+\frac{ie^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}\\
&\quad+\frac{ic^2e^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^3}\\
&\quad+\frac{2^{-2-n}ce^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^3}\\
&\quad+\frac{2^{-2-n}ce^{\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^3}\\
&\quad+\frac{i3^{-1-n}e^{-\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{3i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}\\
&\quad-\frac{i3^{-1-n}e^{\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{3i(a+b\arcsin(c+dx))}{b}\right)}{8d^3}
\end{aligned}$$

output
```
-1/8*I*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-I*(a+b*arcsin(d*x+c))/b)/d^3/exp(I
*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)-1/2*I*c^2*(a+b*arcsin(d*x+c))^n*GAMMA
(1+n,-I*(a+b*arcsin(d*x+c))/b)/d^3/exp(I*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^
n)+1/8*I*exp(I*a/b)*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,I*(a+b*arcsin(d*x+c))/
b)/d^3/((I*(a+b*arcsin(d*x+c))/b)^n)+1/2*I*c^2*exp(I*a/b)*(a+b*arcsin(d*x+
c))^n*GAMMA(1+n,I*(a+b*arcsin(d*x+c))/b)/d^3/((I*(a+b*arcsin(d*x+c))/b)^n)
+2^(-2-n)*c*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-2*I*(a+b*arcsin(d*x+c))/b)/d^
3/exp(2*I*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)+2^(-2-n)*c*exp(2*I*a/b)*(a+b
*arcsin(d*x+c))^n*GAMMA(1+n,2*I*(a+b*arcsin(d*x+c))/b)/d^3/((I*(a+b*arcsin
(d*x+c))/b)^n)+1/8*I*3^(-1-n)*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-3*I*(a+b*ar
csin(d*x+c))/b)/d^3/exp(3*I*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)-1/8*I*3^(-
1-n)*exp(3*I*a/b)*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,3*I*(a+b*arcsin(d*x+c))/
b)/d^3/((I*(a+b*arcsin(d*x+c))/b)^n)
```

### 3.173.2 Mathematica [A] (verified)

Time = 0.59 (sec) , antiderivative size = 419, normalized size of antiderivative = 0.69

$$\int x^2(a+b\arcsin(c+dx))^n\,dx$$

$$= \frac{2^{-3-n}3^{-1-n}e^{-\frac{3ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{(a+b\arcsin(c+dx))^2}{b^2}\right)^{-n}\left(-i2^n3^{1+n}(1+4c^2)\,e^{\frac{2ia}{b}}\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^n\right.}{}$$

input
```
Integrate[x^2*(a + b*ArcSin[c + d*x])^n,x]
```

output
```
(2^(-3 - n)*3^(-1 - n)*(a + b*ArcSin[c + d*x])^n*((-I)*2^n*3^(1 + n)*(1 +
4*c^2)*E^(((2*I)*a)/b)*((I*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((-I
)*(a + b*ArcSin[c + d*x]))/b] + I*2^n*3^(1 + n)*(1 + 4*c^2)*E^(((4*I)*a)/b
)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, (I*(a + b*ArcSin[c + d
*x]))/b] + 2*3^(1 + n)*c*E^((I*a)/b)*((I*(a + b*ArcSin[c + d*x]))/b)^n*Gam
ma[1 + n, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] + 2*3^(1 + n)*c*E^(((5*I)*a)
/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin
[c + d*x]))/b] + I*2^n*((I*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((-3
*I)*(a + b*ArcSin[c + d*x]))/b] - I*2^n*E^(((6*I)*a)/b)*(((-I)*(a + b*ArcS
in[c + d*x]))/b)^n*Gamma[1 + n, ((3*I)*(a + b*ArcSin[c + d*x]))/b]))/(d^3*
E^(((3*I)*a)/b)*((a + b*ArcSin[c + d*x])^2/b^2)^n)
```

### 3.173.3 Rubi [A] (verified)

Time = 1.00 (sec) , antiderivative size = 591, normalized size of antiderivative = 0.97, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$, Rules used = {5304, 27, 5246, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2(a+b\arcsin(c+dx))^n\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int x^2(a+b\arcsin(c+dx))^n d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int d^2x^2(a+b\arcsin(c+dx))^n d(c+dx)}{d^3}$$

$$\Big\downarrow \text{5246}$$

$$\frac{\int d^2x^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^n d\arcsin(c+dx)}{d^3}$$

$$\Big\downarrow \text{7293}$$

$$\frac{\int \left(c^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^n+(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^n-2c(c+dx)\sqrt{1-\right.}{d^3}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{1}{2}ic^2e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{i(a+b\arcsin(c+dx))}{b}\right)+\frac{1}{2}ic^2e^{\frac{ia}{b}}(a+b\arcsin(c+$$

input
```
Int[x^2*(a + b*ArcSin[c + d*x])^n,x]
```

output
```
(((-1/8*I)*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[c +
d*x]))/b])/(E^((I*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) - ((I/2)*c^2
*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[c + d*x]))/b])
/(E^((I*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) + ((I/8)*E^((I*a)/b)*(
a + b*ArcSin[c + d*x])^n*Gamma[1 + n, (I*(a + b*ArcSin[c + d*x]))/b])/((I*
(a + b*ArcSin[c + d*x]))/b)^n + ((I/2)*c^2*E^((I*a)/b)*(a + b*ArcSin[c + d
*x])^n*Gamma[1 + n, (I*(a + b*ArcSin[c + d*x]))/b])/((I*(a + b*ArcSin[c +
d*x]))/b)^n + (2^(-2 - n)*c*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-2*I)
*(a + b*ArcSin[c + d*x]))/b])/(E^(((2*I)*a)/b)*(((-I)*(a + b*ArcSin[c + d*
x]))/b)^n) + (2^(-2 - n)*c*E^(((2*I)*a)/b)*(a + b*ArcSin[c + d*x])^n*Gamma
[1 + n, ((2*I)*(a + b*ArcSin[c + d*x]))/b])/((I*(a + b*ArcSin[c + d*x]))/b
)^n + ((I/8)*3^(-1 - n)*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-3*I)*(a
+ b*ArcSin[c + d*x]))/b])/(E^(((3*I)*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))
/b)^n) - ((I/8)*3^(-1 - n)*E^(((3*I)*a)/b)*(a + b*ArcSin[c + d*x])^n*Gamma
[1 + n, ((3*I)*(a + b*ArcSin[c + d*x]))/b])/((I*(a + b*ArcSin[c + d*x]))/b
)^n)/d^3
```

### 3.173.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.173.4 Maple [F]

$$\int x^2 (a + b \arcsin(dx + c))^n \, dx$$

input
```
int(x^2*(a+b*arcsin(d*x+c))^n,x)
```

output
```
int(x^2*(a+b*arcsin(d*x+c))^n,x)
```

### 3.173.5 Fricas [F]

$$\int x^2 (a + b \arcsin(c + dx))^n \, dx = \int (b \arcsin(dx + c) + a)^n x^2 \, dx$$

input
```
integrate(x^2*(a+b*arcsin(d*x+c))^n,x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x + c) + a)^n*x^2, x)
```

### 3.173.6 Sympy [F]

$$\int x^2 (a + b \arcsin(c + dx))^n \, dx = \int x^2 (a + b \operatorname{asin}(c + dx))^n \, dx$$

input
```
integrate(x**2*(a+b*asin(d*x+c))**n,x)
```

output
```
Integral(x**2*(a + b*asin(c + d*x))**n, x)
```

### 3.173.7 Maxima [F]

$$\int x^2(a+b\arcsin(c+dx))^n\,dx=\int(b\arcsin(dx+c)+a)^n x^2\,dx$$

input
```
integrate(x^2*(a+b*arcsin(d*x+c))^n,x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^n*x^2, x)
```

### 3.173.8 Giac [F]

$$\int x^2(a+b\arcsin(c+dx))^n\,dx=\int(b\arcsin(dx+c)+a)^n x^2\,dx$$

input
```
integrate(x^2*(a+b*arcsin(d*x+c))^n,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^n*x^2, x)
```

### 3.173.9 Mupad [F(-1)]

Timed out.

$$\int x^2(a+b\arcsin(c+dx))^n\,dx=\int x^2\,(a+b\,\mathrm{asin}(c+d\,x))^n\,dx$$

input
```
int(x^2*(a + b*asin(c + d*x))^n,x)
```

output
```
int(x^2*(a + b*asin(c + d*x))^n, x)
```

# 3.174 $\int x(a+b\arcsin(c+dx))^n\,dx$



## 3.174.1 Optimal result

Integrand size = 14, antiderivative size = 301

$$\begin{aligned}\int x(a+b\arcsin(c+dx))^n\,dx &= \frac{ice^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2}\\
&\quad-\frac{ice^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d^2}\\
&\quad-\frac{2^{-3-n}e^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^2}\\
&\quad-\frac{2^{-3-n}e^{\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{2i(a+b\arcsin(c+dx))}{b}\right)}{d^2}\end{aligned}$$

output
```
1/2*I*c*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-I*(a+b*arcsin(d*x+c))/b)/d^2/exp(
I*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)-1/2*I*c*exp(I*a/b)*(a+b*arcsin(d*x+c
))^n*GAMMA(1+n,I*(a+b*arcsin(d*x+c))/b)/d^2/((I*(a+b*arcsin(d*x+c))/b)^n)-
2^(-3-n)*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-2*I*(a+b*arcsin(d*x+c))/b)/d^2/e
xp(2*I*a/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)-2^(-3-n)*exp(2*I*a/b)*(a+b*arcs
in(d*x+c))^n*GAMMA(1+n,2*I*(a+b*arcsin(d*x+c))/b)/d^2/((I*(a+b*arcsin(d*x+
c))/b)^n)
```

### 3.174.2 Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 269, normalized size of antiderivative = 0.89

$$\int x(a+b\arcsin(c+dx))^n\,dx =$$

$$-\frac{i2^{-3-n}e^{-\frac{2ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{(a+b\arcsin(c+dx))^2}{b^2}\right)^{-n}\left(-2^{2+n}ce^{\frac{ia}{b}}\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^n\Gamma\left(1+n,-\frac{i(a+\cdots}{}\right.\right.}{}$$

input
```
Integrate[x*(a + b*ArcSin[c + d*x])^n,x]
```

output
```
((-I)*2^(-3 - n)*(a + b*ArcSin[c + d*x])^n*(-(2^(2 + n)*c*E^((I*a)/b)*((I*
(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[c + d*x]))/
b]) + 2^(2 + n)*c*E^(((3*I)*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n*Gam
ma[1 + n, (I*(a + b*ArcSin[c + d*x]))/b] - I*(((I*(a + b*ArcSin[c + d*x]))
/b)^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] + E^(((4*I)*a)/b)*(
((-I)*(a + b*ArcSin[c + d*x]))/b)^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c +
d*x]))/b])))/(d^2*E^(((2*I)*a)/b)*((a + b*ArcSin[c + d*x])^2/b^2)^n)
```

### 3.174.3 Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 292, normalized size of antiderivative = 0.97, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {5304, 25, 27, 5246, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x(a+b\arcsin(c+dx))^n\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int x(a+b\arcsin(c+dx))^n d(c+dx)}{d}$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{\int -x(a+b\arcsin(c+dx))^n d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{\int -dx(a+b\arcsin(c+dx))^n d(c+dx)}{d^2}$$

$\Big\downarrow$ 5246

$$-\frac{\int -dx\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^n d\arcsin(c+dx)}{d^2}$$

$\Big\downarrow$ 7293

$$-\frac{\int \left(c\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^n-(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^n\right)d\arcsin(c+dx)}{d^2}$$

$\Big\downarrow$ 2009

$$-\frac{-\frac{1}{2}ice^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,-\frac{i(a+b\arcsin(c+dx))}{b}\right)+2^{-n-3}e^{-\frac{2ia}{b}}(a+b\arcsi}{}$$

input
```
Int[x*(a + b*ArcSin[c + d*x])^n,x]
```

output
```
-((((-1/2*I)*c*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[
c + d*x]))/b])/(E^((I*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) + ((I/2)
*c*E^((I*a)/b)*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, (I*(a + b*ArcSin[c +
 d*x]))/b])/((I*(a + b*ArcSin[c + d*x]))/b)^n + (2^(-3 - n)*(a + b*ArcSin[
c + d*x])^n*Gamma[1 + n, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/(E^(((2*I)*a
)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) + (2^(-3 - n)*E^(((2*I)*a)/b)*(
a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((2*I)*(a + b*ArcSin[c + d*x]))/b])/
((I*(a + b*ArcSin[c + d*x]))/b)^n)/d^2)
```

### 3.174.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5246
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_.) + (e_.)*(x_))^(m_.), x_S
ymbol] :> Simp[1/c^(m + 1)   Subst[Int[(a + b*x)^n*Cos[x]*(c*d + e*Sin[x])^
m, x], x, ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

## 3.174.4 Maple [F]

$$\int x(a+b\arcsin(dx+c))^n\,dx$$

input
```
int(x*(a+b*arcsin(d*x+c))^n,x)
```

output
```
int(x*(a+b*arcsin(d*x+c))^n,x)
```

## 3.174.5 Fricas [F]

$$\int x(a+b\arcsin(c+dx))^n\,dx=\int(b\arcsin(dx+c)+a)^n x\,dx$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^n,x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x + c) + a)^n*x, x)
```

### 3.174.6 Sympy [F]

$$\int x(a+b\arcsin(c+dx))^n\,dx = \int x(a+b\operatorname{asin}(c+dx))^n\,dx$$

input
```
integrate(x*(a+b*asin(d*x+c))**n,x)
```

output
```
Integral(x*(a + b*asin(c + d*x))**n, x)
```

### 3.174.7 Maxima [F]

$$\int x(a+b\arcsin(c+dx))^n\,dx = \int (b\arcsin(dx+c)+a)^n x\,dx$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^n,x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^n*x, x)
```

### 3.174.8 Giac [F]

$$\int x(a+b\arcsin(c+dx))^n\,dx = \int (b\arcsin(dx+c)+a)^n x\,dx$$

input
```
integrate(x*(a+b*arcsin(d*x+c))^n,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^n*x, x)
```

### 3.174.9 Mupad [F(-1)]

Timed out.

$$\int x(a+b\arcsin(c+dx))^n\,dx=\int x\,(a+b\,\mathrm{asin}(c+d\,x))^n\,dx$$

input
```
int(x*(a + b*asin(c + d*x))^n,x)
```

output
```
int(x*(a + b*asin(c + d*x))^n, x)
```

# 3.175 $\int (a+b\arcsin(c+dx))^n\,dx$



## 3.175.1 Optimal result

Integrand size = 12, antiderivative size = 147

$$\int (a+b\arcsin(c+dx))^n\,dx = -\frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d} + \frac{ie^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,\frac{i(a+b\arcsin(c+dx))}{b}\right)}{2d}$$

output
```
-1/2*I*(a+b*arcsin(d*x+c))^n*GAMMA(1+n,-I*(a+b*arcsin(d*x+c))/b)/d/exp(I*a
/b)/((-I*(a+b*arcsin(d*x+c))/b)^n)+1/2*I*exp(I*a/b)*(a+b*arcsin(d*x+c))^n*
GAMMA(1+n,I*(a+b*arcsin(d*x+c))/b)/d/((I*(a+b*arcsin(d*x+c))/b)^n)
```

## 3.175.2 Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.88

$$\int (a+b\arcsin(c+dx))^n\,dx = -\frac{ie^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(1+n,-\frac{i(a+b\arcsin(c+dx))}{b}\right)-e^{\frac{2ia}{b}}\left(\frac{i(a+b\arcsin(c+dx))}{b}\right.\right.}{2d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^n,x]
```

output
```
((-1/2*I)*(a + b*ArcSin[c + d*x])^n*(Gamma[1 + n, ((-I)*(a + b*ArcSin[c +
d*x]))/b]/(((-I)*(a + b*ArcSin[c + d*x]))/b)^n - (E^(((2*I)*a)/b)*Gamma[1
+ n, (I*(a + b*ArcSin[c + d*x]))/b])/((I*(a + b*ArcSin[c + d*x]))/b)^n))/(
d*E^((I*a)/b))
```

### 3.175.3 Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.02, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5302, 5134, 3042, 3788, 26, 2612}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^n\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int (a+b\arcsin(c+dx))^n d(c+dx)}{d}$$

$$\Big\downarrow \text{5134}$$

$$\frac{\int (a+b\arcsin(c+dx))^n\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int (a+b\arcsin(c+dx))^n\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3788}$$

$$\frac{\frac{1}{2}i\int -ie^{-\frac{i(a-c-dx)}{b}}(a+b\arcsin(c+dx))^n d(a+b\arcsin(c+dx))-\frac{1}{2}i\int ie^{\frac{i(a-c-dx)}{b}}(a+b\arcsin(c+dx))^n d(a+b\,\mathrm{a}}{bd}$$

$$\Big\downarrow \text{26}$$

$$\frac{\frac{1}{2}\int e^{-\frac{i(a-c-dx)}{b}}(a+b\arcsin(c+dx))^n d(a+b\arcsin(c+dx))+\frac{1}{2}\int e^{\frac{i(a-c-dx)}{b}}(a+b\arcsin(c+dx))^n d(a+b\arcsin(}{bd}$$

$$\Big\downarrow \text{2612}$$

$$\frac{\frac{1}{2}ibe^{\frac{ia}{b}}(a+b\arcsin(c+dx))^n\left(\frac{i(a+b\arcsin(c+dx))}{b}\right)^{-n}\Gamma\left(n+1,\frac{i(a+b\arcsin(c+dx))}{b}\right)-\frac{1}{2}ibe^{-\frac{ia}{b}}(a+b\arcsin(c+dx))^n}{bd}$$

input
```
Int[(a + b*ArcSin[c + d*x])^n,x]
```

output
```
(((-1/2*I)*b*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, ((-I)*(a + b*ArcSin[c
+ d*x]))/b])/(E^((I*a)/b)*(((-I)*(a + b*ArcSin[c + d*x]))/b)^n) + ((I/2)*b
*E^((I*a)/b)*(a + b*ArcSin[c + d*x])^n*Gamma[1 + n, (I*(a + b*ArcSin[c + d
*x]))/b])/((I*(a + b*ArcSin[c + d*x]))/b)^n)/(b*d)
```

### 3.175.3.1 Defintions of rubi rules used

rule 26
```
Int[(Complex[0, a_])*(Fx_), x_Symbol] :> Simp[(Complex[Identity[0], a])   I
nt[Fx, x], x] /; FreeQ[a, x] && EqQ[a^2, 1]
```

rule 2612
```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> Simp[(-F^(g*(e - c*(f/d))))*((c + d*x)^FracPart[m]/(d*((-f)*g*(Log[F]/d)
)^(IntPart[m] + 1)*((-f)*g*Log[F]*((c + d*x)/d))^FracPart[m]))*Gamma[m + 1,
 ((-f)*g*(Log[F]/d))*(c + d*x)], x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&
!IntegerQ[m]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3788
```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I/2   Int[(c + d*x)^m/(E^(I*k*Pi)*E^(I*(e + f*x))), x], x] - Simp
[I/2   Int[(c + d*x)^m*E^(I*k*Pi)*E^(I*(e + f*x)), x], x] /; FreeQ[{c, d, e
, f, m}, x] && IntegerQ[2*k]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.175.4 Maple [F]

$$\int (a + b \arcsin (dx + c))^n \, dx$$

input
```
int((a+b*arcsin(d*x+c))^n,x)
```

output
```
int((a+b*arcsin(d*x+c))^n,x)
```

### 3.175.5 Fricas [F]

$$\int (a + b \arcsin(c + dx))^n \, dx = \int (b \arcsin (dx + c) + a)^n \, dx$$

input
```
integrate((a+b*arcsin(d*x+c))^n,x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x + c) + a)^n, x)
```

### 3.175.6 Sympy [F]

$$\int (a + b \arcsin(c + dx))^n \, dx = \int (a + b \operatorname{asin} (c + dx))^n \, dx$$

input
```
integrate((a+b*asin(d*x+c))**n,x)
```

output
```
Integral((a + b*asin(c + d*x))**n, x)
```

### 3.175.7 Maxima [F]

$$\int (a+b\arcsin(c+dx))^n\,dx=\int (b\arcsin(dx+c)+a)^n\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^n,x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^n, x)
```

### 3.175.8 Giac [F]

$$\int (a+b\arcsin(c+dx))^n\,dx=\int (b\arcsin(dx+c)+a)^n\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^n,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^n, x)
```

### 3.175.9 Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^n\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^n\,dx$$

input
```
int((a + b*asin(c + d*x))^n,x)
```

output
```
int((a + b*asin(c + d*x))^n, x)
```

# 3.176 $\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx$



## 3.176.1 Optimal result

Integrand size = 16, antiderivative size = 16

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \operatorname{Int}\left(\frac{(a+b\arcsin(c+dx))^n}{x},x\right)$$

output
```
Unintegrable((a+b*arcsin(d*x+c))^n/x,x)
```

## 3.176.2 Mathematica [N/A]

Not integrable

Time = 0.34 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^n/x,x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^n/x, x]
```

### 3.176.3 Rubi [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 25, 27, 5300}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^n}{x}d(c+dx)}{d}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int -\frac{(a+b\arcsin(c+dx))^n}{x}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$-\int -\frac{(a+b\arcsin(c+dx))^n}{dx}d(c+dx)$$

$$\Big\downarrow \text{5300}$$

$$-\int -\frac{(a+b\arcsin(c+dx))^n}{dx}d(c+dx)$$

input
```
Int[(a + b*ArcSin[c + d*x])^n/x,x]
```

output
```
$Aborted
```

### 3.176.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.176.4 Maple [N/A] (verified)

Not integrable

Time = 0.46 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(dx+c))^n}{x}dx$$

input
```
int((a+b*arcsin(d*x+c))^n/x,x)
```

output
```
int((a+b*arcsin(d*x+c))^n/x,x)
```

## 3.176.5 Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \int \frac{(b\arcsin(dx+c)+a)^n}{x}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^n/x,x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x + c) + a)^n/x, x)
```

### 3.176.6 Sympy [N/A]

Not integrable

Time = 0.62 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \int \frac{(a+b\operatorname{asin}(c+dx))^n}{x}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**n/x,x)
```

output
```
Integral((a + b*asin(c + d*x))**n/x, x)
```

### 3.176.7 Maxima [N/A]

Not integrable

Time = 0.95 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \int \frac{(b\arcsin(dx+c)+a)^n}{x}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^n/x,x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^n/x, x)
```

### 3.176.8 Giac [N/A]

Not integrable

Time = 0.50 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx = \int \frac{(b\arcsin(dx+c)+a)^n}{x}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^n/x,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^n/x, x)
```

### 3.176.9 Mupad [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 18, normalized size of antiderivative = 1.12

$$\int \frac{(a+b\arcsin(c+dx))^n}{x}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^n}{x}\,dx$$

input
```
int((a + b*asin(c + d*x))^n/x,x)
```

output
```
int((a + b*asin(c + d*x))^n/x, x)
```

# 3.177 $\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx$



## 3.177.1 Optimal result

Integrand size = 21, antiderivative size = 106

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx=\frac{be^4\sqrt{1-(c+dx)^2}}{5d}-\frac{2be^4\left(1-(c+dx)^2\right)^{3/2}}{15d}+\frac{be^4\left(1-(c+dx)^2\right)^{5/2}}{25d}+\frac{e^4(c+dx)^5(a+b\arcsin(c+dx))}{5d}$$

output
```
-2/15*b*e^4*(1-(d*x+c)^2)^(3/2)/d+1/25*b*e^4*(1-(d*x+c)^2)^(5/2)/d+1/5*e^4
*(d*x+c)^5*(a+b*arcsin(d*x+c))/d+1/5*b*e^4*(1-(d*x+c)^2)^(1/2)/d
```

## 3.177.2 Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.73

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx=\frac{e^4\left(-\frac{1}{75}b\sqrt{1-(c+dx)^2}\left(-15+10(1-(c+dx)^2)-3\left(-1+(c+dx)^2\right)^2\right)+\frac{1}{5}(c+dx)^5(a+b\arcsin(c+\right.}{d}$$

input
```
Integrate[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^4*(-1/75*(b*Sqrt[1 - (c + d*x)^2]*(-15 + 10*(1 - (c + d*x)^2) - 3*(-1 +
 (c + d*x)^2)^2)) + ((c + d*x)^5*(a + b*ArcSin[c + d*x]))/5))/d
```

### 3.177.3 Rubi [A] (warning: unable to verify)

Time = 0.28 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.79, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {5304, 27, 5138, 243, 53, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e^4(c+dx)^4(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^4\int (c+dx)^4(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))-\frac{1}{5}b\int \frac{(c+dx)^5}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{243}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))-\frac{1}{10}b\int \frac{(c+dx)^4}{\sqrt{-c-dx+1}}d(c+dx)^2\right)}{d}$$

$$\Big\downarrow \text{53}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))-\frac{1}{10}b\int \left((-c-dx+1)^{3/2}-2\sqrt{-c-dx+1}+\frac{1}{\sqrt{-c-dx+1}}\right)d(c+dx)^2\right)}{d}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))-\frac{1}{10}b\left(-\frac{2}{5}(-c-dx+1)^{5/2}+\frac{4}{3}(-c-dx+1)^{3/2}-2\sqrt{-c-dx+1}\right)\right)}{d}$$

input
```
Int[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^4*(-1/10*(b*(-2*Sqrt[1 - c - d*x] + (4*(1 - c - d*x)^(3/2))/3 - (2*(1 -
 c - d*x)^(5/2))/5)) + ((c + d*x)^5*(a + b*ArcSin[c + d*x]))/5))/d
```

### 3.177.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 53
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0])
|| LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

rule 243
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/2   Subst[In
t[x^((m - 1)/2)*(a + b*x)^p, x], x, x^2], x] /; FreeQ[{a, b, m, p}, x] && I
ntegerQ[(m - 1)/2]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.177.4 Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.93

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\frac{e^4a(dx+c)^5}{5}+e^4b\left(\frac{(dx+c)^5\arcsin(dx+c)}{5}+\frac{(dx+c)^4\sqrt{1-(dx+c)^2}}{25}+\frac{4(dx+c)^2\sqrt{1-(dx+c)^2}}{75}+\frac{8\sqrt{1-(dx+c)^2}}{75}\right)}{d}$ | 99 |
| default | $\frac{\frac{e^4a(dx+c)^5}{5}+e^4b\left(\frac{(dx+c)^5\arcsin(dx+c)}{5}+\frac{(dx+c)^4\sqrt{1-(dx+c)^2}}{25}+\frac{4(dx+c)^2\sqrt{1-(dx+c)^2}}{75}+\frac{8\sqrt{1-(dx+c)^2}}{75}\right)}{d}$ | 99 |
| parts | $\frac{e^4a(dx+c)^5}{5d}+\frac{e^4b\left(\frac{(dx+c)^5\arcsin(dx+c)}{5}+\frac{(dx+c)^4\sqrt{1-(dx+c)^2}}{25}+\frac{4(dx+c)^2\sqrt{1-(dx+c)^2}}{75}+\frac{8\sqrt{1-(dx+c)^2}}{75}\right)}{d}$ | 101 |

input
```
int((d*e*x+c*e)^4*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/5*e^4*a*(d*x+c)^5+e^4*b*(1/5*(d*x+c)^5*arcsin(d*x+c)+1/25*(d*x+c)^4
*(1-(d*x+c)^2)^(1/2)+4/75*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+8/75*(1-(d*x+c)^2)
^(1/2)))
```

### 3.177.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 262 vs. 2(92) = 184.

Time = 0.29 (sec) , antiderivative size = 262, normalized size of antiderivative = 2.47

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx$$
$$= \frac{15\,ad^5e^4x^5+75\,acd^4e^4x^4+150\,ac^2d^3e^4x^3+150\,ac^3d^2e^4x^2+75\,ac^4de^4x+15\,(bd^5e^4x^5+5\,bcd^4e^4x^4+10\,b}{}$$

input
```
integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
1/75*(15*a*d^5*e^4*x^5 + 75*a*c*d^4*e^4*x^4 + 150*a*c^2*d^3*e^4*x^3 + 150*
a*c^3*d^2*e^4*x^2 + 75*a*c^4*d*e^4*x + 15*(b*d^5*e^4*x^5 + 5*b*c*d^4*e^4*x
^4 + 10*b*c^2*d^3*e^4*x^3 + 10*b*c^3*d^2*e^4*x^2 + 5*b*c^4*d*e^4*x + b*c^5
*e^4)*arcsin(d*x + c) + (3*b*d^4*e^4*x^4 + 12*b*c*d^3*e^4*x^3 + 2*(9*b*c^2
 + 2*b)*d^2*e^4*x^2 + 4*(3*b*c^3 + 2*b*c)*d*e^4*x + (3*b*c^4 + 4*b*c^2 + 8
*b)*e^4)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

### 3.177.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 527 vs. 2(85) = 170.

Time = 0.38 (sec) , antiderivative size = 527, normalized size of antiderivative = 4.97

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx$$
$$=\begin{cases} ac^4e^4x+2ac^3de^4x^2+2ac^2d^2e^4x^3+acd^3e^4x^4+\frac{ad^4e^4x^5}{5}+\frac{bc^5e^4\operatorname{asin}(c+dx)}{5d}+bc^4e^4x\operatorname{asin}(c+dx)+\frac{bc^4e^4\sqrt{-c} \\ c^4e^4x(a+b\operatorname{asin}(c)) \end{cases}$$

input
```
integrate((d*e*x+c*e)**4*(a+b*asin(d*x+c)),x)
```

output
```
Piecewise((a*c**4*e**4*x + 2*a*c**3*d*e**4*x**2 + 2*a*c**2*d**2*e**4*x**3
+ a*c*d**3*e**4*x**4 + a*d**4*e**4*x**5/5 + b*c**5*e**4*asin(c + d*x)/(5*d
) + b*c**4*e**4*x*asin(c + d*x) + b*c**4*e**4*sqrt(-c**2 - 2*c*d*x - d**2*
x**2 + 1)/(25*d) + 2*b*c**3*d*e**4*x**2*asin(c + d*x) + 4*b*c**3*e**4*x*sq
rt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 2*b*c**2*d**2*e**4*x**3*asin(c +
d*x) + 6*b*c**2*d*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 4*b
*c**2*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(75*d) + b*c*d**3*e**4*x*
*4*asin(c + d*x) + 4*b*c*d**2*e**4*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 +
 1)/25 + 8*b*c*e**4*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/75 + b*d**4*e*
*4*x**5*asin(c + d*x)/5 + b*d**3*e**4*x**4*sqrt(-c**2 - 2*c*d*x - d**2*x**
2 + 1)/25 + 4*b*d*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/75 + 8*b
*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(75*d), Ne(d, 0)), (c**4*e**4*
x*(a + b*asin(c)), True))
```

### 3.177.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1280 vs. 2(92) = 184.

Time = 0.28 (sec) , antiderivative size = 1280, normalized size of antiderivative = 12.08

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
1/5*a*d^4*e^4*x^5 + a*c*d^3*e^4*x^4 + 2*a*c^2*d^2*e^4*x^3 + 2*a*c^3*d*e^4*
x^2 + (2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2
 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 -
 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2
*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*b*c^3*d*e^4 + 1/3*(6*x^3*arcsin(d*x + c)
 + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x
 + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c
^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2
- 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d
^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*b*c^2*d^2*e^4 + 1/24*(24*x^4*a
rcsin(d*x + c) + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-
d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqr
t(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^
2*x/d^4 - 90*(c^2 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*
d^2))/d^5 - 105*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x
^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c
*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2
+ 1)*(c^2 - 1)*c/d^5)*d)*b*c*d^3*e^4 + 1/600*(120*x^5*arcsin(d*x + c) + (2
4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^4/d^2 - 54*sqrt(-d^2*x^2 - 2*c*d*x
- c^2 + 1)*c*x^3/d^3 + 126*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x^2/d...
```

### 3.177.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.64

$$\begin{aligned}\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx &= \frac{(dx+c)^5ae^4}{5\,d} \\ &+ \frac{\left((dx+c)^2-1\right)^2(dx+c)be^4\arcsin\left(dx+c\right)}{5\,d} \\ &+ \frac{2\left((dx+c)^2-1\right)(dx+c)be^4\arcsin\left(dx+c\right)}{5\,d} \\ &+ \frac{\left((dx+c)^2-1\right)^2\sqrt{-(dx+c)^2+1}be^4}{25\,d} \\ &+ \frac{(dx+c)be^4\arcsin\left(dx+c\right)}{5\,d} \\ &- \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}be^4}{15\,d} + \frac{\sqrt{-(dx+c)^2+1}be^4}{5\,d}\end{aligned}$$

input
```
integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
1/5*(d*x + c)^5*a*e^4/d + 1/5*((d*x + c)^2 - 1)^2*(d*x + c)*b*e^4*arcsin(d
*x + c)/d + 2/5*((d*x + c)^2 - 1)*(d*x + c)*b*e^4*arcsin(d*x + c)/d + 1/25
*((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b*e^4/d + 1/5*(d*x + c)*b*e^4*
arcsin(d*x + c)/d - 2/15*(-(d*x + c)^2 + 1)^(3/2)*b*e^4/d + 1/5*sqrt(-(d*x
 + c)^2 + 1)*b*e^4/d
```

### 3.177.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^4(a+b\arcsin(c+dx))\,dx=\int (c\,e+d\,e\,x)^4\,(a+b\,\mathrm{asin}(c+d\,x))\;dx$$

input
```
int((c*e + d*e*x)^4*(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^4*(a + b*asin(c + d*x)), x)
```

# 3.178 $\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx$



## 3.178.1 Optimal result

Integrand size = 21, antiderivative size = 109

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}}{32d} + \frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}}{16d} - \frac{3be^3\arcsin(c+dx)}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))}{4d}$$

output
```
-3/32*b*e^3*arcsin(d*x+c)/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))/d+3/32*b
*e^3*(d*x+c)*(1-(d*x+c)^2)^(1/2)/d+1/16*b*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2
)/d
```

## 3.178.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.80

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \frac{e^3\Big(3b(c+dx)\sqrt{1-(c+dx)^2}+2b(c+dx)^3\sqrt{1-(c+dx)^2}-3b\arcsin(c+dx)+8(c+dx)^4(a+b\arcsin}{32d}$$

input
```
Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^3*(3*b*(c + d*x)*Sqrt[1 - (c + d*x)^2] + 2*b*(c + d*x)^3*Sqrt[1 - (c +
d*x)^2] - 3*b*ArcSin[c + d*x] + 8*(c + d*x)^4*(a + b*ArcSin[c + d*x])))/(3
2*d)
```

### 3.178.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.92, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {5304, 27, 5138, 262, 262, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e^3(c+dx)^3(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^3\int (c+dx)^3(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))-\frac{1}{4}b\int \frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{262}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))-\frac{1}{4}b\left(\frac{3}{4}\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{4}(c+dx)^3\sqrt{1-(c+dx)^2}\right)\right)}{d}$$

$$\Big\downarrow \text{262}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))-\frac{1}{4}b\left(\frac{3}{4}\left(\frac{1}{2}\int \frac{1}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{2}(c+dx)\sqrt{1-(c+dx)^2}\right)-\frac{1}{4}(c+dx)^3\right.\right.}{d}$$

$$\Big\downarrow \text{223}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))-\frac{1}{4}b\left(\frac{3}{4}\left(\frac{1}{2}\arcsin(c+dx)-\frac{1}{2}(c+dx)\sqrt{1-(c+dx)^2}\right)-\frac{1}{4}(c+dx)^3\sqrt{1-(c}{d}$$

input
```
Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^3*(-1/4*(b*(-1/4*((c + d*x)^3*Sqrt[1 - (c + d*x)^2]) + (3*(-1/2*((c + d
*x)*Sqrt[1 - (c + d*x)^2]) + ArcSin[c + d*x]/2))/4)) + ((c + d*x)^4*(a + b
*ArcSin[c + d*x]))/4))/d
```

### 3.178.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.178.4 Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.83

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\frac{e^3a(dx+c)^4}{4}+e^3b\left(\frac{(dx+c)^4\arcsin(dx+c)}{4}+\frac{(dx+c)^3\sqrt{1-(dx+c)^2}}{16}+\frac{3(dx+c)\sqrt{1-(dx+c)^2}}{32}-\frac{3\arcsin(dx+c)}{32}\right)}{d}$ | 90 |
| default | $\frac{\frac{e^3a(dx+c)^4}{4}+e^3b\left(\frac{(dx+c)^4\arcsin(dx+c)}{4}+\frac{(dx+c)^3\sqrt{1-(dx+c)^2}}{16}+\frac{3(dx+c)\sqrt{1-(dx+c)^2}}{32}-\frac{3\arcsin(dx+c)}{32}\right)}{d}$ | 90 |
| parts | $\frac{e^3a(dx+c)^4}{4d}+\frac{e^3b\left(\frac{(dx+c)^4\arcsin(dx+c)}{4}+\frac{(dx+c)^3\sqrt{1-(dx+c)^2}}{16}+\frac{3(dx+c)\sqrt{1-(dx+c)^2}}{32}-\frac{3\arcsin(dx+c)}{32}\right)}{d}$ | 92 |

input
```
int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/4*e^3*a*(d*x+c)^4+e^3*b*(1/4*(d*x+c)^4*arcsin(d*x+c)+1/16*(d*x+c)^3
*(1-(d*x+c)^2)^(1/2)+3/32*(d*x+c)*(1-(d*x+c)^2)^(1/2)-3/32*arcsin(d*x+c)))
```

### 3.178.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 209 vs. 2(97) = 194.

Time = 0.27 (sec) , antiderivative size = 209, normalized size of antiderivative = 1.92

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx$$
$$=\frac{8\,ad^4e^3x^4+32\,acd^3e^3x^3+48\,ac^2d^2e^3x^2+32\,ac^3de^3x+(8\,bd^4e^3x^4+32\,bcd^3e^3x^3+48\,bc^2d^2e^3x^2+32\,bc^3d}{}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
1/32*(8*a*d^4*e^3*x^4 + 32*a*c*d^3*e^3*x^3 + 48*a*c^2*d^2*e^3*x^2 + 32*a*c
^3*d*e^3*x + (8*b*d^4*e^3*x^4 + 32*b*c*d^3*e^3*x^3 + 48*b*c^2*d^2*e^3*x^2
+ 32*b*c^3*d*e^3*x + (8*b*c^4 - 3*b)*e^3)*arcsin(d*x + c) + (2*b*d^3*e^3*x
^3 + 6*b*c*d^2*e^3*x^2 + 3*(2*b*c^2 + b)*d*e^3*x + (2*b*c^3 + 3*b*c)*e^3)*
sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

### 3.178.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 394 vs. 2(94) = 188.

Time = 0.29 (sec) , antiderivative size = 394, normalized size of antiderivative = 3.61

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx$$
$$=\begin{cases} ac^3e^3x+\frac{3ac^2de^3x^2}{2}+acd^2e^3x^3+\frac{ad^3e^3x^4}{4}+\frac{bc^4e^3\operatorname{asin}(c+dx)}{4d}+bc^3e^3x\operatorname{asin}(c+dx)+\frac{bc^3e^3\sqrt{-c^2-2cdx-d^2x^2+1}}{16d}+ \\ c^3e^3x(a+b\operatorname{asin}(c)) \end{cases}$$

input
```
integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c)),x)
```

output
```
Piecewise((a*c**3*e**3*x + 3*a*c**2*d*e**3*x**2/2 + a*c*d**2*e**3*x**3 + a
*d**3*e**3*x**4/4 + b*c**4*e**3*asin(c + d*x)/(4*d) + b*c**3*e**3*x*asin(c
 + d*x) + b*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(16*d) + 3*b*c
**2*d*e**3*x**2*asin(c + d*x)/2 + 3*b*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d
**2*x**2 + 1)/16 + b*c*d**2*e**3*x**3*asin(c + d*x) + 3*b*c*d*e**3*x**2*sq
rt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/16 + 3*b*c*e**3*sqrt(-c**2 - 2*c*d*x -
 d**2*x**2 + 1)/(32*d) + b*d**3*e**3*x**4*asin(c + d*x)/4 + b*d**2*e**3*x*
*3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/16 + 3*b*e**3*x*sqrt(-c**2 - 2*c*
d*x - d**2*x**2 + 1)/32 - 3*b*e**3*asin(c + d*x)/(32*d), Ne(d, 0)), (c**3*
e**3*x*(a + b*asin(c)), True))
```

### 3.178.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 816 vs. 2(97) = 194.

Time = 0.27 (sec) , antiderivative size = 816, normalized size of antiderivative = 7.49

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \frac{1}{4}ad^3e^3x^4 + acd^2e^3x^3 + \frac{3}{2}ac^2de^3x^2$$
$$+\frac{3}{4}\left(2x^2\arcsin(dx+c) + d\left(\frac{3c^2\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^3} + \frac{\sqrt{-d^2x^2-2cdx-c^2+1}x}{d^2} - \frac{(c^2-1)\,\mathrm{arc}\ldots}{\ldots}\right.\right.$$
$$+\frac{1}{6}\left(6x^3\arcsin(dx+c) + d\left(\frac{2\sqrt{-d^2x^2-2cdx-c^2+1}x^2}{d^2} - \frac{15c^3\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^4} - \frac{5\sqrt{-d^2\ldots}}{\ldots}\right.\right.$$
$$+\frac{1}{96}\left(24x^4\arcsin(dx+c) + \left(\frac{6\sqrt{-d^2x^2-2cdx-c^2+1}x^3}{d^2} - \frac{14\sqrt{-d^2x^2-2cdx-c^2+1}cx^2}{d^3} + \frac{105\,c\ldots}{\ldots}\right.\right.$$
$$+ac^3e^3x + \frac{\left((dx+c)\arcsin(dx+c) + \sqrt{-(dx+c)^2+1}\right)bc^3e^3}{d}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
1/4*a*d^3*e^3*x^4 + a*c*d^2*e^3*x^3 + 3/2*a*c^2*d*e^3*x^2 + 3/4*(2*x^2*arc
sin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2
))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2
*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x -
 c^2 + 1)*c/d^3))*b*c^2*d*e^3 + 1/6*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^
2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2
*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3
+ 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 +
 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x
 - c^2 + 1)*(c^2 - 1)/d^4))*b*c*d^2*e^3 + 1/96*(24*x^4*arcsin(d*x + c) + (
6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-d^2*x^2 - 2*c*d*x
- c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 -
 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x/d^4 - 90*(c^2
- 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 - 105*sq
rt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2 - 2*c*d*x - c^2
 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 -
 (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*c/d
^5)*d)*b*d^3*e^3 + a*c^3*e^3*x + ((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x +
 c)^2 + 1))*b*c^3*e^3/d
```

3.178. $\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx$

### 3.178.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.25

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \frac{(dx+c)^4ae^3}{4\,d} + \frac{\left((dx+c)^2-1\right)^2be^3\arcsin(dx+c)}{4\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)be^3}{16\,d} + \frac{\left((dx+c)^2-1\right)be^3\arcsin(dx+c)}{2\,d} + \frac{5\sqrt{-(dx+c)^2+1}(dx+c)be^3}{32\,d} + \frac{5\,be^3\arcsin(dx+c)}{32\,d}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
1/4*(d*x + c)^4*a*e^3/d + 1/4*((d*x + c)^2 - 1)^2*b*e^3*arcsin(d*x + c)/d
- 1/16*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*b*e^3/d + 1/2*((d*x + c)^2 - 1)*
b*e^3*arcsin(d*x + c)/d + 5/32*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b*e^3/d +
5/32*b*e^3*arcsin(d*x + c)/d
```

### 3.178.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))\,dx = \int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

input
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x)), x)
```

# 3.179 $\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx$



## 3.179.1 Optimal result

Integrand size = 21, antiderivative size = 80

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \frac{be^2\sqrt{1-(c+dx)^2}}{3d} - \frac{be^2(1-(c+dx)^2)^{3/2}}{9d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))}{3d}$$

output
```
-1/9*b*e^2*(1-(d*x+c)^2)^(3/2)/d+1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))/d+1
/3*b*e^2*(1-(d*x+c)^2)^(1/2)/d
```

## 3.179.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.80

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \frac{e^2\left(b(2+c^2+2cdx+d^2x^2)\sqrt{1-(c+dx)^2}+3(c+dx)^3(a+b\arcsin(c+dx))\right)}{9d}$$

input
```
Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^2*(b*(2 + c^2 + 2*c*d*x + d^2*x^2)*Sqrt[1 - (c + d*x)^2] + 3*(c + d*x)^
3*(a + b*ArcSin[c + d*x])))/(9*d)
```

### 3.179.3 Rubi [A] (warning: unable to verify)

Time = 0.27 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.84, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {5304, 27, 5138, 243, 53, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int e^2(c+dx)^2(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \ 27$$

$$\frac{e^2\int (c+dx)^2(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \ 5138$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{3}b\int \frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \ 243$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{6}b\int \frac{(c+dx)^2}{\sqrt{-c-dx+1}}d(c+dx)^2\right)}{d}$$

$$\Big\downarrow \ 53$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{6}b\int \left(\frac{1}{\sqrt{-c-dx+1}}-\sqrt{-c-dx+1}\right)d(c+dx)^2\right)}{d}$$

$$\Big\downarrow \ 2009$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{6}b\left(\frac{2}{3}(-c-dx+1)^{3/2}-2\sqrt{-c-dx+1}\right)\right)}{d}$$

input
```
Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^2*(-1/6*(b*(-2*Sqrt[1 - c - d*x] + (2*(1 - c - d*x)^(3/2))/3)) + ((c +
d*x)^3*(a + b*ArcSin[c + d*x]))/3))/d
```

### 3.179.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 53
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0])
|| LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

rule 243
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/2   Subst[In
t[x^((m - 1)/2)*(a + b*x)^p, x], x, x^2], x] /; FreeQ[{a, b, m, p}, x] && I
ntegerQ[(m - 1)/2]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.179.4 Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.96

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\frac{a e^2 (dx+c)^3}{3}+e^2 b\left(\frac{(dx+c)^3 \arcsin(dx+c)}{3}+\frac{(dx+c)^2\sqrt{1-(dx+c)^2}}{9}+\frac{2\sqrt{1-(dx+c)^2}}{9}\right)}{d}$ | 77 |
| default | $\frac{\frac{a e^2 (dx+c)^3}{3}+e^2 b\left(\frac{(dx+c)^3 \arcsin(dx+c)}{3}+\frac{(dx+c)^2\sqrt{1-(dx+c)^2}}{9}+\frac{2\sqrt{1-(dx+c)^2}}{9}\right)}{d}$ | 77 |
| parts | $\frac{a e^2 (dx+c)^3}{3d}+\frac{e^2 b\left(\frac{(dx+c)^3 \arcsin(dx+c)}{3}+\frac{(dx+c)^2\sqrt{1-(dx+c)^2}}{9}+\frac{2\sqrt{1-(dx+c)^2}}{9}\right)}{d}$ | 79 |

input
```
int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/3*a*e^2*(d*x+c)^3+e^2*b*(1/3*(d*x+c)^3*arcsin(d*x+c)+1/9*(d*x+c)^2*
(1-(d*x+c)^2)^(1/2)+2/9*(1-(d*x+c)^2)^(1/2)))
```

### 3.179.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 151 vs. $2(70) = 140$.

Time = 0.26 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.89

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx$$
$$= \frac{3\,ad^3e^2x^3+9\,acd^2e^2x^2+9\,ac^2de^2x+3\,(bd^3e^2x^3+3\,bcd^2e^2x^2+3\,bc^2de^2x+bc^3e^2)\arcsin{(dx+c)}+(bd^2e}{9\,d}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
1/9*(3*a*d^3*e^2*x^3 + 9*a*c*d^2*e^2*x^2 + 9*a*c^2*d*e^2*x + 3*(b*d^3*e^2*
x^3 + 3*b*c*d^2*e^2*x^2 + 3*b*c^2*d*e^2*x + b*c^3*e^2)*arcsin(d*x + c) + (
b*d^2*e^2*x^2 + 2*b*c*d*e^2*x + (b*c^2 + 2*b)*e^2)*sqrt(-d^2*x^2 - 2*c*d*x
 - c^2 + 1))/d
```

### 3.179.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 258 vs. $2(63) = 126$.

Time = 0.18 (sec) , antiderivative size = 258, normalized size of antiderivative = 3.22

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx$$
$$= \begin{cases} ac^2e^2x + acde^2x^2 + \frac{ad^2e^2x^3}{3} + \frac{bc^3e^2\operatorname{asin}(c+dx)}{3d} + bc^2e^2x\operatorname{asin}(c+dx) + \frac{bc^2e^2\sqrt{-c^2-2cdx-d^2x^2+1}}{9d} + bcde^2x^2\operatorname{asin} \\ c^2e^2x(a+b\operatorname{asin}(c)) \end{cases}$$

input
```
integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c)),x)
```

output
```
Piecewise((a*c**2*e**2*x + a*c*d*e**2*x**2 + a*d**2*e**2*x**3/3 + b*c**3*e
**2*asin(c + d*x)/(3*d) + b*c**2*e**2*x*asin(c + d*x) + b*c**2*e**2*sqrt(-
c**2 - 2*c*d*x - d**2*x**2 + 1)/(9*d) + b*c*d*e**2*x**2*asin(c + d*x) + 2*
b*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/9 + b*d**2*e**2*x**3*asin
(c + d*x)/3 + b*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/9 + 2*b*
e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(9*d), Ne(d, 0)), (c**2*e**2*x*
(a + b*asin(c)), True))
```

### 3.179.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 457 vs. $2(70) = 140$.

Time = 0.28 (sec) , antiderivative size = 457, normalized size of antiderivative = 5.71

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \frac{1}{3}\,ad^2e^2x^3 + acde^2x^2$$
$$+\frac{1}{2}\left(2\,x^2\arcsin(dx+c) + d\left(\frac{3\,c^2\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^3} + \frac{\sqrt{-d^2x^2-2\,cdx-c^2+1}x}{d^2} - \frac{(c^2-1)\operatorname{arc}}{}\right.\right.$$
$$+\frac{1}{18}\left(6\,x^3\arcsin(dx+c) + d\left(\frac{2\sqrt{-d^2x^2-2\,cdx-c^2+1}x^2}{d^2} - \frac{15\,c^3\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^4} - \frac{5\sqrt{-}}{}\right.\right.$$
$$+ac^2e^2x + \frac{\left((dx+c)\arcsin(dx+c) + \sqrt{-(dx+c)^2+1}\right)bc^2e^2}{d}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
1/3*a*d^2*e^2*x^3 + a*c*d*e^2*x^2 + 1/2*(2*x^2*arcsin(d*x + c) + d*(3*c^2*
arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 -
 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 -
 (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*b*c*d*
e^2 + 1/18*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^
4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(
d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d
*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4
))*b*d^2*e^2 + a*c^2*e^2*x + ((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^
2 + 1))*b*c^2*e^2/d
```

### 3.179.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.38

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \frac{(dx+c)^3ae^2}{3\,d} + \frac{\left((dx+c)^2-1\right)(dx+c)be^2\arcsin\left(dx+c\right)}{3\,d} + \frac{(dx+c)be^2\arcsin\left(dx+c\right)}{3\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}be^2}{9\,d} + \frac{\sqrt{-(dx+c)^2+1}be^2}{3\,d}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
1/3*(d*x + c)^3*a*e^2/d + 1/3*((d*x + c)^2 - 1)*(d*x + c)*b*e^2*arcsin(d*x
 + c)/d + 1/3*(d*x + c)*b*e^2*arcsin(d*x + c)/d - 1/9*(-(d*x + c)^2 + 1)^(
3/2)*b*e^2/d + 1/3*sqrt(-(d*x + c)^2 + 1)*b*e^2/d
```

### 3.179.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))\,dx = \int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

input
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x)), x)
```

# 3.180 $\int (ce+dex)(a+b\arcsin(c+dx))\,dx$



## 3.180.1 Optimal result

Integrand size = 19, antiderivative size = 70

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx=\frac{be(c+dx)\sqrt{1-(c+dx)^2}}{4d}-\frac{be\arcsin(c+dx)}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))}{2d}$$

output
```
-1/4*b*e*arcsin(d*x+c)/d+1/2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))/d+1/4*b*e*(d*
x+c)*(1-(d*x+c)^2)^(1/2)/d
```

## 3.180.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.84

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx=\frac{e\left(b(c+dx)\sqrt{1-(c+dx)^2}-b\arcsin(c+dx)+2(c+dx)^2(a+b\arcsin(c+dx))\right)}{4d}$$

input
```
Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x]),x]
```

output
```
(e*(b*(c + d*x)*Sqrt[1 - (c + d*x)^2] - b*ArcSin[c + d*x] + 2*(c + d*x)^2*
(a + b*ArcSin[c + d*x])))/(4*d)
```

### 3.180.3 Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.96, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {5304, 27, 5138, 262, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e(c+dx)(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\int (c+dx)(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))-\frac{1}{2}b\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{262}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))-\frac{1}{2}b\left(\frac{1}{2}\int \frac{1}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{2}(c+dx)\sqrt{1-(c+dx)^2}\right)\right)}{d}$$

$$\Big\downarrow \text{223}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))-\frac{1}{2}b\left(\frac{1}{2}\arcsin(c+dx)-\frac{1}{2}(c+dx)\sqrt{1-(c+dx)^2}\right)\right)}{d}$$

input
```
Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x]),x]
```

output
```
(e*(-1/2*(b*(-1/2*((c + d*x)*Sqrt[1 - (c + d*x)^2]) + ArcSin[c + d*x]/2))
+ ((c + d*x)^2*(a + b*ArcSin[c + d*x]))/2))/d
```

### 3.180.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.180.4 Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.91

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\frac{ae(dx+c)^2}{2}+eb\left(\frac{(dx+c)^2\arcsin(dx+c)}{2}+\frac{(dx+c)\sqrt{1-(dx+c)^2}}{4}-\frac{\arcsin(dx+c)}{4}\right)}{d}$ | 64 |
| default | $\frac{\frac{ae(dx+c)^2}{2}+eb\left(\frac{(dx+c)^2\arcsin(dx+c)}{2}+\frac{(dx+c)\sqrt{1-(dx+c)^2}}{4}-\frac{\arcsin(dx+c)}{4}\right)}{d}$ | 64 |
| parts | $ae\left(\frac{1}{2}d\,x^2+cx\right)+\frac{eb\left(\frac{(dx+c)^2\arcsin(dx+c)}{2}+\frac{(dx+c)\sqrt{1-(dx+c)^2}}{4}-\frac{\arcsin(dx+c)}{4}\right)}{d}$ | 65 |

input
```
int((d*e*x+c*e)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/2*a*e*(d*x+c)^2+e*b*(1/2*(d*x+c)^2*arcsin(d*x+c)+1/4*(d*x+c)*(1-(d*
x+c)^2)^(1/2)-1/4*arcsin(d*x+c)))
```

### 3.180.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.33

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx$$
$$= \frac{2\,ad^2ex^2+4\,acdex+(2\,bd^2ex^2+4\,bcdex+(2\,bc^2-b)e)\arcsin{(dx+c)}+(bdex+bce)\sqrt{-d^2x^2-2\,cdx-}}{4\,d}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
1/4*(2*a*d^2*e*x^2 + 4*a*c*d*e*x + (2*b*d^2*e*x^2 + 4*b*c*d*e*x + (2*b*c^2
 - b)*e)*arcsin(d*x + c) + (b*d*e*x + b*c*e)*sqrt(-d^2*x^2 - 2*c*d*x - c^2
 + 1))/d
```

### 3.180.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 148 vs. $2(58) = 116$.

Time = 0.13 (sec) , antiderivative size = 148, normalized size of antiderivative = 2.11

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx$$
$$= \begin{cases} acex+\frac{adex^2}{2}+\frac{bc^2e\,\mathrm{asin}\,(c+dx)}{2d}+bcex\,\mathrm{asin}\,(c+dx)+\frac{bce\sqrt{-c^2-2cdx-d^2x^2+1}}{4d}+\frac{bdex^2\,\mathrm{asin}\,(c+dx)}{2}+\frac{bex\sqrt{-c^2-2cdx-d}}{4} \\ cex(a+b\,\mathrm{asin}\,(c)) \end{cases}$$

input
```
integrate((d*e*x+c*e)*(a+b*asin(d*x+c)),x)
```

output
```
Piecewise((a*c*e*x + a*d*e*x**2/2 + b*c**2*e*asin(c + d*x)/(2*d) + b*c*e*x
*asin(c + d*x) + b*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(4*d) + b*d*e
*x**2*asin(c + d*x)/2 + b*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/4 - b*
e*asin(c + d*x)/(4*d), Ne(d, 0)), (c*e*x*(a + b*asin(c)), True))
```

### 3.180.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 204 vs. $2(62) = 124$.

Time = 0.26 (sec) , antiderivative size = 204, normalized size of antiderivative = 2.91

$$\int (ce + dex)(a + b\arcsin(c + dx))\,dx = \frac{1}{2}adex^2 + \frac{1}{4}\left(2x^2\arcsin(dx + c) + d\left(\frac{3c^2\arcsin\left(-\frac{d^2x+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^3} + \frac{\sqrt{-d^2x^2 - 2cdx - c^2 + 1}x}{d^2} - \frac{(c^2 - 1)\,\mathrm{arc}\right.\right.$$
$$+ acex + \frac{\left((dx + c)\arcsin(dx + c) + \sqrt{-(dx + c)^2 + 1}\right)bce}{d}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
1/2*a*d*e*x^2 + 1/4*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d
)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*
x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3
 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*b*d*e + a*c*e*x + ((d*x +
c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*b*c*e/d
```

### 3.180.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.10

$$\int (ce + dex)(a + b\arcsin(c + dx))\,dx = \frac{\left((dx + c)^2 - 1\right)be\arcsin(dx + c)}{2d} + \frac{\sqrt{-(dx + c)^2 + 1}(dx + c)be}{4d} + \frac{\left((dx + c)^2 - 1\right)ae}{2d} + \frac{be\arcsin(dx + c)}{4d}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
1/2*((d*x + c)^2 - 1)*b*e*arcsin(d*x + c)/d + 1/4*sqrt(-(d*x + c)^2 + 1)*(
d*x + c)*b*e/d + 1/2*((d*x + c)^2 - 1)*a*e/d + 1/4*b*e*arcsin(d*x + c)/d
```

### 3.180.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))\,dx=\int (c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)\,dx$$

input
```
int((c*e + d*e*x)*(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)*(a + b*asin(c + d*x)), x)
```

# 3.181 $\int (a+b\arcsin(c+dx))\,dx$



## 3.181.1 Optimal result

Integrand size = 10, antiderivative size = 40

$$\int (a+b\arcsin(c+dx))\,dx = ax+\frac{b\sqrt{1-(c+dx)^2}}{d}+\frac{b(c+dx)\arcsin(c+dx)}{d}$$

output
```
a*x+b*(d*x+c)*arcsin(d*x+c)/d+b*(1-(d*x+c)^2)^(1/2)/d
```

## 3.181.2 Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 159 vs. 2(40) = 80.

Time = 0.38 (sec) , antiderivative size = 159, normalized size of antiderivative = 3.98

$$\int (a+b\arcsin(c+dx))\,dx = ax+bx\arcsin(c+dx) + \frac{b\left(2d\sqrt{1-c^2-2cdx-d^2x^2}+2cd\arctan\left(\frac{\sqrt{-d^2}x-\sqrt{1-c^2-2cdx-d^2x^2}}{c}\right)+c\sqrt{-d^2}\log\left(-1+2cdx+2d^2x^2+\right.\right.}{2d^2}$$

input
```
Integrate[a + b*ArcSin[c + d*x],x]
```

output
```
a*x + b*x*ArcSin[c + d*x] + (b*(2*d*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2] + 2*
c*d*ArcTan[(Sqrt[-d^2]*x - Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])/c] + c*Sqrt[
-d^2]*Log[-1 + 2*c*d*x + 2*d^2*x^2 + 2*Sqrt[-d^2]*x*Sqrt[1 - c^2 - 2*c*d*x
 - d^2*x^2]]))/(2*d^2)
```

## 3.181.3 Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \text{2009}$$

$$ax+\frac{b(c+dx)\arcsin(c+dx)}{d}+\frac{b\sqrt{1-(c+dx)^2}}{d}$$

input
```
Int[a + b*ArcSin[c + d*x],x]
```

output
```
a*x + (b*Sqrt[1 - (c + d*x)^2])/d + (b*(c + d*x)*ArcSin[c + d*x])/d
```

### 3.181.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

## 3.181.4 Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.90

| method | result | size |
|---|---|---|
| default | $ax+\frac{b\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+c)^{2}}\right)}{d}$ | 36 |
| parts | $ax+\frac{b\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+c)^{2}}\right)}{d}$ | 36 |
| derivativedivides | $\frac{(dx+c)a+b\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+c)^{2}}\right)}{d}$ | 41 |

input
```
int(a+b*arcsin(d*x+c),x,method=_RETURNVERBOSE)
```

output
```
a*x+b/d*((d*x+c)*arcsin(d*x+c)+(1-(d*x+c)^2)^(1/2))
```

### 3.181.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.20

$$\int (a+b\arcsin(c+dx))\,dx = \frac{adx+(bdx+bc)\arcsin(dx+c)+\sqrt{-d^2x^2-2\,cdx-c^2+1}b}{d}$$

input
```
integrate(a+b*arcsin(d*x+c),x, algorithm="fricas")
```

output
```
(a*d*x + (b*d*x + b*c)*arcsin(d*x + c) + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
)*b)/d
```

### 3.181.6 Sympy [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.28

$$\int (a+b\arcsin(c+dx))\,dx = ax+b\left(\begin{cases}\frac{c\,\mathrm{asin}\,(c+dx)}{d}+x\,\mathrm{asin}\,(c+dx)+\frac{\sqrt{-c^2-2cdx-d^2x^2+1}}{d} & \text{for } d\neq 0\\ x\,\mathrm{asin}\,(c) & \text{otherwise}\end{cases}\right)$$

input
```
integrate(a+b*asin(d*x+c),x)
```

output
```
a*x + b*Piecewise((c*asin(c + d*x)/d + x*asin(c + d*x) + sqrt(-c**2 - 2*c*
d*x - d**2*x**2 + 1)/d, Ne(d, 0)), (x*asin(c), True))
```

### 3.181.7 Maxima [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.88

$$\int (a+b\arcsin(c+dx))\,dx = ax+\frac{\left((dx+c)\arcsin(dx+c)+\sqrt{-(dx+c)^2+1}\right)b}{d}$$

input
```
integrate(a+b*arcsin(d*x+c),x, algorithm="maxima")
```

output
```
a*x + ((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*b/d
```

### 3.181.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.88

$$\int (a+b\arcsin(c+dx))\,dx = ax + \frac{\left((dx+c)\arcsin\left(dx+c\right)+\sqrt{-(dx+c)^2+1}\right)b}{d}$$

input
```
integrate(a+b*arcsin(d*x+c),x, algorithm="giac")
```

output
```
a*x + ((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*b/d
```

### 3.181.9 Mupad [B] (verification not implemented)

Time = 0.63 (sec) , antiderivative size = 92, normalized size of antiderivative = 2.30

$$\int (a+b\arcsin(c+dx))\,dx = a\,x+b\,x\,\mathrm{asin}(c+d\,x)+\frac{b\sqrt{-c^2-2\,c\,d\,x-d^2\,x^2+1}}{d} + \frac{b\,c\,\ln\left(\sqrt{-c^2-2\,c\,d\,x-d^2\,x^2+1}-\frac{x\,d^2+c\,d}{\sqrt{-d^2}}\right)}{\sqrt{-d^2}}$$

input
```
int(a + b*asin(c + d*x),x)
```

output
```
a*x + b*x*asin(c + d*x) + (b*(1 - d^2*x^2 - 2*c*d*x - c^2)^(1/2))/d + (b*c
*log((1 - d^2*x^2 - 2*c*d*x - c^2)^(1/2) - (c*d + d^2*x)/(-d^2)^(1/2)))/(-
d^2)^(1/2)
```

# 3.182 $\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx$



## 3.182.1 Optimal result

Integrand size = 21, antiderivative size = 89

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx = -\frac{i(a+b\arcsin(c+dx))^2}{2bde} + \frac{(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de}$$

output
```
-1/2*I*(a+b*arcsin(d*x+c))^2/b/d/e+(a+b*arcsin(d*x+c))*ln(1-(I*(d*x+c)+(1-
(d*x+c)^2)^(1/2))^2)/d/e-1/2*I*b*polylog(2,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))
^2)/d/e
```

## 3.182.2 Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.80

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx = \frac{b\arcsin(c+dx)\log\left(1-e^{2i\arcsin(c+dx)}\right)+a\log(c+dx)-\frac{1}{2}ib\left(\arcsin(c+dx)^2+\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right.\right.}{de}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x),x]
```

output
```
(b*ArcSin[c + d*x]*Log[1 - E^((2*I)*ArcSin[c + d*x])] + a*Log[c + d*x] - (
I/2)*b*(ArcSin[c + d*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c + d*x])]))/(d*e)
```

### 3.182.3 Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.97, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {5304, 27, 5136, 3042, 25, 4200, 25, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{e(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{c+dx}d(c+dx)}{de}$$

$$\Big\downarrow \; 5136$$

$$\frac{\int \frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{c+dx}d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \; 3042$$

$$\frac{\int -\left((a+b\arcsin(c+dx))\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)\right)d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int (a+b\arcsin(c+dx))\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \; 4200$$

$$\frac{2i\int -\frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\frac{i(a+b\arcsin(c+dx))^2}{2b}}{de}$$

$$\Big\downarrow \; 25$$

$$\frac{-2i\int \frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\frac{i(a+b\arcsin(c+dx))^2}{2b}}{de}$$

$\downarrow$ 2620

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-\frac{1}{2}ib\int\log\left(1-e^{2i\arcsin(c+dx)}\right)d\arcsin(c+dx)\right)-\frac{i(a+b\arcsin}{2b}}{de}$$

$\downarrow$ 2715

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-\frac{1}{4}b\int e^{-2i\arcsin(c+dx)}\log(-c-dx+1)de^{2i\arcsin(c+dx)}\right)-\frac{i(a}{}}{de}$$

$\downarrow$ 2838

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))+\frac{1}{4}b\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)\right)-\frac{i(a+b\arcsin(c+dx))^2}{2b}}{de}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x),x]
```

output
```
(((-1/2*I)*(a + b*ArcSin[c + d*x])^2)/b - (2*I)*((I/2)*(a + b*ArcSin[c + d
*x])*Log[1 - E^((2*I)*ArcSin[c + d*x])] + (b*PolyLog[2, E^((2*I)*ArcSin[c
+ d*x])])/4))/(d*e)
```

### 3.182.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.182.4 Maple [A] (verified)

Time = 0.58 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.73

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{a\ln(dx+c)}{e}+\frac{b\left(-\frac{i\arcsin(dx+c)^2}{2}+\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-i\,\mathrm{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx+c)^2}\right)+\arcsin(dx+\cdots\right.}{e}}{d}$ |
| default | $\frac{\frac{a\ln(dx+c)}{e}+\frac{b\left(-\frac{i\arcsin(dx+c)^2}{2}+\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-i\,\mathrm{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx+c)^2}\right)+\arcsin(dx+\cdots\right.}{e}}{d}$ |
| parts | $\frac{a\ln(dx+c)}{ed}+\frac{b\left(-\frac{i\arcsin(dx+c)^2}{2}+\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-i\,\mathrm{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx+\cdots}\right.\right.}{ed}$ |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e),x,method=_RETURNVERBOSE)
```

output
```
1/d*(a/e*ln(d*x+c)+b/e*(-1/2*I*arcsin(d*x+c)^2+arcsin(d*x+c)*ln(1+I*(d*x+c
)+(1-(d*x+c)^2)^(1/2))-I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(
d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-I*polylog(2,I*(d*x+c)+(1-(d*x+c
)^2)^(1/2))))
```

### 3.182.5 Fricas [F]

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx=\int \frac{b\arcsin\left(dx+c\right)+a}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e),x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x + c) + a)/(d*e*x + c*e), x)
```

### 3.182.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx=\frac{\int \frac{a}{c+dx}\,dx+\int \frac{b\,\mathrm{asin}\,(c+dx)}{c+dx}\,dx}{e}$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e),x)
```

output
```
(Integral(a/(c + d*x), x) + Integral(b*asin(c + d*x)/(c + d*x), x))/e
```

### 3.182.7 Maxima [F]

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx=\int \frac{b\arcsin\left(dx+c\right)+a}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e),x, algorithm="maxima")
```

output
```
b*integrate(arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))/(d*e*x
+ c*e), x) + a*log(d*e*x + c*e)/(d*e)
```

### 3.182.8 Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx=\int \frac{b\arcsin\left(dx+c\right)+a}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e), x)
```

### 3.182.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{ce+dex}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{c\,e+d\,e\,x}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x),x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x), x)
```

# 3.183 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx$



## 3.183.1 Optimal result

Integrand size = 21, antiderivative size = 51

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx = -\frac{a+b\arcsin(c+dx)}{de^2(c+dx)} - \frac{b\,\text{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{de^2}$$

output
```
(-a-b*arcsin(d*x+c))/d/e^2/(d*x+c)-b*arctanh((1-(d*x+c)^2)^(1/2))/d/e^2
```

## 3.183.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.88

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx = -\frac{\frac{a+b\arcsin(c+dx)}{c+dx} + b\,\text{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{de^2}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^2,x]
```

output
```
-(((a + b*ArcSin[c + d*x])/(c + d*x) + b*ArcTanh[Sqrt[1 - (c + d*x)^2]])/(
d*e^2))
```

### 3.183.3 Rubi [A] (warning: unable to verify)

Time = 0.26 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.86, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {5304, 27, 5138, 243, 73, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{e^2(c+dx)^2}d(c+dx)}{d}$$

$$\Big\downarrow \ 27$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{(c+dx)^2}d(c+dx)}{de^2}$$

$$\Big\downarrow \ 5138$$

$$\frac{b\int \frac{1}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{a+b\arcsin(c+dx)}{c+dx}}{de^2}$$

$$\Big\downarrow \ 243$$

$$\frac{\frac{1}{2}b\int \frac{1}{\sqrt{-c-dx+1}(c+dx)^2}d(c+dx)^2-\frac{a+b\arcsin(c+dx)}{c+dx}}{de^2}$$

$$\Big\downarrow \ 73$$

$$\frac{-b\int \frac{1}{1-(c+dx)^4}d\sqrt{-c-dx+1}-\frac{a+b\arcsin(c+dx)}{c+dx}}{de^2}$$

$$\Big\downarrow \ 219$$

$$\frac{-\frac{a+b\arcsin(c+dx)}{c+dx}-b\,\text{arctanh}\left(\sqrt{-c-dx+1}\right)}{de^2}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^2,x]
```

output
```
(-((a + b*ArcSin[c + d*x])/(c + d*x)) - b*ArcTanh[Sqrt[1 - c - d*x]])/(d*e
^2)
```

### 3.183.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 243
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/2   Subst[In
t[x^((m - 1)/2)*(a + b*x)^p, x], x, x^2], x] /; FreeQ[{a, b, m, p}, x] && I
ntegerQ[(m - 1)/2]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.183.4 Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.10

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{a}{e^2(dx+c)}+\frac{b\left(-\frac{\arcsin(dx+c)}{dx+c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)\right)}{e^2}}{d}$ | 56 |
| default | $\frac{-\frac{a}{e^2(dx+c)}+\frac{b\left(-\frac{\arcsin(dx+c)}{dx+c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)\right)}{e^2}}{d}$ | 56 |
| parts | $-\frac{a}{e^2(dx+c)d}+\frac{b\left(-\frac{\arcsin(dx+c)}{dx+c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)\right)}{e^2d}$ | 58 |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^2,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-a/e^2/(d*x+c)+b/e^2*(-1/(d*x+c)*arcsin(d*x+c)-arctanh(1/(1-(d*x+c)^2
)^(1/2))))
```

### 3.183.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 101 vs. $2(49) = 98$.

Time = 0.27 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.98

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx = -\frac{2\,b\arcsin\left(dx+c\right)+\left(bdx+bc\right)\log\left(\sqrt{-d^2x^2-2\,cdx-c^2+1}+1\right)-\left(bdx+bc\right)\log\left(\sqrt{-d^2x^2-2\,cdx-\right.}{2\left(d^2e^2x+cde^2\right)}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^2,x, algorithm="fricas")
```

output
```
-1/2*(2*b*arcsin(d*x + c) + (b*d*x + b*c)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^
2 + 1) + 1) - (b*d*x + b*c)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) - 1) +
2*a)/(d^2*e^2*x + c*d*e^2)
```

### 3.183.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx=\frac{\int \frac{a}{c^2+2cdx+d^2x^2}\,dx+\int \frac{b\,\mathrm{asin}\,(c+dx)}{c^2+2cdx+d^2x^2}\,dx}{e^2}$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**2,x)
```

output
```
(Integral(a/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(b*asin(c + d*x)/(c
**2 + 2*c*d*x + d**2*x**2), x))/e**2
```

### 3.183.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.183.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 108 vs. $2(49) = 98$.

Time = 0.30 (sec) , antiderivative size = 108, normalized size of antiderivative = 2.12

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^2}\,dx=-\frac{1}{2}\,bde^2\left(\frac{\log\left(\sqrt{-\frac{(dex+ce)^2}{e^2}+1}+1\right)-\log\left(-\sqrt{-\frac{(dex+ce)^2}{e^2}+1}+1\right)}{d^2e^4}+\frac{2\,\arcsin\left(dx+c\right)}{(dex+ce)d^2e^3}\right)-\frac{a}{(dex+ce)de}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^2,x, algorithm="giac")
```

output
```
-1/2*b*d*e^2*((log(sqrt(-(d*e*x + c*e)^2/e^2 + 1) + 1) - log(-sqrt(-(d*e*x
 + c*e)^2/e^2 + 1) + 1))/(d^2*e^4) + 2*arcsin(d*x + c)/((d*e*x + c*e)*d^2*
e^3)) - a/((d*e*x + c*e)*d*e)
```

### 3.183.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^2} \, dx = \int \frac{a + b \operatorname{asin}(c + d\,x)}{(c\,e + d\,e\,x)^2} \, dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^2,x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^2, x)
```

# 3.184 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx$



## 3.184.1 Optimal result

Integrand size = 21, antiderivative size = 61

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = -\frac{b\sqrt{1-(c+dx)^2}}{2de^3(c+dx)} - \frac{a+b\arcsin(c+dx)}{2de^3(c+dx)^2}$$

output
```
1/2*(-a-b*arcsin(d*x+c))/d/e^3/(d*x+c)^2-1/2*b*(1-(d*x+c)^2)^(1/2)/d/e^3/(
d*x+c)
```

## 3.184.2 Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.80

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = -\frac{a+b(c+dx)\sqrt{1-(c+dx)^2}+b\arcsin(c+dx)}{2de^3(c+dx)^2}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^3,x]
```

output
```
-1/2*(a + b*(c + d*x)*Sqrt[1 - (c + d*x)^2] + b*ArcSin[c + d*x])/(d*e^3*(c
 + d*x)^2)
```

### 3.184.3 Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.92, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {5304, 27, 5138, 242}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{e^3(c+dx)^3}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{(c+dx)^3}d(c+dx)}{de^3}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{1}{2}b\int \frac{1}{(c+dx)^2\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{a+b\arcsin(c+dx)}{2(c+dx)^2}}{de^3}$$

$$\Big\downarrow \text{242}$$

$$\frac{-\frac{a+b\arcsin(c+dx)}{2(c+dx)^2}-\frac{b\sqrt{1-(c+dx)^2}}{2(c+dx)}}{de^3}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^3,x]
```

output
```
(-1/2*(b*Sqrt[1 - (c + d*x)^2])/(c + d*x) - (a + b*ArcSin[c + d*x])/(2*(c
+ d*x)^2))/(d*e^3)
```

### 3.184.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 242
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(c*x)^
(m + 1)*((a + b*x^2)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, p}, x
] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.184.4 Maple [A] (verified)

Time = 0.23 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.02

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{a}{2e^3(dx+c)^2}+\frac{b\left(-\frac{\arcsin(dx+c)}{2(dx+c)^2}-\frac{\sqrt{1-(dx+c)^2}}{2(dx+c)}\right)}{e^3}}{d}$ | 62 |
| default | $\frac{-\frac{a}{2e^3(dx+c)^2}+\frac{b\left(-\frac{\arcsin(dx+c)}{2(dx+c)^2}-\frac{\sqrt{1-(dx+c)^2}}{2(dx+c)}\right)}{e^3}}{d}$ | 62 |
| parts | $-\frac{a}{2e^3(dx+c)^2 d}+\frac{b\left(-\frac{\arcsin(dx+c)}{2(dx+c)^2}-\frac{\sqrt{1-(dx+c)^2}}{2(dx+c)}\right)}{e^3 d}$ | 64 |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/2*a/e^3/(d*x+c)^2+b/e^3*(-1/2/(d*x+c)^2*arcsin(d*x+c)-1/2/(d*x+c)*
(1-(d*x+c)^2)^(1/2)))
```

### 3.184.5 Fricas [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.67

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = \frac{ad^2x^2+2\,acdx-bc^2\arcsin\left(dx+c\right)-\left(bc^2dx+bc^3\right)\sqrt{-d^2x^2-2\,cdx-c^2+1}}{2\left(c^2d^3e^3x^2+2\,c^3d^2e^3x+c^4de^3\right)}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^3,x, algorithm="fricas")
```

output
```
1/2*(a*d^2*x^2 + 2*a*c*d*x - b*c^2*arcsin(d*x + c) - (b*c^2*d*x + b*c^3)*s
qrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/(c^2*d^3*e^3*x^2 + 2*c^3*d^2*e^3*x + c^
4*d*e^3)
```

### 3.184.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = \frac{\int \frac{a}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{b\,\mathrm{asin}\,(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx}{e^3}$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**3,x)
```

output
```
(Integral(a/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integral
(b*asin(c + d*x)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x))/e**3
```

### 3.184.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 120 vs. 2(55) = 110.

Time = 0.27 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.97

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = -\frac{1}{2}\,b\left(\frac{\sqrt{-d^2x^2-2\,cdx-c^2+1}d}{d^3e^3x+cd^2e^3}+\frac{\arcsin\left(dx+c\right)}{d^3e^3x^2+2\,cd^2e^3x+c^2de^3}\right) - \frac{a}{2\left(d^3e^3x^2+2\,cd^2e^3x+c^2de^3\right)}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^3,x, algorithm="maxima")
```

output
```
-1/2*b*(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*d/(d^3*e^3*x + c*d^2*e^3) + arc
sin(d*x + c)/(d^3*e^3*x^2 + 2*c*d^2*e^3*x + c^2*d*e^3)) - 1/2*a/(d^3*e^3*x
^2 + 2*c*d^2*e^3*x + c^2*d*e^3)
```

### 3.184.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 231 vs. $2(55) = 110$.

Time = 0.31 (sec) , antiderivative size = 231, normalized size of antiderivative = 3.79

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = -\frac{b\arcsin{(dx+c)}}{4\,de^3} - \frac{(dx+c)^2 b\arcsin{(dx+c)}}{8\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^2\arcsin{(dx+c)}}{8\,(dx+c)^2de^3} - \frac{a}{4\,de^3} - \frac{(dx+c)^2 a}{8\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} + \frac{(dx+c)b}{4\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)}{4\,(dx+c)de^3} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)^2}{8\,(dx+c)^2de^3}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^3,x, algorithm="giac")
```

output
```
-1/4*b*arcsin(d*x + c)/(d*e^3) - 1/8*(d*x + c)^2*b*arcsin(d*x + c)/(d*e^3*
(sqrt(-(d*x + c)^2 + 1) + 1)^2) - 1/8*b*(sqrt(-(d*x + c)^2 + 1) + 1)^2*arc
sin(d*x + c)/((d*x + c)^2*d*e^3) - 1/4*a/(d*e^3) - 1/8*(d*x + c)^2*a/(d*e^
3*(sqrt(-(d*x + c)^2 + 1) + 1)^2) + 1/4*(d*x + c)*b/(d*e^3*(sqrt(-(d*x + c
)^2 + 1) + 1)) - 1/4*b*(sqrt(-(d*x + c)^2 + 1) + 1)/((d*x + c)*d*e^3) - 1/
8*a*(sqrt(-(d*x + c)^2 + 1) + 1)^2/((d*x + c)^2*d*e^3)
```

### 3.184.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^3}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{(c\,e+d\,e\,x)^3}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^3,x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^3, x)
```

# 3.185 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx$



## 3.185.1 Optimal result

Integrand size = 21, antiderivative size = 88

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx=-\frac{b\sqrt{1-(c+dx)^2}}{6de^4(c+dx)^2}-\frac{a+b\arcsin(c+dx)}{3de^4(c+dx)^3}-\frac{b\operatorname{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{6de^4}$$

output
```
1/3*(-a-b*arcsin(d*x+c))/d/e^4/(d*x+c)^3-1/6*b*arctanh((1-(d*x+c)^2)^(1/2)
)/d/e^4-1/6*b*(1-(d*x+c)^2)^(1/2)/d/e^4/(d*x+c)^2
```

## 3.185.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.88

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx=-\frac{2a+b(c+dx)\sqrt{1-(c+dx)^2}+2b\arcsin(c+dx)+b(c+dx)^3\operatorname{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{6de^4(c+dx)^3}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^4,x]
```

output
```
-1/6*(2*a + b*(c + d*x)*Sqrt[1 - (c + d*x)^2] + 2*b*ArcSin[c + d*x] + b*(c
 + d*x)^3*ArcTanh[Sqrt[1 - (c + d*x)^2]])/(d*e^4*(c + d*x)^3)
```

### 3.185.3 Rubi [A] (warning: unable to verify)

Time = 0.26 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.83, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5304, 27, 5138, 243, 52, 73, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{e^4(c+dx)^4}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{(c+dx)^4}d(c+dx)}{de^4}$$

$$\Big\downarrow \text{ 5138}$$

$$\frac{\frac{1}{3}b\int \frac{1}{(c+dx)^3\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{a+b\arcsin(c+dx)}{3(c+dx)^3}}{de^4}$$

$$\Big\downarrow \text{ 243}$$

$$\frac{\frac{1}{6}b\int \frac{1}{\sqrt{-c-dx+1}(c+dx)^4}d(c+dx)^2-\frac{a+b\arcsin(c+dx)}{3(c+dx)^3}}{de^4}$$

$$\Big\downarrow \text{ 52}$$

$$\frac{\frac{1}{6}b\left(\frac{1}{2}\int \frac{1}{\sqrt{-c-dx+1}(c+dx)^2}d(c+dx)^2-\frac{\sqrt{-c-dx+1}}{(c+dx)^2}\right)-\frac{a+b\arcsin(c+dx)}{3(c+dx)^3}}{de^4}$$

$$\Big\downarrow \text{ 73}$$

$$\frac{\frac{1}{6}b\left(-\int \frac{1}{1-(c+dx)^4}d\sqrt{-c-dx+1}-\frac{\sqrt{-c-dx+1}}{(c+dx)^2}\right)-\frac{a+b\arcsin(c+dx)}{3(c+dx)^3}}{de^4}$$

$$\Big\downarrow \text{ 219}$$

$$\frac{\frac{1}{6}b\left(-\text{arctanh}\left(\sqrt{-c-dx+1}\right)-\frac{\sqrt{-c-dx+1}}{(c+dx)^2}\right)-\frac{a+b\arcsin(c+dx)}{3(c+dx)^3}}{de^4}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^4,x]
```

output
```
(-1/3*(a + b*ArcSin[c + d*x])/(c + d*x)^3 + (b*(-(Sqrt[1 - c - d*x]/(c + d
*x)^2) - ArcTanh[Sqrt[1 - c - d*x]]))/6)/(d*e^4)
```

### 3.185.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 52
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Simp[d*((
m + n + 2)/((b*c - a*d)*(m + 1)))   Int[(a + b*x)^(m + 1)*(c + d*x)^n, x],
x] /; FreeQ[{a, b, c, d, n}, x] && ILtQ[m, -1] && FractionQ[n] && LtQ[n, 0]
```

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 243
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/2   Subst[In
t[x^((m - 1)/2)*(a + b*x)^p, x], x, x^2], x] /; FreeQ[{a, b, m, p}, x] && I
ntegerQ[(m - 1)/2]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

---

3.185. $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx$

### 3.185.4 Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.89

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{a}{3e^4(dx+c)^3}+\frac{b\left(-\frac{\arcsin(dx+c)}{3(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{6}\right)}{e^4}}{d}$ | 78 |
| default | $\frac{-\frac{a}{3e^4(dx+c)^3}+\frac{b\left(-\frac{\arcsin(dx+c)}{3(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{6}\right)}{e^4}}{d}$ | 78 |
| parts | $-\frac{a}{3e^4(dx+c)^3d}+\frac{b\left(-\frac{\arcsin(dx+c)}{3(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{6}\right)}{e^4d}$ | 80 |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^4,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/3*a/e^4/(d*x+c)^3+b/e^4*(-1/3/(d*x+c)^3*arcsin(d*x+c)-1/6/(d*x+c)^
2*(1-(d*x+c)^2)^(1/2)-1/6*arctanh(1/(1-(d*x+c)^2)^(1/2))))
```

### 3.185.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 209 vs. 2(78) = 156.

Time = 0.31 (sec) , antiderivative size = 209, normalized size of antiderivative = 2.38

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx =$$
$$-\frac{4\,b\arcsin\left(dx+c\right)+\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log\left(\sqrt{-d^2x^2-2\,cdx-c^2+1}+1\right)-\left(bd^3x^3+\right.}{12\left(d^4e^4x^3+3\,cd^3e^4\right.}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^4,x, algorithm="fricas")
```

output
```
-1/12*(4*b*arcsin(d*x + c) + (b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*
c^3)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) + 1) - (b*d^3*x^3 + 3*b*c*d^2*
x^2 + 3*b*c^2*d*x + b*c^3)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) - 1) + 2
*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(b*d*x + b*c) + 4*a)/(d^4*e^4*x^3 + 3*
c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)
```

### 3.185.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx = \frac{\int \frac{a}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{b\,\mathrm{asin}\,(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx}{e^4}$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**4,x)
```

output
```
(Integral(a/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x
**4), x) + Integral(b*asin(c + d*x)/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2
+ 4*c*d**3*x**3 + d**4*x**4), x))/e**4
```

### 3.185.7 Maxima [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx = \int \frac{b\arcsin(dx+c)+a}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^4,x, algorithm="maxima")
```

output
```
-1/3*(3*(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)*inte
grate(1/3*e^(1/2*log(d*x + c + 1) + 1/2*log(-d*x - c + 1))/(d^7*e^4*x^7 +
7*c*d^6*e^4*x^6 + (21*c^2 - 1)*d^5*e^4*x^5 + 5*(7*c^3 - c)*d^4*e^4*x^4 + 5
*(7*c^4 - 2*c^2)*d^3*e^4*x^3 + (21*c^5 - 10*c^3)*d^2*e^4*x^2 + (7*c^6 - 5*
c^4)*d*e^4*x + (c^7 - c^5)*e^4 + (d^5*e^4*x^5 + 5*c*d^4*e^4*x^4 + (10*c^2
- 1)*d^3*e^4*x^3 + (10*c^3 - 3*c)*d^2*e^4*x^2 + (5*c^4 - 3*c^2)*d*e^4*x +
(c^5 - c^3)*e^4)*e^(log(d*x + c + 1) + log(-d*x - c + 1))), x) + arctan2(d
*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))*b/(d^4*e^4*x^3 + 3*c*d^3*e^
4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4) - 1/3*a/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^
2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)
```

### 3.185.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 388 vs. $2(78) = 156$.

Time = 0.67 (sec) , antiderivative size = 388, normalized size of antiderivative = 4.41

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx = -\frac{(dx+c)^3 b\arcsin(dx+c)}{24\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)^3} - \frac{(dx+c)b\arcsin(dx+c)}{8\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)\arcsin(dx+c)}{8\,(dx+c)de^4} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^3\arcsin(dx+c)}{24\,(dx+c)^3de^4} - \frac{b\log\left(\sqrt{-(dx+c)^2+1}+1\right)}{6\,de^4} + \frac{b\log(|dx+c|)}{6\,de^4} - \frac{(dx+c)^3 a}{24\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)^3} + \frac{(dx+c)^2 b}{24\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)^2} - \frac{(dx+c)a}{8\,de^4\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)}{8\,(dx+c)de^4} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^2}{24\,(dx+c)^2de^4} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)^3}{24\,(dx+c)^3de^4}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^4,x, algorithm="giac")
```

output
```
-1/24*(d*x + c)^3*b*arcsin(d*x + c)/(d*e^4*(sqrt(-(d*x + c)^2 + 1) + 1)^3)
 - 1/8*(d*x + c)*b*arcsin(d*x + c)/(d*e^4*(sqrt(-(d*x + c)^2 + 1) + 1)) -
1/8*b*(sqrt(-(d*x + c)^2 + 1) + 1)*arcsin(d*x + c)/((d*x + c)*d*e^4) - 1/2
4*b*(sqrt(-(d*x + c)^2 + 1) + 1)^3*arcsin(d*x + c)/((d*x + c)^3*d*e^4) - 1
/6*b*log(sqrt(-(d*x + c)^2 + 1) + 1)/(d*e^4) + 1/6*b*log(abs(d*x + c))/(d*
e^4) - 1/24*(d*x + c)^3*a/(d*e^4*(sqrt(-(d*x + c)^2 + 1) + 1)^3) + 1/24*(d
*x + c)^2*b/(d*e^4*(sqrt(-(d*x + c)^2 + 1) + 1)^2) - 1/8*(d*x + c)*a/(d*e^
4*(sqrt(-(d*x + c)^2 + 1) + 1)) - 1/8*a*(sqrt(-(d*x + c)^2 + 1) + 1)/((d*x
 + c)*d*e^4) - 1/24*b*(sqrt(-(d*x + c)^2 + 1) + 1)^2/((d*x + c)^2*d*e^4) -
 1/24*a*(sqrt(-(d*x + c)^2 + 1) + 1)^3/((d*x + c)^3*d*e^4)
```

### 3.185.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^4}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{{(c\,e+d\,e\,x)}^4}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^4,x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^4, x)
```

# 3.186 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx$



## 3.186.1 Optimal result

Integrand size = 21, antiderivative size = 94

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx=-\frac{b\sqrt{1-(c+dx)^2}}{12de^5(c+dx)^3}-\frac{b\sqrt{1-(c+dx)^2}}{6de^5(c+dx)}-\frac{a+b\arcsin(c+dx)}{4de^5(c+dx)^4}$$

output
```
1/4*(-a-b*arcsin(d*x+c))/d/e^5/(d*x+c)^4-1/12*b*(1-(d*x+c)^2)^(1/2)/d/e^5/
(d*x+c)^3-1/6*b*(1-(d*x+c)^2)^(1/2)/d/e^5/(d*x+c)
```

## 3.186.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.67

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx$$
$$=-\frac{b(c+dx)\sqrt{1-(c+dx)^2}(1+2(c+dx)^2)+3(a+b\arcsin(c+dx))}{12de^5(c+dx)^4}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^5,x]
```

output
```
-1/12*(b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(1 + 2*(c + d*x)^2) + 3*(a + b*Ar
cSin[c + d*x]))/(d*e^5*(c + d*x)^4)
```

### 3.186.3 Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.93, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {5304, 27, 5138, 245, 242}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int \frac{a+b\arcsin(c+dx)}{e^5(c+dx)^5}d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$
$$\frac{\int \frac{a+b\arcsin(c+dx)}{(c+dx)^5}d(c+dx)}{de^5}$$
$$\Big\downarrow \text{5138}$$
$$\frac{\frac{1}{4}b\int \frac{1}{(c+dx)^4\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{a+b\arcsin(c+dx)}{4(c+dx)^4}}{de^5}$$
$$\Big\downarrow \text{245}$$
$$\frac{\frac{1}{4}b\left(\frac{2}{3}\int \frac{1}{(c+dx)^2\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}}{3(c+dx)^3}\right)-\frac{a+b\arcsin(c+dx)}{4(c+dx)^4}}{de^5}$$
$$\Big\downarrow \text{242}$$
$$\frac{\frac{1}{4}b\left(-\frac{2\sqrt{1-(c+dx)^2}}{3(c+dx)}-\frac{\sqrt{1-(c+dx)^2}}{3(c+dx)^3}\right)-\frac{a+b\arcsin(c+dx)}{4(c+dx)^4}}{de^5}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^5,x]
```

output
```
((b*(-1/3*Sqrt[1 - (c + d*x)^2]/(c + d*x)^3 - (2*Sqrt[1 - (c + d*x)^2])/(3
*(c + d*x))))/4 - (a + b*ArcSin[c + d*x])/(4*(c + d*x)^4))/(d*e^5)
```

### 3.186.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 242
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(c*x)^
(m + 1)*((a + b*x^2)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, p}, x
] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

rule 245
```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[x^(m + 1)*((a +
 b*x^2)^(p + 1)/(a*(m + 1))), x] - Simp[b*((m + 2*(p + 1) + 1)/(a*(m + 1)))
   Int[x^(m + 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, m, p}, x] && ILtQ[Si
mplify[(m + 1)/2 + p + 1], 0] && NeQ[m, -1]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.186.4 Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.89

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{a}{4e^5(dx+c)^4}+\frac{b\left(-\frac{\arcsin(dx+c)}{4(dx+c)^4}-\frac{\sqrt{1-(dx+c)^2}}{12(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)}\right)}{e^5}}{d}$ | 84 |
| default | $\frac{-\frac{a}{4e^5(dx+c)^4}+\frac{b\left(-\frac{\arcsin(dx+c)}{4(dx+c)^4}-\frac{\sqrt{1-(dx+c)^2}}{12(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)}\right)}{e^5}}{d}$ | 84 |
| parts | $-\frac{a}{4e^5(dx+c)^4d}+\frac{b\left(-\frac{\arcsin(dx+c)}{4(dx+c)^4}-\frac{\sqrt{1-(dx+c)^2}}{12(dx+c)^3}-\frac{\sqrt{1-(dx+c)^2}}{6(dx+c)}\right)}{e^5d}$ | 86 |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^5,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/4*a/e^5/(d*x+c)^4+b/e^5*(-1/4/(d*x+c)^4*arcsin(d*x+c)-1/12/(d*x+c)
^3*(1-(d*x+c)^2)^(1/2)-1/6/(d*x+c)*(1-(d*x+c)^2)^(1/2)))
```

### 3.186.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 193 vs. $2(84) = 168$.

Time = 0.29 (sec) , antiderivative size = 193, normalized size of antiderivative = 2.05

$$\int \frac{a + b\arcsin(c + dx)}{(ce + dex)^5} dx = \frac{3\,ad^4x^4 + 12\,acd^3x^3 + 18\,ac^2d^2x^2 + 12\,ac^3dx - 3\,bc^4\arcsin(dx + c) - (2\,bc^4d^3x^3 + 6\,bc^5d^2x^2 + 2\,bc^7 + bc^5}{12\,(c^4d^5e^5x^4 + 4\,c^5d^4e^5x^3 + 6\,c^6d^3e^5x^2 + 4\,c^7d^2e^5x + c^8de^5)}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^5,x, algorithm="fricas")
```

output
```
1/12*(3*a*d^4*x^4 + 12*a*c*d^3*x^3 + 18*a*c^2*d^2*x^2 + 12*a*c^3*d*x - 3*b
*c^4*arcsin(d*x + c) - (2*b*c^4*d^3*x^3 + 6*b*c^5*d^2*x^2 + 2*b*c^7 + b*c^
5 + (6*b*c^6 + b*c^4)*d*x)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/(c^4*d^5*e^
5*x^4 + 4*c^5*d^4*e^5*x^3 + 6*c^6*d^3*e^5*x^2 + 4*c^7*d^2*e^5*x + c^8*d*e^
5)
```

### 3.186.6 Sympy [F]

$$\int \frac{a + b\arcsin(c + dx)}{(ce + dex)^5} dx = \frac{\int \frac{a}{c^5 + 5c^4dx + 10c^3d^2x^2 + 10c^2d^3x^3 + 5cd^4x^4 + d^5x^5} dx + \int \frac{b\,\mathrm{asin}\,(c + dx)}{c^5 + 5c^4dx + 10c^3d^2x^2 + 10c^2d^3x^3 + 5cd^4x^4 + d^5x^5} dx}{e^5}$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**5,x)
```

output
```
(Integral(a/(c**5 + 5*c**4*d*x + 10*c**3*d**2*x**2 + 10*c**2*d**3*x**3 + 5
*c*d**4*x**4 + d**5*x**5), x) + Integral(b*asin(c + d*x)/(c**5 + 5*c**4*d*
x + 10*c**3*d**2*x**2 + 10*c**2*d**3*x**3 + 5*c*d**4*x**4 + d**5*x**5), x)
)/e**5
```

### 3.186.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 263 vs. $2(84) = 168$.

Time = 0.30 (sec) , antiderivative size = 263, normalized size of antiderivative = 2.80

$$\int \frac{a + b\arcsin(c + dx)}{(ce + dex)^5}\,dx$$
$$= \frac{1}{12}b\left(\frac{(2\,d^4x^4 + 8\,cd^3x^3 + 2\,c^4 + (12\,c^2d^2 - d^2)x^2 - c^2 + 2\,(4\,c^3d - cd)x - 1)d}{(d^5e^5x^3 + 3\,cd^4e^5x^2 + 3\,c^2d^3e^5x + c^3d^2e^5)\sqrt{dx + c + 1}\sqrt{-dx - c + 1}} - \frac{3\,\text{arcsi}}{d^5e^5x^4 + 4\,cd^4e^5x^3 + 6\,c}\right.$$
$$- \frac{a}{4\,(d^5e^5x^4 + 4\,cd^4e^5x^3 + 6\,c^2d^3e^5x^2 + 4\,c^3d^2e^5x + c^4de^5)}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^5,x, algorithm="maxima")
```

output
```
1/12*b*((2*d^4*x^4 + 8*c*d^3*x^3 + 2*c^4 + (12*c^2*d^2 - d^2)*x^2 - c^2 +
2*(4*c^3*d - c*d)*x - 1)*d/((d^5*e^5*x^3 + 3*c*d^4*e^5*x^2 + 3*c^2*d^3*e^5
*x + c^3*d^2*e^5)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 3*arcsin(d*x + c
)/(d^5*e^5*x^4 + 4*c*d^4*e^5*x^3 + 6*c^2*d^3*e^5*x^2 + 4*c^3*d^2*e^5*x + c
^4*d*e^5)) - 1/4*a/(d^5*e^5*x^4 + 4*c*d^4*e^5*x^3 + 6*c^2*d^3*e^5*x^2 + 4*
c^3*d^2*e^5*x + c^4*d*e^5)
```

### 3.186.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 447 vs. $2(84) = 168$.

Time = 0.34 (sec) , antiderivative size = 447, normalized size of antiderivative = 4.76

$$\int \frac{a + b\arcsin(c + dx)}{(ce + dex)^5}\,dx =$$
$$-\frac{1}{192}\,de^2\left(\frac{18\,b\arcsin\left(dx + c\right)}{d^2e^7} + \frac{3\left(dx + c\right)^4 b\arcsin\left(dx + c\right)}{d^2e^7\left(\sqrt{-\left(dx + c\right)^2 + 1} + 1\right)^4} + \frac{12\left(dx + c\right)^2 b\arcsin\left(dx + c\right)}{d^2e^7\left(\sqrt{-\left(dx + c\right)^2 + 1} + 1\right)^2} + \frac{12}{}\right.$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^5,x, algorithm="giac")
```

output
```
-1/192*d*e^2*(18*b*arcsin(d*x + c)/(d^2*e^7) + 3*(d*x + c)^4*b*arcsin(d*x
+ c)/(d^2*e^7*(sqrt(-(d*x + c)^2 + 1) + 1)^4) + 12*(d*x + c)^2*b*arcsin(d*
x + c)/(d^2*e^7*(sqrt(-(d*x + c)^2 + 1) + 1)^2) + 12*b*(sqrt(-(d*x + c)^2
+ 1) + 1)^2*arcsin(d*x + c)/((d*x + c)^2*d^2*e^7) + 3*b*(sqrt(-(d*x + c)^2
 + 1) + 1)^4*arcsin(d*x + c)/((d*x + c)^4*d^2*e^7) + 18*a/(d^2*e^7) + 3*(d
*x + c)^4*a/(d^2*e^7*(sqrt(-(d*x + c)^2 + 1) + 1)^4) - 2*(d*x + c)^3*b/(d^
2*e^7*(sqrt(-(d*x + c)^2 + 1) + 1)^3) + 12*(d*x + c)^2*a/(d^2*e^7*(sqrt(-(
d*x + c)^2 + 1) + 1)^2) - 18*(d*x + c)*b/(d^2*e^7*(sqrt(-(d*x + c)^2 + 1)
+ 1)) + 18*b*(sqrt(-(d*x + c)^2 + 1) + 1)/((d*x + c)*d^2*e^7) + 12*a*(sqrt
(-(d*x + c)^2 + 1) + 1)^2/((d*x + c)^2*d^2*e^7) + 2*b*(sqrt(-(d*x + c)^2 +
 1) + 1)^3/((d*x + c)^3*d^2*e^7) + 3*a*(sqrt(-(d*x + c)^2 + 1) + 1)^4/((d*
x + c)^4*d^2*e^7))
```

### 3.186.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^5}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{{(c\,e+d\,e\,x)}^5}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^5,x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^5, x)
```

# 3.187 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx$



## 3.187.1 Optimal result

Integrand size = 21, antiderivative size = 121

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx=-\frac{b\sqrt{1-(c+dx)^2}}{20de^6(c+dx)^4}-\frac{3b\sqrt{1-(c+dx)^2}}{40de^6(c+dx)^2}-\frac{a+b\arcsin(c+dx)}{5de^6(c+dx)^5}-\frac{3b\operatorname{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{40de^6}$$

output
```
1/5*(-a-b*arcsin(d*x+c))/d/e^6/(d*x+c)^5-3/40*b*arctanh((1-(d*x+c)^2)^(1/2
))/d/e^6-1/20*b*(1-(d*x+c)^2)^(1/2)/d/e^6/(d*x+c)^4-3/40*b*(1-(d*x+c)^2)^(
1/2)/d/e^6/(d*x+c)^2
```

## 3.187.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 0.09 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.54

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx=-\frac{\frac{a+b\arcsin(c+dx)}{(c+dx)^5}+b\sqrt{1-(c+dx)^2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},3,\frac{3}{2},1-(c+dx)^2\right)}{5de^6}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^6,x]
```

output
```
-1/5*((a + b*ArcSin[c + d*x])/(c + d*x)^5 + b*Sqrt[1 - (c + d*x)^2]*Hyperg
eometric2F1[1/2, 3, 3/2, 1 - (c + d*x)^2])/(d*e^6)
```

### 3.187.3 Rubi [A] (warning: unable to verify)

Time = 0.26 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.84, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {5304, 27, 5138, 243, 52, 52, 73, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{e^6(c+dx)^6}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{(c+dx)^6}d(c+dx)}{de^6}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{1}{5}b\int \frac{1}{(c+dx)^5\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{a+b\arcsin(c+dx)}{5(c+dx)^5}}{de^6}$$

$$\Big\downarrow \text{243}$$

$$\frac{\frac{1}{10}b\int \frac{1}{\sqrt{-c-dx+1}(c+dx)^6}d(c+dx)^2-\frac{a+b\arcsin(c+dx)}{5(c+dx)^5}}{de^6}$$

$$\Big\downarrow \text{52}$$

$$\frac{\frac{1}{10}b\left(\frac{3}{4}\int \frac{1}{\sqrt{-c-dx+1}(c+dx)^4}d(c+dx)^2-\frac{\sqrt{-c-dx+1}}{2(c+dx)^4}\right)-\frac{a+b\arcsin(c+dx)}{5(c+dx)^5}}{de^6}$$

$$\Big\downarrow \text{52}$$

$$\frac{\frac{1}{10}b\left(\frac{3}{4}\left(\frac{1}{2}\int \frac{1}{\sqrt{-c-dx+1}(c+dx)^2}d(c+dx)^2-\frac{\sqrt{-c-dx+1}}{(c+dx)^2}\right)-\frac{\sqrt{-c-dx+1}}{2(c+dx)^4}\right)-\frac{a+b\arcsin(c+dx)}{5(c+dx)^5}}{de^6}$$

$$\Big\downarrow \text{73}$$

$$\frac{\frac{1}{10}b\left(\frac{3}{4}\left(-\int\frac{1}{1-(c+dx)^4}d\sqrt{-c-dx+1}-\frac{\sqrt{-c-dx+1}}{(c+dx)^2}\right)-\frac{\sqrt{-c-dx+1}}{2(c+dx)^4}\right)-\frac{a+b\arcsin(c+dx)}{5(c+dx)^5}}{de^6}$$

$$\Big\downarrow \; 219$$

$$\frac{\frac{1}{10}b\left(\frac{3}{4}\left(-\text{arctanh}\left(\sqrt{-c-dx+1}\right)-\frac{\sqrt{-c-dx+1}}{(c+dx)^2}\right)-\frac{\sqrt{-c-dx+1}}{2(c+dx)^4}\right)-\frac{a+b\arcsin(c+dx)}{5(c+dx)^5}}{de^6}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^6,x]
```

output
```
(-1/5*(a + b*ArcSin[c + d*x])/(c + d*x)^5 + (b*(-1/2*Sqrt[1 - c - d*x]/(c
+ d*x)^4 + (3*(-(Sqrt[1 - c - d*x]/(c + d*x)^2) - ArcTanh[Sqrt[1 - c - d*x
]]))/4))/10)/(d*e^6)
```

### 3.187.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 52
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Simp[d*((
m + n + 2)/((b*c - a*d)*(m + 1)))   Int[(a + b*x)^(m + 1)*(c + d*x)^n, x],
x] /; FreeQ[{a, b, c, d, n}, x] && ILtQ[m, -1] && FractionQ[n] && LtQ[n, 0]
```

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 243
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/2   Subst[In
t[x^((m - 1)/2)*(a + b*x)^p, x], x, x^2], x] /; FreeQ[{a, b, m, p}, x] && I
ntegerQ[(m - 1)/2]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.187.4 Maple [A] (verified)

Time = 0.27 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.83

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{a}{5e^6(dx+c)^5}+\frac{b\left(-\frac{\arcsin(dx+c)}{5(dx+c)^5}-\frac{\sqrt{1-(dx+c)^2}}{20(dx+c)^4}-\frac{3\sqrt{1-(dx+c)^2}}{40(dx+c)^2}-\frac{3\,\mathrm{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{40}\right)}{e^6}}{d}$ | 100 |
| default | $\frac{-\frac{a}{5e^6(dx+c)^5}+\frac{b\left(-\frac{\arcsin(dx+c)}{5(dx+c)^5}-\frac{\sqrt{1-(dx+c)^2}}{20(dx+c)^4}-\frac{3\sqrt{1-(dx+c)^2}}{40(dx+c)^2}-\frac{3\,\mathrm{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{40}\right)}{e^6}}{d}$ | 100 |
| parts | $-\frac{a}{5e^6(dx+c)^5d}+\frac{b\left(-\frac{\arcsin(dx+c)}{5(dx+c)^5}-\frac{\sqrt{1-(dx+c)^2}}{20(dx+c)^4}-\frac{3\sqrt{1-(dx+c)^2}}{40(dx+c)^2}-\frac{3\,\mathrm{arctanh}\left(\frac{1}{\sqrt{1-(dx+c)^2}}\right)}{40}\right)}{e^6d}$ | 102 |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^6,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/5*a/e^6/(d*x+c)^5+b/e^6*(-1/5/(d*x+c)^5*arcsin(d*x+c)-1/20/(d*x+c)
^4*(1-(d*x+c)^2)^(1/2)-3/40/(d*x+c)^2*(1-(d*x+c)^2)^(1/2)-3/40*arctanh(1/(
1-(d*x+c)^2)^(1/2))))
```

### 3.187.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 321 vs. 2(107) = 214.

Time = 0.34 (sec) , antiderivative size = 321, normalized size of antiderivative = 2.65

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx = -\frac{16\,b\arcsin\left(dx+c\right)+3\left(bd^5x^5+5\,bcd^4x^4+10\,bc^2d^3x^3+10\,bc^3d^2x^2+5\,bc^4dx+bc^5\right)\log\left(\sqrt{-d^2x^2-2\,c}\right.}{}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^6,x, algorithm="fricas")
```

output
```
-1/80*(16*b*arcsin(d*x + c) + 3*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*
x^3 + 10*b*c^3*d^2*x^2 + 5*b*c^4*d*x + b*c^5)*log(sqrt(-d^2*x^2 - 2*c*d*x
- c^2 + 1) + 1) - 3*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + 10*b*c
^3*d^2*x^2 + 5*b*c^4*d*x + b*c^5)*log(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) -
 1) + 2*(3*b*d^3*x^3 + 9*b*c*d^2*x^2 + 3*b*c^3 + (9*b*c^2 + 2*b)*d*x + 2*b
*c)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1) + 16*a)/(d^6*e^6*x^5 + 5*c*d^5*e^6*
x^4 + 10*c^2*d^4*e^6*x^3 + 10*c^3*d^3*e^6*x^2 + 5*c^4*d^2*e^6*x + c^5*d*e^
6)
```

### 3.187.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx = \frac{\int \frac{a}{c^6+6c^5dx+15c^4d^2x^2+20c^3d^3x^3+15c^2d^4x^4+6cd^5x^5+d^6x^6}\,dx+\int \frac{b\operatorname{asin}(c+dx)}{c^6+6c^5dx+15c^4d^2x^2+20c^3d^3x^3+15c^2d^4x^4+6cd^5x^5+d^6x^6}\,dx}{e^6}$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**6,x)
```

output
```
(Integral(a/(c**6 + 6*c**5*d*x + 15*c**4*d**2*x**2 + 20*c**3*d**3*x**3 + 1
5*c**2*d**4*x**4 + 6*c*d**5*x**5 + d**6*x**6), x) + Integral(b*asin(c + d*
x)/(c**6 + 6*c**5*d*x + 15*c**4*d**2*x**2 + 20*c**3*d**3*x**3 + 15*c**2*d*
*4*x**4 + 6*c*d**5*x**5 + d**6*x**6), x))/e**6
```

### 3.187.7 Maxima [F]

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^6} \, dx = \int \frac{b \arcsin(dx + c) + a}{(dex + ce)^6} \, dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^6,x, algorithm="maxima")
```

output
```
-1/5*(5*(d^6*e^6*x^5 + 5*c*d^5*e^6*x^4 + 10*c^2*d^4*e^6*x^3 + 10*c^3*d^3*e
^6*x^2 + 5*c^4*d^2*e^6*x + c^5*d*e^6)*integrate(1/5*e^(1/2*log(d*x + c + 1
) + 1/2*log(-d*x - c + 1))/(d^9*e^6*x^9 + 9*c*d^8*e^6*x^8 + (36*c^2 - 1)*d
^7*e^6*x^7 + 7*(12*c^3 - c)*d^6*e^6*x^6 + 21*(6*c^4 - c^2)*d^5*e^6*x^5 + 7
*(18*c^5 - 5*c^3)*d^4*e^6*x^4 + 7*(12*c^6 - 5*c^4)*d^3*e^6*x^3 + 3*(12*c^7
 - 7*c^5)*d^2*e^6*x^2 + (9*c^8 - 7*c^6)*d*e^6*x + (c^9 - c^7)*e^6 + (d^7*e
^6*x^7 + 7*c*d^6*e^6*x^6 + (21*c^2 - 1)*d^5*e^6*x^5 + 5*(7*c^3 - c)*d^4*e^
6*x^4 + 5*(7*c^4 - 2*c^2)*d^3*e^6*x^3 + (21*c^5 - 10*c^3)*d^2*e^6*x^2 + (7
*c^6 - 5*c^4)*d*e^6*x + (c^7 - c^5)*e^6)*e^(log(d*x + c + 1) + log(-d*x -
c + 1))), x) + arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)))*b/(
d^6*e^6*x^5 + 5*c*d^5*e^6*x^4 + 10*c^2*d^4*e^6*x^3 + 10*c^3*d^3*e^6*x^2 +
5*c^4*d^2*e^6*x + c^5*d*e^6) - 1/5*a/(d^6*e^6*x^5 + 5*c*d^5*e^6*x^4 + 10*c
^2*d^4*e^6*x^3 + 10*c^3*d^3*e^6*x^2 + 5*c^4*d^2*e^6*x + c^5*d*e^6)
```

### 3.187.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 598 vs. $2(107) = 214$.

Time = 0.72 (sec) , antiderivative size = 598, normalized size of antiderivative = 4.94

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx = -\frac{(dx+c)^5 b\arcsin(dx+c)}{160\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^5} - \frac{(dx+c)^3 b\arcsin(dx+c)}{32\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^3} - \frac{(dx+c)b\arcsin(dx+c)}{16\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)\arcsin(dx+c)}{16\,(dx+c)de^6} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^3\arcsin(dx+c)}{32\,(dx+c)^3de^6} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^5\arcsin(dx+c)}{160\,(dx+c)^5de^6} - \frac{3\,b\log\left(\sqrt{-(dx+c)^2+1}+1\right)}{40\,de^6} + \frac{3\,b\log(|dx+c|)}{40\,de^6} - \frac{(dx+c)^5 a}{160\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^5} + \frac{(dx+c)^4 b}{320\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^4} - \frac{(dx+c)^3 a}{32\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^3} + \frac{(dx+c)^2 b}{40\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)^2} - \frac{(dx+c)a}{16\,de^6\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)}{16\,(dx+c)de^6} - \frac{b\left(\sqrt{-(dx+c)^2+1}+1\right)^2}{40\,(dx+c)^2de^6} - \frac{a\left(\sqrt{-(dx+c)^2+1}+1\right)^3}{32\,(dx+c)^3de^6}$$

3.187. $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^6,x, algorithm="giac")
```

output
```
-1/160*(d*x + c)^5*b*arcsin(d*x + c)/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)^5
) - 1/32*(d*x + c)^3*b*arcsin(d*x + c)/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)
^3) - 1/16*(d*x + c)*b*arcsin(d*x + c)/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)
) - 1/16*b*(sqrt(-(d*x + c)^2 + 1) + 1)*arcsin(d*x + c)/((d*x + c)*d*e^6)
- 1/32*b*(sqrt(-(d*x + c)^2 + 1) + 1)^3*arcsin(d*x + c)/((d*x + c)^3*d*e^6
) - 1/160*b*(sqrt(-(d*x + c)^2 + 1) + 1)^5*arcsin(d*x + c)/((d*x + c)^5*d*
e^6) - 3/40*b*log(sqrt(-(d*x + c)^2 + 1) + 1)/(d*e^6) + 3/40*b*log(abs(d*x
 + c))/(d*e^6) - 1/160*(d*x + c)^5*a/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)^5
) + 1/320*(d*x + c)^4*b/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)^4) - 1/32*(d*x
 + c)^3*a/(d*e^6*(sqrt(-(d*x + c)^2 + 1) + 1)^3) + 1/40*(d*x + c)^2*b/(d*e
^6*(sqrt(-(d*x + c)^2 + 1) + 1)^2) - 1/16*(d*x + c)*a/(d*e^6*(sqrt(-(d*x +
 c)^2 + 1) + 1)) - 1/16*a*(sqrt(-(d*x + c)^2 + 1) + 1)/((d*x + c)*d*e^6) -
 1/40*b*(sqrt(-(d*x + c)^2 + 1) + 1)^2/((d*x + c)^2*d*e^6) - 1/32*a*(sqrt(
-(d*x + c)^2 + 1) + 1)^3/((d*x + c)^3*d*e^6) - 1/320*b*(sqrt(-(d*x + c)^2
+ 1) + 1)^4/((d*x + c)^4*d*e^6) - 1/160*a*(sqrt(-(d*x + c)^2 + 1) + 1)^5/(
(d*x + c)^5*d*e^6)
```

### 3.187.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^6}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{(c\,e+d\,e\,x)^6}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^6,x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^6, x)
```

# 3.188 $\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$



## 3.188.1 Optimal result

Integrand size = 23, antiderivative size = 203

$$\begin{aligned}\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx &= -\frac{16}{75}b^2e^4x-\frac{8b^2e^4(c+dx)^3}{225d}-\frac{2b^2e^4(c+dx)^5}{125d}\\ &+\frac{16be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d}\\ &+\frac{8be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{75d}\\ &+\frac{2be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{25d}\\ &+\frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^2}{5d}\end{aligned}$$

output

```
-16/75*b^2*e^4*x-8/225*b^2*e^4*(d*x+c)^3/d-2/125*b^2*e^4*(d*x+c)^5/d+1/5*e
^4*(d*x+c)^5*(a+b*arcsin(d*x+c))^2/d+16/75*b*e^4*(a+b*arcsin(d*x+c))*(1-(d
*x+c)^2)^(1/2)/d+8/75*b*e^4*(d*x+c)^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1
/2)/d+2/25*b*e^4*(d*x+c)^4*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d
```

### 3.188.2 Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 164, normalized size of antiderivative = 0.81

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$$
$$=\frac{e^4\left((c+dx)^5(a+b\arcsin(c+dx))^2-\frac{2}{25}b\left(\frac{20}{9}b(c+dx)^3+b(c+dx)^5-\frac{20}{3}(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^4*((c + d*x)^5*(a + b*ArcSin[c + d*x])^2 - (2*b*((20*b*(c + d*x)^3)/9 +
 b*(c + d*x)^5 - (20*(c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d
*x]))/3 - 5*(c + d*x)^4*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) + (4
0*(b*d*x - Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])))/3))/25))/(5*d)
```

### 3.188.3 Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.87, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {5304, 27, 5138, 5210, 15, 5210, 15, 5182, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$$
$$\Big\downarrow \ 5304$$
$$\frac{\int e^4(c+dx)^4(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$
$$\Big\downarrow \ 27$$
$$\frac{e^4\int (c+dx)^4(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$
$$\Big\downarrow \ 5138$$
$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^2-\frac{2}{5}b\int \frac{(c+dx)^5(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$
$$\Big\downarrow \ 5210$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^2-\frac{2}{5}b\left(\frac{4}{5}\int\frac{(c+dx)^3(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{5}b\int(c+dx)^4d(c+dx)-\frac{1}{5}\sqrt{1}\right.}{d}$$

$$\Big\downarrow \textbf{15}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^2-\frac{2}{5}b\left(\frac{4}{5}\int\frac{(c+dx)^3(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{5}\sqrt{1-(c+dx)^2}(c+dx)^4(a+\right.}{d}$$

$$\Big\downarrow \textbf{5210}$$

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^2-\frac{2}{5}b\left(\frac{4}{5}\left(\frac{2}{3}\int\frac{(c+dx)(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{3}b\int(c+dx)^2d(c+dx)-\frac{1}{3}\sqrt{}\right.\right.\right.$$

$$\Big\downarrow \textbf{15}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^2-\frac{2}{5}b\left(\frac{4}{5}\left(\frac{2}{3}\int\frac{(c+dx)(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{3}\sqrt{1-(c+dx)^2}(c+dx)^2(a\right.\right.\right.}{d}$$

$$\Big\downarrow \textbf{5182}$$

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^2-\frac{2}{5}b\left(\frac{4}{5}\left(\frac{2}{3}\left(b\int 1d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))\right)-\frac{1}{3}\sqrt{1}\right.\right.\right.$$

$$\Big\downarrow \textbf{24}$$

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^2-\frac{2}{5}b\left(-\frac{1}{5}\sqrt{1-(c+dx)^2}(c+dx)^4(a+b\arcsin(c+dx))+\frac{4}{5}\left(-\frac{1}{3}\sqrt{1-(c+\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^4*(((c + d*x)^5*(a + b*ArcSin[c + d*x])^2)/5 - (2*b*((b*(c + d*x)^5)/25
 - ((c + d*x)^4*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/5 + (4*((b*
(c + d*x)^3)/9 - ((c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]
))/3 + (2*(b*(c + d*x) - Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])))/3
))/5))/5))/d
```

## 3.188. $\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$

### 3.188.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.188.4 Maple [A] (verified)

Time = 1.04 (sec) , antiderivative size = 194, normalized size of antiderivative = 0.96

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{e^4a^2(dx+c)^5}{5}+e^4b^2\left(\frac{(dx+c)^5\arcsin(dx+c)^2}{5}+\frac{2\arcsin(dx+c)\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{75}-\frac{2(dx+c)^5}{125}-\frac{8(dx+c)^3}{225}-\frac{16}{7}\right.}{d}$ |
| default | $\frac{\frac{e^4a^2(dx+c)^5}{5}+e^4b^2\left(\frac{(dx+c)^5\arcsin(dx+c)^2}{5}+\frac{2\arcsin(dx+c)\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{75}-\frac{2(dx+c)^5}{125}-\frac{8(dx+c)^3}{225}-\frac{16}{7}\right.}{d}$ |
| parts | $\frac{e^4a^2(dx+c)^5}{5d}+\frac{e^4b^2\left(\frac{(dx+c)^5\arcsin(dx+c)^2}{5}+\frac{2\arcsin(dx+c)\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{75}-\frac{2(dx+c)^5}{125}-\frac{8(dx+c)^3}{225}-\right.}{d}$ |

input
```
int((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/5*e^4*a^2*(d*x+c)^5+e^4*b^2*(1/5*(d*x+c)^5*arcsin(d*x+c)^2+2/75*arc
sin(d*x+c)*(3*(d*x+c)^4+4*(d*x+c)^2+8)*(1-(d*x+c)^2)^(1/2)-2/125*(d*x+c)^5
-8/225*(d*x+c)^3-16/75*d*x-16/75*c)+2*e^4*a*b*(1/5*(d*x+c)^5*arcsin(d*x+c)
+1/25*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)+4/75*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+8/7
5*(1-(d*x+c)^2)^(1/2)))
```

### 3.188.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 567 vs. $2(183) = 366$.

Time = 0.28 (sec) , antiderivative size = 567, normalized size of antiderivative = 2.79

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$$
$$=\frac{9\,(25\,a^2-2\,b^2)d^5e^4x^5+45\,(25\,a^2-2\,b^2)cd^4e^4x^4+10\,(9\,(25\,a^2-2\,b^2)c^2-4\,b^2)d^3e^4x^3+30\,(3\,(25\,a^2-2\,b^2)\dots}{}$$

input
```
integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
1/1125*(9*(25*a^2 - 2*b^2)*d^5*e^4*x^5 + 45*(25*a^2 - 2*b^2)*c*d^4*e^4*x^4
 + 10*(9*(25*a^2 - 2*b^2)*c^2 - 4*b^2)*d^3*e^4*x^3 + 30*(3*(25*a^2 - 2*b^2
)*c^3 - 4*b^2*c)*d^2*e^4*x^2 + 15*(3*(25*a^2 - 2*b^2)*c^4 - 8*b^2*c^2 - 16
*b^2)*d*e^4*x + 225*(b^2*d^5*e^4*x^5 + 5*b^2*c*d^4*e^4*x^4 + 10*b^2*c^2*d^
3*e^4*x^3 + 10*b^2*c^3*d^2*e^4*x^2 + 5*b^2*c^4*d*e^4*x + b^2*c^5*e^4)*arcs
in(d*x + c)^2 + 450*(a*b*d^5*e^4*x^5 + 5*a*b*c*d^4*e^4*x^4 + 10*a*b*c^2*d^
3*e^4*x^3 + 10*a*b*c^3*d^2*e^4*x^2 + 5*a*b*c^4*d*e^4*x + a*b*c^5*e^4)*arcs
in(d*x + c) + 30*(3*a*b*d^4*e^4*x^4 + 12*a*b*c*d^3*e^4*x^3 + 2*(9*a*b*c^2
+ 2*a*b)*d^2*e^4*x^2 + 4*(3*a*b*c^3 + 2*a*b*c)*d*e^4*x + (3*a*b*c^4 + 4*a*
b*c^2 + 8*a*b)*e^4 + (3*b^2*d^4*e^4*x^4 + 12*b^2*c*d^3*e^4*x^3 + 2*(9*b^2*
c^2 + 2*b^2)*d^2*e^4*x^2 + 4*(3*b^2*c^3 + 2*b^2*c)*d*e^4*x + (3*b^2*c^4 +
4*b^2*c^2 + 8*b^2)*e^4)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
))/d
```

### 3.188.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1268 vs. $2(184) = 368$.

Time = 0.64 (sec) , antiderivative size = 1268, normalized size of antiderivative = 6.25

$$\int (ce + dex)^4 (a + b \arcsin(c + dx))^2 \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)**4*(a+b*asin(d*x+c))**2,x)
```

output
```
Piecewise((a**2*c**4*e**4*x + 2*a**2*c**3*d*e**4*x**2 + 2*a**2*c**2*d**2*e
**4*x**3 + a**2*c*d**3*e**4*x**4 + a**2*d**4*e**4*x**5/5 + 2*a*b*c**5*e**4
*asin(c + d*x)/(5*d) + 2*a*b*c**4*e**4*x*asin(c + d*x) + 2*a*b*c**4*e**4*s
qrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(25*d) + 4*a*b*c**3*d*e**4*x**2*asin(
c + d*x) + 8*a*b*c**3*e**4*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 4*
a*b*c**2*d**2*e**4*x**3*asin(c + d*x) + 12*a*b*c**2*d*e**4*x**2*sqrt(-c**2
 - 2*c*d*x - d**2*x**2 + 1)/25 + 8*a*b*c**2*e**4*sqrt(-c**2 - 2*c*d*x - d*
*2*x**2 + 1)/(75*d) + 2*a*b*c*d**3*e**4*x**4*asin(c + d*x) + 8*a*b*c*d**2*
e**4*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 16*a*b*c*e**4*x*sqrt(
-c**2 - 2*c*d*x - d**2*x**2 + 1)/75 + 2*a*b*d**4*e**4*x**5*asin(c + d*x)/5
 + 2*a*b*d**3*e**4*x**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 8*a*b*d
*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/75 + 16*a*b*e**4*sqrt(-c*
*2 - 2*c*d*x - d**2*x**2 + 1)/(75*d) + b**2*c**5*e**4*asin(c + d*x)**2/(5*
d) + b**2*c**4*e**4*x*asin(c + d*x)**2 - 2*b**2*c**4*e**4*x/25 + 2*b**2*c*
*4*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(25*d) + 2*b**
2*c**3*d*e**4*x**2*asin(c + d*x)**2 - 4*b**2*c**3*d*e**4*x**2/25 + 8*b**2*
c**3*e**4*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/25 + 2*b**
2*c**2*d**2*e**4*x**3*asin(c + d*x)**2 - 4*b**2*c**2*d**2*e**4*x**3/25 + 1
2*b**2*c**2*d*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x
)/25 - 8*b**2*c**2*e**4*x/75 + 8*b**2*c**2*e**4*sqrt(-c**2 - 2*c*d*x - ...
```

### 3.188.7 Maxima [F]

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^4(b\arcsin(dx+c)+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
1/5*a^2*d^4*e^4*x^5 + a^2*c*d^3*e^4*x^4 + 2*a^2*c^2*d^2*e^4*x^3 + 2*a^2*c^
3*d*e^4*x^2 + 2*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sq
rt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^
2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3
*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a*b*c^3*d*e^4 + 2/3*(6*x^3*arc
sin(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*ar
csin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 -
 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2
*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4
 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*a*b*c^2*d^2*e^4 +
1/12*(24*x^4*arcsin(d*x + c) + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d
^2 - 14*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^
2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x
 - c^2 + 1)*c^2*x/d^4 - 90*(c^2 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^
2 - (c^2 - 1)*d^2))/d^5 - 105*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 -
 9*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcs
in(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 -
2*c*d*x - c^2 + 1)*(c^2 - 1)*c/d^5)*d)*a*b*c*d^3*e^4 + 1/300*(120*x^5*arcs
in(d*x + c) + (24*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^4/d^2 - 54*sqrt(-d^
2*x^2 - 2*c*d*x - c^2 + 1)*c*x^3/d^3 + 126*sqrt(-d^2*x^2 - 2*c*d*x - c^...
```

### 3.188.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 443 vs. $2(183) = 366$.

Time = 0.32 (sec) , antiderivative size = 443, normalized size of antiderivative = 2.18

$$
\begin{aligned}
&\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx\\
&=\frac{(dx+c)^5a^2e^4}{5\,d}+\frac{\left((dx+c)^2-1\right)^2(dx+c)b^2e^4\arcsin{(dx+c)}^2}{5\,d}\\
&+\frac{2\left((dx+c)^2-1\right)^2(dx+c)abe^4\arcsin{(dx+c)}}{5\,d}\\
&+\frac{2\left((dx+c)^2-1\right)(dx+c)b^2e^4\arcsin{(dx+c)}^2}{5\,d}\\
&+\frac{2\left((dx+c)^2-1\right)^2\sqrt{-(dx+c)^2+1}b^2e^4\arcsin{(dx+c)}}{25\,d}\\
&-\frac{2\left((dx+c)^2-1\right)^2(dx+c)b^2e^4}{125\,d}+\frac{4\left((dx+c)^2-1\right)(dx+c)abe^4\arcsin{(dx+c)}}{5\,d}\\
&+\frac{(dx+c)b^2e^4\arcsin{(dx+c)}^2}{5\,d}+\frac{2\left((dx+c)^2-1\right)^2\sqrt{-(dx+c)^2+1}abe^4}{25\,d}\\
&-\frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^2e^4\arcsin{(dx+c)}}{15\,d}-\frac{76\left((dx+c)^2-1\right)(dx+c)b^2e^4}{1125\,d}\\
&+\frac{2\,(dx+c)abe^4\arcsin{(dx+c)}}{5\,d}-\frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}abe^4}{15\,d}\\
&+\frac{2\sqrt{-(dx+c)^2+1}b^2e^4\arcsin{(dx+c)}}{5\,d}-\frac{298\,(dx+c)b^2e^4}{1125\,d}+\frac{2\sqrt{-(dx+c)^2+1}abe^4}{5\,d}
\end{aligned}
$$

input
```
integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
1/5*(d*x + c)^5*a^2*e^4/d + 1/5*((d*x + c)^2 - 1)^2*(d*x + c)*b^2*e^4*arcs
in(d*x + c)^2/d + 2/5*((d*x + c)^2 - 1)^2*(d*x + c)*a*b*e^4*arcsin(d*x + c
)/d + 2/5*((d*x + c)^2 - 1)*(d*x + c)*b^2*e^4*arcsin(d*x + c)^2/d + 2/25*(
(d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b^2*e^4*arcsin(d*x + c)/d - 2/12
5*((d*x + c)^2 - 1)^2*(d*x + c)*b^2*e^4/d + 4/5*((d*x + c)^2 - 1)*(d*x + c
)*a*b*e^4*arcsin(d*x + c)/d + 1/5*(d*x + c)*b^2*e^4*arcsin(d*x + c)^2/d +
2/25*((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*a*b*e^4/d - 4/15*(-(d*x +
c)^2 + 1)^(3/2)*b^2*e^4*arcsin(d*x + c)/d - 76/1125*((d*x + c)^2 - 1)*(d*x
 + c)*b^2*e^4/d + 2/5*(d*x + c)*a*b*e^4*arcsin(d*x + c)/d - 4/15*(-(d*x +
c)^2 + 1)^(3/2)*a*b*e^4/d + 2/5*sqrt(-(d*x + c)^2 + 1)*b^2*e^4*arcsin(d*x
+ c)/d - 298/1125*(d*x + c)*b^2*e^4/d + 2/5*sqrt(-(d*x + c)^2 + 1)*a*b*e^4
/d
```

3.188. $\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx$

### 3.188.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^2\,dx=\int (c\,e+d\,e\,x)^4\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

input
```
int((c*e + d*e*x)^4*(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^4*(a + b*asin(c + d*x))^2, x)
```

# 3.189 $\int (ce+dex)^3(a+b\arcsin (c+dx))^2\,dx$



## 3.189.1 Optimal result

Integrand size = 23, antiderivative size = 176

$$\begin{aligned}\int (ce+dex)^3(a+b\arcsin (c+dx))^2\,dx &= -\frac{3b^2e^3(c+dx)^2}{32d}-\frac{b^2e^3(c+dx)^4}{32d}+\frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin (c+dx))}{16d}\\ &\quad+\frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin (c+dx))}{8d}\\ &\quad-\frac{3e^3(a+b\arcsin (c+dx))^2}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin (c+dx))^2}{4d}\end{aligned}$$

output
```
-3/32*b^2*e^3*(d*x+c)^2/d-1/32*b^2*e^3*(d*x+c)^4/d-3/32*e^3*(a+b*arcsin(d*
x+c))^2/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))^2/d+3/16*b*e^3*(d*x+c)*(a+
b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d+1/8*b*e^3*(d*x+c)^3*(a+b*arcsin(d*x
+c))*(1-(d*x+c)^2)^(1/2)/d
```

## 3.189.2 Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 142, normalized size of antiderivative = 0.81

$$\int (ce+dex)^3(a+b\arcsin (c+dx))^2\,dx = \frac{e^3\Big((c+dx)^4(a+b\arcsin (c+dx))^2+\frac{1}{8}\Big(-b^2(c+dx)^4+4b(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin (c+dx)}{4d}$$

input
```
Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^3*((c + d*x)^4*(a + b*ArcSin[c + d*x])^2 + (-(b^2*(c + d*x)^4) + 4*b*(c
 + d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) - 3*(b^2*(c + d*x)
^2 - 2*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) + (a + b*
ArcSin[c + d*x])^2))/8))/(4*d)
```

## 3.189.3 Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.88, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {5304, 27, 5138, 5210, 15, 5210, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e^3(c+dx)^3(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^3\int (c+dx)^3(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\int \frac{(c+dx)^4(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{5210}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\int \frac{(c+dx)^2(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{4}b\int (c+dx)^3d(c+dx)-\frac{1}{4}\sqrt{1}\right.\right.}{d}$$

$$\Big\downarrow \text{15}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\int \frac{(c+dx)^2(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{4}\sqrt{1-(c+dx)^2}(c+dx)^3(a+\right.\right.}{d}$$

$$\Big\downarrow \text{5210}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{a+b\arcsin(c+dx)}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{2}b\int(c+dx)d(c+dx)-\frac{1}{2}(c+dx)\sqrt{\right.\right.\right.}{d}$$

$\downarrow$ 15

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{a+b\arcsin(c+dx)}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{2}\sqrt{1-(c+dx)^2}(c+dx)(a+b\arcsi\right.\right.\right.}{d}$$

$\downarrow$ 5152

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(-\frac{1}{4}\sqrt{1-(c+dx)^2}(c+dx)^3(a+b\arcsin(c+dx))+\frac{3}{4}\left(-\frac{1}{2}\sqrt{1-(c+\right.\right.\right.}{d}$$

input
```
Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^3*(((c + d*x)^4*(a + b*ArcSin[c + d*x])^2)/4 - (b*((b*(c + d*x)^4)/16 -
 ((c + d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/4 + (3*((b*(c
 + d*x)^2)/4 - ((c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/2
 + (a + b*ArcSin[c + d*x])^2/(4*b)))/4))/2))/d
```

### 3.189.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.189.4 Maple [A] (verified)

Time = 0.89 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.15

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{e^3a^2(dx+c)^4}{4}+e^3b^2\left(\frac{(dx+c)^4\arcsin(dx+c)^2}{4}-\frac{\arcsin(dx+c)\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{16}+\right.}{}$ |
| default | $\frac{\frac{e^3a^2(dx+c)^4}{4}+e^3b^2\left(\frac{(dx+c)^4\arcsin(dx+c)^2}{4}-\frac{\arcsin(dx+c)\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{16}+\right.}{}$ |
| parts | $\frac{e^3a^2(dx+c)^4}{4d}+\frac{e^3b^2\left(\frac{(dx+c)^4\arcsin(dx+c)^2}{4}-\frac{\arcsin(dx+c)\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{16}\right.}{d}$ |

input
```
int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/4*e^3*a^2*(d*x+c)^4+e^3*b^2*(1/4*(d*x+c)^4*arcsin(d*x+c)^2-1/16*arc
sin(d*x+c)*(-2*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)
+3*arcsin(d*x+c))+3/32*arcsin(d*x+c)^2-1/128*(2*(d*x+c)^2+3)^2)+2*e^3*a*b*
(1/4*(d*x+c)^4*arcsin(d*x+c)+1/16*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)+3/32*(d*x+
c)*(1-(d*x+c)^2)^(1/2)-3/32*arcsin(d*x+c)))
```

### 3.189.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 442 vs. $2(160) = 320$.

Time = 0.27 (sec) , antiderivative size = 442, normalized size of antiderivative = 2.51

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx$$
$$= \frac{(8\,a^2-b^2)d^4e^3x^4+4\,(8\,a^2-b^2)cd^3e^3x^3+3\,(2\,(8\,a^2-b^2)c^2-b^2)d^2e^3x^2+2\,(2\,(8\,a^2-b^2)c^3-3\,b^2c)de^3x\ \cdots}{}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
1/32*((8*a^2 - b^2)*d^4*e^3*x^4 + 4*(8*a^2 - b^2)*c*d^3*e^3*x^3 + 3*(2*(8*
a^2 - b^2)*c^2 - b^2)*d^2*e^3*x^2 + 2*(2*(8*a^2 - b^2)*c^3 - 3*b^2*c)*d*e^
3*x + (8*b^2*d^4*e^3*x^4 + 32*b^2*c*d^3*e^3*x^3 + 48*b^2*c^2*d^2*e^3*x^2 +
 32*b^2*c^3*d*e^3*x + (8*b^2*c^4 - 3*b^2)*e^3)*arcsin(d*x + c)^2 + 2*(8*a*
b*d^4*e^3*x^4 + 32*a*b*c*d^3*e^3*x^3 + 48*a*b*c^2*d^2*e^3*x^2 + 32*a*b*c^3
*d*e^3*x + (8*a*b*c^4 - 3*a*b)*e^3)*arcsin(d*x + c) + 2*(2*a*b*d^3*e^3*x^3
 + 6*a*b*c*d^2*e^3*x^2 + 3*(2*a*b*c^2 + a*b)*d*e^3*x + (2*a*b*c^3 + 3*a*b*
c)*e^3 + (2*b^2*d^3*e^3*x^3 + 6*b^2*c*d^2*e^3*x^2 + 3*(2*b^2*c^2 + b^2)*d*
e^3*x + (2*b^2*c^3 + 3*b^2*c)*e^3)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*
x - c^2 + 1))/d
```

### 3.189.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 916 vs. $2(155) = 310$.

Time = 0.49 (sec) , antiderivative size = 916, normalized size of antiderivative = 5.20

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx$$
$$= \begin{cases} a^2c^3e^3x+\frac{3a^2c^2de^3x^2}{2}+a^2cd^2e^3x^3+\frac{a^2d^3e^3x^4}{4}+\frac{abc^4e^3\operatorname{asin}(c+dx)}{2d}+2abc^3e^3x\operatorname{asin}(c+dx)+\frac{abc^3e^3\sqrt{-c^2-2cdx-\cdots}}{8d}\cdots \\ c^3e^3x(a+b\operatorname{asin}(c))^2 \end{cases}$$

input
```
integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**2,x)
```

output
```
Piecewise((a**2*c**3*e**3*x + 3*a**2*c**2*d*e**3*x**2/2 + a**2*c*d**2*e**3
*x**3 + a**2*d**3*e**3*x**4/4 + a*b*c**4*e**3*asin(c + d*x)/(2*d) + 2*a*b*
c**3*e**3*x*asin(c + d*x) + a*b*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)/(8*d) + 3*a*b*c**2*d*e**3*x**2*asin(c + d*x) + 3*a*b*c**2*e**3*x*sqr
t(-c**2 - 2*c*d*x - d**2*x**2 + 1)/8 + 2*a*b*c*d**2*e**3*x**3*asin(c + d*x
) + 3*a*b*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/8 + 3*a*b*c*
e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(16*d) + a*b*d**3*e**3*x**4*asi
n(c + d*x)/2 + a*b*d**2*e**3*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/8
+ 3*a*b*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/16 - 3*a*b*e**3*asin(
c + d*x)/(16*d) + b**2*c**4*e**3*asin(c + d*x)**2/(4*d) + b**2*c**3*e**3*x
*asin(c + d*x)**2 - b**2*c**3*e**3*x/8 + b**2*c**3*e**3*sqrt(-c**2 - 2*c*d
*x - d**2*x**2 + 1)*asin(c + d*x)/(8*d) + 3*b**2*c**2*d*e**3*x**2*asin(c +
 d*x)**2/2 - 3*b**2*c**2*d*e**3*x**2/16 + 3*b**2*c**2*e**3*x*sqrt(-c**2 -
2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/8 + b**2*c*d**2*e**3*x**3*asin(c +
d*x)**2 - b**2*c*d**2*e**3*x**3/8 + 3*b**2*c*d*e**3*x**2*sqrt(-c**2 - 2*c*
d*x - d**2*x**2 + 1)*asin(c + d*x)/8 - 3*b**2*c*e**3*x/16 + 3*b**2*c*e**3*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(16*d) + b**2*d**3*e**
3*x**4*asin(c + d*x)**2/4 - b**2*d**3*e**3*x**4/32 + b**2*d**2*e**3*x**3*s
qrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/8 - 3*b**2*d*e**3*x**2/
32 + 3*b**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/...
```

### 3.189.7 Maxima [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx=\int (dex+ce)^3(b\arcsin{(dx+c)}+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
1/4*a^2*d^3*e^3*x^4 + a^2*c*d^2*e^3*x^3 + 3/2*a^2*c^2*d*e^3*x^2 + 3/2*(2*x
^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 -
1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin
(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c
*d*x - c^2 + 1)*c/d^3))*a*b*c^2*d*e^3 + 1/3*(6*x^3*arcsin(d*x + c) + d*(2*
sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/
sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*
c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2
))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 -
 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*a*b*c*d^2*e^3 + 1/48*(24*x^4*arcsin(d*
x + c) + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-d^2*x^2
- 2*c*d*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^
2 - (c^2 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x/d^4
- 90*(c^2 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^
5 - 105*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2 - 2*c
*d*x - c^2 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)/sqrt
(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^
2 - 1)*c/d^5)*d)*a*b*d^3*e^3 + a^2*c^3*e^3*x + 2*((d*x + c)*arcsin(d*x + c
) + sqrt(-(d*x + c)^2 + 1))*a*b*c^3*e^3/d + 1/4*(b^2*d^3*e^3*x^4 + 4*b^2*c
*d^2*e^3*x^3 + 6*b^2*c^2*d*e^3*x^2 + 4*b^2*c^3*e^3*x)*arctan2(d*x + c, ...
```

### 3.189.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 342 vs. $2(160) = 320$.

Time = 0.32 (sec) , antiderivative size = 342, normalized size of antiderivative = 1.94

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx = \frac{(dx+c)^4a^2e^3}{4\,d} + \frac{\left((dx+c)^2-1\right)^2b^2e^3\arcsin\left(dx+c\right)^2}{4\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)b^2e^3\arcsin\left(dx+c\right)}{8\,d} + \frac{\left((dx+c)^2-1\right)^2abe^3\arcsin\left(dx+c\right)}{2\,d} + \frac{\left((dx+c)^2-1\right)b^2e^3\arcsin\left(dx+c\right)^2}{2\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)abe^3}{8\,d} + \frac{5\,\sqrt{-(dx+c)^2+1}(dx+c)b^2e^3\arcsin\left(dx+c\right)}{16\,d} - \frac{\left((dx+c)^2-1\right)^2b^2e^3}{32\,d} + \frac{\left((dx+c)^2-1\right)abe^3\arcsin\left(dx+c\right)}{d} + \frac{5\,b^2e^3\arcsin\left(dx+c\right)^2}{32\,d} + \frac{5\,\sqrt{-(dx+c)^2+1}(dx+c)abe^3}{16\,d} - \frac{5\,\left((dx+c)^2-1\right)b^2e^3}{32\,d} + \frac{5\,abe^3\arcsin\left(dx+c\right)}{16\,d} - \frac{17\,b^2e^3}{256\,d}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

3.189. $\int (ce+dex)^3(a+b\arcsin(c+dx))^2\,dx$

output
```
1/4*(d*x + c)^4*a^2*e^3/d + 1/4*((d*x + c)^2 - 1)^2*b^2*e^3*arcsin(d*x + c
)^2/d - 1/8*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*b^2*e^3*arcsin(d*x + c)/d +
 1/2*((d*x + c)^2 - 1)^2*a*b*e^3*arcsin(d*x + c)/d + 1/2*((d*x + c)^2 - 1)
*b^2*e^3*arcsin(d*x + c)^2/d - 1/8*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a*b*
e^3/d + 5/16*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^2*e^3*arcsin(d*x + c)/d -
1/32*((d*x + c)^2 - 1)^2*b^2*e^3/d + ((d*x + c)^2 - 1)*a*b*e^3*arcsin(d*x
+ c)/d + 5/32*b^2*e^3*arcsin(d*x + c)^2/d + 5/16*sqrt(-(d*x + c)^2 + 1)*(d
*x + c)*a*b*e^3/d - 5/32*((d*x + c)^2 - 1)*b^2*e^3/d + 5/16*a*b*e^3*arcsin
(d*x + c)/d - 17/256*b^2*e^3/d
```

### 3.189.9 Mupad [F(-1)]

Timed out.

$$\int (ce + dex)^3 (a + b \arcsin(c + dx))^2 \, dx = \int (c\,e + d\,e\,x)^3 \,(a + b \operatorname{asin}(c + d\,x))^2 \, dx$$

input
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^2, x)
```

# 3.190 $\int (ce + dex)^2 (a + b \arcsin(c + dx))^2 \, dx$



## 3.190.1 Optimal result

Integrand size = 23, antiderivative size = 140

$$
\begin{aligned}
&\int (ce + dex)^2 (a + b \arcsin(c + dx))^2 \, dx \\
&= -\frac{4}{9} b^2 e^2 x - \frac{2b^2 e^2 (c + dx)^3}{27d} + \frac{4be^2 \sqrt{1 - (c + dx)^2} (a + b \arcsin(c + dx))}{9d} \\
&\quad + \frac{2be^2 (c + dx)^2 \sqrt{1 - (c + dx)^2} (a + b \arcsin(c + dx))}{9d} \\
&\quad + \frac{e^2 (c + dx)^3 (a + b \arcsin(c + dx))^2}{3d}
\end{aligned}
$$

output
```
-4/9*b^2*e^2*x-2/27*b^2*e^2*(d*x+c)^3/d+1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+
c))^2/d+4/9*b*e^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d+2/9*b*e^2*(d*x
+c)^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d
```

## 3.190.2 Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.80

$$
\begin{aligned}
&\int (ce + dex)^2 (a + b \arcsin(c + dx))^2 \, dx \\
&= \frac{e^2 \left( (c + dx)^3 (a + b \arcsin(c + dx))^2 - \frac{2}{9} b \left( 6bdx + b(c + dx)^3 - 6\sqrt{1 - (c + dx)^2} (a + b \arcsin(c + dx)) - \right.\right.}{3d}
\end{aligned}
$$

input
```
Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^2*((c + d*x)^3*(a + b*ArcSin[c + d*x])^2 - (2*b*(6*b*d*x + b*(c + d*x)^
3 - 6*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) - 3*(c + d*x)^2*Sqrt[1
 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])))/9))/(3*d)
```

## 3.190.3 Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.89, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {5304, 27, 5138, 5210, 15, 5182, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int e^2(c+dx)^2(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e^2\int (c+dx)^2(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5138}$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\int \frac{(c+dx)^3(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{ 5210}$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\left(\frac{2}{3}\int \frac{(c+dx)(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{3}b\int (c+dx)^2d(c+dx)-\frac{1}{3}\sqrt{1-\right.\right.}{d}$$

$$\Big\downarrow \text{ 15}$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\left(\frac{2}{3}\int \frac{(c+dx)(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{3}\sqrt{1-(c+dx)^2}(c+dx)^2(a+b\right.\right.}{d}$$

$$\Big\downarrow \text{ 5182}$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\left(\frac{2}{3}\left(b\int 1d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))\right)-\frac{1}{3}\sqrt{1-(\right.\right.}{d}$$

$$\Big\downarrow \; 24$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\left(-\frac{1}{3}\sqrt{1-(c+dx)^2}(c+dx)^2(a+b\arcsin(c+dx))+\frac{2}{3}\left(b(c+dx)-\sqrt{\right.\right.\right.}{d}$$

input
```
Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^2*(((c + d*x)^3*(a + b*ArcSin[c + d*x])^2)/3 - (2*b*((b*(c + d*x)^3)/9
- ((c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/3 + (2*(b*(c
 + d*x) - Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])))/3))/3))/d
```

### 3.190.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.190.4 Maple [A] (verified)

Time = 1.00 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.09

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{a^2e^2(dx+c)^3}{3}+e^2b^2\left(\frac{(dx+c)^3\arcsin(dx+c)^2}{3}+\frac{2\arcsin(dx+c)\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{2(dx+c)^3}{27}-\frac{4dx}{9}-\frac{4c}{9}\right)+2e^2ab\left(\frac{(dx+\cdots}{}\right.}{d}$ |
| default | $\frac{\frac{a^2e^2(dx+c)^3}{3}+e^2b^2\left(\frac{(dx+c)^3\arcsin(dx+c)^2}{3}+\frac{2\arcsin(dx+c)\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{2(dx+c)^3}{27}-\frac{4dx}{9}-\frac{4c}{9}\right)+2e^2ab\left(\frac{(dx+\cdots}{}\right.}{d}$ |
| parts | $\frac{a^2e^2(dx+c)^3}{3d}+\frac{e^2b^2\left(\frac{(dx+c)^3\arcsin(dx+c)^2}{3}+\frac{2\arcsin(dx+c)\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{2(dx+c)^3}{27}-\frac{4dx}{9}-\frac{4c}{9}\right)}{d}+\frac{2e^2ab\left(\cdots\right.}{}$ |

input
```
int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/3*a^2*e^2*(d*x+c)^3+e^2*b^2*(1/3*(d*x+c)^3*arcsin(d*x+c)^2+2/9*arcs
in(d*x+c)*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-2/27*(d*x+c)^3-4/9*d*x-4/9*c)+
2*e^2*a*b*(1/3*(d*x+c)^3*arcsin(d*x+c)+1/9*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+2
/9*(1-(d*x+c)^2)^(1/2)))
```

### 3.190.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 307 vs. $2(126) = 252$.

Time = 0.26 (sec) , antiderivative size = 307, normalized size of antiderivative = 2.19

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx$$
$$= \frac{(9\,a^2-2\,b^2)d^3e^2x^3+3\,(9\,a^2-2\,b^2)cd^2e^2x^2+3\,((9\,a^2-2\,b^2)c^2-4\,b^2)de^2x+9\,(b^2d^3e^2x^3+3\,b^2cd^2e^2x^2+}{}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
1/27*((9*a^2 - 2*b^2)*d^3*e^2*x^3 + 3*(9*a^2 - 2*b^2)*c*d^2*e^2*x^2 + 3*((
9*a^2 - 2*b^2)*c^2 - 4*b^2)*d*e^2*x + 9*(b^2*d^3*e^2*x^3 + 3*b^2*c*d^2*e^2
*x^2 + 3*b^2*c^2*d*e^2*x + b^2*c^3*e^2)*arcsin(d*x + c)^2 + 18*(a*b*d^3*e^
2*x^3 + 3*a*b*c*d^2*e^2*x^2 + 3*a*b*c^2*d*e^2*x + a*b*c^3*e^2)*arcsin(d*x
+ c) + 6*(a*b*d^2*e^2*x^2 + 2*a*b*c*d*e^2*x + (a*b*c^2 + 2*a*b)*e^2 + (b^2
*d^2*e^2*x^2 + 2*b^2*c*d*e^2*x + (b^2*c^2 + 2*b^2)*e^2)*arcsin(d*x + c))*s
qrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

### 3.190.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 610 vs. $2(126) = 252$.

Time = 0.31 (sec) , antiderivative size = 610, normalized size of antiderivative = 4.36

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx$$
$$= \begin{cases} a^2c^2e^2x+a^2cde^2x^2+\frac{a^2d^2e^2x^3}{3}+\frac{2abc^3e^2\operatorname{asin}(c+dx)}{3d}+2abc^2e^2x\operatorname{asin}(c+dx)+\frac{2abc^2e^2\sqrt{-c^2-2cdx-d^2x^2+1}}{9d}+2a \\ c^2e^2x(a+b\operatorname{asin}(c))^2 \end{cases}$$

input
```
integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**2,x)
```

output
```
Piecewise((a**2*c**2*e**2*x + a**2*c*d*e**2*x**2 + a**2*d**2*e**2*x**3/3 +
 2*a*b*c**3*e**2*asin(c + d*x)/(3*d) + 2*a*b*c**2*e**2*x*asin(c + d*x) + 2
*a*b*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(9*d) + 2*a*b*c*d*e**
2*x**2*asin(c + d*x) + 4*a*b*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1
)/9 + 2*a*b*d**2*e**2*x**3*asin(c + d*x)/3 + 2*a*b*d*e**2*x**2*sqrt(-c**2
- 2*c*d*x - d**2*x**2 + 1)/9 + 4*a*b*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)/(9*d) + b**2*c**3*e**2*asin(c + d*x)**2/(3*d) + b**2*c**2*e**2*x*asi
n(c + d*x)**2 - 2*b**2*c**2*e**2*x/9 + 2*b**2*c**2*e**2*sqrt(-c**2 - 2*c*d
*x - d**2*x**2 + 1)*asin(c + d*x)/(9*d) + b**2*c*d*e**2*x**2*asin(c + d*x)
**2 - 2*b**2*c*d*e**2*x**2/9 + 4*b**2*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2
*x**2 + 1)*asin(c + d*x)/9 + b**2*d**2*e**2*x**3*asin(c + d*x)**2/3 - 2*b*
*2*d**2*e**2*x**3/27 + 2*b**2*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)*asin(c + d*x)/9 - 4*b**2*e**2*x/9 + 4*b**2*e**2*sqrt(-c**2 - 2*c*d*x
 - d**2*x**2 + 1)*asin(c + d*x)/(9*d), Ne(d, 0)), (c**2*e**2*x*(a + b*asin
(c))**2, True))
```

### 3.190.7 Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx=\int (dex+ce)^2\big(b\arcsin(dx+c)+a\big)^2\,dx$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
1/3*a^2*d^2*e^2*x^3 + a^2*c*d*e^2*x^2 + (2*x^2*arcsin(d*x + c) + d*(3*c^2*
arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 -
 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 -
 (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a*b*c*
d*e^2 + 1/9*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 +
1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d
^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-
(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*
d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^
4))*a*b*d^2*e^2 + a^2*c^2*e^2*x + 2*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*
x + c)^2 + 1))*a*b*c^2*e^2/d + 1/3*(b^2*d^2*e^2*x^3 + 3*b^2*c*d*e^2*x^2 +
3*b^2*c^2*e^2*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2
+ integrate(2/3*(b^2*d^3*e^2*x^3 + 3*b^2*c*d^2*e^2*x^2 + 3*b^2*c^2*d*e^2*x
)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*
sqrt(-d*x - c + 1))/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

### 3.190.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 274 vs. $2(126) = 252$.

Time = 0.31 (sec) , antiderivative size = 274, normalized size of antiderivative = 1.96

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx$$
$$= \frac{\left((dx+c)^2-1\right)(dx+c)b^2e^2\arcsin\left(dx+c\right)^2}{3\,d} + \frac{(dx+c)^3a^2e^2}{3\,d} + \frac{2\left((dx+c)^2-1\right)(dx+c)abe^2\arcsin\left(dx+c\right)}{3\,d} + \frac{(dx+c)b^2e^2\arcsin\left(dx+c\right)^2}{3\,d} - \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^2e^2\arcsin\left(dx+c\right)}{9\,d} - \frac{2\left((dx+c)^2-1\right)(dx+c)b^2e^2}{27\,d} + \frac{2\,(dx+c)abe^2\arcsin\left(dx+c\right)}{3\,d} - \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}abe^2}{9\,d} + \frac{2\sqrt{-(dx+c)^2+1}b^2e^2\arcsin\left(dx+c\right)}{3\,d} - \frac{14\,(dx+c)b^2e^2}{27\,d} + \frac{2\sqrt{-(dx+c)^2+1}abe^2}{3\,d}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
1/3*((d*x + c)^2 - 1)*(d*x + c)*b^2*e^2*arcsin(d*x + c)^2/d + 1/3*(d*x + c
)^3*a^2*e^2/d + 2/3*((d*x + c)^2 - 1)*(d*x + c)*a*b*e^2*arcsin(d*x + c)/d
+ 1/3*(d*x + c)*b^2*e^2*arcsin(d*x + c)^2/d - 2/9*(-(d*x + c)^2 + 1)^(3/2)
*b^2*e^2*arcsin(d*x + c)/d - 2/27*((d*x + c)^2 - 1)*(d*x + c)*b^2*e^2/d +
2/3*(d*x + c)*a*b*e^2*arcsin(d*x + c)/d - 2/9*(-(d*x + c)^2 + 1)^(3/2)*a*b
*e^2/d + 2/3*sqrt(-(d*x + c)^2 + 1)*b^2*e^2*arcsin(d*x + c)/d - 14/27*(d*x
 + c)*b^2*e^2/d + 2/3*sqrt(-(d*x + c)^2 + 1)*a*b*e^2/d
```

### 3.190.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^2\,dx = \int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

input
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^2, x)
```

# 3.191 $\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx$



## 3.191.1 Optimal result

Integrand size = 21, antiderivative size = 105

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx = -\frac{b^2e(c+dx)^2}{4d} + \frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2d} - \frac{e(a+b\arcsin(c+dx))^2}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d}$$

output
```
-1/4*b^2*e*(d*x+c)^2/d-1/4*e*(a+b*arcsin(d*x+c))^2/d+1/2*e*(d*x+c)^2*(a+b*
arcsin(d*x+c))^2/d+1/2*b*e*(d*x+c)*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)
/d
```

## 3.191.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.82

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx = -\frac{e\left(b^2(c+dx)^2 - 2b(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx)) + (a+b\arcsin(c+dx))^2 - 2(c+dx\right.}{4d}$$

input
```
Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
-1/4*(e*(b^2*(c + d*x)^2 - 2*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcS
in[c + d*x]) + (a + b*ArcSin[c + d*x])^2 - 2*(c + d*x)^2*(a + b*ArcSin[c +
 d*x])^2))/d
```

## 3.191.3 Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.93, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {5304, 27, 5138, 5210, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e(c+dx)(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\int (c+dx)(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^2-b\int \frac{(c+dx)^2(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{5210}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^2-b\left(\frac{1}{2}\int \frac{a+b\arcsin(c+dx)}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{2}b\int (c+dx)d(c+dx)-\frac{1}{2}(c+dx)\sqrt{1-(\right.\right.}{d}$$

$$\Big\downarrow \text{15}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^2-b\left(\frac{1}{2}\int \frac{a+b\arcsin(c+dx)}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{2}\sqrt{1-(c+dx)^2}(c+dx)(a+b\arcsin(c+\right.\right.}{d}$$

$$\Big\downarrow \text{5152}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^2-b\left(-\frac{1}{2}\sqrt{1-(c+dx)^2}(c+dx)(a+b\arcsin(c+dx))+\frac{(a+b\arcsin(c+dx))^2}{4b}+\frac{1}{4}\right.\right.}{d}$$

input
```
Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e*(((c + d*x)^2*(a + b*ArcSin[c + d*x])^2)/2 - b*((b*(c + d*x)^2)/4 - ((c
 + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/2 + (a + b*ArcSin[c
 + d*x])^2/(4*b))))/d
```

### 3.191.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.191.4 Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.39

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{a^2 e (dx+c)^2}{2}+b^2 e\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^2}{2}+\frac{\arcsin(dx+c)\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2}-\frac{\arcsin(dx+c)^2}{4}-\frac{(dx+c)^2}{4}\right.}{d}$ |
| default | $\frac{\frac{a^2 e (dx+c)^2}{2}+b^2 e\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^2}{2}+\frac{\arcsin(dx+c)\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2}-\frac{\arcsin(dx+c)^2}{4}-\frac{(dx+c)^2}{4}\right.}{d}$ |
| parts | $a^2 e\left(\frac{1}{2}d\,x^2+cx\right)+\frac{b^2 e\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^2}{2}+\frac{\arcsin(dx+c)\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2}-\frac{\arcsin(dx+c}{4}\right.}{d}$ |

input
```
int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/2*a^2*e*(d*x+c)^2+b^2*e*(1/2*((d*x+c)^2-1)*arcsin(d*x+c)^2+1/2*arcs
in(d*x+c)*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))-1/4*arcsin(d*x+c)^2-
1/4*(d*x+c)^2)+2*e*a*b*(1/2*(d*x+c)^2*arcsin(d*x+c)+1/4*(d*x+c)*(1-(d*x+c)
^2)^(1/2)-1/4*arcsin(d*x+c)))
```

### 3.191.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 188, normalized size of antiderivative = 1.79

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx$$
$$=\frac{(2\,a^2-b^2)d^2ex^2+2\,(2\,a^2-b^2)cdex+(2\,b^2d^2ex^2+4\,b^2cdex+(2\,b^2c^2-b^2)e)\arcsin{(dx+c)}^2+2\,(2\,abd^2e}{}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
1/4*((2*a^2 - b^2)*d^2*e*x^2 + 2*(2*a^2 - b^2)*c*d*e*x + (2*b^2*d^2*e*x^2
+ 4*b^2*c*d*e*x + (2*b^2*c^2 - b^2)*e)*arcsin(d*x + c)^2 + 2*(2*a*b*d^2*e*
x^2 + 4*a*b*c*d*e*x + (2*a*b*c^2 - a*b)*e)*arcsin(d*x + c) + 2*(a*b*d*e*x
+ a*b*c*e + (b^2*d*e*x + b^2*c*e)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x
 - c^2 + 1))/d
```

### 3.191.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 335 vs. $2(88) = 176$.

Time = 0.21 (sec) , antiderivative size = 335, normalized size of antiderivative = 3.19

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx$$
$$= \begin{cases} a^2cex + \frac{a^2dex^2}{2} + \frac{abc^2e\operatorname{asin}(c+dx)}{d} + 2abcex\operatorname{asin}(c+dx) + \frac{abce\sqrt{-c^2-2cdx-d^2x^2+1}}{2d} + abdex^2\operatorname{asin}(c+dx) + \frac{a}{} \\ cex(a+b\operatorname{asin}(c))^2 \end{cases}$$

input
```
integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**2,x)
```

output
```
Piecewise((a**2*c*e*x + a**2*d*e*x**2/2 + a*b*c**2*e*asin(c + d*x)/d + 2*a
*b*c*e*x*asin(c + d*x) + a*b*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(2*
d) + a*b*d*e*x**2*asin(c + d*x) + a*b*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)/2 - a*b*e*asin(c + d*x)/(2*d) + b**2*c**2*e*asin(c + d*x)**2/(2*d) +
 b**2*c*e*x*asin(c + d*x)**2 - b**2*c*e*x/2 + b**2*c*e*sqrt(-c**2 - 2*c*d*
x - d**2*x**2 + 1)*asin(c + d*x)/(2*d) + b**2*d*e*x**2*asin(c + d*x)**2/2
- b**2*d*e*x**2/4 + b**2*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c
+ d*x)/2 - b**2*e*asin(c + d*x)**2/(4*d), Ne(d, 0)), (c*e*x*(a + b*asin(c)
)**2, True))
```

### 3.191.7 Maxima [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)(b\arcsin(dx+c)+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
1/2*a^2*d*e*x^2 + 1/2*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c
*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d
^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a*b*d*e + a^2*c*e*x + 2*
((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a*b*c*e/d + 1/2*(b^2*
d*e*x^2 + 2*b^2*c*e*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c +
1))^2 + integrate((b^2*d^2*e*x^2 + 2*b^2*c*d*e*x)*sqrt(d*x + c + 1)*sqrt(-
d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))/(d^2*x
^2 + 2*c*d*x + c^2 - 1), x)
```

### 3.191.8 Giac [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 184, normalized size of antiderivative = 1.75

$$\int (ce+dex)(a+b\arcsin(c+dx))^2\,dx = \frac{\left((dx+c)^2-1\right)b^2e\arcsin\left(dx+c\right)^2}{2\,d} + \frac{\sqrt{-(dx+c)^2+1}(dx+c)b^2e\arcsin\left(dx+c\right)}{2\,d} + \frac{\left((dx+c)^2-1\right)abe\arcsin\left(dx+c\right)}{d} + \frac{b^2e\arcsin\left(dx+c\right)^2}{4\,d} + \frac{\sqrt{-(dx+c)^2+1}(dx+c)abe}{2\,d} + \frac{\left((dx+c)^2-1\right)a^2e}{2\,d} - \frac{\left((dx+c)^2-1\right)b^2e}{4\,d} + \frac{abe\arcsin\left(dx+c\right)}{2\,d} - \frac{b^2e}{8\,d}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
1/2*((d*x + c)^2 - 1)*b^2*e*arcsin(d*x + c)^2/d + 1/2*sqrt(-(d*x + c)^2 +
1)*(d*x + c)*b^2*e*arcsin(d*x + c)/d + ((d*x + c)^2 - 1)*a*b*e*arcsin(d*x
+ c)/d + 1/4*b^2*e*arcsin(d*x + c)^2/d + 1/2*sqrt(-(d*x + c)^2 + 1)*(d*x +
 c)*a*b*e/d + 1/2*((d*x + c)^2 - 1)*a^2*e/d - 1/4*((d*x + c)^2 - 1)*b^2*e/
d + 1/2*a*b*e*arcsin(d*x + c)/d - 1/8*b^2*e/d
```

### 3.191.9 Mupad [F(-1)]

Timed out.

$$\int (ce + dex)(a + b \arcsin(c + dx))^2 \, dx = \int (c\,e + d\,e\,x)\,\left(a + b\,\mathrm{asin}(c + d\,x)\right)^2 \, dx$$

input
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^2, x)
```

# 3.192 $\int (a+b\arcsin(c+dx))^2\,dx$



## 3.192.1 Optimal result

Integrand size = 12, antiderivative size = 59

$$\int (a+b\arcsin(c+dx))^2\,dx = -2b^2x+\frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{d}+\frac{(c+dx)(a+b\arcsin(c+dx))^2}{d}$$

output
```
-2*b^2*x+(d*x+c)*(a+b*arcsin(d*x+c))^2/d+2*b*(a+b*arcsin(d*x+c))*(1-(d*x+c
)^2)^(1/2)/d
```

## 3.192.2 Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.03

$$\int (a+b\arcsin(c+dx))^2\,dx = \frac{-2b^2(c+dx)+2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))+(c+dx)(a+b\arcsin(c+dx))^2}{d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(-2*b^2*(c + d*x) + 2*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) + (c
 + d*x)*(a + b*ArcSin[c + d*x])^2)/d
```

### 3.192.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {5302, 5130, 5182, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^2\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int (a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^2-2b\int \frac{(c+dx)(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5182}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^2-2b\left(b\int 1d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))\right)}{d}$$

$$\Big\downarrow \text{24}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^2-2b\left(b(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))\right)}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2,x]
```

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^2 - 2*b*(b*(c + d*x) - Sqrt[1 - (c + d*
x)^2]*(a + b*ArcSin[c + d*x])))/d
```

### 3.192.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.192.4 Maple [A] (verified)

Time = 0.42 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.53

| method | result |
|---|---|
| parts | $a^2x+\frac{b^2\left(\arcsin(dx+c)^2(dx+c)-2dx-2c+2\arcsin(dx+c)\sqrt{1-(dx+c)^2}\right)}{d}+\frac{2ab\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+\right.}{d}$ |
| derivativedivides | $\frac{(dx+c)a^2+b^2\left(\arcsin(dx+c)^2(dx+c)-2dx-2c+2\arcsin(dx+c)\sqrt{1-(dx+c)^2}\right)+2ab\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+\right.}{d}$ |
| default | $\frac{(dx+c)a^2+b^2\left(\arcsin(dx+c)^2(dx+c)-2dx-2c+2\arcsin(dx+c)\sqrt{1-(dx+c)^2}\right)+2ab\left((dx+c)\arcsin(dx+c)+\sqrt{1-(dx+\right.}{d}$ |

input
```
int((a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
a^2*x+b^2/d*(arcsin(d*x+c)^2*(d*x+c)-2*d*x-2*c+2*arcsin(d*x+c)*(1-(d*x+c)^
2)^(1/2))+2*a*b/d*((d*x+c)*arcsin(d*x+c)+(1-(d*x+c)^2)^(1/2))
```

### 3.192.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.59

$$\int (a + b \arcsin(c + dx))^2 \, dx$$
$$= \frac{(a^2 - 2\,b^2)dx + (b^2dx + b^2c)\arcsin{(dx + c)}^2 + 2\,(abdx + abc)\arcsin{(dx + c)} + 2\,\sqrt{-d^2x^2 - 2\,cdx - c^2 +}}{d}$$

input
```
integrate((a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
((a^2 - 2*b^2)*d*x + (b^2*d*x + b^2*c)*arcsin(d*x + c)^2 + 2*(a*b*d*x + a*
b*c)*arcsin(d*x + c) + 2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(b^2*arcsin(d*
x + c) + a*b))/d
```

### 3.192.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 143 vs. 2(51) = 102.

Time = 0.12 (sec) , antiderivative size = 143, normalized size of antiderivative = 2.42

$$\int (a + b \arcsin(c + dx))^2 \, dx$$
$$= \begin{cases} a^2x + \frac{2abc \operatorname{asin}{(c+dx)}}{d} + 2abx \operatorname{asin}{(c + dx)} + \frac{2ab\sqrt{-c^2-2cdx-d^2x^2+1}}{d} + \frac{b^2c \operatorname{asin}^2{(c+dx)}}{d} + b^2x \operatorname{asin}^2{(c + dx)} - 2b^2 \\ x(a + b \operatorname{asin}{(c)})^2 \end{cases}$$

input
```
integrate((a+b*asin(d*x+c))**2,x)
```

output
```
Piecewise((a**2*x + 2*a*b*c*asin(c + d*x)/d + 2*a*b*x*asin(c + d*x) + 2*a*
b*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d + b**2*c*asin(c + d*x)**2/d + b*
*2*x*asin(c + d*x)**2 - 2*b**2*x + 2*b**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)*asin(c + d*x)/d, Ne(d, 0)), (x*(a + b*asin(c))**2, True))
```

### 3.192.7 Maxima [F]

$$\int (a+b\arcsin(c+dx))^2\,dx=\int (b\arcsin(dx+c)+a)^2\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
(x*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*d*integrat
e(sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*x*arctan2(d*x + c, sqrt(d*x + c + 1
)*sqrt(-d*x - c + 1))/(d^2*x^2 + 2*c*d*x + c^2 - 1), x))*b^2 + a^2*x + 2*(
(d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a*b/d
```

### 3.192.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.88

$$\begin{aligned}\int (a+b\arcsin(c+dx))^2\,dx=&\ \frac{(dx+c)b^2\arcsin(dx+c)^2}{d}+\frac{2\,(dx+c)ab\arcsin(dx+c)}{d}\\&+\frac{2\,\sqrt{-(dx+c)^2+1}b^2\arcsin(dx+c)}{d}+\frac{(dx+c)a^2}{d}\\&-\frac{2\,(dx+c)b^2}{d}+\frac{2\,\sqrt{-(dx+c)^2+1}ab}{d}\end{aligned}$$

input
```
integrate((a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
(d*x + c)*b^2*arcsin(d*x + c)^2/d + 2*(d*x + c)*a*b*arcsin(d*x + c)/d + 2*
sqrt(-(d*x + c)^2 + 1)*b^2*arcsin(d*x + c)/d + (d*x + c)*a^2/d - 2*(d*x +
c)*b^2/d + 2*sqrt(-(d*x + c)^2 + 1)*a*b/d
```

### 3.192.9 Mupad [B] (verification not implemented)

Time = 0.52 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.49

$$\int (a+b\arcsin(c+dx))^2\,dx = a^2\,x+\frac{b^2\,\left(\mathrm{asin}(c+d\,x)^2-2\right)\,\left(c+d\,x\right)}{d}+\frac{2\,a\,b\,\left(\sqrt{1-{\left(c+d\,x\right)}^2}+\mathrm{asin}(c+d\,x)\,\left(c+d\,x\right)\right)}{d}+\frac{2\,b^2\,\mathrm{asin}(c+d\,x)\,\sqrt{1-{\left(c+d\,x\right)}^2}}{d}$$

input
```
int((a + b*asin(c + d*x))^2,x)
```

output
```
a^2*x + (b^2*(asin(c + d*x)^2 - 2)*(c + d*x))/d + (2*a*b*((1 - (c + d*x)^2
)^(1/2) + asin(c + d*x)*(c + d*x)))/d + (2*b^2*asin(c + d*x)*(1 - (c + d*x
)^2)^(1/2))/d
```

# 3.193 $\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx$



## 3.193.1 Optimal result

Integrand size = 23, antiderivative size = 126

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx = -\frac{i(a+b\arcsin(c+dx))^3}{3bde} + \frac{(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{ib(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{2de}$$

output
```
-1/3*I*(a+b*arcsin(d*x+c))^3/b/d/e+(a+b*arcsin(d*x+c))^2*ln(1-(I*(d*x+c)+(
1-(d*x+c)^2)^(1/2))^2)/d/e-I*b*(a+b*arcsin(d*x+c))*polylog(2,(I*(d*x+c)+(1
-(d*x+c)^2)^(1/2))^2)/d/e+1/2*b^2*polylog(3,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2)
)^2)/d/e
```

## 3.193.2 Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.35

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx = \frac{2ab\arcsin(c+dx)\log\left(1-e^{2i\arcsin(c+dx)}\right)+a^2\log(c+dx)-iab\left(\arcsin(c+dx)^2+\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+}\right.\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x),x]
```

output
```
(2*a*b*ArcSin[c + d*x]*Log[1 - E^((2*I)*ArcSin[c + d*x])] + a^2*Log[c + d*
x] - I*a*b*(ArcSin[c + d*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c + d*x])]) + b
^2*((-1/24*I)*Pi^3 + (I/3)*ArcSin[c + d*x]^3 + ArcSin[c + d*x]^2*Log[1 - E
^((-2*I)*ArcSin[c + d*x])] + I*ArcSin[c + d*x]*PolyLog[2, E^((-2*I)*ArcSin
[c + d*x])] + PolyLog[3, E^((-2*I)*ArcSin[c + d*x])]/2))/(d*e)
```

## 3.193.3 Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 124, normalized size of antiderivative = 0.98, number of steps used = 12, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.478$, Rules used = {5304, 27, 5136, 3042, 25, 4200, 25, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{e(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{c+dx}d(c+dx)}{de}$$

$$\Big\downarrow \text{ 5136}$$

$$\frac{\int \frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{\int -(a+b\arcsin(c+dx))^2\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{\int (a+b\arcsin(c+dx))^2\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \text{ 4200}$$

$$\frac{2i\int -\frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))^2}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\frac{i(a+b\arcsin(c+dx))^3}{3b}}{de}$$

$$\Big\downarrow \text{25}$$

$$\frac{-2i\int \frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))^2}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\frac{i(a+b\arcsin(c+dx))^3}{3b}}{de}$$

$$\Big\downarrow \text{2620}$$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-ib\int(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)d\arcsin}{de}$$

$$\Big\downarrow \text{3011}$$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-\right.\right.}{de}$$

$$\Big\downarrow \text{2720}$$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-\right.\right.}{de}$$

$$\Big\downarrow \text{7143}$$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-\right.\right.}{de}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x),x]
```

output
```
(((-1/3*I)*(a + b*ArcSin[c + d*x])^3)/b - (2*I)*((I/2)*(a + b*ArcSin[c + d
*x])^2*Log[1 - E^((2*I)*ArcSin[c + d*x])] - I*b*((I/2)*(a + b*ArcSin[c + d
*x])*PolyLog[2, E^((2*I)*ArcSin[c + d*x])] - (b*PolyLog[3, E^((2*I)*ArcSin
[c + d*x])])/4)))/(d*e)
```

3.193. $\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx$

### 3.193.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

## 3.193. $\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx$

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

### 3.193.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 366 vs. $2(156) = 312$.

Time = 0.65 (sec) , antiderivative size = 367, normalized size of antiderivative = 2.91

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{a^2\ln(dx+c)}{e}+\frac{b^2\left(-\frac{i\arcsin(dx+c)^3}{3}+\arcsin(dx+c)^2\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-2i\arcsin(dx+c)\operatorname{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx-\right.}\right.}{}}{}$ |
| default | $\frac{\frac{a^2\ln(dx+c)}{e}+\frac{b^2\left(-\frac{i\arcsin(dx+c)^3}{3}+\arcsin(dx+c)^2\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-2i\arcsin(dx+c)\operatorname{polylog}\left(2,-i(dx+c)-\sqrt{1-(dx-\right.}\right.}{}}{}$ |
| parts | $\frac{a^2\ln(dx+c)}{ed}+\frac{b^2\left(-\frac{i\arcsin(dx+c)^3}{3}+\arcsin(dx+c)^2\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)-2i\arcsin(dx+c)\operatorname{polylog}\left(2,-i(d\right.\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e),x,method=_RETURNVERBOSE)
```

output
```
1/d*(a^2/e*ln(d*x+c)+b^2/e*(-1/3*I*arcsin(d*x+c)^3+arcsin(d*x+c)^2*ln(1+I*
(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*polylog(2,-I*(d*x+c)-(1-(d*
x+c)^2)^(1/2))+2*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)^2
*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*polylog(2,I*(d*x+c)
+(1-(d*x+c)^2)^(1/2))+2*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+2*a*b/e*
(-1/2*I*arcsin(d*x+c)^2+arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-
I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)*ln(1-I*(d*x+c)-(
1-(d*x+c)^2)^(1/2))-I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))))
```

### 3.193.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e),x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)/(d*e*x + c*
e), x)
```

### 3.193.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx = \frac{\int \frac{a^2}{c+dx}\,dx + \int \frac{b^2\,\mathrm{asin}^2(c+dx)}{c+dx}\,dx + \int \frac{2ab\,\mathrm{asin}(c+dx)}{c+dx}\,dx}{e}$$

input
```
integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e),x)
```

output
```
(Integral(a**2/(c + d*x), x) + Integral(b**2*asin(c + d*x)**2/(c + d*x), x
) + Integral(2*a*b*asin(c + d*x)/(c + d*x), x))/e
```

### 3.193.7 Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e),x, algorithm="maxima")
```

output
```
a^2*log(d*e*x + c*e)/(d*e) + integrate((b^2*arctan2(d*x + c, sqrt(d*x + c
+ 1)*sqrt(-d*x - c + 1))^2 + 2*a*b*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt
(-d*x - c + 1)))/(d*e*x + c*e), x)
```

### 3.193.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e), x)
```

### 3.193.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{ce+dex}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{c\,e+d\,e\,x}\,dx$$

input
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x),x)
```

output
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x), x)
```

# 3.194 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx$



## 3.194.1 Optimal result

Integrand size = 23, antiderivative size = 116

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = -\frac{(a+b\arcsin(c+dx))^2}{de^2(c+dx)} - \frac{4b(a+b\arcsin(c+dx))\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} + \frac{2ib^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} - \frac{2ib^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2}$$

output
```
-(a+b*arcsin(d*x+c))^2/d/e^2/(d*x+c)-4*b*(a+b*arcsin(d*x+c))*arctanh(I*(d*
x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2+2*I*b^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)
^(1/2))/d/e^2-2*I*b^2*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2
```

## 3.194.2 Mathematica [A] (verified)

Time = 0.83 (sec) , antiderivative size = 176, normalized size of antiderivative = 1.52

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = \frac{-\frac{a^2}{c+dx} - 2ab\left(\frac{\arcsin(c+dx)}{c+dx} + \log\left(\frac{1}{2}(c+dx)\csc\left(\frac{1}{2}\arcsin(c+dx)\right)\right) - \log\left(\sin\left(\frac{1}{2}\arcsin(c+dx)\right)\right)\right) + b^2\left(\text{arc}\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^2,x]
```

output
```
(-(a^2/(c + d*x)) - 2*a*b*(ArcSin[c + d*x]/(c + d*x) + Log[((c + d*x)*Csc[
ArcSin[c + d*x]/2])/2] - Log[Sin[ArcSin[c + d*x]/2]]) + b^2*(ArcSin[c + d*
x]*(-(ArcSin[c + d*x]/(c + d*x)) + 2*Log[1 - E^(I*ArcSin[c + d*x])] - 2*Lo
g[1 + E^(I*ArcSin[c + d*x])]) + (2*I)*PolyLog[2, -E^(I*ArcSin[c + d*x])] -
 (2*I)*PolyLog[2, E^(I*ArcSin[c + d*x])]))/(d*e^2)
```

### 3.194.3 Rubi [A] (warning: unable to verify)

Time = 0.50 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.79, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {5304, 27, 5138, 5218, 3042, 4671, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{e^2(c+dx)^2}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)^2}d(c+dx)}{de^2}$$

$$\Big\downarrow \text{5138}$$

$$\frac{2b\int \frac{a+b\arcsin(c+dx)}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^2}{c+dx}}{de^2}$$

$$\Big\downarrow \text{5218}$$

$$\frac{2b\int \frac{a+b\arcsin(c+dx)}{c+dx}d\arcsin(c+dx)-\frac{(a+b\arcsin(c+dx))^2}{c+dx}}{de^2}$$

$$\Big\downarrow \text{3042}$$

$$\frac{2b\int (a+b\arcsin(c+dx))\csc(\arcsin(c+dx))d\arcsin(c+dx)-\frac{(a+b\arcsin(c+dx))^2}{c+dx}}{de^2}$$

$$\Big\downarrow \text{4671}$$

$$\frac{-\frac{(a+b\arcsin(c+dx))^2}{c+dx}+2b\left(-b\int\log\left(1-e^{i\arcsin(c+dx)}\right)d\arcsin(c+dx)+b\int\log\left(1+e^{i\arcsin(c+dx)}\right)d\arcsin(c+dx)\right.}{de^2}$$

$\big\downarrow$ 2715

$$\frac{-\frac{(a+b\arcsin(c+dx))^2}{c+dx}+2b\left(-ib\int e^{-i\arcsin(c+dx)}\log\left(1+e^{i\arcsin(c+dx)}\right)de^{i\arcsin(c+dx)}+ib\int e^{-i\arcsin(c+dx)}\log(-c-d\right.}{de^2}$$

$\big\downarrow$ 2838

$$\frac{-\frac{(a+b\arcsin(c+dx))^2}{c+dx}+2b\left(-2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-ib\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)+ib\,\text{PolyL}\right.}{de^2}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^2,x]
```

output
```
(-((a + b*ArcSin[c + d*x])^2/(c + d*x)) + 2*b*(-2*(a + b*ArcSin[c + d*x])*
ArcTanh[E^(I*ArcSin[c + d*x])] - I*b*PolyLog[2, E^(I*ArcSin[c + d*x])] + I
*b*PolyLog[2, -c - d*x]))/(d*e^2)
```

### 3.194.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4671
```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Simp[d*(m/f)   Int[(c +
d*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Simp[d*(m/f)   Int[(c + d*x
)^(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IG
tQ[m, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5218
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]]   Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.194.4 Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.78

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{a^2}{e^2(dx+c)}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{dx+c}+2\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-2\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+2}{e^2}}{d}$ |
| default | $\frac{-\frac{a^2}{e^2(dx+c)}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{dx+c}+2\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-2\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+2}{e^2}}{d}$ |
| parts | $-\frac{a^2}{e^2(dx+c)d}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{dx+c}+2\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-2\arcsin(dx+c)\ln\left(1+i(dx+c)+\right.\right.}{e^2d}$ |

input
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^2,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-a^2/e^2/(d*x+c)+b^2/e^2*(-arcsin(d*x+c)^2/(d*x+c)+2*arcsin(d*x+c)*ln
(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c
)^2)^(1/2))+2*I*dilog(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*dilog(1-I*(d*x+
c)-(1-(d*x+c)^2)^(1/2)))+2*a*b/e^2*(-1/(d*x+c)*arcsin(d*x+c)-arctanh(1/(1-
(d*x+c)^2)^(1/2))))
```

## 3.194.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^2}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^2,x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)/(d^2*e^2*x^
2 + 2*c*d*e^2*x + c^2*e^2), x)
```

## 3.194.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx=\frac{\int \frac{a^2}{c^2+2cdx+d^2x^2}\,dx+\int \frac{b^2\operatorname{asin}^2(c+dx)}{c^2+2cdx+d^2x^2}\,dx+\int \frac{2ab\operatorname{asin}(c+dx)}{c^2+2cdx+d^2x^2}\,dx}{e^2}$$

input
```
integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**2,x)
```

output
```
(Integral(a**2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(b**2*asin(c + d
*x)**2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(2*a*b*asin(c + d*x)/(c*
*2 + 2*c*d*x + d**2*x**2), x))/e**2
```

### 3.194.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.194.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^2}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^2, x)
```

### 3.194.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^2}\,dx$$

input
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^2,x)
```

output
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^2, x)
```

# 3.195 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx$



## 3.195.1 Optimal result

Integrand size = 23, antiderivative size = 87

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = -\frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{de^3(c+dx)} - \frac{(a+b\arcsin(c+dx))^2}{2de^3(c+dx)^2} + \frac{b^2\log(c+dx)}{de^3}$$

output
```
-1/2*(a+b*arcsin(d*x+c))^2/d/e^3/(d*x+c)^2+b^2*ln(d*x+c)/d/e^3-b*(a+b*arcs
in(d*x+c))*(1-(d*x+c)^2)^(1/2)/d/e^3/(d*x+c)
```

## 3.195.2 Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.45

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = -\frac{a\left(a+2b(c+dx)\sqrt{1-c^2-2cdx-d^2x^2}\right)+2b\left(a+b(c+dx)\sqrt{1-c^2-2cdx-d^2x^2}\right)\arcsin(c+dx)+}{2de^3(c+dx)^2}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^3,x]
```

output
```
-1/2*(a*(a + 2*b*(c + d*x)*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2]) + 2*b*(a + b
*(c + d*x)*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x] + b^2*ArcSin
[c + d*x]^2 - 2*b^2*(c + d*x)^2*Log[c + d*x])/(d*e^3*(c + d*x)^2)
```

### 3.195.3 Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.87, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {5304, 27, 5138, 5186, 14}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{e^3(c+dx)^3}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)^3}d(c+dx)}{de^3}$$

$$\Big\downarrow \text{5138}$$

$$\frac{b\int \frac{a+b\arcsin(c+dx)}{(c+dx)^2\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^2}{2(c+dx)^2}}{de^3}$$

$$\Big\downarrow \text{5186}$$

$$\frac{b\left(b\int \frac{1}{c+dx}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{c+dx}\right)-\frac{(a+b\arcsin(c+dx))^2}{2(c+dx)^2}}{de^3}$$

$$\Big\downarrow \text{14}$$

$$\frac{b\left(b\log(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{c+dx}\right)-\frac{(a+b\arcsin(c+dx))^2}{2(c+dx)^2}}{de^3}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^3,x]
```

output
```
(-1/2*(a + b*ArcSin[c + d*x])^2/(c + d*x)^2 + b*(-((Sqrt[1 - (c + d*x)^2]*
(a + b*ArcSin[c + d*x]))/(c + d*x)) + b*Log[c + d*x]))/(d*e^3)
```

#### 3.195.3.1 Defintions of rubi rules used

rule 14
```
Int[(a_.)/(x_), x_Symbol] :> Simp[a*Log[x], x] /; FreeQ[a, x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5186
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Simp[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*A
rcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^
2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.195.4 Maple [A] (verified)

Time = 0.66 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.44

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{a^2}{2e^3(dx+c)^2}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{2(dx+c)^2}-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}}{dx+c}+\ln(dx+c)\right)}{e^3}+\frac{2ab\left(-\frac{\arcsin(dx+c)}{2(dx+c)^2}-\frac{\sqrt{1-(dx+c)^2}}{2(dx+c)}\right)}{e^3}}{d}$ |
| default | $\frac{-\frac{a^2}{2e^3(dx+c)^2}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{2(dx+c)^2}-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}}{dx+c}+\ln(dx+c)\right)}{e^3}+\frac{2ab\left(-\frac{\arcsin(dx+c)}{2(dx+c)^2}-\frac{\sqrt{1-(dx+c)^2}}{2(dx+c)}\right)}{e^3}}{d}$ |
| parts | $-\frac{a^2}{2e^3(dx+c)^2d}+\frac{b^2\left(-\frac{\arcsin(dx+c)^2}{2(dx+c)^2}-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}}{dx+c}+\ln(dx+c)\right)}{e^3d}+\frac{2ab\left(-\frac{\arcsin(dx+c)}{2(dx+c)^2}-\frac{\sqrt{1-(dx+c)^2}}{2(dx+c)}\right)}{e^3d}$ |

input
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/2*a^2/e^3/(d*x+c)^2+b^2/e^3*(-1/2*arcsin(d*x+c)^2/(d*x+c)^2-arcsin
(d*x+c)*(1-(d*x+c)^2)^(1/2)/(d*x+c)+ln(d*x+c))+2*a*b/e^3*(-1/2/(d*x+c)^2*a
rcsin(d*x+c)-1/2/(d*x+c)*(1-(d*x+c)^2)^(1/2)))
```

### 3.195.5 Fricas [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.68

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = -\frac{b^2\arcsin(dx+c)^2 + 2\,ab\arcsin(dx+c) + a^2 - 2\,(b^2d^2x^2 + 2\,b^2cdx + b^2c^2)\log(dx+c) + 2\,(abdx + ab}{2\,(d^3e^3x^2 + 2\,cd^2e^3x + c^2de^3)}$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^3,x, algorithm="fricas")
```

output
```
-1/2*(b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2 - 2*(b^2*d^2*x^2
 + 2*b^2*c*d*x + b^2*c^2)*log(d*x + c) + 2*(a*b*d*x + a*b*c + (b^2*d*x + b
^2*c)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/(d^3*e^3*x^2 +
2*c*d^2*e^3*x + c^2*d*e^3)
```

### 3.195.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = \frac{\int \frac{a^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{b^2\operatorname{asin}^2(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{2ab\operatorname{asin}(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx}{e^3}$$

input
```
integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**3,x)
```

output
```
(Integral(a**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integ
ral(b**2*asin(c + d*x)**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3),
 x) + Integral(2*a*b*asin(c + d*x)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d*
*3*x**3), x))/e**3
```

### 3.195.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 236 vs. $2(83) = 166$.

Time = 0.28 (sec) , antiderivative size = 236, normalized size of antiderivative = 2.71

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx$$
$$= -\left(\frac{\sqrt{-d^2x^2-2\,cdx-c^2+1}d\arcsin(dx+c)}{d^3e^3x+cd^2e^3} - \frac{\log(dx+c)}{de^3}\right)b^2$$
$$- ab\left(\frac{\sqrt{-d^2x^2-2\,cdx-c^2+1}d}{d^3e^3x+cd^2e^3} + \frac{\arcsin(dx+c)}{d^3e^3x^2+2\,cd^2e^3x+c^2de^3}\right)$$
$$- \frac{b^2\arcsin(dx+c)^2}{2\,(d^3e^3x^2+2\,cd^2e^3x+c^2de^3)} - \frac{a^2}{2\,(d^3e^3x^2+2\,cd^2e^3x+c^2de^3)}$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^3,x, algorithm="maxima")
```

output
```
-(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*d*arcsin(d*x + c)/(d^3*e^3*x + c*d^2*
e^3) - log(d*x + c)/(d*e^3))*b^2 - a*b*(sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)
*d/(d^3*e^3*x + c*d^2*e^3) + arcsin(d*x + c)/(d^3*e^3*x^2 + 2*c*d^2*e^3*x
+ c^2*d*e^3)) - 1/2*b^2*arcsin(d*x + c)^2/(d^3*e^3*x^2 + 2*c*d^2*e^3*x + c
^2*d*e^3) - 1/2*a^2/(d^3*e^3*x^2 + 2*c*d^2*e^3*x + c^2*d*e^3)
```

### 3.195.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 510 vs. $2(83) = 166$.

Time = 0.37 (sec) , antiderivative size = 510, normalized size of antiderivative = 5.86

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx = -\frac{b^2\arcsin(dx+c)^2}{4\,de^3} - \frac{(dx+c)^2 b^2\arcsin(dx+c)^2}{8\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} - \frac{b^2\left(\sqrt{-(dx+c)^2+1}+1\right)^2\arcsin(dx+c)^2}{8\,(dx+c)^2 de^3} - \frac{ab\arcsin(dx+c)}{2\,de^3} - \frac{(dx+c)^2 ab\arcsin(dx+c)}{4\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} + \frac{(dx+c)b^2\arcsin(dx+c)}{2\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{b^2\left(\sqrt{-(dx+c)^2+1}+1\right)\arcsin(dx+c)}{2\,(dx+c)de^3} - \frac{ab\left(\sqrt{-(dx+c)^2+1}+1\right)^2\arcsin(dx+c)}{4\,(dx+c)^2 de^3} + \frac{2\,b^2\log(2)}{de^3} - \frac{b^2\log\left(2\sqrt{-(dx+c)^2+1}+2\right)}{de^3} + \frac{b^2\log\left(\sqrt{-(dx+c)^2+1}+1\right)}{de^3} + \frac{b^2\log(|dx+c|)}{de^3} - \frac{a^2}{4\,de^3} - \frac{(dx+c)^2 a^2}{8\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)^2} + \frac{(dx+c)ab}{2\,de^3\left(\sqrt{-(dx+c)^2+1}+1\right)} - \frac{ab\left(\sqrt{-(dx+c)^2+1}+1\right)}{2\,(dx+c)de^3} - \frac{a^2\left(\sqrt{-(dx+c)^2+1}+1\right)^2}{8\,(dx+c)^2 de^3}$$

3.195. $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^3,x, algorithm="giac")
```

output
```
-1/4*b^2*arcsin(d*x + c)^2/(d*e^3) - 1/8*(d*x + c)^2*b^2*arcsin(d*x + c)^2
/(d*e^3*(sqrt(-(d*x + c)^2 + 1) + 1)^2) - 1/8*b^2*(sqrt(-(d*x + c)^2 + 1)
+ 1)^2*arcsin(d*x + c)^2/((d*x + c)^2*d*e^3) - 1/2*a*b*arcsin(d*x + c)/(d*
e^3) - 1/4*(d*x + c)^2*a*b*arcsin(d*x + c)/(d*e^3*(sqrt(-(d*x + c)^2 + 1)
+ 1)^2) + 1/2*(d*x + c)*b^2*arcsin(d*x + c)/(d*e^3*(sqrt(-(d*x + c)^2 + 1)
 + 1)) - 1/2*b^2*(sqrt(-(d*x + c)^2 + 1) + 1)*arcsin(d*x + c)/((d*x + c)*d
*e^3) - 1/4*a*b*(sqrt(-(d*x + c)^2 + 1) + 1)^2*arcsin(d*x + c)/((d*x + c)^
2*d*e^3) + 2*b^2*log(2)/(d*e^3) - b^2*log(2*sqrt(-(d*x + c)^2 + 1) + 2)/(d
*e^3) + b^2*log(sqrt(-(d*x + c)^2 + 1) + 1)/(d*e^3) + b^2*log(abs(d*x + c)
)/(d*e^3) - 1/4*a^2/(d*e^3) - 1/8*(d*x + c)^2*a^2/(d*e^3*(sqrt(-(d*x + c)^
2 + 1) + 1)^2) + 1/2*(d*x + c)*a*b/(d*e^3*(sqrt(-(d*x + c)^2 + 1) + 1)) -
1/2*a*b*(sqrt(-(d*x + c)^2 + 1) + 1)/((d*x + c)*d*e^3) - 1/8*a^2*(sqrt(-(d
*x + c)^2 + 1) + 1)^2/((d*x + c)^2*d*e^3)
```

### 3.195.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^3}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^3}\,dx$$

input
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^3,x)
```

output
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^3, x)
```

# 3.196 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx$



## 3.196.1 Optimal result

Integrand size = 23, antiderivative size = 187

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx = -\frac{b^2}{3de^4(c+dx)} - \frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^2}{3de^4(c+dx)^3} - \frac{2b(a+b\arcsin(c+dx))\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} + \frac{ib^2\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{3de^4} - \frac{ib^2\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{3de^4}$$

output
```
-1/3*b^2/d/e^4/(d*x+c)-1/3*(a+b*arcsin(d*x+c))^2/d/e^4/(d*x+c)^3-2/3*b*(a+
b*arcsin(d*x+c))*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4+1/3*I*b^2*po
lylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4-1/3*I*b^2*polylog(2,I*(d*x+c
)+(1-(d*x+c)^2)^(1/2))/d/e^4-1/3*b*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)
/d/e^4/(d*x+c)^2
```

### 3.196.2 Mathematica [A] (verified)

Time = 2.53 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.32

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx = -\frac{4a^2+8ab\arcsin(c+dx)-4ib^2(c+dx)^3\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)+2ab\sin(2\arcsin(c+dx))+ab(\mathrm{l}}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^4,x]
```

output
```
-1/12*(4*a^2 + 8*a*b*ArcSin[c + d*x] - (4*I)*b^2*(c + d*x)^3*PolyLog[2, -E
^(I*ArcSin[c + d*x])] + 2*a*b*Sin[2*ArcSin[c + d*x]] + a*b*(Log[Cos[ArcSin
[c + d*x]/2]] - Log[Sin[ArcSin[c + d*x]/2]])*(3*(c + d*x) - Sin[3*ArcSin[c
 + d*x]]) + b^2*(4*(c + d*x)^2 + 4*ArcSin[c + d*x]^2 + (4*I)*(c + d*x)^3*P
olyLog[2, E^(I*ArcSin[c + d*x])] + ArcSin[c + d*x]*(2*Sin[2*ArcSin[c + d*x
]] + (Log[1 - E^(I*ArcSin[c + d*x])] - Log[1 + E^(I*ArcSin[c + d*x])])*(-3
*(c + d*x) + Sin[3*ArcSin[c + d*x]]))))/(d*e^4*(c + d*x)^3)
```

### 3.196.3 Rubi [A] (warning: unable to verify)

Time = 0.68 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.80, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.435$, Rules used = {5304, 27, 5138, 5204, 15, 5218, 3042, 4671, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{e^4(c+dx)^4}d(c+dx)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)^4}d(c+dx)}{de^4}$$

$$\Big\downarrow \; 5138$$

$$\frac{\frac{2}{3}b\int \frac{a+b\arcsin(c+dx)}{(c+dx)^3\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^2}{3(c+dx)^3}}{de^4}$$

$\big\downarrow$ 5204

$$\frac{\frac{2}{3}b\left(\frac{1}{2}\int \frac{a+b\arcsin(c+dx)}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{2}b\int \frac{1}{(c+dx)^2}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2(c+dx)^2}\right)-\frac{(a+b\arcsin(c+dx))^2}{3(c+dx)^3}}{de^4}$$

$\big\downarrow$ 15

$$\frac{\frac{2}{3}b\left(\frac{1}{2}\int \frac{a+b\arcsin(c+dx)}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2(c+dx)^2}-\frac{b}{2(c+dx)}\right)-\frac{(a+b\arcsin(c+dx))^2}{3(c+dx)^3}}{de^4}$$

$\big\downarrow$ 5218

$$\frac{\frac{2}{3}b\left(\frac{1}{2}\int \frac{a+b\arcsin(c+dx)}{c+dx}d\arcsin(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2(c+dx)^2}-\frac{b}{2(c+dx)}\right)-\frac{(a+b\arcsin(c+dx))^2}{3(c+dx)^3}}{de^4}$$

$\big\downarrow$ 3042

$$\frac{\frac{2}{3}b\left(\frac{1}{2}\int (a+b\arcsin(c+dx))\csc(\arcsin(c+dx))d\arcsin(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2(c+dx)^2}-\frac{b}{2(c+dx)}\right)-\frac{(a+b\mathrm{a}}{3}}{de^4}$$

$\big\downarrow$ 4671

$$\frac{-\frac{(a+b\arcsin(c+dx))^2}{3(c+dx)^3}+\frac{2}{3}b\left(\frac{1}{2}\left(-b\int \log\left(1-e^{i\arcsin(c+dx)}\right)d\arcsin(c+dx)+b\int \log\left(1+e^{i\arcsin(c+dx)}\right)d\arcsin(c+d\right.\right.}{de^4}$$

$\big\downarrow$ 2715

$$\frac{-\frac{(a+b\arcsin(c+dx))^2}{3(c+dx)^3}+\frac{2}{3}b\left(\frac{1}{2}\left(-ib\int e^{-i\arcsin(c+dx)}\log\left(1+e^{i\arcsin(c+dx)}\right)de^{i\arcsin(c+dx)}+ib\int e^{-i\arcsin(c+dx)}\log(-c-\right.\right.}{de}$$

$\big\downarrow$ 2838

$$\frac{-\frac{(a+b\arcsin(c+dx))^2}{3(c+dx)^3}+\frac{2}{3}b\left(\frac{1}{2}\left(-2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-ib\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)+ib\,\text{Po}\right.\right.}{de^4}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^4,x]
```

3.196. $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx$

output
```
(-1/3*(a + b*ArcSin[c + d*x])^2/(c + d*x)^3 + (2*b*(-1/2*b/(c + d*x) - (Sq
rt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/(2*(c + d*x)^2) + (-2*(a + b*
ArcSin[c + d*x])*ArcTanh[E^(I*ArcSin[c + d*x])] - I*b*PolyLog[2, E^(I*ArcS
in[c + d*x])] + I*b*PolyLog[2, -c - d*x])/2))/3)/(d*e^4)
```

### 3.196.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4671
```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Simp[d*(m/f)   Int[(c +
d*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Simp[d*(m/f)   Int[(c + d*x
)^(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IG
tQ[m, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5204
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Simp[c^2*((m + 2*p + 3)/(f^2*(m + 1))
)   Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Simp[b*
c*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m + 1)*(
1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
 c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

rule 5218
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]]   Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.196.4 Maple [A] (verified)

Time = 0.99 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.40

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{a^2}{3e^4(dx+c)^3}+\frac{b^2\left(-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+\arcsin(dx+c)^2+(dx+c)^2}{3(dx+c)^3}-\frac{\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)}{3}+\cdots\right.}{\cdots}}{\cdots}$ |
| default | $\frac{-\frac{a^2}{3e^4(dx+c)^3}+\frac{b^2\left(-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+\arcsin(dx+c)^2+(dx+c)^2}{3(dx+c)^3}-\frac{\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)}{3}+\cdots\right.}{\cdots}}{\cdots}$ |
| parts | $-\frac{a^2}{3e^4(dx+c)^3d}+\frac{b^2\left(-\frac{\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+\arcsin(dx+c)^2+(dx+c)^2}{3(dx+c)^3}-\frac{\arcsin(dx+c)\ln\left(1+i(dx+c)+\sqrt{1-(dx+c\cdots}\right.}{3}\cdots\right.}{\cdots}$ |

input
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^4,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/3*a^2/e^4/(d*x+c)^3+b^2/e^4*(-1/3*(arcsin(d*x+c)*(1-(d*x+c)^2)^(1/
2)*(d*x+c)+arcsin(d*x+c)^2+(d*x+c)^2)/(d*x+c)^3-1/3*arcsin(d*x+c)*ln(1+I*(
d*x+c)+(1-(d*x+c)^2)^(1/2))+1/3*I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)
)+1/3*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-1/3*I*polylog(2,I*
(d*x+c)+(1-(d*x+c)^2)^(1/2)))+2*a*b/e^4*(-1/3/(d*x+c)^3*arcsin(d*x+c)-1/6/
(d*x+c)^2*(1-(d*x+c)^2)^(1/2)-1/6*arctanh(1/(1-(d*x+c)^2)^(1/2))))
```

### 3.196.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^4,x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)/(d^4*e^4*x^
4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x + c^4*e^4), x)
```

### 3.196.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx$$
$$=\frac{\int \frac{a^2}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx+\int \frac{b^2\operatorname{asin}^2(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx+\int \frac{2ab\operatorname{asin}(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx}{e^4}$$

input
```
integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**4,x)
```

output
```
(Integral(a**2/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**
4*x**4), x) + Integral(b**2*asin(c + d*x)**2/(c**4 + 4*c**3*d*x + 6*c**2*d
**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) + Integral(2*a*b*asin(c + d*x)/(
c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x))/e**
4
```

### 3.196.7 Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^4,x, algorithm="maxima")
```

output
```
-1/3*a^2/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4) - 1
/3*(b^2*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 3*(d^4*
e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)*integrate(2/3*((b
^2*d*x + b^2*c)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt
(d*x + c + 1)*sqrt(-d*x - c + 1)) - 3*(a*b*d^2*x^2 + 2*a*b*c*d*x + a*b*c^2
 - a*b)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)))/(d^6*e^4*x
^6 + 6*c*d^5*e^4*x^5 + (15*c^2 - 1)*d^4*e^4*x^4 + 4*(5*c^3 - c)*d^3*e^4*x^
3 + 3*(5*c^4 - 2*c^2)*d^2*e^4*x^2 + 2*(3*c^5 - 2*c^3)*d*e^4*x + (c^6 - c^4
)*e^4), x))/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)
```

### 3.196.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^4,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^4, x)
```

### 3.196.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^4}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^4}\,dx$$

input
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^4,x)
```

output
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^4, x)
```

# 3.197 $\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx$



## 3.197.1 Optimal result

Integrand size = 23, antiderivative size = 338

$$\begin{aligned}\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx &= -\frac{16}{25}ab^2e^4x - \frac{298b^3e^4\sqrt{1-(c+dx)^2}}{375d} + \frac{76b^3e^4(1-(c+dx)^2)^{3/2}}{1125d} \\ &\quad - \frac{6b^3e^4(1-(c+dx)^2)^{5/2}}{625d} - \frac{16b^3e^4(c+dx)\arcsin(c+dx)}{25d} \\ &\quad - \frac{8b^2e^4(c+dx)^3(a+b\arcsin(c+dx))}{75d} - \frac{6b^2e^4(c+dx)^5(a+b\arcsin(c+dx))}{125d} \\ &\quad + \frac{8be^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} \\ &\quad + \frac{4be^4(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} \\ &\quad + \frac{3be^4(c+dx)^4\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{25d} \\ &\quad + \frac{e^4(c+dx)^5(a+b\arcsin(c+dx))^3}{5d}\end{aligned}$$

output
```
-16/25*a*b^2*e^4*x+76/1125*b^3*e^4*(1-(d*x+c)^2)^(3/2)/d-6/625*b^3*e^4*(1-
(d*x+c)^2)^(5/2)/d-16/25*b^3*e^4*(d*x+c)*arcsin(d*x+c)/d-8/75*b^2*e^4*(d*x
+c)^3*(a+b*arcsin(d*x+c))/d-6/125*b^2*e^4*(d*x+c)^5*(a+b*arcsin(d*x+c))/d+
1/5*e^4*(d*x+c)^5*(a+b*arcsin(d*x+c))^3/d-298/375*b^3*e^4*(1-(d*x+c)^2)^(1
/2)/d+8/25*b*e^4*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+4/25*b*e^4*(d
*x+c)^2*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+3/25*b*e^4*(d*x+c)^4*(
a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d
```

### 3.197.2 Mathematica [A] (verified)

Time = 0.94 (sec) , antiderivative size = 307, normalized size of antiderivative = 0.91

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx$$
$$= \frac{e^4\Big((c+dx)^5(a+b\arcsin(c+dx))^3 - \frac{1}{25}b\Big(\frac{40}{9}b^2(2+c^2+2cdx+d^2x^2)\sqrt{1-(c+dx)^2} - \frac{2}{5}b^2\sqrt{1-(c+d}{}$$

input
```
Integrate[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^4*((c + d*x)^5*(a + b*ArcSin[c + d*x])^3 - (b*((40*b^2*(2 + c^2 + 2*c*d
*x + d^2*x^2)*Sqrt[1 - (c + d*x)^2])/9 - (2*b^2*Sqrt[1 - (c + d*x)^2]*(-15
 + 10*(1 - (c + d*x)^2) - 3*(-1 + (c + d*x)^2)^2))/5 + (40*b*(c + d*x)^3*(
a + b*ArcSin[c + d*x]))/3 + 6*b*(c + d*x)^5*(a + b*ArcSin[c + d*x]) - 40*S
qrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 - 20*(c + d*x)^2*Sqrt[1 - (
c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 - 15*(c + d*x)^4*Sqrt[1 - (c + d*x)^
2]*(a + b*ArcSin[c + d*x])^2 + 80*b*(a*d*x + b*Sqrt[1 - (c + d*x)^2] + b*(
c + d*x)*ArcSin[c + d*x])))/25))/(5*d)
```

### 3.197.3 Rubi [A] (warning: unable to verify)

Time = 1.27 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.01, number of steps used = 16, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.652$, Rules used = {5304, 27, 5138, 5210, 5138, 243, 53, 2009, 5210, 5138, 243, 53, 2009, 5182, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e^4(c+dx)^4(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^4\int (c+dx)^4(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\int\frac{(c+dx)^5(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{5210}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{2}{5}b\int(c+dx)^4(a+b\arcsin(c+dx))d(c+dx)+\frac{4}{5}\int\frac{(c+dx)^3(a+b\arcsin(c+}{\sqrt{1-(c+dx)^2}}\right.\right.}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{2}{5}b\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))-\frac{1}{5}b\int\frac{(c+dx)^5}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)+\frac{4}{5}\right.\right.}{d}$$

$$\Big\downarrow \text{243}$$

$$\frac{e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{2}{5}b\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))-\frac{1}{10}b\int\frac{(c+dx)^4}{\sqrt{-c-dx+1}}d(c+dx)^2\right)+\right.\right.}{d}$$

$$\Big\downarrow \text{53}$$

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{2}{5}b\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))-\frac{1}{10}b\int\left((-c-dx+1)^{3/2}-2\sqrt{}\right.\right.\right.\right.$$

$$\Big\downarrow \text{2009}$$

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{4}{5}\int\frac{(c+dx)^3(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{5}\sqrt{1-(c+dx)^2}(c+dx)^4(a+\right.\right.$$

$$\Big\downarrow \text{5210}$$

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{4}{5}\left(\frac{2}{3}b\int(c+dx)^2(a+b\arcsin(c+dx))d(c+dx)+\frac{2}{3}\int\frac{(c+dx)(a+b\arcsin(}{\sqrt{1-(c+dx)}}\right.\right.\right.$$

$$\Big\downarrow \text{5138}$$

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{4}{5}\left(\frac{2}{3}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{3}b\int\frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)\right.\right.\right.$$

$$\Big\downarrow \text{243}$$

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{4}{5}\left(\frac{2}{3}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{6}b\int\frac{(c+dx)^2}{\sqrt{-c-dx+1}}d(c+dx)^2\right)\right.\right.\right.$$

---

3.197. $\int(ce+dex)^4(a+b\arcsin(c+dx))^3\,dx$

$\downarrow$ 53

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{4}{5}\left(\frac{2}{3}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{6}b\int\left(\frac{1}{\sqrt{-c-dx+1}}-\sqrt{-c-d\right.\right.\right.\right.\right.$$

$\downarrow$ 2009

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{4}{5}\left(\frac{2}{3}\int\frac{(c+dx)(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{3}(c+dx)^2\sqrt{1-(c+dx)^2}(a\right.\right.\right.$$

$\downarrow$ 5182

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(\frac{4}{5}\left(\frac{2}{3}\left(2b\int(a+b\arcsin(c+dx))d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcs\right.\right.\right.\right.$$

$\downarrow$ 2009

$$e^4\left(\frac{1}{5}(c+dx)^5(a+b\arcsin(c+dx))^3-\frac{3}{5}b\left(-\frac{1}{5}\sqrt{1-(c+dx)^2}(c+dx)^4(a+b\arcsin(c+dx))^2+\frac{2}{5}b\left(\frac{1}{5}(c+dx)^5(a\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)^4*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^4*(((c + d*x)^5*(a + b*ArcSin[c + d*x])^3)/5 - (3*b*(-1/5*((c + d*x)^4*
Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2) + (2*b*(-1/10*(b*(-2*Sqrt
[1 - c - d*x] + (4*(1 - c - d*x)^(3/2))/3 - (2*(1 - c - d*x)^(5/2))/5)) +
((c + d*x)^5*(a + b*ArcSin[c + d*x]))/5))/5 + (4*(-1/3*((c + d*x)^2*Sqrt[1
 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2) + (2*b*(-1/6*(b*(-2*Sqrt[1 - c
- d*x] + (2*(1 - c - d*x)^(3/2))/3)) + ((c + d*x)^3*(a + b*ArcSin[c + d*x]
))/3))/3 + (2*(-(Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2) + 2*b*(a
*(c + d*x) + b*Sqrt[1 - (c + d*x)^2] + b*(c + d*x)*ArcSin[c + d*x])))/3))/
5))/5))/d
```

## 3.197. $\int(ce+dex)^4(a+b\arcsin(c+dx))^3\,dx$

### 3.197.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 53
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0])
|| LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

rule 243
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/2   Subst[In
t[x^((m - 1)/2)*(a + b*x)^p, x], x, x^2], x] /; FreeQ[{a, b, m, p}, x] && I
ntegerQ[(m - 1)/2]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.197.4 Maple [A] (verified)

Time = 3.28 (sec) , antiderivative size = 383, normalized size of antiderivative = 1.13

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{e^4a^3(dx+c)^5}{5}+e^4b^3\left(\frac{(dx+c)^5\arcsin(dx+c)^3}{5}+\frac{\arcsin(dx+c)^2\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{25}-\frac{6(dx+c)^5\arcsin(dx+c)}{125}-\frac{2(}{}\right.}{}$ |
| default | $\frac{\frac{e^4a^3(dx+c)^5}{5}+e^4b^3\left(\frac{(dx+c)^5\arcsin(dx+c)^3}{5}+\frac{\arcsin(dx+c)^2\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{25}-\frac{6(dx+c)^5\arcsin(dx+c)}{125}-\frac{2(}{}\right.}{}$ |
| parts | $\frac{e^4a^3(dx+c)^5}{5d}+\frac{e^4b^3\left(\frac{(dx+c)^5\arcsin(dx+c)^3}{5}+\frac{\arcsin(dx+c)^2\left(3(dx+c)^4+4(dx+c)^2+8\right)\sqrt{1-(dx+c)^2}}{25}-\frac{6(dx+c)^5\arcsin(dx+c)}{125}\right.}{}$ |

input
```
int((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/5*e^4*a^3*(d*x+c)^5+e^4*b^3*(1/5*(d*x+c)^5*arcsin(d*x+c)^3+1/25*arc
sin(d*x+c)^2*(3*(d*x+c)^4+4*(d*x+c)^2+8)*(1-(d*x+c)^2)^(1/2)-6/125*(d*x+c)
^5*arcsin(d*x+c)-2/625*(3*(d*x+c)^4+4*(d*x+c)^2+8)*(1-(d*x+c)^2)^(1/2)-8/7
5*(d*x+c)^3*arcsin(d*x+c)-8/225*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-16/25*(1
-(d*x+c)^2)^(1/2)-16/25*(d*x+c)*arcsin(d*x+c))+3*e^4*a*b^2*(1/5*(d*x+c)^5*
arcsin(d*x+c)^2+2/75*arcsin(d*x+c)*(3*(d*x+c)^4+4*(d*x+c)^2+8)*(1-(d*x+c)^
2)^(1/2)-2/125*(d*x+c)^5-8/225*(d*x+c)^3-16/75*d*x-16/75*c)+3*e^4*a^2*b*(1
/5*(d*x+c)^5*arcsin(d*x+c)+1/25*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)+4/75*(d*x+c)
^2*(1-(d*x+c)^2)^(1/2)+8/75*(1-(d*x+c)^2)^(1/2)))
```

### 3.197.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 996 vs. $2(304) = 608$.

Time = 0.29 (sec) , antiderivative size = 996, normalized size of antiderivative = 2.95

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx$$
$$=\frac{45\,(25\,a^3-6\,ab^2)d^5e^4x^5+225\,(25\,a^3-6\,ab^2)cd^4e^4x^4-150\,(4\,ab^2-3\,(25\,a^3-6\,ab^2)c^2)d^3e^4x^3-450\,(4\,ab}{}$$

input
```
integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
1/5625*(45*(25*a^3 - 6*a*b^2)*d^5*e^4*x^5 + 225*(25*a^3 - 6*a*b^2)*c*d^4*e
^4*x^4 - 150*(4*a*b^2 - 3*(25*a^3 - 6*a*b^2)*c^2)*d^3*e^4*x^3 - 450*(4*a*b
^2*c - (25*a^3 - 6*a*b^2)*c^3)*d^2*e^4*x^2 - 225*(8*a*b^2*c^2 - (25*a^3 -
6*a*b^2)*c^4 + 16*a*b^2)*d*e^4*x + 1125*(b^3*d^5*e^4*x^5 + 5*b^3*c*d^4*e^4
*x^4 + 10*b^3*c^2*d^3*e^4*x^3 + 10*b^3*c^3*d^2*e^4*x^2 + 5*b^3*c^4*d*e^4*x
 + b^3*c^5*e^4)*arcsin(d*x + c)^3 + 3375*(a*b^2*d^5*e^4*x^5 + 5*a*b^2*c*d^
4*e^4*x^4 + 10*a*b^2*c^2*d^3*e^4*x^3 + 10*a*b^2*c^3*d^2*e^4*x^2 + 5*a*b^2*
c^4*d*e^4*x + a*b^2*c^5*e^4)*arcsin(d*x + c)^2 + 15*(9*(25*a^2*b - 2*b^3)*
d^5*e^4*x^5 + 45*(25*a^2*b - 2*b^3)*c*d^4*e^4*x^4 - 10*(4*b^3 - 9*(25*a^2*
b - 2*b^3)*c^2)*d^3*e^4*x^3 - 30*(4*b^3*c - 3*(25*a^2*b - 2*b^3)*c^3)*d^2*
e^4*x^2 - 15*(8*b^3*c^2 - 3*(25*a^2*b - 2*b^3)*c^4 + 16*b^3)*d*e^4*x - (40
*b^3*c^3 - 9*(25*a^2*b - 2*b^3)*c^5 + 240*b^3*c)*e^4)*arcsin(d*x + c) + (2
7*(25*a^2*b - 2*b^3)*d^4*e^4*x^4 + 108*(25*a^2*b - 2*b^3)*c*d^3*e^4*x^3 +
2*(450*a^2*b - 136*b^3 + 81*(25*a^2*b - 2*b^3)*c^2)*d^2*e^4*x^2 + 4*(27*(2
5*a^2*b - 2*b^3)*c^3 + 2*(225*a^2*b - 68*b^3)*c)*d*e^4*x + (27*(25*a^2*b -
 2*b^3)*c^4 + 1800*a^2*b - 4144*b^3 + 4*(225*a^2*b - 68*b^3)*c^2)*e^4 + 22
5*(3*b^3*d^4*e^4*x^4 + 12*b^3*c*d^3*e^4*x^3 + 2*(9*b^3*c^2 + 2*b^3)*d^2*e^
4*x^2 + 4*(3*b^3*c^3 + 2*b^3*c)*d*e^4*x + (3*b^3*c^4 + 4*b^3*c^2 + 8*b^3)*
e^4)*arcsin(d*x + c)^2 + 450*(3*a*b^2*d^4*e^4*x^4 + 12*a*b^2*c*d^3*e^4*x^3
 + 2*(9*a*b^2*c^2 + 2*a*b^2)*d^2*e^4*x^2 + 4*(3*a*b^2*c^3 + 2*a*b^2*c)*...
```

### 3.197.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2518 vs. $2(306) = 612$.

Time = 1.07 (sec) , antiderivative size = 2518, normalized size of antiderivative = 7.45

$$\int (ce + dex)^4 (a + b \arcsin(c + dx))^3 \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)**4*(a+b*asin(d*x+c))**3,x)
```

output
```
Piecewise((a**3*c**4*e**4*x + 2*a**3*c**3*d*e**4*x**2 + 2*a**3*c**2*d**2*e
**4*x**3 + a**3*c*d**3*e**4*x**4 + a**3*d**4*e**4*x**5/5 + 3*a**2*b*c**5*e
**4*asin(c + d*x)/(5*d) + 3*a**2*b*c**4*e**4*x*asin(c + d*x) + 3*a**2*b*c*
*4*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(25*d) + 6*a**2*b*c**3*d*e**
4*x**2*asin(c + d*x) + 12*a**2*b*c**3*e**4*x*sqrt(-c**2 - 2*c*d*x - d**2*x
**2 + 1)/25 + 6*a**2*b*c**2*d**2*e**4*x**3*asin(c + d*x) + 18*a**2*b*c**2*
d*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 4*a**2*b*c**2*e**4*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(25*d) + 3*a**2*b*c*d**3*e**4*x**4*a
sin(c + d*x) + 12*a**2*b*c*d**2*e**4*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2
 + 1)/25 + 8*a**2*b*c*e**4*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/25 + 3*
a**2*b*d**4*e**4*x**5*asin(c + d*x)/5 + 3*a**2*b*d**3*e**4*x**4*sqrt(-c**2
 - 2*c*d*x - d**2*x**2 + 1)/25 + 4*a**2*b*d*e**4*x**2*sqrt(-c**2 - 2*c*d*x
 - d**2*x**2 + 1)/25 + 8*a**2*b*e**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)
/(25*d) + 3*a*b**2*c**5*e**4*asin(c + d*x)**2/(5*d) + 3*a*b**2*c**4*e**4*x
*asin(c + d*x)**2 - 6*a*b**2*c**4*e**4*x/25 + 6*a*b**2*c**4*e**4*sqrt(-c**
2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(25*d) + 6*a*b**2*c**3*d*e**4*x
**2*asin(c + d*x)**2 - 12*a*b**2*c**3*d*e**4*x**2/25 + 24*a*b**2*c**3*e**4
*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/25 + 6*a*b**2*c**2*
d**2*e**4*x**3*asin(c + d*x)**2 - 12*a*b**2*c**2*d**2*e**4*x**3/25 + 36*a*
b**2*c**2*d*e**4*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*...
```

### 3.197.7 Maxima [F]

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx=\int (dex+ce)^4(b\arcsin(dx+c)+a)^3\,dx$$

input
```
integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
1/5*a^3*d^4*e^4*x^5 + a^3*c*d^3*e^4*x^4 + 2*a^3*c^2*d^2*e^4*x^3 + 2*a^3*c^
3*d*e^4*x^2 + 3*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sq
rt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^
2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3
*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^2*b*c^3*d*e^4 + (6*x^3*arcsi
n(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcs
in(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2
*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d
^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 -
 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*a^2*b*c^2*d^2*e^4 +
1/8*(24*x^4*arcsin(d*x + c) + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^
2 - 14*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2
*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x
- c^2 + 1)*c^2*x/d^4 - 90*(c^2 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2
 - (c^2 - 1)*d^2))/d^5 - 105*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 -
9*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsi
n(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2
*c*d*x - c^2 + 1)*(c^2 - 1)*c/d^5)*d)*a^2*b*c*d^3*e^4 + 1/200*(120*x^5*arc
sin(d*x + c) + (24*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^4/d^2 - 54*sqrt(-d
^2*x^2 - 2*c*d*x - c^2 + 1)*c*x^3/d^3 + 126*sqrt(-d^2*x^2 - 2*c*d*x - c...
```

### 3.197.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 832 vs. $2(304) = 608$.

Time = 0.36 (sec) , antiderivative size = 832, normalized size of antiderivative = 2.46

$$\int (ce + dex)^4 (a + b \arcsin(c + dx))^3 \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^4*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
1/5*((d*x + c)^2 - 1)^2*(d*x + c)*b^3*e^4*arcsin(d*x + c)^3/d + 1/5*(d*x +
 c)^5*a^3*e^4/d + 3/5*((d*x + c)^2 - 1)^2*(d*x + c)*a*b^2*e^4*arcsin(d*x +
 c)^2/d + 2/5*((d*x + c)^2 - 1)*(d*x + c)*b^3*e^4*arcsin(d*x + c)^3/d + 3/
25*((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b^3*e^4*arcsin(d*x + c)^2/d
+ 3/5*((d*x + c)^2 - 1)^2*(d*x + c)*a^2*b*e^4*arcsin(d*x + c)/d - 6/125*((
d*x + c)^2 - 1)^2*(d*x + c)*b^3*e^4*arcsin(d*x + c)/d + 6/5*((d*x + c)^2 -
 1)*(d*x + c)*a*b^2*e^4*arcsin(d*x + c)^2/d + 1/5*(d*x + c)*b^3*e^4*arcsin
(d*x + c)^3/d + 6/25*((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*a*b^2*e^4*
arcsin(d*x + c)/d - 2/5*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^4*arcsin(d*x + c)^2
/d - 6/125*((d*x + c)^2 - 1)^2*(d*x + c)*a*b^2*e^4/d + 6/5*((d*x + c)^2 -
1)*(d*x + c)*a^2*b*e^4*arcsin(d*x + c)/d - 76/375*((d*x + c)^2 - 1)*(d*x +
 c)*b^3*e^4*arcsin(d*x + c)/d + 3/5*(d*x + c)*a*b^2*e^4*arcsin(d*x + c)^2/
d + 3/25*((d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*a^2*b*e^4/d - 6/625*((
d*x + c)^2 - 1)^2*sqrt(-(d*x + c)^2 + 1)*b^3*e^4/d - 4/5*(-(d*x + c)^2 + 1
)^(3/2)*a*b^2*e^4*arcsin(d*x + c)/d + 3/5*sqrt(-(d*x + c)^2 + 1)*b^3*e^4*a
rcsin(d*x + c)^2/d - 76/375*((d*x + c)^2 - 1)*(d*x + c)*a*b^2*e^4/d + 3/5*
(d*x + c)*a^2*b*e^4*arcsin(d*x + c)/d - 298/375*(d*x + c)*b^3*e^4*arcsin(d
*x + c)/d - 2/5*(-(d*x + c)^2 + 1)^(3/2)*a^2*b*e^4/d + 76/1125*(-(d*x + c)
^2 + 1)^(3/2)*b^3*e^4/d + 6/5*sqrt(-(d*x + c)^2 + 1)*a*b^2*e^4*arcsin(d*x
+ c)/d - 298/375*(d*x + c)*a*b^2*e^4/d + 3/5*sqrt(-(d*x + c)^2 + 1)*a^2...
```

### 3.197.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^4(a+b\arcsin(c+dx))^3\,dx=\int (c\,e+d\,e\,x)^4\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^3\,dx$$

input
```
int((c*e + d*e*x)^4*(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)^4*(a + b*asin(c + d*x))^3, x)
```

# 3.198 $\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$



## 3.198.1 Optimal result

Integrand size = 23, antiderivative size = 287

$$\begin{aligned}\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx &= -\frac{45b^3e^3(c+dx)\sqrt{1-(c+dx)^2}}{256d}-\frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{128d}\\&+\frac{45b^3e^3\arcsin(c+dx)}{256d}-\frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))}{32d}\\&-\frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))}{32d}\\&+\frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{32d}\\&+\frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{16d}\\&-\frac{3e^3(a+b\arcsin(c+dx))^3}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^3}{4d}\end{aligned}$$

output
```
45/256*b^3*e^3*arcsin(d*x+c)/d-9/32*b^2*e^3*(d*x+c)^2*(a+b*arcsin(d*x+c))/
d-3/32*b^2*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))/d-3/32*e^3*(a+b*arcsin(d*x+c)
)^3/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))^3/d-45/256*b^3*e^3*(d*x+c)*(1-
(d*x+c)^2)^(1/2)/d-3/128*b^3*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/d+9/32*b*e^
3*(d*x+c)*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+3/16*b*e^3*(d*x+c)^3
*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d
```

### 3.198.2 Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.81

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$$
$$= \frac{e^3\Big((c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{8}\Big(\frac{15}{8}b^3(c+dx)\sqrt{1-(c+dx)^2}+\frac{1}{4}b^3(c+dx)^3\sqrt{1-(c+dx)^2}-\frac{1}{8}\cdots}{}$$

input
```
Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^3*((c + d*x)^4*(a + b*ArcSin[c + d*x])^3 - (3*((15*b^3*(c + d*x)*Sqrt[1
 - (c + d*x)^2])/8 + (b^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/4 - (15*b^3*A
rcSin[c + d*x])/8 + 3*b^2*(c + d*x)^2*(a + b*ArcSin[c + d*x]) + b^2*(c + d
*x)^4*(a + b*ArcSin[c + d*x]) - 3*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b
*ArcSin[c + d*x])^2 - 2*b*(c + d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[
c + d*x])^2 + (a + b*ArcSin[c + d*x])^3))/8))/(4*d)
```

### 3.198.3 Rubi [A] (verified)

Time = 1.05 (sec) , antiderivative size = 297, normalized size of antiderivative = 1.03, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.565$, Rules used = {5304, 27, 5138, 5210, 5138, 262, 262, 223, 5210, 5138, 262, 223, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e^3(c+dx)^3(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^3\int (c+dx)^3(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{4}b\int \frac{(c+dx)^4(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$\downarrow$ 5210

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{4}b\left(\frac{1}{2}b\int(c+dx)^3(a+b\arcsin(c+dx))d(c+dx)+\frac{3}{4}\int\frac{(c+dx)^2(a+b\arcsin(c+}{\sqrt{1-(c+dx)^2}}\right.\right.}{d}$$

$\downarrow$ 5138

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{4}b\left(\frac{1}{2}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))-\frac{1}{4}b\int\frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)+\frac{3}{4}\right.\right.}{d}$$

$\downarrow$ 262

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{4}b\left(\frac{1}{2}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))-\frac{1}{4}b\left(\frac{3}{4}\int\frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}}d(c+dx)-\right.\right.\right.\right.$$

$\downarrow$ 262

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{4}b\left(\frac{1}{2}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))-\frac{1}{4}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{1}{\sqrt{1-(c+dx)^2}}d(c+dx\right.\right.\right.\right.\right.$$

$\downarrow$ 223

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{4}b\left(\frac{3}{4}\int\frac{(c+dx)^2(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{4}\sqrt{1-(c+dx)^2}(c+dx)^3(a+\right.\right.$$

$\downarrow$ 5210

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{4}b\left(\frac{3}{4}\left(b\int(c+dx)(a+b\arcsin(c+dx))d(c+dx)+\frac{1}{2}\int\frac{(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.$$

$\downarrow$ 5138

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{4}b\left(\frac{3}{4}\left(b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))-\frac{1}{2}b\int\frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)+\right.\right.\right.$$

$\downarrow$ 262

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\frac{3}{4}b\left(\frac{3}{4}\left(b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))-\frac{1}{2}b\left(\frac{1}{2}\int\frac{1}{\sqrt{1-(c+dx)^2}}d(c+dx)\right.\right.\right.\right.\right.$$

$\downarrow$ 223

3.198. $\int(ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$

$$e^3\Big(\tfrac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\tfrac{3}{4}b\Big(\tfrac{3}{4}\Big(\tfrac{1}{2}\int\frac{(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)-\tfrac{1}{2}(c+dx)\sqrt{1-(c+dx)^2}(a+b\,\text{ar}$$

$\downarrow$ 5152

$$e^3\Big(\tfrac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^3-\tfrac{3}{4}b\Big(-\tfrac{1}{4}\sqrt{1-(c+dx)^2}(c+dx)^3(a+b\arcsin(c+dx))^2+\tfrac{1}{2}b\Big(\tfrac{1}{4}(c+dx)^4($$

input
```
Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^3*(((c + d*x)^4*(a + b*ArcSin[c + d*x])^3)/4 - (3*b*(-1/4*((c + d*x)^3*
Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2) + (b*(-1/4*(b*(-1/4*((c +
 d*x)^3*Sqrt[1 - (c + d*x)^2]) + (3*(-1/2*((c + d*x)*Sqrt[1 - (c + d*x)^2]
) + ArcSin[c + d*x]/2))/4)) + ((c + d*x)^4*(a + b*ArcSin[c + d*x]))/4))/2
+ (3*(-1/2*((c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2) + (
a + b*ArcSin[c + d*x])^3/(6*b) + b*(-1/2*(b*(-1/2*((c + d*x)*Sqrt[1 - (c +
 d*x)^2]) + ArcSin[c + d*x]/2)) + ((c + d*x)^2*(a + b*ArcSin[c + d*x]))/2)
))/4))/4))/d
```

### 3.198.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.198.4 Maple [A] (verified)

Time = 1.14 (sec) , antiderivative size = 394, normalized size of antiderivative = 1.37

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{e^3a^3(dx+c)^4}{4}+e^3b^3\left(\frac{(dx+c)^4\arcsin(dx+c)^3}{4}-\frac{3\arcsin(dx+c)^2\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{32}\right.}{}$ |
| default | $\frac{\frac{e^3a^3(dx+c)^4}{4}+e^3b^3\left(\frac{(dx+c)^4\arcsin(dx+c)^3}{4}-\frac{3\arcsin(dx+c)^2\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{32}\right.}{}$ |
| parts | $\frac{e^3a^3(dx+c)^4}{4d}+\frac{e^3b^3\left(\frac{(dx+c)^4\arcsin(dx+c)^3}{4}-\frac{3\arcsin(dx+c)^2\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+\right.}{32}\right.}{}$ |

input
```
int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/4*e^3*a^3*(d*x+c)^4+e^3*b^3*(1/4*(d*x+c)^4*arcsin(d*x+c)^3-3/32*arc
sin(d*x+c)^2*(-2*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/
2)+3*arcsin(d*x+c))-3/32*(d*x+c)^4*arcsin(d*x+c)-3/256*(d*x+c)*(2*(d*x+c)^
2+3)*(1-(d*x+c)^2)^(1/2)-27/256*arcsin(d*x+c)-9/32*((d*x+c)^2-1)*arcsin(d*
x+c)-9/64*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3/16*arcsin(d*x+c)^3)+3*e^3*a*b^2*(1
/4*(d*x+c)^4*arcsin(d*x+c)^2-1/16*arcsin(d*x+c)*(-2*(d*x+c)^3*(1-(d*x+c)^2
)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3*arcsin(d*x+c))+3/32*arcsin(d*x+c)^
2-1/128*(2*(d*x+c)^2+3)^2)+3*e^3*a^2*b*(1/4*(d*x+c)^4*arcsin(d*x+c)+1/16*(
d*x+c)^3*(1-(d*x+c)^2)^(1/2)+3/32*(d*x+c)*(1-(d*x+c)^2)^(1/2)-3/32*arcsin(
d*x+c)))
```

### 3.198.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 769 vs. $2(261) = 522$.

Time = 0.31 (sec) , antiderivative size = 769, normalized size of antiderivative = 2.68

$$\int (ce + dex)^3 (a + b \arcsin(c + dx))^3 \, dx$$
$$= \frac{8\,(8\,a^3 - 3\,ab^2) d^4 e^3 x^4 + 32\,(8\,a^3 - 3\,ab^2) c d^3 e^3 x^3 - 24\,(3\,ab^2 - 2\,(8\,a^3 - 3\,ab^2) c^2) d^2 e^3 x^2 - 16\,(9\,ab^2 c - 2\,(8}{}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
1/256*(8*(8*a^3 - 3*a*b^2)*d^4*e^3*x^4 + 32*(8*a^3 - 3*a*b^2)*c*d^3*e^3*x^
3 - 24*(3*a*b^2 - 2*(8*a^3 - 3*a*b^2)*c^2)*d^2*e^3*x^2 - 16*(9*a*b^2*c - 2
*(8*a^3 - 3*a*b^2)*c^3)*d*e^3*x + 8*(8*b^3*d^4*e^3*x^4 + 32*b^3*c*d^3*e^3*
x^3 + 48*b^3*c^2*d^2*e^3*x^2 + 32*b^3*c^3*d*e^3*x + (8*b^3*c^4 - 3*b^3)*e^
3)*arcsin(d*x + c)^3 + 24*(8*a*b^2*d^4*e^3*x^4 + 32*a*b^2*c*d^3*e^3*x^3 +
48*a*b^2*c^2*d^2*e^3*x^2 + 32*a*b^2*c^3*d*e^3*x + (8*a*b^2*c^4 - 3*a*b^2)*
e^3)*arcsin(d*x + c)^2 + 3*(8*(8*a^2*b - b^3)*d^4*e^3*x^4 + 32*(8*a^2*b -
b^3)*c*d^3*e^3*x^3 - 24*(b^3 - 2*(8*a^2*b - b^3)*c^2)*d^2*e^3*x^2 - 16*(3*
b^3*c - 2*(8*a^2*b - b^3)*c^3)*d*e^3*x - (24*b^3*c^2 - 8*(8*a^2*b - b^3)*c
^4 + 24*a^2*b - 15*b^3)*e^3)*arcsin(d*x + c) + 3*(2*(8*a^2*b - b^3)*d^3*e^
3*x^3 + 6*(8*a^2*b - b^3)*c*d^2*e^3*x^2 + 3*(8*a^2*b - 5*b^3 + 2*(8*a^2*b
- b^3)*c^2)*d*e^3*x + (2*(8*a^2*b - b^3)*c^3 + 3*(8*a^2*b - 5*b^3)*c)*e^3
+ 8*(2*b^3*d^3*e^3*x^3 + 6*b^3*c*d^2*e^3*x^2 + 3*(2*b^3*c^2 + b^3)*d*e^3*x
 + (2*b^3*c^3 + 3*b^3*c)*e^3)*arcsin(d*x + c)^2 + 16*(2*a*b^2*d^3*e^3*x^3
+ 6*a*b^2*c*d^2*e^3*x^2 + 3*(2*a*b^2*c^2 + a*b^2)*d*e^3*x + (2*a*b^2*c^3 +
 3*a*b^2*c)*e^3)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

### 3.198.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1828 vs. 2(260) = 520.

Time = 0.76 (sec) , antiderivative size = 1828, normalized size of antiderivative = 6.37

$$\int (ce + dex)^3 (a + b \arcsin(c + dx))^3 \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**3,x)
```

output
```
Piecewise((a**3*c**3*e**3*x + 3*a**3*c**2*d*e**3*x**2/2 + a**3*c*d**2*e**3
*x**3 + a**3*d**3*e**3*x**4/4 + 3*a**2*b*c**4*e**3*asin(c + d*x)/(4*d) + 3
*a**2*b*c**3*e**3*x*asin(c + d*x) + 3*a**2*b*c**3*e**3*sqrt(-c**2 - 2*c*d*
x - d**2*x**2 + 1)/(16*d) + 9*a**2*b*c**2*d*e**3*x**2*asin(c + d*x)/2 + 9*
a**2*b*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/16 + 3*a**2*b*c*d
**2*e**3*x**3*asin(c + d*x) + 9*a**2*b*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x
- d**2*x**2 + 1)/16 + 9*a**2*b*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1
)/(32*d) + 3*a**2*b*d**3*e**3*x**4*asin(c + d*x)/4 + 3*a**2*b*d**2*e**3*x*
*3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/16 + 9*a**2*b*e**3*x*sqrt(-c**2 -
 2*c*d*x - d**2*x**2 + 1)/32 - 9*a**2*b*e**3*asin(c + d*x)/(32*d) + 3*a*b*
*2*c**4*e**3*asin(c + d*x)**2/(4*d) + 3*a*b**2*c**3*e**3*x*asin(c + d*x)**
2 - 3*a*b**2*c**3*e**3*x/8 + 3*a*b**2*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**
2*x**2 + 1)*asin(c + d*x)/(8*d) + 9*a*b**2*c**2*d*e**3*x**2*asin(c + d*x)*
*2/2 - 9*a*b**2*c**2*d*e**3*x**2/16 + 9*a*b**2*c**2*e**3*x*sqrt(-c**2 - 2*
c*d*x - d**2*x**2 + 1)*asin(c + d*x)/8 + 3*a*b**2*c*d**2*e**3*x**3*asin(c
+ d*x)**2 - 3*a*b**2*c*d**2*e**3*x**3/8 + 9*a*b**2*c*d*e**3*x**2*sqrt(-c**
2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/8 - 9*a*b**2*c*e**3*x/16 + 9*a*
b**2*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(16*d) + 3
*a*b**2*d**3*e**3*x**4*asin(c + d*x)**2/4 - 3*a*b**2*d**3*e**3*x**4/32 + 3
*a*b**2*d**2*e**3*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d...
```

### 3.198.7 Maxima [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx=\int (dex+ce)^3(b\arcsin(dx+c)+a)^3\,dx$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
1/4*a^3*d^3*e^3*x^4 + a^3*c*d^2*e^3*x^3 + 3/2*a^3*c^2*d*e^3*x^2 + 9/4*(2*x
^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 -
1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin
(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c
*d*x - c^2 + 1)*c/d^3))*a^2*b*c^2*d*e^3 + 1/2*(6*x^3*arcsin(d*x + c) + d*(
2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d
)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
)*c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d
^2))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2
 - 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*a^2*b*c*d^2*e^3 + 1/32*(24*x^4*arcsi
n(d*x + c) + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-d^2*
x^2 - 2*c*d*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqrt(c^
2*d^2 - (c^2 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x/
d^4 - 90*(c^2 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2)
)/d^5 - 105*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2 -
 2*c*d*x - c^2 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)/
sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)
*(c^2 - 1)*c/d^5)*d)*a^2*b*d^3*e^3 + a^3*c^3*e^3*x + 3*((d*x + c)*arcsin(d
*x + c) + sqrt(-(d*x + c)^2 + 1))*a^2*b*c^3*e^3/d + 1/4*(b^3*d^3*e^3*x^4 +
 4*b^3*c*d^2*e^3*x^3 + 6*b^3*c^2*d*e^3*x^2 + 4*b^3*c^3*e^3*x)*arctan2(d...
```

### 3.198.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 641 vs. $2(261) = 522$.

Time = 0.35 (sec) , antiderivative size = 641, normalized size of antiderivative = 2.23

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$$
$$= \frac{\left((dx+c)^2-1\right)^2 b^3e^3\arcsin\left(dx+c\right)^3}{4\,d} - \frac{3\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)b^3e^3\arcsin\left(dx+c\right)^2}{16\,d} + \frac{(dx+c)^4a^3e^3}{4\,d} + \frac{3\left((dx+c)^2-1\right)^2 ab^2e^3\arcsin\left(dx+c\right)^2}{4\,d} + \frac{\left((dx+c)^2-1\right)b^3e^3\arcsin\left(dx+c\right)^3}{2\,d} - \frac{3\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)ab^2e^3\arcsin\left(dx+c\right)}{8\,d} + \frac{15\sqrt{-(dx+c)^2+1}(dx+c)b^3e^3\arcsin\left(dx+c\right)^2}{32\,d} + \frac{3\left((dx+c)^2-1\right)^2 a^2be^3\arcsin\left(dx+c\right)}{4\,d} - \frac{3\left((dx+c)^2-1\right)^2 b^3e^3\arcsin\left(dx+c\right)}{32\,d} + \frac{3\left((dx+c)^2-1\right)ab^2e^3\arcsin\left(dx+c\right)^2}{2\,d} + \frac{5\,b^3e^3\arcsin\left(dx+c\right)^3}{32\,d} - \frac{3\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)a^2be^3}{16\,d} + \frac{3\left(-(dx+c)^2+1\right)^{\frac{3}{2}}(dx+c)b^3e^3}{128\,d} + \frac{15\sqrt{-(dx+c)^2+1}(dx+c)ab^2e^3\arcsin\left(dx+c\right)}{16\,d} - \frac{3\left((dx+c)^2-1\right)^2 ab^2e^3}{32\,d} + \frac{3\left((dx+c)^2-1\right)a^2be^3\arcsin\left(dx+c\right)}{2\,d} - \frac{15\left((dx+c)^2-1\right)b^3e^3\arcsin\left(dx+c\right)}{32\,d} + \frac{15\,ab^2e^3\arcsin\left(dx+c\right)^2}{32\,d} + \frac{15\sqrt{-(dx+c)^2+1}(dx+c)a^2be^3}{32\,d} - \frac{51\sqrt{-(dx+c)^2+1}(dx+c)b^3e^3}{256\,d} - \frac{15\left((dx+c)^2-1\right)ab^2e^3}{32\,d} + \frac{15\,a^2be^3\arcsin\left(dx+c\right)}{32\,d} - \frac{51\,b^3e^3\arcsin\left(dx+c\right)}{256\,d} - \frac{51\,ab^2e^3}{256\,d}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

3.198. $\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx$

output
```
1/4*((d*x + c)^2 - 1)^2*b^3*e^3*arcsin(d*x + c)^3/d - 3/16*(-(d*x + c)^2 +
 1)^(3/2)*(d*x + c)*b^3*e^3*arcsin(d*x + c)^2/d + 1/4*(d*x + c)^4*a^3*e^3/
d + 3/4*((d*x + c)^2 - 1)^2*a*b^2*e^3*arcsin(d*x + c)^2/d + 1/2*((d*x + c)
^2 - 1)*b^3*e^3*arcsin(d*x + c)^3/d - 3/8*(-(d*x + c)^2 + 1)^(3/2)*(d*x +
c)*a*b^2*e^3*arcsin(d*x + c)/d + 15/32*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^
3*e^3*arcsin(d*x + c)^2/d + 3/4*((d*x + c)^2 - 1)^2*a^2*b*e^3*arcsin(d*x +
 c)/d - 3/32*((d*x + c)^2 - 1)^2*b^3*e^3*arcsin(d*x + c)/d + 3/2*((d*x + c
)^2 - 1)*a*b^2*e^3*arcsin(d*x + c)^2/d + 5/32*b^3*e^3*arcsin(d*x + c)^3/d
- 3/16*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a^2*b*e^3/d + 3/128*(-(d*x + c)^
2 + 1)^(3/2)*(d*x + c)*b^3*e^3/d + 15/16*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*
a*b^2*e^3*arcsin(d*x + c)/d - 3/32*((d*x + c)^2 - 1)^2*a*b^2*e^3/d + 3/2*(
(d*x + c)^2 - 1)*a^2*b*e^3*arcsin(d*x + c)/d - 15/32*((d*x + c)^2 - 1)*b^3
*e^3*arcsin(d*x + c)/d + 15/32*a*b^2*e^3*arcsin(d*x + c)^2/d + 15/32*sqrt(
-(d*x + c)^2 + 1)*(d*x + c)*a^2*b*e^3/d - 51/256*sqrt(-(d*x + c)^2 + 1)*(d
*x + c)*b^3*e^3/d - 15/32*((d*x + c)^2 - 1)*a*b^2*e^3/d + 15/32*a^2*b*e^3*
arcsin(d*x + c)/d - 51/256*b^3*e^3*arcsin(d*x + c)/d - 51/256*a*b^2*e^3/d
```

### 3.198.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^3\,dx = \int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))^3\,dx$$

input
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^3, x)
```

# 3.199 $\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx$



## 3.199.1 Optimal result

Integrand size = 23, antiderivative size = 235

$$\begin{aligned}\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx &= -\frac{4}{3}ab^2e^2x-\frac{14b^3e^2\sqrt{1-(c+dx)^2}}{9d}+\frac{2b^3e^2(1-(c+dx)^2)^{3/2}}{27d}\\ &\quad-\frac{4b^3e^2(c+dx)\arcsin(c+dx)}{3d}-\frac{2b^2e^2(c+dx)^3(a+b\arcsin(c+dx))}{9d}\\ &\quad+\frac{2be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d}\\ &\quad+\frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{3d}\\ &\quad+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^3}{3d}\end{aligned}$$

output
```
-4/3*a*b^2*e^2*x+2/27*b^3*e^2*(1-(d*x+c)^2)^(3/2)/d-4/3*b^3*e^2*(d*x+c)*ar
csin(d*x+c)/d-2/9*b^2*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))/d+1/3*e^2*(d*x+c)^
3*(a+b*arcsin(d*x+c))^3/d-14/9*b^3*e^2*(1-(d*x+c)^2)^(1/2)/d+2/3*b*e^2*(a+
b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+1/3*b*e^2*(d*x+c)^2*(a+b*arcsin(d
*x+c))^2*(1-(d*x+c)^2)^(1/2)/d
```

### 3.199.2 Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 199, normalized size of antiderivative = 0.85

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx$$
$$=\frac{e^2\Big((c+dx)^3(a+b\arcsin(c+dx))^3-b\Big(\frac{2}{9}b^2(2+c^2+2cdx+d^2x^2)\sqrt{1-(c+dx)^2}+\frac{2}{3}b(c+dx)^3(a+b\,\mathrm{a}$$

input
```
Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^2*((c + d*x)^3*(a + b*ArcSin[c + d*x])^3 - b*((2*b^2*(2 + c^2 + 2*c*d*x
 + d^2*x^2)*Sqrt[1 - (c + d*x)^2])/9 + (2*b*(c + d*x)^3*(a + b*ArcSin[c +
d*x]))/3 - 2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 - (c + d*x)^2
*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 + 4*b*(a*d*x + b*Sqrt[1 -
 (c + d*x)^2] + b*(c + d*x)*ArcSin[c + d*x]))))/(3*d)
```

### 3.199.3 Rubi [A] (warning: unable to verify)

Time = 0.75 (sec) , antiderivative size = 213, normalized size of antiderivative = 0.91, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {5304, 27, 5138, 5210, 5138, 243, 53, 2009, 5182, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx$$
$$\Big\downarrow \ 5304$$
$$\frac{\int e^2(c+dx)^2(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$
$$\Big\downarrow \ 27$$
$$\frac{e^2\int (c+dx)^2(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$
$$\Big\downarrow \ 5138$$
$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^3-b\int \frac{(c+dx)^3(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$\downarrow$ 5210

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^3-b\left(\frac{2}{3}b\int(c+dx)^2(a+b\arcsin(c+dx))d(c+dx)+\frac{2}{3}\int\frac{(c+dx)(a+b\arcsin(c+dx}{\sqrt{1-(c+dx)^2}}\right.\right.}{d}$$

$\downarrow$ 5138

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^3-b\left(\frac{2}{3}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{3}b\int\frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)+\frac{2}{3}\right.\right.}{d}$$

$\downarrow$ 243

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^3-b\left(\frac{2}{3}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{6}b\int\frac{(c+dx)^2}{\sqrt{-c-dx+1}}d(c+dx)^2\right)+\frac{2}{3}\right.\right.}{d}$$

$\downarrow$ 53

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^3-b\left(\frac{2}{3}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))-\frac{1}{6}b\int\left(\frac{1}{\sqrt{-c-dx+1}}-\sqrt{-c-dx+}\right.\right.\right.\right.}{d}$$

$\downarrow$ 2009

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^3-b\left(\frac{2}{3}\int\frac{(c+dx)(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{3}(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\right.\right.}{d}$$

$\downarrow$ 5182

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^3-b\left(\frac{2}{3}\left(2b\int(a+b\arcsin(c+dx))d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c\right.\right.\right.}{}$$

$\downarrow$ 2009

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^3-b\left(-\frac{1}{3}(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2+\frac{2}{3}b\left(\frac{1}{3}(c+dx)^3(a\right.\right.\right.}{}$$

input
```
Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^3,x]
```

3.199. $\int(ce+dex)^2(a+b\arcsin(c+dx))^3\,dx$

output
```
(e^2*(((c + d*x)^3*(a + b*ArcSin[c + d*x])^3)/3 - b*(-1/3*((c + d*x)^2*Sqr
t[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2) + (2*b*(-1/6*(b*(-2*Sqrt[1 -
 c - d*x] + (2*(1 - c - d*x)^(3/2))/3)) + ((c + d*x)^3*(a + b*ArcSin[c + d
*x]))/3))/3 + (2*(-(Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2) + 2*b
*(a*(c + d*x) + b*Sqrt[1 - (c + d*x)^2] + b*(c + d*x)*ArcSin[c + d*x])))/3
)))/d
```

### 3.199.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 53
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0])
|| LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

rule 243
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/2   Subst[In
t[x^((m - 1)/2)*(a + b*x)^p, x], x, x^2], x] /; FreeQ[{a, b, m, p}, x] && I
ntegerQ[(m - 1)/2]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.199.4 Maple [A] (verified)

Time = 1.05 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.19

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{e^2a^3(dx+c)^3}{3}+b^3e^2\left(\frac{(dx+c)^3\arcsin(dx+c)^3}{3}+\frac{\arcsin(dx+c)^2\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{3}-\frac{4\sqrt{1-(dx+c)^2}}{3}-\frac{4(dx+c)\arcsin(dx+c)}{3}\right.}{}$ |
| default | $\frac{\frac{e^2a^3(dx+c)^3}{3}+b^3e^2\left(\frac{(dx+c)^3\arcsin(dx+c)^3}{3}+\frac{\arcsin(dx+c)^2\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{3}-\frac{4\sqrt{1-(dx+c)^2}}{3}-\frac{4(dx+c)\arcsin(dx+c)}{3}\right.}{}$ |
| parts | $\frac{e^2a^3(dx+c)^3}{3d}+\frac{b^3e^2\left(\frac{(dx+c)^3\arcsin(dx+c)^3}{3}+\frac{\arcsin(dx+c)^2\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{3}-\frac{4\sqrt{1-(dx+c)^2}}{3}-\frac{4(dx+c)\arcsin(dx-\right.}{d}$ |

input
```
int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/3*e^2*a^3*(d*x+c)^3+b^3*e^2*(1/3*(d*x+c)^3*arcsin(d*x+c)^3+1/3*arcs
in(d*x+c)^2*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-4/3*(1-(d*x+c)^2)^(1/2)-4/3*
(d*x+c)*arcsin(d*x+c)-2/9*(d*x+c)^3*arcsin(d*x+c)-2/27*((d*x+c)^2+2)*(1-(d
*x+c)^2)^(1/2))+3*e^2*a*b^2*(1/3*(d*x+c)^3*arcsin(d*x+c)^2+2/9*arcsin(d*x+
c)*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-2/27*(d*x+c)^3-4/9*d*x-4/9*c)+3*e^2*a
^2*b*(1/3*(d*x+c)^3*arcsin(d*x+c)+1/9*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+2/9*(1
-(d*x+c)^2)^(1/2)))
```

### 3.199.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 530 vs. $2(211) = 422$.

Time = 0.28 (sec) , antiderivative size = 530, normalized size of antiderivative = 2.26

$$\int (ce + dex)^2 (a + b \arcsin(c + dx))^3 \, dx$$
$$= \frac{3\,(3\,a^3 - 2\,ab^2)d^3e^2x^3 + 9\,(3\,a^3 - 2\,ab^2)cd^2e^2x^2 - 9\,(4\,ab^2 - (3\,a^3 - 2\,ab^2)c^2)de^2x + 9\,(b^3d^3e^2x^3 + 3\,b^3cd^2e}{}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
1/27*(3*(3*a^3 - 2*a*b^2)*d^3*e^2*x^3 + 9*(3*a^3 - 2*a*b^2)*c*d^2*e^2*x^2
- 9*(4*a*b^2 - (3*a^3 - 2*a*b^2)*c^2)*d*e^2*x + 9*(b^3*d^3*e^2*x^3 + 3*b^3
*c*d^2*e^2*x^2 + 3*b^3*c^2*d*e^2*x + b^3*c^3*e^2)*arcsin(d*x + c)^3 + 27*(
a*b^2*d^3*e^2*x^3 + 3*a*b^2*c*d^2*e^2*x^2 + 3*a*b^2*c^2*d*e^2*x + a*b^2*c^
3*e^2)*arcsin(d*x + c)^2 + 3*((9*a^2*b - 2*b^3)*d^3*e^2*x^3 + 3*(9*a^2*b -
 2*b^3)*c*d^2*e^2*x^2 - 3*(4*b^3 - (9*a^2*b - 2*b^3)*c^2)*d*e^2*x - (12*b^
3*c - (9*a^2*b - 2*b^3)*c^3)*e^2)*arcsin(d*x + c) + ((9*a^2*b - 2*b^3)*d^2
*e^2*x^2 + 2*(9*a^2*b - 2*b^3)*c*d*e^2*x + (18*a^2*b - 40*b^3 + (9*a^2*b -
 2*b^3)*c^2)*e^2 + 9*(b^3*d^2*e^2*x^2 + 2*b^3*c*d*e^2*x + (b^3*c^2 + 2*b^3
)*e^2)*arcsin(d*x + c)^2 + 18*(a*b^2*d^2*e^2*x^2 + 2*a*b^2*c*d*e^2*x + (a*
b^2*c^2 + 2*a*b^2)*e^2)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
))/d
```

### 3.199.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1173 vs. $2(211) = 422$.

Time = 0.49 (sec) , antiderivative size = 1173, normalized size of antiderivative = 4.99

$$\int (ce + dex)^2 (a + b \arcsin(c + dx))^3 \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**3,x)
```

output
```
Piecewise((a**3*c**2*e**2*x + a**3*c*d*e**2*x**2 + a**3*d**2*e**2*x**3/3 +
 a**2*b*c**3*e**2*asin(c + d*x)/d + 3*a**2*b*c**2*e**2*x*asin(c + d*x) + a
**2*b*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(3*d) + 3*a**2*b*c*d
*e**2*x**2*asin(c + d*x) + 2*a**2*b*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x
**2 + 1)/3 + a**2*b*d**2*e**2*x**3*asin(c + d*x) + a**2*b*d*e**2*x**2*sqrt
(-c**2 - 2*c*d*x - d**2*x**2 + 1)/3 + 2*a**2*b*e**2*sqrt(-c**2 - 2*c*d*x -
 d**2*x**2 + 1)/(3*d) + a*b**2*c**3*e**2*asin(c + d*x)**2/d + 3*a*b**2*c**
2*e**2*x*asin(c + d*x)**2 - 2*a*b**2*c**2*e**2*x/3 + 2*a*b**2*c**2*e**2*sq
rt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(3*d) + 3*a*b**2*c*d*e**
2*x**2*asin(c + d*x)**2 - 2*a*b**2*c*d*e**2*x**2/3 + 4*a*b**2*c*e**2*x*sqr
t(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/3 + a*b**2*d**2*e**2*x**3
*asin(c + d*x)**2 - 2*a*b**2*d**2*e**2*x**3/9 + 2*a*b**2*d*e**2*x**2*sqrt(
-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/3 - 4*a*b**2*e**2*x/3 + 4*a
*b**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(3*d) + b**
3*c**3*e**2*asin(c + d*x)**3/(3*d) - 2*b**3*c**3*e**2*asin(c + d*x)/(9*d)
+ b**3*c**2*e**2*x*asin(c + d*x)**3 - 2*b**3*c**2*e**2*x*asin(c + d*x)/3 +
 b**3*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(3*
d) - 2*b**3*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(27*d) + b**3*
c*d*e**2*x**2*asin(c + d*x)**3 - 2*b**3*c*d*e**2*x**2*asin(c + d*x)/3 + 2*
b**3*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/3 ...
```

### 3.199.7 Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx=\int (dex+ce)^2(b\arcsin{(dx+c)}+a)^3\,dx$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
1/3*a^3*d^2*e^2*x^3 + a^3*c*d*e^2*x^2 + 3/2*(2*x^2*arcsin(d*x + c) + d*(3*
c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x
^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d
^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^
2*b*c*d*e^2 + 1/6*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x -
c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d
^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*ar
csin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2
- 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 -
 1)/d^4))*a^2*b*d^2*e^2 + a^3*c^2*e^2*x + 3*((d*x + c)*arcsin(d*x + c) + s
qrt(-(d*x + c)^2 + 1))*a^2*b*c^2*e^2/d + 1/3*(b^3*d^2*e^2*x^3 + 3*b^3*c*d*
e^2*x^2 + 3*b^3*c^2*e^2*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x -
c + 1))^3 + integrate(((b^3*d^3*e^2*x^3 + 3*b^3*c*d^2*e^2*x^2 + 3*b^3*c^2*
d*e^2*x)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x +
c + 1)*sqrt(-d*x - c + 1))^2 + 3*(a*b^2*d^4*e^2*x^4 + 4*a*b^2*c*d^3*e^2*x^
3 + (6*a*b^2*c^2 - a*b^2)*d^2*e^2*x^2 + 2*(2*a*b^2*c^3 - a*b^2*c)*d*e^2*x
+ (a*b^2*c^4 - a*b^2*c^2)*e^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*
x - c + 1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

### 3.199.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 504 vs. $2(211) = 422$.

Time = 0.35 (sec) , antiderivative size = 504, normalized size of antiderivative = 2.14

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx = \frac{\left((dx+c)^2-1\right)(dx+c)b^3e^2\arcsin(dx+c)^3}{3\,d} + \frac{\left((dx+c)^2-1\right)(dx+c)ab^2e^2\arcsin(dx+c)^2}{d} + \frac{(dx+c)b^3e^2\arcsin(dx+c)^3}{3\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^3e^2\arcsin(dx+c)^2}{3\,d} + \frac{(dx+c)^3a^3e^2}{3\,d} + \frac{\left((dx+c)^2-1\right)(dx+c)a^2be^2\arcsin(dx+c)}{d} - \frac{2\left((dx+c)^2-1\right)(dx+c)b^3e^2\arcsin(dx+c)}{9\,d} + \frac{(dx+c)ab^2e^2\arcsin(dx+c)^2}{d} - \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}ab^2e^2\arcsin(dx+c)}{3\,d} + \frac{\sqrt{-(dx+c)^2+1}b^3e^2\arcsin(dx+c)^2}{d} - \frac{2\left((dx+c)^2-1\right)(dx+c)ab^2e^2}{9\,d} + \frac{(dx+c)a^2be^2\arcsin(dx+c)}{d} - \frac{14\,(dx+c)b^3e^2\arcsin(dx+c)}{9\,d} - \frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}a^2be^2}{3\,d} + \frac{2\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^3e^2}{27\,d} + \frac{2\sqrt{-(dx+c)^2+1}ab^2e^2\arcsin(dx+c)}{d} - \frac{14\,(dx+c)ab^2e^2}{9\,d} + \frac{\sqrt{-(dx+c)^2+1}a^2be^2}{d} - \frac{14\sqrt{-(dx+c)^2+1}b^3e^2}{9\,d}$$

3.199. $\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
1/3*((d*x + c)^2 - 1)*(d*x + c)*b^3*e^2*arcsin(d*x + c)^3/d + ((d*x + c)^2
 - 1)*(d*x + c)*a*b^2*e^2*arcsin(d*x + c)^2/d + 1/3*(d*x + c)*b^3*e^2*arcs
in(d*x + c)^3/d - 1/3*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^2*arcsin(d*x + c)^2/d
 + 1/3*(d*x + c)^3*a^3*e^2/d + ((d*x + c)^2 - 1)*(d*x + c)*a^2*b*e^2*arcsi
n(d*x + c)/d - 2/9*((d*x + c)^2 - 1)*(d*x + c)*b^3*e^2*arcsin(d*x + c)/d +
 (d*x + c)*a*b^2*e^2*arcsin(d*x + c)^2/d - 2/3*(-(d*x + c)^2 + 1)^(3/2)*a*
b^2*e^2*arcsin(d*x + c)/d + sqrt(-(d*x + c)^2 + 1)*b^3*e^2*arcsin(d*x + c)
^2/d - 2/9*((d*x + c)^2 - 1)*(d*x + c)*a*b^2*e^2/d + (d*x + c)*a^2*b*e^2*a
rcsin(d*x + c)/d - 14/9*(d*x + c)*b^3*e^2*arcsin(d*x + c)/d - 1/3*(-(d*x +
 c)^2 + 1)^(3/2)*a^2*b*e^2/d + 2/27*(-(d*x + c)^2 + 1)^(3/2)*b^3*e^2/d + 2
*sqrt(-(d*x + c)^2 + 1)*a*b^2*e^2*arcsin(d*x + c)/d - 14/9*(d*x + c)*a*b^2
*e^2/d + sqrt(-(d*x + c)^2 + 1)*a^2*b*e^2/d - 14/9*sqrt(-(d*x + c)^2 + 1)*
b^3*e^2/d
```

### 3.199.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^3\,dx=\int (c\,e+d\,e\,x)^2\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^3\,dx$$

input
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^3, x)
```

# 3.200 $\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx$



## 3.200.1 Optimal result

Integrand size = 21, antiderivative size = 165

$$\begin{aligned}\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx &= -\frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}}{8d}+\frac{3b^3e\arcsin(c+dx)}{8d}\\&\quad-\frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))}{4d}\\&\quad+\frac{3be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{4d}\\&\quad-\frac{e(a+b\arcsin(c+dx))^3}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^3}{2d}\end{aligned}$$

output
```
3/8*b^3*e*arcsin(d*x+c)/d-3/4*b^2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))/d-1/4*e*
(a+b*arcsin(d*x+c))^3/d+1/2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))^3/d-3/8*b^3*e*
(d*x+c)*(1-(d*x+c)^2)^(1/2)/d+3/4*b*e*(d*x+c)*(a+b*arcsin(d*x+c))^2*(1-(d*
x+c)^2)^(1/2)/d
```

### 3.200.2 Mathematica [A] (verified)

Time = 0.20 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.83

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx$$
$$=\frac{e\left(\frac{3}{2}b^3\left(-\left((c+dx)\sqrt{1-(c+dx)^2}\right)+\arcsin(c+dx)\right)-3b^2(c+dx)^2(a+b\arcsin(c+dx))+3b(c+dx)\cdots\right.}{4d}$$

input
```
Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e*((3*b^3*(-((c + d*x)*Sqrt[1 - (c + d*x)^2]) + ArcSin[c + d*x]))/2 - 3*b
^2*(c + d*x)^2*(a + b*ArcSin[c + d*x]) + 3*b*(c + d*x)*Sqrt[1 - (c + d*x)^
2]*(a + b*ArcSin[c + d*x])^2 - (a + b*ArcSin[c + d*x])^3 + 2*(c + d*x)^2*(
a + b*ArcSin[c + d*x])^3))/(4*d)
```

### 3.200.3 Rubi [A] (verified)

Time = 0.59 (sec) , antiderivative size = 154, normalized size of antiderivative = 0.93, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {5304, 27, 5138, 5210, 5138, 262, 223, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int e(c+dx)(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$
$$\frac{e\int (c+dx)(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$
$$\Big\downarrow \text{5138}$$
$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^3-\frac{3}{2}b\int \frac{(c+dx)^2(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$
$$\Big\downarrow \text{5210}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^3-\frac{3}{2}b\left(b\int(c+dx)(a+b\arcsin(c+dx))d(c+dx)+\frac{1}{2}\int\frac{(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+\right.\right.}{d}$$

$\downarrow$ 5138

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^3-\frac{3}{2}b\left(b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))-\frac{1}{2}b\int\frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)+\frac{1}{2}\int\right.\right.}{d}$$

$\downarrow$ 262

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^3-\frac{3}{2}b\left(b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))-\frac{1}{2}b\left(\frac{1}{2}\int\frac{1}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{2}\right.\right.\right.\right.}{d}$$

$\downarrow$ 223

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^3-\frac{3}{2}b\left(\frac{1}{2}\int\frac{(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{2}(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin\right.\right.}{d}$$

$\downarrow$ 5152

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^3-\frac{3}{2}b\left(\frac{(a+b\arcsin(c+dx))^3}{6b}-\frac{1}{2}(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2+\right.\right.}{d}$$

input
```
Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e*(((c + d*x)^2*(a + b*ArcSin[c + d*x])^3)/2 - (3*b*(-1/2*((c + d*x)*Sqrt
[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2) + (a + b*ArcSin[c + d*x])^3/(
6*b) + b*(-1/2*(b*(-1/2*((c + d*x)*Sqrt[1 - (c + d*x)^2]) + ArcSin[c + d*x
]/2)) + ((c + d*x)^2*(a + b*ArcSin[c + d*x]))/2)))/2))/d
```

### 3.200.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.200. $\int (ce + dex)(a + b \arcsin(c + dx))^3 \, dx$

### 3.200.4 Maple [A] (verified)

Time = 0.64 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.61

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{e\,a^3(dx+c)^2}{2}+e\,b^3\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^3}{2}+\frac{3\arcsin(dx+c)^2\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{4}-\frac{3\left((dx+c)^2-1\right)\arcsin(\cdots}{4}\right.}{}$ |
| default | $\frac{\frac{e\,a^3(dx+c)^2}{2}+e\,b^3\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^3}{2}+\frac{3\arcsin(dx+c)^2\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{4}-\frac{3\left((dx+c)^2-1\right)\arcsin(\cdots}{4}\right.}{}$ |
| parts | $e\,a^3\left(\frac{1}{2}d\,x^2+cx\right)+\frac{e\,b^3\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^3}{2}+\frac{3\arcsin(dx+c)^2\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{4}-\frac{3\left((dx+c\cdots\right.}{}\right.}{d}$ |

input
```
int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/2*e*a^3*(d*x+c)^2+e*b^3*(1/2*((d*x+c)^2-1)*arcsin(d*x+c)^3+3/4*arcs
in(d*x+c)^2*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))-3/4*((d*x+c)^2-1)*
arcsin(d*x+c)-3/8*(d*x+c)*(1-(d*x+c)^2)^(1/2)-3/8*arcsin(d*x+c)-1/2*arcsin
(d*x+c)^3)+3*e*a*b^2*(1/2*((d*x+c)^2-1)*arcsin(d*x+c)^2+1/2*arcsin(d*x+c)*
((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))-1/4*arcsin(d*x+c)^2-1/4*(d*x+c
)^2)+3*e*a^2*b*(1/2*(d*x+c)^2*arcsin(d*x+c)+1/4*(d*x+c)*(1-(d*x+c)^2)^(1/2
)-1/4*arcsin(d*x+c)))
```

### 3.200.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 329 vs. $2(149) = 298$.

Time = 0.27 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.99

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx$$
$$=\frac{2\,(2\,a^3-3\,ab^2)d^2ex^2+4\,(2\,a^3-3\,ab^2)cdex+2\,(2\,b^3d^2ex^2+4\,b^3cdex+(2\,b^3c^2-b^3)e)\arcsin\,(dx+c)^3+\cdots}{}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
1/8*(2*(2*a^3 - 3*a*b^2)*d^2*e*x^2 + 4*(2*a^3 - 3*a*b^2)*c*d*e*x + 2*(2*b^
3*d^2*e*x^2 + 4*b^3*c*d*e*x + (2*b^3*c^2 - b^3)*e)*arcsin(d*x + c)^3 + 6*(
2*a*b^2*d^2*e*x^2 + 4*a*b^2*c*d*e*x + (2*a*b^2*c^2 - a*b^2)*e)*arcsin(d*x
+ c)^2 + 3*(2*(2*a^2*b - b^3)*d^2*e*x^2 + 4*(2*a^2*b - b^3)*c*d*e*x - (2*a
^2*b - b^3 - 2*(2*a^2*b - b^3)*c^2)*e)*arcsin(d*x + c) + 3*((2*a^2*b - b^3
)*d*e*x + (2*a^2*b - b^3)*c*e + 2*(b^3*d*e*x + b^3*c*e)*arcsin(d*x + c)^2
+ 4*(a*b^2*d*e*x + a*b^2*c*e)*arcsin(d*x + c))*sqrt(-d^2*x^2 - 2*c*d*x - c
^2 + 1))/d
```

### 3.200.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 685 vs. $2(148) = 296$.

Time = 0.32 (sec) , antiderivative size = 685, normalized size of antiderivative = 4.15

$$\int (ce + dex)(a + b\arcsin(c + dx))^3\,dx$$

$$= \begin{cases} a^3cex + \frac{a^3dex^2}{2} + \frac{3a^2bc^2e\operatorname{asin}(c+dx)}{2d} + 3a^2bcex\operatorname{asin}(c+dx) + \frac{3a^2bce\sqrt{-c^2-2cdx-d^2x^2+1}}{4d} + \frac{3a^2bdex^2\operatorname{asin}(c+dx)}{2} + 3 \\ cex(a + b\operatorname{asin}(c))^3 \end{cases}$$

input
```
integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**3,x)
```

output
```
Piecewise((a**3*c*e*x + a**3*d*e*x**2/2 + 3*a**2*b*c**2*e*asin(c + d*x)/(2
*d) + 3*a**2*b*c*e*x*asin(c + d*x) + 3*a**2*b*c*e*sqrt(-c**2 - 2*c*d*x - d
**2*x**2 + 1)/(4*d) + 3*a**2*b*d*e*x**2*asin(c + d*x)/2 + 3*a**2*b*e*x*sqr
t(-c**2 - 2*c*d*x - d**2*x**2 + 1)/4 - 3*a**2*b*e*asin(c + d*x)/(4*d) + 3*
a*b**2*c**2*e*asin(c + d*x)**2/(2*d) + 3*a*b**2*c*e*x*asin(c + d*x)**2 - 3
*a*b**2*c*e*x/2 + 3*a*b**2*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(
c + d*x)/(2*d) + 3*a*b**2*d*e*x**2*asin(c + d*x)**2/2 - 3*a*b**2*d*e*x**2/
4 + 3*a*b**2*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/2 - 3
*a*b**2*e*asin(c + d*x)**2/(4*d) + b**3*c**2*e*asin(c + d*x)**3/(2*d) - 3*
b**3*c**2*e*asin(c + d*x)/(4*d) + b**3*c*e*x*asin(c + d*x)**3 - 3*b**3*c*e
*x*asin(c + d*x)/2 + 3*b**3*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin
(c + d*x)**2/(4*d) - 3*b**3*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(8*d
) + b**3*d*e*x**2*asin(c + d*x)**3/2 - 3*b**3*d*e*x**2*asin(c + d*x)/4 + 3
*b**3*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/4 - 3*b**
3*e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/8 - b**3*e*asin(c + d*x)**3/(4
*d) + 3*b**3*e*asin(c + d*x)/(8*d), Ne(d, 0)), (c*e*x*(a + b*asin(c))**3,
True))
```

### 3.200.7 Maxima [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx=\int (dex+ce)(b\arcsin(dx+c)+a)^3\,dx$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
1/2*a^3*d*e*x^2 + 3/4*(2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c
*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1
)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d
^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^2*b*d*e + a^3*c*e*x +
3*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^2*b*c*e/d + 1/2*(
b^3*d*e*x^2 + 2*b^3*c*e*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x -
c + 1))^3 + integrate(3/2*((b^3*d^2*e*x^2 + 2*b^3*c*d*e*x)*sqrt(d*x + c +
1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1
))^2 + 2*(a*b^2*d^3*e*x^3 + 3*a*b^2*c*d^2*e*x^2 + (3*a*b^2*c^2 - a*b^2)*d*
e*x + (a*b^2*c^3 - a*b^2*c)*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*
x - c + 1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

### 3.200.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 340 vs. $2(149) = 298$.

Time = 0.34 (sec) , antiderivative size = 340, normalized size of antiderivative = 2.06

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx = \frac{\left((dx+c)^2-1\right)b^3e\arcsin\left(dx+c\right)^3}{2\,d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)b^3e\arcsin\left(dx+c\right)^2}{4\,d} + \frac{3\left((dx+c)^2-1\right)ab^2e\arcsin\left(dx+c\right)^2}{2\,d} + \frac{b^3e\arcsin\left(dx+c\right)^3}{4\,d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)ab^2e\arcsin\left(dx+c\right)}{2\,d} + \frac{3\left((dx+c)^2-1\right)a^2be\arcsin\left(dx+c\right)}{2\,d} - \frac{3\left((dx+c)^2-1\right)b^3e\arcsin\left(dx+c\right)}{4\,d} + \frac{3\,ab^2e\arcsin\left(dx+c\right)^2}{4\,d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)a^2be}{4\,d} - \frac{3\sqrt{-(dx+c)^2+1}(dx+c)b^3e}{8\,d} + \frac{\left((dx+c)^2-1\right)a^3e}{2\,d} - \frac{3\left((dx+c)^2-1\right)ab^2e}{4\,d} + \frac{3\,a^2be\arcsin\left(dx+c\right)}{4\,d} - \frac{3\,b^3e\arcsin\left(dx+c\right)}{8\,d} - \frac{3\,ab^2e}{8\,d}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

3.200. $\int(ce+dex)(a+b\arcsin(c+dx))^3\,dx$

output
```
1/2*((d*x + c)^2 - 1)*b^3*e*arcsin(d*x + c)^3/d + 3/4*sqrt(-(d*x + c)^2 +
1)*(d*x + c)*b^3*e*arcsin(d*x + c)^2/d + 3/2*((d*x + c)^2 - 1)*a*b^2*e*arc
sin(d*x + c)^2/d + 1/4*b^3*e*arcsin(d*x + c)^3/d + 3/2*sqrt(-(d*x + c)^2 +
 1)*(d*x + c)*a*b^2*e*arcsin(d*x + c)/d + 3/2*((d*x + c)^2 - 1)*a^2*b*e*ar
csin(d*x + c)/d - 3/4*((d*x + c)^2 - 1)*b^3*e*arcsin(d*x + c)/d + 3/4*a*b^
2*e*arcsin(d*x + c)^2/d + 3/4*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a^2*b*e/d -
 3/8*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^3*e/d + 1/2*((d*x + c)^2 - 1)*a^3*
e/d - 3/4*((d*x + c)^2 - 1)*a*b^2*e/d + 3/4*a^2*b*e*arcsin(d*x + c)/d - 3/
8*b^3*e*arcsin(d*x + c)/d - 3/8*a*b^2*e/d
```

### 3.200.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))^3\,dx=\int (c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^3\,dx$$

input
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^3, x)
```

# 3.201 $\int (a+b\arcsin(c+dx))^3\,dx$



## 3.201.1 Optimal result

Integrand size = 12, antiderivative size = 104

$$\int (a+b\arcsin(c+dx))^3\,dx = -6ab^2x-\frac{6b^3\sqrt{1-(c+dx)^2}}{d}-\frac{6b^3(c+dx)\arcsin(c+dx)}{d}+\frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d}+\frac{(c+dx)(a+b\arcsin(c+dx))^3}{d}$$

output
```
-6*a*b^2*x-6*b^3*(d*x+c)*arcsin(d*x+c)/d+(d*x+c)*(a+b*arcsin(d*x+c))^3/d-6
*b^3*(1-(d*x+c)^2)^(1/2)/d+3*b*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d
```

## 3.201.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.92

$$\int (a+b\arcsin(c+dx))^3\,dx = \frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2+(c+dx)(a+b\arcsin(c+dx))^3-6b^2\left(a(c+dx)+b\sqrt{1-(c\right.}{d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(3*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2 + (c + d*x)*(a + b*Ar
cSin[c + d*x])^3 - 6*b^2*(a*(c + d*x) + b*Sqrt[1 - (c + d*x)^2] + b*(c + d
*x)*ArcSin[c + d*x]))/d
```

### 3.201.3 Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.93, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {5302, 5130, 5182, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^3\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int (a+b\arcsin(c+dx))^3d(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^3-3b\int \frac{(c+dx)(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5182}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^3-3b\Big(2b\int (a+b\arcsin(c+dx))d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{2}}{d}$$

$$\Big\downarrow \text{2009}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^3-3b\Big(2b\Big(a(c+dx)+b(c+dx)\arcsin(c+dx)+b\sqrt{1-(c+dx)^2}\Big)-\sqrt{1-(c+}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^3,x]
```

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^3 - 3*b*(-(Sqrt[1 - (c + d*x)^2]*(a + b
*ArcSin[c + d*x])^2) + 2*b*(a*(c + d*x) + b*Sqrt[1 - (c + d*x)^2] + b*(c +
 d*x)*ArcSin[c + d*x])))/d
```

### 3.201.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.201.4 Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.60

| method | result |
|---|---|
| derivativedivides | $\frac{(dx+c)a^3+b^3\left(\arcsin(dx+c)^3(dx+c)+3\arcsin(dx+c)^2\sqrt{1-(dx+c)^2}-6\sqrt{1-(dx+c)^2}-6(dx+c)\arcsin(dx+c)\right)+3a\,b^2\,(}{d}$ |
| default | $\frac{(dx+c)a^3+b^3\left(\arcsin(dx+c)^3(dx+c)+3\arcsin(dx+c)^2\sqrt{1-(dx+c)^2}-6\sqrt{1-(dx+c)^2}-6(dx+c)\arcsin(dx+c)\right)+3a\,b^2\,(}{d}$ |
| parts | $x\,a^3+\frac{b^3\left(\arcsin(dx+c)^3(dx+c)+3\arcsin(dx+c)^2\sqrt{1-(dx+c)^2}-6\sqrt{1-(dx+c)^2}-6(dx+c)\arcsin(dx+c)\right)}{d}+\frac{3a\,b^2}{}$ |

input
```
int((a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*((d*x+c)*a^3+b^3*(arcsin(d*x+c)^3*(d*x+c)+3*arcsin(d*x+c)^2*(1-(d*x+c)
^2)^(1/2)-6*(1-(d*x+c)^2)^(1/2)-6*(d*x+c)*arcsin(d*x+c))+3*a*b^2*(arcsin(d
*x+c)^2*(d*x+c)-2*d*x-2*c+2*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2))+3*a^2*b*((d
*x+c)*arcsin(d*x+c)+(1-(d*x+c)^2)^(1/2)))
```

### 3.201.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.52

$$\int (a+b\arcsin(c+dx))^3\,dx$$
$$=\frac{(b^3dx+b^3c)\arcsin{(dx+c)}^3+(a^3-6\,ab^2)dx+3\,(ab^2dx+ab^2c)\arcsin{(dx+c)}^2+3\,((a^2b-2\,b^3)dx+(a$$

input
```
integrate((a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
((b^3*d*x + b^3*c)*arcsin(d*x + c)^3 + (a^3 - 6*a*b^2)*d*x + 3*(a*b^2*d*x
+ a*b^2*c)*arcsin(d*x + c)^2 + 3*((a^2*b - 2*b^3)*d*x + (a^2*b - 2*b^3)*c)
*arcsin(d*x + c) + 3*(b^3*arcsin(d*x + c)^2 + 2*a*b^2*arcsin(d*x + c) + a^
2*b - 2*b^3)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

### 3.201.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 282 vs. $2(92) = 184$.

Time = 0.19 (sec) , antiderivative size = 282, normalized size of antiderivative = 2.71

$$\int (a+b\arcsin(c+dx))^3\,dx$$
$$=\begin{cases} a^3x+\frac{3a^2bc\operatorname{asin}{(c+dx)}}{d}+3a^2bx\operatorname{asin}{(c+dx)}+\frac{3a^2b\sqrt{-c^2-2cdx-d^2x^2+1}}{d}+\frac{3ab^2c\operatorname{asin}^2{(c+dx)}}{d}+3ab^2x\operatorname{asin}^2{(c+dx} \\ x(a+b\operatorname{asin}{(c)})^3 \end{cases}$$

input
```
integrate((a+b*asin(d*x+c))**3,x)
```

output
```
Piecewise((a**3*x + 3*a**2*b*c*asin(c + d*x)/d + 3*a**2*b*x*asin(c + d*x)
+ 3*a**2*b*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d + 3*a*b**2*c*asin(c + d
*x)**2/d + 3*a*b**2*x*asin(c + d*x)**2 - 6*a*b**2*x + 6*a*b**2*sqrt(-c**2
- 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/d + b**3*c*asin(c + d*x)**3/d - 6
*b**3*c*asin(c + d*x)/d + b**3*x*asin(c + d*x)**3 - 6*b**3*x*asin(c + d*x)
 + 3*b**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/d - 6*b**
3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d, Ne(d, 0)), (x*(a + b*asin(c))**
3, True))
```

### 3.201.7 Maxima [F]

$$\int (a+b\arcsin(c+dx))^3\,dx = \int (b\arcsin(dx+c)+a)^3\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
b^3*x*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + a^3*x + 3
*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^2*b/d + integrate(
3*(sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*b^3*d*x*arctan2(d*x + c, sqrt(d*x
+ c + 1)*sqrt(-d*x - c + 1))^2 + (a*b^2*d^2*x^2 + 2*a*b^2*c*d*x + a*b^2*c^
2 - a*b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2)/(d^2*
x^2 + 2*c*d*x + c^2 - 1), x)
```

### 3.201.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 208 vs. $2(100) = 200$.

Time = 0.29 (sec) , antiderivative size = 208, normalized size of antiderivative = 2.00

$$\begin{aligned}\int (a+b\arcsin(c+dx))^3\,dx =& \frac{(dx+c)b^3\arcsin(dx+c)^3}{d} + \frac{3(dx+c)ab^2\arcsin(dx+c)^2}{d} \\ &+ \frac{3\sqrt{-(dx+c)^2+1}b^3\arcsin(dx+c)^2}{d} \\ &+ \frac{3(dx+c)a^2b\arcsin(dx+c)}{d} - \frac{6(dx+c)b^3\arcsin(dx+c)}{d} \\ &+ \frac{6\sqrt{-(dx+c)^2+1}ab^2\arcsin(dx+c)}{d} \\ &+ \frac{(dx+c)a^3}{d} - \frac{6(dx+c)ab^2}{d} \\ &+ \frac{3\sqrt{-(dx+c)^2+1}a^2b}{d} - \frac{6\sqrt{-(dx+c)^2+1}b^3}{d}\end{aligned}$$

input
```
integrate((a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
(d*x + c)*b^3*arcsin(d*x + c)^3/d + 3*(d*x + c)*a*b^2*arcsin(d*x + c)^2/d
+ 3*sqrt(-(d*x + c)^2 + 1)*b^3*arcsin(d*x + c)^2/d + 3*(d*x + c)*a^2*b*arc
sin(d*x + c)/d - 6*(d*x + c)*b^3*arcsin(d*x + c)/d + 6*sqrt(-(d*x + c)^2 +
 1)*a*b^2*arcsin(d*x + c)/d + (d*x + c)*a^3/d - 6*(d*x + c)*a*b^2/d + 3*sq
rt(-(d*x + c)^2 + 1)*a^2*b/d - 6*sqrt(-(d*x + c)^2 + 1)*b^3/d
```

## 3.201.9 Mupad [B] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.46

$$\begin{aligned}\int (a+b\arcsin(c+dx))^3\,dx &= a^3\,x-\frac{b^3\,\left(6\,\mathrm{asin}(c+d\,x)-\mathrm{asin}(c+d\,x)^3\right)\,\left(c+d\,x\right)}{d}\\&\quad+\frac{3\,a\,b^2\left(2\,\mathrm{asin}(c+d\,x)\,\sqrt{1-(c+d\,x)^2}+\left(\mathrm{asin}(c+d\,x)^2-2\right)\,\left(c+d\,x\right)\right)}{d}\\&\quad+\frac{3\,a^2\,b\left(\sqrt{1-(c+d\,x)^2}+\mathrm{asin}(c+d\,x)\,\left(c+d\,x\right)\right)}{d}\\&\quad+\frac{b^3\,\left(3\,\mathrm{asin}(c+d\,x)^2-6\right)\,\sqrt{1-(c+d\,x)^2}}{d}\end{aligned}$$

input
```
int((a + b*asin(c + d*x))^3,x)
```

output
```
a^3*x - (b^3*(6*asin(c + d*x) - asin(c + d*x)^3)*(c + d*x))/d + (3*a*b^2*(
2*asin(c + d*x)*(1 - (c + d*x)^2)^(1/2) + (asin(c + d*x)^2 - 2)*(c + d*x))
)/d + (3*a^2*b*((1 - (c + d*x)^2)^(1/2) + asin(c + d*x)*(c + d*x)))/d + (b
^3*(3*asin(c + d*x)^2 - 6)*(1 - (c + d*x)^2)^(1/2))/d
```

# 3.202 $\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx$



## 3.202.1 Optimal result

Integrand size = 23, antiderivative size = 169

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx = -\frac{i(a+b\arcsin(c+dx))^4}{4bde} + \frac{(a+b\arcsin(c+dx))^3\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{3ib(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{3b^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{2de} + \frac{3ib^3\operatorname{PolyLog}\left(4,e^{2i\arcsin(c+dx)}\right)}{4de}$$

output
```
-1/4*I*(a+b*arcsin(d*x+c))^4/b/d/e+(a+b*arcsin(d*x+c))^3*ln(1-(I*(d*x+c)+(
1-(d*x+c)^2)^(1/2))^2)/d/e-3/2*I*b*(a+b*arcsin(d*x+c))^2*polylog(2,(I*(d*x
+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e+3/2*b^2*(a+b*arcsin(d*x+c))*polylog(3,(I*(
d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e+3/4*I*b^3*polylog(4,(I*(d*x+c)+(1-(d*x+
c)^2)^(1/2))^2)/d/e
```

### 3.202.2 Mathematica [A] (verified)

Time = 0.47 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.80

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx =$$
$$-\frac{i\left(8ab^2\pi^3+b^3\pi^4+96a^2b\arcsin(c+dx)^2-64ab^2\arcsin(c+dx)^3-16b^3\arcsin(c+dx)^4+192iab^2\operatorname{arcsi}\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x),x]
```

output
```
((-1/64*I)*(8*a*b^2*Pi^3 + b^3*Pi^4 + 96*a^2*b*ArcSin[c + d*x]^2 - 64*a*b^
2*ArcSin[c + d*x]^3 - 16*b^3*ArcSin[c + d*x]^4 + (192*I)*a*b^2*ArcSin[c +
d*x]^2*Log[1 - E^((-2*I)*ArcSin[c + d*x])] + (64*I)*b^3*ArcSin[c + d*x]^3*
Log[1 - E^((-2*I)*ArcSin[c + d*x])] + (192*I)*a^2*b*ArcSin[c + d*x]*Log[1
- E^((2*I)*ArcSin[c + d*x])] + (64*I)*a^3*Log[c + d*x] - 96*b^2*ArcSin[c +
 d*x]*(2*a + b*ArcSin[c + d*x])*PolyLog[2, E^((-2*I)*ArcSin[c + d*x])] + 9
6*a^2*b*PolyLog[2, E^((2*I)*ArcSin[c + d*x])] + (96*I)*a*b^2*PolyLog[3, E^
((-2*I)*ArcSin[c + d*x])] + (96*I)*b^3*ArcSin[c + d*x]*PolyLog[3, E^((-2*I
)*ArcSin[c + d*x])] + 48*b^3*PolyLog[4, E^((-2*I)*ArcSin[c + d*x])]))/(d*e
)
```

### 3.202.3 Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 164, normalized size of antiderivative = 0.97, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {5304, 27, 5136, 3042, 25, 4200, 25, 2620, 3011, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{e(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \; 27$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{c+dx}d(c+dx)}{de}$$

$$\Big\downarrow \text{5136}$$

$$\frac{\int \frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int -(a+b\arcsin(c+dx))^3\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int (a+b\arcsin(c+dx))^3\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \text{4200}$$

$$\frac{2i\int -\frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))^3}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\frac{i(a+b\arcsin(c+dx))^4}{4b}}{de}$$

$$\Big\downarrow \text{25}$$

$$\frac{-2i\int \frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))^3}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\frac{i(a+b\arcsin(c+dx))^4}{4b}}{de}$$

$$\Big\downarrow \text{2620}$$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3-\frac{3}{2}ib\int(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)d\arcs}{de}$$

$$\Big\downarrow \text{3011}$$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3-\frac{3}{2}ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2}{de}$$

$$\Big\downarrow \text{7163}$$

$$-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3-\frac{3}{2}ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2\right.\right.$$

$$\Big\downarrow \text{2720}$$

$$-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3-\frac{3}{2}ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2\right.\right.$$

$$\Big\downarrow \text{7143}$$

---

3.202. $\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3-\frac{3}{2}ib\left(\frac{1}{2}i\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2\right.}{de}$$

input
```
Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x),x]
```

output
```
(((-1/4*I)*(a + b*ArcSin[c + d*x])^4)/b - (2*I)*((I/2)*(a + b*ArcSin[c + d
*x])^3*Log[1 - E^((2*I)*ArcSin[c + d*x])] - ((3*I)/2)*b*((I/2)*(a + b*ArcS
in[c + d*x])^2*PolyLog[2, E^((2*I)*ArcSin[c + d*x])] - I*b*((-1/2*I)*(a +
b*ArcSin[c + d*x])*PolyLog[3, E^((2*I)*ArcSin[c + d*x])] + (b*PolyLog[4, E
^((2*I)*ArcSin[c + d*x])])/4))))/(d*e)
```

### 3.202.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

## 3.202. $\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx$

### 3.202.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 651 vs. $2(206) = 412$.

Time = 0.71 (sec) , antiderivative size = 652, normalized size of antiderivative = 3.86

| method | result |
|---|---|
| derivativedivides | $\frac{a^3\ln(dx+c)}{e} + \frac{b^3\left(-\frac{i\arcsin(dx+c)^4}{4}+\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-3i\arcsin(dx+c)^2\operatorname{polylog}\left(2,i(dx+c)+\sqrt{1-(dx+\right.\right.}{}$ |
| default | $\frac{a^3\ln(dx+c)}{e} + \frac{b^3\left(-\frac{i\arcsin(dx+c)^4}{4}+\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-3i\arcsin(dx+c)^2\operatorname{polylog}\left(2,i(dx+c)+\sqrt{1-(dx+\right.\right.}{}$ |
| parts | $\frac{a^3\ln(dx+c)}{ed} + \frac{b^3\left(-\frac{i\arcsin(dx+c)^4}{4}+\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-3i\arcsin(dx+c)^2\operatorname{polylog}\left(2,i(dx\right.\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e),x,method=_RETURNVERBOSE)
```

output
```
1/d*(a^3/e*ln(d*x+c)+b^3/e*(-1/4*I*arcsin(d*x+c)^4+arcsin(d*x+c)^3*ln(1-I*
(d*x+c)-(1-(d*x+c)^2)^(1/2))-3*I*arcsin(d*x+c)^2*polylog(2,I*(d*x+c)+(1-(d
*x+c)^2)^(1/2))+6*arcsin(d*x+c)*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+6
*I*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)^3*ln(1+I*(d*x+c)
+(1-(d*x+c)^2)^(1/2))-3*I*arcsin(d*x+c)^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)^
2)^(1/2))+6*arcsin(d*x+c)*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+6*I*po
lylog(4,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+3*a*b^2/e*(-1/3*I*arcsin(d*x+c)^3
+arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*pol
ylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+2*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2
)^(1/2))+arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*
x+c)*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+2*polylog(3,I*(d*x+c)+(1-(d*
x+c)^2)^(1/2)))+3*a^2*b/e*(-1/2*I*arcsin(d*x+c)^2+arcsin(d*x+c)*ln(1+I*(d*
x+c)+(1-(d*x+c)^2)^(1/2))-I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcs
in(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-I*polylog(2,I*(d*x+c)+(1-(d*
x+c)^2)^(1/2))))
```

### 3.202.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e),x, algorithm="fricas")
```

output
```
integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcs
in(d*x + c) + a^3)/(d*e*x + c*e), x)
```

### 3.202.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx = \frac{\int \frac{a^3}{c+dx}\,dx+\int \frac{b^3\operatorname{asin}^3(c+dx)}{c+dx}\,dx+\int \frac{3ab^2\operatorname{asin}^2(c+dx)}{c+dx}\,dx+\int \frac{3a^2b\operatorname{asin}(c+dx)}{c+dx}\,dx}{e}$$

input
```
integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e),x)
```

output
```
(Integral(a**3/(c + d*x), x) + Integral(b**3*asin(c + d*x)**3/(c + d*x), x
) + Integral(3*a*b**2*asin(c + d*x)**2/(c + d*x), x) + Integral(3*a**2*b*a
sin(c + d*x)/(c + d*x), x))/e
```

### 3.202.7 Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e),x, algorithm="maxima")
```

output
```
a^3*log(d*e*x + c*e)/(d*e) + integrate((b^3*arctan2(d*x + c, sqrt(d*x + c
+ 1)*sqrt(-d*x - c + 1))^3 + 3*a*b^2*arctan2(d*x + c, sqrt(d*x + c + 1)*sq
rt(-d*x - c + 1))^2 + 3*a^2*b*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x
 - c + 1)))/(d*e*x + c*e), x)
```

### 3.202.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e), x)
```

### 3.202.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{ce+dex}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{c\,e+d\,e\,x}\,dx$$

input
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x),x)
```

output
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x), x)
```

# 3.203 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx$



## 3.203.1 Optimal result

Integrand size = 23, antiderivative size = 190

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = &-\frac{(a+b\arcsin(c+dx))^3}{de^2(c+dx)} \\ &-\frac{6b(a+b\arcsin(c+dx))^2\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} \\ &+\frac{6ib^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} \\ &-\frac{6ib^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2} \\ &-\frac{6b^3\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^2} \\ &+\frac{6b^3\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^2}\end{aligned}$$

output
```
-(a+b*arcsin(d*x+c))^3/d/e^2/(d*x+c)-6*b*(a+b*arcsin(d*x+c))^2*arctanh(I*(
d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2+6*I*b^2*(a+b*arcsin(d*x+c))*polylog(2,-I
*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^2-6*I*b^2*(a+b*arcsin(d*x+c))*polylog(2,
I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2-6*b^3*polylog(3,-I*(d*x+c)-(1-(d*x+c)
^2)^(1/2))/d/e^2+6*b^3*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2
```

## 3.203.2 Mathematica [A] (verified)

Time = 1.11 (sec) , antiderivative size = 342, normalized size of antiderivative = 1.80

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = -\frac{\frac{a^3}{c+dx}+\frac{3a^2b\arcsin(c+dx)}{c+dx}+\frac{3ab^2\arcsin(c+dx)^2}{c+dx}+\frac{b^3\arcsin(c+dx)^3}{c+dx}-6ab^2\arcsin(c+dx)\log\left(1-e^{i\arcsin(c+dx)}\right)-3}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^2,x]
```

output
```
-((a^3/(c + d*x) + (3*a^2*b*ArcSin[c + d*x])/(c + d*x) + (3*a*b^2*ArcSin[c
 + d*x]^2)/(c + d*x) + (b^3*ArcSin[c + d*x]^3)/(c + d*x) - 6*a*b^2*ArcSin[
c + d*x]*Log[1 - E^(I*ArcSin[c + d*x])] - 3*b^3*ArcSin[c + d*x]^2*Log[1 -
E^(I*ArcSin[c + d*x])] + 6*a*b^2*ArcSin[c + d*x]*Log[1 + E^(I*ArcSin[c + d
*x])] + 3*b^3*ArcSin[c + d*x]^2*Log[1 + E^(I*ArcSin[c + d*x])] - 3*a^2*b*L
og[c + d*x] + 3*a^2*b*Log[1 + Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2]] - (6*I)*b
^2*(a + b*ArcSin[c + d*x])*PolyLog[2, -E^(I*ArcSin[c + d*x])] + (6*I)*b^2*
(a + b*ArcSin[c + d*x])*PolyLog[2, E^(I*ArcSin[c + d*x])] + 6*b^3*PolyLog[
3, -E^(I*ArcSin[c + d*x])] - 6*b^3*PolyLog[3, E^(I*ArcSin[c + d*x])])/(d*e
^2))
```

## 3.203.3 Rubi [A] (warning: unable to verify)

Time = 0.69 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.82, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {5304, 27, 5138, 5218, 3042, 4671, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{e^2(c+dx)^2}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{(c+dx)^2}d(c+dx)}{de^2}$$

$\downarrow$ 5138

$$\frac{3b\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^3}{c+dx}}{de^2}$$

$\downarrow$ 5218

$$\frac{3b\int \frac{(a+b\arcsin(c+dx))^2}{c+dx}d\arcsin(c+dx)-\frac{(a+b\arcsin(c+dx))^3}{c+dx}}{de^2}$$

$\downarrow$ 3042

$$\frac{3b\int (a+b\arcsin(c+dx))^2\csc(\arcsin(c+dx))d\arcsin(c+dx)-\frac{(a+b\arcsin(c+dx))^3}{c+dx}}{de^2}$$

$\downarrow$ 4671

$$\frac{-\frac{(a+b\arcsin(c+dx))^3}{c+dx}+3b\left(-2b\int (a+b\arcsin(c+dx))\log\left(1-e^{i\arcsin(c+dx)}\right)d\arcsin(c+dx)+2b\int (a+b\arcsin(c\right.}{de^2}$$

$\downarrow$ 3011

$$-\frac{(a+b\arcsin(c+dx))^3}{c+dx}+3b\left(2b\left(i\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-ib\int \text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)\right.\right.$$

$\downarrow$ 2720

$$-\frac{(a+b\arcsin(c+dx))^3}{c+dx}+3b\left(-2b\left(i\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-b\int e^{-i\arcsin(c+dx)}\,\text{PolyLog}\left(2,e^{i\right.\right.$$

$\downarrow$ 7143

$$-\frac{(a+b\arcsin(c+dx))^3}{c+dx}+3b\left(-2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-2b\left(i\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\right.\right.$$

input
```
Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^2,x]
```

3.203. $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx$

output
```
(-((a + b*ArcSin[c + d*x])^3/(c + d*x)) + 3*b*(-2*(a + b*ArcSin[c + d*x])^
2*ArcTanh[E^(I*ArcSin[c + d*x])] - 2*b*(I*(a + b*ArcSin[c + d*x])*PolyLog[
2, E^(I*ArcSin[c + d*x])] - b*PolyLog[3, E^(I*ArcSin[c + d*x])]) + 2*b*(I*
(a + b*ArcSin[c + d*x])*PolyLog[2, -E^(I*ArcSin[c + d*x])] - b*PolyLog[3,
-c - d*x]))))/(d*e^2)
```

### 3.203.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4671
```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Simp[d*(m/f)   Int[(c +
d*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Simp[d*(m/f)   Int[(c + d*x
)^(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IG
tQ[m, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5218
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]]   Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

### 3.203.4 Maple [A] (verified)

Time = 0.79 (sec) , antiderivative size = 428, normalized size of antiderivative = 2.25

| method | result |
|---|---|
| derivativedivides | $-\frac{a^3}{e^2(dx+c)}+\frac{b^3\left(-\frac{\arcsin(dx+c)^3}{dx+c}+3\arcsin(dx+c)^2\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-6i\arcsin(dx+c)\,\mathrm{polylog}\left(2,i(dx+c)+\sqrt{1-(dx+c}\right.\right.}{}$ |
| default | $-\frac{a^3}{e^2(dx+c)}+\frac{b^3\left(-\frac{\arcsin(dx+c)^3}{dx+c}+3\arcsin(dx+c)^2\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-6i\arcsin(dx+c)\,\mathrm{polylog}\left(2,i(dx+c)+\sqrt{1-(dx+c}\right.\right.}{}$ |
| parts | $-\frac{a^3}{e^2(dx+c)d}+\frac{b^3\left(-\frac{\arcsin(dx+c)^3}{dx+c}+3\arcsin(dx+c)^2\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)-6i\arcsin(dx+c)\,\mathrm{polylog}\left(2,i(d\right.\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^2,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-a^3/e^2/(d*x+c)+b^3/e^2*(-1/(d*x+c)*arcsin(d*x+c)^3+3*arcsin(d*x+c)^
2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-6*I*arcsin(d*x+c)*polylog(2,I*(d*x+c
)+(1-(d*x+c)^2)^(1/2))+6*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-3*arcsin
(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+6*I*arcsin(d*x+c)*polylog(2,
-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-6*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)
))+3*a*b^2/e^2*(-arcsin(d*x+c)^2/(d*x+c)+2*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1
-(d*x+c)^2)^(1/2))-2*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+2*I
*dilog(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*dilog(1-I*(d*x+c)-(1-(d*x+c)^2
)^(1/2)))+3*a^2*b/e^2*(-1/(d*x+c)*arcsin(d*x+c)-arctanh(1/(1-(d*x+c)^2)^(1
/2))))
```

### 3.203.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^2}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^2,x, algorithm="fricas")
```

output
```
integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcs
in(d*x + c) + a^3)/(d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2), x)
```

### 3.203.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = \frac{\int \frac{a^3}{c^2+2cdx+d^2x^2}\,dx + \int \frac{b^3\operatorname{asin}^3(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{3ab^2\operatorname{asin}^2(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{3a^2b\operatorname{asin}(c+dx)}{c^2+2cdx+d^2x^2}\,dx}{e^2}$$

input
```
integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**2,x)
```

output
```
(Integral(a**3/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(b**3*asin(c + d
*x)**3/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(3*a*b**2*asin(c + d*x)*
*2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(3*a**2*b*asin(c + d*x)/(c**
2 + 2*c*d*x + d**2*x**2), x))/e**2
```

### 3.203.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.203.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^2}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^2, x)
```

### 3.203.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^2}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{(c\,e+d\,e\,x)^2}\,dx$$

input
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^2,x)
```

output
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^2, x)
```

# 3.204 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx$



## 3.204.1 Optimal result

Integrand size = 23, antiderivative size = 167

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = &-\frac{3ib(a+b\arcsin(c+dx))^2}{2de^3}\\ &-\frac{3b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^3(c+dx)}\\ &-\frac{(a+b\arcsin(c+dx))^3}{2de^3(c+dx)^2}\\ &+\frac{3b^2(a+b\arcsin(c+dx))\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3}\\ &-\frac{3ib^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{2de^3}\end{aligned}$$

output
```
-3/2*I*b*(a+b*arcsin(d*x+c))^2/d/e^3-1/2*(a+b*arcsin(d*x+c))^3/d/e^3/(d*x+
c)^2+3*b^2*(a+b*arcsin(d*x+c))*ln(1-(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e
^3-3/2*I*b^3*polylog(2,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e^3-3/2*b*(a+b
*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d/e^3/(d*x+c)
```

### 3.204.2 Mathematica [A] (verified)

Time = 1.15 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.49

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx =$$
$$-\frac{3b^2\left(a+b(c+dx)\left(ic+idx+\sqrt{1-c^2-2cdx-d^2x^2}\right)\right)\arcsin(c+dx)^2+b^3\arcsin(c+dx)^3+3b\arcsi}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^3,x]
```

output
```
-1/2*(3*b^2*(a + b*(c + d*x)*(I*c + I*d*x + Sqrt[1 - c^2 - 2*c*d*x - d^2*x
^2]))*ArcSin[c + d*x]^2 + b^3*ArcSin[c + d*x]^3 + 3*b*ArcSin[c + d*x]*(a*(
a + 2*b*(c + d*x)*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2]) - 2*b^2*(c + d*x)^2*L
og[1 - E^((2*I)*ArcSin[c + d*x])]) + a*(a*(a + 3*b*(c + d*x)*Sqrt[1 - c^2
- 2*c*d*x - d^2*x^2]) - 6*b^2*(c + d*x)^2*Log[c + d*x]) + (3*I)*b^3*(c + d
*x)^2*PolyLog[2, E^((2*I)*ArcSin[c + d*x])])/(d*e^3*(c + d*x)^2)
```

### 3.204.3 Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.93, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.522$, Rules used = {5304, 27, 5138, 5186, 5136, 3042, 25, 4200, 25, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{e^3(c+dx)^3}d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{(c+dx)^3}d(c+dx)}{de^3}$$
$$\Big\downarrow \text{5138}$$

$$\frac{\frac{3}{2}b\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)^2\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^3}{2(c+dx)^2}}{de^3}$$

$$\Big\downarrow \text{5186}$$

$$\frac{\frac{3}{2}b\left(2b\int \frac{a+b\arcsin(c+dx)}{c+dx}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}\right)-\frac{(a+b\arcsin(c+dx))^3}{2(c+dx)^2}}{de^3}$$

$$\Big\downarrow \text{5136}$$

$$\frac{\frac{3}{2}b\left(2b\int \frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{c+dx}d\arcsin(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}\right)-\frac{(a+b\arcsin(c+dx))^3}{2(c+dx)^2}}{de^3}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\frac{3}{2}b\left(2b\int -\left((a+b\arcsin(c+dx))\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)\right)d\arcsin(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}\right)-\frac{(a+}{}}{de^3}$$

$$\Big\downarrow \text{25}$$

$$\frac{\frac{3}{2}b\left(-2b\int (a+b\arcsin(c+dx))\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}\right)-\frac{(a+b\,\mathrm{ar}}{2(}}{de^3}$$

$$\Big\downarrow \text{4200}$$

$$\frac{-\frac{(a+b\arcsin(c+dx))^3}{2(c+dx)^2}+\frac{3}{2}b\left(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}+2b\left(2i\int -\frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\right.\right.}{de^3}$$

$$\Big\downarrow \text{25}$$

$$\frac{-\frac{(a+b\arcsin(c+dx))^3}{2(c+dx)^2}+\frac{3}{2}b\left(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}+2b\left(-2i\int \frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\right.\right.}{de^3}$$

$$\Big\downarrow \text{2620}$$

$$\frac{-\frac{(a+b\arcsin(c+dx))^3}{2(c+dx)^2}+\frac{3}{2}b\left(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}+2b\left(-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))\right.\right.\right.}{de^3}$$

$$\Big\downarrow \text{2715}$$

$$\frac{-\frac{(a+b\arcsin(c+dx))^3}{2(c+dx)^2}+\frac{3}{2}b\left(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}+2b\left(-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))\right.\right.\right.}{de^3}$$

---

3.204. $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx$

$$\downarrow \text{2838}$$

$$\frac{-\frac{(a+b\arcsin(c+dx))^3}{2(c+dx)^2}+\frac{3}{2}b\Big(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}+2b\Big(-2i\big(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))}{de^3}$$

input
```
Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^3,x]
```

output
```
(-1/2*(a + b*ArcSin[c + d*x])^3/(c + d*x)^2 + (3*b*(-((Sqrt[1 - (c + d*x)^
2]*(a + b*ArcSin[c + d*x])^2)/(c + d*x)) + 2*b*(((-1/2*I)*(a + b*ArcSin[c
+ d*x])^2)/b - (2*I)*((I/2)*(a + b*ArcSin[c + d*x])*Log[1 - E^((2*I)*ArcSi
n[c + d*x])] + (b*PolyLog[2, E^((2*I)*ArcSin[c + d*x])])/4))))/2)/(d*e^3)
```

### 3.204.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5186
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Simp[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*A
rcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^
2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.204.4 Maple [A] (verified)

Time = 0.91 (sec) , antiderivative size = 324, normalized size of antiderivative = 1.94

| method | result |
|---|---|
| derivativedivides | $-\frac{a^3}{2e^3(dx+c)^2}+\frac{b^3\left(-\frac{\arcsin(dx+c)^2\left(-3i(dx+c)^2+3(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}+3\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx\right.\right.}{}$ |
| default | $-\frac{a^3}{2e^3(dx+c)^2}+\frac{b^3\left(-\frac{\arcsin(dx+c)^2\left(-3i(dx+c)^2+3(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}+3\arcsin(dx+c)\ln\left(1-i(dx+c)-\sqrt{1-(dx\right.\right.}{}$ |
| parts | $-\frac{a^3}{2e^3(dx+c)^2d}+\frac{b^3\left(-\frac{\arcsin(dx+c)^2\left(-3i(dx+c)^2+3(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}+3\arcsin(dx+c)\ln\left(1-i(dx+c)\right.\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/2*a^3/e^3/(d*x+c)^2+b^3/e^3*(-1/2*arcsin(d*x+c)^2*(-3*I*(d*x+c)^2+
3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))/(d*x+c)^2+3*arcsin(d*x+c)*ln(
1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+3*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)
^2)^(1/2))-3*I*arcsin(d*x+c)^2-3*I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2)
)-3*I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+3*a*b^2/e^3*(-1/2*arcsin(
d*x+c)^2/(d*x+c)^2-arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)/(d*x+c)+ln(d*x+c))+3*
a^2*b/e^3*(-1/2/(d*x+c)^2*arcsin(d*x+c)-1/2/(d*x+c)*(1-(d*x+c)^2)^(1/2)))
```

## 3.204.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^3}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^3,x, algorithm="fricas")
```

output
```
integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcs
in(d*x + c) + a^3)/(d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^
3), x)
```

### 3.204.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = \frac{\int \frac{a^3}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{b^3\operatorname{asin}^3(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{3ab^2\operatorname{asin}^2(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{3a^2b\operatorname{asin}(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx}{e^3}$$

input
```
integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**3,x)
```

output
```
(Integral(a**3/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integ
ral(b**3*asin(c + d*x)**3/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3),
 x) + Integral(3*a*b**2*asin(c + d*x)**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**
2 + d**3*x**3), x) + Integral(3*a**2*b*asin(c + d*x)/(c**3 + 3*c**2*d*x +
3*c*d**2*x**2 + d**3*x**3), x))/e**3
```

### 3.204.7 Maxima [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = \text{Timed out}$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^3,x, algorithm="maxima")
```

output
```
Timed out
```

### 3.204.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^3}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^3,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^3, x)
```

### 3.204.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{(c\,e+d\,e\,x)^3}\,dx$$

input
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^3,x)
```

output
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^3, x)
```

# 3.205 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx$



## 3.205.1 Optimal result

Integrand size = 23, antiderivative size = 291

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = &-\frac{b^2(a+b\arcsin(c+dx))}{de^4(c+dx)}\\ &-\frac{b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2de^4(c+dx)^2}\\ &-\frac{(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^3}\\ &-\frac{b(a+b\arcsin(c+dx))^2\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4}\\ &-\frac{b^3\operatorname{arctanh}\left(\sqrt{1-(c+dx)^2}\right)}{de^4}\\ &+\frac{ib^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4}\\ &-\frac{ib^2(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4}\\ &-\frac{b^3\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^4}\\ &+\frac{b^3\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^4}\end{aligned}$$

output
```
-b^2*(a+b*arcsin(d*x+c))/d/e^4/(d*x+c)-1/3*(a+b*arcsin(d*x+c))^3/d/e^4/(d*
x+c)^3-b*(a+b*arcsin(d*x+c))^2*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^
4-b^3*arctanh((1-(d*x+c)^2)^(1/2))/d/e^4+I*b^2*(a+b*arcsin(d*x+c))*polylog
(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4-I*b^2*(a+b*arcsin(d*x+c))*polylog
(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-b^3*polylog(3,-I*(d*x+c)-(1-(d*x+c
)^2)^(1/2))/d/e^4+b^3*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-1/2*b
*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d/e^4/(d*x+c)^2
```

### 3.205.2 Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 732 vs. $2(291) = 582$.

Time = 8.26 (sec) , antiderivative size = 732, normalized size of antiderivative = 2.52

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = -\frac{a^3}{3de^4(c+dx)^3} - \frac{a^2b\sqrt{1-c^2-2cdx-d^2x^2}}{2de^4(c+dx)^2} - \frac{a^2b\arcsin(c+dx)}{de^4(c+dx)^3} + \frac{a^2b\log(c+dx)}{2de^4} - \frac{a^2b\log\left(1+\sqrt{1-c^2-2cdx-d^2x^2}\right)}{2de^4} + \frac{ab^2\left(8i\,\mathrm{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right) - \frac{2(2+4\arcsin(c+dx)^2-2\cos(2\arcsin(c+dx))-3(c+dx)\arcsin(c+dx)\log(1-e^{i\arcsin(c+dx)})}{\cdots}\right.}{\cdots} + \frac{b^3\left(-24\arcsin(c+dx)\cot\left(\frac{1}{2}\arcsin(c+dx)\right) - 4\arcsin(c+dx)^3\cot\left(\frac{1}{2}\arcsin(c+dx)\right) - 6\arcsin(c+\cdots\right.}{\cdots}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^4,x]
```

output
```
-1/3*a^3/(d*e^4*(c + d*x)^3) - (a^2*b*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])/(
2*d*e^4*(c + d*x)^2) - (a^2*b*ArcSin[c + d*x])/(d*e^4*(c + d*x)^3) + (a^2*
b*Log[c + d*x])/(2*d*e^4) - (a^2*b*Log[1 + Sqrt[1 - c^2 - 2*c*d*x - d^2*x^
2]])/(2*d*e^4) + (a*b^2*((8*I)*PolyLog[2, -E^(I*ArcSin[c + d*x])] - (2*(2
+ 4*ArcSin[c + d*x]^2 - 2*Cos[2*ArcSin[c + d*x]] - 3*(c + d*x)*ArcSin[c +
d*x]*Log[1 - E^(I*ArcSin[c + d*x])] + 3*(c + d*x)*ArcSin[c + d*x]*Log[1 +
E^(I*ArcSin[c + d*x])] + (4*I)*(c + d*x)^3*PolyLog[2, E^(I*ArcSin[c + d*x]
)] + 2*ArcSin[c + d*x]*Sin[2*ArcSin[c + d*x]] + ArcSin[c + d*x]*Log[1 - E^
(I*ArcSin[c + d*x])]*Sin[3*ArcSin[c + d*x]] - ArcSin[c + d*x]*Log[1 + E^(I
*ArcSin[c + d*x])]*Sin[3*ArcSin[c + d*x]]))/(c + d*x)^3))/(8*d*e^4) + (b^3
*(-24*ArcSin[c + d*x]*Cot[ArcSin[c + d*x]/2] - 4*ArcSin[c + d*x]^3*Cot[Arc
Sin[c + d*x]/2] - 6*ArcSin[c + d*x]^2*Csc[ArcSin[c + d*x]/2]^2 - (c + d*x)
*ArcSin[c + d*x]^3*Csc[ArcSin[c + d*x]/2]^4 + 24*ArcSin[c + d*x]^2*Log[1 -
 E^(I*ArcSin[c + d*x])] - 24*ArcSin[c + d*x]^2*Log[1 + E^(I*ArcSin[c + d*x
])] + 48*Log[Tan[ArcSin[c + d*x]/2]] + (48*I)*ArcSin[c + d*x]*PolyLog[2, -
E^(I*ArcSin[c + d*x])] - (48*I)*ArcSin[c + d*x]*PolyLog[2, E^(I*ArcSin[c +
 d*x])] - 48*PolyLog[3, -E^(I*ArcSin[c + d*x])] + 48*PolyLog[3, E^(I*ArcSi
n[c + d*x])] + 6*ArcSin[c + d*x]^2*Sec[ArcSin[c + d*x]/2]^2 - (16*ArcSin[c
 + d*x]^3*Sin[ArcSin[c + d*x]/2]^4)/(c + d*x)^3 - 24*ArcSin[c + d*x]*Tan[A
rcSin[c + d*x]/2] - 4*ArcSin[c + d*x]^3*Tan[ArcSin[c + d*x]/2]))/(48*d*...
```

### 3.205.3 Rubi [A] (warning: unable to verify)

Time = 1.15 (sec) , antiderivative size = 239, normalized size of antiderivative = 0.82, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.609$, Rules used = {5304, 27, 5138, 5204, 5138, 243, 73, 219, 5218, 3042, 4671, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{e^4(c+dx)^4}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{(c+dx)^4}d(c+dx)}{de^4}$$

$$\Big\downarrow \text{5138}$$

$$\frac{b\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)^3\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^3}{3(c+dx)^3}}{de^4}$$

$\big\downarrow$ 5204

$$\frac{b\left(b\int \frac{a+b\arcsin(c+dx)}{(c+dx)^2}d(c+dx)+\frac{1}{2}\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2(c+dx)^2}\right)-\frac{(a+b\arcsin(c+dx))^3}{3(c+dx)^3}}{de^4}$$

$\big\downarrow$ 5138

$$\frac{b\left(b\left(b\int \frac{1}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{a+b\arcsin(c+dx)}{c+dx}\right)+\frac{1}{2}\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx}{2(c+dx)^2}}{de^4}$$

$\big\downarrow$ 243

$$\frac{b\left(b\left(\frac{1}{2}b\int \frac{1}{\sqrt{-c-dx+1}(c+dx)^2}d(c+dx)^2-\frac{a+b\arcsin(c+dx)}{c+dx}\right)+\frac{1}{2}\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+}{2(c+dx)^2}}{de^4}$$

$\big\downarrow$ 73

$$\frac{b\left(b\left(-b\int \frac{1}{1-(c+dx)^4}d\sqrt{-c-dx+1}-\frac{a+b\arcsin(c+dx)}{c+dx}\right)+\frac{1}{2}\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx}{2(c+dx)^2}}{de^4}$$

$\big\downarrow$ 219

$$\frac{b\left(\frac{1}{2}\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)+b\left(-\frac{a+b\arcsin(c+dx)}{c+dx}-b\text{arctanh}\left(\sqrt{-c-dx+1}\right)\right)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{2(c+dx)^2}}{de^4}$$

$\big\downarrow$ 5218

$$\frac{b\left(\frac{1}{2}\int \frac{(a+b\arcsin(c+dx))^2}{c+dx}d\arcsin(c+dx)+b\left(-\frac{a+b\arcsin(c+dx)}{c+dx}-b\text{arctanh}\left(\sqrt{-c-dx+1}\right)\right)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(}{2(c+dx)^2}}{de^4}$$

$\big\downarrow$ 3042

$$\frac{b\left(\frac{1}{2}\int (a+b\arcsin(c+dx))^2\csc(\arcsin(c+dx))d\arcsin(c+dx)+b\left(-\frac{a+b\arcsin(c+dx)}{c+dx}-b\text{arctanh}\left(\sqrt{-c-dx+1}\right)\right.}{de^4}$$

$\big\downarrow$ 4671

$$-\frac{(a+b\arcsin(c+dx))^3}{3(c+dx)^3}+b\left(\frac{1}{2}\left(-2b\int (a+b\arcsin(c+dx))\log\left(1-e^{i\arcsin(c+dx)}\right)d\arcsin(c+dx)+2b\int (a+b\arcsin(\right.\right.$$

---

3.205. $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx$

$$\Big\downarrow \; 3011$$

$$-\frac{(a+b\arcsin(c+dx))^3}{3(c+dx)^3}+b\Big(\frac{1}{2}\Big(2b\Big(i\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-ib\int\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)$$

$$\Big\downarrow \; 2720$$

$$-\frac{(a+b\arcsin(c+dx))^3}{3(c+dx)^3}+b\Big(\frac{1}{2}\Big(-2b\Big(i\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-b\int e^{-i\arcsin(c+dx)}\,\text{PolyLog}\left(2,e\right.$$

$$\Big\downarrow \; 7143$$

$$-\frac{(a+b\arcsin(c+dx))^3}{3(c+dx)^3}+b\Big(\frac{1}{2}\Big(-2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-2b\Big(i\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+\right.$$

input
```
Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^4,x]
```

output
```
(-1/3*(a + b*ArcSin[c + d*x])^3/(c + d*x)^3 + b*(-1/2*(Sqrt[1 - (c + d*x)^
2]*(a + b*ArcSin[c + d*x])^2)/(c + d*x)^2 + b*(-((a + b*ArcSin[c + d*x])/(
c + d*x)) - b*ArcTanh[Sqrt[1 - c - d*x]]) + (-2*(a + b*ArcSin[c + d*x])^2*
ArcTanh[E^(I*ArcSin[c + d*x])] - 2*b*(I*(a + b*ArcSin[c + d*x])*PolyLog[2,
 E^(I*ArcSin[c + d*x])] - b*PolyLog[3, E^(I*ArcSin[c + d*x])]) + 2*b*(I*(a
 + b*ArcSin[c + d*x])*PolyLog[2, -E^(I*ArcSin[c + d*x])] - b*PolyLog[3, -c
 - d*x]))/2))/(d*e^4)
```

### 3.205.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 243
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/2   Subst[In
t[x^((m - 1)/2)*(a + b*x)^p, x], x, x^2], x] /; FreeQ[{a, b, m, p}, x] && I
ntegerQ[(m - 1)/2]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4671
```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Simp[d*(m/f)   Int[(c +
d*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Simp[d*(m/f)   Int[(c + d*x
)^(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IG
tQ[m, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

## 3.205. $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx$

rule 5204
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Simp[c^2*((m + 2*p + 3)/(f^2*(m + 1))
)   Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Simp[b*
c*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m + 1)*(
1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
 c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

rule 5218
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]]   Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

### 3.205.4 Maple [A] (verified)

Time = 1.25 (sec) , antiderivative size = 550, normalized size of antiderivative = 1.89

| method | result |
|---|---|
| derivativedivides | $-\frac{a^3}{3e^4(dx+c)^3}+\frac{b^3\left(-\frac{\arcsin(dx+c)\left(3\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+2\arcsin(dx+c)^2+6(dx+c)^2\right)}{6(dx+c)^3}+\frac{\arcsin(dx+c)^2\ln\left(1-i(dx+\right.}{2}\right.}{}$ |
| default | $-\frac{a^3}{3e^4(dx+c)^3}+\frac{b^3\left(-\frac{\arcsin(dx+c)\left(3\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+2\arcsin(dx+c)^2+6(dx+c)^2\right)}{6(dx+c)^3}+\frac{\arcsin(dx+c)^2\ln\left(1-i(dx+\right.}{2}\right.}{}$ |
| parts | $-\frac{a^3}{3e^4(dx+c)^3d}+\frac{b^3\left(-\frac{\arcsin(dx+c)\left(3\arcsin(dx+c)\sqrt{1-(dx+c)^2}\,(dx+c)+2\arcsin(dx+c)^2+6(dx+c)^2\right)}{6(dx+c)^3}+\arcsin(dx+c)^2\ln\left(1-\right.\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^4,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/3*a^3/e^4/(d*x+c)^3+b^3/e^4*(-1/6/(d*x+c)^3*arcsin(d*x+c)*(3*arcsi
n(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+2*arcsin(d*x+c)^2+6*(d*x+c)^2)+1/2*ar
csin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-I*arcsin(d*x+c)*polylog(
2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-
1/2*arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+I*arcsin(d*x+c)*po
lylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)
^(1/2))-2*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+3*a*b^2/e^4*(-1/3*(arcsi
n(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+arcsin(d*x+c)^2+(d*x+c)^2)/(d*x+c)^3+
1/3*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-1/3*I*polylog(2,I*(d
*x+c)+(1-(d*x+c)^2)^(1/2))-1/3*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^
(1/2))+1/3*I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+3*a^2*b/e^4*(-1/3/
(d*x+c)^3*arcsin(d*x+c)-1/6/(d*x+c)^2*(1-(d*x+c)^2)^(1/2)-1/6*arctanh(1/(1
-(d*x+c)^2)^(1/2))))
```

## 3.205.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^4,x, algorithm="fricas")
```

output
```
integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcs
in(d*x + c) + a^3)/(d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*
c^3*d*e^4*x + c^4*e^4), x)
```

## 3.205.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = \frac{\int \frac{a^3}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{b^3\operatorname{asin}^3(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{3ab^2\operatorname{asin}^2(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{}{c}}{e^4}$$

input
```
integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**4,x)
```

output
```
(Integral(a**3/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**
4*x**4), x) + Integral(b**3*asin(c + d*x)**3/(c**4 + 4*c**3*d*x + 6*c**2*d
**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) + Integral(3*a*b**2*asin(c + d*x
)**2/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x
) + Integral(3*a**2*b*asin(c + d*x)/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2
+ 4*c*d**3*x**3 + d**4*x**4), x))/e**4
```

## 3.205.7 Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^4,x, algorithm="maxima")
```

output
```
-1/3*a^3/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4) - 1
/3*(b^3*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 3*(d^4*
e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)*integrate(((b^3*d
*x + b^3*c)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x
 + c + 1)*sqrt(-d*x - c + 1))^2 - 3*(a*b^2*d^2*x^2 + 2*a*b^2*c*d*x + a*b^2
*c^2 - a*b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 - 3
*(a^2*b*d^2*x^2 + 2*a^2*b*c*d*x + a^2*b*c^2 - a^2*b)*arctan2(d*x + c, sqrt
(d*x + c + 1)*sqrt(-d*x - c + 1)))/(d^6*e^4*x^6 + 6*c*d^5*e^4*x^5 + (15*c^
2 - 1)*d^4*e^4*x^4 + 4*(5*c^3 - c)*d^3*e^4*x^3 + 3*(5*c^4 - 2*c^2)*d^2*e^4
*x^2 + 2*(3*c^5 - 2*c^3)*d*e^4*x + (c^6 - c^4)*e^4), x))/(d^4*e^4*x^3 + 3*
c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)
```

### 3.205.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^4,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^4, x)
```

### 3.205.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^4}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{(c\,e+d\,e\,x)^4}\,dx$$

input
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^4,x)
```

output
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^4, x)
```

# 3.206 $\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx$



## 3.206.1 Optimal result

Integrand size = 23, antiderivative size = 357

$$\begin{aligned}\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx &= \frac{45b^4e^3(c+dx)^2}{128d}+\frac{3b^4e^3(c+dx)^4}{128d}-\frac{45b^3e^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{64d}\\ &-\frac{3b^3e^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{32d}+\frac{45b^2e^3(a+b\arcsin(c+dx))^2}{128d}\\ &-\frac{9b^2e^3(c+dx)^2(a+b\arcsin(c+dx))^2}{16d}-\frac{3b^2e^3(c+dx)^4(a+b\arcsin(c+dx))^2}{16d}\\ &+\frac{3be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{8d}\\ &+\frac{be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{4d}\\ &-\frac{3e^3(a+b\arcsin(c+dx))^4}{32d}+\frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^4}{4d}\end{aligned}$$

output
```
45/128*b^4*e^3*(d*x+c)^2/d+3/128*b^4*e^3*(d*x+c)^4/d+45/128*b^2*e^3*(a+b*a
rcsin(d*x+c))^2/d-9/16*b^2*e^3*(d*x+c)^2*(a+b*arcsin(d*x+c))^2/d-3/16*b^2*
e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))^2/d-3/32*e^3*(a+b*arcsin(d*x+c))^4/d+1/4
*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))^4/d-45/64*b^3*e^3*(d*x+c)*(a+b*arcsin(d
*x+c))*(1-(d*x+c)^2)^(1/2)/d-3/32*b^3*e^3*(d*x+c)^3*(a+b*arcsin(d*x+c))*(1
-(d*x+c)^2)^(1/2)/d+3/8*b*e^3*(d*x+c)*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^
(1/2)/d+1/4*b*e^3*(d*x+c)^3*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d
```

### 3.206.2 Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 287, normalized size of antiderivative = 0.80

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx$$
$$=\frac{e^3\left(\frac{45}{4}b^4(c+dx)^2+\frac{3}{4}b^4(c+dx)^4-\frac{45}{2}b^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))-3b^3(c+dx)^3\sqrt{1}\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e^3*((45*b^4*(c + d*x)^2)/4 + (3*b^4*(c + d*x)^4)/4 - (45*b^3*(c + d*x)*S
qrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/2 - 3*b^3*(c + d*x)^3*Sqrt[1
 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]) + (45*b^2*(a + b*ArcSin[c + d*x])^
2)/4 - 18*b^2*(c + d*x)^2*(a + b*ArcSin[c + d*x])^2 - 6*b^2*(c + d*x)^4*(a
 + b*ArcSin[c + d*x])^2 + 12*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcS
in[c + d*x])^3 + 8*b*(c + d*x)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d
*x])^3 - 3*(a + b*ArcSin[c + d*x])^4 + 8*(c + d*x)^4*(a + b*ArcSin[c + d*x
])^4))/(32*d)
```

### 3.206.3 Rubi [A] (verified)

Time = 1.58 (sec) , antiderivative size = 384, normalized size of antiderivative = 1.08, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {5304, 27, 5138, 5210, 5138, 5210, 15, 5138, 5152, 5210, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int e^3(c+dx)^3(a+b\arcsin(c+dx))^4d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e^3\int (c+dx)^3(a+b\arcsin(c+dx))^4d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5138}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\int\frac{(c+dx)^4(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$\downarrow$ 5210

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\left(\frac{3}{4}b\int(c+dx)^3(a+b\arcsin(c+dx))^2d(c+dx)+\frac{3}{4}\int\frac{(c+dx)^2(a+b\arcsin(c+\right.\right.}{\sqrt{1-(c+dx)^2}}}{d}$$

$\downarrow$ 5138

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\left(\frac{3}{4}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\int\frac{(c+dx)^4(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c\right.\right.\right.}{d}$$

$\downarrow$ 5210

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\left(\frac{3}{4}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\int\frac{(c+dx)^2(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 15

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\left(\frac{3}{4}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\int\frac{(c+dx)^2(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 5138

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\left(\frac{3}{4}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\int\frac{(c+dx)^2(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 5152

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\left(\frac{3}{4}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\int\frac{(c+dx)^2(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 5210

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\left(\frac{3}{4}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{a+b\arcsin(c+dx)}{\sqrt{1-(c+dx)^2}}d(c+\right.\right.\right.\right.\right.$$

$\downarrow$ 15

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\left(\frac{3}{4}b\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^2-\frac{1}{2}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{a+b\arcsin(c+dx)}{\sqrt{1-(c+dx)^2}}d(c+\right.\right.\right.\right.\right.$$

3.206. $\int(ce+dex)^3(a+b\arcsin(c+dx))^4\,dx$

$$\Big\downarrow \text{5152}$$

$$e^3\Big(\tfrac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^4-b\Big(-\tfrac{1}{4}(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3+\tfrac{3}{4}b\Big(\tfrac{1}{4}(c+dx)^4(a$$

input
```
Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e^3*(((c + d*x)^4*(a + b*ArcSin[c + d*x])^4)/4 - b*(-1/4*((c + d*x)^3*Sqr
t[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3) + (3*b*(((c + d*x)^4*(a + b*
ArcSin[c + d*x])^2)/4 - (b*((b*(c + d*x)^4)/16 - ((c + d*x)^3*Sqrt[1 - (c
+ d*x)^2]*(a + b*ArcSin[c + d*x]))/4 + (3*((b*(c + d*x)^2)/4 - ((c + d*x)*
Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/2 + (a + b*ArcSin[c + d*x])
^2/(4*b)))/4))/2))/4 + (3*(-1/2*((c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*Ar
cSin[c + d*x])^3) + (a + b*ArcSin[c + d*x])^4/(8*b) + (3*b*(((c + d*x)^2*(
a + b*ArcSin[c + d*x])^2)/2 - b*((b*(c + d*x)^2)/4 - ((c + d*x)*Sqrt[1 - (
c + d*x)^2]*(a + b*ArcSin[c + d*x]))/2 + (a + b*ArcSin[c + d*x])^2/(4*b))
)/2))/4)))/d
```

### 3.206.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.206.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 656 vs. $2(327) = 654$.

Time = 1.38 (sec) , antiderivative size = 657, normalized size of antiderivative = 1.84

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{e^3a^4(dx+c)^4}{4}+e^3b^4\left(\frac{(dx+c)^4\arcsin(dx+c)^4}{4}-\frac{\arcsin(dx+c)^3\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{8}-\right.}{}$ |
| default | $\frac{\frac{e^3a^4(dx+c)^4}{4}+e^3b^4\left(\frac{(dx+c)^4\arcsin(dx+c)^4}{4}-\frac{\arcsin(dx+c)^3\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right)}{8}-\right.}{}$ |
| parts | $\frac{e^3a^4(dx+c)^4}{4d}+\frac{e^3b^4\left(\frac{(dx+c)^4\arcsin(dx+c)^4}{4}-\frac{\arcsin(dx+c)^3\left(-2(dx+c)^3\sqrt{1-(dx+c)^2}-3(dx+c)\sqrt{1-(dx+c)^2}+3\arcsin(dx+c)\right.}{8}\right.}{}$ |

input
```
int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/4*e^3*a^4*(d*x+c)^4+e^3*b^4*(1/4*(d*x+c)^4*arcsin(d*x+c)^4-1/8*arcs
in(d*x+c)^3*(-2*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2
)+3*arcsin(d*x+c))-3/16*(d*x+c)^4*arcsin(d*x+c)^2+3/64*arcsin(d*x+c)*(-2*(
d*x+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3*arcsin(d*x+c)
)+27/128*arcsin(d*x+c)^2+3/512*(2*(d*x+c)^2+3)^2-9/16*((d*x+c)^2-1)*arcsin
(d*x+c)^2-9/16*arcsin(d*x+c)*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))+9
/32*(d*x+c)^2+9/32*arcsin(d*x+c)^4)+4*e^3*a*b^3*(1/4*(d*x+c)^4*arcsin(d*x+
c)^3-3/32*arcsin(d*x+c)^2*(-2*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(
d*x+c)^2)^(1/2)+3*arcsin(d*x+c))-3/32*(d*x+c)^4*arcsin(d*x+c)-3/256*(d*x+c
)*(2*(d*x+c)^2+3)*(1-(d*x+c)^2)^(1/2)-27/256*arcsin(d*x+c)-9/32*((d*x+c)^2
-1)*arcsin(d*x+c)-9/64*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3/16*arcsin(d*x+c)^3)+6
*e^3*a^2*b^2*(1/4*(d*x+c)^4*arcsin(d*x+c)^2-1/16*arcsin(d*x+c)*(-2*(d*x+c)
^3*(1-(d*x+c)^2)^(1/2)-3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+3*arcsin(d*x+c))+3/32
*arcsin(d*x+c)^2-1/128*(2*(d*x+c)^2+3)^2)+4*e^3*a^3*b*(1/4*(d*x+c)^4*arcsi
n(d*x+c)+1/16*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)+3/32*(d*x+c)*(1-(d*x+c)^2)^(1/
2)-3/32*arcsin(d*x+c)))
```

### 3.206.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1148 vs. 2(327) = 654.

Time = 0.30 (sec) , antiderivative size = 1148, normalized size of antiderivative = 3.22

$$\int (ce + dex)^3 (a + b \arcsin(c + dx))^4 \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
1/128*((32*a^4 - 24*a^2*b^2 + 3*b^4)*d^4*e^3*x^4 + 4*(32*a^4 - 24*a^2*b^2
+ 3*b^4)*c*d^3*e^3*x^3 - 3*(24*a^2*b^2 - 15*b^4 - 2*(32*a^4 - 24*a^2*b^2 +
 3*b^4)*c^2)*d^2*e^3*x^2 + 2*(2*(32*a^4 - 24*a^2*b^2 + 3*b^4)*c^3 - 9*(8*a
^2*b^2 - 5*b^4)*c)*d*e^3*x + 4*(8*b^4*d^4*e^3*x^4 + 32*b^4*c*d^3*e^3*x^3 +
 48*b^4*c^2*d^2*e^3*x^2 + 32*b^4*c^3*d*e^3*x + (8*b^4*c^4 - 3*b^4)*e^3)*ar
csin(d*x + c)^4 + 16*(8*a*b^3*d^4*e^3*x^4 + 32*a*b^3*c*d^3*e^3*x^3 + 48*a*
b^3*c^2*d^2*e^3*x^2 + 32*a*b^3*c^3*d*e^3*x + (8*a*b^3*c^4 - 3*a*b^3)*e^3)*
arcsin(d*x + c)^3 + 3*(8*(8*a^2*b^2 - b^4)*d^4*e^3*x^4 + 32*(8*a^2*b^2 - b
^4)*c*d^3*e^3*x^3 - 24*(b^4 - 2*(8*a^2*b^2 - b^4)*c^2)*d^2*e^3*x^2 - 16*(3
*b^4*c - 2*(8*a^2*b^2 - b^4)*c^3)*d*e^3*x - (24*b^4*c^2 - 8*(8*a^2*b^2 - b
^4)*c^4 + 24*a^2*b^2 - 15*b^4)*e^3)*arcsin(d*x + c)^2 + 2*(8*(8*a^3*b - 3*
a*b^3)*d^4*e^3*x^4 + 32*(8*a^3*b - 3*a*b^3)*c*d^3*e^3*x^3 - 24*(3*a*b^3 -
2*(8*a^3*b - 3*a*b^3)*c^2)*d^2*e^3*x^2 - 16*(9*a*b^3*c - 2*(8*a^3*b - 3*a*
b^3)*c^3)*d*e^3*x - (72*a*b^3*c^2 - 8*(8*a^3*b - 3*a*b^3)*c^4 + 24*a^3*b -
 45*a*b^3)*e^3)*arcsin(d*x + c) + 2*(2*(8*a^3*b - 3*a*b^3)*d^3*e^3*x^3 + 6
*(8*a^3*b - 3*a*b^3)*c*d^2*e^3*x^2 + 3*(8*a^3*b - 15*a*b^3 + 2*(8*a^3*b -
3*a*b^3)*c^2)*d*e^3*x + (2*(8*a^3*b - 3*a*b^3)*c^3 + 3*(8*a^3*b - 15*a*b^3
)*c)*e^3 + 8*(2*b^4*d^3*e^3*x^3 + 6*b^4*c*d^2*e^3*x^2 + 3*(2*b^4*c^2 + b^4
)*d*e^3*x + (2*b^4*c^3 + 3*b^4*c)*e^3)*arcsin(d*x + c)^3 + 24*(2*a*b^3*d^3
*e^3*x^3 + 6*a*b^3*c*d^2*e^3*x^2 + 3*(2*a*b^3*c^2 + a*b^3)*d*e^3*x + (2...
```

### 3.206.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2876 vs. 2(325) = 650.

Time = 1.21 (sec) , antiderivative size = 2876, normalized size of antiderivative = 8.06

$$\int (ce + dex)^3 (a + b \arcsin(c + dx))^4 \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**4,x)
```

output
```
Piecewise((a**4*c**3*e**3*x + 3*a**4*c**2*d*e**3*x**2/2 + a**4*c*d**2*e**3
*x**3 + a**4*d**3*e**3*x**4/4 + a**3*b*c**4*e**3*asin(c + d*x)/d + 4*a**3*
b*c**3*e**3*x*asin(c + d*x) + a**3*b*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2
*x**2 + 1)/(4*d) + 6*a**3*b*c**2*d*e**3*x**2*asin(c + d*x) + 3*a**3*b*c**2
*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/4 + 4*a**3*b*c*d**2*e**3*x**
3*asin(c + d*x) + 3*a**3*b*c*d*e**3*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2
+ 1)/4 + 3*a**3*b*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(8*d) + a**
3*b*d**3*e**3*x**4*asin(c + d*x) + a**3*b*d**2*e**3*x**3*sqrt(-c**2 - 2*c*
d*x - d**2*x**2 + 1)/4 + 3*a**3*b*e**3*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2
+ 1)/8 - 3*a**3*b*e**3*asin(c + d*x)/(8*d) + 3*a**2*b**2*c**4*e**3*asin(c
+ d*x)**2/(2*d) + 6*a**2*b**2*c**3*e**3*x*asin(c + d*x)**2 - 3*a**2*b**2*c
**3*e**3*x/4 + 3*a**2*b**2*c**3*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)
*asin(c + d*x)/(4*d) + 9*a**2*b**2*c**2*d*e**3*x**2*asin(c + d*x)**2 - 9*a
**2*b**2*c**2*d*e**3*x**2/8 + 9*a**2*b**2*c**2*e**3*x*sqrt(-c**2 - 2*c*d*x
 - d**2*x**2 + 1)*asin(c + d*x)/4 + 6*a**2*b**2*c*d**2*e**3*x**3*asin(c +
d*x)**2 - 3*a**2*b**2*c*d**2*e**3*x**3/4 + 9*a**2*b**2*c*d*e**3*x**2*sqrt(
-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/4 - 9*a**2*b**2*c*e**3*x/8
+ 9*a**2*b**2*c*e**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(
8*d) + 3*a**2*b**2*d**3*e**3*x**4*asin(c + d*x)**2/2 - 3*a**2*b**2*d**3*e*
*3*x**4/16 + 3*a**2*b**2*d**2*e**3*x**3*sqrt(-c**2 - 2*c*d*x - d**2*x**...
```

### 3.206.7 Maxima [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx=\int (dex+ce)^3(b\arcsin(dx+c)+a)^4\,dx$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
1/4*a^4*d^3*e^3*x^4 + a^4*c*d^2*e^3*x^3 + 3/2*a^4*c^2*d*e^3*x^2 + 3*(2*x^2
*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)
*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-
(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d
*x - c^2 + 1)*c/d^3))*a^3*b*c^2*d*e^3 + 2/3*(6*x^3*arcsin(d*x + c) + d*(2*
sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/
sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*
c*x/d^3 + 9*(c^2 - 1)*c*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2
))/d^4 + 15*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 -
 2*c*d*x - c^2 + 1)*(c^2 - 1)/d^4))*a^3*b*c*d^2*e^3 + 1/24*(24*x^4*arcsin(
d*x + c) + (6*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x^3/d^2 - 14*sqrt(-d^2*x^
2 - 2*c*d*x - c^2 + 1)*c*x^2/d^3 + 105*c^4*arcsin(-(d^2*x + c*d)/sqrt(c^2*
d^2 - (c^2 - 1)*d^2))/d^5 + 35*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^2*x/d^
4 - 90*(c^2 - 1)*c^2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/
d^5 - 105*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c^3/d^5 - 9*sqrt(-d^2*x^2 - 2
*c*d*x - c^2 + 1)*(c^2 - 1)*x/d^4 + 9*(c^2 - 1)^2*arcsin(-(d^2*x + c*d)/sq
rt(c^2*d^2 - (c^2 - 1)*d^2))/d^5 + 55*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(
c^2 - 1)*c/d^5)*d)*a^3*b*d^3*e^3 + a^4*c^3*e^3*x + 4*((d*x + c)*arcsin(d*x
 + c) + sqrt(-(d*x + c)^2 + 1))*a^3*b*c^3*e^3/d + 1/4*(b^4*d^3*e^3*x^4 + 4
*b^4*c*d^2*e^3*x^3 + 6*b^4*c^2*d*e^3*x^2 + 4*b^4*c^3*e^3*x)*arctan2(d*x...
```

### 3.206.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1016 vs. $2(327) = 654$.

Time = 0.38 (sec) , antiderivative size = 1016, normalized size of antiderivative = 2.85

$$\int (ce + dex)^3(a + b \arcsin(c + dx))^4 \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
1/4*((d*x + c)^2 - 1)^2*b^4*e^3*arcsin(d*x + c)^4/d - 1/4*(-(d*x + c)^2 +
1)^(3/2)*(d*x + c)*b^4*e^3*arcsin(d*x + c)^3/d + ((d*x + c)^2 - 1)^2*a*b^3
*e^3*arcsin(d*x + c)^3/d + 1/2*((d*x + c)^2 - 1)*b^4*e^3*arcsin(d*x + c)^4
/d - 3/4*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a*b^3*e^3*arcsin(d*x + c)^2/d
+ 5/8*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^4*e^3*arcsin(d*x + c)^3/d + 1/4*(
d*x + c)^4*a^4*e^3/d + 3/2*((d*x + c)^2 - 1)^2*a^2*b^2*e^3*arcsin(d*x + c)
^2/d - 3/16*((d*x + c)^2 - 1)^2*b^4*e^3*arcsin(d*x + c)^2/d + 2*((d*x + c)
^2 - 1)*a*b^3*e^3*arcsin(d*x + c)^3/d + 5/32*b^4*e^3*arcsin(d*x + c)^4/d -
 3/4*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a^2*b^2*e^3*arcsin(d*x + c)/d + 3/
32*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*b^4*e^3*arcsin(d*x + c)/d + 15/8*sqr
t(-(d*x + c)^2 + 1)*(d*x + c)*a*b^3*e^3*arcsin(d*x + c)^2/d + ((d*x + c)^2
 - 1)^2*a^3*b*e^3*arcsin(d*x + c)/d - 3/8*((d*x + c)^2 - 1)^2*a*b^3*e^3*ar
csin(d*x + c)/d + 3*((d*x + c)^2 - 1)*a^2*b^2*e^3*arcsin(d*x + c)^2/d - 15
/16*((d*x + c)^2 - 1)*b^4*e^3*arcsin(d*x + c)^2/d + 5/8*a*b^3*e^3*arcsin(d
*x + c)^3/d - 1/4*(-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a^3*b*e^3/d + 3/32*(-
(d*x + c)^2 + 1)^(3/2)*(d*x + c)*a*b^3*e^3/d + 15/8*sqrt(-(d*x + c)^2 + 1)
*(d*x + c)*a^2*b^2*e^3*arcsin(d*x + c)/d - 51/64*sqrt(-(d*x + c)^2 + 1)*(d
*x + c)*b^4*e^3*arcsin(d*x + c)/d - 3/16*((d*x + c)^2 - 1)^2*a^2*b^2*e^3/d
 + 3/128*((d*x + c)^2 - 1)^2*b^4*e^3/d + 2*((d*x + c)^2 - 1)*a^3*b*e^3*arc
sin(d*x + c)/d - 15/8*((d*x + c)^2 - 1)*a*b^3*e^3*arcsin(d*x + c)/d + 1...
```

## 3.206.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^4\,dx=\int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))^4\,dx$$

input
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^4,x)
```

output
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^4, x)
```

# 3.207 $\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$



## 3.207.1 Optimal result

Integrand size = 23, antiderivative size = 289

$$\begin{aligned}\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx &= \frac{160}{27}b^4e^2x+\frac{8b^4e^2(c+dx)^3}{81d}-\frac{160b^3e^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d}\\ &-\frac{8b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{27d}\\ &-\frac{8b^2e^2(c+dx)(a+b\arcsin(c+dx))^2}{3d}-\frac{4b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^2}{9d}\\ &+\frac{8be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d}\\ &+\frac{4be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{9d}\\ &+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^4}{3d}\end{aligned}$$

output
```
160/27*b^4*e^2*x+8/81*b^4*e^2*(d*x+c)^3/d-8/3*b^2*e^2*(d*x+c)*(a+b*arcsin(
d*x+c))^2/d-4/9*b^2*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))^2/d+1/3*e^2*(d*x+c)^
3*(a+b*arcsin(d*x+c))^4/d-160/27*b^3*e^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)
^(1/2)/d-8/27*b^3*e^2*(d*x+c)^2*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d+
8/9*b*e^2*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d+4/9*b*e^2*(d*x+c)^2*
(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d
```

### 3.207.2 Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 235, normalized size of antiderivative = 0.81

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$$
$$= \frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{9}b\left(-\frac{2}{9}b^3(c+dx)^3+\frac{2}{3}b^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e^2*(((c + d*x)^3*(a + b*ArcSin[c + d*x])^4)/3 - (4*b*((-2*b^3*(c + d*x)^
3)/9 + (2*b^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/3
 + 6*b*(c + d*x)*(a + b*ArcSin[c + d*x])^2 + b*(c + d*x)^3*(a + b*ArcSin[c
 + d*x])^2 - 2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3 - (c + d*x)
^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3 - (40*b^2*(b*d*x - Sqrt
[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])))/3))/9))/d
```

### 3.207.3 Rubi [A] (verified)

Time = 1.31 (sec) , antiderivative size = 288, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.565$, Rules used = {5304, 27, 5138, 5210, 5138, 5182, 5130, 5182, 24, 5210, 15, 5182, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int e^2(c+dx)^2(a+b\arcsin(c+dx))^4d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$
$$\frac{e^2\int (c+dx)^2(a+b\arcsin(c+dx))^4d(c+dx)}{d}$$
$$\Big\downarrow \text{5138}$$
$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\int \frac{(c+dx)^3(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$\Big\downarrow$ 5210

$$e^2\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\Bigg(b\int(c+dx)^2(a+b\arcsin(c+dx))^2d(c+dx)+\frac{2}{3}\int\frac{(c+dx)(a+b\arcsin(c+d}{\sqrt{1-(c+dx)^2}}$$
$$d$$

$\Big\downarrow$ 5138

$$e^2\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\Bigg(b\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\int\frac{(c+dx)^3(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c$$
$$d$$

$\Big\downarrow$ 5182

$$e^2\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\Bigg(b\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\int\frac{(c+dx)^3(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c$$

$\Big\downarrow$ 5130

$$e^2\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\Bigg(\frac{2}{3}\Bigg(3b\Bigg((c+dx)(a+b\arcsin(c+dx))^2-2b\int\frac{(c+dx)(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c$$

$\Big\downarrow$ 5182

$$e^2\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\Bigg(\frac{2}{3}\Bigg(3b\Bigg((c+dx)(a+b\arcsin(c+dx))^2-2b\Bigg(b\int 1d(c+dx)-\sqrt{1-(c}$$

$\Big\downarrow$ 24

$$e^2\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\Bigg(b\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\int\frac{(c+dx)^3(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c$$

$\Big\downarrow$ 5210

$$e^2\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\Bigg(b\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\Bigg(\frac{2}{3}\int\frac{(c+dx)(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d($$

$\Big\downarrow$ 15

$$e^2\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\Bigg(b\Bigg(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\Bigg(\frac{2}{3}\int\frac{(c+dx)(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d($$

$\Big\downarrow$ 5182

3.207. $\int(ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\left(b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^2-\frac{2}{3}b\left(\frac{2}{3}\left(b\int 1d(c+dx)-\sqrt{1-(\right.\right.\right.\right.\right.$$

$\downarrow$ 24

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^4-\frac{4}{3}b\left(-\frac{1}{3}(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3+b\left(\frac{1}{3}(c+dx)^3(a\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e^2*(((c + d*x)^3*(a + b*ArcSin[c + d*x])^4)/3 - (4*b*(-1/3*((c + d*x)^2*
Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3) + b*(((c + d*x)^3*(a + b*
ArcSin[c + d*x])^2)/3 - (2*b*((b*(c + d*x)^3)/9 - ((c + d*x)^2*Sqrt[1 - (c
 + d*x)^2]*(a + b*ArcSin[c + d*x]))/3 + (2*(b*(c + d*x) - Sqrt[1 - (c + d*
x)^2]*(a + b*ArcSin[c + d*x])))/3))/3) + (2*(-(Sqrt[1 - (c + d*x)^2]*(a +
b*ArcSin[c + d*x])^3) + 3*b*((c + d*x)*(a + b*ArcSin[c + d*x])^2 - 2*b*(b*
(c + d*x) - Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])))))/3))/3))/d
```

### 3.207.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.207.4 Maple [A] (verified)

Time = 1.19 (sec) , antiderivative size = 440, normalized size of antiderivative = 1.52

| method | result |
|---|---|
| derivativedivides | $\frac{e^2a^4(dx+c)^3}{3}+e^2b^4\left(\frac{(dx+c)^3\arcsin(dx+c)^4}{3}+\frac{4\arcsin(dx+c)^3\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{8\arcsin(dx+c)^2(dx+c)}{3}+\frac{160dx}{27}+\frac{160c}{27}\right.$ |
| default | $\frac{e^2a^4(dx+c)^3}{3}+e^2b^4\left(\frac{(dx+c)^3\arcsin(dx+c)^4}{3}+\frac{4\arcsin(dx+c)^3\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{8\arcsin(dx+c)^2(dx+c)}{3}+\frac{160dx}{27}+\frac{160c}{27}\right.$ |
| parts | $\frac{e^2a^4(dx+c)^3}{3d}+\frac{e^2b^4\left(\frac{(dx+c)^3\arcsin(dx+c)^4}{3}+\frac{4\arcsin(dx+c)^3\left((dx+c)^2+2\right)\sqrt{1-(dx+c)^2}}{9}-\frac{8\arcsin(dx+c)^2(dx+c)}{3}+\frac{160dx}{27}+\right.}{}$ |

input
```
int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/3*e^2*a^4*(d*x+c)^3+e^2*b^4*(1/3*(d*x+c)^3*arcsin(d*x+c)^4+4/9*arcs
in(d*x+c)^3*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-8/3*arcsin(d*x+c)^2*(d*x+c)+
160/27*d*x+160/27*c-16/3*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)-4/9*(d*x+c)^3*a
rcsin(d*x+c)^2-8/27*arcsin(d*x+c)*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)+8/81*(
d*x+c)^3)+4*e^2*a*b^3*(1/3*(d*x+c)^3*arcsin(d*x+c)^3+1/3*arcsin(d*x+c)^2*(
(d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2)-4/3*(1-(d*x+c)^2)^(1/2)-4/3*(d*x+c)*arcsi
n(d*x+c)-2/9*(d*x+c)^3*arcsin(d*x+c)-2/27*((d*x+c)^2+2)*(1-(d*x+c)^2)^(1/2
))+6*e^2*a^2*b^2*(1/3*(d*x+c)^3*arcsin(d*x+c)^2+2/9*arcsin(d*x+c)*((d*x+c)
^2+2)*(1-(d*x+c)^2)^(1/2)-2/27*(d*x+c)^3-4/9*d*x-4/9*c)+4*e^2*a^3*b*(1/3*(
d*x+c)^3*arcsin(d*x+c)+1/9*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)+2/9*(1-(d*x+c)^2)
^(1/2)))
```

### 3.207.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 784 vs. $2(263) = 526$.

Time = 0.29 (sec) , antiderivative size = 784, normalized size of antiderivative = 2.71

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$$
$$= \frac{(27\,a^4-36\,a^2b^2+8\,b^4)d^3e^2x^3+3\,(27\,a^4-36\,a^2b^2+8\,b^4)cd^2e^2x^2-3\,(72\,a^2b^2-160\,b^4-(27\,a^4-36\,a^2b^2}{}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
1/81*((27*a^4 - 36*a^2*b^2 + 8*b^4)*d^3*e^2*x^3 + 3*(27*a^4 - 36*a^2*b^2 +
 8*b^4)*c*d^2*e^2*x^2 - 3*(72*a^2*b^2 - 160*b^4 - (27*a^4 - 36*a^2*b^2 + 8
*b^4)*c^2)*d*e^2*x + 27*(b^4*d^3*e^2*x^3 + 3*b^4*c*d^2*e^2*x^2 + 3*b^4*c^2
*d*e^2*x + b^4*c^3*e^2)*arcsin(d*x + c)^4 + 108*(a*b^3*d^3*e^2*x^3 + 3*a*b
^3*c*d^2*e^2*x^2 + 3*a*b^3*c^2*d*e^2*x + a*b^3*c^3*e^2)*arcsin(d*x + c)^3
+ 18*((9*a^2*b^2 - 2*b^4)*d^3*e^2*x^3 + 3*(9*a^2*b^2 - 2*b^4)*c*d^2*e^2*x^
2 - 3*(4*b^4 - (9*a^2*b^2 - 2*b^4)*c^2)*d*e^2*x - (12*b^4*c - (9*a^2*b^2 -
 2*b^4)*c^3)*e^2)*arcsin(d*x + c)^2 + 36*((3*a^3*b - 2*a*b^3)*d^3*e^2*x^3
+ 3*(3*a^3*b - 2*a*b^3)*c*d^2*e^2*x^2 - 3*(4*a*b^3 - (3*a^3*b - 2*a*b^3)*c
^2)*d*e^2*x - (12*a*b^3*c - (3*a^3*b - 2*a*b^3)*c^3)*e^2)*arcsin(d*x + c)
+ 12*((3*a^3*b - 2*a*b^3)*d^2*e^2*x^2 + 2*(3*a^3*b - 2*a*b^3)*c*d*e^2*x +
3*(b^4*d^2*e^2*x^2 + 2*b^4*c*d*e^2*x + (b^4*c^2 + 2*b^4)*e^2)*arcsin(d*x +
 c)^3 + (6*a^3*b - 40*a*b^3 + (3*a^3*b - 2*a*b^3)*c^2)*e^2 + 9*(a*b^3*d^2*
e^2*x^2 + 2*a*b^3*c*d*e^2*x + (a*b^3*c^2 + 2*a*b^3)*e^2)*arcsin(d*x + c)^2
 + ((9*a^2*b^2 - 2*b^4)*d^2*e^2*x^2 + 2*(9*a^2*b^2 - 2*b^4)*c*d*e^2*x + (1
8*a^2*b^2 - 40*b^4 + (9*a^2*b^2 - 2*b^4)*c^2)*e^2)*arcsin(d*x + c))*sqrt(-
d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

### 3.207.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1889 vs. $2(264) = 528$.

Time = 0.72 (sec) , antiderivative size = 1889, normalized size of antiderivative = 6.54

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**4,x)
```

output
```
Piecewise((a**4*c**2*e**2*x + a**4*c*d*e**2*x**2 + a**4*d**2*e**2*x**3/3 +
 4*a**3*b*c**3*e**2*asin(c + d*x)/(3*d) + 4*a**3*b*c**2*e**2*x*asin(c + d*
x) + 4*a**3*b*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(9*d) + 4*a*
*3*b*c*d*e**2*x**2*asin(c + d*x) + 8*a**3*b*c*e**2*x*sqrt(-c**2 - 2*c*d*x
- d**2*x**2 + 1)/9 + 4*a**3*b*d**2*e**2*x**3*asin(c + d*x)/3 + 4*a**3*b*d*
e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/9 + 8*a**3*b*e**2*sqrt(-c*
*2 - 2*c*d*x - d**2*x**2 + 1)/(9*d) + 2*a**2*b**2*c**3*e**2*asin(c + d*x)*
*2/d + 6*a**2*b**2*c**2*e**2*x*asin(c + d*x)**2 - 4*a**2*b**2*c**2*e**2*x/
3 + 4*a**2*b**2*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d
*x)/(3*d) + 6*a**2*b**2*c*d*e**2*x**2*asin(c + d*x)**2 - 4*a**2*b**2*c*d*e
**2*x**2/3 + 8*a**2*b**2*c*e**2*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*as
in(c + d*x)/3 + 2*a**2*b**2*d**2*e**2*x**3*asin(c + d*x)**2 - 4*a**2*b**2*
d**2*e**2*x**3/9 + 4*a**2*b**2*d*e**2*x**2*sqrt(-c**2 - 2*c*d*x - d**2*x**
2 + 1)*asin(c + d*x)/3 - 8*a**2*b**2*e**2*x/3 + 8*a**2*b**2*e**2*sqrt(-c**
2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/(3*d) + 4*a*b**3*c**3*e**2*asin
(c + d*x)**3/(3*d) - 8*a*b**3*c**3*e**2*asin(c + d*x)/(9*d) + 4*a*b**3*c**
2*e**2*x*asin(c + d*x)**3 - 8*a*b**3*c**2*e**2*x*asin(c + d*x)/3 + 4*a*b**
3*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/(3*d) -
 8*a*b**3*c**2*e**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(27*d) + 4*a*b**
3*c*d*e**2*x**2*asin(c + d*x)**3 - 8*a*b**3*c*d*e**2*x**2*asin(c + d*x)...
```

### 3.207.7 Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx = \int (dex+ce)^2(b\arcsin(dx+c)+a)^4\,dx$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
1/3*a^4*d^2*e^2*x^3 + a^4*c*d*e^2*x^2 + 2*(2*x^2*arcsin(d*x + c) + d*(3*c^
2*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2
 - 2*c*d*x - c^2 + 1)*x/d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2
 - (c^2 - 1)*d^2))/d^3 - 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^3*
b*c*d*e^2 + 2/9*(6*x^3*arcsin(d*x + c) + d*(2*sqrt(-d^2*x^2 - 2*c*d*x - c^
2 + 1)*x^2/d^2 - 15*c^3*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2
))/d^4 - 5*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c*x/d^3 + 9*(c^2 - 1)*c*arcs
in(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(-d^2*x^2 -
2*c*d*x - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*(c^2 - 1
)/d^4))*a^3*b*d^2*e^2 + a^4*c^2*e^2*x + 4*((d*x + c)*arcsin(d*x + c) + sqr
t(-(d*x + c)^2 + 1))*a^3*b*c^2*e^2/d + 1/3*(b^4*d^2*e^2*x^3 + 3*b^4*c*d*e^
2*x^2 + 3*b^4*c^2*e^2*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c
+ 1))^4 + integrate(2/3*(2*(b^4*d^3*e^2*x^3 + 3*b^4*c*d^2*e^2*x^2 + 3*b^4*
c^2*d*e^2*x)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*
x + c + 1)*sqrt(-d*x - c + 1))^3 + 6*(a*b^3*d^4*e^2*x^4 + 4*a*b^3*c*d^3*e^
2*x^3 + (6*a*b^3*c^2 - a*b^3)*d^2*e^2*x^2 + 2*(2*a*b^3*c^3 - a*b^3*c)*d*e^
2*x + (a*b^3*c^4 - a*b^3*c^2)*e^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt
(-d*x - c + 1))^3 + 9*(a^2*b^2*d^4*e^2*x^4 + 4*a^2*b^2*c*d^3*e^2*x^3 + (6*
a^2*b^2*c^2 - a^2*b^2)*d^2*e^2*x^2 + 2*(2*a^2*b^2*c^3 - a^2*b^2*c)*d*e^2*x
 + (a^2*b^2*c^4 - a^2*b^2*c^2)*e^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*...
```

### 3.207.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 809 vs. $2(263) = 526$.

Time = 0.40 (sec) , antiderivative size = 809, normalized size of antiderivative = 2.80

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx = \frac{\left((dx+c)^2-1\right)(dx+c)b^4e^2\arcsin(dx+c)^4}{3d} + \frac{4\left((dx+c)^2-1\right)(dx+c)ab^3e^2\arcsin(dx+c)^3}{3d} + \frac{(dx+c)b^4e^2\arcsin(dx+c)^4}{3d} - \frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^4e^2\arcsin(dx+c)^3}{9d} + \frac{2\left((dx+c)^2-1\right)(dx+c)a^2b^2e^2\arcsin(dx+c)^2}{d} - \frac{4\left((dx+c)^2-1\right)(dx+c)b^4e^2\arcsin(dx+c)^2}{9d} + \frac{4(dx+c)ab^3e^2\arcsin(dx+c)^3}{3d} - \frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}ab^3e^2\arcsin(dx+c)^2}{3d} + \frac{4\sqrt{-(dx+c)^2+1}b^4e^2\arcsin(dx+c)^3}{3d} + \frac{(dx+c)^3a^4e^2}{3d} + \frac{4\left((dx+c)^2-1\right)(dx+c)a^3be^2\arcsin(dx+c)}{3d} - \frac{8\left((dx+c)^2-1\right)(dx+c)ab^3e^2\arcsin(dx+c)}{9d} + \frac{2(dx+c)a^2b^2e^2\arcsin(dx+c)^2}{d} - \frac{28(dx+c)b^4e^2\arcsin(dx+c)^2}{9d} - \frac{4\left(-(dx+c)^2+1\right)^{\frac{3}{2}}a^2b^2e^2\arcsin(dx+c)}{3d} + \frac{8\left(-(dx+c)^2+1\right)^{\frac{3}{2}}b^4e^2\arcsin(dx+c)}{27d} + \frac{4\sqrt{-(dx+c)^2+1}ab^3e^2\arcsin(dx+c)^2}{d} - \frac{4\left((dx+c)^2-1\right)(dx+c)a^2b^2e^2}{9d} + \frac{8\left((dx+c)^2-1\right)(dx+c)b^4e^2}{81d} + \frac{4(dx+c)a^3be^2\arcsin(dx+c)}{3d} - \frac{56(dx+c)ab^3e^2\arcsin(dx+c)}{9d}$$

3.207. $\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
1/3*((d*x + c)^2 - 1)*(d*x + c)*b^4*e^2*arcsin(d*x + c)^4/d + 4/3*((d*x +
c)^2 - 1)*(d*x + c)*a*b^3*e^2*arcsin(d*x + c)^3/d + 1/3*(d*x + c)*b^4*e^2*
arcsin(d*x + c)^4/d - 4/9*(-(d*x + c)^2 + 1)^(3/2)*b^4*e^2*arcsin(d*x + c)
^3/d + 2*((d*x + c)^2 - 1)*(d*x + c)*a^2*b^2*e^2*arcsin(d*x + c)^2/d - 4/9
*((d*x + c)^2 - 1)*(d*x + c)*b^4*e^2*arcsin(d*x + c)^2/d + 4/3*(d*x + c)*a
*b^3*e^2*arcsin(d*x + c)^3/d - 4/3*(-(d*x + c)^2 + 1)^(3/2)*a*b^3*e^2*arcs
in(d*x + c)^2/d + 4/3*sqrt(-(d*x + c)^2 + 1)*b^4*e^2*arcsin(d*x + c)^3/d +
 1/3*(d*x + c)^3*a^4*e^2/d + 4/3*((d*x + c)^2 - 1)*(d*x + c)*a^3*b*e^2*arc
sin(d*x + c)/d - 8/9*((d*x + c)^2 - 1)*(d*x + c)*a*b^3*e^2*arcsin(d*x + c)
/d + 2*(d*x + c)*a^2*b^2*e^2*arcsin(d*x + c)^2/d - 28/9*(d*x + c)*b^4*e^2*
arcsin(d*x + c)^2/d - 4/3*(-(d*x + c)^2 + 1)^(3/2)*a^2*b^2*e^2*arcsin(d*x
+ c)/d + 8/27*(-(d*x + c)^2 + 1)^(3/2)*b^4*e^2*arcsin(d*x + c)/d + 4*sqrt(
-(d*x + c)^2 + 1)*a*b^3*e^2*arcsin(d*x + c)^2/d - 4/9*((d*x + c)^2 - 1)*(d
*x + c)*a^2*b^2*e^2/d + 8/81*((d*x + c)^2 - 1)*(d*x + c)*b^4*e^2/d + 4/3*(
d*x + c)*a^3*b*e^2*arcsin(d*x + c)/d - 56/9*(d*x + c)*a*b^3*e^2*arcsin(d*x
 + c)/d - 4/9*(-(d*x + c)^2 + 1)^(3/2)*a^3*b*e^2/d + 8/27*(-(d*x + c)^2 +
1)^(3/2)*a*b^3*e^2/d + 4*sqrt(-(d*x + c)^2 + 1)*a^2*b^2*e^2*arcsin(d*x + c
)/d - 56/9*sqrt(-(d*x + c)^2 + 1)*b^4*e^2*arcsin(d*x + c)/d - 28/9*(d*x +
c)*a^2*b^2*e^2/d + 488/81*(d*x + c)*b^4*e^2/d + 4/3*sqrt(-(d*x + c)^2 + 1)
*a^3*b*e^2/d - 56/9*sqrt(-(d*x + c)^2 + 1)*a*b^3*e^2/d
```

### 3.207.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^4\,dx=\int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))^4\,dx$$

input
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^4,x)
```

output
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^4, x)
```

# 3.208 $\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx$



## 3.208.1 Optimal result

Integrand size = 21, antiderivative size = 198

$$\begin{aligned}\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx &= \frac{3b^4e(c+dx)^2}{4d}-\frac{3b^3e(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{2d}\\ &+\frac{3b^2e(a+b\arcsin(c+dx))^2}{4d}-\frac{3b^2e(c+dx)^2(a+b\arcsin(c+dx))^2}{2d}\\ &+\frac{be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d}\\ &-\frac{e(a+b\arcsin(c+dx))^4}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^4}{2d}\end{aligned}$$

output
```
3/4*b^4*e*(d*x+c)^2/d+3/4*b^2*e*(a+b*arcsin(d*x+c))^2/d-3/2*b^2*e*(d*x+c)^
2*(a+b*arcsin(d*x+c))^2/d-1/4*e*(a+b*arcsin(d*x+c))^4/d+1/2*e*(d*x+c)^2*(a
+b*arcsin(d*x+c))^4/d-3/2*b^3*e*(d*x+c)*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^
(1/2)/d+b*e*(d*x+c)*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d
```

### 3.208.2 Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 163, normalized size of antiderivative = 0.82

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx =$$
$$-\frac{e\Big(-4b(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3+(a+b\arcsin(c+dx))^4-2(c+dx)^2(a+b\arcs}{}$$

input
```
Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
-1/4*(e*(-4*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3 +
(a + b*ArcSin[c + d*x])^4 - 2*(c + d*x)^2*(a + b*ArcSin[c + d*x])^4 + 3*b^
2*(-(b^2*(c + d*x)^2) + 2*b*(c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[
c + d*x]) - (a + b*ArcSin[c + d*x])^2 + 2*(c + d*x)^2*(a + b*ArcSin[c + d*
x])^2)))/d
```

### 3.208.3 Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.94, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {5304, 27, 5138, 5210, 5138, 5152, 5210, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int e(c+dx)(a+b\arcsin(c+dx))^4d(c+dx)}{d}$$
$$\Big\downarrow \; 27$$
$$\frac{e\int (c+dx)(a+b\arcsin(c+dx))^4d(c+dx)}{d}$$
$$\Big\downarrow \; 5138$$
$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^4-2b\int \frac{(c+dx)^2(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$\downarrow$ 5210

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^4-2b\left(\frac{3}{2}b\int(c+dx)(a+b\arcsin(c+dx))^2d(c+dx)+\frac{1}{2}\int\frac{(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c\right.\right.}{d}$$

$\downarrow$ 5138

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^4-2b\left(\frac{3}{2}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^2-b\int\frac{(c+dx)^2(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+\right.\right.\right.}{d}$$

$\downarrow$ 5152

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^4-2b\left(\frac{3}{2}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^2-b\int\frac{(c+dx)^2(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+\right.\right.\right.}{d}$$

$\downarrow$ 5210

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^4-2b\left(\frac{3}{2}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^2-b\left(\frac{1}{2}\int\frac{a+b\arcsin(c+dx)}{\sqrt{1-(c+dx)^2}}d(c+dx)\right.\right.\right.\right.$$

$\downarrow$ 15

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^4-2b\left(\frac{3}{2}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^2-b\left(\frac{1}{2}\int\frac{a+b\arcsin(c+dx)}{\sqrt{1-(c+dx)^2}}d(c+dx)\right.\right.\right.\right.$$

$\downarrow$ 5152

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^4-2b\left(\frac{(a+b\arcsin(c+dx))^4}{8b}-\frac{1}{2}(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3+\right.\right.$$

input
```
Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e*(((c + d*x)^2*(a + b*ArcSin[c + d*x])^4)/2 - 2*b*(-1/2*((c + d*x)*Sqrt[
1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3) + (a + b*ArcSin[c + d*x])^4/(8
*b) + (3*b*(((c + d*x)^2*(a + b*ArcSin[c + d*x])^2)/2 - b*((b*(c + d*x)^2)
/4 - ((c + d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x]))/2 + (a + b*
ArcSin[c + d*x])^2/(4*b))))/2)))/d
```

3.208. $\int(ce+dex)(a+b\arcsin(c+dx))^4\,dx$

### 3.208.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.208.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 411 vs. $2(182) = 364$.

Time = 0.88 (sec) , antiderivative size = 412, normalized size of antiderivative = 2.08

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{e a^4 (dx+c)^2}{2}+e b^4\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^4}{2}+\arcsin(dx+c)^3\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)-\frac{3\left((dx+c)^2-1\right)\text{ar}\cdots}{2}\cdots\right.}{\cdots}$ |
| default | $\frac{\frac{e a^4 (dx+c)^2}{2}+e b^4\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^4}{2}+\arcsin(dx+c)^3\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)-\frac{3\left((dx+c)^2-1\right)\text{ar}\cdots}{2}\cdots\right.}{\cdots}$ |
| parts | $e a^4\left(\frac{1}{2}d x^2+cx\right)+\frac{e b^4\left(\frac{\left((dx+c)^2-1\right)\arcsin(dx+c)^4}{2}+\arcsin(dx+c)^3\left((dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)-\frac{3(\cdots}{\cdots}\cdots\right.}{\cdots}$ |

input
```
int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

output
```
1/d*(1/2*e*a^4*(d*x+c)^2+e*b^4*(1/2*((d*x+c)^2-1)*arcsin(d*x+c)^4+arcsin(d
*x+c)^3*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))-3/2*((d*x+c)^2-1)*arcs
in(d*x+c)^2-3/2*arcsin(d*x+c)*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))+
3/4*arcsin(d*x+c)^2+3/4*(d*x+c)^2-3/4*arcsin(d*x+c)^4)+4*e*a*b^3*(1/2*((d*
x+c)^2-1)*arcsin(d*x+c)^3+3/4*arcsin(d*x+c)^2*((d*x+c)*(1-(d*x+c)^2)^(1/2)
+arcsin(d*x+c))-3/4*((d*x+c)^2-1)*arcsin(d*x+c)-3/8*(d*x+c)*(1-(d*x+c)^2)^
(1/2)-3/8*arcsin(d*x+c)-1/2*arcsin(d*x+c)^3)+6*e*a^2*b^2*(1/2*((d*x+c)^2-1
)*arcsin(d*x+c)^2+1/2*arcsin(d*x+c)*((d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*
x+c))-1/4*arcsin(d*x+c)^2-1/4*(d*x+c)^2)+4*e*a^3*b*(1/2*(d*x+c)^2*arcsin(d
*x+c)+1/4*(d*x+c)*(1-(d*x+c)^2)^(1/2)-1/4*arcsin(d*x+c)))
```

### 3.208.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 483 vs. $2(182) = 364$.

Time = 0.28 (sec) , antiderivative size = 483, normalized size of antiderivative = 2.44

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx = \frac{(2a^4-6a^2b^2+3b^4)d^2ex^2+2(2a^4-6a^2b^2+3b^4)cdex+(2b^4d^2ex^2+4b^4cdex+(2b^4c^2-b^4)e)\arcsin(\cdots}{\cdots}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
1/4*((2*a^4 - 6*a^2*b^2 + 3*b^4)*d^2*e*x^2 + 2*(2*a^4 - 6*a^2*b^2 + 3*b^4)
*c*d*e*x + (2*b^4*d^2*e*x^2 + 4*b^4*c*d*e*x + (2*b^4*c^2 - b^4)*e)*arcsin(
d*x + c)^4 + 4*(2*a*b^3*d^2*e*x^2 + 4*a*b^3*c*d*e*x + (2*a*b^3*c^2 - a*b^3
)*e)*arcsin(d*x + c)^3 + 3*(2*(2*a^2*b^2 - b^4)*d^2*e*x^2 + 4*(2*a^2*b^2 -
 b^4)*c*d*e*x - (2*a^2*b^2 - b^4 - 2*(2*a^2*b^2 - b^4)*c^2)*e)*arcsin(d*x
+ c)^2 + 2*(2*(2*a^3*b - 3*a*b^3)*d^2*e*x^2 + 4*(2*a^3*b - 3*a*b^3)*c*d*e*
x - (2*a^3*b - 3*a*b^3 - 2*(2*a^3*b - 3*a*b^3)*c^2)*e)*arcsin(d*x + c) + 2
*((2*a^3*b - 3*a*b^3)*d*e*x + 2*(b^4*d*e*x + b^4*c*e)*arcsin(d*x + c)^3 +
(2*a^3*b - 3*a*b^3)*c*e + 6*(a*b^3*d*e*x + a*b^3*c*e)*arcsin(d*x + c)^2 +
3*((2*a^2*b^2 - b^4)*d*e*x + (2*a^2*b^2 - b^4)*c*e)*arcsin(d*x + c))*sqrt(
-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

### 3.208.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1027 vs. $2(178) = 356$.

Time = 0.49 (sec) , antiderivative size = 1027, normalized size of antiderivative = 5.19

$$\int (ce + dex)(a + b\arcsin(c + dx))^4 \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**4,x)
```

output
```
Piecewise((a**4*c*e*x + a**4*d*e*x**2/2 + 2*a**3*b*c**2*e*asin(c + d*x)/d
+ 4*a**3*b*c*e*x*asin(c + d*x) + a**3*b*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x*
*2 + 1)/d + 2*a**3*b*d*e*x**2*asin(c + d*x) + a**3*b*e*x*sqrt(-c**2 - 2*c*
d*x - d**2*x**2 + 1) - a**3*b*e*asin(c + d*x)/d + 3*a**2*b**2*c**2*e*asin(
c + d*x)**2/d + 6*a**2*b**2*c*e*x*asin(c + d*x)**2 - 3*a**2*b**2*c*e*x + 3
*a**2*b**2*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/d + 3*a
**2*b**2*d*e*x**2*asin(c + d*x)**2 - 3*a**2*b**2*d*e*x**2/2 + 3*a**2*b**2*
e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x) - 3*a**2*b**2*e*as
in(c + d*x)**2/(2*d) + 2*a*b**3*c**2*e*asin(c + d*x)**3/d - 3*a*b**3*c**2*
e*asin(c + d*x)/d + 4*a*b**3*c*e*x*asin(c + d*x)**3 - 6*a*b**3*c*e*x*asin(
c + d*x) + 3*a*b**3*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x
)**2/d - 3*a*b**3*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/(2*d) + 2*a*b*
*3*d*e*x**2*asin(c + d*x)**3 - 3*a*b**3*d*e*x**2*asin(c + d*x) + 3*a*b**3*
e*x*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2 - 3*a*b**3*e*x*
sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/2 - a*b**3*e*asin(c + d*x)**3/d + 3*
a*b**3*e*asin(c + d*x)/(2*d) + b**4*c**2*e*asin(c + d*x)**4/(2*d) - 3*b**4
*c**2*e*asin(c + d*x)**2/(2*d) + b**4*c*e*x*asin(c + d*x)**4 - 3*b**4*c*e*
x*asin(c + d*x)**2 + 3*b**4*c*e*x/2 + b**4*c*e*sqrt(-c**2 - 2*c*d*x - d**2
*x**2 + 1)*asin(c + d*x)**3/d - 3*b**4*c*e*sqrt(-c**2 - 2*c*d*x - d**2*x**
2 + 1)*asin(c + d*x)/(2*d) + b**4*d*e*x**2*asin(c + d*x)**4/2 - 3*b**4*...
```

### 3.208.7 Maxima [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx = \int (dex+ce)(b\arcsin(dx+c)+a)^4\,dx$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
1/2*a^4*d*e*x^2 + (2*x^2*arcsin(d*x + c) + d*(3*c^2*arcsin(-(d^2*x + c*d)/
sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 + sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*x/
d^2 - (c^2 - 1)*arcsin(-(d^2*x + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^3 -
 3*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*c/d^3))*a^3*b*d*e + a^4*c*e*x + 4*((
d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^3*b*c*e/d + 1/2*(b^4*
d*e*x^2 + 2*b^4*c*e*x)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c +
1))^4 + integrate(2*((b^4*d^2*e*x^2 + 2*b^4*c*d*e*x)*sqrt(d*x + c + 1)*sqr
t(-d*x - c + 1)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 +
 2*(a*b^3*d^3*e*x^3 + 3*a*b^3*c*d^2*e*x^2 + (3*a*b^3*c^2 - a*b^3)*d*e*x +
(a*b^3*c^3 - a*b^3*c)*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c
+ 1))^3 + 3*(a^2*b^2*d^3*e*x^3 + 3*a^2*b^2*c*d^2*e*x^2 + (3*a^2*b^2*c^2 -
a^2*b^2)*d*e*x + (a^2*b^2*c^3 - a^2*b^2*c)*e)*arctan2(d*x + c, sqrt(d*x +
c + 1)*sqrt(-d*x - c + 1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

### 3.208.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 533 vs. $2(182) = 364$.

Time = 0.37 (sec) , antiderivative size = 533, normalized size of antiderivative = 2.69

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx = \frac{\left((dx+c)^2-1\right)b^4e\arcsin\left(dx+c\right)^4}{2\,d} + \frac{\sqrt{-(dx+c)^2+1}(dx+c)b^4e\arcsin\left(dx+c\right)^3}{d} + \frac{2\left((dx+c)^2-1\right)ab^3e\arcsin\left(dx+c\right)^3}{d} + \frac{b^4e\arcsin\left(dx+c\right)^4}{4\,d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)ab^3e\arcsin\left(dx+c\right)^2}{d} + \frac{3\left((dx+c)^2-1\right)a^2b^2e\arcsin\left(dx+c\right)^2}{d} - \frac{3\left((dx+c)^2-1\right)b^4e\arcsin\left(dx+c\right)^2}{2\,d} + \frac{ab^3e\arcsin\left(dx+c\right)^3}{d} + \frac{3\sqrt{-(dx+c)^2+1}(dx+c)a^2b^2e\arcsin\left(dx+c\right)}{d} - \frac{3\sqrt{-(dx+c)^2+1}(dx+c)b^4e\arcsin\left(dx+c\right)}{2\,d} + \frac{2\left((dx+c)^2-1\right)a^3be\arcsin\left(dx+c\right)}{d} - \frac{3\left((dx+c)^2-1\right)ab^3e\arcsin\left(dx+c\right)}{d} + \frac{3\,a^2b^2e\arcsin\left(dx+c\right)^2}{2\,d} - \frac{3\,b^4e\arcsin\left(dx+c\right)^2}{4\,d} + \frac{\sqrt{-(dx+c)^2+1}(dx+c)a^3be}{d} - \frac{3\sqrt{-(dx+c)^2+1}(dx+c)ab^3e}{2\,d} + \frac{\left((dx+c)^2-1\right)a^4e}{2\,d} - \frac{3\left((dx+c)^2-1\right)a^2b^2e}{2\,d} + \frac{3\left((dx+c)^2-1\right)b^4e}{4\,d} + \frac{a^3be\arcsin\left(dx+c\right)}{d} - \frac{3\,ab^3e\arcsin\left(dx+c\right)}{2\,d} - \frac{3\,a^2b^2e}{4\,d} + \frac{3\,b^4e}{8\,d}$$

3.208. $\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
1/2*((d*x + c)^2 - 1)*b^4*e*arcsin(d*x + c)^4/d + sqrt(-(d*x + c)^2 + 1)*(
d*x + c)*b^4*e*arcsin(d*x + c)^3/d + 2*((d*x + c)^2 - 1)*a*b^3*e*arcsin(d*
x + c)^3/d + 1/4*b^4*e*arcsin(d*x + c)^4/d + 3*sqrt(-(d*x + c)^2 + 1)*(d*x
 + c)*a*b^3*e*arcsin(d*x + c)^2/d + 3*((d*x + c)^2 - 1)*a^2*b^2*e*arcsin(d
*x + c)^2/d - 3/2*((d*x + c)^2 - 1)*b^4*e*arcsin(d*x + c)^2/d + a*b^3*e*ar
csin(d*x + c)^3/d + 3*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a^2*b^2*e*arcsin(d*
x + c)/d - 3/2*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^4*e*arcsin(d*x + c)/d +
2*((d*x + c)^2 - 1)*a^3*b*e*arcsin(d*x + c)/d - 3*((d*x + c)^2 - 1)*a*b^3*
e*arcsin(d*x + c)/d + 3/2*a^2*b^2*e*arcsin(d*x + c)^2/d - 3/4*b^4*e*arcsin
(d*x + c)^2/d + sqrt(-(d*x + c)^2 + 1)*(d*x + c)*a^3*b*e/d - 3/2*sqrt(-(d*
x + c)^2 + 1)*(d*x + c)*a*b^3*e/d + 1/2*((d*x + c)^2 - 1)*a^4*e/d - 3/2*((
d*x + c)^2 - 1)*a^2*b^2*e/d + 3/4*((d*x + c)^2 - 1)*b^4*e/d + a^3*b*e*arcs
in(d*x + c)/d - 3/2*a*b^3*e*arcsin(d*x + c)/d - 3/4*a^2*b^2*e/d + 3/8*b^4*
e/d
```

### 3.208.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))^4\,dx=\int (c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^4\,dx$$

input
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^4,x)
```

output
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^4, x)
```

# 3.209 $\int (a+b\arcsin(c+dx))^4\,dx$



## 3.209.1 Optimal result

Integrand size = 12, antiderivative size = 119

$$\int (a+b\arcsin(c+dx))^4\,dx = 24b^4x - \frac{24b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}{d} - \frac{12b^2(c+dx)(a+b\arcsin(c+dx))^2}{d} + \frac{4b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{d} + \frac{(c+dx)(a+b\arcsin(c+dx))^4}{d}$$

output
```
24*b^4*x-12*b^2*(d*x+c)*(a+b*arcsin(d*x+c))^2/d+(d*x+c)*(a+b*arcsin(d*x+c)
)^4/d-24*b^3*(a+b*arcsin(d*x+c))*(1-(d*x+c)^2)^(1/2)/d+4*b*(a+b*arcsin(d*x
+c))^3*(1-(d*x+c)^2)^(1/2)/d
```

## 3.209.2 Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.97

$$\int (a+b\arcsin(c+dx))^4\,dx = \frac{4b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3 + (c+dx)(a+b\arcsin(c+dx))^4 - 12b^2\left(-2b^2(c+dx) + 2b\sqrt{1}\right.}{d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(4*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^3 + (c + d*x)*(a + b*Ar
cSin[c + d*x])^4 - 12*b^2*(-2*b^2*(c + d*x) + 2*b*Sqrt[1 - (c + d*x)^2]*(a
 + b*ArcSin[c + d*x]) + (c + d*x)*(a + b*ArcSin[c + d*x])^2))/d
```

### 3.209.3 Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 116, normalized size of antiderivative = 0.97, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5302, 5130, 5182, 5130, 5182, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^4\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int (a+b\arcsin(c+dx))^4d(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^4-4b\int \frac{(c+dx)(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5182}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^4-4b\Big(3b\int (a+b\arcsin(c+dx))^2d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^4-4b\Big(3b\Big((c+dx)(a+b\arcsin(c+dx))^2-2b\int \frac{(c+dx)(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)\Big)-}{d}$$

$$\Big\downarrow \text{5182}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^4-4b\Big(3b\Big((c+dx)(a+b\arcsin(c+dx))^2-2b\Big(b\int 1d(c+dx)-\sqrt{1-(c+dx)^2}(a}{d}$$

$$\Big\downarrow \; 24$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^4-4b\Big(3b\Big((c+dx)(a+b\arcsin(c+dx))^2-2b\Big(b(c+dx)-\sqrt{1-(c+dx)^2}(a+b\,\text{a}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^4,x]
```

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^4 - 4*b*(-(Sqrt[1 - (c + d*x)^2]*(a + b
*ArcSin[c + d*x])^3) + 3*b*((c + d*x)*(a + b*ArcSin[c + d*x])^2 - 2*b*(b*(
c + d*x) - Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])))))/d
```

### 3.209.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.209.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 254 vs. $2(115) = 230$.

Time = 0.66 (sec) , antiderivative size = 255, normalized size of antiderivative = 2.14

| method | result |
|---|---|
| derivativedivides | $\frac{(dx+c)a^4+b^4\left(\arcsin(dx+c)^4(dx+c)+4\arcsin(dx+c)^3\sqrt{1-(dx+c)^2}-12\arcsin(dx+c)^2(dx+c)+24dx+24c-24\arcsin(\cdots\right.}{}$ |
| default | $\frac{(dx+c)a^4+b^4\left(\arcsin(dx+c)^4(dx+c)+4\arcsin(dx+c)^3\sqrt{1-(dx+c)^2}-12\arcsin(dx+c)^2(dx+c)+24dx+24c-24\arcsin(\cdots\right.}{}$ |
| parts | $x\,a^4+\frac{b^4\left(\arcsin(dx+c)^4(dx+c)+4\arcsin(dx+c)^3\sqrt{1-(dx+c)^2}-12\arcsin(dx+c)^2(dx+c)+24dx+24c-24\arcsin(dx\cdots\right.}{d}$ |

input
```
int((a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

output
```
1/d*((d*x+c)*a^4+b^4*(arcsin(d*x+c)^4*(d*x+c)+4*arcsin(d*x+c)^3*(1-(d*x+c)
^2)^(1/2)-12*arcsin(d*x+c)^2*(d*x+c)+24*d*x+24*c-24*arcsin(d*x+c)*(1-(d*x+
c)^2)^(1/2))+4*a*b^3*(arcsin(d*x+c)^3*(d*x+c)+3*arcsin(d*x+c)^2*(1-(d*x+c)
^2)^(1/2)-6*(1-(d*x+c)^2)^(1/2)-6*(d*x+c)*arcsin(d*x+c))+6*a^2*b^2*(arcsin
(d*x+c)^2*(d*x+c)-2*d*x-2*c+2*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2))+4*a^3*b*(
(d*x+c)*arcsin(d*x+c)+(1-(d*x+c)^2)^(1/2)))
```

### 3.209.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 233 vs. $2(115) = 230$.

Time = 0.27 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.96

$$\int (a+b\arcsin(c+dx))^4\,dx$$
$$=\frac{(b^4dx+b^4c)\arcsin(dx+c)^4+4\,(ab^3dx+ab^3c)\arcsin(dx+c)^3+(a^4-12\,a^2b^2+24\,b^4)dx+6\,((a^2b^2-2\cdots}{}$$

input
```
integrate((a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
((b^4*d*x + b^4*c)*arcsin(d*x + c)^4 + 4*(a*b^3*d*x + a*b^3*c)*arcsin(d*x
+ c)^3 + (a^4 - 12*a^2*b^2 + 24*b^4)*d*x + 6*((a^2*b^2 - 2*b^4)*d*x + (a^2
*b^2 - 2*b^4)*c)*arcsin(d*x + c)^2 + 4*((a^3*b - 6*a*b^3)*d*x + (a^3*b - 6
*a*b^3)*c)*arcsin(d*x + c) + 4*(b^4*arcsin(d*x + c)^3 + 3*a*b^3*arcsin(d*x
 + c)^2 + a^3*b - 6*a*b^3 + 3*(a^2*b^2 - 2*b^4)*arcsin(d*x + c))*sqrt(-d^2
*x^2 - 2*c*d*x - c^2 + 1))/d
```

### 3.209.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 444 vs. $2(105) = 210$.

Time = 0.26 (sec) , antiderivative size = 444, normalized size of antiderivative = 3.73

$$\int (a+b\arcsin(c+dx))^4\,dx$$
$$= \begin{cases} a^4x + \frac{4a^3bc\operatorname{asin}(c+dx)}{d} + 4a^3bx\operatorname{asin}(c+dx) + \frac{4a^3b\sqrt{-c^2-2cdx-d^2x^2+1}}{d} + \frac{6a^2b^2c\operatorname{asin}^2(c+dx)}{d} + 6a^2b^2x\operatorname{asin}^2(c+ \\ x(a+b\operatorname{asin}(c))^4 \end{cases}$$

input
```
integrate((a+b*asin(d*x+c))**4,x)
```

output
```
Piecewise((a**4*x + 4*a**3*b*c*asin(c + d*x)/d + 4*a**3*b*x*asin(c + d*x)
+ 4*a**3*b*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d + 6*a**2*b**2*c*asin(c
+ d*x)**2/d + 6*a**2*b**2*x*asin(c + d*x)**2 - 12*a**2*b**2*x + 12*a**2*b*
*2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/d + 4*a*b**3*c*asin
(c + d*x)**3/d - 24*a*b**3*c*asin(c + d*x)/d + 4*a*b**3*x*asin(c + d*x)**3
 - 24*a*b**3*x*asin(c + d*x) + 12*a*b**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2
+ 1)*asin(c + d*x)**2/d - 24*a*b**3*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/
d + b**4*c*asin(c + d*x)**4/d - 12*b**4*c*asin(c + d*x)**2/d + b**4*x*asin
(c + d*x)**4 - 12*b**4*x*asin(c + d*x)**2 + 24*b**4*x + 4*b**4*sqrt(-c**2
- 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**3/d - 24*b**4*sqrt(-c**2 - 2*c*d
*x - d**2*x**2 + 1)*asin(c + d*x)/d, Ne(d, 0)), (x*(a + b*asin(c))**4, Tru
e))
```

### 3.209.7 Maxima [F]

$$\int (a+b\arcsin(c+dx))^4\,dx = \int (b\arcsin(dx+c)+a)^4\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
b^4*x*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4 + a^4*x + 4
*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^3*b/d + integrate(
2*(2*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*b^4*d*x*arctan2(d*x + c, sqrt(d*
x + c + 1)*sqrt(-d*x - c + 1))^3 + 2*(a*b^3*d^2*x^2 + 2*a*b^3*c*d*x + a*b^
3*c^2 - a*b^3)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 +
3*(a^2*b^2*d^2*x^2 + 2*a^2*b^2*c*d*x + a^2*b^2*c^2 - a^2*b^2)*arctan2(d*x
+ c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1
), x)
```

### 3.209.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 329 vs. $2(115) = 230$.

Time = 0.30 (sec) , antiderivative size = 329, normalized size of antiderivative = 2.76

$$\int (a+b\arcsin(c+dx))^4\,dx = \frac{(dx+c)b^4\arcsin{(dx+c)}^4}{d} + \frac{4\,(dx+c)ab^3\arcsin{(dx+c)}^3}{d} + \frac{4\sqrt{-(dx+c)^2+1}b^4\arcsin{(dx+c)}^3}{d} + \frac{6\,(dx+c)a^2b^2\arcsin{(dx+c)}^2}{d} - \frac{12\,(dx+c)b^4\arcsin{(dx+c)}^2}{d} + \frac{12\sqrt{-(dx+c)^2+1}ab^3\arcsin{(dx+c)}^2}{d} + \frac{4\,(dx+c)a^3b\arcsin{(dx+c)}}{d} - \frac{24\,(dx+c)ab^3\arcsin{(dx+c)}}{d} + \frac{12\sqrt{-(dx+c)^2+1}a^2b^2\arcsin{(dx+c)}}{d} - \frac{24\sqrt{-(dx+c)^2+1}b^4\arcsin{(dx+c)}}{d} + \frac{(dx+c)a^4}{d} - \frac{12\,(dx+c)a^2b^2}{d} + \frac{24\,(dx+c)b^4}{d} + \frac{4\sqrt{-(dx+c)^2+1}a^3b}{d} - \frac{24\sqrt{-(dx+c)^2+1}ab^3}{d}$$

input
```
integrate((a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
(d*x + c)*b^4*arcsin(d*x + c)^4/d + 4*(d*x + c)*a*b^3*arcsin(d*x + c)^3/d
+ 4*sqrt(-(d*x + c)^2 + 1)*b^4*arcsin(d*x + c)^3/d + 6*(d*x + c)*a^2*b^2*a
rcsin(d*x + c)^2/d - 12*(d*x + c)*b^4*arcsin(d*x + c)^2/d + 12*sqrt(-(d*x
+ c)^2 + 1)*a*b^3*arcsin(d*x + c)^2/d + 4*(d*x + c)*a^3*b*arcsin(d*x + c)/
d - 24*(d*x + c)*a*b^3*arcsin(d*x + c)/d + 12*sqrt(-(d*x + c)^2 + 1)*a^2*b
^2*arcsin(d*x + c)/d - 24*sqrt(-(d*x + c)^2 + 1)*b^4*arcsin(d*x + c)/d + (
d*x + c)*a^4/d - 12*(d*x + c)*a^2*b^2/d + 24*(d*x + c)*b^4/d + 4*sqrt(-(d*
x + c)^2 + 1)*a^3*b/d - 24*sqrt(-(d*x + c)^2 + 1)*a*b^3/d
```

## 3.209. $\int (a+b\arcsin(c+dx))^4\,dx$

### 3.209.9 Mupad [B] (verification not implemented)

Time = 0.61 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.92

$$\int (a+b\arcsin(c+dx))^4\,dx$$
$$= a^4\,x+\frac{b^4\,\left(c+d\,x\right)\,\left({\mathrm{asin}\left(c+d\,x\right)}^4-12\,{\mathrm{asin}\left(c+d\,x\right)}^2+24\right)}{d}$$
$$-\frac{b^4\,\left(24\,\mathrm{asin}\left(c+d\,x\right)-4\,{\mathrm{asin}\left(c+d\,x\right)}^3\right)\,\sqrt{1-{\left(c+d\,x\right)}^2}}{d}$$
$$+\frac{6\,a^2\,b^2\,\left(2\,\mathrm{asin}\left(c+d\,x\right)\,\sqrt{1-{\left(c+d\,x\right)}^2}+\left({\mathrm{asin}\left(c+d\,x\right)}^2-2\right)\,\left(c+d\,x\right)\right)}{d}$$
$$+\frac{4\,a^3\,b\,\left(\sqrt{1-{\left(c+d\,x\right)}^2}+\mathrm{asin}\left(c+d\,x\right)\,\left(c+d\,x\right)\right)}{d}$$
$$+\frac{4\,a\,b^3\,\left(3\,{\mathrm{asin}\left(c+d\,x\right)}^2-6\right)\,\sqrt{1-{\left(c+d\,x\right)}^2}}{d}$$
$$-\frac{4\,a\,b^3\,\left(6\,\mathrm{asin}\left(c+d\,x\right)-{\mathrm{asin}\left(c+d\,x\right)}^3\right)\,\left(c+d\,x\right)}{d}$$

input
```
int((a + b*asin(c + d*x))^4,x)
```

output
```
a^4*x + (b^4*(c + d*x)*(asin(c + d*x)^4 - 12*asin(c + d*x)^2 + 24))/d - (b
^4*(24*asin(c + d*x) - 4*asin(c + d*x)^3)*(1 - (c + d*x)^2)^(1/2))/d + (6*
a^2*b^2*(2*asin(c + d*x)*(1 - (c + d*x)^2)^(1/2) + (asin(c + d*x)^2 - 2)*(
c + d*x)))/d + (4*a^3*b*((1 - (c + d*x)^2)^(1/2) + asin(c + d*x)*(c + d*x)
))/d + (4*a*b^3*(3*asin(c + d*x)^2 - 6)*(1 - (c + d*x)^2)^(1/2))/d - (4*a*
b^3*(6*asin(c + d*x) - asin(c + d*x)^3)*(c + d*x))/d
```

# 3.210 $\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx$



## 3.210.1 Optimal result

Integrand size = 23, antiderivative size = 202

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = -\frac{i(a+b\arcsin(c+dx))^5}{5bde} + \frac{(a+b\arcsin(c+dx))^4\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de} - \frac{2ib(a+b\arcsin(c+dx))^3\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3b^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{de} + \frac{3ib^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(4,e^{2i\arcsin(c+dx)}\right)}{de} - \frac{3b^4\operatorname{PolyLog}\left(5,e^{2i\arcsin(c+dx)}\right)}{2de}$$

output
```
-1/5*I*(a+b*arcsin(d*x+c))^5/b/d/e+(a+b*arcsin(d*x+c))^4*ln(1-(I*(d*x+c)+(
1-(d*x+c)^2)^(1/2))^2)/d/e-2*I*b*(a+b*arcsin(d*x+c))^3*polylog(2,(I*(d*x+c
)+(1-(d*x+c)^2)^(1/2))^2)/d/e+3*b^2*(a+b*arcsin(d*x+c))^2*polylog(3,(I*(d*
x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e+3*I*b^3*(a+b*arcsin(d*x+c))*polylog(4,(I*
(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e-3/2*b^4*polylog(5,(I*(d*x+c)+(1-(d*x+c
)^2)^(1/2))^2)/d/e
```

### 3.210.2 Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 439 vs. 2(202) = 404.

Time = 0.81 (sec) , antiderivative size = 439, normalized size of antiderivative = 2.17

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx$$
$$= \frac{16a^4\log(c+dx)+64a^3b\left(\arcsin(c+dx)\log\left(1-e^{2i\arcsin(c+dx)}\right)-\frac{1}{2}i\left(\arcsin(c+dx)^2+\operatorname{PolyLog}\left(2,e^{2i\operatorname{arcs}}\right.\right.\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x),x]
```

output
```
(16*a^4*Log[c + d*x] + 64*a^3*b*(ArcSin[c + d*x]*Log[1 - E^((2*I)*ArcSin[c
 + d*x])] - (I/2)*(ArcSin[c + d*x]^2 + PolyLog[2, E^((2*I)*ArcSin[c + d*x]
)])) + 4*a^2*b^2*((-I)*Pi^3 + (8*I)*ArcSin[c + d*x]^3 + 24*ArcSin[c + d*x]
^2*Log[1 - E^((-2*I)*ArcSin[c + d*x])] + (24*I)*ArcSin[c + d*x]*PolyLog[2,
 E^((-2*I)*ArcSin[c + d*x])] + 12*PolyLog[3, E^((-2*I)*ArcSin[c + d*x])])
- I*a*b^3*(Pi^4 - 16*ArcSin[c + d*x]^4 + (64*I)*ArcSin[c + d*x]^3*Log[1 -
E^((-2*I)*ArcSin[c + d*x])] - 96*ArcSin[c + d*x]^2*PolyLog[2, E^((-2*I)*Ar
cSin[c + d*x])] + (96*I)*ArcSin[c + d*x]*PolyLog[3, E^((-2*I)*ArcSin[c + d
*x])] + 48*PolyLog[4, E^((-2*I)*ArcSin[c + d*x])]) + 16*b^4*((-1/160*I)*Pi
^5 + (I/5)*ArcSin[c + d*x]^5 + ArcSin[c + d*x]^4*Log[1 - E^((-2*I)*ArcSin[
c + d*x])] + (2*I)*ArcSin[c + d*x]^3*PolyLog[2, E^((-2*I)*ArcSin[c + d*x])
] + 3*ArcSin[c + d*x]^2*PolyLog[3, E^((-2*I)*ArcSin[c + d*x])] - (3*I)*Arc
Sin[c + d*x]*PolyLog[4, E^((-2*I)*ArcSin[c + d*x])] - (3*PolyLog[5, E^((-2
*I)*ArcSin[c + d*x])])/2))/(16*d*e)
```

### 3.210.3 Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.565$, Rules used = {5304, 27, 5136, 3042, 25, 4200, 25, 2620, 3011, 7163, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{e(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{c+dx}d(c+dx)}{de}$$

$$\Big\downarrow \; 5136$$

$$\frac{\int \frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{c+dx}d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \; 3042$$

$$\frac{\int -(a+b\arcsin(c+dx))^4\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int (a+b\arcsin(c+dx))^4\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)}{de}$$

$$\Big\downarrow \; 4200$$

$$\frac{2i\int -\frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))^4}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\frac{i(a+b\arcsin(c+dx))^5}{5b}}{de}$$

$$\Big\downarrow \; 25$$

$$\frac{-2i\int \frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))^4}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\frac{i(a+b\arcsin(c+dx))^5}{5b}}{de}$$

$$\Big\downarrow \; 2620$$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^4-2ib\int (a+b\arcsin(c+dx))^3\log\left(1-e^{2i\arcsin(c+dx)}\right)d\arcs}{de}$$

$$\Big\downarrow \; 3011$$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^4-2ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3\right.\right.}{de}$$

$$\Big\downarrow \; 7163$$

$$\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^4-2ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3\right.\right.}{}$$

---

3.210. $\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx$

$\big\downarrow$ 7163

$$-2i\left(\tfrac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^4-2ib\left(\tfrac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3\right.\right.$$

$\big\downarrow$ 2720

$$-2i\left(\tfrac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^4-2ib\left(\tfrac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3\right.\right.$$

$\big\downarrow$ 7143

$$-2i\left(\tfrac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^4-2ib\left(\tfrac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3\right.\right.$$

input
```
Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x),x]
```

output
```
(((-1/5*I)*(a + b*ArcSin[c + d*x])^5)/b - (2*I)*((I/2)*(a + b*ArcSin[c + d
*x])^4*Log[1 - E^((2*I)*ArcSin[c + d*x])] - (2*I)*b*((I/2)*(a + b*ArcSin[c
 + d*x])^3*PolyLog[2, E^((2*I)*ArcSin[c + d*x])] - ((3*I)/2)*b*((-1/2*I)*(
a + b*ArcSin[c + d*x])^2*PolyLog[3, E^((2*I)*ArcSin[c + d*x])] + I*b*((-1/
2*I)*(a + b*ArcSin[c + d*x])*PolyLog[4, E^((2*I)*ArcSin[c + d*x])] + (b*Po
lyLog[5, E^((2*I)*ArcSin[c + d*x])])/4)))))/(d*e)
```

### 3.210.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

## 3.210. $\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx$

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

## 3.210.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1006 vs. $2(255) = 510$.

Time = 0.81 (sec) , antiderivative size = 1007, normalized size of antiderivative = 4.99

| method | result | size |
|---|---|---|
| derivativedivides | Expression too large to display | 1007 |
| default | Expression too large to display | 1007 |
| parts | Expression too large to display | 1018 |

input
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e),x,method=_RETURNVERBOSE)
```

output
```
1/d*(a^4/e*ln(d*x+c)+b^4/e*(-1/5*I*arcsin(d*x+c)^5+arcsin(d*x+c)^4*ln(1+I*
(d*x+c)+(1-(d*x+c)^2)^(1/2))-4*I*arcsin(d*x+c)^3*polylog(2,-I*(d*x+c)-(1-(
d*x+c)^2)^(1/2))+12*arcsin(d*x+c)^2*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/
2))+24*I*arcsin(d*x+c)*polylog(4,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-24*polylo
g(5,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)^4*ln(1-I*(d*x+c)-(1-(d*x
+c)^2)^(1/2))-4*I*arcsin(d*x+c)^3*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))
+12*arcsin(d*x+c)^2*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+24*I*arcsin(d
*x+c)*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-24*polylog(5,I*(d*x+c)+(1-(
d*x+c)^2)^(1/2)))+4*a*b^3/e*(-1/4*I*arcsin(d*x+c)^4+arcsin(d*x+c)^3*ln(1-I
*(d*x+c)-(1-(d*x+c)^2)^(1/2))-3*I*arcsin(d*x+c)^2*polylog(2,I*(d*x+c)+(1-(
d*x+c)^2)^(1/2))+6*arcsin(d*x+c)*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+
6*I*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+arcsin(d*x+c)^3*ln(1+I*(d*x+c
)+(1-(d*x+c)^2)^(1/2))-3*I*arcsin(d*x+c)^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)
^2)^(1/2))+6*arcsin(d*x+c)*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+6*I*p
olylog(4,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+6*a^2*b^2/e*(-1/3*I*arcsin(d*x+c
)^3+arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)*
polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+2*polylog(3,-I*(d*x+c)-(1-(d*x+c
)^2)^(1/2))+arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*I*arcsin
(d*x+c)*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+2*polylog(3,I*(d*x+c)+(1-
(d*x+c)^2)^(1/2)))+4*a^3*b/e*(-1/2*I*arcsin(d*x+c)^2+arcsin(d*x+c)*ln(1...
```

### 3.210.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e),x, algorithm="fricas")
```

output
```
integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*ar
csin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/(d*e*x + c*e), x)
```

### 3.210.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = \frac{\int \frac{a^4}{c+dx}\,dx + \int \frac{b^4\operatorname{asin}^4(c+dx)}{c+dx}\,dx + \int \frac{4ab^3\operatorname{asin}^3(c+dx)}{c+dx}\,dx + \int \frac{6a^2b^2\operatorname{asin}^2(c+dx)}{c+dx}\,dx + \int \frac{4a^3b\operatorname{asin}(c+dx)}{c+dx}\,dx}{e}$$

input
```
integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e),x)
```

output
```
(Integral(a**4/(c + d*x), x) + Integral(b**4*asin(c + d*x)**4/(c + d*x), x
) + Integral(4*a*b**3*asin(c + d*x)**3/(c + d*x), x) + Integral(6*a**2*b**
2*asin(c + d*x)**2/(c + d*x), x) + Integral(4*a**3*b*asin(c + d*x)/(c + d*
x), x))/e
```

### 3.210.7 Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e),x, algorithm="maxima")
```

output
```
a^4*log(d*e*x + c*e)/(d*e) + integrate((b^4*arctan2(d*x + c, sqrt(d*x + c
+ 1)*sqrt(-d*x - c + 1))^4 + 4*a*b^3*arctan2(d*x + c, sqrt(d*x + c + 1)*sq
rt(-d*x - c + 1))^3 + 6*a^2*b^2*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d
*x - c + 1))^2 + 4*a^3*b*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c
+ 1)))/(d*e*x + c*e), x)
```

### 3.210.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e), x)
```

### 3.210.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^4}{ce+dex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{c\,e+d\,e\,x}\,dx$$

input
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x),x)
```

output
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x), x)
```

# 3.211 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx$



## 3.211.1 Optimal result

Integrand size = 23, antiderivative size = 270

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx = & -\frac{(a+b\arcsin(c+dx))^4}{de^2(c+dx)} \\ & -\frac{8b(a+b\arcsin(c+dx))^3\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^2} \\ & +\frac{12ib^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^2} \\ & -\frac{12ib^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^2} \\ & -\frac{24b^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^2} \\ & +\frac{24b^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^2} \\ & -\frac{24ib^4\operatorname{PolyLog}\left(4,-e^{i\arcsin(c+dx)}\right)}{de^2} \\ & +\frac{24ib^4\operatorname{PolyLog}\left(4,e^{i\arcsin(c+dx)}\right)}{de^2}\end{aligned}$$

output
```
-(a+b*arcsin(d*x+c))^4/d/e^2/(d*x+c)-8*b*(a+b*arcsin(d*x+c))^3*arctanh(I*(
d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2+12*I*b^2*(a+b*arcsin(d*x+c))^2*polylog(2
,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^2-12*I*b^2*(a+b*arcsin(d*x+c))^2*poly
log(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2-24*b^3*(a+b*arcsin(d*x+c))*poly
log(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^2+24*b^3*(a+b*arcsin(d*x+c))*pol
ylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^2-24*I*b^4*polylog(4,-I*(d*x+c)-
(1-(d*x+c)^2)^(1/2))/d/e^2+24*I*b^4*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2
))/d/e^2
```

### 3.211.2 Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 575 vs. 2(270) = 540.

Time = 2.32 (sec) , antiderivative size = 575, normalized size of antiderivative = 2.13

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx$$
$$= \frac{-\frac{a^4}{c+dx} - 4a^3b\left(\frac{\arcsin(c+dx)}{c+dx} + \log\left(\frac{1}{2}(c+dx)\csc\left(\frac{1}{2}\arcsin(c+dx)\right)\right) - \log\left(\sin\left(\frac{1}{2}\arcsin(c+dx)\right)\right)\right) + 6a^2b^2}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^2,x]
```

output
```
(-(a^4/(c + d*x)) - 4*a^3*b*(ArcSin[c + d*x]/(c + d*x) + Log[((c + d*x)*Cs
c[ArcSin[c + d*x]/2])/2] - Log[Sin[ArcSin[c + d*x]/2]]) + 6*a^2*b^2*(ArcSi
n[c + d*x]*(-(ArcSin[c + d*x]/(c + d*x)) + 2*Log[1 - E^(I*ArcSin[c + d*x])
] - 2*Log[1 + E^(I*ArcSin[c + d*x])]) + (2*I)*PolyLog[2, -E^(I*ArcSin[c +
d*x])] - (2*I)*PolyLog[2, E^(I*ArcSin[c + d*x])]) + 4*a*b^3*(-(ArcSin[c +
d*x]^3/(c + d*x)) + 3*ArcSin[c + d*x]^2*Log[1 - E^(I*ArcSin[c + d*x])] - 3
*ArcSin[c + d*x]^2*Log[1 + E^(I*ArcSin[c + d*x])] + (6*I)*ArcSin[c + d*x]*
PolyLog[2, -E^(I*ArcSin[c + d*x])] - (6*I)*ArcSin[c + d*x]*PolyLog[2, E^(I
*ArcSin[c + d*x])] - 6*PolyLog[3, -E^(I*ArcSin[c + d*x])] + 6*PolyLog[3, E
^(I*ArcSin[c + d*x])]) + b^4*((-1/2*I)*Pi^4 + I*ArcSin[c + d*x]^4 - ArcSin
[c + d*x]^4/(c + d*x) + 4*ArcSin[c + d*x]^3*Log[1 - E^((-I)*ArcSin[c + d*x
])] - 4*ArcSin[c + d*x]^3*Log[1 + E^(I*ArcSin[c + d*x])] + (12*I)*ArcSin[c
 + d*x]^2*PolyLog[2, E^((-I)*ArcSin[c + d*x])] + (12*I)*ArcSin[c + d*x]^2*
PolyLog[2, -E^(I*ArcSin[c + d*x])] + 24*ArcSin[c + d*x]*PolyLog[3, E^((-I)
*ArcSin[c + d*x])] - 24*ArcSin[c + d*x]*PolyLog[3, -E^(I*ArcSin[c + d*x])]
 - (24*I)*PolyLog[4, E^((-I)*ArcSin[c + d*x])] - (24*I)*PolyLog[4, -E^(I*A
rcSin[c + d*x])]))/(d*e^2)
```

### 3.211.3 Rubi [A] (warning: unable to verify)

Time = 0.88 (sec) , antiderivative size = 228, normalized size of antiderivative = 0.84, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {5304, 27, 5138, 5218, 3042, 4671, 3011, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{e^2(c+dx)^2}d(c+dx)}{d}$$

$$\Big\downarrow \ 27$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{(c+dx)^2}d(c+dx)}{de^2}$$

$$\Big\downarrow \ 5138$$

$$\frac{4b\int \frac{(a+b\arcsin(c+dx))^3}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^4}{c+dx}}{de^2}$$

$$\Big\downarrow \ 5218$$

$$\frac{4b\int \frac{(a+b\arcsin(c+dx))^3}{c+dx}d\arcsin(c+dx)-\frac{(a+b\arcsin(c+dx))^4}{c+dx}}{de^2}$$

$$\Big\downarrow \ 3042$$

$$\frac{4b\int (a+b\arcsin(c+dx))^3\csc(\arcsin(c+dx))d\arcsin(c+dx)-\frac{(a+b\arcsin(c+dx))^4}{c+dx}}{de^2}$$

$$\Big\downarrow \ 4671$$

$$\frac{-\frac{(a+b\arcsin(c+dx))^4}{c+dx}+4b\left(-3b\int (a+b\arcsin(c+dx))^2\log\left(1-e^{i\arcsin(c+dx)}\right)d\arcsin(c+dx)+3b\int (a+b\arcsin(c\right.}{de^2}$$

$$\Big\downarrow \ 3011$$

$$-\frac{(a+b\arcsin(c+dx))^4}{c+dx}+4b\left(3b\left(i\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-2ib\int (a+b\arcsin(c+dx))\,\text{Poly}\right.\right.$$

$$\Big\downarrow \ 7163$$

$$-\frac{(a+b\arcsin(c+dx))^4}{c+dx}+4b\left(3b\left(i\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-2ib\left(ib\int\text{PolyLog}\left(3,-e^{i\arcsin(c-}\right.\right.\right.\right.$$

$\downarrow$ 2720

$$-\frac{(a+b\arcsin(c+dx))^4}{c+dx}+4b\left(-3b\left(i\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-2ib\left(b\int e^{-i\arcsin(c+dx)}\,\text{PolyLog}\right.\right.\right.$$

$\downarrow$ 7143

$$-\frac{(a+b\arcsin(c+dx))^4}{c+dx}+4b\left(-2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^3-3b\left(i\,\text{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\right.\right.$$

input
```
Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^2,x]
```

output
```
(-((a + b*ArcSin[c + d*x])^4/(c + d*x)) + 4*b*(-2*(a + b*ArcSin[c + d*x])^
3*ArcTanh[E^(I*ArcSin[c + d*x])] - 3*b*(I*(a + b*ArcSin[c + d*x])^2*PolyLo
g[2, E^(I*ArcSin[c + d*x])] - (2*I)*b*((-I)*(a + b*ArcSin[c + d*x])*PolyLo
g[3, E^(I*ArcSin[c + d*x])] + b*PolyLog[4, E^(I*ArcSin[c + d*x])])) + 3*b*
(I*(a + b*ArcSin[c + d*x])^2*PolyLog[2, -E^(I*ArcSin[c + d*x])] - (2*I)*b*
((-I)*(a + b*ArcSin[c + d*x])*PolyLog[3, -E^(I*ArcSin[c + d*x])] + b*PolyL
og[4, -c - d*x]))))/(d*e^2)
```

### 3.211.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4671
```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Simp[d*(m/f)   Int[(c +
d*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Simp[d*(m/f)   Int[(c + d*x
)^(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IG
tQ[m, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5218
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]]   Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

## 3.211. $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx$

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

### 3.211.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 720 vs. $2(336) = 672$.

Time = 0.91 (sec) , antiderivative size = 721, normalized size of antiderivative = 2.67

| method | result |
|---|---|
| derivativedivides | $-\frac{a^4}{e^2(dx+c)}+\frac{b^4\left(-\frac{\arcsin(dx+c)^4}{dx+c}-4\arcsin(dx+c)^3\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+4\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)\right.}{}$ |
| default | $-\frac{a^4}{e^2(dx+c)}+\frac{b^4\left(-\frac{\arcsin(dx+c)^4}{dx+c}-4\arcsin(dx+c)^3\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+4\arcsin(dx+c)^3\ln\left(1-i(dx+c)-\sqrt{1-(dx+c)^2}\right)\right.}{}$ |
| parts | $-\frac{a^4}{e^2(dx+c)d}+\frac{b^4\left(-\frac{\arcsin(dx+c)^4}{dx+c}-4\arcsin(dx+c)^3\ln\left(1+i(dx+c)+\sqrt{1-(dx+c)^2}\right)+4\arcsin(dx+c)^3\ln\left(1-i(dx+c\right.\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^2,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-a^4/e^2/(d*x+c)+b^4/e^2*(-1/(d*x+c)*arcsin(d*x+c)^4-4*arcsin(d*x+c)^
3*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+4*arcsin(d*x+c)^3*ln(1-I*(d*x+c)-(1-
(d*x+c)^2)^(1/2))-24*arcsin(d*x+c)*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2
))+24*arcsin(d*x+c)*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+12*I*arcsin(d
*x+c)^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-12*I*arcsin(d*x+c)^2*pol
ylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-24*I*polylog(4,-I*(d*x+c)-(1-(d*x+c)
^2)^(1/2))+24*I*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+4*a*b^3/e^2*(-1/
(d*x+c)*arcsin(d*x+c)^3+3*arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/
2))-6*I*arcsin(d*x+c)*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+6*polylog(3
,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-3*arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c
)^2)^(1/2))+6*I*arcsin(d*x+c)*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-6*
polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+6*a^2*b^2/e^2*(-arcsin(d*x+c)^2
/(d*x+c)+2*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*arcsin(d*x+
c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+2*I*dilog(1+I*(d*x+c)+(1-(d*x+c)^2)
^(1/2))-2*I*dilog(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+4*a^3*b/e^2*(-1/(d*x+c
)*arcsin(d*x+c)-arctanh(1/(1-(d*x+c)^2)^(1/2))))
```

### 3.211.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^2}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^2,x, algorithm="fricas")
```

output
```
integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*ar
csin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/(d^2*e^2*x^2 + 2*c*d*e^2*
x + c^2*e^2), x)
```

### 3.211.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx = \frac{\int \frac{a^4}{c^2+2cdx+d^2x^2}\,dx + \int \frac{b^4\operatorname{asin}^4(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{4ab^3\operatorname{asin}^3(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{6a^2b^2\operatorname{asin}^2(c+dx)}{c^2+2cdx+d^2x^2}\,dx + \int \frac{4a^3b\operatorname{asin}(c+dx)}{c^2+2cdx+d^2x^2}\,dx}{e^2}$$

input
```
integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**2,x)
```

output
```
(Integral(a**4/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(b**4*asin(c + d
*x)**4/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(4*a*b**3*asin(c + d*x)*
*3/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(6*a**2*b**2*asin(c + d*x)**
2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(4*a**3*b*asin(c + d*x)/(c**2
 + 2*c*d*x + d**2*x**2), x))/e**2
```

### 3.211.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.211.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^2}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^2, x)
```

### 3.211.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^2}\,dx=\int \frac{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^4}{{\left(c\,e+d\,e\,x\right)}^2} \,d x$$

input
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^2,x)
```

output
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^2, x)
```

# 3.212 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx$



## 3.212.1 Optimal result

Integrand size = 23, antiderivative size = 198

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = &-\frac{2ib(a+b\arcsin(c+dx))^3}{de^3} \\ &-\frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{de^3(c+dx)} \\ &-\frac{(a+b\arcsin(c+dx))^4}{2de^3(c+dx)^2} \\ &+\frac{6b^2(a+b\arcsin(c+dx))^2\log\left(1-e^{2i\arcsin(c+dx)}\right)}{de^3} \\ &-\frac{6ib^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(2,e^{2i\arcsin(c+dx)}\right)}{de^3} \\ &+\frac{3b^4\operatorname{PolyLog}\left(3,e^{2i\arcsin(c+dx)}\right)}{de^3}\end{aligned}$$

output
```
-2*I*b*(a+b*arcsin(d*x+c))^3/d/e^3-1/2*(a+b*arcsin(d*x+c))^4/d/e^3/(d*x+c)
^2+6*b^2*(a+b*arcsin(d*x+c))^2*ln(1-(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e
^3-6*I*b^3*(a+b*arcsin(d*x+c))*polylog(2,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2
)/d/e^3+3*b^4*polylog(3,(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))^2)/d/e^3-2*b*(a+b*
arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d/e^3/(d*x+c)
```

### 3.212.2 Mathematica [A] (verified)

Time = 1.87 (sec) , antiderivative size = 385, normalized size of antiderivative = 1.94

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx$$
$$= \frac{-\frac{2a^4}{(c+dx)^2}-\frac{8a^3b\sqrt{1-(c+dx)^2}}{c+dx}-\frac{8a^3b\arcsin(c+dx)}{(c+dx)^2}-\frac{2b^4\arcsin(c+dx)^4}{(c+dx)^2}+24a^2b^2\left(-\frac{\sqrt{1-(c+dx)^2}\arcsin(c+dx)}{c+dx}-\frac{\arcsin(c+dx)^2}{2(c+dx)^2}\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^3,x]
```

output
```
((-2*a^4)/(c + d*x)^2 - (8*a^3*b*Sqrt[1 - (c + d*x)^2])/(c + d*x) - (8*a^3
*b*ArcSin[c + d*x])/(c + d*x)^2 - (2*b^4*ArcSin[c + d*x]^4)/(c + d*x)^2 +
24*a^2*b^2*(-((Sqrt[1 - (c + d*x)^2]*ArcSin[c + d*x])/(c + d*x)) - ArcSin[
c + d*x]^2/(2*(c + d*x)^2) + Log[c + d*x]) + 8*a*b^3*((-3*Sqrt[1 - (c + d*
x)^2]*ArcSin[c + d*x]^2)/(c + d*x) - ArcSin[c + d*x]^3/(c + d*x)^2 + 6*Arc
Sin[c + d*x]*Log[1 - E^((2*I)*ArcSin[c + d*x])] - (3*I)*(ArcSin[c + d*x]^2
 + PolyLog[2, E^((2*I)*ArcSin[c + d*x])])) + b^4*((-I)*Pi^3 + (8*I)*ArcSin
[c + d*x]^3 - (8*Sqrt[1 - (c + d*x)^2]*ArcSin[c + d*x]^3)/(c + d*x) + 24*A
rcSin[c + d*x]^2*Log[1 - E^((-2*I)*ArcSin[c + d*x])] + (24*I)*ArcSin[c + d
*x]*PolyLog[2, E^((-2*I)*ArcSin[c + d*x])] + 12*PolyLog[3, E^((-2*I)*ArcSi
n[c + d*x])]))/(4*d*e^3)
```

### 3.212.3 Rubi [A] (verified)

Time = 0.89 (sec) , antiderivative size = 191, normalized size of antiderivative = 0.96, number of steps used = 14, number of rules used = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {5304, 27, 5138, 5186, 5136, 3042, 25, 4200, 25, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{e^3(c+dx)^3}d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{(c+dx)^3}d(c+dx)}{de^3}$$

$\downarrow$ 5138

$$\frac{2b\int \frac{(a+b\arcsin(c+dx))^3}{(c+dx)^2\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^4}{2(c+dx)^2}}{de^3}$$

$\downarrow$ 5186

$$\frac{2b\left(3b\int \frac{(a+b\arcsin(c+dx))^2}{c+dx}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}\right)-\frac{(a+b\arcsin(c+dx))^4}{2(c+dx)^2}}{de^3}$$

$\downarrow$ 5136

$$\frac{2b\left(3b\int \frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{c+dx}d\arcsin(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}\right)-\frac{(a+b\arcsin(c+dx))^4}{2(c+dx)^2}}{de^3}$$

$\downarrow$ 3042

$$\frac{2b\left(3b\int -(a+b\arcsin(c+dx))^2\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}\right)-\frac{(a+b}{}$$

$\downarrow$ 25

$$\frac{2b\left(-3b\int (a+b\arcsin(c+dx))^2\tan\left(\arcsin(c+dx)+\frac{\pi}{2}\right)d\arcsin(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}\right)-\frac{(a+b}{2}}{de^3}$$

$\downarrow$ 4200

$$\frac{-\frac{(a+b\arcsin(c+dx))^4}{2(c+dx)^2}+2b\left(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}+3b\left(2i\int -\frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))^2}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\right.\right.}{de^3}$$

$\downarrow$ 25

$$\frac{-\frac{(a+b\arcsin(c+dx))^4}{2(c+dx)^2}+2b\left(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}+3b\left(-2i\int \frac{e^{2i\arcsin(c+dx)}(a+b\arcsin(c+dx))^2}{1-e^{2i\arcsin(c+dx)}}d\arcsin(c+dx)-\right.\right.}{de^3}$$

$\downarrow$ 2620

$$\frac{-\frac{(a+b\arcsin(c+dx))^4}{2(c+dx)^2}+2b\left(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}+3b\left(-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2\right.\right.\right.}{de^3}$$

$\downarrow$ 3011

---

3.212. $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}dx$

$$-\frac{(a+b\arcsin(c+dx))^4}{2(c+dx)^2}+2b\Bigg(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}+3b\Big(-2i\left(\tfrac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2$$

$\downarrow$ 2720

$$-\frac{(a+b\arcsin(c+dx))^4}{2(c+dx)^2}+2b\Bigg(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}+3b\Big(-2i\left(\tfrac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2$$

$\downarrow$ 7143

$$-\frac{(a+b\arcsin(c+dx))^4}{2(c+dx)^2}+2b\Bigg(-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{c+dx}+3b\Big(-2i\left(\tfrac{1}{2}i\log\left(1-e^{2i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2$$

input
```
Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^3,x]
```

output
```
(-1/2*(a + b*ArcSin[c + d*x])^4/(c + d*x)^2 + 2*b*(-((Sqrt[1 - (c + d*x)^2
]*(a + b*ArcSin[c + d*x])^3)/(c + d*x)) + 3*b*(((-1/3*I)*(a + b*ArcSin[c +
 d*x])^3)/b - (2*I)*((I/2)*(a + b*ArcSin[c + d*x])^2*Log[1 - E^((2*I)*ArcS
in[c + d*x])] - I*b*((I/2)*(a + b*ArcSin[c + d*x])*PolyLog[2, E^((2*I)*Arc
Sin[c + d*x])] - (b*PolyLog[3, E^((2*I)*ArcSin[c + d*x])])/4)))))/(d*e^3)
```

### 3.212.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5186
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] - Simp[b*c*(n/(f*(m + 1)))*Simp[(d + e*x
^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m + 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*A
rcSin[c*x])^(n - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && EqQ[c^
2*d + e, 0] && GtQ[n, 0] && EqQ[m + 2*p + 3, 0] && NeQ[m, -1]
```

3.212. $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx$

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

### 3.212.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 592 vs. 2(228) = 456.

Time = 1.07 (sec) , antiderivative size = 593, normalized size of antiderivative = 2.99

| method | result |
|---|---|
| derivativedivides | $-\frac{a^4}{2e^3(dx+c)^2}+\frac{b^4\left(-\frac{\arcsin(dx+c)^3\left(-4i(dx+c)^2+4(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}-4i\arcsin(dx+c)^3+6\arcsin(dx+c)^2\ln\left(1+\right.\right.}{}$ |
| default | $-\frac{a^4}{2e^3(dx+c)^2}+\frac{b^4\left(-\frac{\arcsin(dx+c)^3\left(-4i(dx+c)^2+4(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}-4i\arcsin(dx+c)^3+6\arcsin(dx+c)^2\ln\left(1+\right.\right.}{}$ |
| parts | $-\frac{a^4}{2e^3(dx+c)^2d}+\frac{b^4\left(-\frac{\arcsin(dx+c)^3\left(-4i(dx+c)^2+4(dx+c)\sqrt{1-(dx+c)^2}+\arcsin(dx+c)\right)}{2(dx+c)^2}-4i\arcsin(dx+c)^3+6\arcsin(dx\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/2*a^4/e^3/(d*x+c)^2+b^4/e^3*(-1/2*arcsin(d*x+c)^3*(-4*I*(d*x+c)^2+
4*(d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))/(d*x+c)^2-4*I*arcsin(d*x+c)^3
+6*arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-12*I*arcsin(d*x+c)*
polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+12*polylog(3,-I*(d*x+c)-(1-(d*x+
c)^2)^(1/2))+6*arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-12*I*ar
csin(d*x+c)*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+12*polylog(3,I*(d*x+c
)+(1-(d*x+c)^2)^(1/2)))+4*a*b^3/e^3*(-1/2*arcsin(d*x+c)^2*(-3*I*(d*x+c)^2+
3*(d*x+c)*(1-(d*x+c)^2)^(1/2)+arcsin(d*x+c))/(d*x+c)^2+3*arcsin(d*x+c)*ln(
1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+3*arcsin(d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)
^2)^(1/2))-3*I*arcsin(d*x+c)^2-3*I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2)
)-3*I*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2)))+6*a^2*b^2/e^3*(-1/2*arcsi
n(d*x+c)^2/(d*x+c)^2-arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)/(d*x+c)+ln(d*x+c))+
4*a^3*b/e^3*(-1/2/(d*x+c)^2*arcsin(d*x+c)-1/2/(d*x+c)*(1-(d*x+c)^2)^(1/2))
)
```

## 3.212.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^3}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^3,x, algorithm="fricas")
```

output
```
integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*ar
csin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/(d^3*e^3*x^3 + 3*c*d^2*e^
3*x^2 + 3*c^2*d*e^3*x + c^3*e^3), x)
```

## 3.212.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx$$
$$= \frac{\int \frac{a^4}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{b^4\operatorname{asin}^4(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{4ab^3\operatorname{asin}^3(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx + \int \frac{6a^2b^2\operatorname{asin}^2(c+dx)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx}{e^3}$$

input
```
integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**3,x)
```

output
```
(Integral(a**4/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integ
ral(b**4*asin(c + d*x)**4/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3),
 x) + Integral(4*a*b**3*asin(c + d*x)**3/(c**3 + 3*c**2*d*x + 3*c*d**2*x**
2 + d**3*x**3), x) + Integral(6*a**2*b**2*asin(c + d*x)**2/(c**3 + 3*c**2*
d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integral(4*a**3*b*asin(c + d*x)/(c*
*3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x))/e**3
```

### 3.212.7 Maxima [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = \text{Timed out}$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^3,x, algorithm="maxima")
```

output
```
Timed out
```

### 3.212.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^3}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^3,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^3, x)
```

### 3.212.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^3}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{(c\,e+d\,e\,x)^3}\,dx$$

input
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^3,x)
```

output
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^3, x)
```

# 3.213 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx$

### 3.213.1 Optimal result

Integrand size = 23, antiderivative size = 439

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = -\frac{2b^2(a+b\arcsin(c+dx))^2}{de^4(c+dx)} - \frac{2b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{3de^4(c+dx)^2} - \frac{(a+b\arcsin(c+dx))^4}{3de^4(c+dx)^3} - \frac{8b^3(a+b\arcsin(c+dx))\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4b(a+b\arcsin(c+dx))^3\operatorname{arctanh}\left(e^{i\arcsin(c+dx)}\right)}{3de^4} + \frac{4ib^4\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{2ib^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4ib^4\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{2ib^2(a+b\arcsin(c+dx))^2\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4b^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{4b^3(a+b\arcsin(c+dx))\operatorname{PolyLog}\left(3,e^{i\arcsin(c+dx)}\right)}{de^4} - \frac{4ib^4\operatorname{PolyLog}\left(4,-e^{i\arcsin(c+dx)}\right)}{de^4} + \frac{4ib^4\operatorname{PolyLog}\left(4,e^{i\arcsin(c+dx)}\right)}{de^4}$$

output
```
-2*b^2*(a+b*arcsin(d*x+c))^2/d/e^4/(d*x+c)-1/3*(a+b*arcsin(d*x+c))^4/d/e^4
/(d*x+c)^3-8*b^3*(a+b*arcsin(d*x+c))*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2)
)/d/e^4-4/3*b*(a+b*arcsin(d*x+c))^3*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2))
/d/e^4+4*I*b^4*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4+2*I*b^2*(a+
b*arcsin(d*x+c))^2*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4-4*I*b^4
*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-2*I*b^2*(a+b*arcsin(d*x+c)
)^2*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-4*b^3*(a+b*arcsin(d*x+c
))*polylog(3,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4+4*b^3*(a+b*arcsin(d*x+c
))*polylog(3,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))/d/e^4-4*I*b^4*polylog(4,-I*(d*
x+c)-(1-(d*x+c)^2)^(1/2))/d/e^4+4*I*b^4*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^
(1/2))/d/e^4-2/3*b*(a+b*arcsin(d*x+c))^3*(1-(d*x+c)^2)^(1/2)/d/e^4/(d*x+c)
^2
```

### 3.213.2 Mathematica [B] (warning: unable to verify)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 1274 vs. 2(439) = 878.

Time = 11.49 (sec) , antiderivative size = 1274, normalized size of antiderivative = 2.90

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = \text{Too large to display}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^4,x]
```

output
```
-1/3*a^4/(d*e^4*(c + d*x)^3) + (a^2*b^2*((8*I)*PolyLog[2, -E^(I*ArcSin[c +
 d*x])] - (2*(2 + 4*ArcSin[c + d*x]^2 - 2*Cos[2*ArcSin[c + d*x]] - 3*(c +
d*x)*ArcSin[c + d*x]*Log[1 - E^(I*ArcSin[c + d*x])] + 3*(c + d*x)*ArcSin[c
 + d*x]*Log[1 + E^(I*ArcSin[c + d*x])] + (4*I)*(c + d*x)^3*PolyLog[2, E^(I
*ArcSin[c + d*x])] + 2*ArcSin[c + d*x]*Sin[2*ArcSin[c + d*x]] + ArcSin[c +
 d*x]*Log[1 - E^(I*ArcSin[c + d*x])]*Sin[3*ArcSin[c + d*x]] - ArcSin[c + d
*x]*Log[1 + E^(I*ArcSin[c + d*x])]*Sin[3*ArcSin[c + d*x]]))/(c + d*x)^3))/
(4*d*e^4) + (a*b^3*(-24*ArcSin[c + d*x]*Cot[ArcSin[c + d*x]/2] - 4*ArcSin[
c + d*x]^3*Cot[ArcSin[c + d*x]/2] - 6*ArcSin[c + d*x]^2*Csc[ArcSin[c + d*x
]/2]^2 - (c + d*x)*ArcSin[c + d*x]^3*Csc[ArcSin[c + d*x]/2]^4 + 24*ArcSin[
c + d*x]^2*Log[1 - E^(I*ArcSin[c + d*x])] - 24*ArcSin[c + d*x]^2*Log[1 + E
^(I*ArcSin[c + d*x])] + 48*Log[Tan[ArcSin[c + d*x]/2]] + (48*I)*ArcSin[c +
 d*x]*PolyLog[2, -E^(I*ArcSin[c + d*x])] - (48*I)*ArcSin[c + d*x]*PolyLog[
2, E^(I*ArcSin[c + d*x])] - 48*PolyLog[3, -E^(I*ArcSin[c + d*x])] + 48*Pol
yLog[3, E^(I*ArcSin[c + d*x])] + 6*ArcSin[c + d*x]^2*Sec[ArcSin[c + d*x]/2
]^2 - (16*ArcSin[c + d*x]^3*Sin[ArcSin[c + d*x]/2]^4)/(c + d*x)^3 - 24*Arc
Sin[c + d*x]*Tan[ArcSin[c + d*x]/2] - 4*ArcSin[c + d*x]^3*Tan[ArcSin[c + d
*x]/2]))/(12*d*e^4) + (b^4*((-2*I)*Pi^4 + (4*I)*ArcSin[c + d*x]^4 - 24*Arc
Sin[c + d*x]^2*Cot[ArcSin[c + d*x]/2] - 2*ArcSin[c + d*x]^4*Cot[ArcSin[c +
 d*x]/2] - 4*ArcSin[c + d*x]^3*Csc[ArcSin[c + d*x]/2]^2 - ((c + d*x)*Ar...
```

### 3.213.3 Rubi [A] (warning: unable to verify)

Time = 1.62 (sec) , antiderivative size = 365, normalized size of antiderivative = 0.83, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.609$, Rules used = {5304, 27, 5138, 5204, 5138, 5218, 3042, 4671, 2715, 2838, 3011, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{e^4(c+dx)^4}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{(c+dx)^4}d(c+dx)}{de^4}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{4}{3}b\int \frac{(a+b\arcsin(c+dx))^3}{(c+dx)^3\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^4}{3(c+dx)^3}}{de^4}$$

$\downarrow$ 5204

$$\frac{\frac{4}{3}b\left(\frac{3}{2}b\int \frac{(a+b\arcsin(c+dx))^2}{(c+dx)^2}d(c+dx)+\frac{1}{2}\int \frac{(a+b\arcsin(c+dx))^3}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}{2(c+dx)^2}\right)-\frac{(a+b\arcsin(c-}{3(c+dx)}}{de^4}$$

$\downarrow$ 5138

$$\frac{\frac{4}{3}b\left(\frac{3}{2}b\left(2b\int \frac{a+b\arcsin(c+dx)}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{(a+b\arcsin(c+dx))^2}{c+dx}\right)+\frac{1}{2}\int \frac{(a+b\arcsin(c+dx))^3}{(c+dx)\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{\sqrt{1-(c+dx)^2}(a+b\arcs}{2(c+dx)^2}}{de^4}$$

$\downarrow$ 5218

$$\frac{\frac{4}{3}b\left(\frac{3}{2}b\left(2b\int \frac{a+b\arcsin(c+dx)}{c+dx}d\arcsin(c+dx)-\frac{(a+b\arcsin(c+dx))^2}{c+dx}\right)+\frac{1}{2}\int \frac{(a+b\arcsin(c+dx))^3}{c+dx}d\arcsin(c+dx)-\sqrt{1-(c+a}}{de^4}$$

$\downarrow$ 3042

$$\frac{\frac{4}{3}b\left(\frac{3}{2}b\left(2b\int (a+b\arcsin(c+dx))\csc(\arcsin(c+dx))d\arcsin(c+dx)-\frac{(a+b\arcsin(c+dx))^2}{c+dx}\right)+\frac{1}{2}\int (a+b\arcsin(c+}{de^4}$$

$\downarrow$ 4671

$$-\frac{(a+b\arcsin(c+dx))^4}{3(c+dx)^3}+\frac{4}{3}b\left(\frac{3}{2}b\left(-\frac{(a+b\arcsin(c+dx))^2}{c+dx}+2b\left(-b\int \log\left(1-e^{i\arcsin(c+dx)}\right)d\arcsin(c+dx)+b\int \log\left(1+e^{i\right.\right.\right.$$

$\downarrow$ 2715

$$-\frac{(a+b\arcsin(c+dx))^4}{3(c+dx)^3}+\frac{4}{3}b\left(\frac{1}{2}\left(-3b\int (a+b\arcsin(c+dx))^2\log\left(1-e^{i\arcsin(c+dx)}\right)d\arcsin(c+dx)+3b\int (a+b\arcsi\right.\right.$$

$\downarrow$ 2838

$$-\frac{(a+b\arcsin(c+dx))^4}{3(c+dx)^3}+\frac{4}{3}b\left(\frac{1}{2}\left(-3b\int (a+b\arcsin(c+dx))^2\log\left(1-e^{i\arcsin(c+dx)}\right)d\arcsin(c+dx)+3b\int (a+b\arcsi\right.\right.$$

$\downarrow$ 3011

$$-\frac{(a+b\arcsin(c+dx))^4}{3(c+dx)^3}+\frac{4}{3}b\left(\frac{1}{2}\left(3b\left(i\,\text{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-2ib\int (a+b\arcsin(c+dx))\,\text{F}\right.\right.\right.$$

---

3.213. $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx$

$\Big\downarrow$ 7163

$$-\frac{(a+b\arcsin(c+dx))^4}{3(c+dx)^3}+\frac{4}{3}b\Big(\frac{1}{2}\big(3b\big(i\operatorname{PolyLog}\left(2,-e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-2ib\big(ib\int\operatorname{PolyLog}\left(3,-e^{i\arcsi\right.$$

$\Big\downarrow$ 2720

$$-\frac{(a+b\arcsin(c+dx))^4}{3(c+dx)^3}+\frac{4}{3}b\Big(\frac{1}{2}\big(-3b\big(i\operatorname{PolyLog}\left(2,e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))^2-2ib\big(b\int e^{-i\arcsin(c+dx)}\operatorname{PolyL}$$

$\Big\downarrow$ 7143

$$-\frac{(a+b\arcsin(c+dx))^4}{3(c+dx)^3}+\frac{4}{3}b\Big(\frac{3}{2}b\Big(-\frac{(a+b\arcsin(c+dx))^2}{c+dx}+2b\left(-2\text{arctanh}\left(e^{i\arcsin(c+dx)}\right)(a+b\arcsin(c+dx))-ib\operatorname{PolyLo}\right.$$

input
```
Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^4,x]
```

output
```
(-1/3*(a + b*ArcSin[c + d*x])^4/(c + d*x)^3 + (4*b*(-1/2*(Sqrt[1 - (c + d*
x)^2]*(a + b*ArcSin[c + d*x])^3)/(c + d*x)^2 + (3*b*(-((a + b*ArcSin[c + d
*x])^2/(c + d*x)) + 2*b*(-2*(a + b*ArcSin[c + d*x])*ArcTanh[E^(I*ArcSin[c
+ d*x])] - I*b*PolyLog[2, E^(I*ArcSin[c + d*x])] + I*b*PolyLog[2, -c - d*x
])))/2 + (-2*(a + b*ArcSin[c + d*x])^3*ArcTanh[E^(I*ArcSin[c + d*x])] - 3*
b*(I*(a + b*ArcSin[c + d*x])^2*PolyLog[2, E^(I*ArcSin[c + d*x])] - (2*I)*b
*((-I)*(a + b*ArcSin[c + d*x])*PolyLog[3, E^(I*ArcSin[c + d*x])] + b*PolyL
og[4, E^(I*ArcSin[c + d*x])])) + 3*b*(I*(a + b*ArcSin[c + d*x])^2*PolyLog[
2, -E^(I*ArcSin[c + d*x])] - (2*I)*b*((-I)*(a + b*ArcSin[c + d*x])*PolyLog
[3, -E^(I*ArcSin[c + d*x])] + b*PolyLog[4, -c - d*x])))/2))/3)/(d*e^4)
```

### 3.213.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

3.213. $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx$

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4671
```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[-
2*(c + d*x)^m*(ArcTanh[E^(I*(e + f*x))]/f), x] + (-Simp[d*(m/f)   Int[(c +
d*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Simp[d*(m/f)   Int[(c + d*x
)^(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IG
tQ[m, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5204
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[(f*x)^(m + 1)*(d + e*x^2)^(p + 1)*((a + b
*ArcSin[c*x])^n/(d*f*(m + 1))), x] + (Simp[c^2*((m + 2*p + 3)/(f^2*(m + 1))
)   Int[(f*x)^(m + 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] - Simp[b*
c*(n/(f*(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m + 1)*(
1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b,
 c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && ILtQ[m, -1]
```

## 3.213. $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx$

rule 5218
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_))/Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[(1/c^(m + 1))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*
x^2]]   Subst[Int[(a + b*x)^n*Sin[x]^m, x], x, ArcSin[c*x]], x] /; FreeQ[{a
, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0] && IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

### 3.213.4 Maple [A] (verified)

Time = 1.38 (sec) , antiderivative size = 1009, normalized size of antiderivative = 2.30

| method | result | size |
|---|---|---|
| derivativedivides | Expression too large to display | 1009 |
| default | Expression too large to display | 1009 |
| parts | Expression too large to display | 1020 |

input
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^4,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/3*a^4/e^4/(d*x+c)^3+b^4/e^4*(-1/3/(d*x+c)^3*arcsin(d*x+c)^2*(2*arc
sin(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+arcsin(d*x+c)^2+6*(d*x+c)^2)-2/3*ar
csin(d*x+c)^3*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+2*I*arcsin(d*x+c)^2*poly
log(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-4*arcsin(d*x+c)*polylog(3,-I*(d*x+c)
-(1-(d*x+c)^2)^(1/2))-4*I*polylog(4,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))+2/3*ar
csin(d*x+c)^3*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-2*I*arcsin(d*x+c)^2*poly
log(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+4*arcsin(d*x+c)*polylog(3,I*(d*x+c)+(
1-(d*x+c)^2)^(1/2))+4*I*polylog(4,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-4*arcsin(
d*x+c)*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+4*I*polylog(2,-I*(d*x+c)-(1-(d*
x+c)^2)^(1/2))+4*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-4*I*pol
ylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+4*a*b^3/e^4*(-1/6/(d*x+c)^3*arcsin(
d*x+c)*(3*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+2*arcsin(d*x+c)^2+6*(d
*x+c)^2)+1/2*arcsin(d*x+c)^2*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-I*arcsin(
d*x+c)*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+polylog(3,I*(d*x+c)+(1-(d*
x+c)^2)^(1/2))-1/2*arcsin(d*x+c)^2*ln(1+I*(d*x+c)+(1-(d*x+c)^2)^(1/2))+I*a
rcsin(d*x+c)*polylog(2,-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-polylog(3,-I*(d*x+c
)-(1-(d*x+c)^2)^(1/2))-2*arctanh(I*(d*x+c)+(1-(d*x+c)^2)^(1/2)))+6*a^2*b^2
/e^4*(-1/3*(arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)*(d*x+c)+arcsin(d*x+c)^2+(d*x
+c)^2)/(d*x+c)^3+1/3*arcsin(d*x+c)*ln(1-I*(d*x+c)-(1-(d*x+c)^2)^(1/2))-1/3
*I*polylog(2,I*(d*x+c)+(1-(d*x+c)^2)^(1/2))-1/3*arcsin(d*x+c)*ln(1+I*(d...
```

### 3.213.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^4,x, algorithm="fricas")
```

output
```
integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*ar
csin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/(d^4*e^4*x^4 + 4*c*d^3*e^
4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x + c^4*e^4), x)
```

### 3.213.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = \frac{\int \frac{a^4}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{b^4\operatorname{asin}^4(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{4ab^3\operatorname{asin}^3(c+dx)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx + \int \frac{}{c}}{e^4}$$

input
```
integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**4,x)
```

output
```
(Integral(a**4/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**
4*x**4), x) + Integral(b**4*asin(c + d*x)**4/(c**4 + 4*c**3*d*x + 6*c**2*d
**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) + Integral(4*a*b**3*asin(c + d*x
)**3/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x
) + Integral(6*a**2*b**2*asin(c + d*x)**2/(c**4 + 4*c**3*d*x + 6*c**2*d**2
*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) + Integral(4*a**3*b*asin(c + d*x)/(
c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x))/e**
4
```

### 3.213.7 Maxima [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^4,x, algorithm="maxima")
```

output
```
-1/3*a^4/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4) - 1
/3*(b^4*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4 + 3*(d^4*
e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2*d^2*e^4*x + c^3*d*e^4)*integrate(2/3*(2*
(b^4*d*x + b^4*c)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*arctan2(d*x + c, sq
rt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 - 6*(a*b^3*d^2*x^2 + 2*a*b^3*c*d*x +
 a*b^3*c^2 - a*b^3)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))
^3 - 9*(a^2*b^2*d^2*x^2 + 2*a^2*b^2*c*d*x + a^2*b^2*c^2 - a^2*b^2)*arctan2
(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 - 6*(a^3*b*d^2*x^2 + 2*a
^3*b*c*d*x + a^3*b*c^2 - a^3*b)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d
*x - c + 1)))/(d^6*e^4*x^6 + 6*c*d^5*e^4*x^5 + (15*c^2 - 1)*d^4*e^4*x^4 +
4*(5*c^3 - c)*d^3*e^4*x^3 + 3*(5*c^4 - 2*c^2)*d^2*e^4*x^2 + 2*(3*c^5 - 2*c
^3)*d*e^4*x + (c^6 - c^4)*e^4), x))/(d^4*e^4*x^3 + 3*c*d^3*e^4*x^2 + 3*c^2
*d^2*e^4*x + c^3*d*e^4)
```

### 3.213.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx=\int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^4,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^4, x)
```

### 3.213.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^4}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{(c\,e+d\,e\,x)^4}\,dx$$

input
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^4,x)
```

output
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^4, x)
```

# 3.214 $\int (a+b\arcsin(c+dx))^5\,dx$



## 3.214.1 Optimal result

Integrand size = 12, antiderivative size = 164

$$\int (a+b\arcsin(c+dx))^5\,dx = 120ab^4x+\frac{120b^5\sqrt{1-(c+dx)^2}}{d}+\frac{120b^5(c+dx)\arcsin(c+dx)}{d}-\frac{60b^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}{d}-\frac{20b^2(c+dx)(a+b\arcsin(c+dx))^3}{d}+\frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}{d}+\frac{(c+dx)(a+b\arcsin(c+dx))^5}{d}$$

output
```
120*a*b^4*x+120*b^5*(d*x+c)*arcsin(d*x+c)/d-20*b^2*(d*x+c)*(a+b*arcsin(d*x
+c))^3/d+(d*x+c)*(a+b*arcsin(d*x+c))^5/d+120*b^5*(1-(d*x+c)^2)^(1/2)/d-60*
b^3*(a+b*arcsin(d*x+c))^2*(1-(d*x+c)^2)^(1/2)/d+5*b*(a+b*arcsin(d*x+c))^4*
(1-(d*x+c)^2)^(1/2)/d
```

### 3.214.2 Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.91

$$\int (a+b\arcsin(c+dx))^5\,dx$$
$$=\frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4+(c+dx)(a+b\arcsin(c+dx))^5-20b^2\Big(3b\sqrt{1-(c+dx)^2}(a+$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^5,x]
```

output
```
(5*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^4 + (c + d*x)*(a + b*Ar
cSin[c + d*x])^5 - 20*b^2*(3*b*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x
])^2 + (c + d*x)*(a + b*ArcSin[c + d*x])^3 - 6*b^2*(a*(c + d*x) + b*Sqrt[1
 - (c + d*x)^2] + b*(c + d*x)*ArcSin[c + d*x])))/d
```

### 3.214.3 Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 152, normalized size of antiderivative = 0.93, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5302, 5130, 5182, 5130, 5182, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^5\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int (a+b\arcsin(c+dx))^5 d(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^5-5b\int \frac{(c+dx)(a+b\arcsin(c+dx))^4}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5182}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^5-5b\Big(4b\int (a+b\arcsin(c+dx))^3d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^5-5b\Big(4b\Big((c+dx)(a+b\arcsin(c+dx))^3-3b\int\frac{(c+dx)(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)\Big)}{d}$$

$$\Big\downarrow \text{5182}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^5-5b\Big(4b\Big((c+dx)(a+b\arcsin(c+dx))^3-3b\Big(2b\int(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{2009}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^5-5b\Big(4b\Big((c+dx)(a+b\arcsin(c+dx))^3-3b\Big(2b\Big(a(c+dx)+b(c+dx)\arcsin(c}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^5,x]
```

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^5 - 5*b*(-(Sqrt[1 - (c + d*x)^2]*(a + b
*ArcSin[c + d*x])^4) + 4*b*((c + d*x)*(a + b*ArcSin[c + d*x])^3 - 3*b*(-(S
qrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^2) + 2*b*(a*(c + d*x) + b*Sqr
t[1 - (c + d*x)^2] + b*(c + d*x)*ArcSin[c + d*x])))))/d
```

### 3.214.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.214.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 366 vs. 2(158) = 316.

Time = 0.66 (sec) , antiderivative size = 367, normalized size of antiderivative = 2.24

| method | result |
|---|---|
| derivativedivides | $\frac{(dx+c)a^5+b^5\left(\arcsin(dx+c)^5(dx+c)+5\arcsin(dx+c)^4\sqrt{1-(dx+c)^2}-20\arcsin(dx+c)^3(dx+c)-60\arcsin(dx+c)^2\sqrt{1-}\right.}{}$ |
| default | $\frac{(dx+c)a^5+b^5\left(\arcsin(dx+c)^5(dx+c)+5\arcsin(dx+c)^4\sqrt{1-(dx+c)^2}-20\arcsin(dx+c)^3(dx+c)-60\arcsin(dx+c)^2\sqrt{1-}\right.}{}$ |
| parts | $x\,a^5+\frac{b^5\left(\arcsin(dx+c)^5(dx+c)+5\arcsin(dx+c)^4\sqrt{1-(dx+c)^2}-20\arcsin(dx+c)^3(dx+c)-60\arcsin(dx+c)^2\sqrt{1-(d}\right.}{d}$ |

input
```
int((a+b*arcsin(d*x+c))^5,x,method=_RETURNVERBOSE)
```

output
```
1/d*((d*x+c)*a^5+b^5*(arcsin(d*x+c)^5*(d*x+c)+5*arcsin(d*x+c)^4*(1-(d*x+c)
^2)^(1/2)-20*arcsin(d*x+c)^3*(d*x+c)-60*arcsin(d*x+c)^2*(1-(d*x+c)^2)^(1/2
)+120*(1-(d*x+c)^2)^(1/2)+120*(d*x+c)*arcsin(d*x+c))+5*a*b^4*(arcsin(d*x+c
)^4*(d*x+c)+4*arcsin(d*x+c)^3*(1-(d*x+c)^2)^(1/2)-12*arcsin(d*x+c)^2*(d*x+
c)+24*d*x+24*c-24*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2))+10*a^2*b^3*(arcsin(d*
x+c)^3*(d*x+c)+3*arcsin(d*x+c)^2*(1-(d*x+c)^2)^(1/2)-6*(1-(d*x+c)^2)^(1/2)
-6*(d*x+c)*arcsin(d*x+c))+10*a^3*b^2*(arcsin(d*x+c)^2*(d*x+c)-2*d*x-2*c+2*
arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2))+5*a^4*b*((d*x+c)*arcsin(d*x+c)+(1-(d*x+
c)^2)^(1/2)))
```

### 3.214.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 323 vs. 2(158) = 316.

Time = 0.26 (sec) , antiderivative size = 323, normalized size of antiderivative = 1.97

$$\int (a+b\arcsin(c+dx))^5\,dx$$
$$=\frac{(b^5dx+b^5c)\arcsin(dx+c)^5+5(ab^4dx+ab^4c)\arcsin(dx+c)^4+10((a^2b^3-2b^5)dx+(a^2b^3-2b^5)c)\operatorname{ar}}{}$$

input
```
integrate((a+b*arcsin(d*x+c))^5,x, algorithm="fricas")
```

output
```
((b^5*d*x + b^5*c)*arcsin(d*x + c)^5 + 5*(a*b^4*d*x + a*b^4*c)*arcsin(d*x
+ c)^4 + 10*((a^2*b^3 - 2*b^5)*d*x + (a^2*b^3 - 2*b^5)*c)*arcsin(d*x + c)^
3 + (a^5 - 20*a^3*b^2 + 120*a*b^4)*d*x + 10*((a^3*b^2 - 6*a*b^4)*d*x + (a^
3*b^2 - 6*a*b^4)*c)*arcsin(d*x + c)^2 + 5*((a^4*b - 12*a^2*b^3 + 24*b^5)*d
*x + (a^4*b - 12*a^2*b^3 + 24*b^5)*c)*arcsin(d*x + c) + 5*(b^5*arcsin(d*x
+ c)^4 + 4*a*b^4*arcsin(d*x + c)^3 + a^4*b - 12*a^2*b^3 + 24*b^5 + 6*(a^2*
b^3 - 2*b^5)*arcsin(d*x + c)^2 + 4*(a^3*b^2 - 6*a*b^4)*arcsin(d*x + c))*sq
rt(-d^2*x^2 - 2*c*d*x - c^2 + 1))/d
```

### 3.214.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 663 vs. $2(146) = 292$.

Time = 0.41 (sec) , antiderivative size = 663, normalized size of antiderivative = 4.04

$$\int (a + b \arcsin(c + dx))^5 \, dx$$
$$= \begin{cases} a^5x + \frac{5a^4bc \operatorname{asin}(c+dx)}{d} + 5a^4bx \operatorname{asin}(c + dx) + \frac{5a^4b\sqrt{-c^2-2cdx-d^2x^2+1}}{d} + \frac{10a^3b^2c \operatorname{asin}^2(c+dx)}{d} + 10a^3b^2x \operatorname{asin}^2(c - \\ x(a + b \operatorname{asin}(c))^5 \end{cases}$$

input
```
integrate((a+b*asin(d*x+c))**5,x)
```

output
```
Piecewise((a**5*x + 5*a**4*b*c*asin(c + d*x)/d + 5*a**4*b*x*asin(c + d*x)
+ 5*a**4*b*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d + 10*a**3*b**2*c*asin(c
 + d*x)**2/d + 10*a**3*b**2*x*asin(c + d*x)**2 - 20*a**3*b**2*x + 20*a**3*
b**2*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*x)/d + 10*a**2*b**3*
c*asin(c + d*x)**3/d - 60*a**2*b**3*c*asin(c + d*x)/d + 10*a**2*b**3*x*asi
n(c + d*x)**3 - 60*a**2*b**3*x*asin(c + d*x) + 30*a**2*b**3*sqrt(-c**2 - 2
*c*d*x - d**2*x**2 + 1)*asin(c + d*x)**2/d - 60*a**2*b**3*sqrt(-c**2 - 2*c
*d*x - d**2*x**2 + 1)/d + 5*a*b**4*c*asin(c + d*x)**4/d - 60*a*b**4*c*asin
(c + d*x)**2/d + 5*a*b**4*x*asin(c + d*x)**4 - 60*a*b**4*x*asin(c + d*x)**
2 + 120*a*b**4*x + 20*a*b**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c
+ d*x)**3/d - 120*a*b**4*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c + d*
x)/d + b**5*c*asin(c + d*x)**5/d - 20*b**5*c*asin(c + d*x)**3/d + 120*b**5
*c*asin(c + d*x)/d + b**5*x*asin(c + d*x)**5 - 20*b**5*x*asin(c + d*x)**3
+ 120*b**5*x*asin(c + d*x) + 5*b**5*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*
asin(c + d*x)**4/d - 60*b**5*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)*asin(c
+ d*x)**2/d + 120*b**5*sqrt(-c**2 - 2*c*d*x - d**2*x**2 + 1)/d, Ne(d, 0)),
 (x*(a + b*asin(c))**5, True))
```

### 3.214.7 Maxima [F]

$$\int (a+b\arcsin(c+dx))^5\,dx = \int (b\arcsin{(dx+c)}+a)^5\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^5,x, algorithm="maxima")
```

output
```
b^5*x*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^5 + a^5*x + 5
*((d*x + c)*arcsin(d*x + c) + sqrt(-(d*x + c)^2 + 1))*a^4*b/d + integrate(
5*(sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*b^5*d*x*arctan2(d*x + c, sqrt(d*x
+ c + 1)*sqrt(-d*x - c + 1))^4 + (a*b^4*d^2*x^2 + 2*a*b^4*c*d*x + a*b^4*c^
2 - a*b^4)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4 + 2*(a
^2*b^3*d^2*x^2 + 2*a^2*b^3*c*d*x + a^2*b^3*c^2 - a^2*b^3)*arctan2(d*x + c,
 sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 2*(a^3*b^2*d^2*x^2 + 2*a^3*b^2*
c*d*x + a^3*b^2*c^2 - a^3*b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*
x - c + 1))^2)/(d^2*x^2 + 2*c*d*x + c^2 - 1), x)
```

### 3.214.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 482 vs. $2(158) = 316$.

Time = 0.30 (sec) , antiderivative size = 482, normalized size of antiderivative = 2.94

$$\int (a+b\arcsin(c+dx))^5\,dx = \frac{(dx+c)b^5\arcsin(dx+c)^5}{d} + \frac{5(dx+c)ab^4\arcsin(dx+c)^4}{d} + \frac{5\sqrt{-(dx+c)^2+1}b^5\arcsin(dx+c)^4}{d} + \frac{10(dx+c)a^2b^3\arcsin(dx+c)^3}{d} - \frac{20(dx+c)b^5\arcsin(dx+c)^3}{d} + \frac{20\sqrt{-(dx+c)^2+1}ab^4\arcsin(dx+c)^3}{d} + \frac{10(dx+c)a^3b^2\arcsin(dx+c)^2}{d} - \frac{60(dx+c)ab^4\arcsin(dx+c)^2}{d} + \frac{30\sqrt{-(dx+c)^2+1}a^2b^3\arcsin(dx+c)^2}{d} - \frac{60\sqrt{-(dx+c)^2+1}b^5\arcsin(dx+c)^2}{d} + \frac{5(dx+c)a^4b\arcsin(dx+c)}{d} - \frac{60(dx+c)a^2b^3\arcsin(dx+c)}{d} + \frac{120(dx+c)b^5\arcsin(dx+c)}{d} + \frac{20\sqrt{-(dx+c)^2+1}a^3b^2\arcsin(dx+c)}{d} - \frac{120\sqrt{-(dx+c)^2+1}ab^4\arcsin(dx+c)}{d} + \frac{(dx+c)a^5}{d} - \frac{20(dx+c)a^3b^2}{d} + \frac{120(dx+c)ab^4}{d} + \frac{5\sqrt{-(dx+c)^2+1}a^4b}{d} - \frac{60\sqrt{-(dx+c)^2+1}a^2b^3}{d} + \frac{120\sqrt{-(dx+c)^2+1}b^5}{d}$$

input
```
integrate((a+b*arcsin(d*x+c))^5,x, algorithm="giac")
```

output
```
(d*x + c)*b^5*arcsin(d*x + c)^5/d + 5*(d*x + c)*a*b^4*arcsin(d*x + c)^4/d
+ 5*sqrt(-(d*x + c)^2 + 1)*b^5*arcsin(d*x + c)^4/d + 10*(d*x + c)*a^2*b^3*
arcsin(d*x + c)^3/d - 20*(d*x + c)*b^5*arcsin(d*x + c)^3/d + 20*sqrt(-(d*x
 + c)^2 + 1)*a*b^4*arcsin(d*x + c)^3/d + 10*(d*x + c)*a^3*b^2*arcsin(d*x +
 c)^2/d - 60*(d*x + c)*a*b^4*arcsin(d*x + c)^2/d + 30*sqrt(-(d*x + c)^2 +
1)*a^2*b^3*arcsin(d*x + c)^2/d - 60*sqrt(-(d*x + c)^2 + 1)*b^5*arcsin(d*x
+ c)^2/d + 5*(d*x + c)*a^4*b*arcsin(d*x + c)/d - 60*(d*x + c)*a^2*b^3*arcs
in(d*x + c)/d + 120*(d*x + c)*b^5*arcsin(d*x + c)/d + 20*sqrt(-(d*x + c)^2
 + 1)*a^3*b^2*arcsin(d*x + c)/d - 120*sqrt(-(d*x + c)^2 + 1)*a*b^4*arcsin(
d*x + c)/d + (d*x + c)*a^5/d - 20*(d*x + c)*a^3*b^2/d + 120*(d*x + c)*a*b^
4/d + 5*sqrt(-(d*x + c)^2 + 1)*a^4*b/d - 60*sqrt(-(d*x + c)^2 + 1)*a^2*b^3
/d + 120*sqrt(-(d*x + c)^2 + 1)*b^5/d
```

### 3.214.9 Mupad [B] (verification not implemented)

Time = 0.70 (sec) , antiderivative size = 317, normalized size of antiderivative = 1.93

$$\int (a+b\arcsin(c+dx))^5\,dx$$
$$= a^5\,x + \frac{10\,a^3\,b^2\,\left(2\,\mathrm{asin}(c+d\,x)\,\sqrt{1-{(c+d\,x)}^2}+\left({\mathrm{asin}(c+d\,x)}^2-2\right)\,\left(c+d\,x\right)\right)}{d}$$
$$+ \frac{5\,a^4\,b\,\left(\sqrt{1-{(c+d\,x)}^2}+\mathrm{asin}(c+d\,x)\,\left(c+d\,x\right)\right)}{d}$$
$$+ \frac{b^5\,\left(c+d\,x\right)\,\left({\mathrm{asin}(c+d\,x)}^5-20\,{\mathrm{asin}(c+d\,x)}^3+120\,\mathrm{asin}(c+d\,x)\right)}{d}$$
$$+ \frac{b^5\,\sqrt{1-{(c+d\,x)}^2}\,\left(5\,{\mathrm{asin}(c+d\,x)}^4-60\,{\mathrm{asin}(c+d\,x)}^2+120\right)}{d}$$
$$+ \frac{5\,a\,b^4\,\left(c+d\,x\right)\,\left({\mathrm{asin}(c+d\,x)}^4-12\,{\mathrm{asin}(c+d\,x)}^2+24\right)}{d}$$
$$+ \frac{10\,a^2\,b^3\,\left(3\,{\mathrm{asin}(c+d\,x)}^2-6\right)\,\sqrt{1-{(c+d\,x)}^2}}{d}$$
$$- \frac{10\,a^2\,b^3\,\left(6\,\mathrm{asin}(c+d\,x)-{\mathrm{asin}(c+d\,x)}^3\right)\,\left(c+d\,x\right)}{d}$$
$$- \frac{5\,a\,b^4\,\left(24\,\mathrm{asin}(c+d\,x)-4\,{\mathrm{asin}(c+d\,x)}^3\right)\,\sqrt{1-{(c+d\,x)}^2}}{d}$$

input
```
int((a + b*asin(c + d*x))^5,x)
```

output
```
a^5*x + (10*a^3*b^2*(2*asin(c + d*x)*(1 - (c + d*x)^2)^(1/2) + (asin(c + d
*x)^2 - 2)*(c + d*x)))/d + (5*a^4*b*((1 - (c + d*x)^2)^(1/2) + asin(c + d*
x)*(c + d*x)))/d + (b^5*(c + d*x)*(120*asin(c + d*x) - 20*asin(c + d*x)^3
+ asin(c + d*x)^5))/d + (b^5*(1 - (c + d*x)^2)^(1/2)*(5*asin(c + d*x)^4 -
60*asin(c + d*x)^2 + 120))/d + (5*a*b^4*(c + d*x)*(asin(c + d*x)^4 - 12*as
in(c + d*x)^2 + 24))/d + (10*a^2*b^3*(3*asin(c + d*x)^2 - 6)*(1 - (c + d*x
)^2)^(1/2))/d - (10*a^2*b^3*(6*asin(c + d*x) - asin(c + d*x)^3)*(c + d*x))
/d - (5*a*b^4*(24*asin(c + d*x) - 4*asin(c + d*x)^3)*(1 - (c + d*x)^2)^(1/
2))/d
```

## 3.214. $\int (a+b\arcsin(c+dx))^5\,dx$

# 3.215 $\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx$



## 3.215.1 Optimal result

Integrand size = 23, antiderivative size = 213

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx = \frac{e^4\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8bd} - \frac{3e^4\cos\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\cos\left(\frac{5a}{b}\right)\operatorname{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8bd} - \frac{3e^4\sin\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16bd} + \frac{e^4\sin\left(\frac{5a}{b}\right)\operatorname{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16bd}$$

output
```
1/8*e^4*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b/d-3/16*e^4*Ci(3*(a+b*arcsin(d
*x+c))/b)*cos(3*a/b)/b/d+1/16*e^4*Ci(5*(a+b*arcsin(d*x+c))/b)*cos(5*a/b)/b
/d+1/8*e^4*Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/b/d-3/16*e^4*Si(3*(a+b*arcsi
n(d*x+c))/b)*sin(3*a/b)/b/d+1/16*e^4*Si(5*(a+b*arcsin(d*x+c))/b)*sin(5*a/b
)/b/d
```

### 3.215.2 Mathematica [A] (verified)

Time = 0.56 (sec) , antiderivative size = 150, normalized size of antiderivative = 0.70

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{e^4\left(2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)-3\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)+\cos\left(\frac{5a}{b}\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^4*(2*Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] - 3*Cos[(3*a)/b]*CosIn
tegral[3*(a/b + ArcSin[c + d*x])] + Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcS
in[c + d*x])] + 2*Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] - 3*Sin[(3*a
)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])] + Sin[(5*a)/b]*SinIntegral[5*(
a/b + ArcSin[c + d*x])]))/(16*b*d)
```

### 3.215.3 Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 169, normalized size of antiderivative = 0.79, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {5304, 27, 5146, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int \frac{e^4(c+dx)^4}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \; 27$$
$$\frac{e^4\int \frac{(c+dx)^4}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \; 5146$$
$$\frac{e^4\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^4\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\big\downarrow \; 4906$$

$$\frac{e^4 \int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16(a+b\arcsin(c+dx))}-\frac{3\cos\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16(a+b\arcsin(c+dx))}+\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{8(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{bd}$$

$$\big\downarrow \; 2009$$

$$\frac{e^4\left(\frac{1}{8}\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\frac{3}{16}\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)+\frac{1}{16}\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\right.}{}$$

input
```
Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^4*((Cos[a/b]*CosIntegral[(a + b*ArcSin[c + d*x])/b])/8 - (3*Cos[(3*a)/b
]*CosIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/16 + (Cos[(5*a)/b]*CosIntegr
al[(5*(a + b*ArcSin[c + d*x]))/b])/16 + (Sin[a/b]*SinIntegral[(a + b*ArcSi
n[c + d*x])/b])/8 - (3*Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x])
)/b])/16 + (Sin[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c + d*x]))/b])/16))/
(b*d)
```

### 3.215.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

3.215. $\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx$

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.215.4 Maple [A] (verified)

Time = 0.28 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.72

| method | result |
|---|---|
| derivativedivides | $\frac{e^4\left(\text{Ci}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)+\text{Si}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)+2\ \text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+2\ \text{Ci}\left(\arcsin(dx-\right.\right.}{16db}$ |
| default | $\frac{e^4\left(\text{Ci}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)\cos\left(\frac{5a}{b}\right)+\text{Si}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)\sin\left(\frac{5a}{b}\right)+2\ \text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)+2\ \text{Ci}\left(\arcsin(dx-\right.\right.}{16db}$ |

input
```
int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
1/16/d*e^4*(Ci(5*arcsin(d*x+c)+5*a/b)*cos(5*a/b)+Si(5*arcsin(d*x+c)+5*a/b)
*sin(5*a/b)+2*Si(arcsin(d*x+c)+a/b)*sin(a/b)+2*Ci(arcsin(d*x+c)+a/b)*cos(a
/b)-3*Si(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)-3*Ci(3*arcsin(d*x+c)+3*a/b)*cos
(3*a/b))/b
```

### 3.215.5 Fricas [F]

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^4}{b\arcsin\left(dx+c\right)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
integral((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*
x + c^4*e^4)/(b*arcsin(d*x + c) + a), x)
```

### 3.215.6 Sympy [F]

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx = e^4\left(\int \frac{c^4}{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{d^4x^4}{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{4cd^3x^3}{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{6c^2d^2x^2}{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{4c^3dx}{a+b\,\mathrm{asin}\,(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c)),x)
```

output
```
e**4*(Integral(c**4/(a + b*asin(c + d*x)), x) + Integral(d**4*x**4/(a + b*
asin(c + d*x)), x) + Integral(4*c*d**3*x**3/(a + b*asin(c + d*x)), x) + In
tegral(6*c**2*d**2*x**2/(a + b*asin(c + d*x)), x) + Integral(4*c**3*d*x/(a
 + b*asin(c + d*x)), x))
```

### 3.215.7 Maxima [F]

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx = \int \frac{(dex+ce)^4}{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^4/(b*arcsin(d*x + c) + a), x)
```

### 3.215.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 419 vs. $2(201) = 402$.

Time = 0.35 (sec) , antiderivative size = 419, normalized size of antiderivative = 1.97

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx = \frac{e^4\cos\left(\frac{a}{b}\right)^5\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(dx+c)\right)}{bd} + \frac{e^4\cos\left(\frac{a}{b}\right)^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(dx+c)\right)}{bd} - \frac{5e^4\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(dx+c)\right)}{4bd} - \frac{3e^4\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(dx+c)\right)}{4bd} - \frac{3e^4\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(dx+c)\right)}{4bd} - \frac{3e^4\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(dx+c)\right)}{4bd} + \frac{5e^4\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{5a}{b}+5\arcsin(dx+c)\right)}{16bd} + \frac{9e^4\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(dx+c)\right)}{16bd} + \frac{e^4\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{8bd} + \frac{e^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{5a}{b}+5\arcsin(dx+c)\right)}{16bd} + \frac{3e^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(dx+c)\right)}{16bd} + \frac{e^4\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{8bd}$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
e^4*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(d*x + c))/(b*d) + e^4*cos(a/b
)^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b*d) - 5/4*e^4*cos(a
/b)^3*cos_integral(5*a/b + 5*arcsin(d*x + c))/(b*d) - 3/4*e^4*cos(a/b)^3*c
os_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) - 3/4*e^4*cos(a/b)^2*sin(a/b)
*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b*d) - 3/4*e^4*cos(a/b)^2*sin(a/
b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) + 5/16*e^4*cos(a/b)*cos_i
ntegral(5*a/b + 5*arcsin(d*x + c))/(b*d) + 9/16*e^4*cos(a/b)*cos_integral(
3*a/b + 3*arcsin(d*x + c))/(b*d) + 1/8*e^4*cos(a/b)*cos_integral(a/b + arc
sin(d*x + c))/(b*d) + 1/16*e^4*sin(a/b)*sin_integral(5*a/b + 5*arcsin(d*x
+ c))/(b*d) + 3/16*e^4*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b
*d) + 1/8*e^4*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b*d)
```

3.215. $\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx$

### 3.215.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{a+b\arcsin(c+dx)}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^4}{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

input
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x)), x)
```

# 3.216 $\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx$



## 3.216.1 Optimal result

Integrand size = 23, antiderivative size = 145

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = -\frac{e^3\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{4bd} + \frac{e^3\,\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{8bd} + \frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4bd} - \frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{8bd}$$

output
```
1/4*e^3*cos(2*a/b)*Si(2*(a+b*arcsin(d*x+c))/b)/b/d-1/8*e^3*cos(4*a/b)*Si(4
*(a+b*arcsin(d*x+c))/b)/b/d-1/4*e^3*Ci(2*(a+b*arcsin(d*x+c))/b)*sin(2*a/b)
/b/d+1/8*e^3*Ci(4*(a+b*arcsin(d*x+c))/b)*sin(4*a/b)/b/d
```

### 3.216.2 Mathematica [A] (verified)

Time = 0.46 (sec) , antiderivative size = 109, normalized size of antiderivative = 0.75

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{e^3\left(-2\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)\sin\left(\frac{2a}{b}\right)+\text{CosIntegral}\left(4\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)\sin\left(\frac{4a}{b}\right)+2\,\text{co}\right.}{8bd}$$

input
```
Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^3*(-2*CosIntegral[2*(a/b + ArcSin[c + d*x])]*Sin[(2*a)/b] + CosIntegral
[4*(a/b + ArcSin[c + d*x])]*Sin[(4*a)/b] + 2*Cos[(2*a)/b]*SinIntegral[2*(a
/b + ArcSin[c + d*x])] - Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c + d*x]
)]))/(8*b*d)
```

### 3.216.3 Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 119, normalized size of antiderivative = 0.82, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {5304, 27, 5146, 25, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx$$
$$\Big\downarrow \text{ 5304}$$
$$\frac{\int \frac{e^3(c+dx)^3}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \text{ 27}$$
$$\frac{e^3\int \frac{(c+dx)^3}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \text{ 5146}$$
$$\frac{e^3\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \; 25$$

$$-\frac{e^3\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \; 4906$$

$$-\frac{e^3\int \left(\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4(a+b\arcsin(c+dx))}-\frac{\sin\left(\frac{4a}{b}-\frac{4(a+b\arcsin(c+dx))}{b}\right)}{8(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \; 2009$$

$$\frac{e^3\left(-\frac{1}{4}\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)+\frac{1}{8}\sin\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)+\frac{1}{4}\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\right.\right.}{bd}$$

input
```
Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^3*(-1/4*(CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b]*Sin[(2*a)/b]) + (Co
sIntegral[(4*(a + b*ArcSin[c + d*x]))/b]*Sin[(4*a)/b])/8 + (Cos[(2*a)/b]*S
inIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/4 - (Cos[(4*a)/b]*SinIntegral[(
4*(a + b*ArcSin[c + d*x]))/b])/8))/(b*d)
```

### 3.216.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

3.216. $\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx$

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.216.4 Maple [A] (verified)

Time = 0.30 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.77

| method | result |
|---|---|
| derivativedivides | $-\frac{e^3\left(\mathrm{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-\mathrm{Ci}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)-2\ \mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+2\ \mathrm{Ci}(2\,\mathrm{ar}\right.}{8db}$ |
| default | $-\frac{e^3\left(\mathrm{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)-\mathrm{Ci}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\sin\left(\frac{4a}{b}\right)-2\ \mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)+2\ \mathrm{Ci}(2\,\mathrm{ar}\right.}{8db}$ |

input
```
int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
-1/8/d*e^3*(Si(4*arcsin(d*x+c)+4*a/b)*cos(4*a/b)-Ci(4*arcsin(d*x+c)+4*a/b)
*sin(4*a/b)-2*Si(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)+2*Ci(2*arcsin(d*x+c)+2*
a/b)*sin(2*a/b))/b
```

### 3.216.5 Fricas [F]

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^3}{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
integral((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)/(b*arcs
in(d*x + c) + a), x)
```

### 3.216.6 Sympy [F]

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = e^3\left(\int \frac{c^3}{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{d^3x^3}{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{3cd^2x^2}{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{3c^2dx}{a+b\,\mathrm{asin}\,(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c)),x)
```

output
```
e**3*(Integral(c**3/(a + b*asin(c + d*x)), x) + Integral(d**3*x**3/(a + b*
asin(c + d*x)), x) + Integral(3*c*d**2*x**2/(a + b*asin(c + d*x)), x) + In
tegral(3*c**2*d*x/(a + b*asin(c + d*x)), x))
```

### 3.216.7 Maxima [F]

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = \int \frac{(dex+ce)^3}{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a), x)
```

### 3.216.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 277 vs. $2(137) = 274$.

Time = 0.33 (sec) , antiderivative size = 277, normalized size of antiderivative = 1.91

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx = \frac{e^3\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{bd} - \frac{e^3\cos\left(\frac{a}{b}\right)^4\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(dx+c)\right)}{bd} - \frac{e^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{4a}{b}+4\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{2bd} - \frac{e^3\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{2bd} + \frac{e^3\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(dx+c)\right)}{bd} + \frac{e^3\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(dx+c)\right)}{2bd} - \frac{e^3\operatorname{Si}\left(\frac{4a}{b}+4\arcsin(dx+c)\right)}{8bd} - \frac{e^3\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(dx+c)\right)}{4bd}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
e^3*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(d*x + c))*sin(a/b)/(b*d) - e^
3*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b*d) - 1/2*e^3*cos(a
/b)*cos_integral(4*a/b + 4*arcsin(d*x + c))*sin(a/b)/(b*d) - 1/2*e^3*cos(a
/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin(a/b)/(b*d) + e^3*cos(a/b)^
2*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b*d) + 1/2*e^3*cos(a/b)^2*sin_i
ntegral(2*a/b + 2*arcsin(d*x + c))/(b*d) - 1/8*e^3*sin_integral(4*a/b + 4*
arcsin(d*x + c))/(b*d) - 1/4*e^3*sin_integral(2*a/b + 2*arcsin(d*x + c))/(
b*d)
```

### 3.216.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{a+b\arcsin(c+dx)}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^3}{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

input
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x)), x)
```

# 3.217 $\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx$



## 3.217.1 Optimal result

Integrand size = 23, antiderivative size = 141

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = \frac{e^2\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4bd} - \frac{e^2\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4bd} + \frac{e^2\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4bd} - \frac{e^2\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4bd}$$

output
```
1/4*e^2*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b/d-1/4*e^2*Ci(3*(a+b*arcsin(d*
x+c))/b)*cos(3*a/b)/b/d+1/4*e^2*Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/b/d-1/4
*e^2*Si(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b/d
```

### 3.217.2 Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.72

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{e^2\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)-\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)+\sin\left(\frac{a}{b}\right)\text{Si}(}{4bd}$$

input
```
Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^2*(Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] - Cos[(3*a)/b]*CosIntegr
al[3*(a/b + ArcSin[c + d*x])] + Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]
] - Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])]))/(4*b*d)
```

### 3.217.3 Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.82, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {5304, 27, 5146, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int \frac{e^2(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$
$$\frac{e^2\int \frac{(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \text{5146}$$
$$\frac{e^2\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^2\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$
$$\Big\downarrow \text{4906}$$

$$\frac{e^2\int\left(\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4(a+b\arcsin(c+dx))}-\frac{\cos\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e^2\left(\frac{1}{4}\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\frac{1}{4}\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)+\frac{1}{4}\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+\right.\right.}{bd}$$

input
```
Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x]),x]
```

output
```
(e^2*((Cos[a/b]*CosIntegral[(a + b*ArcSin[c + d*x])/b])/4 - (Cos[(3*a)/b]*
CosIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/4 + (Sin[a/b]*SinIntegral[(a +
 b*ArcSin[c + d*x])/b])/4 - (Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c +
 d*x]))/b])/4))/(b*d)
```

### 3.217.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

3.217. $\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx$

### 3.217.4 Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.73

| method | result |
|---|---|
| derivativedivides | $-\frac{e^2\left(\text{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)+\text{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)-\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\text{Ci}(\arcsin(dx+\right.}{4db}$ |
| default | $-\frac{e^2\left(\text{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\cos\left(\frac{3a}{b}\right)+\text{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)-\text{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\text{Ci}(\arcsin(dx+\right.}{4db}$ |

input
```
int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
-1/4/d*e^2*(Ci(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)+Si(3*arcsin(d*x+c)+3*a/b)
*sin(3*a/b)-Si(arcsin(d*x+c)+a/b)*sin(a/b)-Ci(arcsin(d*x+c)+a/b)*cos(a/b))
/b
```

### 3.217.5 Fricas [F]

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = \int \frac{(dex+ce)^2}{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)/(b*arcsin(d*x + c) + a), x)
```

### 3.217.6 Sympy [F]

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = e^2\left(\int \frac{c^2}{a+b\,\text{asin}\,(c+dx)}\,dx + \int \frac{d^2x^2}{a+b\,\text{asin}\,(c+dx)}\,dx + \int \frac{2cdx}{a+b\,\text{asin}\,(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c)),x)
```

output
```
e**2*(Integral(c**2/(a + b*asin(c + d*x)), x) + Integral(d**2*x**2/(a + b*
asin(c + d*x)), x) + Integral(2*c*d*x/(a + b*asin(c + d*x)), x))
```

### 3.217.7 Maxima [F]

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = \int \frac{(dex+ce)^2}{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a), x)
```

### 3.217.8 Giac [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.44

$$\begin{aligned}\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx = &-\frac{e^2\cos\left(\frac{a}{b}\right)^3\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(dx+c)\right)}{bd} \\ &-\frac{e^2\cos\left(\frac{a}{b}\right)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(dx+c)\right)}{bd} \\ &+\frac{3e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{3a}{b}+3\arcsin(dx+c)\right)}{4bd} \\ &+\frac{e^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{4bd} \\ &+\frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3a}{b}+3\arcsin(dx+c)\right)}{4bd} \\ &+\frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{4bd}\end{aligned}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
-e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) - e^2*cos(a/
b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) + 3/4*e^2*cos(
a/b)*cos_integral(3*a/b + 3*arcsin(d*x + c))/(b*d) + 1/4*e^2*cos(a/b)*cos_
integral(a/b + arcsin(d*x + c))/(b*d) + 1/4*e^2*sin(a/b)*sin_integral(3*a/
b + 3*arcsin(d*x + c))/(b*d) + 1/4*e^2*sin(a/b)*sin_integral(a/b + arcsin(
d*x + c))/(b*d)
```

### 3.217.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{a+b\arcsin(c+dx)}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^2}{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

input
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x)), x)
```

# 3.218 $\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx$



## 3.218.1 Optimal result

Integrand size = 21, antiderivative size = 69

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=-\frac{e\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{2bd}+\frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2bd}$$

output
```
1/2*e*cos(2*a/b)*Si(2*(a+b*arcsin(d*x+c))/b)/b/d-1/2*e*Ci(2*(a+b*arcsin(d*
x+c))/b)*sin(2*a/b)/b/d
```

## 3.218.2 Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.88

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=\frac{e\left(-\text{CosIntegral}\left(\frac{2a}{b}+2\arcsin(c+dx)\right)\sin\left(\frac{2a}{b}\right)+\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2a}{b}+2\arcsin(c+dx)\right)\right)}{2bd}$$

input
```
Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x]),x]
```

output
```
(e*(-(CosIntegral[(2*a)/b + 2*ArcSin[c + d*x]]*Sin[(2*a)/b]) + Cos[(2*a)/b
]*SinIntegral[(2*a)/b + 2*ArcSin[c + d*x]]))/(2*b*d)
```

### 3.218.3 Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.88, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {5304, 27, 5146, 25, 4906, 27, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e(c+dx)}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\int \frac{c+dx}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{5146}$$

$$\frac{e\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{25}$$

$$-\frac{e\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{4906}$$

$$-\frac{e\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2(a+b\arcsin(c+dx))}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{27}$$

$$-\frac{e\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{2bd}$$

$$\Big\downarrow \text{3042}$$

$$-\frac{e\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{2bd}$$

$$\Big\downarrow \text{3784}$$

$$\frac{e\left(-\sin\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\cos\left(\frac{2a}{b}\right)\int-\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx\right.}{2bd}$$

$$\Big\downarrow \text{25}$$

$$\frac{e\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))\right)}{2bd}$$

$$\Big\downarrow \text{3042}$$

$$\frac{e\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx\right.}{2bd}$$

$$\Big\downarrow \text{3780}$$

$$\frac{e\left(\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)-\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))\right)}{2bd}$$

$$\Big\downarrow \text{3783}$$

$$\frac{e\left(\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)-\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\right)}{2bd}$$

input
```
Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x]),x]
```

output
```
(e*(-(CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b]*Sin[(2*a)/b]) + Cos[(2*a)
/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/b]))/(2*b*d)
```

### 3.218.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

3.218. $\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx$

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.218. $\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx$

### 3.218.4 Maple [A] (verified)

Time = 0.21 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.87

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{e\left(\operatorname{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\operatorname{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2db}$ | 60 |
| default | $\frac{e\left(\operatorname{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)-\operatorname{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)\right)}{2db}$ | 60 |

input
```
int((d*e*x+c*e)/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
1/2/d*e*(Si(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)-Ci(2*arcsin(d*x+c)+2*a/b)*si
n(2*a/b))/b
```

### 3.218.5 Fricas [F]

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=\int \frac{dex+ce}{b\arcsin\left(dx+c\right)+a}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
integral((d*e*x + c*e)/(b*arcsin(d*x + c) + a), x)
```

### 3.218.6 Sympy [F]

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=e\left(\int \frac{c}{a+b\operatorname{asin}\left(c+dx\right)}\,dx+\int \frac{dx}{a+b\operatorname{asin}\left(c+dx\right)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)/(a+b*asin(d*x+c)),x)
```

output
```
e*(Integral(c/(a + b*asin(c + d*x)), x) + Integral(d*x/(a + b*asin(c + d*x
)), x))
```

### 3.218.7 Maxima [F]

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=\int \frac{dex+ce}{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a), x)
```

### 3.218.8 Giac [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.38

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=-\frac{e\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{2a}{b}+2\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{bd}+\frac{e\cos\left(\frac{a}{b}\right)^2\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(dx+c)\right)}{bd}-\frac{e\operatorname{Si}\left(\frac{2a}{b}+2\arcsin(dx+c)\right)}{2bd}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
-e*cos(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin(a/b)/(b*d) + e*cos
(a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b*d) - 1/2*e*sin_integral
(2*a/b + 2*arcsin(d*x + c))/(b*d)
```

### 3.218.9 Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{a+b\arcsin(c+dx)}\,dx=\int \frac{c\,e+d\,e\,x}{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

input
```
int((c*e + d*e*x)/(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)/(a + b*asin(c + d*x)), x)
```

# 3.219 $\int \frac{1}{a+b\arcsin(c+dx)}\,dx$



## 3.219.1 Optimal result

Integrand size = 12, antiderivative size = 57

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}+\frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}$$

output
```
Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b/d+Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/
b/d
```

## 3.219.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.84

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx = \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(c+dx)\right)}{bd}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-1),x]
```

output
```
(Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] + Sin[a/b]*SinIntegral[a/b +
ArcSin[c + d*x]])/(b*d)
```

### 3.219.3 Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.91, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {5302, 5134, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{a+b\arcsin(c+dx)}dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{5134}$$

$$\frac{\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3784}$$

$$\frac{\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{25}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3780}$$

$$\frac{\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}$$

$$\Big\downarrow \; 3783$$

$$\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{bd}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-1),x]
```

output
```
(Cos[a/b]*CosIntegral[(a + b*ArcSin[c + d*x])/b] + Sin[a/b]*SinIntegral[(a
 + b*ArcSin[c + d*x])/b])/(b*d)
```

### 3.219.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

3.219. $\int \frac{1}{a+b\arcsin(c+dx)}\,dx$

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.219.4 Maple [A] (verified)

Time = 0.26 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.91

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\frac{\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\mathrm{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{d}$ | 52 |
| default | $\frac{\frac{\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)}{b}+\frac{\mathrm{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b}}{d}$ | 52 |

input
```
int(1/(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
1/d*(Si(arcsin(d*x+c)+a/b)*sin(a/b)/b+Ci(arcsin(d*x+c)+a/b)*cos(a/b)/b)
```

### 3.219.5 Fricas [F]

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx=\int \frac{1}{b\arcsin\left(dx+c\right)+a}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
integral(1/(b*arcsin(d*x + c) + a), x)
```

### 3.219.6 Sympy [F]

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx=\int \frac{1}{a+b\operatorname{asin}\left(c+dx\right)}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c)),x)
```

output
```
Integral(1/(a + b*asin(c + d*x)), x)
```

### 3.219.7 Maxima [F]

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx = \int \frac{1}{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
integrate(1/(b*arcsin(d*x + c) + a), x)
```

### 3.219.8 Giac [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.93

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx = \frac{\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{bd} + \frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{bd}$$

input
```
integrate(1/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b*d) + sin(a/b)*sin_integral
(a/b + arcsin(d*x + c))/(b*d)
```

### 3.219.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a+b\arcsin(c+dx)}\,dx = \int \frac{1}{a+b\operatorname{asin}(c+d\,x)}\,dx$$

input
```
int(1/(a + b*asin(c + d*x)),x)
```

output
```
int(1/(a + b*asin(c + d*x)), x)
```

# 3.220 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx$



## 3.220.1 Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\frac{\text{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))},x\right)}{e}$$

output
```
Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c)),x)/e
```

## 3.220.2 Mathematica [N/A]

Not integrable

Time = 0.96 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx$$

input
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])),x]
```

output
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])), x]
```

## 3.220.3 Rubi [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}dx$$
$$\Big\downarrow \text{ 5304}$$
$$\frac{\int \frac{1}{e(c+dx)(a+b\arcsin(c+dx))}d(c+dx)}{d}$$
$$\Big\downarrow \text{ 27}$$
$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))}d(c+dx)}{de}$$
$$\Big\downarrow \text{ 5148}$$
$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))}d(c+dx)}{de}$$

input
```
Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])),x]
```

output
```
$Aborted
```

### 3.220.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.220.4 Maple [N/A] (verified)

Not integrable

Time = 0.34 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{1}{(dex+ce)\left(a+b\arcsin\left(dx+c\right)\right)}dx$$

input
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x)
```

output
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x)
```

### 3.220.5 Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.35

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx = \int \frac{1}{(dex+ce)(b\arcsin\left(dx+c\right)+a)}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
integral(1/(a*d*e*x + a*c*e + (b*d*e*x + b*c*e)*arcsin(d*x + c)), x)
```

### 3.220.6 Sympy [N/A]

Not integrable

Time = 1.03 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.48

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx = \frac{\int \frac{1}{ac+adx+bc\operatorname{asin}\left(c+dx\right)+bdx\operatorname{asin}\left(c+dx\right)}\,dx}{e}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c)),x)
```

output
```
Integral(1/(a*c + a*d*x + b*c*asin(c + d*x) + b*d*x*asin(c + d*x)), x)/e
```

### 3.220.7 Maxima [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\int \frac{1}{(dex+ce)(b\arcsin{(dx+c)}+a)}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)), x)
```

### 3.220.8 Giac [N/A]

Not integrable

Time = 0.90 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx=\int \frac{1}{(dex+ce)(b\arcsin{(dx+c)}+a)}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)), x)
```

### 3.220.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))}\,dx = \int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}\,dx$$

input
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))),x)
```

output
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))), x)
```

# 3.221 $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx$



## 3.221.1 Optimal result

Integrand size = 23, antiderivative size = 258

$$\begin{aligned}\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = & -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} \\ & +\frac{e^4\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{8b^2d} \\ & -\frac{9e^4\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{16b^2d} \\ & +\frac{5e^4\,\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{16b^2d} \\ & -\frac{e^4\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^2d} \\ & +\frac{9e^4\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16b^2d} \\ & -\frac{5e^4\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16b^2d}\end{aligned}$$

output
```
-1/8*e^4*cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^2/d+9/16*e^4*cos(3*a/b)*Si(3
*(a+b*arcsin(d*x+c))/b)/b^2/d-5/16*e^4*cos(5*a/b)*Si(5*(a+b*arcsin(d*x+c))
/b)/b^2/d+1/8*e^4*Ci((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^2/d-9/16*e^4*Ci(3*(
a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^2/d+5/16*e^4*Ci(5*(a+b*arcsin(d*x+c))/b
)*sin(5*a/b)/b^2/d-e^4*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c
))
```

### 3.221.2 Mathematica [A] (verified)

Time = 1.61 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.10

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = \frac{e^4\left(-\frac{16b(c+dx)^4\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)}+16\left(-3\,\mathrm{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)\sin\left(\frac{a}{b}\right)+\mathrm{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(c\right.\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^4*((-16*b*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x]) +
16*(-3*CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] + CosIntegral[3*(a/b +
ArcSin[c + d*x])]*Sin[(3*a)/b] + 3*Cos[a/b]*SinIntegral[a/b + ArcSin[c + d
*x]] - Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])]) + 5*(10*CosInt
egral[a/b + ArcSin[c + d*x]]*Sin[a/b] - 5*CosIntegral[3*(a/b + ArcSin[c +
d*x])]*Sin[(3*a)/b] + CosIntegral[5*(a/b + ArcSin[c + d*x])]*Sin[(5*a)/b]
- 10*Cos[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] + 5*Cos[(3*a)/b]*SinInteg
ral[3*(a/b + ArcSin[c + d*x])] - Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[
c + d*x])])))/(16*b^2*d)
```

### 3.221.3 Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 210, normalized size of antiderivative = 0.81, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {5304, 27, 5142, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int \frac{e^4(c+dx)^4}{(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$

$$\Big\downarrow \ 27$$

$$\frac{e^4\int \frac{(c+dx)^4}{(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$

$\Big\downarrow$ 5142

$$\frac{e^4\left(\frac{\int \left(\frac{5\sin\left(\frac{5a}{b}-\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16(a+b\arcsin(c+dx))}-\frac{9\sin\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16(a+b\arcsin(c+dx))}+\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{8(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^4\sqrt{1-(c+dx}}{b(a+b\arcsin(c+dx}}\right.}{d}$$

$\Big\downarrow$ 2009

$$\frac{e^4\left(\frac{\frac{1}{8}\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\frac{9}{16}\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)+\frac{5}{16}\sin\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)-\frac{1}{8}\cos(}{b^2}\right.}{d}$$

input
```
Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^4*(-(((c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x]))) +
 ((CosIntegral[(a + b*ArcSin[c + d*x])/b]*Sin[a/b])/8 - (9*CosIntegral[(3*
(a + b*ArcSin[c + d*x]))/b]*Sin[(3*a)/b])/16 + (5*CosIntegral[(5*(a + b*Ar
cSin[c + d*x]))/b]*Sin[(5*a)/b])/16 - (Cos[a/b]*SinIntegral[(a + b*ArcSin[
c + d*x])/b])/8 + (9*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))/
b])/16 - (5*Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c + d*x]))/b])/16)/b
^2))/d
```

### 3.221.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

3.221. $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx$

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.221.4 Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 396, normalized size of antiderivative = 1.53

| method | result |
|---|---|
| derivativedivides | $-\frac{e^4\left(5\arcsin(dx+c)\cos\left(\frac{5a}{b}\right)\mathrm{Si}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)b+9\arcsin(dx+c)\,\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b-5\arcsin(dx+\right.}{}$ |
| default | $-\frac{e^4\left(5\arcsin(dx+c)\cos\left(\frac{5a}{b}\right)\mathrm{Si}\left(5\arcsin(dx+c)+\frac{5a}{b}\right)b+9\arcsin(dx+c)\,\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)\sin\left(\frac{3a}{b}\right)b-5\arcsin(dx+\right.}{}$ |

input
```
int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
-1/16/d*e^4*(5*arcsin(d*x+c)*cos(5*a/b)*Si(5*arcsin(d*x+c)+5*a/b)*b+9*arcs
in(d*x+c)*Ci(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)*b-5*arcsin(d*x+c)*sin(5*a/b
)*Ci(5*arcsin(d*x+c)+5*a/b)*b+2*arcsin(d*x+c)*cos(a/b)*Si(arcsin(d*x+c)+a/
b)*b-2*arcsin(d*x+c)*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*b-9*arcsin(d*x+c)*cos(
3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*b+5*cos(5*a/b)*Si(5*arcsin(d*x+c)+5*a/b)*
a+9*Ci(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)*a-5*sin(5*a/b)*Ci(5*arcsin(d*x+c)
+5*a/b)*a+2*cos(a/b)*Si(arcsin(d*x+c)+a/b)*a-2*sin(a/b)*Ci(arcsin(d*x+c)+a
/b)*a-9*cos(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*a+cos(5*arcsin(d*x+c))*b-3*co
s(3*arcsin(d*x+c))*b+2*(1-(d*x+c)^2)^(1/2)*b)/(a+b*arcsin(d*x+c))/b^2
```

### 3.221.5 Fricas [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{(dex+ce)^4}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*
x + c^4*e^4)/(b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2), x)
```

### 3.221.6 Sympy [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = e^4\left(\int \frac{c^4}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{d^4x^4}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{4cd^3x^3}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{6c^2d^2x^2}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{4c^3dx}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**2,x)
```

output
```
e**4*(Integral(c**4/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2),
x) + Integral(d**4*x**4/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**
2), x) + Integral(4*c*d**3*x**3/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c
+ d*x)**2), x) + Integral(6*c**2*d**2*x**2/(a**2 + 2*a*b*asin(c + d*x) + b
**2*asin(c + d*x)**2), x) + Integral(4*c**3*d*x/(a**2 + 2*a*b*asin(c + d*x
) + b**2*asin(c + d*x)**2), x))
```

### 3.221.7 Maxima [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(dex+ce)^4}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
-((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x + c^4
*e^4)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1) - (b^2*d*arctan2(d*x + c, sqrt(
d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)*integrate((5*d^5*e^4*x^5 + 25*c*
d^4*e^4*x^4 + 2*(25*c^2 - 2)*d^3*e^4*x^3 + 2*(25*c^3 - 6*c)*d^2*e^4*x^2 +
(25*c^4 - 12*c^2)*d*e^4*x + (5*c^5 - 4*c^3)*e^4)*sqrt(d*x + c + 1)*sqrt(-d
*x - c + 1)/(a*b*d^2*x^2 + 2*a*b*c*d*x + a*b*c^2 - a*b + (b^2*d^2*x^2 + 2*
b^2*c*d*x + b^2*c^2 - b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x -
c + 1))), x))/(b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)
) + a*b*d)
```

### 3.221.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1401 vs. 2(244) = 488.

Time = 0.42 (sec) , antiderivative size = 1401, normalized size of antiderivative = 5.43

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
5*b*e^4*arcsin(d*x + c)*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(d*x + c))
*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 5*b*e^4*arcsin(d*x + c)*cos(
a/b)^5*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*
b^2*d) + 5*a*e^4*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/
b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 5*a*e^4*cos(a/b)^5*sin_integral(5*a
/b + 5*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 15/4*b*e^4*arc
sin(d*x + c)*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(
b^3*d*arcsin(d*x + c) + a*b^2*d) - 9/4*b*e^4*arcsin(d*x + c)*cos(a/b)^2*co
s_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*
b^2*d) + 25/4*b*e^4*arcsin(d*x + c)*cos(a/b)^3*sin_integral(5*a/b + 5*arcs
in(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 9/4*b*e^4*arcsin(d*x + c)
*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c)
 + a*b^2*d) - 15/4*a*e^4*cos(a/b)^2*cos_integral(5*a/b + 5*arcsin(d*x + c)
)*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 9/4*a*e^4*cos(a/b)^2*cos_in
tegral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*
d) + 25/4*a*e^4*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^3*d*
arcsin(d*x + c) + a*b^2*d) + 9/4*a*e^4*cos(a/b)^3*sin_integral(3*a/b + 3*a
rcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 5/16*b*e^4*arcsin(d*x
+ c)*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x +
c) + a*b^2*d) + 9/16*b*e^4*arcsin(d*x + c)*cos_integral(3*a/b + 3*arcsi...
```

### 3.221.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(c\,e+d\,e\,x)^4}{(a+b\,\mathrm{asin}\,(c+d\,x))^2}\,dx$$

input
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^2, x)
```

# 3.222 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx$



## 3.222.1 Optimal result

Integrand size = 23, antiderivative size = 190

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e^3\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} - \frac{e^3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} + \frac{e^3\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^2d} - \frac{e^3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2b^2d}$$

output
```
1/2*e^3*Ci(2*(a+b*arcsin(d*x+c))/b)*cos(2*a/b)/b^2/d-1/2*e^3*Ci(4*(a+b*arc
sin(d*x+c))/b)*cos(4*a/b)/b^2/d+1/2*e^3*Si(2*(a+b*arcsin(d*x+c))/b)*sin(2*
a/b)/b^2/d-1/2*e^3*Si(4*(a+b*arcsin(d*x+c))/b)*sin(4*a/b)/b^2/d-e^3*(d*x+c
)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
```

### 3.222.2 Mathematica [A] (verified)

Time = 1.34 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.16

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx =$$
$$-\frac{e^3\left(\frac{2b(c+dx)^3\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)}-4\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)+\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(4\left(\frac{a}{b}+\right.\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^2,x]
```

output
```
-1/2*(e^3*((2*b*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])
 - 4*Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c + d*x])] + Cos[(4*a)/b]*Co
sIntegral[4*(a/b + ArcSin[c + d*x])] + 3*Log[a + b*ArcSin[c + d*x]] - 4*Si
n[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c + d*x])] + 3*(Cos[(2*a)/b]*CosInt
egral[2*(a/b + ArcSin[c + d*x])] - Log[a + b*ArcSin[c + d*x]] + Sin[(2*a)/
b]*SinIntegral[2*(a/b + ArcSin[c + d*x])]) + Sin[(4*a)/b]*SinIntegral[4*(a
/b + ArcSin[c + d*x])])))/(b^2*d)
```

### 3.222.3 Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 160, normalized size of antiderivative = 0.84, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {5304, 27, 5142, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx$$
$$\Big\downarrow \text{ 5304}$$
$$\frac{\int \frac{e^3(c+dx)^3}{(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$
$$\Big\downarrow \text{ 27}$$
$$\frac{e^3\int \frac{(c+dx)^3}{(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$
$$\Big\downarrow \text{ 5142}$$

$$\frac{e^3\left(\frac{\int\left(\frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2(a+b\arcsin(c+dx))}-\frac{\cos\left(\frac{4a}{b}-\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^3\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{d}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e^3\left(\frac{\frac{1}{2}\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)-\frac{1}{2}\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)+\frac{1}{2}\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)-\frac{1}{2}\sin\left(\frac{4a}{b}\right)\text{Si}(}{b^2}\right.}{d}$$

input
```
Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^3*(-(((c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x]))) +
 ((Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/2 - (Cos[(4*a)
/b]*CosIntegral[(4*(a + b*ArcSin[c + d*x]))/b])/2 + (Sin[(2*a)/b]*SinInteg
ral[(2*(a + b*ArcSin[c + d*x]))/b])/2 - (Sin[(4*a)/b]*SinIntegral[(4*(a +
b*ArcSin[c + d*x]))/b])/2)/b^2))/d
```

### 3.222.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.222.4 Maple [A] (verified)

Time = 0.30 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.47

| method | result |
|---|---|
| derivativedivides | $\frac{e^3\left(4\arcsin(dx+c)\operatorname{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b-4\arcsin(dx+c)\sin\left(\frac{4a}{b}\right)\operatorname{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)b-4\arcsin(dx+c)\right.}{}$ |
| default | $\frac{e^3\left(4\arcsin(dx+c)\operatorname{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\cos\left(\frac{2a}{b}\right)b-4\arcsin(dx+c)\sin\left(\frac{4a}{b}\right)\operatorname{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)b-4\arcsin(dx+c)\right.}{}$ |

input
```
int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
1/8/d*e^3*(4*arcsin(d*x+c)*Ci(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)*b-4*arcsin
(d*x+c)*sin(4*a/b)*Si(4*arcsin(d*x+c)+4*a/b)*b-4*arcsin(d*x+c)*cos(4*a/b)*
Ci(4*arcsin(d*x+c)+4*a/b)*b+4*arcsin(d*x+c)*sin(2*a/b)*Si(2*arcsin(d*x+c)+
2*a/b)*b+4*Ci(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)*a-4*sin(4*a/b)*Si(4*arcsin
(d*x+c)+4*a/b)*a-4*cos(4*a/b)*Ci(4*arcsin(d*x+c)+4*a/b)*a+4*sin(2*a/b)*Si(
2*arcsin(d*x+c)+2*a/b)*a+sin(4*arcsin(d*x+c))*b-2*sin(2*arcsin(d*x+c))*b)/
(a+b*arcsin(d*x+c))/b^2
```

### 3.222.5 Fricas [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)/(b^2*ar
csin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2), x)
```

### 3.222.6 Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = e^3\left(\int \frac{c^3}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{d^3x^3}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{3cd^2x^2}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{3c^2dx}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**2,x)
```

output
```
e**3*(Integral(c**3/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2),
x) + Integral(d**3*x**3/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**
2), x) + Integral(3*c*d**2*x**2/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c
+ d*x)**2), x) + Integral(3*c**2*d*x/(a**2 + 2*a*b*asin(c + d*x) + b**2*as
in(c + d*x)**2), x))
```

### 3.222.7 Maxima [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
-((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)*sqrt(d*x + c +
 1)*sqrt(-d*x - c + 1) - (b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d
*x - c + 1)) + a*b*d)*integrate((4*d^4*e^3*x^4 + 16*c*d^3*e^3*x^3 + 3*(8*c
^2 - 1)*d^2*e^3*x^2 + 2*(8*c^3 - 3*c)*d*e^3*x + (4*c^4 - 3*c^2)*e^3)*sqrt(
d*x + c + 1)*sqrt(-d*x - c + 1)/(a*b*d^2*x^2 + 2*a*b*c*d*x + a*b*c^2 - a*b
 + (b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 - b^2)*arctan2(d*x + c, sqrt(d*x +
 c + 1)*sqrt(-d*x - c + 1))), x))/(b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1
)*sqrt(-d*x - c + 1)) + a*b*d)
```

### 3.222.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 928 vs. $2(180) = 360$.

Time = 0.41 (sec) , antiderivative size = 928, normalized size of antiderivative = 4.88

$$\int \frac{(ce + dex)^3}{(a + b \arcsin(c + dx))^2} \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
-4*b*e^3*arcsin(d*x + c)*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(d*x + c)
)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 4*b*e^3*arcsin(d*x + c)*cos(a/b)^3*s
in(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a
*b^2*d) - 4*a*e^3*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*
d*arcsin(d*x + c) + a*b^2*d) - 4*a*e^3*cos(a/b)^3*sin(a/b)*sin_integral(4*
a/b + 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 4*b*e^3*arcsi
n(d*x + c)*cos(a/b)^2*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*arcsi
n(d*x + c) + a*b^2*d) + b*e^3*arcsin(d*x + c)*cos(a/b)^2*cos_integral(2*a/
b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 2*b*e^3*arcsin(
d*x + c)*cos(a/b)*sin(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*
arcsin(d*x + c) + a*b^2*d) + b*e^3*arcsin(d*x + c)*cos(a/b)*sin(a/b)*sin_i
ntegral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 4*a
*e^3*cos(a/b)^2*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x
+ c) + a*b^2*d) + a*e^3*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))
/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 2*a*e^3*cos(a/b)*sin(a/b)*sin_integra
l(4*a/b + 4*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + a*e^3*cos
(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x +
 c) + a*b^2*d) + (-(d*x + c)^2 + 1)^(3/2)*(d*x + c)*b*e^3/(b^3*d*arcsin(d*
x + c) + a*b^2*d) - 1/2*b*e^3*arcsin(d*x + c)*cos_integral(4*a/b + 4*arcsi
n(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 1/2*b*e^3*arcsin(d*x + ...
```

### 3.222.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce + dex)^3}{(a + b \arcsin(c + dx))^2} \, dx = \int \frac{(c\,e + d\,e\,x)^3}{(a + b\,\mathrm{asin}\,(c + d\,x))^2} \, dx$$

input
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^2, x)
```

# 3.223 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx$



## 3.223.1 Optimal result

Integrand size = 23, antiderivative size = 186

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx = -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{4b^2d} - \frac{3e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{4b^2d} - \frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{4b^2d} + \frac{3e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4b^2d}$$

output
```
-1/4*e^2*cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^2/d+3/4*e^2*cos(3*a/b)*Si(3*
(a+b*arcsin(d*x+c))/b)/b^2/d+1/4*e^2*Ci((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^
2/d-3/4*e^2*Ci(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^2/d-e^2*(d*x+c)^2*(1-
(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
```

### 3.223.2 Mathematica [A] (verified)

Time = 1.23 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.75

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx$$
$$= \frac{e^2\left(-\frac{4b(c+dx)^2\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)} + \text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)\sin\left(\frac{a}{b}\right) - 3\,\text{CosIntegral}\left(3\left(\frac{a}{b}+\arcsin(c+dx\right.\right.}{4b^2d}$$

input
```
Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^2*((-4*b*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x]) + C
osIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] - 3*CosIntegral[3*(a/b + ArcSin
[c + d*x])]*Sin[(3*a)/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] + 3
*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])]))/(4*b^2*d)
```

### 3.223.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.84, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {5304, 27, 5142, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int \frac{e^2(c+dx)^2}{(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{e^2\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$

$$\Big\downarrow \; 5142$$

$$\frac{e^2\left(\frac{\int \left(\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4(a+b\arcsin(c+dx))}-\frac{3\sin\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{d}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e^2\left(\frac{\frac{1}{4}\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\frac{3}{4}\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)-\frac{1}{4}\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)+\frac{3}{4}\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\,a\ldots}{}\right.}{b^2}\right.}{d}$$

input
```
Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e^2*(-(((c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x]))) +
 ((CosIntegral[(a + b*ArcSin[c + d*x])/b]*Sin[a/b])/4 - (3*CosIntegral[(3*
(a + b*ArcSin[c + d*x]))/b]*Sin[(3*a)/b])/4 - (Cos[a/b]*SinIntegral[(a + b
*ArcSin[c + d*x])/b])/4 + (3*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c +
 d*x]))/b])/4)/b^2))/d
```

### 3.223.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.223.4 Maple [A] (verified)

Time = 0.62 (sec) , antiderivative size = 266, normalized size of antiderivative = 1.43

| method | result |
|---|---|
| derivativedivides | $\frac{e^2\left(\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)b-\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b+3\arcsin(dx+c)\cos\left(\frac{3a}{b}\right)\operatorname{S}\right.}{}$ |
| default | $\frac{e^2\left(\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)b-\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b+3\arcsin(dx+c)\cos\left(\frac{3a}{b}\right)\operatorname{S}\right.}{}$ |

input
```
int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
1/4/d*e^2*(arcsin(d*x+c)*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*b-arcsin(d*x+c)*co
s(a/b)*Si(arcsin(d*x+c)+a/b)*b+3*arcsin(d*x+c)*cos(3*a/b)*Si(3*arcsin(d*x+
c)+3*a/b)*b-3*arcsin(d*x+c)*Ci(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)*b+sin(a/b
)*Ci(arcsin(d*x+c)+a/b)*a-cos(a/b)*Si(arcsin(d*x+c)+a/b)*a+3*cos(3*a/b)*Si
(3*arcsin(d*x+c)+3*a/b)*a-3*Ci(3*arcsin(d*x+c)+3*a/b)*sin(3*a/b)*a+cos(3*a
rcsin(d*x+c))*b-(1-(d*x+c)^2)^(1/2)*b)/(a+b*arcsin(d*x+c))/b^2
```

### 3.223.5 Fricas [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)/(b^2*arcsin(d*x + c)^2 + 2*
a*b*arcsin(d*x + c) + a^2), x)
```

### 3.223.6 Sympy [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx = e^2\left(\int \frac{c^2}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{d^2x^2}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx + \int \frac{2cdx}{a^2+2ab\operatorname{asin}(c+dx)+b^2\operatorname{asin}^2(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**2,x)
```

output
```
e**2*(Integral(c**2/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2),
x) + Integral(d**2*x**2/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**
2), x) + Integral(2*c*d*x/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)
**2), x))
```

### 3.223.7 Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
-((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)*sqrt(d*x + c + 1)*sqrt(-d*x - c +
1) - (b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d
)*integrate((3*d^3*e^2*x^3 + 9*c*d^2*e^2*x^2 + (9*c^2 - 2)*d*e^2*x + (3*c^
3 - 2*c)*e^2)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)/(a*b*d^2*x^2 + 2*a*b*c*
d*x + a*b*c^2 - a*b + (b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 - b^2)*arctan2(
d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))), x))/(b^2*d*arctan2(d*x +
c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)
```

### 3.223.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 698 vs. $2(176) = 352$.

Time = 0.41 (sec) , antiderivative size = 698, normalized size of antiderivative = 3.75

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx$$
$$= -\frac{3\,be^2\arcsin(dx+c)\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{b^3d\arcsin(dx+c)+ab^2d}$$
$$+\frac{3\,be^2\arcsin(dx+c)\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}$$
$$-\frac{3\,ae^2\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{b^3d\arcsin(dx+c)+ab^2d}$$
$$+\frac{3\,ae^2\cos\left(\frac{a}{b}\right)^3\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}$$
$$+\frac{3\,be^2\arcsin(dx+c)\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$+\frac{be^2\arcsin(dx+c)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$-\frac{9\,be^2\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$-\frac{be^2\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$+\frac{3\,ae^2\operatorname{Ci}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}+\frac{ae^2\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$-\frac{9\,ae^2\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{3\,a}{b}+3\,\arcsin(dx+c)\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}-\frac{ae^2\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{4\,(b^3d\arcsin(dx+c)+ab^2d)}$$
$$+\frac{\left(-(dx+c)^2+1\right)^{\frac{3}{2}}be^2}{b^3d\arcsin(dx+c)+ab^2d}-\frac{\sqrt{-(dx+c)^2+1}be^2}{b^3d\arcsin(dx+c)+ab^2d}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
-3*b*e^2*arcsin(d*x + c)*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x + c)
)*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 3*b*e^2*arcsin(d*x + c)*cos
(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a
*b^2*d) - 3*a*e^2*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a
/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 3*a*e^2*cos(a/b)^3*sin_integral(3*
a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 3/4*b*e^2*arc
sin(d*x + c)*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsi
n(d*x + c) + a*b^2*d) + 1/4*b*e^2*arcsin(d*x + c)*cos_integral(a/b + arcsi
n(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 9/4*b*e^2*arcsin(
d*x + c)*cos(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^3*d*arcsin(d*
x + c) + a*b^2*d) - 1/4*b*e^2*arcsin(d*x + c)*cos(a/b)*sin_integral(a/b +
arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + 3/4*a*e^2*cos_integra
l(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) +
1/4*a*e^2*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x +
 c) + a*b^2*d) - 9/4*a*e^2*cos(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c)
)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - 1/4*a*e^2*cos(a/b)*sin_integral(a/b
+ arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + (-(d*x + c)^2 + 1)^
(3/2)*b*e^2/(b^3*d*arcsin(d*x + c) + a*b^2*d) - sqrt(-(d*x + c)^2 + 1)*b*e
^2/(b^3*d*arcsin(d*x + c) + a*b^2*d)
```

### 3.223.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\,(c+d\,x))^2}\,dx$$

input
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^2, x)
```

# 3.224 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx$



## 3.224.1 Optimal result

Integrand size = 21, antiderivative size = 104

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx = -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{e\cos\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2d} + \frac{e\sin\left(\frac{2a}{b}\right)\operatorname{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2d}$$

output
```
e*Ci(2*(a+b*arcsin(d*x+c))/b)*cos(2*a/b)/b^2/d+e*Si(2*(a+b*arcsin(d*x+c))/
b)*sin(2*a/b)/b^2/d-e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
```

## 3.224.2 Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.95

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx = \frac{e\left(-\frac{b(c+dx)\sqrt{1-c^2-2cdx-d^2x^2}}{a+b\arcsin(c+dx)} + \cos\left(\frac{2a}{b}\right)\operatorname{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right) + \sin\left(\frac{2a}{b}\right)\operatorname{Si}\left(2\left(\frac{a}{b}+\arcsin(c+\right.\right.\right.}{b^2d}$$

input
```
Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e*(-((b*(c + d*x)*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])/(a + b*ArcSin[c + d*
x])) + Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c + d*x])] + Sin[(2*a)/b]*
SinIntegral[2*(a/b + ArcSin[c + d*x])]))/(b^2*d)
```

### 3.224.3 Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.92, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {5304, 27, 5142, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e(c+dx)}{(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\int \frac{c+dx}{(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$

$$\Big\downarrow \text{5142}$$

$$\frac{e\left(\frac{\int \frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{d}$$

$$\Big\downarrow \text{3042}$$

$$\frac{e\left(\frac{\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{d}$$

$$\Big\downarrow \text{3784}$$

$$\frac{e\left(\frac{\cos\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int -\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{d}$$

$\downarrow$ 25

$$\frac{e\left(\frac{\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{d}$$

$\downarrow$ 3042

$$\frac{e\left(\frac{\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{d}$$

$\downarrow$ 3780

$$\frac{e\left(\frac{\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{d}$$

$\downarrow$ 3783

$$\frac{e\left(\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)+\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{d}$$

input
```
Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(e*(-(((c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x]))) + (Co
s[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b] + Sin[(2*a)/b]*SinIn
tegral[(2*(a + b*ArcSin[c + d*x]))/b])/b^2))/d
```

### 3.224.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.224.4 Maple [A] (verified)

Time = 0.20 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.45

| method | result |
|---|---|
| derivativedivides | $\frac{e(2\arcsin(dx+c)\,\mathrm{Ci}(2\arcsin(dx+c)+\frac{2a}{b})\cos(\frac{2a}{b})b+2\arcsin(dx+c)\sin(\frac{2a}{b})\,\mathrm{Si}(2\arcsin(dx+c)+\frac{2a}{b})b+2\ \mathrm{Ci}(2\arcsin(dx}{2d(a+b\arcsin(dx+c))b^2}$ |
| default | $\frac{e(2\arcsin(dx+c)\,\mathrm{Ci}(2\arcsin(dx+c)+\frac{2a}{b})\cos(\frac{2a}{b})b+2\arcsin(dx+c)\sin(\frac{2a}{b})\,\mathrm{Si}(2\arcsin(dx+c)+\frac{2a}{b})b+2\ \mathrm{Ci}(2\arcsin(dx}{2d(a+b\arcsin(dx+c))b^2}$ |

input
```
int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
1/2/d*e*(2*arcsin(d*x+c)*Ci(2*arcsin(d*x+c)+2*a/b)*cos(2*a/b)*b+2*arcsin(d
*x+c)*sin(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*b+2*Ci(2*arcsin(d*x+c)+2*a/b)*c
os(2*a/b)*a+2*sin(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*a-sin(2*arcsin(d*x+c))*
b)/(a+b*arcsin(d*x+c))/b^2
```

### 3.224.5 Fricas [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{dex+ce}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral((d*e*x + c*e)/(b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^
2), x)
```

### 3.224.6 Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx=e\left(\int \frac{c}{a^2+2ab\,\mathrm{asin}\,(c+dx)+b^2\,\mathrm{asin}^2\,(c+dx)}\,dx+\int \frac{dx}{a^2+2ab\,\mathrm{asin}\,(c+dx)+b^2\,\mathrm{asin}^2\,(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**2,x)
```

output
```
e*(Integral(c/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2), x) + I
ntegral(d*x/(a**2 + 2*a*b*asin(c + d*x) + b**2*asin(c + d*x)**2), x))
```

### 3.224.7 Maxima [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{dex+ce}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
-((d*e*x + c*e)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1) - (b^2*d*arctan2(d*x
+ c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)*integrate((2*d^2*e*x^2
 + 4*c*d*e*x + (2*c^2 - 1)*e)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)/(a*b*d^
2*x^2 + 2*a*b*c*d*x + a*b*c^2 - a*b + (b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2
 - b^2)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))), x))/(b^2*
d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)
```

### 3.224.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 341 vs. $2(102) = 204$.

Time = 0.37 (sec) , antiderivative size = 341, normalized size of antiderivative = 3.28

$$\begin{aligned}\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx &= \frac{2\,be\arcsin(dx+c)\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}\\
&\quad+\frac{2\,be\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}\\
&\quad+\frac{2\,ae\cos\left(\frac{a}{b}\right)^2\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}\\
&\quad+\frac{2\,ae\cos\left(\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{2\,a}{b}+2\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}\\
&\quad-\frac{be\arcsin(dx+c)\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}\\
&\quad-\frac{\sqrt{-(dx+c)^2+1}(dx+c)be}{b^3d\arcsin(dx+c)+ab^2d}-\frac{ae\operatorname{Ci}\left(\frac{2\,a}{b}+2\,\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d}\end{aligned}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
2*b*e*arcsin(d*x + c)*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(
b^3*d*arcsin(d*x + c) + a*b^2*d) + 2*b*e*arcsin(d*x + c)*cos(a/b)*sin(a/b)
*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d)
 + 2*a*e*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(
d*x + c) + a*b^2*d) + 2*a*e*cos(a/b)*sin(a/b)*sin_integral(2*a/b + 2*arcsi
n(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - b*e*arcsin(d*x + c)*cos_in
tegral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - sqrt
(-(d*x + c)^2 + 1)*(d*x + c)*b*e/(b^3*d*arcsin(d*x + c) + a*b^2*d) - a*e*c
os_integral(2*a/b + 2*arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d)
```

### 3.224.9 Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{c\,e+d\,e\,x}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^2}\,dx$$

input
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^2, x)
```

# 3.225 $\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx$



## 3.225.1 Optimal result

Integrand size = 12, antiderivative size = 93

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = -\frac{\sqrt{1-(c+dx)^2}}{bd(a+b\arcsin(c+dx))} + \frac{\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{b^2d} - \frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2d}$$

output
```
-cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^2/d+Ci((a+b*arcsin(d*x+c))/b)*sin(a/
b)/b^2/d-(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
```

## 3.225.2 Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.85

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \frac{-\frac{b\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)} + \text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)\sin\left(\frac{a}{b}\right) - \cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a}{b}+\arcsin(c+dx)\right)}{b^2d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-2),x]
```

output
```
(-((b*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])) + CosIntegral[a/b +
ArcSin[c + d*x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b + ArcSin[c + d*x]])/(
b^2*d)
```

### 3.225.3 Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.95, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.833$, Rules used = {5302, 5132, 5224, 25, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$

$$\Big\downarrow \text{5132}$$

$$\frac{-\frac{\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}d(c+dx)}{b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{d}$$

$$\Big\downarrow \text{5224}$$

$$\frac{-\frac{\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{d}$$

$$\Big\downarrow \text{25}$$

$$\frac{\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{d}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{d}$$

$$\Big\downarrow \text{3784}$$

$$-\frac{\frac{-\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int-\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{d}$$

$\Big\downarrow$ 25

$$-\frac{\frac{\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{d}$$

$\Big\downarrow$ 3042

$$-\frac{\frac{\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{d}$$

$\Big\downarrow$ 3780

$$-\frac{\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{d}$$

$\Big\downarrow$ 3783

$$-\frac{\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-2),x]
```

output
```
(-(Sqrt[1 - (c + d*x)^2]/(b*(a + b*ArcSin[c + d*x]))) - (-(CosIntegral[(a
+ b*ArcSin[c + d*x])/b]*Sin[a/b]) + Cos[a/b]*SinIntegral[(a + b*ArcSin[c +
 d*x])/b])/b^2)/d
```

### 3.225.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

---

3.225. $\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx$

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.225.4 Maple [A] (verified)

Time = 0.41 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.88

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{\sqrt{1-(dx+c)^2}}{(a+b\arcsin(dx+c))b}+\frac{\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b^2}}{d}$ | 82 |
| default | $\frac{-\frac{\sqrt{1-(dx+c)^2}}{(a+b\arcsin(dx+c))b}+\frac{\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\sin\left(\frac{a}{b}\right)-\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)}{b^2}}{d}$ | 82 |

input
```
int(1/(a+b*arcsin(d*x+c))^2,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-(1-(d*x+c)^2)^(1/2)/(a+b*arcsin(d*x+c))/b+(Ci(arcsin(d*x+c)+a/b)*sin
(a/b)-Si(arcsin(d*x+c)+a/b)*cos(a/b))/b^2)
```

### 3.225.5 Fricas [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral(1/(b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2), x)
```

### 3.225.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^2}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**2,x)
```

output
```
Integral((a + b*asin(c + d*x))**(-2), x)
```

### 3.225.7 Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
((b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b*d)*in
tegrate(sqrt(d*x + c + 1)*(d*x + c)*sqrt(-d*x - c + 1)/(a*b*d^2*x^2 + 2*a*
b*c*d*x + a*b*c^2 - a*b + (b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 - b^2)*arct
an2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))), x) - sqrt(d*x + c + 1
)*sqrt(-d*x - c + 1))/(b^2*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x
- c + 1)) + a*b*d)
```

### 3.225.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 215 vs. $2(91) = 182$.

Time = 0.31 (sec) , antiderivative size = 215, normalized size of antiderivative = 2.31

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx = \frac{b\arcsin(dx+c)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{b^3d\arcsin(dx+c)+ab^2d} - \frac{b\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d} + \frac{a\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)\sin\left(\frac{a}{b}\right)}{b^3d\arcsin(dx+c)+ab^2d} - \frac{a\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{b^3d\arcsin(dx+c)+ab^2d} - \frac{\sqrt{-(dx+c)^2+1}b}{b^3d\arcsin(dx+c)+ab^2d}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
b*arcsin(d*x + c)*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^3*d*arcs
in(d*x + c) + a*b^2*d) - b*arcsin(d*x + c)*cos(a/b)*sin_integral(a/b + arc
sin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) + a*cos_integral(a/b + arc
sin(d*x + c))*sin(a/b)/(b^3*d*arcsin(d*x + c) + a*b^2*d) - a*cos(a/b)*sin_
integral(a/b + arcsin(d*x + c))/(b^3*d*arcsin(d*x + c) + a*b^2*d) - sqrt(-
(d*x + c)^2 + 1)*b/(b^3*d*arcsin(d*x + c) + a*b^2*d)
```

### 3.225.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^2}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^2}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^2,x)
```

output
```
int(1/(a + b*asin(c + d*x))^2, x)
```

# 3.226 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx$



## 3.226.1 Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \frac{\text{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^2},x\right)}{e}$$

output
```
Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^2,x)/e
```

## 3.226.2 Mathematica [N/A]

Not integrable

Time = 4.96 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx$$

input
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2),x]
```

output
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2), x]
```

### 3.226.3 Rubi [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{1}{e(c+dx)(a+b\arcsin(c+dx))^2}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^2}d(c+dx)}{de}$$

$$\Big\downarrow \text{5148}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^2}d(c+dx)}{de}$$

input
```
Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^2),x]
```

output
```
$Aborted
```

#### 3.226.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.226.4 Maple [N/A] (verified)

Not integrable

Time = 0.38 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{1}{(dex + ce)\left(a + b\arcsin\left(dx + c\right)\right)^2} dx$$

input
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x)
```

output
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x)
```

## 3.226.5 Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 61, normalized size of antiderivative = 2.65

$$\int \frac{1}{(ce + dex)(a + b\arcsin(c + dx))^2} \, dx = \int \frac{1}{(dex + ce)(b\arcsin\left(dx + c\right) + a)^2} \, dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral(1/(a^2*d*e*x + a^2*c*e + (b^2*d*e*x + b^2*c*e)*arcsin(d*x + c)^2
+ 2*(a*b*d*e*x + a*b*c*e)*arcsin(d*x + c)), x)
```

### 3.226.6 Sympy [N/A]

Not integrable

Time = 1.86 (sec) , antiderivative size = 73, normalized size of antiderivative = 3.17

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \frac{\int \frac{1}{a^2c+a^2dx+2abc\,\mathrm{asin}\,(c+dx)+2abdx\,\mathrm{asin}\,(c+dx)+b^2c\,\mathrm{asin}^2\,(c+dx)+b^2dx\,\mathrm{asin}^2\,(c+dx)}\,dx}{e}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**2,x)
```

output
```
Integral(1/(a**2*c + a**2*d*x + 2*a*b*c*asin(c + d*x) + 2*a*b*d*x*asin(c +
 d*x) + b**2*c*asin(c + d*x)**2 + b**2*d*x*asin(c + d*x)**2), x)/e
```

### 3.226.7 Maxima [N/A]

Not integrable

Time = 4.16 (sec) , antiderivative size = 357, normalized size of antiderivative = 15.52

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^2}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
((a*b*d^2*e*x + a*b*c*d*e + (b^2*d^2*e*x + b^2*c*d*e)*arctan2(d*x + c, sqr
t(d*x + c + 1)*sqrt(-d*x - c + 1)))*integrate(sqrt(d*x + c + 1)*sqrt(-d*x
- c + 1)/(a*b*d^4*e*x^4 + 4*a*b*c*d^3*e*x^3 + (6*a*b*c^2 - a*b)*d^2*e*x^2
+ 2*(2*a*b*c^3 - a*b*c)*d*e*x + (a*b*c^4 - a*b*c^2)*e + (b^2*d^4*e*x^4 + 4
*b^2*c*d^3*e*x^3 + (6*b^2*c^2 - b^2)*d^2*e*x^2 + 2*(2*b^2*c^3 - b^2*c)*d*e
*x + (b^2*c^4 - b^2*c^2)*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x -
 c + 1))), x) - sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))/(a*b*d^2*e*x + a*b*c
*d*e + (b^2*d^2*e*x + b^2*c*d*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-
d*x - c + 1)))
```

### 3.226.8 Giac [N/A]

Not integrable

Time = 2.15 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(dex+ce)(b\arcsin{(dx+c)}+a)^2}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^2), x)
```

### 3.226.9 Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^2}\,dx = \int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^2}\,dx$$

input
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^2),x)
```

output
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^2), x)
```

# 3.227 $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$



## 3.227.1 Optimal result

Integrand size = 23, antiderivative size = 322

$$\begin{aligned}\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx &= -\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} \\ &\quad -\frac{2e^4(c+dx)^3}{b^2d(a+b\arcsin(c+dx))}+\frac{5e^4(c+dx)^5}{2b^2d(a+b\arcsin(c+dx))} \\ &\quad -\frac{e^4\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{16b^3d} \\ &\quad +\frac{27e^4\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} \\ &\quad -\frac{25e^4\cos\left(\frac{5a}{b}\right)\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} \\ &\quad -\frac{e^4\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{16b^3d} \\ &\quad +\frac{27e^4\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^3d} \\ &\quad -\frac{25e^4\sin\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{32b^3d}\end{aligned}$$

output
```
-2*e^4*(d*x+c)^3/b^2/d/(a+b*arcsin(d*x+c))+5/2*e^4*(d*x+c)^5/b^2/d/(a+b*ar
csin(d*x+c))-1/16*e^4*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b^3/d+27/32*e^4*C
i(3*(a+b*arcsin(d*x+c))/b)*cos(3*a/b)/b^3/d-25/32*e^4*Ci(5*(a+b*arcsin(d*x
+c))/b)*cos(5*a/b)/b^3/d-1/16*e^4*Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^3/d
+27/32*e^4*Si(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^3/d-25/32*e^4*Si(5*(a+
b*arcsin(d*x+c))/b)*sin(5*a/b)/b^3/d-1/2*e^4*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)
/b/d/(a+b*arcsin(d*x+c))^2
```

### 3.227.2 Mathematica [A] (verified)

Time = 1.53 (sec) , antiderivative size = 317, normalized size of antiderivative = 0.98

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$$
$$= \frac{e^4\left(-\frac{16b^2(c+dx)^4\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}+\frac{16b(-4(c+dx)^3+5(c+dx)^5)}{a+b\arcsin(c+dx)}+48\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)-\cos\left(\frac{3a}{b}\right.\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^4*((-16*b^2*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^
2 + (16*b*(-4*(c + d*x)^3 + 5*(c + d*x)^5))/(a + b*ArcSin[c + d*x]) + 48*(
Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] - Cos[(3*a)/b]*CosIntegral[3*(
a/b + ArcSin[c + d*x])] + Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] - Si
n[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])]) - 25*(2*Cos[a/b]*CosInt
egral[a/b + ArcSin[c + d*x]] - 3*Cos[(3*a)/b]*CosIntegral[3*(a/b + ArcSin[
c + d*x])] + Cos[(5*a)/b]*CosIntegral[5*(a/b + ArcSin[c + d*x])] + 2*Sin[a
/b]*SinIntegral[a/b + ArcSin[c + d*x]] - 3*Sin[(3*a)/b]*SinIntegral[3*(a/b
 + ArcSin[c + d*x])] + Sin[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c + d*x])]
)))/(32*b^3*d)
```

### 3.227.3 Rubi [A] (verified)

Time = 1.08 (sec) , antiderivative size = 385, normalized size of antiderivative = 1.20, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {5304, 27, 5144, 5222, 5146, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

3.227. $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$$

$$\downarrow \text{5304}$$

$$\frac{\int \frac{e^4(c+dx)^4}{(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$

$$\downarrow \text{27}$$

$$\frac{e^4\int \frac{(c+dx)^4}{(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$

$$\downarrow \text{5144}$$

$$\frac{e^4\left(\frac{2\int \frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{b}-\frac{5\int \frac{(c+dx)^5}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^4}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\downarrow \text{5222}$$

$$\frac{e^4\left(\frac{2\left(\frac{3\int \frac{(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^3}{b(a+b\arcsin(c+dx))}\right)}{b}-\frac{5\left(\frac{5\int \frac{(c+dx)^4}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^5}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^4}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\downarrow \text{5146}$$

$$\frac{e^4\left(-\frac{5\left(\frac{5\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^4\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^5}{b(a+b\arcsin(c+dx))}\right)}{2b}+\frac{2\left(\frac{3\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\text{si}}{a+b\arcsin}\right.}{}\right.}{d}$$

$$\downarrow \text{4906}$$

3.227. $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$

$$\frac{e^4\left(-\frac{5\left(\frac{5\int\left(\frac{\cos\left(\frac{5a}{b}-\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16(a+b\arcsin(c+dx))}-\frac{3\cos\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16(a+b\arcsin(c+dx))}+\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{8(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^5}{b(a+b\arcsin(c+dx))}\right)}{2b}\right.}{d}$$

$\downarrow$ 2009

$$\frac{e^4\left(\frac{2\left(\frac{3\left(\frac{1}{4}\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\frac{1}{4}\cos\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)+\frac{1}{4}\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\frac{1}{4}\sin\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\right.\right.}{b^2}\right.}{b}\right.}{}$$

input
```
Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^4*(-1/2*((c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x])^
2) + (2*(-((c + d*x)^3/(b*(a + b*ArcSin[c + d*x]))) + (3*((Cos[a/b]*CosInt
egral[(a + b*ArcSin[c + d*x])/b])/4 - (Cos[(3*a)/b]*CosIntegral[(3*(a + b*
ArcSin[c + d*x]))/b])/4 + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b]
)/4 - (Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/4))/b^2))/
b - (5*(-((c + d*x)^5/(b*(a + b*ArcSin[c + d*x]))) + (5*((Cos[a/b]*CosInte
gral[(a + b*ArcSin[c + d*x])/b])/8 - (3*Cos[(3*a)/b]*CosIntegral[(3*(a + b
*ArcSin[c + d*x]))/b])/16 + (Cos[(5*a)/b]*CosIntegral[(5*(a + b*ArcSin[c +
 d*x]))/b])/16 + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b])/8 - (3*
Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/16 + (Sin[(5*a)/b
]*SinIntegral[(5*(a + b*ArcSin[c + d*x]))/b])/16))/b^2))/(2*b)))/d
```

## 3.227. $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$

### 3.227.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.227. $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$

### 3.227.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 719 vs. $2(304) = 608$.

Time = 0.87 (sec) , antiderivative size = 720, normalized size of antiderivative = 2.24

| method | result |
|---|---|
| derivativedivides | $\frac{e^4\left(54\arcsin(dx+c)\sin\left(\frac{3a}{b}\right)\mathrm{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)ab+54\arcsin(dx+c)\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)ab-50\arcsin(\right.}{}$ |
| default | $\frac{e^4\left(54\arcsin(dx+c)\sin\left(\frac{3a}{b}\right)\mathrm{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)ab+54\arcsin(dx+c)\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)ab-50\arcsin(\right.}{}$ |

input
```
int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
1/32/d*e^4*(54*arcsin(d*x+c)*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*a*b+54*a
rcsin(d*x+c)*cos(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a*b-50*arcsin(d*x+c)*sin
(5*a/b)*Si(5*arcsin(d*x+c)+5*a/b)*a*b-50*arcsin(d*x+c)*cos(5*a/b)*Ci(5*arc
sin(d*x+c)+5*a/b)*a*b-4*arcsin(d*x+c)*sin(a/b)*Si(arcsin(d*x+c)+a/b)*a*b-4
*arcsin(d*x+c)*cos(a/b)*Ci(arcsin(d*x+c)+a/b)*a*b+2*a*b*(d*x+c)-25*arcsin(
d*x+c)^2*sin(5*a/b)*Si(5*arcsin(d*x+c)+5*a/b)*b^2-25*arcsin(d*x+c)^2*cos(5
*a/b)*Ci(5*arcsin(d*x+c)+5*a/b)*b^2-2*arcsin(d*x+c)^2*sin(a/b)*Si(arcsin(d
*x+c)+a/b)*b^2-2*arcsin(d*x+c)^2*cos(a/b)*Ci(arcsin(d*x+c)+a/b)*b^2+27*arc
sin(d*x+c)^2*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*b^2+27*arcsin(d*x+c)^2*c
os(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*b^2+3*cos(3*arcsin(d*x+c))*b^2-cos(5*a
rcsin(d*x+c))*b^2-2*(1-(d*x+c)^2)^(1/2)*b^2+27*sin(3*a/b)*Si(3*arcsin(d*x+
c)+3*a/b)*a^2+27*cos(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^2-9*sin(3*arcsin(d
*x+c))*a*b+5*arcsin(d*x+c)*sin(5*arcsin(d*x+c))*b^2-25*sin(5*a/b)*Si(5*arc
sin(d*x+c)+5*a/b)*a^2-25*cos(5*a/b)*Ci(5*arcsin(d*x+c)+5*a/b)*a^2+5*sin(5*
arcsin(d*x+c))*a*b+2*arcsin(d*x+c)*b^2*(d*x+c)-2*sin(a/b)*Si(arcsin(d*x+c)
+a/b)*a^2-2*cos(a/b)*Ci(arcsin(d*x+c)+a/b)*a^2-9*arcsin(d*x+c)*sin(3*arcsi
n(d*x+c))*b^2)/(a+b*arcsin(d*x+c))^2/b^3
```

### 3.227.5 Fricas [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(dex+ce)^4}{(b\arcsin(dx+c)+a)^3}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
integral((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*
x + c^4*e^4)/(b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*
arcsin(d*x + c) + a^3), x)
```

### 3.227.6 Sympy [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx$$
$$= e^4\left(\int \frac{c^4}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{d^4x^4}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{4cd^3x^3}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{6c^2d^2x^2}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{4c^3dx}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**3,x)
```

output
```
e**4*(Integral(c**4/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x
)**2 + b**3*asin(c + d*x)**3), x) + Integral(d**4*x**4/(a**3 + 3*a**2*b*as
in(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x) + Int
egral(4*c*d**3*x**3/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x
)**2 + b**3*asin(c + d*x)**3), x) + Integral(6*c**2*d**2*x**2/(a**3 + 3*a*
*2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x
) + Integral(4*c**3*d*x/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c +
 d*x)**2 + b**3*asin(c + d*x)**3), x))
```

### 3.227.7 Maxima [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(dex+ce)^4}{(b\arcsin(dx+c)+a)^3}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
1/2*(5*a*d^5*e^4*x^5 + 25*a*c*d^4*e^4*x^4 + 2*(25*a*c^2 - 2*a)*d^3*e^4*x^3
 + 2*(25*a*c^3 - 6*a*c)*d^2*e^4*x^2 + (25*a*c^4 - 12*a*c^2)*d*e^4*x + (5*a
*c^5 - 4*a*c^3)*e^4 - (b*d^4*e^4*x^4 + 4*b*c*d^3*e^4*x^3 + 6*b*c^2*d^2*e^4
*x^2 + 4*b*c^3*d*e^4*x + b*c^4*e^4)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1) +
 (5*b*d^5*e^4*x^5 + 25*b*c*d^4*e^4*x^4 + 2*(25*b*c^2 - 2*b)*d^3*e^4*x^3 +
2*(25*b*c^3 - 6*b*c)*d^2*e^4*x^2 + (25*b*c^4 - 12*b*c^2)*d*e^4*x + (5*b*c^
5 - 4*b*c^3)*e^4)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) -
 2*(b^4*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b
^3*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)*i
ntegrate(1/2*(25*d^4*e^4*x^4 + 100*c*d^3*e^4*x^3 + 6*(25*c^2 - 2)*d^2*e^4*
x^2 + 4*(25*c^3 - 6*c)*d*e^4*x + (25*c^4 - 12*c^2)*e^4)/(b^3*arctan2(d*x +
 c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b^2), x))/(b^4*d*arctan2(d*x
 + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d*x + c,
 sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)
```

### 3.227.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3180 vs. $2(304) = 608$.

Time = 0.61 (sec) , antiderivative size = 3180, normalized size of antiderivative = 9.88

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
-25/2*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^5*cos_integral(5*a/b + 5*arcsin(d
*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
 - 25/2*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^4*sin(a/b)*sin_integral(5*a/b +
 5*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) +
 a^2*b^3*d) - 25*a*b*e^4*arcsin(d*x + c)*cos(a/b)^5*cos_integral(5*a/b + 5
*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a
^2*b^3*d) - 25*a*b*e^4*arcsin(d*x + c)*cos(a/b)^4*sin(a/b)*sin_integral(5*
a/b + 5*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x +
 c) + a^2*b^3*d) + 125/8*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^3*cos_integral
(5*a/b + 5*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*
x + c) + a^2*b^3*d) - 25/2*a^2*e^4*cos(a/b)^5*cos_integral(5*a/b + 5*arcsi
n(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3
*d) + 27/8*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^3*cos_integral(3*a/b + 3*arc
sin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b
^3*d) + 75/8*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^2*sin(a/b)*sin_integral(5*
a/b + 5*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x +
 c) + a^2*b^3*d) - 25/2*a^2*e^4*cos(a/b)^4*sin(a/b)*sin_integral(5*a/b + 5
*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a
^2*b^3*d) + 27/8*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^2*sin(a/b)*sin_integra
l(3*a/b + 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsi...
```

### 3.227.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{(c\,e+d\,e\,x)^4}{(a+b\,\mathrm{asin}\,(c+d\,x))^3}\,dx$$

input
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^3, x)
```

# 3.228 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$



## 3.228.1 Optimal result

Integrand size = 23, antiderivative size = 249

$$\begin{aligned}\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx = &-\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}\\
&-\frac{3e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))}+\frac{2e^3(c+dx)^4}{b^2d(a+b\arcsin(c+dx))}\\
&+\frac{e^3\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{2b^3d}\\
&-\frac{e^3\,\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{4a}{b}\right)}{b^3d}\\
&-\frac{e^3\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2b^3d}\\
&+\frac{e^3\cos\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{b^3d}\end{aligned}$$

output
```
-3/2*e^3*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))+2*e^3*(d*x+c)^4/b^2/d/(a+b*ar
csin(d*x+c))-1/2*e^3*cos(2*a/b)*Si(2*(a+b*arcsin(d*x+c))/b)/b^3/d+e^3*cos(
4*a/b)*Si(4*(a+b*arcsin(d*x+c))/b)/b^3/d+1/2*e^3*Ci(2*(a+b*arcsin(d*x+c))/
b)*sin(2*a/b)/b^3/d-e^3*Ci(4*(a+b*arcsin(d*x+c))/b)*sin(4*a/b)/b^3/d-1/2*e
^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^2
```

### 3.228.2 Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 181, normalized size of antiderivative = 0.73

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$$
$$= \frac{e^3\left(-\frac{b^2(c+dx)^3\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}+\frac{b\left(-3(c+dx)^2+4(c+dx)^4\right)}{a+b\arcsin(c+dx)}+\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)\sin\left(\frac{2a}{b}\right)-2\,\text{CosInte}}{}$$

input
```
Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^3*(-((b^2*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^2)
 + (b*(-3*(c + d*x)^2 + 4*(c + d*x)^4))/(a + b*ArcSin[c + d*x]) + CosInteg
ral[2*(a/b + ArcSin[c + d*x])]*Sin[(2*a)/b] - 2*CosIntegral[4*(a/b + ArcSi
n[c + d*x])]*Sin[(4*a)/b] - Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c + d
*x])] + 2*Cos[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c + d*x])]))/(2*b^3*d)
```

### 3.228.3 Rubi [A] (verified)

Time = 1.31 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.12, number of steps used = 16, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.652, Rules used = {5304, 27, 5144, 5222, 5146, 25, 4906, 27, 2009, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int \frac{e^3(c+dx)^3}{(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$
$$\Big\downarrow \; 27$$
$$\frac{e^3\int \frac{(c+dx)^3}{(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$
$$\Big\downarrow \; 5144$$

$$\frac{e^3\left(\frac{3\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{2\int \frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^3}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$\Big\downarrow$ 5222

$$\frac{e^3\left(\frac{3\left(\frac{2\int \frac{c+dx}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{2\left(\frac{4\int \frac{(c+dx)^3}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^4}{b(a+b\arcsin(c+dx))}\right)}{b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^3}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$\Big\downarrow$ 5146

$$\frac{e^3\left(-\frac{2\left(\frac{4\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^4}{b(a+b\arcsin(c+dx))}\right)}{b}+\frac{3\left(\frac{2\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right.}{a+b\operatorname{arc}\ldots}\ldots\right.}{\ldots}\ldots\right.}{d}$$

$\Big\downarrow$ 25

$$\frac{e^3\left(-\frac{2\left(-\frac{4\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^4}{b(a+b\arcsin(c+dx))}\right)}{b}+\frac{3\left(-\frac{2\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\operatorname{ar}\ldots}\ldots\right.}{\ldots}\ldots\right.}{d}$$

$\Big\downarrow$ 4906

$$\frac{e^3\left(\frac{3\left(-\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2(a+b\arcsin(c+dx))}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{2\left(-\frac{4\int \left(\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4(a+b\arcsin(c+dx))}-\frac{\sin\left(\frac{4a}{b}-\frac{4(a+b\operatorname{arc}\ldots}{\ldots}\right.}{8(a+b\arcsin(\ldots}\ldots\right.}{b^2}\ldots\right.}{b}\ldots\right.}{d}$$

3.228. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$

$$\Big\downarrow \ 27$$

$$\frac{e^3\left(\frac{3\left(-\frac{\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{2\left(-\frac{4\int\left(\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4(a+b\arcsin(c+dx))}-\frac{\sin\left(\frac{4a}{b}-\frac{4(a+b\arcs}{b}\right.}{8(a+b\arcsin(c}\right.}{b^2}\right.}{b}\right.}{d}$$

$$\Big\downarrow \ 2009$$

$$e^3\left(\frac{3\left(-\frac{\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{2\left(\frac{4\left(-\frac{1}{4}\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)+\frac{1}{8}\sin\left(\frac{4a}{b}\right.\right.}{}\right.}{}\right.$$

$$\Big\downarrow \ 3042$$

$$e^3\left(\frac{3\left(-\frac{\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{2\left(\frac{4\left(-\frac{1}{4}\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)+\frac{1}{8}\sin\left(\frac{4a}{b}\right.\right.}{}\right.}{}\right.$$

$$\Big\downarrow \ 3784$$

$$e^3\left(\frac{3\left(\frac{-\sin\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\cos\left(\frac{2a}{b}\right)\int-\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\right.$$

$$\Big\downarrow \ 25$$

---

3.228. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$

$$e^3\left(\frac{3\left(\frac{\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{2(\ldots$$

$\downarrow$ 3042

$$e^3\left(\frac{3\left(\frac{\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\ldots$$

$\downarrow$ 3780

$$e^3\left(\frac{3\left(\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)-\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{2\left(\frac{4\left(-\frac{1}{4}\sin\left(\frac{2a}{b}\right)\text{Co}\ldots\right.}{\ldots}\right.}{\ldots}\right.$$

$\downarrow$ 3783

$$e^3\left(\frac{3\left(\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)-\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{2\left(\frac{4\left(-\frac{1}{4}\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\,a\ldots\right.\right.}{\ldots}\right.}{\ldots}\right.$$

input
```
Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^3,x]
```

## 3.228. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$

output
```
(e^3*(-1/2*((c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x])^
2) + (3*(-((c + d*x)^2/(b*(a + b*ArcSin[c + d*x]))) + (-(CosIntegral[(2*(a
 + b*ArcSin[c + d*x]))/b]*Sin[(2*a)/b]) + Cos[(2*a)/b]*SinIntegral[(2*(a +
 b*ArcSin[c + d*x]))/b])/b^2))/(2*b) - (2*(-((c + d*x)^4/(b*(a + b*ArcSin[
c + d*x]))) + (4*(-1/4*(CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b]*Sin[(2*
a)/b]) + (CosIntegral[(4*(a + b*ArcSin[c + d*x]))/b]*Sin[(4*a)/b])/8 + (Co
s[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/4 - (Cos[(4*a)/b]*S
inIntegral[(4*(a + b*ArcSin[c + d*x]))/b])/8))/b^2))/b))/d
```

### 3.228.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

## 3.228. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.228. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx$

### 3.228.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 506 vs. $2(239) = 478$.

Time = 0.34 (sec) , antiderivative size = 507, normalized size of antiderivative = 2.04

| method | result |
|---|---|
| derivativedivides | $-\frac{e^3\left(16\arcsin(dx+c)^2\sin\left(\frac{4a}{b}\right)\mathrm{Ci}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)b^2-16\arcsin(dx+c)^2\,\mathrm{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b^2+8\,\mathrm{arcs}\cdots\right.}{\cdots}$ |
| default | $-\frac{e^3\left(16\arcsin(dx+c)^2\sin\left(\frac{4a}{b}\right)\mathrm{Ci}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)b^2-16\arcsin(dx+c)^2\,\mathrm{Si}\left(4\arcsin(dx+c)+\frac{4a}{b}\right)\cos\left(\frac{4a}{b}\right)b^2+8\,\mathrm{arcs}\cdots\right.}{\cdots}$ |

input
```
int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
-1/16/d*e^3*(16*arcsin(d*x+c)^2*sin(4*a/b)*Ci(4*arcsin(d*x+c)+4*a/b)*b^2-1
6*arcsin(d*x+c)^2*Si(4*arcsin(d*x+c)+4*a/b)*cos(4*a/b)*b^2+8*arcsin(d*x+c)
^2*cos(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*b^2-8*arcsin(d*x+c)^2*sin(2*a/b)*C
i(2*arcsin(d*x+c)+2*a/b)*b^2+32*arcsin(d*x+c)*sin(4*a/b)*Ci(4*arcsin(d*x+c
)+4*a/b)*a*b-32*arcsin(d*x+c)*Si(4*arcsin(d*x+c)+4*a/b)*cos(4*a/b)*a*b+16*
arcsin(d*x+c)*cos(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*a*b-16*arcsin(d*x+c)*si
n(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a*b-4*arcsin(d*x+c)*cos(4*arcsin(d*x+c)
)*b^2+4*arcsin(d*x+c)*cos(2*arcsin(d*x+c))*b^2+16*sin(4*a/b)*Ci(4*arcsin(d
*x+c)+4*a/b)*a^2-16*Si(4*arcsin(d*x+c)+4*a/b)*cos(4*a/b)*a^2+8*cos(2*a/b)*
Si(2*arcsin(d*x+c)+2*a/b)*a^2-8*sin(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a^2-4
*cos(4*arcsin(d*x+c))*a*b+2*sin(2*arcsin(d*x+c))*b^2+4*cos(2*arcsin(d*x+c)
)*a*b-sin(4*arcsin(d*x+c))*b^2)/(a+b*arcsin(d*x+c))^2/b^3
```

### 3.228.5 Fricas [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^3}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
integral((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)/(b^3*ar
csin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsin(d*x + c) + a^
3), x)
```

### 3.228.6 Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx = e^3\left(\int \frac{c^3}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{d^3x^3}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{3cd^2x^2}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx + \int \frac{3c^2dx}{a^3+3a^2b\operatorname{asin}(c+dx)+3ab^2\operatorname{asin}^2(c+dx)+b^3\operatorname{asin}^3(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**3,x)
```

output
```
e**3*(Integral(c**3/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x
)**2 + b**3*asin(c + d*x)**3), x) + Integral(d**3*x**3/(a**3 + 3*a**2*b*as
in(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x) + Int
egral(3*c*d**2*x**2/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x
)**2 + b**3*asin(c + d*x)**3), x) + Integral(3*c**2*d*x/(a**3 + 3*a**2*b*a
sin(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x))
```

### 3.228.7 Maxima [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^3}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
1/2*(4*a*d^4*e^3*x^4 + 16*a*c*d^3*e^3*x^3 + 3*(8*a*c^2 - a)*d^2*e^3*x^2 +
2*(8*a*c^3 - 3*a*c)*d*e^3*x + (4*a*c^4 - 3*a*c^2)*e^3 - (b*d^3*e^3*x^3 + 3
*b*c*d^2*e^3*x^2 + 3*b*c^2*d*e^3*x + b*c^3*e^3)*sqrt(d*x + c + 1)*sqrt(-d*
x - c + 1) + (4*b*d^4*e^3*x^4 + 16*b*c*d^3*e^3*x^3 + 3*(8*b*c^2 - b)*d^2*e
^3*x^2 + 2*(8*b*c^3 - 3*b*c)*d*e^3*x + (4*b*c^4 - 3*b*c^2)*e^3)*arctan2(d*
x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 2*(b^4*d*arctan2(d*x + c, s
qrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d*x + c, sqrt(d
*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)*integrate((8*d^3*e^3*x^3 + 24
*c*d^2*e^3*x^2 + 3*(8*c^2 - 1)*d*e^3*x + (8*c^3 - 3*c)*e^3)/(b^3*arctan2(d
*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b^2), x))/(b^4*d*arctan2
(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d*x
+ c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)
```

### 3.228.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2201 vs. $2(239) = 478$.

Time = 0.54 (sec) , antiderivative size = 2201, normalized size of antiderivative = 8.84

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
-8*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(d*x
+ c))*sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*
b^3*d) + 8*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^4*sin_integral(4*a/b + 4*arc
sin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b
^3*d) - 16*a*b*e^3*arcsin(d*x + c)*cos(a/b)^3*cos_integral(4*a/b + 4*arcsi
n(d*x + c))*sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c)
+ a^2*b^3*d) + 16*a*b*e^3*arcsin(d*x + c)*cos(a/b)^4*sin_integral(4*a/b +
4*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) +
a^2*b^3*d) + 4*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)*cos_integral(4*a/b + 4*a
rcsin(d*x + c))*sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x +
 c) + a^2*b^3*d) - 8*a^2*e^3*cos(a/b)^3*cos_integral(4*a/b + 4*arcsin(d*x
+ c))*sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*
b^3*d) + b^2*e^3*arcsin(d*x + c)^2*cos(a/b)*cos_integral(2*a/b + 2*arcsin(
d*x + c))*sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) +
a^2*b^3*d) - 8*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^2*sin_integral(4*a/b + 4
*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a
^2*b^3*d) + 8*a^2*e^3*cos(a/b)^4*sin_integral(4*a/b + 4*arcsin(d*x + c))/(
b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - b^2*e^3
*arcsin(d*x + c)^2*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^5
*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 8*a*b*e...
```

### 3.228.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{(c\,e+d\,e\,x)^3}{(a+b\,\mathrm{asin}\,(c+d\,x))^3}\,dx$$

input
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^3, x)
```

# 3.229 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx$



## 3.229.1 Optimal result

Integrand size = 23, antiderivative size = 248

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e^2(c+dx)}{b^2d(a+b\arcsin(c+dx))} + \frac{3e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))} - \frac{e^2\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^3d} + \frac{9e^2\cos\left(\frac{3a}{b}\right)\operatorname{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^3d} - \frac{e^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{8b^3d} + \frac{9e^2\sin\left(\frac{3a}{b}\right)\operatorname{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^3d}$$

output
```
-e^2*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))+3/2*e^2*(d*x+c)^3/b^2/d/(a+b*arcsin
(d*x+c))-1/8*e^2*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b^3/d+9/8*e^2*Ci(3*(a+
b*arcsin(d*x+c))/b)*cos(3*a/b)/b^3/d-1/8*e^2*Si((a+b*arcsin(d*x+c))/b)*sin
(a/b)/b^3/d+9/8*e^2*Si(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^3/d-1/2*e^2*(
d*x+c)^2*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^2
```

### 3.229.2 Mathematica [A] (verified)

Time = 0.90 (sec) , antiderivative size = 219, normalized size of antiderivative = 0.88

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx = \frac{e^2\left(-\frac{4b^2(c+dx)^2\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}+\frac{4b(-2(c+dx)+3(c+dx)^3)}{a+b\arcsin(c+dx)}+8\left(\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)+\sin\left(\frac{a}{b}\right)\text{Si}\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^2*((-4*b^2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^2
 + (4*b*(-2*(c + d*x) + 3*(c + d*x)^3))/(a + b*ArcSin[c + d*x]) + 8*(Cos[a
/b]*CosIntegral[a/b + ArcSin[c + d*x]] + Sin[a/b]*SinIntegral[a/b + ArcSin
[c + d*x]]) + 9*(-(Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]]) + Cos[(3*a
)/b]*CosIntegral[3*(a/b + ArcSin[c + d*x])] - Sin[a/b]*SinIntegral[a/b + A
rcSin[c + d*x]] + Sin[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])])))/(
8*b^3*d)
```

### 3.229.3 Rubi [A] (verified)

Time = 1.34 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.08, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.609, Rules used = {5304, 27, 5144, 5222, 5134, 3042, 3784, 25, 3042, 3780, 3783, 5146, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e^2(c+dx)^2}{(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^2\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$

$$\Big\downarrow \text{5144}$$

$$\frac{e^2\left(\frac{\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{b}-\frac{3\int \frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\downarrow \text{5222}$$

$$\frac{e^2\left(\frac{\frac{\int \frac{1}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{b}-\frac{3\left(\frac{3\int \frac{(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^3}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\downarrow \text{5134}$$

$$\frac{e^2\left(\frac{\frac{\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{b}-\frac{3\left(\frac{3\int \frac{(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^3}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\downarrow \text{3042}$$

$$\frac{e^2\left(\frac{\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{b}-\frac{3\left(\frac{3\int \frac{(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^3}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\downarrow \text{3784}$$

$$\frac{e^2\left(\frac{\frac{\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{b}-\frac{3\left(\frac{3\int \frac{(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^3}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\downarrow \text{25}$$

$$\frac{e^2\left(\frac{\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{b}-\frac{3\left(\frac{3\int \frac{(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^3}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

3.229. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx$

$$\Big\downarrow \text{3042}$$

$$e^2\left(\frac{\frac{\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{b}-\frac{3\left(\frac{3\int \frac{(\cdots}{a+b\,\mathrm{a}\cdots}}{\cdots}\right.}{\cdots}}{d}\right.$$

$$\Big\downarrow \text{3780}$$

$$e^2\left(\frac{\frac{\frac{\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{b}-\frac{3\left(\frac{3\int \frac{(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\cdots\right.}{2b}}{d}\right.$$

$$\Big\downarrow \text{3783}$$

$$e^2\left(\frac{-\frac{3\left(\frac{3\int \frac{(c+dx)^2}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^3}{b(a+b\arcsin(c+dx))}\right)}{2b}+\frac{\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}-\frac{c+dx}{b(a+b\arcsin(\cdots}}{b}}{d}\right.$$

$$\Big\downarrow \text{5146}$$

$$e^2\left(\frac{-\frac{3\left(\frac{3\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^2\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^3}{b(a+b\arcsin(c+dx))}\right)}{2b}+\frac{\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx}{b}\cdots\right.}{b^2}}{\cdots}}{d}\right.$$

$$\Big\downarrow \text{4906}$$

---

3.229. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx$

$$e^2\left(-\frac{3\left(\frac{3\int\left(\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4(a+b\arcsin(c+dx))}-\frac{\cos\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^3}{b(a+b\arcsin(c+dx))}\right)}{2b}+\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcs}{}\right.}{}\right.$$
$$\overline{\qquad\qquad d \qquad\qquad}$$

$\downarrow$ 2009

$$e^2\left(\frac{\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{b}-\frac{3\left(\frac{3\left(\frac{1}{4}\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\frac{1}{4}c\right.}{}\right.}{}\right.$$

input
```
Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e^2*(-1/2*((c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x])^
2) + (-((c + d*x)/(b*(a + b*ArcSin[c + d*x]))) + (Cos[a/b]*CosIntegral[(a
+ b*ArcSin[c + d*x])/b] + Sin[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b])
/b^2)/b - (3*(-((c + d*x)^3/(b*(a + b*ArcSin[c + d*x]))) + (3*((Cos[a/b]*C
osIntegral[(a + b*ArcSin[c + d*x])/b])/4 - (Cos[(3*a)/b]*CosIntegral[(3*(a
 + b*ArcSin[c + d*x]))/b])/4 + (Sin[a/b]*SinIntegral[(a + b*ArcSin[c + d*x
])/b])/4 - (Sin[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/4))/b
^2))/(2*b)))/d
```

### 3.229.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

3.229. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx$

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

## 3.229. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx$

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.229.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 475 vs. $2(234) = 468$.

Time = 0.75 (sec) , antiderivative size = 476, normalized size of antiderivative = 1.92

| method | result |
|---|---|
| derivativedivides | $\frac{e^2\left(9\arcsin(dx+c)^2\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)b^2+9\arcsin(dx+c)^2\sin\left(\frac{3a}{b}\right)\mathrm{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)b^2-\arcsin(dx\right.}{}$ |
| default | $\frac{e^2\left(9\arcsin(dx+c)^2\cos\left(\frac{3a}{b}\right)\mathrm{Ci}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)b^2+9\arcsin(dx+c)^2\sin\left(\frac{3a}{b}\right)\mathrm{Si}\left(3\arcsin(dx+c)+\frac{3a}{b}\right)b^2-\arcsin(dx\right.}{}$ |

input
```
int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
1/8/d*e^2*(9*arcsin(d*x+c)^2*cos(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*b^2+9*ar
csin(d*x+c)^2*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*b^2-arcsin(d*x+c)^2*sin
(a/b)*Si(arcsin(d*x+c)+a/b)*b^2-arcsin(d*x+c)^2*cos(a/b)*Ci(arcsin(d*x+c)+
a/b)*b^2+18*arcsin(d*x+c)*cos(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a*b+18*arcs
in(d*x+c)*sin(3*a/b)*Si(3*arcsin(d*x+c)+3*a/b)*a*b-2*arcsin(d*x+c)*sin(a/b
)*Si(arcsin(d*x+c)+a/b)*a*b-2*arcsin(d*x+c)*cos(a/b)*Ci(arcsin(d*x+c)+a/b)
*a*b-3*arcsin(d*x+c)*sin(3*arcsin(d*x+c))*b^2+arcsin(d*x+c)*b^2*(d*x+c)+9*
cos(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^2+9*sin(3*a/b)*Si(3*arcsin(d*x+c)+3
*a/b)*a^2-sin(a/b)*Si(arcsin(d*x+c)+a/b)*a^2-cos(a/b)*Ci(arcsin(d*x+c)+a/b
)*a^2+cos(3*arcsin(d*x+c))*b^2-3*sin(3*arcsin(d*x+c))*a*b-(1-(d*x+c)^2)^(1
/2)*b^2+a*b*(d*x+c))/(a+b*arcsin(d*x+c))^2/b^3
```

### 3.229.5 Fricas [F]

$$\int \frac{(ce + dex)^2}{(a + b\arcsin(c + dx))^3}\,dx = \int \frac{(dex + ce)^2}{(b\arcsin(dx + c) + a)^3}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)/(b^3*arcsin(d*x + c)^3 + 3*
a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcsin(d*x + c) + a^3), x)
```

### 3.229.6 Sympy [F]

$$\int \frac{(ce + dex)^2}{(a + b\arcsin(c + dx))^3}\,dx = e^2\left(\int \frac{c^2}{a^3 + 3a^2b\operatorname{asin}(c + dx) + 3ab^2\operatorname{asin}^2(c + dx) + b^3\operatorname{asin}^3(c + dx)}\,dx + \int \frac{d^2x^2}{a^3 + 3a^2b\operatorname{asin}(c + dx) + 3ab^2\operatorname{asin}^2(c + dx) + b^3\operatorname{asin}^3(c + dx)}\,dx + \int \frac{2cdx}{a^3 + 3a^2b\operatorname{asin}(c + dx) + 3ab^2\operatorname{asin}^2(c + dx) + b^3\operatorname{asin}^3(c + dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**3,x)
```

output
```
e**2*(Integral(c**2/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x
)**2 + b**3*asin(c + d*x)**3), x) + Integral(d**2*x**2/(a**3 + 3*a**2*b*as
in(c + d*x) + 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x) + Int
egral(2*c*d*x/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)**2 +
 b**3*asin(c + d*x)**3), x))
```

### 3.229.7 Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^3}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
1/2*(3*a*d^3*e^2*x^3 + 9*a*c*d^2*e^2*x^2 + (9*a*c^2 - 2*a)*d*e^2*x + (3*a*
c^3 - 2*a*c)*e^2 - (b*d^2*e^2*x^2 + 2*b*c*d*e^2*x + b*c^2*e^2)*sqrt(d*x +
c + 1)*sqrt(-d*x - c + 1) + (3*b*d^3*e^2*x^3 + 9*b*c*d^2*e^2*x^2 + (9*b*c^
2 - 2*b)*d*e^2*x + (3*b*c^3 - 2*b*c)*e^2)*arctan2(d*x + c, sqrt(d*x + c +
1)*sqrt(-d*x - c + 1)) - 2*(b^4*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(
-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x
- c + 1)) + a^2*b^2*d)*integrate(1/2*(9*d^2*e^2*x^2 + 18*c*d*e^2*x + (9*c^
2 - 2)*e^2)/(b^3*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) +
a*b^2), x))/(b^4*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^
2 + 2*a*b^3*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2
*b^2*d)
```

### 3.229.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1641 vs. 2(234) = 468.

Time = 0.58 (sec) , antiderivative size = 1641, normalized size of antiderivative = 6.62

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
9/2*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(d*x
 + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) +
 9/2*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*
arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^
2*b^3*d) + 9*a*b*e^2*arcsin(d*x + c)*cos(a/b)^3*cos_integral(3*a/b + 3*arc
sin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b
^3*d) + 9*a*b*e^2*arcsin(d*x + c)*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b +
 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) +
 a^2*b^3*d) - 27/8*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)*cos_integral(3*a/b +
 3*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) +
 a^2*b^3*d) + 9/2*a^2*e^2*cos(a/b)^3*cos_integral(3*a/b + 3*arcsin(d*x + c
))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/8
*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b
^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 9/8*b^2*
e^2*arcsin(d*x + c)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^
5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 9/2*a^2*e
^2*cos(a/b)^2*sin(a/b)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^5*d*arcs
in(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/8*b^2*e^2*arcsi
n(d*x + c)^2*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*
x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 3/2*((d*x + c)^2 - ...
```

### 3.229.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\,(c+d\,x))^3}\,dx$$

input
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^3, x)
```

# 3.230 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx$



## 3.230.1 Optimal result

Integrand size = 21, antiderivative size = 157

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2} - \frac{e}{2b^2d(a+b\arcsin(c+dx))} + \frac{e(c+dx)^2}{b^2d(a+b\arcsin(c+dx))} + \frac{e\,\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{2a}{b}\right)}{b^3d} - \frac{e\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^3d}$$

output
```
-1/2*e/b^2/d/(a+b*arcsin(d*x+c))+e*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))-e*c
os(2*a/b)*Si(2*(a+b*arcsin(d*x+c))/b)/b^3/d+e*Ci(2*(a+b*arcsin(d*x+c))/b)*
sin(2*a/b)/b^3/d-1/2*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
^2
```

### 3.230.2 Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.78

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx = \frac{e\left(-\frac{b^2(c+dx)\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}+\frac{b(-1+2(c+dx)^2)}{a+b\arcsin(c+dx)}+2\,\text{CosIntegral}\left(2\left(\frac{a}{b}+\arcsin(c+dx)\right)\right)\sin\left(\frac{2a}{b}\right)-2\cos\left(\frac{2a}{b}\right)\text{Si}(2(}{2b^3d}$$

input
```
Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e*(-((b^2*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^2) + (
b*(-1 + 2*(c + d*x)^2))/(a + b*ArcSin[c + d*x]) + 2*CosIntegral[2*(a/b + A
rcSin[c + d*x])]*Sin[(2*a)/b] - 2*Cos[(2*a)/b]*SinIntegral[2*(a/b + ArcSin
[c + d*x])]))/(2*b^3*d)
```

### 3.230.3 Rubi [A] (verified)

Time = 0.98 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.94, number of steps used = 16, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.714, Rules used = {5304, 27, 5144, 5152, 5222, 5146, 25, 4906, 27, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e(c+dx)}{(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\int \frac{c+dx}{(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$

$$\Big\downarrow \text{5144}$$

$$\frac{e\left(\frac{\int \frac{1}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\Big\downarrow \; 5152$$

$$\frac{e\left(-\frac{\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{b}-\frac{1}{2b^2(a+b\arcsin(c+dx))}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\Big\downarrow \; 5222$$

$$\frac{e\left(-\frac{\frac{2\int \frac{c+dx}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{1}{2b^2(a+b\arcsin(c+dx))}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\Big\downarrow \; 5146$$

$$\frac{e\left(-\frac{\frac{2\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{1}{2b^2(a+b\arcsin(c+dx))}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\Big\downarrow \; 25$$

$$\frac{e\left(-\frac{-\frac{2\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{1}{2b^2(a+b\arcsin(c+dx))}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\Big\downarrow \; 4906$$

$$\frac{e\left(-\frac{-\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2(a+b\arcsin(c+dx))}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{1}{2b^2(a+b\arcsin(c+dx))}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{e\left(-\frac{-\frac{\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{1}{2b^2(a+b\arcsin(c+dx))}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$$\Big\downarrow \; 3042$$

---

3.230. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx$

$$\frac{e\left(-\frac{-\frac{\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{1}{2b^2(a+b\arcsin(c+dx))}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{2b(a+b\arcsin(c+dx))^2}\right)}{d}$$

$\downarrow$ 3784

$$\frac{e\left(-\frac{\frac{-\sin\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\cos\left(\frac{2a}{b}\right)\int -\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{}{2b^2}\right.}{d}$$

$\downarrow$ 25

$$\frac{e\left(-\frac{\frac{\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{}{2b^2(a+}\right.}{d}$$

$\downarrow$ 3042

$$\frac{e\left(-\frac{\frac{\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{}{2b^2}\right.}{d}$$

$\downarrow$ 3780

$$\frac{e\left(-\frac{\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)-\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{1}{2b^2(a+b\arcsin(c+dx))}\right.}{d}$$

$\downarrow$ 3783

$$\frac{e\left(-\frac{\frac{\cos\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)-\sin\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2}-\frac{(c+dx)^2}{b(a+b\arcsin(c+dx))}}{b}-\frac{1}{2b^2(a+b\arcsin(c+dx))}-\frac{\sqrt{1-(c+dx}}{2b(a+b\arcsin}\right.}{d}$$

3.230. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx$

input
```
Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^3,x]
```

output
```
(e*(-1/2*((c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x])^2) -
 1/(2*b^2*(a + b*ArcSin[c + d*x])) - (-((c + d*x)^2/(b*(a + b*ArcSin[c + d
*x]))) + (-(CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b]*Sin[(2*a)/b]) + Cos
[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/b^2)/b))/d
```

### 3.230.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.230.4 Maple [A] (verified)

Time = 0.24 (sec) , antiderivative size = 264, normalized size of antiderivative = 1.68

| method | result |
|---|---|
| derivativedivides | $\frac{e\left(4\arcsin(dx+c)^2\sin\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^2-4\arcsin(dx+c)^2\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^2+8\arcsin(dx\right.}{}$ |
| default | $\frac{e\left(4\arcsin(dx+c)^2\sin\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^2-4\arcsin(dx+c)^2\cos\left(\frac{2a}{b}\right)\mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^2+8\arcsin(dx\right.}{}$ |

3.230. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx$

input
```
int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
1/4/d*e*(4*arcsin(d*x+c)^2*sin(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*b^2-4*arcs
in(d*x+c)^2*cos(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*b^2+8*arcsin(d*x+c)*sin(2
*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a*b-8*arcsin(d*x+c)*cos(2*a/b)*Si(2*arcsin
(d*x+c)+2*a/b)*a*b-2*arcsin(d*x+c)*cos(2*arcsin(d*x+c))*b^2+4*sin(2*a/b)*C
i(2*arcsin(d*x+c)+2*a/b)*a^2-4*cos(2*a/b)*Si(2*arcsin(d*x+c)+2*a/b)*a^2-2*
cos(2*arcsin(d*x+c))*a*b-sin(2*arcsin(d*x+c))*b^2)/(a+b*arcsin(d*x+c))^2/b
^3
```

### 3.230.5 Fricas [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx = \int \frac{dex+ce}{(b\arcsin\left(dx+c\right)+a)^3}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
integral((d*e*x + c*e)/(b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2
+ 3*a^2*b*arcsin(d*x + c) + a^3), x)
```

### 3.230.6 Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx = e\left(\int \frac{c}{a^3+3a^2b\operatorname{asin}\left(c+dx\right)+3ab^2\operatorname{asin}^2\left(c+dx\right)+b^3\operatorname{asin}^3\left(c+dx\right)}\,dx + \int \frac{dx}{a^3+3a^2b\operatorname{asin}\left(c+dx\right)+3ab^2\operatorname{asin}^2\left(c+dx\right)+b^3\operatorname{asin}^3\left(c+dx\right)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**3,x)
```

output
```
e*(Integral(c/(a**3 + 3*a**2*b*asin(c + d*x) + 3*a*b**2*asin(c + d*x)**2 +
 b**3*asin(c + d*x)**3), x) + Integral(d*x/(a**3 + 3*a**2*b*asin(c + d*x)
+ 3*a*b**2*asin(c + d*x)**2 + b**3*asin(c + d*x)**3), x))
```

### 3.230.7 Maxima [F]

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^3} \, dx = \int \frac{dex + ce}{(b \arcsin(dx + c) + a)^3} \, dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
1/2*(2*a*d^2*e*x^2 + 4*a*c*d*e*x - (b*d*e*x + b*c*e)*sqrt(d*x + c + 1)*sqr
t(-d*x - c + 1) + (2*a*c^2 - a)*e + (2*b*d^2*e*x^2 + 4*b*c*d*e*x + (2*b*c^
2 - b)*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 2*(b^4*
d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arc
tan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)*integrate
(2*(d*e*x + c*e)/(b^3*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1
)) + a*b^2), x))/(b^4*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c +
 1))^2 + 2*a*b^3*d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))
+ a^2*b^2*d)
```

### 3.230.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 888 vs. $2(151) = 302$.

Time = 0.50 (sec) , antiderivative size = 888, normalized size of antiderivative = 5.66

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^3} \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
2*b^2*e*arcsin(d*x + c)^2*cos(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))
*sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d
) - 2*b^2*e*arcsin(d*x + c)^2*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x
 + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) +
 4*a*b*e*arcsin(d*x + c)*cos(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*
sin(a/b)/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
 - 4*a*b*e*arcsin(d*x + c)*cos(a/b)^2*sin_integral(2*a/b + 2*arcsin(d*x +
c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 2*
a^2*e*cos(a/b)*cos_integral(2*a/b + 2*arcsin(d*x + c))*sin(a/b)/(b^5*d*arc
sin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + b^2*e*arcsin(d*x
 + c)^2*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 +
 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 2*a^2*e*cos(a/b)^2*sin_integral(
2*a/b + 2*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x
 + c) + a^2*b^3*d) + ((d*x + c)^2 - 1)*b^2*e*arcsin(d*x + c)/(b^5*d*arcsin
(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) + 2*a*b*e*arcsin(d*x
+ c)*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*
a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/2*sqrt(-(d*x + c)^2 + 1)*(d*x + c
)*b^2*e/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
+ ((d*x + c)^2 - 1)*a*b*e/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x
+ c) + a^2*b^3*d) + 1/2*b^2*e*arcsin(d*x + c)/(b^5*d*arcsin(d*x + c)^2 ...
```

### 3.230.9 Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{c\,e+d\,e\,x}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^3}\,dx$$

input
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^3, x)
```

# 3.231 $\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx$



## 3.231.1 Optimal result

Integrand size = 12, antiderivative size = 127

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{\sqrt{1-(c+dx)^2}}{2bd(a+b\arcsin(c+dx))^2}+\frac{c+dx}{2b^2d(a+b\arcsin(c+dx))} - \frac{\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{2b^3d} - \frac{\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{2b^3d}$$

output
```
1/2*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))-1/2*Ci((a+b*arcsin(d*x+c))/b)*cos(a/
b)/b^3/d-1/2*Si((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^3/d-1/2*(1-(d*x+c)^2)^(1
/2)/b/d/(a+b*arcsin(d*x+c))^2
```

## 3.231.2 Mathematica [A] (verified)

Time = 0.41 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.80

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{\frac{b^2\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}-\frac{b(c+dx)}{a+b\arcsin(c+dx)}+\cos\left(\frac{a}{b}\right)\operatorname{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)+\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(c+\right.}{2b^3d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-3),x]
```

output
```
-1/2*((b^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^2 - (b*(c + d*x)
)/(a + b*ArcSin[c + d*x]) + Cos[a/b]*CosIntegral[a/b + ArcSin[c + d*x]] +
Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]])/(b^3*d)
```

## 3.231.3 Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.93, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.833, Rules used = {5302, 5132, 5222, 5134, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$

$$\Big\downarrow \text{5132}$$

$$\frac{-\frac{\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{d}$$

$$\Big\downarrow \text{5222}$$

$$\frac{-\frac{\frac{\int \frac{1}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{d}$$

$$\Big\downarrow \text{5134}$$

$$\frac{-\frac{\frac{\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{d}$$

$$\Big\downarrow \text{3042}$$

$$\frac{-\frac{\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{d}$$

$\Big\downarrow$ 3784

$$\frac{-\frac{\frac{\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{d}$$

$\Big\downarrow$ 25

$$\frac{-\frac{\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{d}$$

$\Big\downarrow$ 3042

$$\frac{-\frac{\frac{\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{d}$$

$\Big\downarrow$ 3780

$$\frac{-\frac{\frac{\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{d}$$

$\Big\downarrow$ 3783

$$\frac{-\frac{\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-3),x]
```

output
```
(-1/2*Sqrt[1 - (c + d*x)^2]/(b*(a + b*ArcSin[c + d*x])^2) - (-((c + d*x)/(
b*(a + b*ArcSin[c + d*x]))) + (Cos[a/b]*CosIntegral[(a + b*ArcSin[c + d*x]
)/b] + Sin[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b])/b^2)/(2*b))/d
```

3.231. $\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx$

### 3.231.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

## 3.231. $\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx$

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.231.4 Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.24

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{\sqrt{1-(dx+c)^2}}{2(a+b\arcsin(dx+c))^2 b}-\frac{\arcsin(dx+c)\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b+\operatorname{Ci}(\arcsin(dx+ \cdots}{2(a+b\arcsin(dx+c))b^3}}{d}$ |
| default | $\frac{-\frac{\sqrt{1-(dx+c)^2}}{2(a+b\arcsin(dx+c))^2 b}-\frac{\arcsin(dx+c)\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\cos\left(\frac{a}{b}\right)b+\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b+\operatorname{Ci}(\arcsin(dx+ \cdots}{2(a+b\arcsin(dx+c))b^3}}{d}$ |

input
```
int(1/(a+b*arcsin(d*x+c))^3,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/2*(1-(d*x+c)^2)^(1/2)/(a+b*arcsin(d*x+c))^2/b-1/2*(arcsin(d*x+c)*C
i(arcsin(d*x+c)+a/b)*cos(a/b)*b+arcsin(d*x+c)*sin(a/b)*Si(arcsin(d*x+c)+a/
b)*b+Ci(arcsin(d*x+c)+a/b)*cos(a/b)*a+sin(a/b)*Si(arcsin(d*x+c)+a/b)*a-(d*
x+c)*b)/(a+b*arcsin(d*x+c))/b^3)
```

### 3.231.5 Fricas [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{1}{(b\arcsin(dx+c)+a)^3}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
integral(1/(b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*ar
csin(d*x + c) + a^3), x)
```

### 3.231.6 Sympy [F]

$$\int \frac{1}{(a + b\arcsin(c + dx))^3} \, dx = \int \frac{1}{(a + b\operatorname{asin}(c + dx))^3} \, dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**3,x)
```

output
```
Integral((a + b*asin(c + d*x))**(-3), x)
```

### 3.231.7 Maxima [F]

$$\int \frac{1}{(a + b\arcsin(c + dx))^3} \, dx = \int \frac{1}{(b\arcsin(dx + c) + a)^3} \, dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
1/2*(a*d*x - sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)*b + a*c + (b*d*x + b*c)*
arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 2*(b^4*d*arctan2(
d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arctan2(d*x +
 c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)*integrate(1/2/(b^3*
arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a*b^2), x))/(b^4*
d*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*a*b^3*d*arc
tan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) + a^2*b^2*d)
```

### 3.231.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 547 vs. $2(117) = 234$.

Time = 0.31 (sec) , antiderivative size = 547, normalized size of antiderivative = 4.31

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx = -\frac{b^2\arcsin(dx+c)^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{b^2\arcsin(dx+c)^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{ab\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d} - \frac{ab\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d} + \frac{(dx+c)b^2\arcsin(dx+c)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{a^2\cos\left(\frac{a}{b}\right)\operatorname{Ci}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{a^2\sin\left(\frac{a}{b}\right)\operatorname{Si}\left(\frac{a}{b}+\arcsin(dx+c)\right)}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} + \frac{(dx+c)ab}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)} - \frac{\sqrt{-(dx+c)^2+1}b^2}{2\left(b^5d\arcsin(dx+c)^2+2\,ab^4d\arcsin(dx+c)+a^2b^3d\right)}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
-1/2*b^2*arcsin(d*x + c)^2*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b
^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/2*b^2*
arcsin(d*x + c)^2*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^5*d*arcs
in(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - a*b*arcsin(d*x +
c)*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 +
 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - a*b*arcsin(d*x + c)*sin(a/b)*sin
_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcs
in(d*x + c) + a^2*b^3*d) + 1/2*(d*x + c)*b^2*arcsin(d*x + c)/(b^5*d*arcsin
(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) - 1/2*a^2*cos(a/b)*co
s_integral(a/b + arcsin(d*x + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arc
sin(d*x + c) + a^2*b^3*d) - 1/2*a^2*sin(a/b)*sin_integral(a/b + arcsin(d*x
 + c))/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) + a^2*b^3*d) +
 1/2*(d*x + c)*a*b/(b^5*d*arcsin(d*x + c)^2 + 2*a*b^4*d*arcsin(d*x + c) +
a^2*b^3*d) - 1/2*sqrt(-(d*x + c)^2 + 1)*b^2/(b^5*d*arcsin(d*x + c)^2 + 2*a
*b^4*d*arcsin(d*x + c) + a^2*b^3*d)
```

3.231. $\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx$

### 3.231.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^3}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^3}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^3,x)
```

output
```
int(1/(a + b*asin(c + d*x))^3, x)
```

# 3.232 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx$



## 3.232.1 Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx=\frac{\text{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^3},x\right)}{e}$$

output
```
Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^3,x)/e
```

## 3.232.2 Mathematica [N/A]

Not integrable

Time = 1.30 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx=\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx$$

input
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3),x]
```

output
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3), x]
```

### 3.232.3 Rubi [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3} \, dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int \frac{1}{e(c+dx)(a+b\arcsin(c+dx))^3}d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$
$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^3}d(c+dx)}{de}$$
$$\Big\downarrow \text{5148}$$
$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^3}d(c+dx)}{de}$$

input
```
Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^3),x]
```

output
```
$Aborted
```

#### 3.232.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.232.4 Maple [N/A] (verified)

Not integrable

Time = 0.68 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{1}{(dex+ce)\,(a+b\arcsin(dx+c))^3}dx$$

input
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x)
```

output
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x)
```

### 3.232.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 91, normalized size of antiderivative = 3.96

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^3}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
integral(1/(a^3*d*e*x + a^3*c*e + (b^3*d*e*x + b^3*c*e)*arcsin(d*x + c)^3
+ 3*(a*b^2*d*e*x + a*b^2*c*e)*arcsin(d*x + c)^2 + 3*(a^2*b*d*e*x + a^2*b*c
*e)*arcsin(d*x + c)), x)
```

### 3.232.6 Sympy [N/A]

Not integrable

Time = 3.61 (sec) , antiderivative size = 112, normalized size of antiderivative = 4.87

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx$$
$$=\frac{\int \frac{1}{a^3c+a^3dx+3a^2bc\,\mathrm{asin}\,(c+dx)+3a^2bdx\,\mathrm{asin}\,(c+dx)+3ab^2c\,\mathrm{asin}^2\,(c+dx)+3ab^2dx\,\mathrm{asin}^2\,(c+dx)+b^3c\,\mathrm{asin}^3\,(c+dx)+b^3dx\,\mathrm{asin}^3\,(c+dx)}\,dx}{e}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**3,x)
```

output
```
Integral(1/(a**3*c + a**3*d*x + 3*a**2*b*c*asin(c + d*x) + 3*a**2*b*d*x*as
in(c + d*x) + 3*a*b**2*c*asin(c + d*x)**2 + 3*a*b**2*d*x*asin(c + d*x)**2
+ b**3*c*asin(c + d*x)**3 + b**3*d*x*asin(c + d*x)**3), x)/e
```

### 3.232.7 Maxima [N/A]

Not integrable

Time = 196.97 (sec) , antiderivative size = 520, normalized size of antiderivative = 22.61

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx=\int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^3}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
-1/2*((b*d*x + b*c)*sqrt(d*x + c + 1)*sqrt(-d*x - c + 1) - b*arctan2(d*x +
 c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)) - 2*(a^2*b^2*d^3*e*x^2 + 2*a^2*b
^2*c*d^2*e*x + a^2*b^2*c^2*d*e + (b^4*d^3*e*x^2 + 2*b^4*c*d^2*e*x + b^4*c^
2*d*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*(a*b^3
*d^3*e*x^2 + 2*a*b^3*c*d^2*e*x + a*b^3*c^2*d*e)*arctan2(d*x + c, sqrt(d*x
+ c + 1)*sqrt(-d*x - c + 1)))*integrate(1/(a*b^2*d^3*e*x^3 + 3*a*b^2*c*d^2
*e*x^2 + 3*a*b^2*c^2*d*e*x + a*b^2*c^3*e + (b^3*d^3*e*x^3 + 3*b^3*c*d^2*e*
x^2 + 3*b^3*c^2*d*e*x + b^3*c^3*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt
(-d*x - c + 1))), x) - a)/(a^2*b^2*d^3*e*x^2 + 2*a^2*b^2*c*d^2*e*x + a^2*b
^2*c^2*d*e + (b^4*d^3*e*x^2 + 2*b^4*c*d^2*e*x + b^4*c^2*d*e)*arctan2(d*x +
 c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*(a*b^3*d^3*e*x^2 + 2*a*b^3
*c*d^2*e*x + a*b^3*c^2*d*e)*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x -
 c + 1)))
```

### 3.232.8 Giac [N/A]

Not integrable

Time = 7.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^3}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^3), x)
```

### 3.232.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^3}\,dx = \int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^3}\,dx$$

input
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^3),x)
```

output
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^3), x)
```

# 3.233 $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx$



## 3.233.1 Optimal result

Integrand size = 23, antiderivative size = 416

$$\begin{aligned}\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = &-\frac{e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}-\frac{2e^4(c+dx)^3}{3b^2d(a+b\arcsin(c+dx))^2}\\&+\frac{5e^4(c+dx)^5}{6b^2d(a+b\arcsin(c+dx))^2}-\frac{2e^4(c+dx)^2\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))}\\&+\frac{25e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))}\\&-\frac{e^4\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{48b^4d}\\&+\frac{27e^4\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{32b^4d}\\&-\frac{125e^4\,\text{CosIntegral}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{5a}{b}\right)}{96b^4d}\\&+\frac{e^4\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{48b^4d}\\&-\frac{27e^4\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{32b^4d}\\&+\frac{125e^4\cos\left(\frac{5a}{b}\right)\text{Si}\left(\frac{5(a+b\arcsin(c+dx))}{b}\right)}{96b^4d}\end{aligned}$$

output
```
-2/3*e^4*(d*x+c)^3/b^2/d/(a+b*arcsin(d*x+c))^2+5/6*e^4*(d*x+c)^5/b^2/d/(a+
b*arcsin(d*x+c))^2+1/48*e^4*cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^4/d-27/32
*e^4*cos(3*a/b)*Si(3*(a+b*arcsin(d*x+c))/b)/b^4/d+125/96*e^4*cos(5*a/b)*Si
(5*(a+b*arcsin(d*x+c))/b)/b^4/d-1/48*e^4*Ci((a+b*arcsin(d*x+c))/b)*sin(a/b
)/b^4/d+27/32*e^4*Ci(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^4/d-125/96*e^4*
Ci(5*(a+b*arcsin(d*x+c))/b)*sin(5*a/b)/b^4/d-1/3*e^4*(d*x+c)^4*(1-(d*x+c)^
2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^3-2*e^4*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)/b^3
/d/(a+b*arcsin(d*x+c))+25/6*e^4*(d*x+c)^4*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*a
rcsin(d*x+c))
```

## 3.233.2 Mathematica [A] (verified)

Time = 1.69 (sec) , antiderivative size = 414, normalized size of antiderivative = 1.00

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = \frac{e^4\left(-\frac{32b^3(c+dx)^4\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3}+\frac{16b^2(-4(c+dx)^3+5(c+dx)^5)}{(a+b\arcsin(c+dx))^2}+\frac{16b\sqrt{1-(c+dx)^2}(-12(c+dx)^2+25(c+dx)^4)}{a+b\arcsin(c+dx)}+384(-\operatorname{CosIntegr}\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e^4*((-32*b^3*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^
3 + (16*b^2*(-4*(c + d*x)^3 + 5*(c + d*x)^5))/(a + b*ArcSin[c + d*x])^2 +
(16*b*Sqrt[1 - (c + d*x)^2]*(-12*(c + d*x)^2 + 25*(c + d*x)^4))/(a + b*Arc
Sin[c + d*x]) + 384*(-(CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b]) + Cos[
a/b]*SinIntegral[a/b + ArcSin[c + d*x]]) + 544*(3*CosIntegral[a/b + ArcSin
[c + d*x]]*Sin[a/b] - CosIntegral[3*(a/b + ArcSin[c + d*x])]*Sin[(3*a)/b]
- 3*Cos[a/b]*SinIntegral[a/b + ArcSin[c + d*x]] + Cos[(3*a)/b]*SinIntegral
[3*(a/b + ArcSin[c + d*x])]) - 125*(10*CosIntegral[a/b + ArcSin[c + d*x]]*
Sin[a/b] - 5*CosIntegral[3*(a/b + ArcSin[c + d*x])]*Sin[(3*a)/b] + CosInte
gral[5*(a/b + ArcSin[c + d*x])]*Sin[(5*a)/b] - 10*Cos[a/b]*SinIntegral[a/b
 + ArcSin[c + d*x]] + 5*Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*x])
] - Cos[(5*a)/b]*SinIntegral[5*(a/b + ArcSin[c + d*x])])))/(96*b^4*d)
```

### 3.233.3 Rubi [A] (verified)

Time = 0.99 (sec) , antiderivative size = 483, normalized size of antiderivative = 1.16, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {5304, 27, 5144, 5222, 5142, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e^4(c+dx)^4}{(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^4\int \frac{(c+dx)^4}{(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \text{5144}$$

$$\frac{e^4\left(\frac{4\int \frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{3b}-\frac{5\int \frac{(c+dx)^5}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{3b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^4}{3b(a+b\arcsin(c+dx))^3}\right)}{d}$$

$$\Big\downarrow \text{5222}$$

$$\frac{e^4\left(\frac{4\left(\frac{3\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{(c+dx)^3}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{5\left(\frac{5\int \frac{(c+dx)^4}{(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{(c+dx)^5}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{\sqrt{1-(c+dx)^2}(c}{3b(a+b\arcsin(c}\right.}{d}$$

$$\Big\downarrow \text{5142}$$

$$e^4\left(-\frac{5\left(\frac{5\left(\frac{\int\left(\frac{5\sin\left(\frac{5a}{b}-\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16(a+b\arcsin(c+dx))}-\frac{9\sin\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16(a+b\arcsin(c+dx))}+\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{8(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^4\sqrt{1-(c+d\ldots}}{b(a+b\arcsin(c+d\ldots}\right.}{2b}\right.}{3b}\right.$$

$\downarrow$ 2009

$$e^4\left(\frac{4\left(\frac{3\left(\frac{1}{4}\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\frac{3}{4}\sin\left(\frac{3a}{b}\right)\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)-\frac{1}{4}\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)+\frac{3}{4}\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+\ldots}{}\right.\right.}{b^2}\right.}{2b}\right.}{3b}\right.$$

input
```
Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^4,x]
```

3.233. $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx$

output
```
(e^4*(-1/3*((c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x])^
3) + (4*(-1/2*(c + d*x)^3/(b*(a + b*ArcSin[c + d*x])^2) + (3*(-(((c + d*x)
^2*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x]))) + ((CosIntegral[(a
+ b*ArcSin[c + d*x])/b]*Sin[a/b])/4 - (3*CosIntegral[(3*(a + b*ArcSin[c +
d*x]))/b]*Sin[(3*a)/b])/4 - (Cos[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/
b])/4 + (3*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/4)/b^2
))/(2*b)))/(3*b) - (5*(-1/2*(c + d*x)^5/(b*(a + b*ArcSin[c + d*x])^2) + (5
*(-(((c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x]))) + ((C
osIntegral[(a + b*ArcSin[c + d*x])/b]*Sin[a/b])/8 - (9*CosIntegral[(3*(a +
 b*ArcSin[c + d*x]))/b]*Sin[(3*a)/b])/16 + (5*CosIntegral[(5*(a + b*ArcSin
[c + d*x]))/b]*Sin[(5*a)/b])/16 - (Cos[a/b]*SinIntegral[(a + b*ArcSin[c +
d*x])/b])/8 + (9*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/
16 - (5*Cos[(5*a)/b]*SinIntegral[(5*(a + b*ArcSin[c + d*x]))/b])/16)/b^2))
/(2*b)))/(3*b)))/d
```

### 3.233.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

3.233. $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx$

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.233.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1137 vs. $2(390) = 780$.

Time = 0.91 (sec) , antiderivative size = 1138, normalized size of antiderivative = 2.74

| method | result | size |
|---|---|---|
| derivativedivides | Expression too large to display | 1138 |
| default | Expression too large to display | 1138 |

input
```
int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

output
```
1/96/d*e^4*(2*arcsin(d*x+c)*b^3*(d*x+c)-2*cos(5*arcsin(d*x+c))*b^3-4*(1-(d
*x+c)^2)^(1/2)*b^3+6*arcsin(d*x+c)*cos(a/b)*Si(arcsin(d*x+c)+a/b)*a^2*b-6*
arcsin(d*x+c)*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a^2*b+243*arcsin(d*x+c)^2*sin
(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a*b^2-243*arcsin(d*x+c)^2*Si(3*arcsin(d*
x+c)+3*a/b)*cos(3*a/b)*a*b^2+243*arcsin(d*x+c)*sin(3*a/b)*Ci(3*arcsin(d*x+
c)+3*a/b)*a^2*b-243*arcsin(d*x+c)*Si(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)*a^2
*b+375*arcsin(d*x+c)^2*Si(5*arcsin(d*x+c)+5*a/b)*cos(5*a/b)*a*b^2-375*arcs
in(d*x+c)^2*Ci(5*arcsin(d*x+c)+5*a/b)*sin(5*a/b)*a*b^2+375*arcsin(d*x+c)*S
i(5*arcsin(d*x+c)+5*a/b)*cos(5*a/b)*a^2*b-375*arcsin(d*x+c)*Ci(5*arcsin(d*
x+c)+5*a/b)*sin(5*a/b)*a^2*b+6*arcsin(d*x+c)^2*cos(a/b)*Si(arcsin(d*x+c)+a
/b)*a*b^2-6*arcsin(d*x+c)^2*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a*b^2+6*cos(3*a
rcsin(d*x+c))*b^3+81*arcsin(d*x+c)^3*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*
b^3-81*arcsin(d*x+c)^3*Si(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)*b^3-54*arcsin(
d*x+c)*cos(3*arcsin(d*x+c))*a*b^2+125*arcsin(d*x+c)^3*Si(5*arcsin(d*x+c)+5
*a/b)*cos(5*a/b)*b^3-125*arcsin(d*x+c)^3*Ci(5*arcsin(d*x+c)+5*a/b)*sin(5*a
/b)*b^3+50*arcsin(d*x+c)*cos(5*arcsin(d*x+c))*a*b^2+2*arcsin(d*x+c)^3*cos(
a/b)*Si(arcsin(d*x+c)+a/b)*b^3-2*arcsin(d*x+c)^3*sin(a/b)*Ci(arcsin(d*x+c)
+a/b)*b^3+4*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)*a*b^2-9*arcsin(d*x+c)*sin(3*
arcsin(d*x+c))*b^3+81*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^3-81*Si(3*arc
sin(d*x+c)+3*a/b)*cos(3*a/b)*a^3-9*sin(3*arcsin(d*x+c))*a*b^2-27*cos(3*...
```

### 3.233.5 Fricas [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{(dex+ce)^4}{(b\arcsin(dx+c)+a)^4}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
integral((d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*
x + c^4*e^4)/(b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^
2*arcsin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4), x)
```

### 3.233.6 Sympy [F]

$$\int \frac{(ce + dex)^4}{(a + b \arcsin(c + dx))^4} dx$$
$$= e^4 \left( \int \frac{c^4}{a^4 + 4a^3b \operatorname{asin}(c + dx) + 6a^2b^2 \operatorname{asin}^2(c + dx) + 4ab^3 \operatorname{asin}^3(c + dx) + b^4 \operatorname{asin}^4(c + dx)} dx \right.$$
$$+ \int \frac{d^4x^4}{a^4 + 4a^3b \operatorname{asin}(c + dx) + 6a^2b^2 \operatorname{asin}^2(c + dx) + 4ab^3 \operatorname{asin}^3(c + dx) + b^4 \operatorname{asin}^4(c + dx)} dx$$
$$+ \int \frac{4cd^3x^3}{a^4 + 4a^3b \operatorname{asin}(c + dx) + 6a^2b^2 \operatorname{asin}^2(c + dx) + 4ab^3 \operatorname{asin}^3(c + dx) + b^4 \operatorname{asin}^4(c + dx)} dx$$
$$+ \int \frac{6c^2d^2x^2}{a^4 + 4a^3b \operatorname{asin}(c + dx) + 6a^2b^2 \operatorname{asin}^2(c + dx) + 4ab^3 \operatorname{asin}^3(c + dx) + b^4 \operatorname{asin}^4(c + dx)} dx$$
$$\left. + \int \frac{4c^3dx}{a^4 + 4a^3b \operatorname{asin}(c + dx) + 6a^2b^2 \operatorname{asin}^2(c + dx) + 4ab^3 \operatorname{asin}^3(c + dx) + b^4 \operatorname{asin}^4(c + dx)} dx \right)$$

input
```
integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**4,x)
```

output
```
e**4*(Integral(c**4/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c +
d*x)**2 + 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integra
l(d**4*x**4/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2
+ 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(4*c*d*
*3*x**3/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*
a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(6*c**2*d**
2*x**2/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a
*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(4*c**3*d*x/
(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**3*a
sin(c + d*x)**3 + b**4*asin(c + d*x)**4), x))
```

### 3.233.7 Maxima [F(-1)]

Timed out.

$$\int \frac{(ce + dex)^4}{(a + b \arcsin(c + dx))^4} dx = \text{Timed out}$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
Timed out
```

### 3.233.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 5870 vs. 2(390) = 780.

Time = 0.79 (sec) , antiderivative size = 5870, normalized size of antiderivative = 14.11

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
-125/6*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(
d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2
+ 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 125/6*b^3*e^4*arcsin(d*x + c)
^3*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcsin(d*x +
c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4
*d) - 125/2*a*b^2*e^4*arcsin(d*x + c)^2*cos(a/b)^4*cos_integral(5*a/b + 5*
arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x
+ c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 125/2*a*b^2*e^4*arcsin
(d*x + c)^2*cos(a/b)^5*sin_integral(5*a/b + 5*arcsin(d*x + c))/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c)
+ a^3*b^4*d) + 125/8*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(5*a
/b + 5*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcs
in(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 125/2*a^2*b*e^4
*arcsin(d*x + c)*cos(a/b)^4*cos_integral(5*a/b + 5*arcsin(d*x + c))*sin(a/
b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*ar
csin(d*x + c) + a^3*b^4*d) + 27/8*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)^2*cos
_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3
*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 62
5/24*b^3*e^4*arcsin(d*x + c)^3*cos(a/b)^3*sin_integral(5*a/b + 5*arcsin(d*
x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*...
```

### 3.233.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^4}\,dx = \int \frac{(c\,e+d\,e\,x)^4}{(a+b\,\mathrm{asin}\,(c+d\,x))^4}\,dx$$

input
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^4,x)
```

output
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^4, x)
```

# 3.234 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$



## 3.234.1 Optimal result

Integrand size = 23, antiderivative size = 346

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx = -\frac{e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e^3(c+dx)^2}{2b^2d(a+b\arcsin(c+dx))^2} + \frac{2e^3(c+dx)^4}{3b^2d(a+b\arcsin(c+dx))^2} - \frac{e^3(c+dx)\sqrt{1-(c+dx)^2}}{b^3d(a+b\arcsin(c+dx))} + \frac{8e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} - \frac{e^3\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} + \frac{4e^3\cos\left(\frac{4a}{b}\right)\text{CosIntegral}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} - \frac{e^3\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} + \frac{4e^3\sin\left(\frac{4a}{b}\right)\text{Si}\left(\frac{4(a+b\arcsin(c+dx))}{b}\right)}{3b^4d}$$

output
```
-1/2*e^3*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))^2+2/3*e^3*(d*x+c)^4/b^2/d/(a+
b*arcsin(d*x+c))^2-1/3*e^3*Ci(2*(a+b*arcsin(d*x+c))/b)*cos(2*a/b)/b^4/d+4/
3*e^3*Ci(4*(a+b*arcsin(d*x+c))/b)*cos(4*a/b)/b^4/d-1/3*e^3*Si(2*(a+b*arcsi
n(d*x+c))/b)*sin(2*a/b)/b^4/d+4/3*e^3*Si(4*(a+b*arcsin(d*x+c))/b)*sin(4*a/
b)/b^4/d-1/3*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^3-e
^3*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))+8/3*e^3*(d*x+c)^3
*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))
```

### 3.234.2 Mathematica [A] (verified)

Time = 1.26 (sec) , antiderivative size = 320, normalized size of antiderivative = 0.92

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$$
$$= \frac{e^3\left(-\frac{2b^3(c+dx)^3\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3}+\frac{b^2(-3(c+dx)^2+4(c+dx)^4)}{(a+b\arcsin(c+dx))^2}+\frac{2b\sqrt{1-(c+dx)^2}(-3(c+dx)+8(c+dx)^3)}{a+b\arcsin(c+dx)}+6\log(a+b\arcsin(c+ d\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e^3*((-2*b^3*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^3
 + (b^2*(-3*(c + d*x)^2 + 4*(c + d*x)^4))/(a + b*ArcSin[c + d*x])^2 + (2*b
*Sqrt[1 - (c + d*x)^2]*(-3*(c + d*x) + 8*(c + d*x)^3))/(a + b*ArcSin[c + d
*x]) + 6*Log[a + b*ArcSin[c + d*x]] + 30*(Cos[(2*a)/b]*CosIntegral[2*(a/b
+ ArcSin[c + d*x])] - Log[a + b*ArcSin[c + d*x]] + Sin[(2*a)/b]*SinIntegra
l[2*(a/b + ArcSin[c + d*x])]) + 8*(-4*Cos[(2*a)/b]*CosIntegral[2*(a/b + Ar
cSin[c + d*x])] + Cos[(4*a)/b]*CosIntegral[4*(a/b + ArcSin[c + d*x])] + 3*
Log[a + b*ArcSin[c + d*x]] - 4*Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c
+ d*x])] + Sin[(4*a)/b]*SinIntegral[4*(a/b + ArcSin[c + d*x])])))/(6*b^4*d
)
```

### 3.234.3 Rubi [A] (verified)

Time = 1.30 (sec) , antiderivative size = 367, normalized size of antiderivative = 1.06, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.522$, Rules used = {5304, 27, 5144, 5222, 5142, 2009, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int \frac{e^3(c+dx)^3}{(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{e^3\int \frac{(c+dx)^3}{(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \; 5144$$

$$\frac{e^3\left(\frac{\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{b}-\frac{4\int \frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{3b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^3}{3b(a+b\arcsin(c+dx))^3}\right)}{d}$$

$$\Big\downarrow \; 5222$$

$$\frac{e^3\left(\frac{\frac{\int \frac{c+dx}{(a+b\arcsin(c+dx))^2}d(c+dx)}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}}{b}-\frac{4\left(\frac{2\int \frac{(c+dx)^3}{(a+b\arcsin(c+dx))^2}d(c+dx)}{b}-\frac{(c+dx)^4}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^3}{3b(a+b\arcsin(c+dx))^3}\right.}{d}$$

$$\Big\downarrow \; 5142$$

3.234. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$

$$e^3\left(\frac{\frac{\frac{\int \frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}-\frac{4\left(\frac{2\left(\int\left(\frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2(a+b\arcsin(c+dx))}-\ldots\right.\right.}{\ldots}\right.}{\ldots}\right.$$

$d$

$\downarrow$ 2009

$$e^3\left(\frac{\frac{\frac{\int \frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}-\frac{4\left(\frac{2\left(\frac{1}{2}\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+\ldots}{b}\right.\right.}{\ldots}\right.}{\ldots}\right.$$

$\downarrow$ 3042

$$e^3\left(\frac{\frac{\frac{\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}-\frac{4\left(\frac{2\left(\frac{1}{2}\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin\ldots}{b}\right.\right.}{\ldots}\right.}{\ldots}\right.$$

$\downarrow$ 3784

3.234. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$

$$e^3\left(\frac{\frac{\frac{\cos\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int -\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}-\frac{(c\cdots}{2b(a+b\,a\cdots}}{b}\cdots\right.$$

$\Big\downarrow$ 25

$$e^3\left(\frac{\frac{\frac{\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}-\frac{(c+\cdots}{2b(a+b\arcsin\cdots}}{b}\cdots\right.$$

$\Big\downarrow$ 3042

$$e^3\left(\frac{\frac{\frac{\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}-\frac{\cdots}{2b(a+b\cdots}}{b}\cdots\right.$$

$\Big\downarrow$ 3780

3.234. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$

$$e^3\left(\frac{\frac{\frac{\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}}{b}-\frac{4\left(\cdots\right.}{\cdots}\right.$$

$\downarrow$ 3783

$$e^3\left(\frac{\frac{\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)+\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}}{b}-\frac{4\left(2\left(\frac{\frac{1}{2}\cos\left(\frac{2a}{b}\right)\text{C}\cdots}{\cdots}\right.\right.}{\cdots}\right.$$

input
```
Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e^3*(-1/3*((c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x])^
3) + (-1/2*(c + d*x)^2/(b*(a + b*ArcSin[c + d*x])^2) + (-(((c + d*x)*Sqrt[
1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x]))) + (Cos[(2*a)/b]*CosIntegral
[(2*(a + b*ArcSin[c + d*x]))/b] + Sin[(2*a)/b]*SinIntegral[(2*(a + b*ArcSi
n[c + d*x]))/b])/b^2)/b)/b - (4*(-1/2*(c + d*x)^4/(b*(a + b*ArcSin[c + d*x
])^2) + (2*(-(((c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x
]))) + ((Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/2 - (Cos
[(4*a)/b]*CosIntegral[(4*(a + b*ArcSin[c + d*x]))/b])/2 + (Sin[(2*a)/b]*Si
nIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/2 - (Sin[(4*a)/b]*SinIntegral[(4
*(a + b*ArcSin[c + d*x]))/b])/2)/b^2))/b))/(3*b)))/d
```

## 3.234. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$

### 3.234.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

---

## 3.234. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.234.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 782 vs. 2(324) = 648.

Time = 0.33 (sec) , antiderivative size = 783, normalized size of antiderivative = 2.26

| method | result | size |
|---|---|---|
| derivativedivides | Expression too large to display | 783 |
| default | Expression too large to display | 783 |

input
```
int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

output
```
-1/24/d*e^3*(8*arcsin(d*x+c)^2*sin(4*arcsin(d*x+c))*b^3+2*arcsin(d*x+c)*co
s(2*arcsin(d*x+c))*b^3-2*arcsin(d*x+c)*cos(4*arcsin(d*x+c))*b^3+8*cos(2*a/
b)*Ci(2*arcsin(d*x+c)+2*a/b)*a^3+8*Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*a^
3-32*sin(4*a/b)*Si(4*arcsin(d*x+c)+4*a/b)*a^3-32*cos(4*a/b)*Ci(4*arcsin(d*
x+c)+4*a/b)*a^3-4*sin(2*arcsin(d*x+c))*a^2*b+2*cos(2*arcsin(d*x+c))*a*b^2+
8*sin(4*arcsin(d*x+c))*a^2*b-2*cos(4*arcsin(d*x+c))*a*b^2-4*arcsin(d*x+c)^
2*sin(2*arcsin(d*x+c))*b^3+24*arcsin(d*x+c)^2*cos(2*a/b)*Ci(2*arcsin(d*x+c
)+2*a/b)*a*b^2+24*arcsin(d*x+c)^2*Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*a*b
^2-96*arcsin(d*x+c)^2*sin(4*a/b)*Si(4*arcsin(d*x+c)+4*a/b)*a*b^2-96*arcsin
(d*x+c)^2*cos(4*a/b)*Ci(4*arcsin(d*x+c)+4*a/b)*a*b^2+24*arcsin(d*x+c)*cos(
2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a^2*b+24*arcsin(d*x+c)*Si(2*arcsin(d*x+c)
+2*a/b)*sin(2*a/b)*a^2*b-96*arcsin(d*x+c)*sin(4*a/b)*Si(4*arcsin(d*x+c)+4*
a/b)*a^2*b-96*arcsin(d*x+c)*cos(4*a/b)*Ci(4*arcsin(d*x+c)+4*a/b)*a^2*b+8*a
rcsin(d*x+c)^3*cos(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*b^3+8*arcsin(d*x+c)^3*
Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*b^3-32*arcsin(d*x+c)^3*sin(4*a/b)*Si(
4*arcsin(d*x+c)+4*a/b)*b^3-32*arcsin(d*x+c)^3*cos(4*a/b)*Ci(4*arcsin(d*x+c
)+4*a/b)*b^3-8*arcsin(d*x+c)*sin(2*arcsin(d*x+c))*a*b^2+16*arcsin(d*x+c)*s
in(4*arcsin(d*x+c))*a*b^2-sin(4*arcsin(d*x+c))*b^3+2*sin(2*arcsin(d*x+c))*
b^3)/(a+b*arcsin(d*x+c))^3/b^4
```

### 3.234.5 Fricas [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^4}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
integral((d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3)/(b^4*ar
csin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arcsin(d*x + c)^2
+ 4*a^3*b*arcsin(d*x + c) + a^4), x)
```

### 3.234.6 Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx$$
$$= e^3\left(\int \frac{c^3}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx + \int \frac{d^3x^3}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx + \int \frac{3cd^2x^2}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx + \int \frac{3c^2dx}{a^4+4a^3b\operatorname{asin}(c+dx)+6a^2b^2\operatorname{asin}^2(c+dx)+4ab^3\operatorname{asin}^3(c+dx)+b^4\operatorname{asin}^4(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**4,x)
```

output
```
e**3*(Integral(c**3/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c +
d*x)**2 + 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integra
l(d**3*x**3/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2
+ 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(3*c*d*
*2*x**2/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*
a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(3*c**2*d*x
/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**3*
asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x))
```

### 3.234.7 Maxima [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
Timed out
```

### 3.234.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 4040 vs. 2(324) = 648.

Time = 0.76 (sec) , antiderivative size = 4040, normalized size of antiderivative = 11.68

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
32/3*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin(d*
x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5
*d*arcsin(d*x + c) + a^3*b^4*d) + 32/3*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)^
3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^
3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d)
 + 32*a*b^2*e^3*arcsin(d*x + c)^2*cos(a/b)^4*cos_integral(4*a/b + 4*arcsin
(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*
b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 32*a*b^2*e^3*arcsin(d*x + c)^2*cos(a/
b)^3*sin(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x +
c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4
*d) - 32/3*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(4*a/b + 4*arc
sin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a
^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 32*a^2*b*e^3*arcsin(d*x + c)*cos(a
/b)^4*cos_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3
*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 2/
3*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x +
 c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*
arcsin(d*x + c) + a^3*b^4*d) - 16/3*b^3*e^3*arcsin(d*x + c)^3*cos(a/b)*sin
(a/b)*sin_integral(4*a/b + 4*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3
*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) +...
```

### 3.234.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^4}\,dx = \int \frac{(c\,e+d\,e\,x)^3}{(a+b\,\mathrm{asin}\,(c+d\,x))^4}\,dx$$

input
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^4,x)
```

output
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^4, x)
```

# 3.235 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$



## 3.235.1 Optimal result

Integrand size = 23, antiderivative size = 337

$$\begin{aligned}\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx &= -\frac{e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}-\frac{e^2(c+dx)}{3b^2d(a+b\arcsin(c+dx))^2}\\
&\quad+\frac{e^2(c+dx)^3}{2b^2d(a+b\arcsin(c+dx))^2}-\frac{e^2\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))}\\
&\quad+\frac{3e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{2b^3d(a+b\arcsin(c+dx))}\\
&\quad-\frac{e^2\,\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{24b^4d}\\
&\quad+\frac{9e^2\,\text{CosIntegral}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)\sin\left(\frac{3a}{b}\right)}{8b^4d}\\
&\quad+\frac{e^2\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^4d}\\
&\quad-\frac{9e^2\cos\left(\frac{3a}{b}\right)\text{Si}\left(\frac{3(a+b\arcsin(c+dx))}{b}\right)}{8b^4d}\end{aligned}$$

output
```
-1/3*e^2*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^2+1/2*e^2*(d*x+c)^3/b^2/d/(a+b*
arcsin(d*x+c))^2+1/24*e^2*cos(a/b)*Si((a+b*arcsin(d*x+c))/b)/b^4/d-9/8*e^2
*cos(3*a/b)*Si(3*(a+b*arcsin(d*x+c))/b)/b^4/d-1/24*e^2*Ci((a+b*arcsin(d*x+
c))/b)*sin(a/b)/b^4/d+9/8*e^2*Ci(3*(a+b*arcsin(d*x+c))/b)*sin(3*a/b)/b^4/d
-1/3*e^2*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^3-1/3*e^2*(
1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))+3/2*e^2*(d*x+c)^2*(1-(d*x+c)^
2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))
```

### 3.235.2 Mathematica [A] (verified)

Time = 1.26 (sec) , antiderivative size = 264, normalized size of antiderivative = 0.78

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$$
$$= \frac{e^2\left(-\frac{8b^3(c+dx)^2\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3}+\frac{4b^2(-2(c+dx)+3(c+dx)^3)}{(a+b\arcsin(c+dx))^2}+\frac{4b\sqrt{1-(c+dx)^2}(-2+9(c+dx)^2)}{a+b\arcsin(c+dx)}+80\left(\text{CosIntegral}\left(\frac{a}{b}+\arcsin(\right.\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e^2*((-8*b^3*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^3
 + (4*b^2*(-2*(c + d*x) + 3*(c + d*x)^3))/(a + b*ArcSin[c + d*x])^2 + (4*b
*Sqrt[1 - (c + d*x)^2]*(-2 + 9*(c + d*x)^2))/(a + b*ArcSin[c + d*x]) + 80*
(CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] - Cos[a/b]*SinIntegral[a/b +
ArcSin[c + d*x]]) + 27*(-3*CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] + C
osIntegral[3*(a/b + ArcSin[c + d*x])]*Sin[(3*a)/b] + 3*Cos[a/b]*SinIntegra
l[a/b + ArcSin[c + d*x]] - Cos[(3*a)/b]*SinIntegral[3*(a/b + ArcSin[c + d*
x])])))/(24*b^4*d)
```

### 3.235.3 Rubi [A] (verified)

Time = 1.56 (sec) , antiderivative size = 360, normalized size of antiderivative = 1.07, number of steps used = 16, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.652$, Rules used = {5304, 27, 5144, 5222, 5132, 5142, 2009, 5224, 25, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{e^2(c+dx)^2}{(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e^2\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5144}$$

$$\frac{e^2\left(\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{3b}-\frac{\int \frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^2}{3b(a+b\arcsin(c+dx))^3}\right)}{d}$$

$$\Big\downarrow \text{ 5222}$$

$$\frac{e^2\left(\frac{2\left(\frac{\int \frac{1}{(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{\frac{3\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{(c+dx)^3}{2b(a+b\arcsin(c+dx))^2}}{b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)^2}{3b(a+b\arcsin(c+dx))^3}\right.}{d}$$

$$\Big\downarrow \text{ 5132}$$

$$\frac{e^2\left(-\frac{\frac{3\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{(c+dx)^3}{2b(a+b\arcsin(c+dx))^2}}{b}+\frac{2\left(\frac{-\frac{\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}d(c+dx)}{b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c\right.}{3b}\right.}{d}$$

$$\Big\downarrow \text{ 5142}$$

3.235. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$

$$\frac{e^2\left(-\frac{\frac{3\left(\frac{\int \left(\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4(a+b\arcsin(c+dx))}-\frac{3\sin\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4(a+b\arcsin(c+dx))}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)^2\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}\right)}{2b}-\frac{(c+dx)^3}{2b(a+b\arcsin(c+dx))^2}}{b}+\frac{2\left(\cdots\right.}{\cdots}\right.}{d}$$

$\downarrow$ 2009

$$e^2\left(\frac{2\left(\frac{-\frac{\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}d(c+dx)}{b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{3\left(\frac{\frac{1}{4}\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\frac{3}{4}\sin\cdots}{\cdots}\right.}{\cdots}\right.$$

$\downarrow$ 5224

$$e^2\left(\frac{2\left(\frac{-\frac{\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{3\left(\frac{\frac{1}{4}\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+d\cdots}{b}\right.}{\cdots}\right.}{\cdots}\right.$$

$\downarrow$ 25

$$e^2\left(\frac{2\left(\frac{\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{3\left(\frac{\frac{1}{4}\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\cdots}{\cdots}\right.}{\cdots}\right.$$

3.235. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$

$\downarrow$ 3042

$$e^2\left(\frac{2\left(\frac{\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{3\left(\frac{\frac{1}{4}\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\ldots}{\ldots}\right.}{\ldots}\right.$$

$\downarrow$ 3784

$$e^2\left(\frac{2\left(\frac{-\frac{-\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int-\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{c\ldots}{2b(a+b\,\text{ar}\ldots}\right.}{3b}\right.$$

$\downarrow$ 25

$$e^2\left(\frac{2\left(\frac{-\frac{\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{c+dx\ldots}{2b(a+b\arcsin\ldots}\right.}{3b}\right.$$

$\downarrow$ 3042

3.235. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$

$$e^2\left(\frac{2\left(\frac{-\frac{\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{c}{2b(a+b\arc}\right.}{3b}\right.$$

$\downarrow$ 3780

$$e^2\left(\frac{2\left(\frac{-\frac{\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{3\left(\right.}{}\right.$$

$\downarrow$ 3783

$$e^2\left(\frac{2\left(\frac{-\frac{\cos\left(\frac{a}{b}\right)\mathrm{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\sin\left(\frac{a}{b}\right)\mathrm{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{3\left(\frac{\frac{1}{4}\sin\left(\frac{a}{b}\right)\mathrm{CosInte}}{}\right.}{}\right.$$

input
```
Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^4,x]
```

3.235. $\int\frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$

output
```
(e^2*(-1/3*((c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x])^
3) + (2*(-1/2*(c + d*x)/(b*(a + b*ArcSin[c + d*x])^2) + (-(Sqrt[1 - (c + d
*x)^2]/(b*(a + b*ArcSin[c + d*x]))) - (-(CosIntegral[(a + b*ArcSin[c + d*x
])/b]*Sin[a/b]) + Cos[a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b])/b^2)/(2
*b)))/(3*b) - (-1/2*(c + d*x)^3/(b*(a + b*ArcSin[c + d*x])^2) + (3*(-(((c
+ d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x]))) + ((CosIntegr
al[(a + b*ArcSin[c + d*x])/b]*Sin[a/b])/4 - (3*CosIntegral[(3*(a + b*ArcSi
n[c + d*x]))/b]*Sin[(3*a)/b])/4 - (Cos[a/b]*SinIntegral[(a + b*ArcSin[c +
d*x])/b])/4 + (3*Cos[(3*a)/b]*SinIntegral[(3*(a + b*ArcSin[c + d*x]))/b])/
4)/b^2))/(2*b))/b))/d
```

### 3.235.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

---

3.235. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

---

## 3.235. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx$

### 3.235.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 752 vs. $2(313) = 626$.

Time = 0.76 (sec) , antiderivative size = 753, normalized size of antiderivative = 2.23

| method | result |
|---|---|
| derivativedivides | $\frac{e^2\left(\arcsin(dx+c)b^3(dx+c)-2\sqrt{1-(dx+c)^2}\,b^3+3\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)a^2b-3\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\right.}{}$ |
| default | $\frac{e^2\left(\arcsin(dx+c)b^3(dx+c)-2\sqrt{1-(dx+c)^2}\,b^3+3\arcsin(dx+c)\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)a^2b-3\arcsin(dx+c)\sin\left(\frac{a}{b}\right)\right.}{}$ |

input
```
int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

output
```
1/24/d*e^2*(arcsin(d*x+c)*b^3*(d*x+c)-2*(1-(d*x+c)^2)^(1/2)*b^3+3*arcsin(d
*x+c)*cos(a/b)*Si(arcsin(d*x+c)+a/b)*a^2*b-3*arcsin(d*x+c)*sin(a/b)*Ci(arc
sin(d*x+c)+a/b)*a^2*b+81*arcsin(d*x+c)^2*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a
/b)*a*b^2-81*arcsin(d*x+c)^2*Si(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)*a*b^2+81
*arcsin(d*x+c)*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^2*b-81*arcsin(d*x+c)
*Si(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)*a^2*b+3*arcsin(d*x+c)^2*cos(a/b)*Si(
arcsin(d*x+c)+a/b)*a*b^2-3*arcsin(d*x+c)^2*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*
a*b^2+2*cos(3*arcsin(d*x+c))*b^3+27*arcsin(d*x+c)^3*sin(3*a/b)*Ci(3*arcsin
(d*x+c)+3*a/b)*b^3-27*arcsin(d*x+c)^3*Si(3*arcsin(d*x+c)+3*a/b)*cos(3*a/b)
*b^3-18*arcsin(d*x+c)*cos(3*arcsin(d*x+c))*a*b^2+arcsin(d*x+c)^3*cos(a/b)*
Si(arcsin(d*x+c)+a/b)*b^3-arcsin(d*x+c)^3*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*b
^3+2*arcsin(d*x+c)*(1-(d*x+c)^2)^(1/2)*a*b^2-3*arcsin(d*x+c)*sin(3*arcsin(
d*x+c))*b^3+27*sin(3*a/b)*Ci(3*arcsin(d*x+c)+3*a/b)*a^3-27*Si(3*arcsin(d*x
+c)+3*a/b)*cos(3*a/b)*a^3-3*sin(3*arcsin(d*x+c))*a*b^2-9*cos(3*arcsin(d*x+
c))*a^2*b+a*b^2*(d*x+c)+(1-(d*x+c)^2)^(1/2)*a^2*b+cos(a/b)*Si(arcsin(d*x+c
)+a/b)*a^3-sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a^3+arcsin(d*x+c)^2*(1-(d*x+c)^2
)^(1/2)*b^3-9*arcsin(d*x+c)^2*cos(3*arcsin(d*x+c))*b^3)/(a+b*arcsin(d*x+c)
)^3/b^4
```

### 3.235.5 Fricas [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^4}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)/(b^4*arcsin(d*x + c)^4 + 4*
a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*arcsin(d*x + c)^2 + 4*a^3*b*arcsin(d*x
 + c) + a^4), x)
```

### 3.235.6 Sympy [F]

$$\begin{aligned}&\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx\\&=e^2\left(\int \frac{c^2}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\right.\\&\quad+\int \frac{d^2x^2}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\\&\quad\left.+\int \frac{2cdx}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\right)\end{aligned}$$

input
```
integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**4,x)
```

output
```
e**2*(Integral(c**2/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c +
d*x)**2 + 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integra
l(d**2*x**2/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2
+ 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(2*c*d*
x/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**3
*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x))
```

### 3.235.7 Maxima [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
Timed out
```

### 3.235.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3109 vs. $2(313) = 626$.

Time = 0.78 (sec) , antiderivative size = 3109, normalized size of antiderivative = 9.23

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
9/2*b^3*e^2*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x
 + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3
*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 9/2*b^3*e^2*arcsin(d*x + c)^3*co
s(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3
+ 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) +
 27/2*a*b^2*e^2*arcsin(d*x + c)^2*cos(a/b)^2*cos_integral(3*a/b + 3*arcsin
(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2
 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 27/2*a*b^2*e^2*arcsin(d*x +
c)^2*cos(a/b)^3*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x
+ c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b
^4*d) - 9/8*b^3*e^2*arcsin(d*x + c)^3*cos_integral(3*a/b + 3*arcsin(d*x +
c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^
2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 27/2*a^2*b*e^2*arcsin(d*x + c)*cos(
a/b)^2*cos_integral(3*a/b + 3*arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x
+ c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b
^4*d) - 1/24*b^3*e^2*arcsin(d*x + c)^3*cos_integral(a/b + arcsin(d*x + c))
*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b
^5*d*arcsin(d*x + c) + a^3*b^4*d) + 27/8*b^3*e^2*arcsin(d*x + c)^3*cos(a/b
)*sin_integral(3*a/b + 3*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b
^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 27/...
```

### 3.235.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^2}{{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)}^4}\,dx$$

input
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^4,x)
```

output
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^4, x)
```

# 3.236 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx$



## 3.236.1 Optimal result

Integrand size = 21, antiderivative size = 208

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx = -\frac{e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3} - \frac{e}{6b^2d(a+b\arcsin(c+dx))^2} + \frac{e(c+dx)^2}{3b^2d(a+b\arcsin(c+dx))^2} + \frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3b^3d(a+b\arcsin(c+dx))} - \frac{2e\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d} - \frac{2e\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{3b^4d}$$

output
```
-1/6*e/b^2/d/(a+b*arcsin(d*x+c))^2+1/3*e*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c
))^2-2/3*e*Ci(2*(a+b*arcsin(d*x+c))/b)*cos(2*a/b)/b^4/d-2/3*e*Si(2*(a+b*ar
csin(d*x+c))/b)*sin(2*a/b)/b^4/d-1/3*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(a+
b*arcsin(d*x+c))^3+2/3*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x
+c))
```

### 3.236.2 Mathematica [A] (verified)

Time = 0.88 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.89

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx = \frac{e\left(-\frac{2b^3(c+dx)\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3}+\frac{b^2(-1+2(c+dx)^2)}{(a+b\arcsin(c+dx))^2}+\frac{4b(c+dx)\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)}-4\log(a+b\arcsin(c+dx))-4\left(\cos\left(\frac{2a}{b}\right)\text{C}\right.\right.}{6b^4}$$

input
```
Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e*((-2*b^3*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^3 + (
b^2*(-1 + 2*(c + d*x)^2))/(a + b*ArcSin[c + d*x])^2 + (4*b*(c + d*x)*Sqrt[
1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x]) - 4*Log[a + b*ArcSin[c + d*x]] -
 4*(Cos[(2*a)/b]*CosIntegral[2*(a/b + ArcSin[c + d*x])] - Log[a + b*ArcSin
[c + d*x]] + Sin[(2*a)/b]*SinIntegral[2*(a/b + ArcSin[c + d*x])])))/(6*b^4
*d)
```

### 3.236.3 Rubi [A] (verified)

Time = 0.96 (sec) , antiderivative size = 193, normalized size of antiderivative = 0.93, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.571$, Rules used = {5304, 27, 5144, 5152, 5222, 5142, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int \frac{e(c+dx)}{(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \ 27$$

$$\frac{e\int \frac{c+dx}{(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \ 5144$$

$$\frac{e\left(\frac{\int \frac{1}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{3b}-\frac{2\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{3b}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^3}\right)}{d}$$

$\downarrow$ 5152

$$\frac{e\left(-\frac{2\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{3b}-\frac{1}{6b^2(a+b\arcsin(c+dx))^2}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^3}\right)}{d}$$

$\downarrow$ 5222

$$\frac{e\left(-\frac{2\left(\frac{\int \frac{c+dx}{(a+b\arcsin(c+dx))^2}d(c+dx)}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{1}{6b^2(a+b\arcsin(c+dx))^2}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^3}\right)}{d}$$

$\downarrow$ 5142

$$\frac{e\left(-\frac{2\left(\frac{\frac{\int \frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{1}{6b^2(a+b\arcsin(c+dx))^2}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^3}\right)}{d}$$

$\downarrow$ 3042

$$\frac{e\left(-\frac{2\left(\frac{\frac{\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{1}{6b^2(a+b\arcsin(c+dx))^2}-\frac{\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^3}\right)}{d}$$

$\downarrow$ 3784

---

3.236. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx$

$$\frac{e\left(-\frac{2\left(\frac{\frac{\cos\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int -\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{b}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{\cdots}{2b(a\cdots}\cdots}{3b}\cdots\right.}{d}\cdots$$

$\downarrow$ 25

$$\frac{e\left(-\frac{2\left(\frac{\frac{\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{b}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{\cdots}{2b(a+\cdots}\cdots}{3b}\cdots\right.}{d}\cdots$$

$\downarrow$ 3042

$$\frac{e\left(-\frac{2\left(\frac{\frac{\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{b}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{\cdots}{2b\cdots}\cdots}{3b}\cdots\right.}{d}\cdots$$

$\downarrow$ 3780

$$\frac{e\left(-\frac{2\left(\frac{\frac{\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{b}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}\cdots\right.}{d}\cdots$$

---

**3.236.** $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx$

$\Big\downarrow$ 3783

$$\frac{e\left(-\frac{2\left(\frac{\frac{\cos\left(\frac{2a}{b}\right)\text{CosIntegral}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)+\sin\left(\frac{2a}{b}\right)\text{Si}\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{b^2}}{b}-\frac{(c+dx)\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}-\frac{(c+dx)^2}{2b(a+b\arcsin(c+dx))^2}\right)}{3b}-\frac{}{6b^2(a+b\,\text{arc}}\right.}{d}$$

input
```
Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^4,x]
```

output
```
(e*(-1/3*((c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c + d*x])^3) -
 1/(6*b^2*(a + b*ArcSin[c + d*x])^2) - (2*(-1/2*(c + d*x)^2/(b*(a + b*ArcS
in[c + d*x])^2) + (-(((c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*(a + b*ArcSin[c
+ d*x]))) + (Cos[(2*a)/b]*CosIntegral[(2*(a + b*ArcSin[c + d*x]))/b] + Sin
[(2*a)/b]*SinIntegral[(2*(a + b*ArcSin[c + d*x]))/b])/b^2)/b))/(3*b)))/d
```

### 3.236.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.236. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx$

### 3.236.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 398 vs. 2(192) = 384.

Time = 0.22 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.92

| method | result |
|---|---|
| derivativedivides | $-\frac{e\left(4\arcsin(dx+c)^3\cos\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^3+4\arcsin(dx+c)^3\mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)b^3+12\arcsin\right.}{}$ |
| default | $-\frac{e\left(4\arcsin(dx+c)^3\cos\left(\frac{2a}{b}\right)\mathrm{Ci}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)b^3+4\arcsin(dx+c)^3\mathrm{Si}\left(2\arcsin(dx+c)+\frac{2a}{b}\right)\sin\left(\frac{2a}{b}\right)b^3+12\arcsin\right.}{}$ |

input
```
int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

output
```
-1/6/d*e*(4*arcsin(d*x+c)^3*cos(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*b^3+4*arc
sin(d*x+c)^3*Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*b^3+12*arcsin(d*x+c)^2*c
os(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a*b^2+12*arcsin(d*x+c)^2*Si(2*arcsin(d
*x+c)+2*a/b)*sin(2*a/b)*a*b^2-2*arcsin(d*x+c)^2*sin(2*arcsin(d*x+c))*b^3+1
2*arcsin(d*x+c)*cos(2*a/b)*Ci(2*arcsin(d*x+c)+2*a/b)*a^2*b+12*arcsin(d*x+c
)*Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*a^2*b+arcsin(d*x+c)*cos(2*arcsin(d*
x+c))*b^3-4*arcsin(d*x+c)*sin(2*arcsin(d*x+c))*a*b^2+4*cos(2*a/b)*Ci(2*arc
sin(d*x+c)+2*a/b)*a^3+4*Si(2*arcsin(d*x+c)+2*a/b)*sin(2*a/b)*a^3+cos(2*arc
sin(d*x+c))*a*b^2-2*sin(2*arcsin(d*x+c))*a^2*b+sin(2*arcsin(d*x+c))*b^3)/(
a+b*arcsin(d*x+c))^3/b^4
```

### 3.236.5 Fricas [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx = \int \frac{dex+ce}{(b\arcsin(dx+c)+a)^4}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
integral((d*e*x + c*e)/(b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3
+ 6*a^2*b^2*arcsin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4), x)
```

### 3.236.6 Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx$$
$$=e\left(\int \frac{c}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\right.$$
$$\left.+\int \frac{dx}{a^4+4a^3b\,\mathrm{asin}\,(c+dx)+6a^2b^2\,\mathrm{asin}^2\,(c+dx)+4ab^3\,\mathrm{asin}^3\,(c+dx)+b^4\,\mathrm{asin}^4\,(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**4,x)
```

output
```
e*(Integral(c/(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**
2 + 4*a*b**3*asin(c + d*x)**3 + b**4*asin(c + d*x)**4), x) + Integral(d*x/
(a**4 + 4*a**3*b*asin(c + d*x) + 6*a**2*b**2*asin(c + d*x)**2 + 4*a*b**3*a
sin(c + d*x)**3 + b**4*asin(c + d*x)**4), x))
```

### 3.236.7 Maxima [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
Timed out
```

### 3.236.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1665 vs. $2(192) = 384$.

Time = 0.74 (sec) , antiderivative size = 1665, normalized size of antiderivative = 8.00

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
-4/3*b^3*e*arcsin(d*x + c)^3*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x
+ c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d
*arcsin(d*x + c) + a^3*b^4*d) - 4/3*b^3*e*arcsin(d*x + c)^3*cos(a/b)*sin(a
/b)*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a
*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 4*a*
b^2*e*arcsin(d*x + c)^2*cos(a/b)^2*cos_integral(2*a/b + 2*arcsin(d*x + c))
/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcs
in(d*x + c) + a^3*b^4*d) - 4*a*b^2*e*arcsin(d*x + c)^2*cos(a/b)*sin(a/b)*s
in_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*
d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 2/3*b^3*e
*arcsin(d*x + c)^3*cos_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d
*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^
3*b^4*d) - 4*a^2*b*e*arcsin(d*x + c)*cos(a/b)^2*cos_integral(2*a/b + 2*arc
sin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a
^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 4*a^2*b*e*arcsin(d*x + c)*cos(a/b)
*sin(a/b)*sin_integral(2*a/b + 2*arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3
 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d)
+ 2/3*sqrt(-(d*x + c)^2 + 1)*(d*x + c)*b^3*e*arcsin(d*x + c)^2/(b^7*d*arcs
in(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c)
+ a^3*b^4*d) + 2*a*b^2*e*arcsin(d*x + c)^2*cos_integral(2*a/b + 2*arcsi...
```

### 3.236.9 Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{c\,e+d\,e\,x}{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^4}\,dx$$

input
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^4,x)
```

output
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^4, x)
```

# 3.237 $\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx$



## 3.237.1 Optimal result

Integrand size = 12, antiderivative size = 164

$$\begin{aligned}\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx = & -\frac{\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^3}+\frac{c+dx}{6b^2d(a+b\arcsin(c+dx))^2} \\ & +\frac{\sqrt{1-(c+dx)^2}}{6b^3d(a+b\arcsin(c+dx))} \\ & -\frac{\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}\right)}{6b^4d} \\ & +\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{6b^4d}\end{aligned}$$

output
```
1/6*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^2+1/6*cos(a/b)*Si((a+b*arcsin(d*x+c)
)/b)/b^4/d-1/6*Ci((a+b*arcsin(d*x+c))/b)*sin(a/b)/b^4/d-1/3*(1-(d*x+c)^2)^
(1/2)/b/d/(a+b*arcsin(d*x+c))^3+1/6*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(
d*x+c))
```

### 3.237.2 Mathematica [A] (verified)

Time = 0.45 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.82

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx = \frac{-\frac{2b^3\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^3}+\frac{b^2(c+dx)}{(a+b\arcsin(c+dx))^2}+\frac{b\sqrt{1-(c+dx)^2}}{a+b\arcsin(c+dx)}-\text{CosIntegral}\left(\frac{a}{b}+\arcsin(c+dx)\right)\sin\left(\frac{a}{b}\right)+\cos\left(\frac{a}{b}\right)}{6b^4d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-4),x]
```

output
```
((-2*b^3*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^3 + (b^2*(c + d*x)
)/(a + b*ArcSin[c + d*x])^2 + (b*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c +
d*x]) - CosIntegral[a/b + ArcSin[c + d*x]]*Sin[a/b] + Cos[a/b]*SinIntegral
[a/b + ArcSin[c + d*x]])/(6*b^4*d)
```

### 3.237.3 Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.99, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5302, 5132, 5222, 5132, 5224, 25, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx$$

$$\Big\downarrow \ 5302$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \ 5132$$

$$\frac{-\frac{\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^3}d(c+dx)}{3b}-\frac{\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^3}}{d}$$

$$\Big\downarrow \ 5222$$

$$\frac{-\frac{\frac{\int \frac{1}{(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^3}}{d}$$

$$\Big\downarrow \ 5132$$

$$\frac{-\frac{\frac{-\frac{\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))}d(c+dx)}{b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^3}}{d}$$

$$\Big\downarrow \ 5224$$

$$\frac{-\frac{\frac{-\frac{\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^3}}{d}$$

$$\Big\downarrow \ 25$$

$$\frac{-\frac{\frac{\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^3}}{d}$$

$$\Big\downarrow \ 3042$$

$$\frac{-\frac{\frac{\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^3}}{d}$$

$$\Big\downarrow \ 3784$$

$$\frac{-\frac{\frac{-\frac{-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+)}}{3b}}{d}$$

$$\Big\downarrow \ 25$$

$$\frac{-\frac{\frac{-\frac{\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx)}}{3b}}{d}$$

$$\Big\downarrow \ 3042$$

3.237. $\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx$

$$-\frac{-\frac{-\frac{\frac{\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{3b}-\frac{c+dx}{2b(a+b\arcsin(c+}}{d}$$

$\downarrow$ 3780

$$-\frac{-\frac{-\frac{\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{3b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}-\frac{\sqrt{1-(}}{3b(a+b\arcsin}}{d}$$

$\downarrow$ 3783

$$-\frac{\frac{-\frac{\frac{\cos\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)-\sin\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}-\frac{\sqrt{1-(c+dx)^2}}{b(a+b\arcsin(c+dx))}}{2b}-\frac{c+dx}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^3}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-4),x]
```

output
```
(-1/3*Sqrt[1 - (c + d*x)^2]/(b*(a + b*ArcSin[c + d*x])^3) - (-1/2*(c + d*x
)/(b*(a + b*ArcSin[c + d*x])^2) + (-(Sqrt[1 - (c + d*x)^2]/(b*(a + b*ArcSi
n[c + d*x]))) - (-(CosIntegral[(a + b*ArcSin[c + d*x])/b]*Sin[a/b]) + Cos[
a/b]*SinIntegral[(a + b*ArcSin[c + d*x])/b])/b^2)/(2*b))/(3*b))/d
```

### 3.237.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

3.237. $\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx$

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.237. $\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx$

### 3.237.4 Maple [A] (verified)

Time = 0.56 (sec) , antiderivative size = 270, normalized size of antiderivative = 1.65

| method | result |
|---|---|
| derivativedivides | $-\frac{\sqrt{1-(dx+c)^2}}{3(a+b\arcsin(dx+c))^3 b}+\frac{\arcsin(dx+c)^2\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b^2-\arcsin(dx+c)^2\sin\left(\frac{a}{b}\right)\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)b^2+2\arcsin(d}{}$ |
| default | $-\frac{\sqrt{1-(dx+c)^2}}{3(a+b\arcsin(dx+c))^3 b}+\frac{\arcsin(dx+c)^2\cos\left(\frac{a}{b}\right)\operatorname{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)b^2-\arcsin(dx+c)^2\sin\left(\frac{a}{b}\right)\operatorname{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)b^2+2\arcsin(d}{}$ |

input
```
int(1/(a+b*arcsin(d*x+c))^4,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/3*(1-(d*x+c)^2)^(1/2)/(a+b*arcsin(d*x+c))^3/b+1/6*(arcsin(d*x+c)^2
*cos(a/b)*Si(arcsin(d*x+c)+a/b)*b^2-arcsin(d*x+c)^2*sin(a/b)*Ci(arcsin(d*x
+c)+a/b)*b^2+2*arcsin(d*x+c)*cos(a/b)*Si(arcsin(d*x+c)+a/b)*a*b-2*arcsin(d
*x+c)*sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a*b+(1-(d*x+c)^2)^(1/2)*arcsin(d*x+c)
*b^2+cos(a/b)*Si(arcsin(d*x+c)+a/b)*a^2-sin(a/b)*Ci(arcsin(d*x+c)+a/b)*a^2
+(1-(d*x+c)^2)^(1/2)*a*b+(d*x+c)*b^2)/(a+b*arcsin(d*x+c))^2/b^4)
```

### 3.237.5 Fricas [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{1}{(b\arcsin(dx+c)+a)^4}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
integral(1/(b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*
arcsin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4), x)
```

### 3.237.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^4}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**4,x)
```

output
```
Integral((a + b*asin(c + d*x))**(-4), x)
```

### 3.237.7 Maxima [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
Timed out
```

### 3.237.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1112 vs. $2(150) = 300$.

Time = 0.31 (sec) , antiderivative size = 1112, normalized size of antiderivative = 6.78

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx = \text{Too large to display}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
-1/6*b^3*arcsin(d*x + c)^3*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b
^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(
d*x + c) + a^3*b^4*d) + 1/6*b^3*arcsin(d*x + c)^3*cos(a/b)*sin_integral(a/
b + arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^
2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/2*a*b^2*arcsin(d*x + c)^2
*cos_integral(a/b + arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3
*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/
2*a*b^2*arcsin(d*x + c)^2*cos(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^
7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d
*x + c) + a^3*b^4*d) - 1/2*a^2*b*arcsin(d*x + c)*cos_integral(a/b + arcsin
(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(d*x + c)^2
 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/2*a^2*b*arcsin(d*x + c)*co
s(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^7*d*arcsin(d*x + c)^3 + 3*a*
b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/6*s
qrt(-(d*x + c)^2 + 1)*b^3*arcsin(d*x + c)^2/(b^7*d*arcsin(d*x + c)^3 + 3*a
*b^6*d*arcsin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/6*
(d*x + c)*b^3*arcsin(d*x + c)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*arcsin(
d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) - 1/6*a^3*cos_integr
al(a/b + arcsin(d*x + c))*sin(a/b)/(b^7*d*arcsin(d*x + c)^3 + 3*a*b^6*d*ar
csin(d*x + c)^2 + 3*a^2*b^5*d*arcsin(d*x + c) + a^3*b^4*d) + 1/6*a^3*co...
```

### 3.237.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^4}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}\,(c+d\,x))^4}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^4,x)
```

output
```
int(1/(a + b*asin(c + d*x))^4, x)
```

# 3.238 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx$



## 3.238.1 Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx=\frac{\operatorname{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^4},x\right)}{e}$$

output
```
Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^4,x)/e
```

## 3.238.2 Mathematica [N/A]

Not integrable

Time = 15.14 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx=\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx$$

input
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4),x]
```

output
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4), x]
```

## 3.238.3 Rubi [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{1}{e(c+dx)(a+b\arcsin(c+dx))^4}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^4}d(c+dx)}{de}$$

$$\Big\downarrow \text{5148}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^4}d(c+dx)}{de}$$

input
```
Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^4),x]
```

output
```
$Aborted
```

### 3.238.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.238.4 Maple [N/A] (verified)

Not integrable

Time = 1.27 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{1}{(dex+ce)\left(a+b\arcsin\left(dx+c\right)\right)^{4}}dx$$

input
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x)
```

output
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x)
```

## 3.238.5 Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 121, normalized size of antiderivative = 5.26

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx = \int \frac{1}{(dex+ce)(b\arcsin\left(dx+c\right)+a)^{4}}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
integral(1/(a^4*d*e*x + a^4*c*e + (b^4*d*e*x + b^4*c*e)*arcsin(d*x + c)^4
+ 4*(a*b^3*d*e*x + a*b^3*c*e)*arcsin(d*x + c)^3 + 6*(a^2*b^2*d*e*x + a^2*b
^2*c*e)*arcsin(d*x + c)^2 + 4*(a^3*b*d*e*x + a^3*b*c*e)*arcsin(d*x + c)),
x)
```

### 3.238.6 Sympy [N/A]

Not integrable

Time = 7.76 (sec) , antiderivative size = 151, normalized size of antiderivative = 6.57

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx$$
$$=\frac{\int \frac{1}{a^4c+a^4dx+4a^3bc\,\mathrm{asin}\,(c+dx)+4a^3bdx\,\mathrm{asin}\,(c+dx)+6a^2b^2c\,\mathrm{asin}^2\,(c+dx)+6a^2b^2dx\,\mathrm{asin}^2\,(c+dx)+4ab^3c\,\mathrm{asin}^3\,(c+dx)+4ab^3dx\,\mathrm{asin}^3\,(c+dx)+b}}{e}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**4,x)
```

output
```
Integral(1/(a**4*c + a**4*d*x + 4*a**3*b*c*asin(c + d*x) + 4*a**3*b*d*x*as
in(c + d*x) + 6*a**2*b**2*c*asin(c + d*x)**2 + 6*a**2*b**2*d*x*asin(c + d*
x)**2 + 4*a*b**3*c*asin(c + d*x)**3 + 4*a*b**3*d*x*asin(c + d*x)**3 + b**4
*c*asin(c + d*x)**4 + b**4*d*x*asin(c + d*x)**4), x)/e
```

### 3.238.7 Maxima [F(-1)]

Timed out.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx = \text{Timed out}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
Timed out
```

### 3.238.8 Giac [N/A]

Not integrable

Time = 21.19 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^4}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^4), x)
```

### 3.238.9 Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^4}\,dx=\int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^4} \,dx$$

input
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^4),x)
```

output
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^4), x)
```

# 3.239 $\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx$



## 3.239.1 Optimal result

Integrand size = 12, antiderivative size = 191

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = -\frac{\sqrt{1-(c+dx)^2}}{4bd(a+b\arcsin(c+dx))^4} + \frac{c+dx}{12b^2d(a+b\arcsin(c+dx))^3} + \frac{\sqrt{1-(c+dx)^2}}{24b^3d(a+b\arcsin(c+dx))^2} - \frac{c+dx}{24b^4d(a+b\arcsin(c+dx))} + \frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^5d} + \frac{\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{24b^5d}$$

output
```
1/12*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^3+1/24*(-d*x-c)/b^4/d/(a+b*arcsin(d
*x+c))+1/24*Ci((a+b*arcsin(d*x+c))/b)*cos(a/b)/b^5/d+1/24*Si((a+b*arcsin(d
*x+c))/b)*sin(a/b)/b^5/d-1/4*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^4
+1/24*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^2
```

### 3.239.2 Mathematica [A] (verified)

Time = 0.50 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.82

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = \frac{-\frac{6b^4\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^4}+\frac{2b^3(c+dx)}{(a+b\arcsin(c+dx))^3}+\frac{b^2\sqrt{1-(c+dx)^2}}{(a+b\arcsin(c+dx))^2}-\frac{b(c+dx)}{a+b\arcsin(c+dx)}+\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a}{b}+\arcsin(\right.}{24b^5d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-5),x]
```

output
```
((-6*b^4*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[c + d*x])^4 + (2*b^3*(c + d*
x))/(a + b*ArcSin[c + d*x])^3 + (b^2*Sqrt[1 - (c + d*x)^2])/(a + b*ArcSin[
c + d*x])^2 - (b*(c + d*x))/(a + b*ArcSin[c + d*x]) + Cos[a/b]*CosIntegral
[a/b + ArcSin[c + d*x]] + Sin[a/b]*SinIntegral[a/b + ArcSin[c + d*x]])/(24
*b^5*d)
```

### 3.239.3 Rubi [A] (verified)

Time = 0.93 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.01, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5302, 5132, 5222, 5132, 5222, 5134, 3042, 3784, 25, 3042, 3780, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^5}d(c+dx)}{d}$$

$$\Big\downarrow \text{5132}$$

$$\frac{-\frac{\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^4}d(c+dx)}{4b}-\frac{\sqrt{1-(c+dx)^2}}{4b(a+b\arcsin(c+dx))^4}}{d}$$

$$\Big\downarrow \text{5222}$$

$$-\frac{\frac{\frac{\int \frac{1}{(a+b\arcsin(c+dx))^3}d(c+dx)}{3b}-\frac{c+dx}{3b(a+b\arcsin(c+dx))^3}}{4b}-\frac{\sqrt{1-(c+dx)^2}}{4b(a+b\arcsin(c+dx))^4}}{d}$$

$\Big\downarrow$ 5132

$$-\frac{\frac{\frac{-\frac{\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^2}d(c+dx)}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{c+dx}{3b(a+b\arcsin(c+dx))^3}}{4b}-\frac{\sqrt{1-(c+dx)^2}}{4b(a+b\arcsin(c+dx))^4}}{d}$$

$\Big\downarrow$ 5222

$$-\frac{\frac{\frac{-\frac{\frac{\int \frac{1}{a+b\arcsin(c+dx)}d(c+dx)}{b}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{c+dx}{3b(a+b\arcsin(c+dx))^3}}{4b}-\frac{\sqrt{1-(c+dx)^2}}{4b(a+b\arcsin(c+dx))^4}}{d}$$

$\Big\downarrow$ 5134

$$-\frac{\frac{\frac{-\frac{\frac{\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{c+dx}{3b(a+b\arcsin(c+dx))^3}}{4b}-\frac{\sqrt{1-(c+dx)^2}}{4b(a+b\arcsin(c+dx))^4}}{d}$$

$\Big\downarrow$ 3042

$$-\frac{\frac{\frac{-\frac{\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{c+dx}{3b(a+b\arcsin(c+dx))^3}}{4b}-\frac{\sqrt{1-(c+dx)^2}}{4b(a+b\arcsin(c+dx))^4}}{d}$$

$\Big\downarrow$ 3784

$$-\frac{\frac{\frac{-\frac{\frac{\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{3b}}{4b}}{d}$$

$\Big\downarrow$ 25

---

3.239. $\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx$

$$\frac{-\frac{\frac{-\frac{\frac{\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx)}}{3b}}{4b}}{d}$$

$\Big\downarrow$ 3042

$$\frac{-\frac{\frac{-\frac{\frac{\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)}}{2b(a+b\arcsin(c+}}{3b}}{4b}}{d}$$

$\Big\downarrow$ 3780

$$\frac{-\frac{\frac{-\frac{\frac{\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{a+b\arcsin(c+dx)}d(a+b\arcsin(c+dx))+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{c+dx}{3b(a+b\arcsin(}}{4b}}{d}$$

$\Big\downarrow$ 3783

$$\frac{-\frac{\frac{-\frac{\frac{\cos\left(\frac{a}{b}\right)\text{CosIntegral}\left(\frac{a+b\arcsin(c+dx)}{b}\right)+\sin\left(\frac{a}{b}\right)\text{Si}\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{b^2}-\frac{c+dx}{b(a+b\arcsin(c+dx))}}{2b}-\frac{\sqrt{1-(c+dx)^2}}{2b(a+b\arcsin(c+dx))^2}}{3b}-\frac{c+dx}{3b(a+b\arcsin(c+dx))^3}}{4b}-\frac{}{4b(a}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-5),x]
```

output
```
(-1/4*Sqrt[1 - (c + d*x)^2]/(b*(a + b*ArcSin[c + d*x])^4) - (-1/3*(c + d*x
)/(b*(a + b*ArcSin[c + d*x])^3) + (-1/2*Sqrt[1 - (c + d*x)^2]/(b*(a + b*Ar
cSin[c + d*x])^2) - (-((c + d*x)/(b*(a + b*ArcSin[c + d*x]))) + (Cos[a/b]*
CosIntegral[(a + b*ArcSin[c + d*x])/b] + Sin[a/b]*SinIntegral[(a + b*ArcSi
n[c + d*x])/b])/b^2)/(2*b))/(3*b))/(4*b))/d
```

## 3.239. $\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx$

### 3.239.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 3784
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[Cos[(d*
e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/(c + d*x), x], x] + Simp[Sin[(d*e - c*
f)/d]   Int[Cos[c*(f/d) + f*x]/(c + d*x), x], x] /; FreeQ[{c, d, e, f}, x]
&& NeQ[d*e - c*f, 0]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

## 3.239. $\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx$

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.239.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 386 vs. 2(178) = 356.

Time = 0.52 (sec) , antiderivative size = 387, normalized size of antiderivative = 2.03

| method | result |
|---|---|
| derivativedivides | $-\frac{\sqrt{1-(dx+c)^2}}{4(a+b\arcsin(dx+c))^4 b}+\frac{\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\arcsin(dx+c)^3 b^3+\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\arcsin(dx+c)^3 b^3+3\sin\left(\frac{a}{b}\right)\cdots}{\cdots}$ |
| default | $-\frac{\sqrt{1-(dx+c)^2}}{4(a+b\arcsin(dx+c))^4 b}+\frac{\sin\left(\frac{a}{b}\right)\mathrm{Si}\left(\arcsin(dx+c)+\frac{a}{b}\right)\arcsin(dx+c)^3 b^3+\cos\left(\frac{a}{b}\right)\mathrm{Ci}\left(\arcsin(dx+c)+\frac{a}{b}\right)\arcsin(dx+c)^3 b^3+3\sin\left(\frac{a}{b}\right)\cdots}{\cdots}$ |

input
```
int(1/(a+b*arcsin(d*x+c))^5,x,method=_RETURNVERBOSE)
```

output
```
1/d*(-1/4*(1-(d*x+c)^2)^(1/2)/(a+b*arcsin(d*x+c))^4/b+1/24*(sin(a/b)*Si(ar
csin(d*x+c)+a/b)*arcsin(d*x+c)^3*b^3+cos(a/b)*Ci(arcsin(d*x+c)+a/b)*arcsin
(d*x+c)^3*b^3+3*sin(a/b)*Si(arcsin(d*x+c)+a/b)*arcsin(d*x+c)^2*a*b^2+3*cos
(a/b)*Ci(arcsin(d*x+c)+a/b)*arcsin(d*x+c)^2*a*b^2+3*sin(a/b)*Si(arcsin(d*x
+c)+a/b)*arcsin(d*x+c)*a^2*b+3*cos(a/b)*Ci(arcsin(d*x+c)+a/b)*arcsin(d*x+c
)*a^2*b-arcsin(d*x+c)^2*b^3*(d*x+c)+(1-(d*x+c)^2)^(1/2)*arcsin(d*x+c)*b^3+
sin(a/b)*Si(arcsin(d*x+c)+a/b)*a^3+cos(a/b)*Ci(arcsin(d*x+c)+a/b)*a^3-2*ar
csin(d*x+c)*a*b^2*(d*x+c)+(1-(d*x+c)^2)^(1/2)*a*b^2-a^2*b*(d*x+c)+2*(d*x+c
)*b^3)/(a+b*arcsin(d*x+c))^3/b^5)
```

### 3.239.5 Fricas [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx=\int \frac{1}{(b\arcsin(dx+c)+a)^5}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^5,x, algorithm="fricas")
```

output
```
integral(1/(b^5*arcsin(d*x + c)^5 + 5*a*b^4*arcsin(d*x + c)^4 + 10*a^2*b^3
*arcsin(d*x + c)^3 + 10*a^3*b^2*arcsin(d*x + c)^2 + 5*a^4*b*arcsin(d*x + c
) + a^5), x)
```

### 3.239.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^5}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**5,x)
```

output
```
Integral((a + b*asin(c + d*x))**(-5), x)
```

### 3.239.7 Maxima [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = \text{Timed out}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^5,x, algorithm="maxima")
```

output
```
Timed out
```

### 3.239.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1915 vs. 2(175) = 350.

Time = 0.31 (sec) , antiderivative size = 1915, normalized size of antiderivative = 10.03

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = \text{Too large to display}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^5,x, algorithm="giac")
```

output
```
1/24*b^4*arcsin(d*x + c)^4*cos(a/b)*cos_integral(a/b + arcsin(d*x + c))/(b
^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(
d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) + 1/24*b^4*arcsin(d*
x + c)^4*sin(a/b)*sin_integral(a/b + arcsin(d*x + c))/(b^9*d*arcsin(d*x +
c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3
*b^6*d*arcsin(d*x + c) + a^4*b^5*d) + 1/6*a*b^3*arcsin(d*x + c)^3*cos(a/b)
*cos_integral(a/b + arcsin(d*x + c))/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*
arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x
 + c) + a^4*b^5*d) + 1/6*a*b^3*arcsin(d*x + c)^3*sin(a/b)*sin_integral(a/b
 + arcsin(d*x + c))/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3
 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d
) - 1/24*(d*x + c)*b^4*arcsin(d*x + c)^3/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^
8*d*arcsin(d*x + c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin
(d*x + c) + a^4*b^5*d) + 1/4*a^2*b^2*arcsin(d*x + c)^2*cos(a/b)*cos_integr
al(a/b + arcsin(d*x + c))/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x
+ c)^3 + 6*a^2*b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4
*b^5*d) + 1/4*a^2*b^2*arcsin(d*x + c)^2*sin(a/b)*sin_integral(a/b + arcsin
(d*x + c))/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*arcsin(d*x + c)^3 + 6*a^2*
b^7*d*arcsin(d*x + c)^2 + 4*a^3*b^6*d*arcsin(d*x + c) + a^4*b^5*d) - 1/8*(
d*x + c)*a*b^3*arcsin(d*x + c)^2/(b^9*d*arcsin(d*x + c)^4 + 4*a*b^8*d*a...
```

### 3.239.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^5}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+d\,x))^5}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^5,x)
```

output
```
int(1/(a + b*asin(c + d*x))^5, x)
```

# 3.240 $\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx$



## 3.240.1 Optimal result

Integrand size = 25, antiderivative size = 288

$$
\begin{aligned}
&\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx\\
&= -\frac{3e^3\sqrt{a+b\arcsin(c+dx)}}{32d}+\frac{e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{4d}\\
&\quad-\frac{\sqrt{b}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{64d}\\
&\quad+\frac{\sqrt{b}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{16d}\\
&\quad+\frac{\sqrt{b}e^3\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{16d}\\
&\quad-\frac{\sqrt{b}e^3\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{64d}
\end{aligned}
$$

output
```
-1/128*e^3*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)/b^(1/2))*b^(1/2)*2^(1/2)*Pi^(1/2)/d-1/128*e^3*FresnelS(2*2^(1/2)/Pi^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d
+1/16*e^3*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2)
)*b^(1/2)*Pi^(1/2)/d+1/16*e^3*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)
/Pi^(1/2))*sin(2*a/b)*b^(1/2)*Pi^(1/2)/d-3/32*e^3*(a+b*arcsin(d*x+c))^(1/2
)/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.240.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.22 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.88

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx =$$
$$-\frac{ibe^3e^{-\frac{4ia}{b}}\left(4\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-4\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{2i(a+b}{}\right.\right.}{128d\sqrt{a+}}$$

input
```
Integrate[(c*e + d*e*x)^3*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
((-1/128*I)*b*e^3*(4*Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c +
d*x]))/b]*Gamma[3/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - 4*Sqrt[2]*E^(((
6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((2*I)*(a + b*Ar
cSin[c + d*x]))/b] - Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-
4*I)*(a + b*ArcSin[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c
 + d*x]))/b]*Gamma[3/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]))/(d*E^(((4*I)*
a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.240.3 Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 264, normalized size of antiderivative = 0.92, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {5304, 27, 5140, 5224, 3042, 3793, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int e^3(c+dx)^3\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$
$$\frac{e^3\int (c+dx)^3\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{5140}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4\sqrt{a+b\arcsin(c+dx)}-\frac{1}{8}b\int\frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{5224}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4\sqrt{a+b\arcsin(c+dx)}-\frac{1}{8}\int\frac{\sin^4\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{d}$$

$$\Big\downarrow \text{3042}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4\sqrt{a+b\arcsin(c+dx)}-\frac{1}{8}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)^4}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{d}$$

$$\Big\downarrow \text{3793}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4\sqrt{a+b\arcsin(c+dx)}-\frac{1}{8}\int\left(\frac{\cos\left(\frac{4a}{b}-\frac{4(a+b\arcsin(c+dx))}{b}\right)}{8\sqrt{a+b\arcsin(c+dx)}}-\frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2\sqrt{a+b\arcsin(c+dx)}}+\frac{3}{8\sqrt{a+b\arcsin(c+dx}}\right.\right.}{d}$$

$$\Big\downarrow \text{2009}$$

$$e^3\left(\frac{1}{8}\left(-\frac{1}{8}\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\frac{1}{2}\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\frac{1}{2}\right.\right.$$

input
```
Int[(c*e + d*e*x)^3*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(e^3*(((c + d*x)^4*Sqrt[a + b*ArcSin[c + d*x]])/4 + ((-3*Sqrt[a + b*ArcSin
[c + d*x]])/4 - (Sqrt[b]*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sq
rt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/8 + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*Fr
esnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/2 + (Sqrt[b]*S
qrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(
2*a)/b])/2 - (Sqrt[b]*Sqrt[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]]*Sin[(4*a)/b])/8)/8))/d
```

## 3.240. $\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx$

### 3.240.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3793
```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.240. $\int (ce+dex)^3 \sqrt{a+b\arcsin(c+dx)}\,dx$

### 3.240.4 Maple [A] (verified)

Time = 1.14 (sec) , antiderivative size = 395, normalized size of antiderivative = 1.37

| method | result |
|---|---|
| default | $-\frac{e^3\left(\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,b-\sin\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\cdots\right.}{}$ |

input
```
int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/128*e^3/d/(a+b*arcsin(d*x+c))^(1/2)*(cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(
1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/
2)*(a+b*arcsin(d*x+c))^(1/2)*b-sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/
b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)*b-8*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*co
s(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)/b)*b+8*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*Fresne
lS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+16*arcsi
n(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b+16*cos(-2*(a+b*arcsin(d*x+c
))/b+2*a/b)*a-4*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*arcsin(d*x+c)*b-4*cos(
-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a)
```

### 3.240.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.240.6 Sympy [F]

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx = e^3\left(\int c^3\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int d^3x^3\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int 3cd^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int 3c^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**(1/2),x)
```

output
```
e**3*(Integral(c**3*sqrt(a + b*asin(c + d*x)), x) + Integral(d**3*x**3*sqr
t(a + b*asin(c + d*x)), x) + Integral(3*c*d**2*x**2*sqrt(a + b*asin(c + d*
x)), x) + Integral(3*c**2*d*x*sqrt(a + b*asin(c + d*x)), x))
```

### 3.240.7 Maxima [F]

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx = \int (dex+ce)^3\sqrt{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^3*sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.240.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.26 (sec) , antiderivative size = 1088, normalized size of antiderivative = 3.78

$$\int (ce+dex)^3\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
1/16*I*sqrt(pi)*a*b*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) +
 I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt
(2)*b^(3/2) - I*sqrt(2)*b^(5/2)/abs(b))*d) + 1/128*sqrt(pi)*b^2*e^3*erf(-s
qrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x +
 c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2)*b^(3/2) - I*sqrt(2)*b^(5/2
)/abs(b))*d) - 1/16*I*sqrt(pi)*a*sqrt(b)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*
x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b)
)*e^(4*I*a/b)/((sqrt(2)*b + I*sqrt(2)*b^2/abs(b))*d) + 1/128*sqrt(pi)*b^(3
/2)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(
b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((sqrt(2)*b + I*sqrt(2)
*b^2/abs(b))*d) + 1/8*I*sqrt(pi)*a*sqrt(b)*e^3*erf(-sqrt(b*arcsin(d*x + c)
 + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/
((b + I*b^2/abs(b))*d) - 1/32*sqrt(pi)*b^(3/2)*e^3*erf(-sqrt(b*arcsin(d*x
+ c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a
/b)/((b + I*b^2/abs(b))*d) - 1/8*I*sqrt(pi)*a*sqrt(b)*e^3*erf(-sqrt(b*arcs
in(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e
^(-2*I*a/b)/((b - I*b^2/abs(b))*d) - 1/32*sqrt(pi)*b^(3/2)*e^3*erf(-sqrt(b
*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(
b))*e^(-2*I*a/b)/((b - I*b^2/abs(b))*d) + 1/16*I*sqrt(pi)*a*e^3*erf(-sqrt(
2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + ...
```

### 3.240.9 Mupad [F(-1)]

Timed out.

$$\int (ce + dex)^3 \sqrt{a + b \arcsin(c + dx)}\, dx = \int (c\,e + d\,e\,x)^3\, \sqrt{a + b\,\mathrm{asin}\,(c + d\,x)}\, dx$$

input
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(1/2), x)
```

# 3.241 $\int (ce+dex)^2 \sqrt{a+b\arcsin (c+dx)} \, dx$



## 3.241.1 Optimal result

Integrand size = 25, antiderivative size = 274

$$\int (ce+dex)^2 \sqrt{a+b\arcsin (c+dx)} \, dx = \frac{e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{3d} - \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d} + \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{12d} + \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d} - \frac{\sqrt{b}e^2\sqrt{\frac{\pi}{6}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{12d}$$

output
```
1/72*e^2*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^
(1/2))*b^(1/2)*6^(1/2)*Pi^(1/2)/d-1/72*e^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*
arcsin(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*b^(1/2)*6^(1/2)*Pi^(1/2)/d-1/8*e^
2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*b^
(1/2)*2^(1/2)*Pi^(1/2)/d+1/8*e^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x
+c))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d+1/3*e^2*(d*x+c)^3*
(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.241.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.32 (sec) , antiderivative size = 248, normalized size of antiderivative = 0.91

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{be^2e^{-\frac{3ia}{b}}\left(9e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+9e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)}{72d\sqrt{a+b\,\mathrm{ar}}}$$

input
```
Integrate[(c*e + d*e*x)^2*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(b*e^2*(9*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2
, ((-I)*(a + b*ArcSin[c + d*x]))/b] + 9*E^(((4*I)*a)/b)*Sqrt[(I*(a + b*Arc
Sin[c + d*x]))/b]*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b] - Sqrt[3]*(Sqr
t[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-3*I)*(a + b*ArcSin[c + d
*x]))/b] + E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2,
((3*I)*(a + b*ArcSin[c + d*x]))/b])))/(72*d*E^(((3*I)*a)/b)*Sqrt[a + b*Arc
Sin[c + d*x]])
```

### 3.241.3 Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 256, normalized size of antiderivative = 0.93, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.320$, Rules used = {5304, 27, 5140, 5224, 25, 3042, 3793, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int e^2(c+dx)^2\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$
$$\frac{e^2\int (c+dx)^2\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \ 5140$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3\sqrt{a+b\arcsin(c+dx)}-\frac{1}{6}b\int\frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \ 5224$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3\sqrt{a+b\arcsin(c+dx)}-\frac{1}{6}\int-\frac{\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{d}$$

$$\Big\downarrow \ 25$$

$$\frac{e^2\left(\frac{1}{6}\int\frac{\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\frac{1}{3}(c+dx)^3\sqrt{a+b\arcsin(c+dx)}\right)}{d}$$

$$\Big\downarrow \ 3042$$

$$\frac{e^2\left(\frac{1}{6}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)^3}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\frac{1}{3}(c+dx)^3\sqrt{a+b\arcsin(c+dx)}\right)}{d}$$

$$\Big\downarrow \ 3793$$

$$\frac{e^2\left(\frac{1}{6}\int\left(\frac{3\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\frac{\sin\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))+\frac{1}{3}(c+dx)^3\sqrt{a+b\arcsin(c+\right.}{d}$$

$$\Big\downarrow \ 2009$$

$$e^2\left(\frac{1}{6}\left(\frac{3}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{1}{2}\sqrt{\frac{\pi}{6}}\sqrt{b}\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{3}{2}\right.\right.$$

input
```
Int[(c*e + d*e*x)^2*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(e^2*(((c + d*x)^3*Sqrt[a + b*ArcSin[c + d*x]])/3 + ((-3*Sqrt[b]*Sqrt[Pi/2
]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/2 +
 (Sqrt[b]*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c
 + d*x]])/Sqrt[b]])/2 + (3*Sqrt[b]*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a
+ b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2 - (Sqrt[b]*Sqrt[Pi/6]*FresnelC[
(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/2)/6))/d
```

## 3.241. $\int(ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx$

### 3.241.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3793
```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.241. $\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx$

### 3.241.4 Maple [A] (verified)

Time = 1.17 (sec) , antiderivative size = 394, normalized size of antiderivative = 1.44

| method | result |
|---|---|
| default | $-\frac{e^{2}\left(-9\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b-9\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\mathrm{F}}{}$ |

input
```
int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/72*e^2/d/(a+b*arcsin(d*x+c))^(1/2)*(-9*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b)*b-9*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)/b)*b+(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*
cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b)*b+(-3/b)^(1/2)*Pi^(1/2)*2^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(3*a/b
)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+
18*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+18*sin(-(a+b*arcsin(d*x
+c))/b+a/b)*a-6*arcsin(d*x+c)*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*b-6*sin(
-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a)
```

### 3.241.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.241.6 Sympy [F]

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = e^2\left(\int c^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int d^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int 2cdx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**(1/2),x)
```

output
```
e**2*(Integral(c**2*sqrt(a + b*asin(c + d*x)), x) + Integral(d**2*x**2*sqr
t(a + b*asin(c + d*x)), x) + Integral(2*c*d*x*sqrt(a + b*asin(c + d*x)), x
))
```

### 3.241.7 Maxima [F]

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = \int (dex+ce)^2\sqrt{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^2*sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.241.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.32 (sec) , antiderivative size = 1169, normalized size of antiderivative = 4.27

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
1/8*sqrt(2)*sqrt(pi)*a*b*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e
^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 1/16*I*sqrt(2)*sqrt(p
i)*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1
/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/s
qrt(abs(b)) + b*sqrt(abs(b)))*d) + 1/8*sqrt(2)*sqrt(pi)*a*b*e^2*erf(1/2*I*
sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcs
in(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt
(abs(b)))*d) - 1/16*I*sqrt(2)*sqrt(pi)*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*
sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 1/
4*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt
(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b
)/((sqrt(6)*b + I*sqrt(6)*b^2/abs(b))*d) - 1/24*I*sqrt(pi)*b^(3/2)*e^2*erf
(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*a
rcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b + I*sqrt(6)*b^
2/abs(b))*d) - 1/4*sqrt(pi)*a*sqrt(b)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d
*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/a
bs(b))*e^(-3*I*a/b)/((sqrt(6)*b - I*sqrt(6)*b^2/abs(b))*d) + 1/24*I*sqrt(p
i)*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1...
```

### 3.241.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2\sqrt{a+b\arcsin(c+dx)}\,dx = \int (c\,e+d\,e\,x)^2\,\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}\,dx$$

input
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(1/2), x)
```

# 3.242 $\int (ce + dex)\sqrt{a + b\arcsin(c + dx)}\,dx$



## 3.242.1 Optimal result

Integrand size = 23, antiderivative size = 156

$$\int (ce + dex)\sqrt{a + b\arcsin(c + dx)}\,dx = -\frac{e\sqrt{a + b\arcsin(c + dx)}}{4d} + \frac{e(c + dx)^2\sqrt{a + b\arcsin(c + dx)}}{2d} + \frac{\sqrt{b}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{8d} + \frac{\sqrt{b}e\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{8d}$$

output
```
1/8*e*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*b^
(1/2)*Pi^(1/2)/d+1/8*e*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/
2))*sin(2*a/b)*b^(1/2)*Pi^(1/2)/d-1/4*e*(a+b*arcsin(d*x+c))^(1/2)/d+1/2*e*
(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.242.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.08 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.88

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx = \frac{ibee^{-\frac{2ia}{b}}\left(-\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{2i(a+b\arcsin(c+dx))}{b}\right)\right)}{8\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}$$

input
```
Integrate[(c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
((I/8)*b*e*(-(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-2*I)*(a
 + b*ArcSin[c + d*x]))/b]) + E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x
]))/b]*Gamma[3/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(Sqrt[2]*d*E^(((2*I
)*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.242.3 Rubi [A] (verified)

Time = 0.61 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.95, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {5304, 27, 5140, 5224, 3042, 3793, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int e(c+dx)\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \ 27$$

$$\frac{e\int (c+dx)\sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \ 5140$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}b\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{5224}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}\int\frac{\sin^2\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{d}$$

$$\Big\downarrow \text{3042}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)^2}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{d}$$

$$\Big\downarrow \text{3793}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}\int\left(\frac{1}{2\sqrt{a+b\arcsin(c+dx)}}-\frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))\right.}{d}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e\left(\frac{1}{4}\left(\frac{1}{2}\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\frac{1}{2}\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-\sqrt{a+b\arcs}\right.\right.}{d}$$

input
```
Int[(c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(e*(((c + d*x)^2*Sqrt[a + b*ArcSin[c + d*x]])/2 + (-Sqrt[a + b*ArcSin[c +
d*x]] + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d
*x]])/(Sqrt[b]*Sqrt[Pi])])/2 + (Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*Ar
cSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/2)/4))/d
```

### 3.242.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3793
```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.242.4 Maple [A] (verified)

Time = 0.79 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.30

| method | result |
|---|---|
| default | $-\frac{e\left(-\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)b+\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{2a}{b}\right)\text{FresnelS}}{8d\sqrt{a+b\arcsin(dx}}$ |

input
```
int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/8*e/d/(a+b*arcsin(d*x+c))^(1/2)*(-(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x
+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b)*b+(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*
a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)
*b+2*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b+2*cos(-2*(a+b*arc
sin(d*x+c))/b+2*a/b)*a)
```

### 3.242.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.242.6 Sympy [F]

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx = e\left(\int c\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int dx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**(1/2),x)
```

output
```
e*(Integral(c*sqrt(a + b*asin(c + d*x)), x) + Integral(d*x*sqrt(a + b*asin
(c + d*x)), x))
```

### 3.242.7 Maxima [F]

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx = \int (dex+ce)\sqrt{b\arcsin(dx+c)+a}\,dx$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)*sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.242.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.12 (sec) , antiderivative size = 488, normalized size of antiderivative = 3.13

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{i\sqrt{\pi}a\sqrt{b}e\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{4\left(b+\frac{ib^2}{|b|}\right)d}$$
$$-\frac{\sqrt{\pi}b^{\frac{3}{2}}e\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{16\left(b+\frac{ib^2}{|b|}\right)d}$$
$$-\frac{i\sqrt{\pi}a\sqrt{b}e\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{4\left(b-\frac{ib^2}{|b|}\right)d}$$
$$-\frac{\sqrt{\pi}b^{\frac{3}{2}}e\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{16\left(b-\frac{ib^2}{|b|}\right)d}$$
$$+\frac{i\sqrt{\pi}ae\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{4\,d\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)}$$
$$-\frac{i\sqrt{\pi}ae\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{4\sqrt{b}d\left(\frac{ib}{|b|}+1\right)}$$
$$-\frac{\sqrt{b\arcsin(dx+c)+a}\,ee^{(2i\arcsin(dx+c))}}{8\,d}-\frac{\sqrt{b\arcsin(dx+c)+a}\,ee^{(-2i\arcsin(dx+c))}}{8\,d}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
1/4*I*sqrt(pi)*a*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sq
rt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*
d) - 1/16*sqrt(pi)*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*
sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b)
)*d) - 1/4*I*sqrt(pi)*a*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b - I*b^2/
abs(b))*d) - 1/16*sqrt(pi)*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt
(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b - I*b
^2/abs(b))*d) + 1/4*I*sqrt(pi)*a*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b
) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(d*(sqrt(b)
 - I*b^(3/2)/abs(b))) - 1/4*I*sqrt(pi)*a*e*erf(-sqrt(b*arcsin(d*x + c) + a
)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqr
t(b)*d*(I*b/abs(b) + 1)) - 1/8*sqrt(b*arcsin(d*x + c) + a)*e*e^(2*I*arcsin
(d*x + c))/d - 1/8*sqrt(b*arcsin(d*x + c) + a)*e*e^(-2*I*arcsin(d*x + c))/
d
```

### 3.242.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)\sqrt{a+b\arcsin(c+dx)}\,dx=\int (c\,e+d\,e\,x)\ \sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

input
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^(1/2), x)
```

# 3.243 $\int \sqrt{a+b\arcsin(c+dx)}\,dx$



## 3.243.1 Optimal result

Integrand size = 14, antiderivative size = 133

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx=\frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d}-\frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{d}+\frac{\sqrt{b}\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{d}$$

output
```
-1/2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))
*b^(1/2)*2^(1/2)*Pi^(1/2)/d+1/2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b^(1/2))*sin(a/b)*b^(1/2)*2^(1/2)*Pi^(1/2)/d+(d*x+c)*(a+b*arcsin
(d*x+c))^(1/2)/d
```

## 3.243.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.04 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.97

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx$$
$$=\frac{be^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d\sqrt{a+b\arcsin(c+dx)}}$$

input
```
Integrate[Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(b*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[
c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[
3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(2*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c
 + d*x]])
```

### 3.243.3 Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.97, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857, Rules used = {5302, 5130, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \sqrt{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}-\frac{1}{2}b\int \frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5224}$$

$$\frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}-\frac{1}{2}\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{d}$$

$$\Big\downarrow \text{25}$$

$$\frac{\frac{1}{2}\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\frac{1}{2}\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+(c+dx)\sqrt{a+b\arcsin(c+dx)}}{d}$$

$$\Big\downarrow \text{3787}$$

$$\frac{\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int-\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)+(}{d}$$

$$\Big\downarrow \; 25$$

$$\frac{\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)+(c}{d}$$

$$\Big\downarrow \; 3042$$

$$\frac{\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)+}{d}$$

$$\Big\downarrow \; 3785$$

$$\frac{\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{d}$$

$$\Big\downarrow \; 3786$$

$$\frac{\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\cos\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+}\right.}{d}$$

$$\Big\downarrow \; 3832$$

$$\frac{\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)+}{d}$$

$$\Big\downarrow \; 3833$$

$$\frac{\frac{1}{2}\left(\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)+(c+dx}{d}$$

input
```
Int[Sqrt[a + b*ArcSin[c + d*x]],x]
```

3.243. $\int\sqrt{a+b\arcsin(c+dx)}\,dx$

output
```
((c + d*x)*Sqrt[a + b*ArcSin[c + d*x]] + (-(Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*Fr
esnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]) + Sqrt[b]*Sqrt[2
*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/
2)/d
```

### 3.243.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.243.4 Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.53

| method | result |
|---|---|
| default | $-\frac{-\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b-\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelC}}{2d\sqrt{a+b\arcsin(dx+c)}}$ |

input
```
int((a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/2/d/(a+b*arcsin(d*x+c))^(1/2)*(-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)/b)*b-2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b)*b+2*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+2*sin(-(a+b*arc
sin(d*x+c))/b+a/b)*a)
```

### 3.243.5 Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >> Error detected within library code: inte
grate: implementation incomplete (constant residues)
```

### 3.243.6 Sympy [F]

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{a+b\operatorname{asin}{(c+dx)}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**(1/2),x)
```

output
```
Integral(sqrt(a + b*asin(c + d*x)), x)
```

### 3.243.7 Maxima [F]

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{b\arcsin{(dx+c)}+a}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.243.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.64 (sec) , antiderivative size = 563, normalized size of antiderivative = 4.23

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx$$
$$= \frac{\sqrt{2}\sqrt{\pi}ab\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{2\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$+\frac{i\sqrt{2}\sqrt{\pi}b^2\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4\left(\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$+\frac{\sqrt{2}\sqrt{\pi}ab\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{2\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$-\frac{i\sqrt{2}\sqrt{\pi}b^2\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4\left(-\frac{ib^2}{\sqrt{|b|}}+b\sqrt{|b|}\right)d}$$
$$-\frac{\sqrt{\pi}a\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}a\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{i\sqrt{b\arcsin(dx+c)+a}e^{(i\arcsin(dx+c))}}{2d}+\frac{i\sqrt{b\arcsin(dx+c)+a}e^{(-i\arcsin(dx+c))}}{2d}$$

input
```
integrate((a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

3.243. $\int \sqrt{a+b\arcsin(c+dx)}\,dx$

output
```
1/2*sqrt(2)*sqrt(pi)*a*b*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sq
rt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*
a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 1/4*I*sqrt(2)*sqrt(pi)*b^
2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2
)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b
)) + b*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a*b*erf(1/2*I*sqrt(2)*sqrt(
b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d)
- 1/4*I*sqrt(2)*sqrt(pi)*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^
(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - sqrt(pi)*a*erf(-1/2*
I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt(2)*b/sqrt(abs(b))
+ sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*a*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(
b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) -
 1/2*I*sqrt(b*arcsin(d*x + c) + a)*e^(I*arcsin(d*x + c))/d + 1/2*I*sqrt(b*
arcsin(d*x + c) + a)*e^(-I*arcsin(d*x + c))/d
```

### 3.243.9 Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\arcsin(c+dx)}\,dx = \int \sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}\,dx$$

input
```
int((a + b*asin(c + d*x))^(1/2),x)
```

output
```
int((a + b*asin(c + d*x))^(1/2), x)
```

# 3.244 $\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx$



## 3.244.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx = \frac{\operatorname{Int}\left(\frac{\sqrt{a+b\arcsin(c+dx)}}{c+dx},x\right)}{e}$$

output
```
Unintegrable((a+b*arcsin(d*x+c))^(1/2)/(d*x+c),x)/e
```

## 3.244.2 Mathematica [N/A]

Not integrable

Time = 0.53 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx = \int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx$$

input
```
Integrate[Sqrt[a + b*ArcSin[c + d*x]]/(c*e + d*e*x),x]
```

output
```
Integrate[Sqrt[a + b*ArcSin[c + d*x]]/(c*e + d*e*x), x]
```

### 3.244.3 Rubi [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int \frac{\sqrt{a+b\arcsin(c+dx)}}{e(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \; 27$$
$$\frac{\int \frac{\sqrt{a+b\arcsin(c+dx)}}{c+dx}d(c+dx)}{de}$$
$$\Big\downarrow \; 5148$$
$$\frac{\int \frac{\sqrt{a+b\arcsin(c+dx)}}{c+dx}d(c+dx)}{de}$$

input
```
Int[Sqrt[a + b*ArcSin[c + d*x]]/(c*e + d*e*x),x]
```

output
```
$Aborted
```

#### 3.244.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.244.4 Maple [N/A] (verified)

Not integrable

Time = 0.60 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{\sqrt{a+b\arcsin\left(dx+c\right)}}{dex+ce}dx$$

input
```
int((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x)
```

output
```
int((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x)
```

### 3.244.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.244.6 Sympy [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.80

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx = \frac{\int \frac{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}{c+dx}\,dx}{e}$$

input
```
integrate((a+b*asin(d*x+c))**(1/2)/(d*e*x+c*e),x)
```

output
```
Integral(sqrt(a + b*asin(c + d*x))/(c + d*x), x)/e
```

### 3.244.7 Maxima [N/A]

Not integrable

Time = 0.92 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a + b \arcsin(c + dx)}}{ce + dex} \, dx = \int \frac{\sqrt{b \arcsin{(dx + c)} + a}}{dex + ce} \, dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x, algorithm="maxima")
```

output
```
integrate(sqrt(b*arcsin(d*x + c) + a)/(d*e*x + c*e), x)
```

### 3.244.8 Giac [N/A]

Not integrable

Time = 1.36 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a + b \arcsin(c + dx)}}{ce + dex} \, dx = \int \frac{\sqrt{b \arcsin{(dx + c)} + a}}{dex + ce} \, dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(1/2)/(d*e*x+c*e),x, algorithm="giac")
```

output
```
integrate(sqrt(b*arcsin(d*x + c) + a)/(d*e*x + c*e), x)
```

### 3.244.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{\sqrt{a+b\arcsin(c+dx)}}{ce+dex}\,dx=\int \frac{\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}}{c\,e+d\,e\,x}\,dx$$

input
```
int((a + b*asin(c + d*x))^(1/2)/(c*e + d*e*x),x)
```

output
```
int((a + b*asin(c + d*x))^(1/2)/(c*e + d*e*x), x)
```

# 3.245 $\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx$



## 3.245.1 Optimal result

Integrand size = 25, antiderivative size = 380

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = \frac{9be^3(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{64d} + \frac{3be^3(c+dx)^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{32d} - \frac{3e^3(a+b\arcsin(c+dx))^{3/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{3b^{3/2}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{512d} - \frac{3b^{3/2}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{64d} + \frac{3b^{3/2}e^3\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{64d} - \frac{3b^{3/2}e^3\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{512d}$$

output
```
-3/32*e^3*(a+b*arcsin(d*x+c))^(3/2)/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c)
)^(3/2)/d+3/1024*b^(3/2)*e^3*cos(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-3/1024*b^(3/2)*e^3*Fresnel
C(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)
*Pi^(1/2)/d-3/64*b^(3/2)*e^3*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/
2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/d+3/64*b^(3/2)*e^3*FresnelC(2*(a+b*arcsin(d*
x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+9/64*b*e^3*(d*x+c)*(1-
(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d+3/32*b*e^3*(d*x+c)^3*(1-(d*x+
c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.245.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.28 (sec) , antiderivative size = 252, normalized size of antiderivative = 0.66

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx =$$

$$-\frac{b^2e^3e^{-\frac{4ia}{b}}\left(-8\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-8\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2},\frac{2i(a+b\,a\right.\right.}{512d\sqrt{a+b}}$$

input
```
Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
-1/512*(b^2*e^3*(-8*Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d
*x]))/b]*Gamma[5/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - 8*Sqrt[2]*E^(((6
*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2, ((2*I)*(a + b*Arc
Sin[c + d*x]))/b] + Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2, ((-4
*I)*(a + b*ArcSin[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c
+ d*x]))/b]*Gamma[5/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]))/(d*E^(((4*I)*a
)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.245.3 Rubi [A] (verified)

Time = 2.89 (sec) , antiderivative size = 452, normalized size of antiderivative = 1.19, number of steps used = 23, number of rules used = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.880, Rules used = {5304, 27, 5140, 5210, 5146, 25, 4906, 2009, 5210, 5146, 25, 4906, 27, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e^3(c+dx)^3(a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^3\int (c+dx)^3(a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{5140}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\int \frac{(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{5210}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{1}{8}b\int \frac{(c+dx)^3}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)+\frac{3}{4}\int \frac{(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx\right.}{d}$$

$$\Big\downarrow \text{5146}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\int \frac{(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin}{\sqrt{a+b\arcsin}}\right.\right.}{d}$$

$$\Big\downarrow \text{25}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\int \frac{(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{8}\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^3(}{\sqrt{a+b\arcsin(c}}\right.\right.}{d}$$

$$\Big\downarrow \text{4906}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\int\frac{(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{8}\int\left(\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.}{d}$$

$\downarrow$ 2009

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\int\frac{(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(-\frac{1}{4}\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{Fresne}\right.\right.\right.$$

$\downarrow$ 5210

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{4}b\int\frac{c+dx}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)+\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\right.\right.\right.$$

$\downarrow$ 5146

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{4}\int-\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\right.}{\sqrt{a+b\arcsin(c+}}\right.\right.\right.$$

$\downarrow$ 25

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{4}\int\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a}{}\right.}{\sqrt{a+b\arcsin(c+dx}}\right.\right.\right.$$

$\downarrow$ 4906

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{4}\int\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2\sqrt{a+b\arcsin(c+dx)}}d(a\right.\right.\right.$$

$\downarrow$ 27

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{8}\int\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a\right.\right.\right.$$

$\downarrow$ 3042

## 3.245. $\int(ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx$

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{8}\int\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a\right.\right.\right.$$

$\downarrow$ 3787

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(-\sin\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+\right.}{\sqrt{a+b\arcsin(c+}}\right.\right.\right.\right.$$

$\downarrow$ 25

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right.}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.$$

$\downarrow$ 3042

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right.}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.$$

$\downarrow$ 3785

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right.}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.$$

$\downarrow$ 3786

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(2\cos\left(\frac{2a}{b}\right)\int\sin\left(\frac{2(a+b\arcsin(c+}{b}\right.\right.\right.\right.\right.$$

$\downarrow$ 3832

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{8}\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-2\sin\left(\frac{2a}{b}\right)\int\cos\right.\right.\right.\right.$$

$\downarrow$ 3833

## 3.245. $\int(ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx$

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{c}}{}\right.\right.\right.\right.\right.$$

$$\Big\downarrow \text{5152}$$

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{3/2}-\frac{3}{8}b\left(\frac{3}{4}\left(\frac{1}{8}\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\right.\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(e^3*(((c + d*x)^4*(a + b*ArcSin[c + d*x])^(3/2))/4 - (3*b*(-1/4*((c + d*x
)^3*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]]) + (3*(-1/2*((c + d*
x)*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]]) + (a + b*ArcSin[c +
d*x])^(3/2)/(3*b) + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*
ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] - Sqrt[b]*Sqrt[Pi]*FresnelC[(2*Sqrt[
a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/8))/4 + (-1/8*(S
qrt[b]*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
+ d*x]])/Sqrt[b]]) + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b
*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/4 - (Sqrt[b]*Sqrt[Pi]*FresnelC[(2*
Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/4 + (Sqrt[b
]*Sqrt[Pi/2]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*
Sin[(4*a)/b])/8)/8))/8))/d
```

### 3.245.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

## 3.245. $\int (ce + dex)^3 (a + b \arcsin(c + dx))^{3/2} \, dx$

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.245.4 Maple [A] (verified)

Time = 1.22 (sec) , antiderivative size = 604, normalized size of antiderivative = 1.59

| method | result |
|---|---|
| default | $-\frac{e^3\left(3\sqrt{a+b\arcsin(dx+c)}\,\operatorname{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\cos\left(\frac{4a}{b}\right)\sqrt{\pi}\,\sqrt{2}\,\sqrt{-\frac{1}{b}}\,b^2+3\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2}{}\right.\right.}{}$ |

input
```
int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-1/1024*e^3/d*(3*(a+b*arcsin(d*x+c))^(1/2)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1
/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*cos(4*a/b)*Pi^(1/2)*2^(1/2)*(-1/b)^
(1/2)*b^2+3*(a+b*arcsin(d*x+c))^(1/2)*sin(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*Pi^(1/2)*2^(1/2)*(-1/b)^(1/2)
*b^2-48*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fresnel
S(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-48*(-1/
b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelC(2*2^(1/2)/
Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2+128*arcsin(d*x+c)^2
*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2-32*arcsin(d*x+c)^2*cos(-4*(a+b*ar
csin(d*x+c))/b+4*a/b)*b^2-12*arcsin(d*x+c)*sin(-4*(a+b*arcsin(d*x+c))/b+4*
a/b)*b^2+256*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b+96*arcs
in(d*x+c)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2-64*arcsin(d*x+c)*cos(-4*
(a+b*arcsin(d*x+c))/b+4*a/b)*a*b-12*sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a*
b+128*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2+96*sin(-2*(a+b*arcsin(d*x+c)
)/b+2*a/b)*a*b-32*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a^2)/(a+b*arcsin(d*x
+c))^(1/2)
```

## 3.245.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.245.6 Sympy [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = e^3\left(\int ac^3\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int ad^3x^3\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int bc^3\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 3acd^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int 3ac^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int bd^3x^3\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 3bcd^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 3bc^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx\right)$$

input
```
integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**(3/2),x)
```

output
```
e**3*(Integral(a*c**3*sqrt(a + b*asin(c + d*x)), x) + Integral(a*d**3*x**3
*sqrt(a + b*asin(c + d*x)), x) + Integral(b*c**3*sqrt(a + b*asin(c + d*x))
*asin(c + d*x), x) + Integral(3*a*c*d**2*x**2*sqrt(a + b*asin(c + d*x)), x
) + Integral(3*a*c**2*d*x*sqrt(a + b*asin(c + d*x)), x) + Integral(b*d**3*
x**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral(3*b*c*d**2*x**
2*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral(3*b*c**2*d*x*sqrt
(a + b*asin(c + d*x))*asin(c + d*x), x))
```

### 3.245.7 Maxima [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = \int (dex+ce)^3(b\arcsin(dx+c)+a)^{\frac{3}{2}}\,dx$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^3*(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.245.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.29 (sec) , antiderivative size = 2237, normalized size of antiderivative = 5.89

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
1/16*I*sqrt(pi)*a^2*b^2*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(
b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((s
qrt(2)*b^(5/2) + I*sqrt(2)*b^(7/2)/abs(b))*d) + 1/8*I*sqrt(pi)*a^2*b^2*e^3
*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2)*b^(5/2) - I*sqrt(2)
*b^(7/2)/abs(b))*d) + 1/64*sqrt(pi)*a*b^3*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d
*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b
))*e^(-4*I*a/b)/((sqrt(2)*b^(5/2) - I*sqrt(2)*b^(7/2)/abs(b))*d) - 1/8*I*s
qrt(pi)*a^2*b^(3/2)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) -
 I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((sqrt(
2)*b^2 + I*sqrt(2)*b^3/abs(b))*d) + 1/64*sqrt(pi)*a*b^(5/2)*e^3*erf(-sqrt(
2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c)
+ a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((sqrt(2)*b^2 + I*sqrt(2)*b^3/abs(b))*d)
+ 1/8*I*sqrt(pi)*a^2*b^(3/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
- I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/
abs(b))*d) - 1/16*sqrt(pi)*a*b^(5/2)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/
sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2
+ I*b^3/abs(b))*d) - 1/8*I*sqrt(pi)*a^2*b^(3/2)*e^3*erf(-sqrt(b*arcsin(d*x
 + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I
*a/b)/((b^2 - I*b^3/abs(b))*d) - 1/16*sqrt(pi)*a*b^(5/2)*e^3*erf(-sqrt(...
```

### 3.245.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{3/2}\,dx = \int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

input
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(3/2), x)
```

# 3.246 $\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx$



## 3.246.1 Optimal result

Integrand size = 25, antiderivative size = 361

$$\begin{aligned}\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx &= \frac{be^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{3d}\\
&+\frac{be^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{6d}\\
&+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{3d}\\
&-\frac{3b^{3/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d}\\
&+\frac{b^{3/2}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{24d}\\
&-\frac{3b^{3/2}e^2\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8d}\\
&+\frac{b^{3/2}e^2\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{24d}\end{aligned}$$

output
```
1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))^(3/2)/d+1/144*b^(3/2)*e^2*cos(3*a/b)
*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)*Pi^(
1/2)/d+1/144*b^(3/2)*e^2*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d-3/16*b^(3/2)*e^2*cos(a/b)*Fresne
lC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-
3/16*b^(3/2)*e^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/
2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d+1/3*b*e^2*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(
d*x+c))^(1/2)/d+1/6*b*e^2*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/d
```

## 3.246.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.32 (sec) , antiderivative size = 268, normalized size of antiderivative = 0.74

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = \frac{be^2e^{-\frac{3ia}{b}}\sqrt{a+b\arcsin(c+dx)}\left(27e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+27e^{\frac{4ia}{b}}\sqrt{-\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(b*e^2*Sqrt[a + b*ArcSin[c + d*x]]*(27*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcS
in[c + d*x]))/b]*Gamma[5/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + 27*E^(((4*
I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2, (I*(a + b*ArcSi
n[c + d*x]))/b] - Sqrt[3]*(Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2,
((-3*I)*(a + b*ArcSin[c + d*x]))/b] + E^(((6*I)*a)/b)*Sqrt[((-I)*(a + b*Ar
cSin[c + d*x]))/b]*Gamma[5/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b])))/(216*d
*E^(((3*I)*a)/b)*Sqrt[(a + b*ArcSin[c + d*x])^2/b^2])
```

### 3.246.3 Rubi [A] (verified)

Time = 2.05 (sec) , antiderivative size = 441, normalized size of antiderivative = 1.22, number of steps used = 18, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.680, Rules used = {5304, 27, 5140, 5210, 5146, 4906, 2009, 5182, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int e^2(c+dx)^2(a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e^2\int (c+dx)^2(a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5140}$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int \frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{ 5210}$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{1}{6}b\int \frac{(c+dx)^2}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)+\frac{2}{3}\int \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx\right.}{d}$$

$$\Big\downarrow \text{ 5146}$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\int \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{6}\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^2\left(\right.}{\sqrt{a+b\arcsin(c+}}\right.\right.}{d}$$

$$\Big\downarrow \text{ 4906}$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\int \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{6}\int \left(\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\right.\right.\right.}{d}$$

$$\Big\downarrow \text{ 2009}$$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\int\frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{6}\left(\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\right.\right.\right.$$

$\downarrow$ 5182

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}b\int\frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)-\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(\right.\right.\right.$$

$\downarrow$ 5134

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\int\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sqrt{1-(c+dx}\right.\right.\right.$$

$\downarrow$ 3042

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sqrt{1-(c+}\right.\right.\right.$$

$\downarrow$ 3787

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(\cos\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\right.\right.\right.\right.$$

$\downarrow$ 25

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\right.\right.\right.\right.$$

$\downarrow$ 3042

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\right.\right.\right.\right.$$

$\downarrow$ 3785

3.246. $\int(ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{a}{b}\right.\right.\right.\right.\right.$$

$$\Big\downarrow \text{3786}$$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\,\mathrm{co}\right.\right.\right.\right.$$

$$\Big\downarrow \text{3832}$$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{\phantom{x}}\right.\right.\right.\right.$$

$$\Big\downarrow \text{3833}$$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{2\pi}\sqrt{b}\,\mathrm{si}\right.\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(e^2*(((c + d*x)^3*(a + b*ArcSin[c + d*x])^(3/2))/3 - (b*(-1/3*((c + d*x)^
2*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]]) + (2*(-(Sqrt[1 - (c +
 d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]]) + (Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*Fresn
elC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + Sqrt[b]*Sqrt[2*Pi]
*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2))/
3 + ((Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
 + d*x]])/Sqrt[b]])/2 - (Sqrt[b]*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6/
Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/2 + (Sqrt[b]*Sqrt[Pi/2]*Fresnel
S[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2 - (Sqrt[b]
*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin
[(3*a)/b])/2)/6))/2))/d
```

## 3.246. $\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx$

### 3.246.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

## 3.246. $\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx$

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.246. $\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx$

### 3.246.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 599 vs. 2(289) = 578.

Time = 1.21 (sec) , antiderivative size = 600, normalized size of antiderivative = 1.66

| method | result |
|---|---|
| default | $-\frac{e^{2}\left(-\sqrt{-\frac{3}{b}}\,\sqrt{2}\,\sqrt{\pi}\,\sqrt{a+b\arcsin\left(dx+c\right)}\,\cos\left(\frac{3a}{b}\right)\operatorname{FresnelC}\left(\frac{3\sqrt{2}\,\sqrt{a+b\arcsin\left(dx+c\right)}}{\sqrt{\pi}\,\sqrt{-\frac{3}{b}}\,b}\right)b^{2}+\sqrt{-\frac{3}{b}}\,\sqrt{2}\,\sqrt{\pi}\,\sqrt{a+b\arcsin\left(dx+c\right)}\,\sin\left(\frac{3a}{b}\right)}{}$ |

input
```
int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-1/144*e^2/d*(-(-3/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos
(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
/b)*b^2+(-3/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(3*a/b)
*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2
+27*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2-27*(a+b
*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b
*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2+36*arcsin(d*x+c
)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^2-12*arcsin(d*x+c)^2*sin(-3*(a+b*arc
sin(d*x+c))/b+3*a/b)*b^2+72*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*
a*b-54*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2-24*arcsin(d*x+c)*
sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a*b+6*arcsin(d*x+c)*cos(-3*(a+b*arcsin
(d*x+c))/b+3*a/b)*b^2+36*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2-54*cos(-(a+b*
arcsin(d*x+c))/b+a/b)*a*b-12*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a^2+6*cos
(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a*b)/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.246.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.246.6 Sympy [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = e^2\left(\int ac^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int ad^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int bc^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 2acdx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int bd^2x^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int 2bcdx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx\right)$$

input
```
integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**(3/2),x)
```

output
```
e**2*(Integral(a*c**2*sqrt(a + b*asin(c + d*x)), x) + Integral(a*d**2*x**2
*sqrt(a + b*asin(c + d*x)), x) + Integral(b*c**2*sqrt(a + b*asin(c + d*x))
*asin(c + d*x), x) + Integral(2*a*c*d*x*sqrt(a + b*asin(c + d*x)), x) + In
tegral(b*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral(
2*b*c*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

### 3.246.7 Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = \int (dex+ce)^2(b\arcsin(dx+c)+a)^{\frac{3}{2}}\,dx$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^2*(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.246.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.56 (sec) , antiderivative size = 2199, normalized size of antiderivative = 6.09

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
1/8*sqrt(2)*sqrt(pi)*a^2*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c)
 + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/
b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/8*I*sqrt(2)*s
qrt(pi)*a*b^3*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(
b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((
I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/8*sqrt(2)*sqrt(pi)*a^2*b^2*e
^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2
)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs
(b)) + b^2*sqrt(abs(b)))*d) - 1/8*I*sqrt(2)*sqrt(pi)*a*b^3*e^2*erf(1/2*I*s
qrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqr
t(abs(b)))*d) - 1/4*sqrt(pi)*a^2*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsi
n(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b
)/abs(b))*e^(3*I*a/b)/((sqrt(6)*b^2 + I*sqrt(6)*b^3/abs(b))*d) - 1/12*I*sq
rt(pi)*a*b^(5/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
- 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((
sqrt(6)*b^2 + I*sqrt(6)*b^3/abs(b))*d) - 1/8*I*sqrt(2)*sqrt(pi)*a*b^2*e^2*
erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*
sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b))
 + b*sqrt(abs(b)))*d) + 3/32*sqrt(2)*sqrt(pi)*b^3*e^2*erf(-1/2*I*sqrt(2...
```

### 3.246.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{3/2}\,dx=\int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

input
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(3/2), x)
```

# 3.247 $\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx$



## 3.247.1 Optimal result

Integrand size = 23, antiderivative size = 199

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx = \frac{3be(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} - \frac{e(a+b\arcsin(c+dx))^{3/2}}{4d} + \frac{e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{2d} - \frac{3b^{3/2}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{32d} + \frac{3b^{3/2}e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{32d}$$

output
```
-1/4*e*(a+b*arcsin(d*x+c))^(3/2)/d+1/2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))^(3/
2)/d-3/32*b^(3/2)*e*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2
)/Pi^(1/2))*Pi^(1/2)/d+3/32*b^(3/2)*e*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)
/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+3/8*b*e*(d*x+c)*(1-(d*x+c)^2)^(1/
2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.247.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.09 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.69

$$\int (ce + dex)(a + b\arcsin(c + dx))^{3/2}\,dx = \frac{b^2 e e^{-\frac{2ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2}, -\frac{2i(a+b\arcsin(c+dx))}{b}\right) + e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{5}{2}, \frac{2i(a+b\arcsin}{b}\right.\right.}{16\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}$$

input
```
Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(b^2*e*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[5/2, ((-2*I)*(a + b*A
rcSin[c + d*x]))/b] + E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*
Gamma[5/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(16*Sqrt[2]*d*E^(((2*I)*a)
/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.247.3 Rubi [A] (verified)

Time = 1.50 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.96, number of steps used = 18, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.739$, Rules used = {5304, 27, 5140, 5210, 5146, 25, 4906, 27, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce + dex)(a + b\arcsin(c + dx))^{3/2}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e(c+dx)(a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\int (c+dx)(a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{5140}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\int\frac{(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$\downarrow$ 5210

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{4}b\int\frac{c+dx}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)+\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{2}\sqrt{\right.}{d}$$

$\downarrow$ 5146

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{4}\int-\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b}{}\right.}{\sqrt{a+b\arcsin(c+dx)}}\right.}{d}$$

$\downarrow$ 25

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{4}\int\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b\,\mathrm{arc}}{}\right.}{\sqrt{a+b\arcsin(c+dx)}}\right.}{d}$$

$\downarrow$ 4906

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{4}\int\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2\sqrt{a+b\arcsin(c+dx)}}d(a+b\,\mathrm{a}\right.\right.}{d}$$

$\downarrow$ 27

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{8}\int\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\,\mathrm{a}\right.\right.}{d}$$

$\downarrow$ 3042

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{1}{8}\int\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\,\mathrm{a}\right.\right.}{d}$$

$\downarrow$ 3787

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(-\sin\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.$$

3.247. $\int(ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx$

$$\downarrow 25$$

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(\right.\right.\right.$$

$$\downarrow 3042$$

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(\right.\right.\right.$$

$$\downarrow 3785$$

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(\right.\right.\right.$$

$$\downarrow 3786$$

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(2\cos\left(\frac{2a}{b}\right)\int\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right.\right.\right.\right.$$

$$\downarrow 3832$$

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{8}\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-2\sin\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(\right.\right.\right.\right.$$

$$\downarrow 3833$$

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)+\frac{1}{8}\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\,\text{ar}}}{\sqrt{b}}\right.\right.\right.\right.$$

$$d$$

$$\downarrow 5152$$

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{8}\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{Fres}\right.\right.\right.$$

$$d$$

input
```
Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2),x]
```

3.247. $\int(ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx$

output
```
(e*(((c + d*x)^2*(a + b*ArcSin[c + d*x])^(3/2))/2 - (3*b*(-1/2*((c + d*x)*
Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]]) + (a + b*ArcSin[c + d*x
])^(3/2)/(3*b) + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*Arc
Sin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] - Sqrt[b]*Sqrt[Pi]*FresnelC[(2*Sqrt[a +
 b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/8))/4))/d
```

### 3.247.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

---

## 3.247. $\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx$

### 3.247.4 Maple [A] (verified)

Time = 0.87 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.55

| method | result |
|---|---|
| default | $-\frac{e\left(-3\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\mathrm{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)b^2-3\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{2a}{b}\right)\mathrm{Fresn}\right.}{}$ |

input
```
int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-1/32*e/d/(a+b*arcsin(d*x+c))^(1/2)*(-3*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(
d*x+c))^(1/2)*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)/b)*b^2-3*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(
1/2)/b)*b^2+8*arcsin(d*x+c)^2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2+16*a
rcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b+6*arcsin(d*x+c)*sin(-
2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2+8*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a
^2+6*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b)
```

### 3.247.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.247.6 Sympy [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx = e\left(\int ac\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int adx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int bc\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx + \int bdx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx\right)$$

input
```
integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**(3/2),x)
```

output
```
e*(Integral(a*c*sqrt(a + b*asin(c + d*x)), x) + Integral(a*d*x*sqrt(a + b*
asin(c + d*x)), x) + Integral(b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x),
 x) + Integral(b*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

### 3.247.7 Maxima [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx = \int (dex+ce)(b\arcsin\,(dx+c)+a)^{\frac{3}{2}}\,dx$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.247.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.86 (sec) , antiderivative size = 929, normalized size of antiderivative = 4.67

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
1/4*I*sqrt(pi)*a^2*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*
sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(
b))*d) - 1/8*sqrt(pi)*a*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3
/abs(b))*d) - 1/4*I*sqrt(pi)*a^2*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a
)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b
^2 - I*b^3/abs(b))*d) - 1/8*sqrt(pi)*a*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x +
c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/
b)/((b^2 - I*b^3/abs(b))*d) + 1/8*sqrt(pi)*a*b^2*e*erf(-sqrt(b*arcsin(d*x
+ c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a
/b)/((b^(3/2) + I*b^(5/2)/abs(b))*d) + 1/4*I*sqrt(pi)*a^2*b*e*erf(-sqrt(b*
arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b
))*e^(-2*I*a/b)/((b^(3/2) - I*b^(5/2)/abs(b))*d) + 1/8*sqrt(pi)*a*b^2*e*er
f(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqr
t(b)/abs(b))*e^(-2*I*a/b)/((b^(3/2) - I*b^(5/2)/abs(b))*d) - 1/4*I*sqrt(pi
)*a^2*sqrt(b)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin
(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d) + 3/64*I
*sqrt(pi)*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*ar
csin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b + I*b^2/abs(b))*d) - 3/
64*I*sqrt(pi)*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sq...
```

### 3.247.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{3/2}\,dx=\int (c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^{3/2}\,dx$$

input
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^(3/2), x)
```

# 3.248 $\int (a+b\arcsin(c+dx))^{3/2}\,dx$



## 3.248.1 Optimal result

Integrand size = 14, antiderivative size = 175

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \frac{3b\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{2d} + \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{d} - \frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2d} - \frac{3b^{3/2}\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2d}$$

output
```
(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d-3/4*b^(3/2)*cos(a/b)*FresnelC(2^(1/2)/
Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-3/4*b^(3/2)
*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(
1/2)*Pi^(1/2)/d+3/2*b*(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

## 3.248.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.79 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.78

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \frac{abe^{-\frac{ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{3}{2},\frac{i(a+b\arcsin(c+
}{2d\sqrt{a+b\arcsin(c+dx)}} + \frac{\sqrt{b}\left(2\sqrt{b}\sqrt{a+b\arcsin(c+dx)}\left(3\sqrt{1-(c+dx)^2}+2(c+dx)\arcsin(c+dx)\right)-\sqrt{2\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b}}{}\right.}{4d}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(a*b*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSi
n[c + d*x]))/b] + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamm
a[3/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(2*d*E^((I*a)/b)*Sqrt[a + b*ArcSin
[c + d*x]]) + (Sqrt[b]*(2*Sqrt[b]*Sqrt[a + b*ArcSin[c + d*x]]*(3*Sqrt[1 -
(c + d*x)^2] + 2*(c + d*x)*ArcSin[c + d*x]) - Sqrt[2*Pi]*FresnelC[(Sqrt[2/
Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(3*b*Cos[a/b] + 2*a*Sin[a/b]) +
Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*(2*a
*Cos[a/b] - 3*b*Sin[a/b])))/(4*d)
```

### 3.248.3 Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.94, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857, Rules used = {5302, 5130, 5182, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int (a+b\arcsin(c+dx))^{3/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\int\frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$\downarrow$ 5182

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}b\int\frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)-\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}\right)}{d}$$

$\downarrow$ 5134

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\int\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sqrt{1-(c+dx)^2}\sqrt{a+b}\right.}{d}$$

$\downarrow$ 3042

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sqrt{1-(c+dx)^2}\sqrt{a-}\right.}{d}$$

$\downarrow$ 3787

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\cos\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int-\frac{\sin\left(\frac{a+}{}\right.}{\sqrt{a+b}}\right.\right.}{d}$$

$\downarrow$ 25

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\,a}{}\right.}{\sqrt{a+b\,ar}}\right.\right.}{d}$$

$\downarrow$ 3042

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\,ar}{}\right.}{\sqrt{a+b}}\right.\right.}{d}$$

$\downarrow$ 3785

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a}{}\right.\right.\right.}{d}$$

3.248. $\int(a+b\arcsin(c+dx))^{3/2}\,dx$

$$\downarrow 3786$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\Big(\frac{1}{2}\Big(2\sin\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{a}{b}\right)\int\text{co}\ldots}{d}$$

$$\downarrow 3832$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\Bigg(\frac{1}{2}\Bigg(2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{2\pi}\sqrt{b}\sin\ldots}{d}$$

$$\downarrow 3833$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\Bigg(\frac{1}{2}\Bigg(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{Fres}\ldots}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^(3/2) - (3*b*(-(Sqrt[1 - (c + d*x)^2]*S
qrt[a + b*ArcSin[c + d*x]]) + (Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[
2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + Sqrt[b]*Sqrt[2*Pi]*FresnelS[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2))/2)/d
```

### 3.248.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

3.248. $\int (a+b\arcsin(c+dx))^{3/2}\,dx$

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.248. $\int (a+b\arcsin(c+dx))^{3/2}\,dx$

### 3.248.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 303 vs. $2(139) = 278$.

Time = 0.35 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.74

| method | result |
|---|---|
| default | $-\frac{3\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}\,b^{2}-3\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b}}{\sqrt{\pi}}\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-1/4/d*(3*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1
/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2-3
*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)*b^2+4*arcsin(d
*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+8*arcsin(d*x+c)*sin(-(a+b*arcs
in(d*x+c))/b+a/b)*a*b-6*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+
4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2-6*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*
b)/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.248.5 Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.248.6 Sympy [F]

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\int \left(a+b\,\mathrm{asin}\,(c+dx)\right)^{\frac{3}{2}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**(3/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(3/2), x)
```

### 3.248.7 Maxima [F]

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\int (b\arcsin\,(dx+c)+a)^{\frac{3}{2}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.248.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.90 (sec) , antiderivative size = 1061, normalized size of antiderivative = 6.06

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\text{Too large to display}$$

input
```
integrate((a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e
^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/2*I*sqrt(2)*sqrt(
pi)*a*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sq
rt(abs(b)) + b^2*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1/2*I
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arc
sin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*s
qrt(abs(b)))*d) - 1/2*I*sqrt(2)*sqrt(pi)*a*b^3*erf(1/2*I*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*
sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d) -
1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e
^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/8*sqrt(2)*sqrt(pi)*
b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^2/sqrt(abs
(b)) + b*sqrt(abs(b)))*d) + 1/2*I*sqrt(2)*sqrt(pi)*a*b^2*erf(1/2*I*sqrt(2)
*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x
+ c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)
))*d) + 3/8*sqrt(2)*sqrt(pi)*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + ...
```

### 3.248.9 Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{3/2}\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^{3/2}\,dx$$

input
```
int((a + b*asin(c + d*x))^(3/2),x)
```

output
```
int((a + b*asin(c + d*x))^(3/2), x)
```

# 3.249 $\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx$



## 3.249.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\frac{\text{Int}\left(\frac{(a+b\arcsin(c+dx))^{3/2}}{c+dx},x\right)}{e}$$

output
```
Unintegrable((a+b*arcsin(d*x+c))^(3/2)/(d*x+c),x)/e
```

## 3.249.2 Mathematica [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(3/2)/(c*e + d*e*x),x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^(3/2)/(c*e + d*e*x), x]
```

## 3.249.3 Rubi [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}dx$$
$$\Big\downarrow \ 5304$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^{3/2}}{e(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \ 27$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^{3/2}}{c+dx}d(c+dx)}{de}$$
$$\Big\downarrow \ 5148$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^{3/2}}{c+dx}d(c+dx)}{de}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(3/2)/(c*e + d*e*x),x]
```

output
```
$Aborted
```

### 3.249.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.249.4 Maple [N/A] (verified)

Not integrable

Time = 0.55 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^{\frac{3}{2}}}{dex+ce}dx$$

input
```
int((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x)
```

output
```
int((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x)
```

### 3.249.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.249.6 Sympy [N/A]

Not integrable

Time = 3.31 (sec) , antiderivative size = 51, normalized size of antiderivative = 2.04

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx = \frac{\int \frac{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}{c+dx}\,dx + \int \frac{b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}{c+dx}\,dx}{e}$$

input
```
integrate((a+b*asin(d*x+c))**(3/2)/(d*e*x+c*e),x)
```

output
```
(Integral(a*sqrt(a + b*asin(c + d*x))/(c + d*x), x) + Integral(b*sqrt(a +
b*asin(c + d*x))*asin(c + d*x)/(c + d*x), x))/e
```

### 3.249.7 Maxima [N/A]

Not integrable

Time = 1.10 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\int \frac{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(3/2)/(d*e*x + c*e), x)
```

### 3.249.8 Giac [N/A]

Not integrable

Time = 0.94 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx=\int \frac{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(3/2)/(d*e*x+c*e),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(3/2)/(d*e*x + c*e), x)
```

### 3.249.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{3/2}}{ce+dex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^{3/2}}{c\,e+d\,e\,x}\,dx$$

input
```
int((a + b*asin(c + d*x))^(3/2)/(c*e + d*e*x),x)
```

output
```
int((a + b*asin(c + d*x))^(3/2)/(c*e + d*e*x), x)
```

# 3.250 $\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx$



## 3.250.1 Optimal result

Integrand size = 25, antiderivative size = 475

$$\begin{aligned}\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx &= \frac{225b^2e^3\sqrt{a+b\arcsin(c+dx)}}{2048d}\\ &- \frac{45b^2e^3(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{256d}\\ &- \frac{15b^2e^3(c+dx)^4\sqrt{a+b\arcsin(c+dx)}}{256d}\\ &+ \frac{15be^3(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{64d}\\ &+ \frac{5be^3(c+dx)^3\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{32d}\\ &- \frac{3e^3(a+b\arcsin(c+dx))^{5/2}}{32d} + \frac{e^3(c+dx)^4(a+b\arcsin(c+dx))^{5/2}}{4d}\\ &+ \frac{15b^{5/2}e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4096d}\\ &- \frac{15b^{5/2}e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{256d}\\ &- \frac{15b^{5/2}e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{256d}\\ &+ \frac{15b^{5/2}e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{4096d}\end{aligned}$$

output
```
-3/32*e^3*(a+b*arcsin(d*x+c))^(5/2)/d+1/4*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c)
)^(5/2)/d+15/8192*b^(5/2)*e^3*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*
arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d+15/8192*b^(5/2)*e^3*Fresn
elS(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/
2)*Pi^(1/2)/d-15/256*b^(5/2)*e^3*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))
^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/d-15/256*b^(5/2)*e^3*FresnelS(2*(a+b*arc
sin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+15/64*b*e^3*(d*x
+c)*(a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d+5/32*b*e^3*(d*x+c)^3*(
a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d+225/2048*b^2*e^3*(a+b*arcsi
n(d*x+c))^(1/2)/d-45/256*b^2*e^3*(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)/d-15/
256*b^2*e^3*(d*x+c)^4*(a+b*arcsin(d*x+c))^(1/2)/d
```

## 3.250.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.20 (sec) , antiderivative size = 255, normalized size of antiderivative = 0.54

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx = \frac{ib^3e^3e^{-\frac{4ia}{b}}\left(16\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-16\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\cdots\right)}{\cdots}$$

input
```
Integrate[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
((I/2048)*b^3*e^3*(16*Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c +
 d*x]))/b]*Gamma[7/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - 16*Sqrt[2]*E^(
((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[7/2, ((2*I)*(a + b*
ArcSin[c + d*x]))/b] - Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[7/2, (
(-4*I)*(a + b*ArcSin[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin
[c + d*x]))/b]*Gamma[7/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]))/(d*E^(((4*I
)*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.250.3 Rubi [A] (verified)

Time = 2.53 (sec) , antiderivative size = 553, normalized size of antiderivative = 1.16, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {5304, 27, 5140, 5210, 5140, 5210, 5140, 5152, 5224, 3042, 3793, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int e^3(c+dx)^3(a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^3\int (c+dx)^3(a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{5140}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\int \frac{(c+dx)^4(a+b\arcsin(c+dx))^{3/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \text{5210}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\left(\frac{3}{8}b\int (c+dx)^3\sqrt{a+b\arcsin(c+dx)}d(c+dx)+\frac{3}{4}\int \frac{(c+dx)^2(a+b\arcsin}{\sqrt{1-(c+dx}}\right.\right.}{d}$$

$$\Big\downarrow \text{5140}$$

$$\frac{e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\left(\frac{3}{8}b\left(\frac{1}{4}(c+dx)^4\sqrt{a+b\arcsin(c+dx)}-\frac{1}{8}b\int \frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+}}\right.\right.\right.}{d}$$

$$\Big\downarrow \text{5210}$$

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\left(\frac{3}{8}b\left(\frac{1}{4}(c+dx)^4\sqrt{a+b\arcsin(c+dx)}-\frac{1}{8}b\int \frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+}}\right.\right.\right.$$

$$\Big\downarrow \text{5140}$$

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\left(\frac{3}{8}b\left(\frac{1}{4}(c+dx)^4\sqrt{a+b\arcsin(c+dx)}-\frac{1}{8}b\int \frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+}}\right.\right.\right.$$

$\downarrow$ 5152

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\left(\frac{3}{4}\left(\frac{3}{4}b\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}b\int\frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin}}\right.\right.\right.\right.$$

$\downarrow$ 5224

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\left(\frac{3}{8}b\left(\frac{1}{4}(c+dx)^4\sqrt{a+b\arcsin(c+dx)}-\frac{1}{8}\int\frac{\sin^4\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(\right.\right.\right.$$

$\downarrow$ 3042

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\left(\frac{3}{4}\left(\frac{3}{4}b\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.$$

$\downarrow$ 3793

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\left(\frac{3}{4}\left(\frac{3}{4}b\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}\int\left(\frac{1}{2\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.\right.$$

$\downarrow$ 2009

$$e^3\left(\frac{1}{4}(c+dx)^4(a+b\arcsin(c+dx))^{5/2}-\frac{5}{8}b\left(\frac{3}{4}\left(\frac{3}{4}b\left(\frac{1}{4}\left(\frac{1}{2}\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\frac{1}{2}\sqrt{\pi}\sqrt{b}\,\mathrm{s}\right.\right.\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)^3*(a + b*ArcSin[c + d*x])^(5/2),x]
```

3.250. $\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx$

output
```
(e^3*(((c + d*x)^4*(a + b*ArcSin[c + d*x])^(5/2))/4 - (5*b*(-1/4*((c + d*x
)^3*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^(3/2)) + (3*(-1/2*((c +
d*x)*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^(3/2)) + (a + b*ArcSin[
c + d*x])^(5/2)/(5*b) + (3*b*(((c + d*x)^2*Sqrt[a + b*ArcSin[c + d*x]])/2
+ (-Sqrt[a + b*ArcSin[c + d*x]] + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[
(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/2 + (Sqrt[b]*Sqrt[Pi]
*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]
)/2)/4))/4))/4 + (3*b*(((c + d*x)^4*Sqrt[a + b*ArcSin[c + d*x]])/4 + ((-3*
Sqrt[a + b*ArcSin[c + d*x]])/4 - (Sqrt[b]*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelC
[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/8 + (Sqrt[b]*Sqrt[Pi
]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])
])/2 + (Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]
*Sqrt[Pi])]*Sin[(2*a)/b])/2 - (Sqrt[b]*Sqrt[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*S
qrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(4*a)/b])/8)/8))/8))/8))/d
```

### 3.250.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3793
```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.250.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 885 vs. $2(391) = 782$.

Time = 1.23 (sec) , antiderivative size = 886, normalized size of antiderivative = 1.87

| method | result | size |
|---|---|---|
| default | Expression too large to display | 886 |

input
```
int((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-1/8192*e^3/d/(a+b*arcsin(d*x+c))^(1/2)*(-15*Pi^(1/2)*2^(1/2)*cos(4*a/b)*F
resnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(a+b*
arcsin(d*x+c))^(1/2)*(-1/b)^(1/2)*b^3+15*Pi^(1/2)*2^(1/2)*sin(4*a/b)*Fresn
elS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(a+b*arcs
in(d*x+c))^(1/2)*(-1/b)^(1/2)*b^3+480*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b)*b^3-480*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(
1/2)/b)*b^3+1024*arcsin(d*x+c)^3*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3-2
56*arcsin(d*x+c)^3*cos(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b^3+3072*arcsin(d*x
+c)^2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+1280*arcsin(d*x+c)^2*sin(-
2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3-768*arcsin(d*x+c)^2*cos(-4*(a+b*arcsin(
d*x+c))/b+4*a/b)*a*b^2-160*arcsin(d*x+c)^2*sin(-4*(a+b*arcsin(d*x+c))/b+4*
a/b)*b^3+3072*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b-960*
arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+2560*arcsin(d*x+c)*s
in(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2-768*arcsin(d*x+c)*cos(-4*(a+b*arc
sin(d*x+c))/b+4*a/b)*a^2*b+60*arcsin(d*x+c)*cos(-4*(a+b*arcsin(d*x+c))/b+4
*a/b)*b^3-320*arcsin(d*x+c)*sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a*b^2+1024
*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^3-960*cos(-2*(a+b*arcsin(d*x+c))/b+
2*a/b)*a*b^2+1280*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b-256*cos(-4*...
```

### 3.250.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.250.6 Sympy [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx = e^3\left(\int a^2c^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int a^2d^3x^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int b^2c^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)\,dx + \int 2abc^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx + \int 3a^2cd^2x^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int 3a^2c^2dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx + \int b^2d^3x^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)\,dx + \int 2abd^3x^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx + \int 3b^2cd^2x^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)\,dx + \int 3b^2c^2dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)\,dx + \int 6abcd^2x^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx + \int 6abc^2dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx\right)$$

input
```
integrate((d*e*x+c*e)**3*(a+b*asin(d*x+c))**(5/2),x)
```

output
```
e**3*(Integral(a**2*c**3*sqrt(a + b*asin(c + d*x)), x) + Integral(a**2*d**
3*x**3*sqrt(a + b*asin(c + d*x)), x) + Integral(b**2*c**3*sqrt(a + b*asin(
c + d*x))*asin(c + d*x)**2, x) + Integral(2*a*b*c**3*sqrt(a + b*asin(c + d
*x))*asin(c + d*x), x) + Integral(3*a**2*c*d**2*x**2*sqrt(a + b*asin(c + d
*x)), x) + Integral(3*a**2*c**2*d*x*sqrt(a + b*asin(c + d*x)), x) + Integr
al(b**2*d**3*x**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + Integra
l(2*a*b*d**3*x**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral(3
*b**2*c*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + Integra
l(3*b**2*c**2*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + Integra
l(6*a*b*c*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) + Integral
(6*a*b*c**2*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

### 3.250.7 Maxima [F]

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx=\int (dex+ce)^3(b\arcsin{(dx+c)}+a)^{\frac{5}{2}}\,dx$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^3*(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.250.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.85 (sec) , antiderivative size = 3408, normalized size of antiderivative = 7.17

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx=\text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^3*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
-1/8192*(-512*I*sqrt(pi)*a^3*b^2*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*
I*a/b)/(sqrt(2)*b^(5/2) - I*sqrt(2)*b^(7/2)/abs(b)) - 128*sqrt(b*arcsin(d*
x + c) + a)*b^2*e^3*arcsin(d*x + c)^2*e^(4*I*arcsin(d*x + c)) + 512*sqrt(b
*arcsin(d*x + c) + a)*b^2*e^3*arcsin(d*x + c)^2*e^(2*I*arcsin(d*x + c)) +
512*sqrt(b*arcsin(d*x + c) + a)*b^2*e^3*arcsin(d*x + c)^2*e^(-2*I*arcsin(d
*x + c)) - 128*sqrt(b*arcsin(d*x + c) + a)*b^2*e^3*arcsin(d*x + c)^2*e^(-4
*I*arcsin(d*x + c)) - 1536*I*sqrt(pi)*a^3*b*e^3*erf(-sqrt(2)*sqrt(b*arcsin
(d*x + c) + a)/sqrt(b) - I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs
(b))*e^(4*I*a/b)/(sqrt(2)*b^(3/2) + I*sqrt(2)*b^(5/2)/abs(b)) - 192*sqrt(p
i)*a^2*b^2*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(2
)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/(sqrt(2)*b^(3/2)
 + I*sqrt(2)*b^(5/2)/abs(b)) + 1024*I*sqrt(pi)*a^3*b*e^3*erf(-sqrt(b*arcsi
n(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^
(2*I*a/b)/(b^(3/2) + I*b^(5/2)/abs(b)) - 1024*I*sqrt(pi)*a^3*b*e^3*erf(-sq
rt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/
abs(b))*e^(-2*I*a/b)/(b^(3/2) - I*b^(5/2)/abs(b)) - 1024*I*sqrt(pi)*a^3*b*
e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*ar
csin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/(sqrt(2)*b^(3/2) - I*sqrt(
2)*b^(5/2)/abs(b)) - 384*sqrt(pi)*a^2*b^2*e^3*erf(-sqrt(2)*sqrt(b*arcsi...
```

### 3.250.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^3(a+b\arcsin(c+dx))^{5/2}\,dx=\int (c\,e+d\,e\,x)^3\,(a+b\,\mathrm{asin}(c+d\,x))^{5/2}\,dx$$

input
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int((c*e + d*e*x)^3*(a + b*asin(c + d*x))^(5/2), x)
```

# 3.251 $\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx$



## 3.251.1 Optimal result

Integrand size = 25, antiderivative size = 427

$$\begin{aligned}\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx =&-\frac{5b^2e^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{6d}-\frac{5b^2e^2(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{36d}\\&+\frac{5be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{9d}\\&+\frac{5be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{18d}\\&+\frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{3d}\\&+\frac{15b^{5/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{16d}\\&-\frac{5b^{5/2}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{144d}\\&-\frac{15b^{5/2}e^2\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{16d}\\&+\frac{5b^{5/2}e^2\sqrt{\frac{\pi}{6}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{144d}\end{aligned}$$

output
```
1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))^(5/2)/d-5/864*b^(5/2)*e^2*cos(3*a/b)
*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)*Pi^(
1/2)/d+5/864*b^(5/2)*e^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d+15/32*b^(5/2)*e^2*cos(a/b)*Fresn
elS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d
-15/32*b^(5/2)*e^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(
1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d+5/9*b*e^2*(a+b*arcsin(d*x+c))^(3/2)*(1-(
d*x+c)^2)^(1/2)/d+5/18*b*e^2*(d*x+c)^2*(a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c
)^2)^(1/2)/d-5/6*b^2*e^2*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d-5/36*b^2*e^2*
(d*x+c)^3*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.251.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.31 (sec) , antiderivative size = 249, normalized size of antiderivative = 0.58

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = \frac{b^3e^2e^{-\frac{3ia}{b}}\left(-81e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)-81e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2}\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
(b^3*e^2*(-81*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma
[7/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - 81*E^(((4*I)*a)/b)*Sqrt[(I*(a +
b*ArcSin[c + d*x]))/b]*Gamma[7/2, (I*(a + b*ArcSin[c + d*x]))/b] + Sqrt[3]
*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[7/2, ((-3*I)*(a + b*ArcSin[
c + d*x]))/b] + E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[
7/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b])))/(648*d*E^(((3*I)*a)/b)*Sqrt[a +
 b*ArcSin[c + d*x]])
```

### 3.251.3 Rubi [A] (verified)

Time = 2.46 (sec) , antiderivative size = 499, normalized size of antiderivative = 1.17, number of steps used = 20, number of rules used = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.760, Rules used = {5304, 27, 5140, 5210, 5140, 5182, 5130, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3793, 2009, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int e^2(c+dx)^2(a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{e^2\int (c+dx)^2(a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$$\Big\downarrow \; 5140$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\int \frac{(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \; 5210$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\int (c+dx)^2\sqrt{a+b\arcsin(c+dx)}d(c+dx)+\frac{2}{3}\int \frac{(c+dx)(a+b\arcsin(c}{\sqrt{1-(c+dx}}\right.\right.}{d}$$

$$\Big\downarrow \; 5140$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{3}(c+dx)^3\sqrt{a+b\arcsin(c+dx)}-\frac{1}{6}b\int \frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+}}\right.\right.\right.}{d}$$

$$\Big\downarrow \; 5182$$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{3}(c+dx)^3\sqrt{a+b\arcsin(c+dx)}-\frac{1}{6}b\int \frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+}}\right.\right.\right.$$

$$\Big\downarrow \; 5130$$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{2}{3}\left(\frac{3}{2}b\left((c+dx)\sqrt{a+b\arcsin(c+dx)}-\frac{1}{2}b\int\frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c-}}\right.\right.\right.\right.$$

$\downarrow$ 5224

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{3}(c+dx)^3\sqrt{a+b\arcsin(c+dx)}-\frac{1}{6}\int-\frac{\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.$$

$\downarrow$ 25

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{6}\int\frac{\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\frac{1}{3}(c+dx)^3\right.\right.\right.$$

$\downarrow$ 3042

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{2}{3}\left(\frac{3}{2}b\left(\frac{1}{2}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+(c+dx)\right.\right.\right.\right.$$

$\downarrow$ 3787

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{6}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)^3}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\frac{1}{3}(c+dx)^3\right.\right.\right.$$

$\downarrow$ 25

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{6}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)^3}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\frac{1}{3}(c+dx)^3\right.\right.\right.$$

$\downarrow$ 3042

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{6}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)^3}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\frac{1}{3}(c+dx)^3\right.\right.\right.$$

$\downarrow$ 3785

3.251. $\int(ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{6}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)^3}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\frac{1}{3}(c+dx)^3\sqrt{\right.\right.\right.$$

$\downarrow$ 3786

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{6}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)^3}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\frac{1}{3}(c+dx)^3\sqrt{\right.\right.\right.$$

$\downarrow$ 3793

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{1}{2}b\left(\frac{1}{6}\int\left(\frac{3\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\frac{\sin\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\right.\right.\right.$$

$\downarrow$ 2009

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{2}{3}\left(\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-\right.\right.\right.\right.\right.$$

$\downarrow$ 3832

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{2}{3}\left(\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right.\right.\right.\right.\right.$$

$\downarrow$ 3833

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{5/2}-\frac{5}{6}b\left(\frac{2}{3}\left(\frac{3}{2}b\left(\frac{1}{2}\left(\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{\right.\right.\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(5/2),x]
```

3.251. $\int(ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx$

output
```
(e^2*(((c + d*x)^3*(a + b*ArcSin[c + d*x])^(5/2))/3 - (5*b*(-1/3*((c + d*x
)^2*Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^(3/2)) + (2*(-(Sqrt[1 -
(c + d*x)^2]*(a + b*ArcSin[c + d*x])^(3/2)) + (3*b*((c + d*x)*Sqrt[a + b*A
rcSin[c + d*x]] + (-(Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt
[a + b*ArcSin[c + d*x]])/Sqrt[b]]) + Sqrt[b]*Sqrt[2*Pi]*FresnelC[(Sqrt[2/P
i]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2))/2))/3 + (b*(((c + d
*x)^3*Sqrt[a + b*ArcSin[c + d*x]])/3 + ((-3*Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*Fr
esnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/2 + (Sqrt[b]*Sqr
t[Pi/6]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqr
t[b]])/2 + (3*Sqrt[b]*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
+ d*x]])/Sqrt[b]]*Sin[a/b])/2 - (Sqrt[b]*Sqrt[Pi/6]*FresnelC[(Sqrt[6/Pi]*S
qrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/2)/6))/2))/6))/d
```

### 3.251.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3793
```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

## 3.251. $\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx$

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.251.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 878 vs. $2(347) = 694$.

Time = 1.24 (sec) , antiderivative size = 879, normalized size of antiderivative = 2.06

| method | result | size |
|---|---|---|
| default | Expression too large to display | 879 |

input
```
int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-1/864*e^2/d*(405*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*cos(a/b)*Fres
nelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/
2)*b^3+405*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*sin(a/b)*FresnelC(2^
(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3-
5*Pi^(1/2)*2^(1/2)*(-3/b)^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3
/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(a+b*arcsin(d*x+c))^(1/2)*b^3-5*Pi^
(1/2)*2^(1/2)*(-3/b)^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(
1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(a+b*arcsin(d*x+c))^(1/2)*b^3+216*arcsin
(d*x+c)^3*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3-72*sin(-3*(a+b*arcsin(d*x+c)
)/b+3*a/b)*arcsin(d*x+c)^3*b^3+648*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c)
)/b+a/b)*a*b^2-540*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^3-216
*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)^2*a*b^2+60*cos(-3*(a+b*
arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)^2*b^3+648*arcsin(d*x+c)*sin(-(a+b*ar
csin(d*x+c))/b+a/b)*a^2*b-810*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b
)*b^3-1080*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^2-216*sin(-3*
(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)*a^2*b+30*sin(-3*(a+b*arcsin(d*x
+c))/b+3*a/b)*arcsin(d*x+c)*b^3+120*cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*ar
csin(d*x+c)*a*b^2+216*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^3-810*sin(-(a+b*ar
csin(d*x+c))/b+a/b)*a*b^2-540*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b-72*sin
(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a^3+30*sin(-3*(a+b*arcsin(d*x+c))/b+3*...
```

### 3.251.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.251.6 Sympy [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = e^2\Bigg(\int a^2c^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx$$
$$+\int a^2d^2x^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx+\int b^2c^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)\,dx$$
$$+\int 2abc^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx+\int 2a^2cdx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,dx$$
$$+\int b^2d^2x^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)\,dx$$
$$+\int 2abd^2x^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx$$
$$+\int 2b^2cdx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)\,dx$$
$$+\int 4abcdx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)\,dx\Bigg)$$

input
```
integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**(5/2),x)
```

output
```
e**2*(Integral(a**2*c**2*sqrt(a + b*asin(c + d*x)), x) + Integral(a**2*d**
2*x**2*sqrt(a + b*asin(c + d*x)), x) + Integral(b**2*c**2*sqrt(a + b*asin(
c + d*x))*asin(c + d*x)**2, x) + Integral(2*a*b*c**2*sqrt(a + b*asin(c + d
*x))*asin(c + d*x), x) + Integral(2*a**2*c*d*x*sqrt(a + b*asin(c + d*x)),
x) + Integral(b**2*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x
) + Integral(2*a*b*d**2*x**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x) +
 Integral(2*b**2*c*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) + In
tegral(4*a*b*c*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

### 3.251.7 Maxima [F]

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = \int (dex+ce)^2(b\arcsin\,(dx+c)+a)^{\frac{5}{2}}\,dx$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^2*(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.251.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 2.21 (sec) , antiderivative size = 2826, normalized size of antiderivative = 6.62

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
1/576*(72*sqrt(2)*sqrt(pi)*a^3*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*
x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(ab
s(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 72*sqrt(2)*sq
rt(pi)*a^3*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(
b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(
-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 216*I*sqrt(2)*sqrt(pi)*a^2*b^2*e
^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(
2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b
)) + b*sqrt(abs(b))) - 216*I*sqrt(2)*sqrt(pi)*a^2*b^2*e^2*erf(1/2*I*sqrt(2
)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x
 + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)
)) + 24*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*arcsin(d*x + c)^2*e^(3*I*arc
sin(d*x + c)) - 72*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*arcsin(d*x + c)^2
*e^(I*arcsin(d*x + c)) + 72*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^2*arcsin(d
*x + c)^2*e^(-I*arcsin(d*x + c)) - 24*I*sqrt(b*arcsin(d*x + c) + a)*b^2*e^
2*arcsin(d*x + c)^2*e^(-3*I*arcsin(d*x + c)) - 144*sqrt(pi)*a^3*sqrt(b)*e^
2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqr
t(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(6)*b + I*sqrt(6
)*b^2/abs(b)) - 144*I*sqrt(pi)*a^2*b^(3/2)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arc
sin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*s...
```

### 3.251.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{5/2}\,dx = \int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))^{5/2}\,dx$$

input
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(5/2), x)
```

# 3.252 $\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx$



## 3.252.1 Optimal result

Integrand size = 23, antiderivative size = 256

$$\begin{aligned}\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx =& \frac{15b^2e\sqrt{a+b\arcsin(c+dx)}}{64d} \\ &-\frac{15b^2e(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{32d} \\ &+\frac{5be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{8d} \\ &-\frac{e(a+b\arcsin(c+dx))^{5/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{2d} \\ &-\frac{15b^{5/2}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{128d} \\ &-\frac{15b^{5/2}e\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{128d}\end{aligned}$$

output
```
-1/4*e*(a+b*arcsin(d*x+c))^(5/2)/d+1/2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))^(5/
2)/d-15/128*b^(5/2)*e*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1
/2)/Pi^(1/2))*Pi^(1/2)/d-15/128*b^(5/2)*e*FresnelS(2*(a+b*arcsin(d*x+c))^(
1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+5/8*b*e*(d*x+c)*(a+b*arcsin(d
*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d+15/64*b^2*e*(a+b*arcsin(d*x+c))^(1/2)/d
-15/32*b^2*e*(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.252.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.08 (sec) , antiderivative size = 140, normalized size of antiderivative = 0.55

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = \frac{ib^3ee^{-\frac{2ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{7}{2},\frac{2i(a+b\arcs}{b}\right.\right.}{32\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}$$

input
```
Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
((I/32)*b^3*e*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[7/2, ((-2*I)*(
a + b*ArcSin[c + d*x]))/b] - E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x
]))/b]*Gamma[7/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(Sqrt[2]*d*E^(((2*I
)*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.252.3 Rubi [A] (verified)

Time = 1.22 (sec) , antiderivative size = 244, normalized size of antiderivative = 0.95, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.435$, Rules used = {5304, 27, 5140, 5210, 5140, 5152, 5224, 3042, 3793, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int e(c+dx)(a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e\int (c+dx)(a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5140}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{5/2}-\frac{5}{4}b\int \frac{(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$\downarrow$ 5210

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{5/2}-\frac{5}{4}b\left(\frac{3}{4}b\int(c+dx)\sqrt{a+b\arcsin(c+dx)}d(c+dx)+\frac{1}{2}\int\frac{(a+b\arcsin(c+dx))^{3/2}}{\sqrt{1-(c+dx)^2}}\right.\right.}{d}$$

$\downarrow$ 5140

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{5/2}-\frac{5}{4}b\left(\frac{3}{4}b\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}b\int\frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+d}}\right.\right.\right.}{d}$$

$\downarrow$ 5152

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{5/2}-\frac{5}{4}b\left(\frac{3}{4}b\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}b\int\frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+d}}\right.\right.\right.}{d}$$

$\downarrow$ 5224

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{5/2}-\frac{5}{4}b\left(\frac{3}{4}b\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}\int\frac{\sin^2\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(c\right.\right.\right.}{d}$$

$\downarrow$ 3042

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{5/2}-\frac{5}{4}b\left(\frac{3}{4}b\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)^2}{\sqrt{a+b\arcsin(c+dx)}}d(c\right.\right.\right.}{d}$$

$\downarrow$ 3793

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{5/2}-\frac{5}{4}b\left(\frac{3}{4}b\left(\frac{1}{2}(c+dx)^2\sqrt{a+b\arcsin(c+dx)}-\frac{1}{4}\int\left(\frac{1}{2\sqrt{a+b\arcsin(c+dx)}}-\frac{\cos}{}\right.\right.\right.\right.$$

$\downarrow$ 2009

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{5/2}-\frac{5}{4}b\left(\frac{3}{4}b\left(\frac{1}{4}\left(\frac{1}{2}\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\frac{1}{2}\sqrt{\pi}\sqrt{b}\sin\left(\frac{2}{}\right.\right.\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2),x]
```

3.252. $\int(ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx$

output
```
(e*(((c + d*x)^2*(a + b*ArcSin[c + d*x])^(5/2))/2 - (5*b*(-1/2*((c + d*x)*
Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^(3/2)) + (a + b*ArcSin[c + d
*x])^(5/2)/(5*b) + (3*b*(((c + d*x)^2*Sqrt[a + b*ArcSin[c + d*x]])/2 + (-S
qrt[a + b*ArcSin[c + d*x]] + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sq
rt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/2 + (Sqrt[b]*Sqrt[Pi]*Fres
nelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/2)/
4))/4))/4))/d
```

### 3.252.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3793
```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.252.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 448 vs. $2(210) = 420$.

Time = 0.85 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.75

| method | result |
|---|---|
| default | $-\frac{e\left(15\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)b^3-15\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{2a}{b}\right)\mathrm{Fres}\right.}{}$ |

input
```
int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-1/128*e/d/(a+b*arcsin(d*x+c))^(1/2)*(15*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)/b)*b^3-15*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)/b)*b^3+32*arcsin(d*x+c)^3*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+9
6*arcsin(d*x+c)^2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+40*arcsin(d*x+
c)^2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+96*arcsin(d*x+c)*cos(-2*(a+b*
arcsin(d*x+c))/b+2*a/b)*a^2*b-30*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/
b+2*a/b)*b^3+80*arcsin(d*x+c)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+32
*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^3-30*cos(-2*(a+b*arcsin(d*x+c))/b+2
*a/b)*a*b^2+40*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b)
```

### 3.252.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.252.6 Sympy [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = e\left(\int a^2c\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int a^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\,dx + \int b^2c\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 2abc\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx + \int b^2dx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)\,dx + \int 2abdx\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)\,dx\right)$$

input
```
integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**(5/2),x)
```

output
```
e*(Integral(a**2*c*sqrt(a + b*asin(c + d*x)), x) + Integral(a**2*d*x*sqrt(
a + b*asin(c + d*x)), x) + Integral(b**2*c*sqrt(a + b*asin(c + d*x))*asin(
c + d*x)**2, x) + Integral(2*a*b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x)
, x) + Integral(b**2*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2, x) +
Integral(2*a*b*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x), x))
```

### 3.252.7 Maxima [F]

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx=\int (dex+ce)(b\arcsin(dx+c)+a)^{\frac{5}{2}}\,dx$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.252.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.13 (sec) , antiderivative size = 1449, normalized size of antiderivative = 5.66

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx=\text{Too large to display}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
1/4*I*sqrt(pi)*a^3*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*
sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b^3/abs(
b))*d) - 3/8*sqrt(pi)*a^2*b^(5/2)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(
b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^2 + I*b
^3/abs(b))*d) - 1/4*I*sqrt(pi)*a^3*b^(3/2)*e*erf(-sqrt(b*arcsin(d*x + c) +
 a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(
(b^2 - I*b^3/abs(b))*d) - 3/8*sqrt(pi)*a^2*b^(5/2)*e*erf(-sqrt(b*arcsin(d*
x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*
I*a/b)/((b^2 - I*b^3/abs(b))*d) - 1/8*sqrt(b*arcsin(d*x + c) + a)*b^2*e*ar
csin(d*x + c)^2*e^(2*I*arcsin(d*x + c))/d - 1/8*sqrt(b*arcsin(d*x + c) + a
)*b^2*e*arcsin(d*x + c)^2*e^(-2*I*arcsin(d*x + c))/d + 3/8*sqrt(pi)*a^2*b^
2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) +
a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^(3/2) + I*b^(5/2)/abs(b))*d) - 9/64*I*s
qrt(pi)*a*b^3*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin
(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/((b^(3/2) + I*b^(5/2)/abs(b))*d
) + 1/4*I*sqrt(pi)*a^3*b*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sq
rt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^(3/2) - I*b^(5/
2)/abs(b))*d) + 3/8*sqrt(pi)*a^2*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sq
rt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/((b^(3/
2) - I*b^(5/2)/abs(b))*d) + 9/64*I*sqrt(pi)*a*b^3*e*erf(-sqrt(b*arcsin(...
```

### 3.252.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{5/2}\,dx = \int (c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^{5/2}\,dx$$

input
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^(5/2), x)
```

# 3.253 $\int (a+b\arcsin(c+dx))^{5/2}\,dx$



## 3.253.1 Optimal result

Integrand size = 14, antiderivative size = 204

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx=-\frac{15b^2(c+dx)\sqrt{a+b\arcsin(c+dx)}}{4d}+\frac{5b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{d}+\frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4d}-\frac{15b^{5/2}\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4d}$$

output
```
(d*x+c)*(a+b*arcsin(d*x+c))^(5/2)/d+15/8*b^(5/2)*cos(a/b)*FresnelS(2^(1/2)
/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d-15/8*b^(5/
2)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2
^(1/2)*Pi^(1/2)/d+5/2*b*(a+b*arcsin(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d-15
/4*b^2*(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.253.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.35 (sec) , antiderivative size = 419, normalized size of antiderivative = 2.05

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \frac{\sqrt{b}e^{-\frac{ia}{b}}\left(i(4a^2+15b^2)\left(-1+e^{\frac{2ia}{b}}\right)\sqrt{2\pi}\sqrt{a+b\arcsin(c+dx)}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
(Sqrt[b]*(I*(4*a^2 + 15*b^2)*(-1 + E^(((2*I)*a)/b))*Sqrt[2*Pi]*Sqrt[a + b*
ArcSin[c + d*x]]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]
] + (4*a^2 + 15*b^2)*(1 + E^(((2*I)*a)/b))*Sqrt[2*Pi]*Sqrt[a + b*ArcSin[c
+ d*x]]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + 4*Sqr
t[b]*(E^((I*a)/b)*(a + b*ArcSin[c + d*x])*(-15*b*(c + d*x) + 10*a*Sqrt[1 -
 c^2 - 2*c*d*x - d^2*x^2] + 2*(4*a*(c + d*x) + 5*b*Sqrt[1 - c^2 - 2*c*d*x
- d^2*x^2])*ArcSin[c + d*x] + 4*b*(c + d*x)*ArcSin[c + d*x]^2) + 2*a^2*Sqr
t[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, ((-I)*(a + b*ArcSin[c + d*x
]))/b] + 2*a^2*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[3
/2, (I*(a + b*ArcSin[c + d*x]))/b])))/(16*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[
c + d*x]])
```

### 3.253.3 Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.94, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 1.000$, Rules used = {5302, 5130, 5182, 5130, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx$$

$$\Big\downarrow \; 5302$$

$$\frac{\int (a+b\arcsin(c+dx))^{5/2}d(c+dx)}{d}$$

$$\Big\downarrow \; 5130$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\int \frac{(c+dx)(a+b\arcsin(c+dx))^{3/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$$\Big\downarrow \; 5182$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\int \sqrt{a+b\arcsin(c+dx)}d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+d\ldots\right.}{d}$$

$$\Big\downarrow \; 5130$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left((c+dx)\sqrt{a+b\arcsin(c+dx)}-\frac{1}{2}b\int \frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+\ldots\right.\right.}{d}$$

$$\Big\downarrow \; 5224$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left((c+dx)\sqrt{a+b\arcsin(c+dx)}-\frac{1}{2}\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\,\mathrm{ar}\ldots\right.\right.}{d}$$

$$\Big\downarrow \; 25$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+(c+dx)\sqrt{a+b\,\mathrm{arc}\ldots}\right.\right.}{d}$$

$$\Big\downarrow \; 3042$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+(c+dx)\sqrt{a+b\,\mathrm{arc}\ldots}\right.\right.}{d}$$

$$\Big\downarrow \; 3787$$

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int -\frac{\mathrm{si}\ldots}{\ldots}\right.\right.\right.}{}$$

$$\Big\downarrow \; 25$$

3.253. $\int (a+b\arcsin(c+dx))^{5/2}\,dx$

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int\frac{\sin(}{\sqrt{a}}\right.\right.\right.$$

$\downarrow$ 3042

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int\right.\right.\right.$$

$\downarrow$ 3785

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-\cos\left(\frac{a}{b}\right)\right.\right.\right.$$

$\downarrow$ 3786

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\cos\left(\frac{a}{b}\right)\right.\right.\right.$$

$\downarrow$ 3832

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-\sqrt{2\pi}\sqrt{b}\right.\right.\right.$$

$\downarrow$ 3833

$$(c+dx)(a+b\arcsin(c+dx))^{5/2}-\frac{5}{2}b\left(\frac{3}{2}b\left(\frac{1}{2}\left(\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\right.\right.\right.$$

input
```
Int[(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^(5/2) - (5*b*(-(Sqrt[1 - (c + d*x)^2]*(
a + b*ArcSin[c + d*x])^(3/2)) + (3*b*((c + d*x)*Sqrt[a + b*ArcSin[c + d*x]
] + (-(Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]]) + Sqrt[b]*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*
ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2))/2))/2)/d
```

## 3.253. $\int(a+b\arcsin(c+dx))^{5/2}\,dx$

### 3.253.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

## 3.253. $\int (a+b\arcsin(c+dx))^{5/2}\,dx$

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.253.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 440 vs. $2(164) = 328$.

Time = 0.33 (sec) , antiderivative size = 441, normalized size of antiderivative = 2.16

| method | result |
|---|---|
| default | $-\frac{15\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sqrt{2}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b^3+15\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sqrt{2}\,\sin\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\right.}{}$ |

input
```
int((a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-1/8/d*(15*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*cos(a/b)*FresnelS(2^
(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3+
15*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*2^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi
^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*b^3+8*arcsin
(d*x+c)^3*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3+24*arcsin(d*x+c)^2*sin(-(a+b
*arcsin(d*x+c))/b+a/b)*a*b^2-20*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b
+a/b)*b^3+24*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b-30*arcsin
(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^3-40*arcsin(d*x+c)*cos(-(a+b*arc
sin(d*x+c))/b+a/b)*a*b^2+8*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^3-30*sin(-(a+
b*arcsin(d*x+c))/b+a/b)*a*b^2-20*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b)/(a
+b*arcsin(d*x+c))^(1/2)
```

### 3.253.5 Fricas [F(-2)]

Exception generated.

$$\int (a + b \arcsin(c + dx))^{5/2} \, dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.253.6 Sympy [F]

$$\int (a + b \arcsin(c + dx))^{5/2} \, dx = \int (a + b \operatorname{asin}(c + dx))^{\frac{5}{2}} \, dx$$

input
```
integrate((a+b*asin(d*x+c))**(5/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(5/2), x)
```

### 3.253.7 Maxima [F]

$$\int (a + b \arcsin(c + dx))^{5/2} \, dx = \int (b \arcsin(dx + c) + a)^{\frac{5}{2}} \, dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.253.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.26 (sec) , antiderivative size = 1279, normalized size of antiderivative = 6.27

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \text{Too large to display}$$

input
```
integrate((a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
1/2*sqrt(2)*sqrt(pi)*a^3*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a
)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e
^(I*a/b)/((I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b)))*d) + 1/2*sqrt(2)*sqrt(pi
)*a^3*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2
*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^4/s
qrt(abs(b)) + b^3*sqrt(abs(b)))*d) + 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^3*erf(-1
/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^3/sqrt(abs(b)) + b^2
*sqrt(abs(b)))*d) - 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^3*erf(1/2*I*sqrt(2)*sqrt(
b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) +
 a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b)))*d
) - 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b)
)/b)*e^(I*a/b)/((I*b^2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) - 15/16*I*sqrt(2)
*sqrt(pi)*b^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b))
- 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/((I*b^
2/sqrt(abs(b)) + b*sqrt(abs(b)))*d) + 3/2*I*sqrt(2)*sqrt(pi)*a^2*b^2*erf(1
/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/((-I*b^2/sqrt(abs(b)) + b
*sqrt(abs(b)))*d) + 15/16*I*sqrt(2)*sqrt(pi)*b^4*erf(1/2*I*sqrt(2)*sqrt...
```

### 3.253.9 Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{5/2}\,dx = \int (a+b\,\text{asin}(c+d\,x))^{5/2}\,dx$$

input
```
int((a + b*asin(c + d*x))^(5/2),x)
```

output
```
int((a + b*asin(c + d*x))^(5/2), x)
```

# 3.254 $\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx$



## 3.254.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx = \frac{\text{Int}\left(\frac{(a+b\arcsin(c+dx))^{5/2}}{c+dx},x\right)}{e}$$

output
```
Unintegrable((a+b*arcsin(d*x+c))^(5/2)/(d*x+c),x)/e
```

## 3.254.2 Mathematica [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx = \int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(5/2)/(c*e + d*e*x),x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^(5/2)/(c*e + d*e*x), x]
```

### 3.254.3 Rubi [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^{5/2}}{e(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \; 27$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^{5/2}}{c+dx}d(c+dx)}{de}$$
$$\Big\downarrow \; 5148$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^{5/2}}{c+dx}d(c+dx)}{de}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(5/2)/(c*e + d*e*x),x]
```

output
```
$Aborted
```

#### 3.254.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.254.4 Maple [N/A] (verified)

Not integrable

Time = 0.66 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^{\frac{5}{2}}}{dex+ce}dx$$

input
```
int((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x)
```

output
```
int((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x)
```

### 3.254.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.254.6 Sympy [N/A]

Not integrable

Time = 24.40 (sec) , antiderivative size = 88, normalized size of antiderivative = 3.52

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx = \frac{\int \frac{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}{c+dx}\,dx + \int \frac{b^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)}{c+dx}\,dx + \int \frac{2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx}}{c+dx}}{e}$$

input
```
integrate((a+b*asin(d*x+c))**(5/2)/(d*e*x+c*e),x)
```

output
```
(Integral(a**2*sqrt(a + b*asin(c + d*x))/(c + d*x), x) + Integral(b**2*sqr
t(a + b*asin(c + d*x))*asin(c + d*x)**2/(c + d*x), x) + Integral(2*a*b*sqr
t(a + b*asin(c + d*x))*asin(c + d*x)/(c + d*x), x))/e
```

### 3.254.7 Maxima [N/A]

Not integrable

Time = 1.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(5/2)/(d*e*x + c*e), x)
```

### 3.254.8 Giac [N/A]

Not integrable

Time = 0.98 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{5/2}}{ce+dex}\,dx=\int \frac{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(5/2)/(d*e*x+c*e),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(5/2)/(d*e*x + c*e), x)
```

### 3.254.9 Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a + b \arcsin(c + dx))^{5/2}}{ce + dex} \, dx = \int \frac{(a + b \operatorname{asin}(c + d\, x))^{5/2}}{c\, e + d\, e\, x} \, dx$$

input
```
int((a + b*asin(c + d*x))^(5/2)/(c*e + d*e*x),x)
```

output
```
int((a + b*asin(c + d*x))^(5/2)/(c*e + d*e*x), x)
```

# 3.255 $\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx$

### 3.255.1 Optimal result

Integrand size = 25, antiderivative size = 518

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = -\frac{175b^3e^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{54d} - \frac{35b^3e^2(c+dx)^2\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{216d} - \frac{35b^2e^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{18d} - \frac{35b^2e^2(c+dx)^3(a+b\arcsin(c+dx))^{3/2}}{108d} + \frac{7be^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{9d} + \frac{7be^2(c+dx)^2\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{18d} + \frac{e^2(c+dx)^3(a+b\arcsin(c+dx))^{7/2}}{3d} + \frac{105b^{7/2}e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{32d} - \frac{35b^{7/2}e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{864d} + \frac{105b^{7/2}e^2\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{32d} - \frac{35b^{7/2}e^2\sqrt{\frac{\pi}{6}}\,\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{864d}$$

output
```
-35/18*b^2*e^2*(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d-35/108*b^2*e^2*(d*x+c)^
3*(a+b*arcsin(d*x+c))^(3/2)/d+1/3*e^2*(d*x+c)^3*(a+b*arcsin(d*x+c))^(7/2)/
d-35/5184*b^(7/2)*e^2*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x
+c))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/d-35/5184*b^(7/2)*e^2*FresnelS(6^(1/2
)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/
d+105/64*b^(7/2)*e^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d+105/64*b^(7/2)*e^2*FresnelS(2^(1/2)/Pi
^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d+7/9*
b*e^2*(a+b*arcsin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d+7/18*b*e^2*(d*x+c)^2
*(a+b*arcsin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d-175/54*b^3*e^2*(1-(d*x+c)
^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d-35/216*b^3*e^2*(d*x+c)^2*(1-(d*x+c)^
2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.255.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.36 (sec) , antiderivative size = 267, normalized size of antiderivative = 0.52

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = \frac{be^2e^{-\frac{3ia}{b}}(a+b\arcsin(c+dx))^{5/2}\left(-243e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{9}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)-243e\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
(b*e^2*(a + b*ArcSin[c + d*x])^(5/2)*(-243*E^(((2*I)*a)/b)*Sqrt[(I*(a + b*
ArcSin[c + d*x]))/b]*Gamma[9/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - 243*E^
(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[9/2, (I*(a + b*
ArcSin[c + d*x]))/b] + Sqrt[3]*(Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[
9/2, ((-3*I)*(a + b*ArcSin[c + d*x]))/b] + E^(((6*I)*a)/b)*Sqrt[((-I)*(a +
 b*ArcSin[c + d*x]))/b]*Gamma[9/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b])))/(
1944*d*E^(((3*I)*a)/b)*((a + b*ArcSin[c + d*x])^2/b^2)^(3/2))
```

### 3.255.3 Rubi [F]

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int e^2(c+dx)^2(a+b\arcsin(c+dx))^{7/2}d(c+dx)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{e^2\int (c+dx)^2(a+b\arcsin(c+dx))^{7/2}d(c+dx)}{d}$$

$$\Big\downarrow \; 5140$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\int \frac{(c+dx)^3(a+b\arcsin(c+dx))^{5/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$$\Big\downarrow \; 5210$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\int (c+dx)^2(a+b\arcsin(c+dx))^{3/2}d(c+dx)+\frac{2}{3}\int \frac{(c+dx)(a+b\arcsi}{\sqrt{1-(c+}}\right.\right.}{d}$$

$$\Big\downarrow \; 5140$$

$$\frac{e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int \frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.}{d}$$

$$\Big\downarrow \; 5182$$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int \frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.$$

$$\Big\downarrow \; 5130$$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{2}{3}\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\int \frac{(c+dx)\sqrt{a+b\arcsin(c+dx}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.\right.$$

$$\Big\downarrow \; 5182$$

$$e^2\Big(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\Big(\frac{2}{3}\Big(\frac{5}{2}b\Big((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\Big(\frac{1}{2}b\int\frac{1}{\sqrt{a+b\arcsin(c+dx)}}$$

$\downarrow$ 5134

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\Big(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int\frac{(c+dx)^3\sqrt{a+b\arcsin(c+}}{\sqrt{1-(c+dx)^2}}\right.\right.$$

$\downarrow$ 3042

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\Big(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int\frac{(c+dx)^3\sqrt{a+b\arcsin(c+}}{\sqrt{1-(c+dx)^2}}\right.\right.$$

$\downarrow$ 3787

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\Big(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int\frac{(c+dx)^3\sqrt{a+b\arcsin(c+}}{\sqrt{1-(c+dx)^2}}\right.\right.$$

$\downarrow$ 25

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\Big(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int\frac{(c+dx)^3\sqrt{a+b\arcsin(c+}}{\sqrt{1-(c+dx)^2}}\right.\right.$$

$\downarrow$ 3042

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\Big(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int\frac{(c+dx)^3\sqrt{a+b\arcsin(c+}}{\sqrt{1-(c+dx)^2}}\right.\right.$$

$\downarrow$ 3785

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\Big(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int\frac{(c+dx)^3\sqrt{a+b\arcsin(c+}}{\sqrt{1-(c+dx)^2}}\right.\right.$$

$\downarrow$ 3786

3.255. $\int(ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int\frac{(c+dx)^3\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.$$

$\downarrow$ 3832

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{2}{3}\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(2\cos\left(\frac{a}{b}\right)\int\cos\left(\right.\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 3833

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\int\frac{(c+dx)^3\sqrt{a+b\arcsin(c+}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.$$

$\downarrow$ 5210

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{1}{6}b\int\frac{(c+dx)^2}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.$$

$\downarrow$ 5146

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\int\frac{(c+dx)\sqrt{a+b\arcsin(}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.\right.$$

$\downarrow$ 4906

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\int\frac{(c+dx)\sqrt{a+b\arcsin(}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.\right.$$

$\downarrow$ 2009

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\int\frac{(c+dx)\sqrt{a+b\arcsin(}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.\right.$$

$\downarrow$ 5182

3.255. $\int(ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}b\int\frac{1}{\sqrt{a+b\arcsin(c+}}\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 5134

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\int\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsi}{b}\right.}{\sqrt{a+b\arcsin(}}\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 3042

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsi}{b}\right.}{\sqrt{a+b\arcsi}}\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 3787

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(\cos\left(\frac{a}{b}\right)\int\frac{\cos(}{\sqrt{a}}\right.\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 25

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin(}{\sqrt{a}}\right.\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 3042

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin(}{\sqrt{a}}\right.\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 3785

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin(}{\sqrt{a}}\right.\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 3786

3.255. $\int(ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx$

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\sin\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 3832

$$e^2\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{7/2}-\frac{7}{6}b\left(\frac{5}{6}b\left(\frac{1}{3}(c+dx)^3(a+b\arcsin(c+dx))^{3/2}-\frac{1}{2}b\left(\frac{2}{3}\left(\frac{1}{2}\left(2\cos\left(\frac{a}{b}\right)\int\cos\right.\right.\right.\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)^2*(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
$Aborted
```

### 3.255.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

## 3.255. $\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx$

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

## 3.255. $\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx$

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.255.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1233 vs. 2(426) = 852.

Time = 1.32 (sec) , antiderivative size = 1234, normalized size of antiderivative = 2.38

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1234 |

input
```
int((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
-1/5184*e^2/d*(5184*arcsin(d*x+c)^3*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3+
7776*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-13608*arcsin(
d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3+5184*arcsin(d*x+c)*sin(-(a+
b*arcsin(d*x+c))/b+a/b)*a^3*b-22680*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))
/b+a/b)*a*b^3-13608*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2+
504*cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)^3*b^4+420*sin(-3*(a+
b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c)^2*b^4-210*cos(-3*(a+b*arcsin(d*x+c
))/b+3*a/b)*arcsin(d*x+c)*b^4+420*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a^2*
b^2+504*cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*a^3*b-210*cos(-3*(a+b*arcsin(d
*x+c))/b+3*a/b)*a*b^3-432*sin(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*arcsin(d*x+c
)^4*b^4+1296*arcsin(d*x+c)^4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4-4536*arcs
in(d*x+c)^3*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^4-11340*arcsin(d*x+c)^2*sin(
-(a+b*arcsin(d*x+c))/b+a/b)*b^4+17010*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c
))/b+a/b)*b^4-11340*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-4536*cos(-(a+b
*arcsin(d*x+c))/b+a/b)*a^3*b+17010*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3-8
505*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/
(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4+8505*(a
+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)
^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4-432*sin(-3*(a
+b*arcsin(d*x+c))/b+3*a/b)*a^4+35*(a+b*arcsin(d*x+c))^(1/2)*(-3/b)^(1/2...
```

### 3.255.5 Fricas [F(-2)]

Exception generated.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.255.6 Sympy [F(-1)]

Timed out.

$$\int (ce + dex)^2 (a + b \arcsin(c + dx))^{7/2} \, dx = \text{Timed out}$$

input
```
integrate((d*e*x+c*e)**2*(a+b*asin(d*x+c))**(7/2),x)
```

output
```
Timed out
```

### 3.255.7 Maxima [F]

$$\int (ce + dex)^2 (a + b \arcsin(c + dx))^{7/2} \, dx = \int (dex + ce)^2 (b \arcsin(dx + c) + a)^{\frac{7}{2}} \, dx$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^2*(b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.255.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 3.01 (sec) , antiderivative size = 8028, normalized size of antiderivative = 15.50

$$\int (ce + dex)^2 (a + b \arcsin(c + dx))^{7/2} \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)^2*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
1/3456*(1296*sqrt(2)*sqrt(pi)*a^4*b^2*e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin
(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt
(abs(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) + 1296*sqrt(
2)*sqrt(pi)*a^4*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt
(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a
/b)/(-I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) - 864*sqrt(2)*sqrt(pi)*a^4*b*
e^2*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt
(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(
b)) + b*sqrt(abs(b))) + 2808*I*sqrt(2)*sqrt(pi)*a^3*b^2*e^2*erf(-1/2*I*sqr
t(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(
d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^2/sqrt(abs(b)) + b*sqrt(abs(b
))) - 864*sqrt(2)*sqrt(pi)*a^4*b*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x +
 c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b
))/b)*e^(-I*a/b)/(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) - 2808*I*sqrt(2)*s
qrt(pi)*a^3*b^2*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs
(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/
(-I*b^2/sqrt(abs(b)) + b*sqrt(abs(b))) + 432*I*sqrt(b*arcsin(d*x + c) + a)
*a*b^2*e^2*arcsin(d*x + c)^2*e^(3*I*arcsin(d*x + c)) - 1296*I*sqrt(b*arcsi
n(d*x + c) + a)*a*b^2*e^2*arcsin(d*x + c)^2*e^(I*arcsin(d*x + c)) + 1296*I
*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e^2*arcsin(d*x + c)^2*e^(-I*arcsin(d...
```

### 3.255.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^2(a+b\arcsin(c+dx))^{7/2}\,dx = \int (c\,e+d\,e\,x)^2\,(a+b\,\mathrm{asin}(c+d\,x))^{7/2}\,dx$$

input
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(7/2),x)
```

output
```
int((c*e + d*e*x)^2*(a + b*asin(c + d*x))^(7/2), x)
```

# 3.256 $\int (ce + dex)(a + b\arcsin(c + dx))^{7/2}\,dx$



## 3.256.1 Optimal result

Integrand size = 23, antiderivative size = 301

$$\begin{aligned}
&\int (ce + dex)(a + b\arcsin(c + dx))^{7/2}\,dx = \\
&-\frac{105b^3e(c+dx)\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{128d} \\
&+\frac{35b^2e(a+b\arcsin(c+dx))^{3/2}}{64d}-\frac{35b^2e(c+dx)^2(a+b\arcsin(c+dx))^{3/2}}{32d} \\
&+\frac{7be(c+dx)\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{8d} \\
&-\frac{e(a+b\arcsin(c+dx))^{7/2}}{4d}+\frac{e(c+dx)^2(a+b\arcsin(c+dx))^{7/2}}{2d} \\
&+\frac{105b^{7/2}e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{512d} \\
&-\frac{105b^{7/2}e\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{512d}
\end{aligned}$$

output
```
35/64*b^2*e*(a+b*arcsin(d*x+c))^(3/2)/d-35/32*b^2*e*(d*x+c)^2*(a+b*arcsin(
d*x+c))^(3/2)/d-1/4*e*(a+b*arcsin(d*x+c))^(7/2)/d+1/2*e*(d*x+c)^2*(a+b*arc
sin(d*x+c))^(7/2)/d+105/512*b^(7/2)*e*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*
x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/d-105/512*b^(7/2)*e*FresnelC(2*(a+b
*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/d+7/8*b*e*(d*x
+c)*(a+b*arcsin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d-105/128*b^3*e*(d*x+c)*
(1-(d*x+c)^2)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.256.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.10 (sec) , antiderivative size = 137, normalized size of antiderivative = 0.46

$$\int (ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx =$$
$$-\frac{b^4ee^{-\frac{2ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{9}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{9}{2},\frac{2i(a+b\arcsin(c+dx))}{b}\right)\right)}{64\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}$$

input
```
Integrate[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
-1/64*(b^4*e*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[9/2, ((-2*I)*(a
 + b*ArcSin[c + d*x]))/b] + E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]
))/b]*Gamma[9/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(Sqrt[2]*d*E^(((2*I)
*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.256.3 Rubi [A] (verified)

Time = 2.17 (sec) , antiderivative size = 288, normalized size of antiderivative = 0.96, number of steps used = 21, number of rules used = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.870, Rules used = {5304, 27, 5140, 5210, 5140, 5152, 5210, 5146, 25, 4906, 27, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int e(c+dx)(a+b\arcsin(c+dx))^{7/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e\int (c+dx)(a+b\arcsin(c+dx))^{7/2}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5140}$$

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\int\frac{(c+dx)^2(a+b\arcsin(c+dx))^{5/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)\right)}{d}$$

$\downarrow$ 5210

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\int(c+dx)(a+b\arcsin(c+dx))^{3/2}d(c+dx)+\frac{1}{2}\int\frac{(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}\right.\right.}{d}$$

$\downarrow$ 5140

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\int\frac{(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.}{d}$$

$\downarrow$ 5152

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\int\frac{(c+dx)^2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}\right.\right.\right.}{d}$$

$\downarrow$ 5210

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{4}b\int\frac{c+dx}{\sqrt{a+b\arcsin(c+dx)}}d(\right.\right.\right.\right.}{}$$

$\downarrow$ 5146

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.}{}$$

$\downarrow$ 25

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.}{}$$

$\downarrow$ 4906

$$\frac{e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.}{}$$

$\downarrow$ 27

3.256. $\int(ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx$

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 3042

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 3787

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 25

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 3042

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 3785

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d\right.\right.\right.\right.$$

$\downarrow$ 3786

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c\right.\right.\right.\right.$$

$\downarrow$ 3832

3.256. $\int(ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx$

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{8}\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{Fresn}\right.\right.\right.\right.\right.$$

$\downarrow$ 3833

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{2}\int\frac{\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c\right.\right.\right.\right.$$

$\downarrow$ 5152

$$e\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{7/2}-\frac{7}{4}b\left(\frac{5}{4}b\left(\frac{1}{2}(c+dx)^2(a+b\arcsin(c+dx))^{3/2}-\frac{3}{4}b\left(\frac{1}{8}\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{Fresn}\right.\right.\right.\right.\right.$$

input
```
Int[(c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
(e*(((c + d*x)^2*(a + b*ArcSin[c + d*x])^(7/2))/2 - (7*b*(-1/2*((c + d*x)*
Sqrt[1 - (c + d*x)^2]*(a + b*ArcSin[c + d*x])^(5/2)) + (a + b*ArcSin[c + d
*x])^(7/2)/(7*b) + (5*b*(((c + d*x)^2*(a + b*ArcSin[c + d*x])^(3/2))/2 - (
3*b*(-1/2*((c + d*x)*Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]]) +
(a + b*ArcSin[c + d*x])^(3/2)/(3*b) + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*Fresn
elS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] - Sqrt[b]*Sqrt[Pi]
*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]
)/8))/4))/4))/d
```

### 3.256.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5140
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^(m + 1)*((a + b*ArcSin[c*x])^n/(m + 1)), x] - Simp[b*c*(n/(m + 1))   Int[x
^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{
a, b, c}, x] && IGtQ[m, 0] && GtQ[n, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

## 3.256. $\int (ce+dex)(a+b\arcsin(c+dx))^{7/2}\,dx$

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.256.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 653 vs. $2(249) = 498$.

Time = 0.92 (sec) , antiderivative size = 654, normalized size of antiderivative = 2.17

| method | result |
|---|---|
| default | $\frac{eb\left(128\sqrt{a+b\arcsin(dx+c)}\sqrt{\pi}\sqrt{-\frac{1}{b}}\arcsin(dx+c)^3\cos\left(-\frac{2(a+b\arcsin(dx+c))}{b}+\frac{2a}{b}\right)b^3+384\sqrt{a+b\arcsin(dx+c)}\sqrt{\pi}\sqrt{-\frac{1}{b}}\arcsin(da\right.}{}$ |

input
```
int((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
1/512*e/d*b*(128*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*arcsin(d*
x+c)^3*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+384*(a+b*arcsin(d*x+c))^(1/
2)*Pi^(1/2)*(-1/b)^(1/2)*arcsin(d*x+c)^2*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/
b)*a*b^2+224*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*arcsin(d*x+c)
^2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+384*(a+b*arcsin(d*x+c))^(1/2)*P
i^(1/2)*(-1/b)^(1/2)*arcsin(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2
*b-280*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*arcsin(d*x+c)*cos(-
2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3+448*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*
(-1/b)^(1/2)*arcsin(d*x+c)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+128*(
a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*cos(-2*(a+b*arcsin(d*x+c))/
b+2*a/b)*a^3-280*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*cos(-2*(a
+b*arcsin(d*x+c))/b+2*a/b)*a*b^2+224*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*(-
1/b)^(1/2)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2*b-210*(a+b*arcsin(d*x+c
))^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^3-105
*Pi*b^3*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b)-105*Pi*b^3*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/b))*(-1/b)^(1/2)/Pi^(1/2)
```

### 3.256.5 Fricas [F(-2)]

Exception generated.

$$\int (ce + dex)(a + b \arcsin(c + dx))^{7/2} \, dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.256.6 Sympy [F(-1)]

Timed out.

$$\int (ce + dex)(a + b \arcsin(c + dx))^{7/2} \, dx = \text{Timed out}$$

input
```
integrate((d*e*x+c*e)*(a+b*asin(d*x+c))**(7/2),x)
```

output
```
Timed out
```

### 3.256.7 Maxima [F]

$$\int (ce + dex)(a + b \arcsin(c + dx))^{7/2} \, dx = \int (dex + ce)(b \arcsin(dx + c) + a)^{\frac{7}{2}} \, dx$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.256.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.34 (sec) , antiderivative size = 2561, normalized size of antiderivative = 8.51

$$\int (ce + dex)(a + b \arcsin(c + dx))^{7/2} \, dx = \text{Too large to display}$$

input
```
integrate((d*e*x+c*e)*(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
-1/1024*(128*sqrt(b*arcsin(d*x + c) + a)*b^3*e*arcsin(d*x + c)^3*e^(2*I*ar
csin(d*x + c)) + 128*sqrt(b*arcsin(d*x + c) + a)*b^3*e*arcsin(d*x + c)^3*e
^(-2*I*arcsin(d*x + c)) + 384*sqrt(b*arcsin(d*x + c) + a)*a*b^2*e*arcsin(d
*x + c)^2*e^(2*I*arcsin(d*x + c)) + 224*I*sqrt(b*arcsin(d*x + c) + a)*b^3*
e*arcsin(d*x + c)^2*e^(2*I*arcsin(d*x + c)) + 384*sqrt(b*arcsin(d*x + c) +
 a)*a*b^2*e*arcsin(d*x + c)^2*e^(-2*I*arcsin(d*x + c)) - 224*I*sqrt(b*arcs
in(d*x + c) + a)*b^3*e*arcsin(d*x + c)^2*e^(-2*I*arcsin(d*x + c)) + 768*I*
sqrt(pi)*a^4*b*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b*arcsi
n(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b^(3/2) + I*b^(5/2)/abs(b)) +
 192*sqrt(pi)*a^3*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(
b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(b^(3/2) + I*b^(5/2)/ab
s(b)) - 768*I*sqrt(pi)*a^4*b*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) +
I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b^(3/2) - I*b^
(5/2)/abs(b)) + 192*sqrt(pi)*a^3*b^2*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sq
rt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(b^(3/2
) - I*b^(5/2)/abs(b)) - 256*I*sqrt(pi)*a^4*sqrt(b)*e*erf(-sqrt(b*arcsin(d*
x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I
*a/b)/(b + I*b^2/abs(b)) + 832*sqrt(pi)*a^3*b^(3/2)*e*erf(-sqrt(b*arcsin(d
*x + c) + a)/sqrt(b) - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*
I*a/b)/(b + I*b^2/abs(b)) - 288*I*sqrt(pi)*a^2*b^(5/2)*e*erf(-sqrt(b*ar...
```

### 3.256.9 Mupad [F(-1)]

Timed out.

$$\int (ce + dex)(a + b \arcsin(c + dx))^{7/2} \, dx = \int (c\,e + d\,e\,x)\ (a + b\,\mathrm{asin}(c + d\,x))^{7/2} \, dx$$

input
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^(7/2),x)
```

output
```
int((c*e + d*e*x)*(a + b*asin(c + d*x))^(7/2), x)
```

# 3.257 $\int (a+b\arcsin(c+dx))^{7/2}\,dx$



## 3.257.1 Optimal result

Integrand size = 14, antiderivative size = 243

$$\begin{aligned}\int (a+b\arcsin(c+dx))^{7/2}\,dx = &-\frac{105b^3\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}{8d} \\ &-\frac{35b^2(c+dx)(a+b\arcsin(c+dx))^{3/2}}{4d} \\ &+\frac{7b\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}{2d}+\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}}{d} \\ &+\frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8d} \\ &+\frac{105b^{7/2}\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{8d}\end{aligned}$$

output
```
-35/4*b^2*(d*x+c)*(a+b*arcsin(d*x+c))^(3/2)/d+(d*x+c)*(a+b*arcsin(d*x+c))^
(7/2)/d+105/16*b^(7/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/d+105/16*b^(7/2)*FresnelS(2^(1/2)/Pi^(
1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d+7/2*b*
(a+b*arcsin(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)/d-105/8*b^3*(1-(d*x+c)^2)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/d
```

### 3.257.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 3.20 (sec) , antiderivative size = 545, normalized size of antiderivative = 2.24

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \frac{e^{-\frac{ia}{b}}\left(\sqrt{b}\left(8ia^3\left(-1+e^{\frac{2ia}{b}}\right)+105b^3\left(1+e^{\frac{2ia}{b}}\right)\right)\sqrt{\frac{\pi}{2}}\sqrt{a+b\arcsin(c+dx)}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+}}{}\right.\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
(Sqrt[b]*((8*I)*a^3*(-1 + E^(((2*I)*a)/b)) + 105*b^3*(1 + E^(((2*I)*a)/b))
)*Sqrt[Pi/2]*Sqrt[a + b*ArcSin[c + d*x]]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*A
rcSin[c + d*x]])/Sqrt[b]] + 2*b*(E^((I*a)/b)*(a + b*ArcSin[c + d*x])*(7*(-
10*a*b*(c + d*x) + 4*a^2*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2] - 15*b^2*Sqrt[1
 - c^2 - 2*c*d*x - d^2*x^2]) + (24*a^2*(c + d*x) - 70*b^2*(c + d*x) + 56*a
*b*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x] + 4*b*(6*a*(c + d*x)
 + 7*b*Sqrt[1 - c^2 - 2*c*d*x - d^2*x^2])*ArcSin[c + d*x]^2 + 8*b^2*(c + d
*x)*ArcSin[c + d*x]^3) + 4*a^3*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamm
a[3/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + 4*a^3*E^(((2*I)*a)/b)*Sqrt[(I*(
a + b*ArcSin[c + d*x]))/b]*Gamma[3/2, (I*(a + b*ArcSin[c + d*x]))/b]) + Sq
rt[b]*Sqrt[2*Pi]*Sqrt[a + b*ArcSin[c + d*x]]*FresnelS[(Sqrt[2/Pi]*Sqrt[a +
 b*ArcSin[c + d*x]])/Sqrt[b]]*(4*a^3*(1 + E^(((2*I)*a)/b)) + 105*b^3*E^((I
*a)/b)*Sin[a/b]))/(16*d*E^((I*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.257.3 Rubi [A] (verified)

Time = 1.07 (sec) , antiderivative size = 228, normalized size of antiderivative = 0.94, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5302, 5130, 5182, 5130, 5182, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx$$

$$\Big\downarrow \text{ 5302}$$

$$\frac{\int (a+b\arcsin(c+dx))^{7/2}d(c+dx)}{d}$$

$\downarrow$ 5130

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\int \frac{(c+dx)(a+b\arcsin(c+dx))^{5/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{d}$$

$\downarrow$ 5182

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\int (a+b\arcsin(c+dx))^{3/2}d(c+dx)-\sqrt{1-(c+dx)^2}(a+b\arcsin(c+\right.}{d}$$

$\downarrow$ 5130

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\int \frac{(c+dx)\sqrt{a+b\arcsin(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx\right.\right.}{d}$$

$\downarrow$ 5182

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}b\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)\right.\right.\right.}{d}$$

$\downarrow$ 5134

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+\right.\right.\right.}{d}$$

$\downarrow$ 3042

$$\frac{(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(\right.\right.\right.}{d}$$

$\downarrow$ 3787

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.$$

$\downarrow$ 25

---

3.257. $\int (a+b\arcsin(c+dx))^{7/2}\,dx$

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.\right.$$

$\downarrow$ 3042

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.\right.$$

$\downarrow$ 3785

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}\right.\right.\right.\right.\right.$$

$\downarrow$ 3786

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(2\sin\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+d}{b}\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 3832

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c}{b}\right.\right.\right.\right.\right.\right.$$

$\downarrow$ 3833

$$(c+dx)(a+b\arcsin(c+dx))^{7/2}-\frac{7}{2}b\left(\frac{5}{2}b\left((c+dx)(a+b\arcsin(c+dx))^{3/2}-\frac{3}{2}b\left(\frac{1}{2}\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\right.\right.\right.\right.\right.\right.$$

input
```
Int[(a + b*ArcSin[c + d*x])^(7/2),x]
```

## 3.257. $\int(a+b\arcsin(c+dx))^{7/2}\,dx$

output
```
((c + d*x)*(a + b*ArcSin[c + d*x])^(7/2) - (7*b*(-(Sqrt[1 - (c + d*x)^2]*(
a + b*ArcSin[c + d*x])^(5/2)) + (5*b*((c + d*x)*(a + b*ArcSin[c + d*x])^(3
/2) - (3*b*(-(Sqrt[1 - (c + d*x)^2]*Sqrt[a + b*ArcSin[c + d*x]]) + (Sqrt[b
]*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sq
rt[b]] + Sqrt[b]*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]]*Sin[a/b])/2))/2))/2))/2)/d
```

### 3.257.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.257.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 615 vs. $2(197) = 394$.

Time = 0.36 (sec) , antiderivative size = 616, normalized size of antiderivative = 2.53

| method | result |
|---|---|
| default | $-\frac{-105\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{-\frac{1}{b}}\,b^4+105\sqrt{a+b\arcsin(dx+c)}\,\sqrt{\pi}\,\sin\left(\frac{a}{b}\right)\mathrm{FresnelS}}{}$ |

input
```
int((a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
-1/16/d*(-105*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*cos(a/b)*FresnelC(2^(1/2)
/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b
^4+105*(a+b*arcsin(d*x+c))^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/
2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-1/b)^(1/2)*b^4+16*a
rcsin(d*x+c)^4*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4+64*arcsin(d*x+c)^3*sin(
-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3-56*arcsin(d*x+c)^3*cos(-(a+b*arcsin(d*x+
c))/b+a/b)*b^4+96*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-
140*arcsin(d*x+c)^2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b^4-168*arcsin(d*x+c)^
2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3+64*arcsin(d*x+c)*sin(-(a+b*arcsin(
d*x+c))/b+a/b)*a^3*b-280*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b
^3-168*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2+210*arcsin(d*
x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^4+16*sin(-(a+b*arcsin(d*x+c))/b+a/b
)*a^4-140*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a^2*b^2-56*cos(-(a+b*arcsin(d*x+
c))/b+a/b)*a^3*b+210*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b^3)/(a+b*arcsin(d*
x+c))^(1/2)
```

### 3.257.5 Fricas [F(-2)]

Exception generated.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.257.6 Sympy [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(d*x+c))**(7/2),x)
```

output
```
Timed out
```

### 3.257.7 Maxima [F]

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\int (b\arcsin(dx+c)+a)^{\frac{7}{2}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.257.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.54 (sec) , antiderivative size = 2308, normalized size of antiderivative = 9.50

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\text{Too large to display}$$

input
```
integrate((a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
-1/32*(16*sqrt(2)*sqrt(pi)*a^4*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b)
)/b)*e^(I*a/b)/(I*b^4/sqrt(abs(b)) + b^3*sqrt(abs(b))) + 16*sqrt(2)*sqrt(p
i)*a^4*b^3*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^4/s
qrt(abs(b)) + b^3*sqrt(abs(b))) - 64*sqrt(2)*sqrt(pi)*a^4*b^2*erf(-1/2*I*s
qrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(a
bs(b))) + 32*I*sqrt(2)*sqrt(pi)*a^3*b^3*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d
*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(a
bs(b))/b)*e^(I*a/b)/(I*b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) - 64*sqrt(2)*s
qrt(pi)*a^4*b^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b))
 - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*
b^3/sqrt(abs(b)) + b^2*sqrt(abs(b))) - 32*I*sqrt(2)*sqrt(pi)*a^3*b^3*erf(1
/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b
*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(-I*b^3/sqrt(abs(b)) + b^
2*sqrt(abs(b))) + 16*I*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c)^3*e
^(I*arcsin(d*x + c)) - 16*I*sqrt(b*arcsin(d*x + c) + a)*b^3*arcsin(d*x + c
)^3*e^(-I*arcsin(d*x + c)) + 32*sqrt(2)*sqrt(pi)*a^4*b*erf(-1/2*I*sqrt(2)*
sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*...
```

### 3.257.9 Mupad [F(-1)]

Timed out.

$$\int (a+b\arcsin(c+dx))^{7/2}\,dx=\int (a+b\,\mathrm{asin}(c+d\,x))^{7/2}\,dx$$

input
```
int((a + b*asin(c + d*x))^(7/2),x)
```

output
```
int((a + b*asin(c + d*x))^(7/2), x)
```

# 3.258 $\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx$



## 3.258.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx=\frac{\text{Int}\left(\frac{(a+b\arcsin(c+dx))^{7/2}}{c+dx},x\right)}{e}$$

output
```
Unintegrable((a+b*arcsin(d*x+c))^(7/2)/(d*x+c),x)/e
```

## 3.258.2 Mathematica [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx=\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(7/2)/(c*e + d*e*x),x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^(7/2)/(c*e + d*e*x), x]
```

### 3.258.3 Rubi [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^{7/2}}{e(c+dx)}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^{7/2}}{c+dx}d(c+dx)}{de}$$

$$\Big\downarrow \text{5148}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^{7/2}}{c+dx}d(c+dx)}{de}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(7/2)/(c*e + d*e*x),x]
```

output
```
$Aborted
```

#### 3.258.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.258.4 Maple [N/A] (verified)

Not integrable

Time = 0.70 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^{\frac{7}{2}}}{dex+ce}dx$$

input
```
int((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x)
```

output
```
int((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x)
```

### 3.258.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.258.6 Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(d*x+c))**(7/2)/(d*e*x+c*e),x)
```

output
```
Timed out
```

### 3.258.7 Maxima [N/A]

Not integrable

Time = 2.04 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(7/2)/(d*e*x + c*e), x)
```

### 3.258.8 Giac [N/A]

Not integrable

Time = 0.98 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx = \int \frac{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}{dex+ce}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^(7/2)/(d*e*x+c*e),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(7/2)/(d*e*x + c*e), x)
```

### 3.258.9 Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^{7/2}}{ce+dex}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^{7/2}}{c\,e+d\,e\,x}\,dx$$

input
```
int((a + b*asin(c + d*x))^(7/2)/(c*e + d*e*x),x)
```

output
```
int((a + b*asin(c + d*x))^(7/2)/(c*e + d*e*x), x)
```

# 3.259 $\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx$



## 3.259.1 Optimal result

Integrand size = 25, antiderivative size = 365

$$\begin{aligned}\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx &= \frac{e^4\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4\sqrt{b}d} \\ &\quad - \frac{e^4\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} \\ &\quad + \frac{e^4\sqrt{\frac{\pi}{10}}\cos\left(\frac{5a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} \\ &\quad + \frac{e^4\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{4\sqrt{b}d} \\ &\quad - \frac{e^4\sqrt{\frac{3\pi}{2}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{8\sqrt{b}d} \\ &\quad + \frac{e^4\sqrt{\frac{\pi}{10}}\operatorname{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{8\sqrt{b}d}\end{aligned}$$

output
```
1/80*e^4*cos(5*a/b)*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
^(1/2))*10^(1/2)*Pi^(1/2)/d/b^(1/2)+1/80*e^4*FresnelS(10^(1/2)/Pi^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(5*a/b)*10^(1/2)*Pi^(1/2)/d/b^(1/2)+1/
8*e^4*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)
)*2^(1/2)*Pi^(1/2)/d/b^(1/2)+1/8*e^4*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)-1/16*e^4*cos(3
*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)
*Pi^(1/2)/d/b^(1/2)-1/16*e^4*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d/b^(1/2)
```

## 3.259.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.30 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.01

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$
$$= \frac{ie^4e^{-\frac{5ia}{b}}\left(-10e^{\frac{4ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+10e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{i(a+b\arcsin(c+\right.\right.}{b}}$$

input
```
Integrate[(c*e + d*e*x)^4/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
((I/160)*e^4*(-10*E^(((4*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*G
amma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + 10*E^(((6*I)*a)/b)*Sqrt[(I*(
a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b] + 5*S
qrt[3]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, (
(-3*I)*(a + b*ArcSin[c + d*x]))/b] - 5*Sqrt[3]*E^(((8*I)*a)/b)*Sqrt[(I*(a
+ b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b] - S
qrt[5]*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*Ar
cSin[c + d*x]))/b] + Sqrt[5]*E^(((10*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*
x]))/b]*Gamma[1/2, ((5*I)*(a + b*ArcSin[c + d*x]))/b]))/(d*E^(((5*I)*a)/b)
*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.259.3 Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 339, normalized size of antiderivative = 0.93, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {5304, 27, 5146, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e^4(c+dx)^4}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^4\int \frac{(c+dx)^4}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5146}$$

$$\frac{e^4\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^4\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{4906}$$

$$\frac{e^4\int \left(\frac{\cos\left(\frac{5a}{b}-\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16\sqrt{a+b\arcsin(c+dx)}}-\frac{3\cos\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16\sqrt{a+b\arcsin(c+dx)}}+\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{8\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{2009}$$

$$e^4\left(\frac{1}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{1}{8}\sqrt{\frac{3\pi}{2}}\sqrt{b}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\frac{1}{8}\sqrt{\right.$$

input
```
Int[(c*e + d*e*x)^4/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(e^4*((Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]])/4 - (Sqrt[b]*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*FresnelC[(Sq
rt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/8 + (Sqrt[b]*Sqrt[Pi/10]*C
os[(5*a)/b]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/8
 + (Sqrt[b]*Sqrt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/S
qrt[b]]*Sin[a/b])/4 - (Sqrt[b]*Sqrt[(3*Pi)/2]*FresnelS[(Sqrt[6/Pi]*Sqrt[a
+ b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/8 + (Sqrt[b]*Sqrt[Pi/10]*Fres
nelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(5*a)/b])/8))/
(b*d)
```

### 3.259.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.259. $\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

### 3.259.4 Maple [A] (verified)

Time = 1.29 (sec) , antiderivative size = 317, normalized size of antiderivative = 0.87

| method | result |
|---|---|
| default | $-\frac{e^4\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{5}{b}}\left(2\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{5}{b}}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)b-2\sqrt{-\frac{1}{b}}\,\sqrt{-\frac{5}{b}}\,\sin\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right.}{}$ |

input
```
int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/80*e^4/d*2^(1/2)*Pi^(1/2)*(-5/b)^(1/2)*(2*(-1/b)^(1/2)*(-5/b)^(1/2)*cos
(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*
b-2*(-1/b)^(1/2)*(-5/b)^(1/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b-(-3/b)^(1/2)*(-5/b)^(1/2)*cos(3*a/b)*Fr
esnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+(-3/
b)^(1/2)*(-5/b)^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*
(a+b*arcsin(d*x+c))^(1/2)/b)*b-cos(5*a/b)*FresnelC(5*2^(1/2)/Pi^(1/2)/(-5/
b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+sin(5*a/b)*FresnelS(5*2^(1/2)/Pi^(1/
2)/(-5/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))
```

### 3.259.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.259.6 Sympy [F]

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx = e^4\left(\int \frac{c^4}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{d^4x^4}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{4cd^3x^3}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{6c^2d^2x^2}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{4c^3dx}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**(1/2),x)
```

output
```
e**4*(Integral(c**4/sqrt(a + b*asin(c + d*x)), x) + Integral(d**4*x**4/sqr
t(a + b*asin(c + d*x)), x) + Integral(4*c*d**3*x**3/sqrt(a + b*asin(c + d*
x)), x) + Integral(6*c**2*d**2*x**2/sqrt(a + b*asin(c + d*x)), x) + Integr
al(4*c**3*d*x/sqrt(a + b*asin(c + d*x)), x))
```

### 3.259.7 Maxima [F]

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{(dex+ce)^4}{\sqrt{b\arcsin(dx+c)+a}}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^4/sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.259.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.82 (sec) , antiderivative size = 507, normalized size of antiderivative = 1.39

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$
$$= -\frac{\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{\sqrt{10}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}-\frac{i\sqrt{10}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{5ia}{b}\right)}}{16\left(\sqrt{10}\sqrt{b}+\frac{i\sqrt{10}b^{\frac{3}{2}}}{|b|}\right)d}$$
$$+\frac{\sqrt{6}\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}-\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{3ia}{b}\right)}}{32\sqrt{b}d\left(\frac{ib}{|b|}+1\right)}$$
$$-\frac{\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{8d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}e^4\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{8d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$+\frac{\sqrt{6}\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}+\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{3ia}{b}\right)}}{32\sqrt{b}d\left(-\frac{ib}{|b|}+1\right)}$$
$$-\frac{\sqrt{\pi}e^4\operatorname{erf}\left(-\frac{\sqrt{10}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}+\frac{i\sqrt{10}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{5ia}{b}\right)}}{16\left(\sqrt{10}\sqrt{b}-\frac{i\sqrt{10}b^{\frac{3}{2}}}{|b|}\right)d}$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

3.259. $\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

output
```
-1/16*sqrt(pi)*e^4*erf(-1/2*sqrt(10)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) -
 1/2*I*sqrt(10)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(5*I*a/b)/((
sqrt(10)*sqrt(b) + I*sqrt(10)*b^(3/2)/abs(b))*d) + 1/32*sqrt(6)*sqrt(pi)*e
^4*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/2*I*sqrt(6)*sq
rt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/(sqrt(b)*d*(I*b/abs(
b) + 1)) - 1/8*sqrt(pi)*e^4*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)
/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^
(I*a/b)/(d*(I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - 1/8*sqrt(p
i)*e^4*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sq
rt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2
)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) + 1/32*sqrt(6)*sqrt(pi)*e^4*erf(
-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + 1/2*I*sqrt(6)*sqrt(b*ar
csin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(sqrt(b)*d*(-I*b/abs(b) +
1)) - 1/16*sqrt(pi)*e^4*erf(-1/2*sqrt(10)*sqrt(b*arcsin(d*x + c) + a)/sqrt
(b) + 1/2*I*sqrt(10)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-5*I*a
/b)/((sqrt(10)*sqrt(b) - I*sqrt(10)*b^(3/2)/abs(b))*d)
```

### 3.259.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^4}{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

input
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^(1/2), x)
```

# 3.260 $\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx$



## 3.260.1 Optimal result

Integrand size = 25, antiderivative size = 233

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{8\sqrt{b}d} + \frac{e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{4\sqrt{b}d} - \frac{e^3\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{4\sqrt{b}d} + \frac{e^3\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{8\sqrt{b}d}$$

output
```
-1/16*e^3*cos(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
/b^(1/2))*2^(1/2)*Pi^(1/2)/d/b^(1/2)+1/16*e^3*FresnelC(2*2^(1/2)/Pi^(1/2)*
(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)+1
/4*e^3*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*P
i^(1/2)/d/b^(1/2)-1/4*e^3*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^
(1/2))*sin(2*a/b)*Pi^(1/2)/d/b^(1/2)
```

### 3.260.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.07

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$
$$= \frac{e^3 e^{-\frac{4ia}{b}}\left(-2\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-2\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{2i(a+b\,\mathrm{arc}\right.\right.}{32d\sqrt{a+b\,\mathrm{a}}}$$

input
```
Integrate[(c*e + d*e*x)^3/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(e^3*(-2*Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Ga
mma[1/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - 2*Sqrt[2]*E^(((6*I)*a)/b)*S
qrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c + d*x
]))/b] + Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-4*I)*(a + b*
ArcSin[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]
*Gamma[1/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]))/(32*d*E^(((4*I)*a)/b)*Sqr
t[a + b*ArcSin[c + d*x]])
```

### 3.260.3 Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 219, normalized size of antiderivative = 0.94, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {5304, 27, 5146, 25, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$
$$\Big\downarrow \; 5304$$
$$\frac{\int \frac{e^3(c+dx)^3}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$
$$\Big\downarrow \; 27$$

$$\frac{e^3\int \frac{(c+dx)^3}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5146}$$

$$\frac{e^3\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{25}$$

$$-\frac{e^3\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{4906}$$

$$-\frac{e^3\int \left(\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\frac{\sin\left(\frac{4a}{b}-\frac{4(a+b\arcsin(c+dx))}{b}\right)}{8\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{2009}$$

$$\frac{e^3\left(-\frac{1}{4}\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\frac{1}{8}\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{1}{8}\sqrt{\frac{\pi}{2}}\cdots}{bd}$$

input
```
Int[(c*e + d*e*x)^3/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(e^3*(-1/8*(Sqrt[b]*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a
+ b*ArcSin[c + d*x]])/Sqrt[b]]) + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[
(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/4 - (Sqrt[b]*Sqrt[Pi]
*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]
)/4 + (Sqrt[b]*Sqrt[Pi/2]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]]*Sin[(4*a)/b])/8))/(b*d)
```

3.260. $\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

### 3.260.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.260.4 Maple [A] (verified)

Time = 1.14 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.80

| method | result |
|---|---|
| default | $-\frac{e^{3}\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\left(-\sqrt{2}\,\cos\left(\frac{4a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin\left(dx+c\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)-\sqrt{2}\,\sin\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin\left(dx+c\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)+4\cos\left(\frac{2a}{b}\right)\text{Fresne}}{16d}$ |

input
```
int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/16*e^3/d*Pi^(1/2)*(-1/b)^(1/2)*(-2^(1/2)*cos(4*a/b)*FresnelS(2*2^(1/2)/
Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-2^(1/2)*sin(4*a/b)*Fres
nelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+4*cos(2*
a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)
+4*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)/b))
```

### 3.260.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.260.6 Sympy [F]

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = e^3\left(\int \frac{c^3}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{d^3x^3}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{3cd^2x^2}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{3c^2dx}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**(1/2),x)
```

output
```
e**3*(Integral(c**3/sqrt(a + b*asin(c + d*x)), x) + Integral(d**3*x**3/sqr
t(a + b*asin(c + d*x)), x) + Integral(3*c*d**2*x**2/sqrt(a + b*asin(c + d*
x)), x) + Integral(3*c**2*d*x/sqrt(a + b*asin(c + d*x)), x))
```

### 3.260.7 Maxima [F]

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{(dex+ce)^3}{\sqrt{b\arcsin(dx+c)+a}}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^3/sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.260.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.74 (sec) , antiderivative size = 318, normalized size of antiderivative = 1.36

$$\begin{aligned}\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx &= \frac{i\sqrt{\pi}e^3\,\mathrm{erf}\left(-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{4ia}{b}\right)}}{16\left(\sqrt{2}\sqrt{b}+\frac{i\sqrt{2}b^{\frac{3}{2}}}{|b|}\right)d} \\ &\quad+\frac{i\sqrt{\pi}e^3\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{8\,d\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)} \\ &\quad-\frac{i\sqrt{\pi}e^3\,\mathrm{erf}\left(-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{4ia}{b}\right)}}{16\left(\sqrt{2}\sqrt{b}-\frac{i\sqrt{2}b^{\frac{3}{2}}}{|b|}\right)d} \\ &\quad-\frac{i\sqrt{\pi}e^3\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{8\sqrt{b}d\left(\frac{ib}{|b|}+1\right)}\end{aligned}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
1/16*I*sqrt(pi)*e^3*erf(-sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*s
qrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(4*I*a/b)/((sqrt(2)*s
qrt(b) + I*sqrt(2)*b^(3/2)/abs(b))*d) + 1/8*I*sqrt(pi)*e^3*erf(-sqrt(b*arc
sin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*
e^(-2*I*a/b)/(d*(sqrt(b) - I*b^(3/2)/abs(b))) - 1/16*I*sqrt(pi)*e^3*erf(-s
qrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(2)*sqrt(b*arcsin(d*x +
 c) + a)*sqrt(b)/abs(b))*e^(-4*I*a/b)/((sqrt(2)*sqrt(b) - I*sqrt(2)*b^(3/2
)/abs(b))*d) - 1/8*I*sqrt(pi)*e^3*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
 - I*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b)*d*(I
*b/abs(b) + 1))
```

### 3.260.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{(c\,e+d\,e\,x)^3}{\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}}\,dx$$

input
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(1/2), x)
```

# 3.261 $\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx$



## 3.261.1 Optimal result

Integrand size = 25, antiderivative size = 243

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d} - \frac{e^2\sqrt{\frac{\pi}{6}}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2\sqrt{b}d} + \frac{e^2\sqrt{\frac{\pi}{2}}\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2\sqrt{b}d} - \frac{e^2\sqrt{\frac{\pi}{6}}\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{2\sqrt{b}d}$$

output
```
-1/12*e^2*cos(3*a/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
^(1/2))*6^(1/2)*Pi^(1/2)/d/b^(1/2)-1/12*e^2*FresnelS(6^(1/2)/Pi^(1/2)*(a+b
*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/d/b^(1/2)+1/4*e
^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2
^(1/2)*Pi^(1/2)/d/b^(1/2)+1/4*e^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)
```

### 3.261.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.28 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.02

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{ie^2e^{-\frac{3ia}{b}}\left(3e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)-3e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{i(a+b\arcsin(c+dx}{b}\right.}{24d\sqrt{a+}}$$

input
```
Integrate[(c*e + d*e*x)^2/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
((-1/24*I)*e^2*(3*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*G
amma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - 3*E^(((4*I)*a)/b)*Sqrt[(I*(a
 + b*ArcSin[c + d*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b] + Sqrt
[3]*(-(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*Ar
cSin[c + d*x]))/b]) + E^(((6*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*
Gamma[1/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b])))/(d*E^(((3*I)*a)/b)*Sqrt[a
 + b*ArcSin[c + d*x]])
```

### 3.261.3 Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 229, normalized size of antiderivative = 0.94, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {5304, 27, 5146, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e^2(c+dx)^2}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^2 \int \frac{(c+dx)^2}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$\Big\downarrow$ 5146

$$\frac{e^2 \int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^2\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$\Big\downarrow$ 4906

$$\frac{e^2 \int \left(\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\frac{\cos\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))}{bd}$$

$\Big\downarrow$ 2009

$$\frac{e^2\left(\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{1}{2}\sqrt{\frac{\pi}{6}}\sqrt{b}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\frac{1}{2}\sqrt{\frac{\pi}{2}}\right.}{bd}$$

input
```
Int[(c*e + d*e*x)^2/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(e^2*((Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]])/2 - (Sqrt[b]*Sqrt[Pi/6]*Cos[(3*a)/b]*FresnelC[(Sqrt[6
/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/2 + (Sqrt[b]*Sqrt[Pi/2]*Fresne
lS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2 - (Sqrt[b
]*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Si
n[(3*a)/b])/2))/(b*d)
```

### 3.261.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

3.261. $\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.261.4 Maple [A] (verified)

Time = 1.09 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.85

| method | result |
|---|---|
| default | $-\frac{e^{2} \sqrt{2}\, \sqrt{\pi}\, \sqrt{-\frac{3}{b}}\, \left(\cos \left(\frac{a}{b}\right) \operatorname{FresnelC}\left(\frac{\sqrt{2}\, \sqrt{a+b \arcsin \left(d x+c\right)}}{\sqrt{\pi}\, \sqrt{-\frac{1}{b}}\, b}\right) \sqrt{-\frac{1}{b}}\, \sqrt{-\frac{3}{b}}\, b-\sin \left(\frac{a}{b}\right) \operatorname{FresnelS}\left(\frac{\sqrt{2}\, \sqrt{a+b \arcsin \left(d x+c\right)}}{\sqrt{\pi}\, \sqrt{-\frac{1}{b}}\, b}\right) \sqrt{-\frac{1}{b}}\, \sqrt{-\frac{3}{b}}\, b+}{12 d}$ |

input
```
int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/12*e^2/d*2^(1/2)*Pi^(1/2)*(-3/b)^(1/2)*(cos(a/b)*FresnelC(2^(1/2)/Pi^(1
/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*(-3/b)^(1/2)*b-
sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*(-1/b)^(1/2)*(-3/b)^(1/2)*b+cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/
b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/
2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))
```

### 3.261.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.261.6 Sympy [F]

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = e^2\left(\int \frac{c^2}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{d^2x^2}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx + \int \frac{2cdx}{\sqrt{a+b\,\mathrm{asin}\,(c+dx)}}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**(1/2),x)
```

output
```
e**2*(Integral(c**2/sqrt(a + b*asin(c + d*x)), x) + Integral(d**2*x**2/sqr
t(a + b*asin(c + d*x)), x) + Integral(2*c*d*x/sqrt(a + b*asin(c + d*x)), x
))
```

### 3.261.7 Maxima [F]

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{(dex+ce)^2}{\sqrt{b\arcsin(dx+c)+a}}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^2/sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.261.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.74 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.42

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$
$$= \frac{\sqrt{\pi}e^2\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}-\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}+\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)d}$$
$$-\frac{\sqrt{\pi}e^2\operatorname{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{4d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$-\frac{\sqrt{\pi}e^2\operatorname{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{4d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$
$$+\frac{\sqrt{\pi}e^2\operatorname{erf}\left(-\frac{\sqrt{6}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{b}}+\frac{i\sqrt{6}\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{2|b|}\right)e^{\left(-\frac{3ia}{b}\right)}}{4\left(\sqrt{6}\sqrt{b}-\frac{i\sqrt{6}b^{\frac{3}{2}}}{|b|}\right)d}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
1/4*sqrt(pi)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - 1/
2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(3*I*a/b)/((sqrt
(6)*sqrt(b) + I*sqrt(6)*b^(3/2)/abs(b))*d) - 1/4*sqrt(pi)*e^2*erf(-1/2*I*s
qrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsi
n(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt(2)*b/sqrt(abs(b)) + s
qrt(2)*sqrt(abs(b)))) - 1/4*sqrt(pi)*e^2*erf(1/2*I*sqrt(2)*sqrt(b*arcsin(d
*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(a
bs(b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))
) + 1/4*sqrt(pi)*e^2*erf(-1/2*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)/sqrt(b)
+ 1/2*I*sqrt(6)*sqrt(b*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(-3*I*a/b)/(
(sqrt(6)*sqrt(b) - I*sqrt(6)*b^(3/2)/abs(b))*d)
```

### 3.261.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^2}{\sqrt{a+b\,\mathrm{asin}\left(c+d\,x\right)}}\,dx$$

input
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(1/2), x)
```

# 3.262 $\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx$



## 3.262.1 Optimal result

Integrand size = 23, antiderivative size = 105

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{2\sqrt{b}d} - \frac{e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{2\sqrt{b}d}$$

output
```
1/2*e*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi
^(1/2)/d/b^(1/2)-1/2*e*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/
2))*sin(2*a/b)*Pi^(1/2)/d/b^(1/2)
```

## 3.262.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.07 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.28

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = -\frac{ee^{-\frac{2ia}{b}}\left(\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{4ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{2i(a+b\arcsin(c+dx))}{b}\right)\right)}{4\sqrt{2}d\sqrt{a+b\arcsin(c+dx)}}$$

input
```
Integrate[(c*e + d*e*x)/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
-1/4*(e*(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-2*I)*(a + b*
ArcSin[c + d*x]))/b] + E^(((4*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]
*Gamma[1/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/(Sqrt[2]*d*E^(((2*I)*a)/b
)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.262.3 Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.98, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.609, Rules used = {5304, 27, 5146, 25, 4906, 27, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{e(c+dx)}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e\int \frac{c+dx}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5146}$$

$$\frac{e\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{ 25}$$

$$-\frac{e\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{ 4906}$$

$$-\frac{e\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \; 27$$

$$-\frac{e\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{2bd}$$

$$\Big\downarrow \; 3042$$

$$-\frac{e\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{2bd}$$

$$\Big\downarrow \; 3787$$

$$\frac{e\left(-\sin\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{2a}{b}\right)\int -\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx\right.}{2bd}$$

$$\Big\downarrow \; 25$$

$$\frac{e\left(\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{2bd}$$

$$\Big\downarrow \; 3042$$

$$\frac{e\left(\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx)\right.}{2bd}$$

$$\Big\downarrow \; 3785$$

$$\frac{e\left(\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-2\sin\left(\frac{2a}{b}\right)\int \cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+\right.}{2bd}$$

$$\Big\downarrow \; 3786$$

$$\frac{e\left(2\cos\left(\frac{2a}{b}\right)\int \sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\sin\left(\frac{2a}{b}\right)\int \cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsi\right.}{2bd}$$

$$\Big\downarrow \; 3832$$

$$\frac{e\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-2\sin\left(\frac{2a}{b}\right)\int \cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{2bd}$$

---

3.262. $\displaystyle\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

$$\downarrow \text{3833}$$

$$\frac{e\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\right)}{2bd}$$

input
```
Int[(c*e + d*e*x)/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(e*(Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])
/(Sqrt[b]*Sqrt[Pi])] - Sqrt[b]*Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c +
d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]))/(2*b*d)
```

### 3.262.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.262.4 Maple [A] (verified)

Time = 0.68 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.91

| method | result | size |
|---|---|---|
| default | $-\frac{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,e\left(\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)+\sin\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)\right)}{2d}$ | 96 |

input
```
int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/2*Pi^(1/2)*(-1/b)^(1/2)*e*(cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b
)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2
)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))/d
```

### 3.262.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{ce + dex}{\sqrt{a + b \arcsin(c + dx)}} \, dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.262.6 Sympy [F]

$$\int \frac{ce + dex}{\sqrt{a + b \arcsin(c + dx)}} \, dx = e\left(\int \frac{c}{\sqrt{a + b \operatorname{asin}(c + dx)}} \, dx + \int \frac{dx}{\sqrt{a + b \operatorname{asin}(c + dx)}} \, dx\right)$$

input
```
integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**(1/2),x)
```

output
```
e*(Integral(c/sqrt(a + b*asin(c + d*x)), x) + Integral(d*x/sqrt(a + b*asin
(c + d*x)), x))
```

### 3.262.7 Maxima [F]

$$\int \frac{ce + dex}{\sqrt{a + b \arcsin(c + dx)}} \, dx = \int \frac{dex + ce}{\sqrt{b \arcsin(dx + c) + a}} \, dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)/sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.262.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.70 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.35

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{i\sqrt{\pi}e\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}+\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(-\frac{2ia}{b}\right)}}{4\,d\left(\sqrt{b}-\frac{ib^{\frac{3}{2}}}{|b|}\right)} - \frac{i\sqrt{\pi}e\,\mathrm{erf}\left(-\frac{\sqrt{b\arcsin(dx+c)+a}}{\sqrt{b}}-\frac{i\sqrt{b\arcsin(dx+c)+a}\sqrt{b}}{|b|}\right)e^{\left(\frac{2ia}{b}\right)}}{4\sqrt{b}d\left(\frac{ib}{|b|}+1\right)}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
1/4*I*sqrt(pi)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) + I*sqrt(b*arcsi
n(d*x + c) + a)*sqrt(b)/abs(b))*e^(-2*I*a/b)/(d*(sqrt(b) - I*b^(3/2)/abs(b
))) - 1/4*I*sqrt(pi)*e*erf(-sqrt(b*arcsin(d*x + c) + a)/sqrt(b) - I*sqrt(b
*arcsin(d*x + c) + a)*sqrt(b)/abs(b))*e^(2*I*a/b)/(sqrt(b)*d*(I*b/abs(b) +
 1))
```

### 3.262.9 Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{c\,e+d\,e\,x}{\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}}\,dx$$

input
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^(1/2), x)
```

# 3.263 $\int \frac{1}{\sqrt{a+b \arcsin(c+dx)}} \, dx$



## 3.263.1 Optimal result

Integrand size = 14, antiderivative size = 105

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{\sqrt{b}d} + \frac{\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{\sqrt{b}d}$$

output
```
cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1
/2)*Pi^(1/2)/d/b^(1/2)+FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/d/b^(1/2)
```

## 3.263.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.08 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.25

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{ie^{-\frac{ia}{b}}\left(-\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right)+e^{\frac{2ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{i(a+b\arcsin(c+dx))}{b}\right)\right)}{2d\sqrt{a+b\arcsin(c+dx)}}$$

input
```
Integrate[1/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
((I/2)*(-(Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*A
rcSin[c + d*x]))/b]) + E^(((2*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]
*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(d*E^((I*a)/b)*Sqrt[a + b*Arc
Sin[c + d*x]])
```

### 3.263.3 Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.01, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.714$, Rules used = {5302, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5134}$$

$$\frac{\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3787}$$

$$\frac{\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{25}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{bd}$$

$$\Big\downarrow \text{3785}$$

$$\frac{\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd}$$

$$\Big\downarrow \text{3786}$$

$$\frac{2\sin\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}}{bd}$$

$$\Big\downarrow \text{3832}$$

$$\frac{2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{bd}$$

$$\Big\downarrow \text{3833}$$

$$\frac{\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{bd}$$

input
```
Int[1/Sqrt[a + b*ArcSin[c + d*x]],x]
```

output
```
(Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*
x]])/Sqrt[b]] + Sqrt[b]*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[
c + d*x]])/Sqrt[b]]*Sin[a/b])/(b*d)
```

3.263. $\int\frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

### 3.263.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.263. $\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx$

### 3.263.4 Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.90

| method | result | size |
|---|---|---|
| default | $\frac{\sqrt{2}\,\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(dx+c\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)-\sin\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin\left(dx+c\right)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\right)}{d}$ | 94 |

input
```
int(1/(a+b*arcsin(d*x+c))^(1/2),x,method=_RETURNVERBOSE)
```

output
```
2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*(cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(
1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b
)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b))/d
```

### 3.263.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.263.6 Sympy [F]

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\operatorname{asin}(c+dx)}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**(1/2),x)
```

output
```
Integral(1/sqrt(a + b*asin(c + d*x)), x)
```

### 3.263.7 Maxima [F]

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{1}{\sqrt{b\arcsin(dx+c)+a}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate(1/sqrt(b*arcsin(d*x + c) + a), x)
```

### 3.263.8 Giac [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 0.39 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.59

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx=-\frac{\sqrt{\pi}\,\mathrm{erf}\left(-\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(\frac{ia}{b}\right)}}{d\left(\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}-\frac{\sqrt{\pi}\,\mathrm{erf}\left(\frac{i\sqrt{2}\sqrt{b\arcsin(dx+c)+a}}{2\sqrt{|b|}}-\frac{\sqrt{2}\sqrt{b\arcsin(dx+c)+a}\sqrt{|b|}}{2b}\right)e^{\left(-\frac{ia}{b}\right)}}{d\left(-\frac{i\sqrt{2}b}{\sqrt{|b|}}+\sqrt{2}\sqrt{|b|}\right)}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
-sqrt(pi)*erf(-1/2*I*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/
2*sqrt(2)*sqrt(b*arcsin(d*x + c) + a)*sqrt(abs(b))/b)*e^(I*a/b)/(d*(I*sqrt
(2)*b/sqrt(abs(b)) + sqrt(2)*sqrt(abs(b)))) - sqrt(pi)*erf(1/2*I*sqrt(2)*s
qrt(b*arcsin(d*x + c) + a)/sqrt(abs(b)) - 1/2*sqrt(2)*sqrt(b*arcsin(d*x +
c) + a)*sqrt(abs(b))/b)*e^(-I*a/b)/(d*(-I*sqrt(2)*b/sqrt(abs(b)) + sqrt(2)
*sqrt(abs(b))))
```

### 3.263.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^(1/2),x)
```

output
```
int(1/(a + b*asin(c + d*x))^(1/2), x)
```

# 3.264 $\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx$



## 3.264.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx = \frac{\text{Int}\left(\frac{1}{(c+dx)\sqrt{a+b\arcsin(c+dx)}},x\right)}{e}$$

output
```
Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^(1/2),x)/e
```

## 3.264.2 Mathematica [N/A]

Not integrable

Time = 0.17 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx$$

input
```
Integrate[1/((c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]]),x]
```

output
```
Integrate[1/((c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]]), x]
```

### 3.264.3 Rubi [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{1}{e(c+dx)\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{1}{(c+dx)\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{de}$$

$$\Big\downarrow \text{5148}$$

$$\frac{\int \frac{1}{(c+dx)\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{de}$$

input
```
Int[1/((c*e + d*e*x)*Sqrt[a + b*ArcSin[c + d*x]]),x]
```

output
```
$Aborted
```

#### 3.264.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.264.4 Maple [N/A] (verified)

Not integrable

Time = 0.56 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(dex + ce)\sqrt{a + b\arcsin(dx + c)}}dx$$

input
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x)
```

output
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x)
```

### 3.264.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(ce + dex)\sqrt{a + b\arcsin(c + dx)}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.264.6 Sympy [N/A]

Not integrable

Time = 0.74 (sec) , antiderivative size = 36, normalized size of antiderivative = 1.44

$$\int \frac{1}{(ce + dex)\sqrt{a + b\arcsin(c + dx)}}\,dx = \frac{\int \frac{1}{c\sqrt{a + b\,\mathrm{asin}\,(c + dx)} + dx\sqrt{a + b\,\mathrm{asin}\,(c + dx)}}\,dx}{e}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**(1/2),x)
```

output
```
Integral(1/(c*sqrt(a + b*asin(c + d*x)) + d*x*sqrt(a + b*asin(c + d*x))),
x)/e
```

### 3.264.7 Maxima [N/A]

Not integrable

Time = 0.97 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{1}{(dex+ce)\sqrt{b\arcsin{(dx+c)}+a}}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="maxima")
```

output
```
integrate(1/((d*e*x + c*e)*sqrt(b*arcsin(d*x + c) + a)), x)
```

### 3.264.8 Giac [N/A]

Not integrable

Time = 0.85 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx=\int \frac{1}{(dex+ce)\sqrt{b\arcsin{(dx+c)}+a}}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(1/2),x, algorithm="giac")
```

output
```
integrate(1/((d*e*x + c*e)*sqrt(b*arcsin(d*x + c) + a)), x)
```

### 3.264.9 Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)\sqrt{a+b\arcsin(c+dx)}}\,dx = \int \frac{1}{(c\,e+d\,e\,x)\,\sqrt{a+b\,\mathrm{asin}\,(c+d\,x)}}\,dx$$

input
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(1/2)),x)
```

output
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(1/2)), x)
```

# 3.265 $\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx$



## 3.265.1 Optimal result

Integrand size = 25, antiderivative size = 412

$$\begin{aligned}\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx &= -\frac{2e^4(c+dx)^4\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} \\ &- \frac{e^4\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{2b^{3/2}d} \\ &+ \frac{3e^4\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d} \\ &- \frac{e^4\sqrt{\frac{5\pi}{2}}\cos\left(\frac{5a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{4b^{3/2}d} \\ &+ \frac{e^4\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{2b^{3/2}d} \\ &- \frac{3e^4\sqrt{\frac{3\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{4b^{3/2}d} \\ &+ \frac{e^4\sqrt{\frac{5\pi}{2}}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{10}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{5a}{b}\right)}{4b^{3/2}d}\end{aligned}$$

output
```
-1/4*e^4*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1
/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/d+1/4*e^4*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d+3/8*e^4*cos
(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/
2)*Pi^(1/2)/b^(3/2)/d-3/8*e^4*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/d-1/8*e^4*cos(5*a/b)*
FresnelS(10^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*10^(1/2)*Pi^
(1/2)/b^(3/2)/d+1/8*e^4*FresnelC(10^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)/b^(1/2))*sin(5*a/b)*10^(1/2)*Pi^(1/2)/b^(3/2)/d-2*e^4*(d*x+c)^4*(1-(d*x
+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.265.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.82 (sec) , antiderivative size = 572, normalized size of antiderivative = 1.39

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{e^4 e^{-\frac{5i(a+b\arcsin(c+dx))}{b}}\left(-e^{\frac{5ia}{b}}+3e^{\frac{5ia}{b}+2i\arcsin(c+dx)}-2e^{\frac{5ia}{b}+4i\arcsin(c+dx)}-2e^{\frac{5i}{b}}\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(e^4*(-E^(((5*I)*a)/b) + 3*E^(((5*I)*a)/b + (2*I)*ArcSin[c + d*x]) - 2*E^(
((5*I)*a)/b + (4*I)*ArcSin[c + d*x]) - 2*E^(((5*I)*a)/b + (6*I)*ArcSin[c +
 d*x]) + 3*E^(((5*I)*a)/b + (8*I)*ArcSin[c + d*x]) - E^(((5*I)*(a + 2*b*Ar
cSin[c + d*x]))/b) + 2*E^(((4*I)*a)/b + (5*I)*ArcSin[c + d*x])*Sqrt[((-I)*
(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] +
 2*E^(((6*I)*a)/b + (5*I)*ArcSin[c + d*x])*Sqrt[(I*(a + b*ArcSin[c + d*x])
)/b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b] - 3*Sqrt[3]*E^(((2*I)*a)/b
+ (5*I)*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2,
 ((-3*I)*(a + b*ArcSin[c + d*x]))/b] - 3*Sqrt[3]*E^(((8*I)*a)/b + (5*I)*Ar
cSin[c + d*x])*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((3*I)*(a +
b*ArcSin[c + d*x]))/b] + Sqrt[5]*E^((5*I)*ArcSin[c + d*x])*Sqrt[((-I)*(a +
 b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-5*I)*(a + b*ArcSin[c + d*x]))/b] + S
qrt[5]*E^(((5*I)*(2*a + b*ArcSin[c + d*x]))/b)*Sqrt[(I*(a + b*ArcSin[c + d
*x]))/b]*Gamma[1/2, ((5*I)*(a + b*ArcSin[c + d*x]))/b]))/(16*b*d*E^(((5*I)
*(a + b*ArcSin[c + d*x]))/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.265.3 Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 383, normalized size of antiderivative = 0.93, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {5304, 27, 5142, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx$$

$$\Big\downarrow \; 5304$$

$$\frac{\int \frac{e^4(c+dx)^4}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{e^4\int \frac{(c+dx)^4}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \; 5142$$

$$\frac{e^4\left(\frac{2\int \left(\frac{5\sin\left(\frac{5a}{b}-\frac{5(a+b\arcsin(c+dx))}{b}\right)}{16\sqrt{a+b\arcsin(c+dx)}}-\frac{9\sin\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{16\sqrt{a+b\arcsin(c+dx)}}+\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{8\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^4\sqrt{1-(c+}{b\sqrt{a+b\arcsin(c-}}\right.}{d}$$

$$\Big\downarrow \; 2009$$

$$\frac{e^4\left(\frac{2\left(\frac{1}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{3}{8}\sqrt{\frac{3\pi}{2}}\sqrt{b}\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\frac{1}{8}\sqrt{\frac{5\pi}{2}}\sqrt{b}\sin\left(\frac{5a}{b}\right)\text{FresnelC}\left(\right.}{}\right.}{}$$

input
```
Int[(c*e + d*e*x)^4/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(e^4*((-2*(c + d*x)^4*Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]
]) + (2*(-1/4*(Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b
*ArcSin[c + d*x]])/Sqrt[b]]) + (3*Sqrt[b]*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*Fres
nelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/8 - (Sqrt[b]*Sqrt[
(5*Pi)/2]*Cos[(5*a)/b]*FresnelS[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/
Sqrt[b]])/8 + (Sqrt[b]*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c
 + d*x]])/Sqrt[b]]*Sin[a/b])/4 - (3*Sqrt[b]*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[
6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/8 + (Sqrt[b]*Sqr
t[(5*Pi)/2]*FresnelC[(Sqrt[10/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Si
n[(5*a)/b])/8))/b^2))/d
```

### 3.265.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.265.4 Maple [A] (verified)

Time = 1.53 (sec) , antiderivative size = 483, normalized size of antiderivative = 1.17

| method | result |
|---|---|
| default | $-\frac{e^4\left(-2\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-2\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{\cdots}}{\cdots}\right.\right.}{\cdots}$ |

input
```
int((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-1/8*e^4/d/b*(-2*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1
/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2
)-2*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)+3*cos(3*a/b
)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^
(1/2)*Pi^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)+3*sin(3*a/b)*Fresnel
C(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^
(1/2)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)-cos(5*a/b)*FresnelS(5*2^(1/2)
/Pi^(1/2)/(-5/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-5/b)^(1/2)*P
i^(1/2)*(a+b*arcsin(d*x+c))^(1/2)-sin(5*a/b)*FresnelC(5*2^(1/2)/Pi^(1/2)/(
-5/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*(-5/b)^(1/2)*Pi^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)+2*cos(-(a+b*arcsin(d*x+c))/b+a/b)-3*cos(-3*(a+b*arc
sin(d*x+c))/b+3*a/b)+cos(-5*(a+b*arcsin(d*x+c))/b+5*a/b))/(a+b*arcsin(d*x+
c))^(1/2)
```

### 3.265.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.265.6 Sympy [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx = e^4\left(\int \frac{c^4}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{d^4x^4}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{4cd^3x^3}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{6c^2d^2x^2}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{4c^3dx}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**4/(a+b*asin(d*x+c))**(3/2),x)
```

output
```
e**4*(Integral(c**4/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d
*x))*asin(c + d*x)), x) + Integral(d**4*x**4/(a*sqrt(a + b*asin(c + d*x))
+ b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x) + Integral(4*c*d**3*x**3/
(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)),
 x) + Integral(6*c**2*d**2*x**2/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a +
b*asin(c + d*x))*asin(c + d*x)), x) + Integral(4*c**3*d*x/(a*sqrt(a + b*as
in(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x))
```

### 3.265.7 Maxima [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(dex+ce)^4}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^4/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.265.8 Giac [F]

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx=\int \frac{(dex+ce)^4}{(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^4/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^4/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.265.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^4}{(a+b\arcsin(c+dx))^{3/2}}\,dx=\int \frac{(c\,e+d\,e\,x)^4}{(a+b\,\mathrm{asin}\,(c+d\,x))^{3/2}}\,dx$$

input
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int((c*e + d*e*x)^4/(a + b*asin(c + d*x))^(3/2), x)
```

# 3.266 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx$



## 3.266.1 Optimal result

Integrand size = 25, antiderivative size = 270

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{e^3\sqrt{\frac{\pi}{2}}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d} + \frac{e^3\sqrt{\pi}\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d} - \frac{e^3\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{b^{3/2}d}$$

output
```
-1/2*e^3*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b^(1/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/d-1/2*e^3*FresnelS(2*2^(1/2)/Pi^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d+e^3
*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2
)/b^(3/2)/d+e^3*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin
(2*a/b)*Pi^(1/2)/b^(3/2)/d-2*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*ar
csin(d*x+c))^(1/2)
```

## 3.266.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.36 (sec) , antiderivative size = 300, normalized size of antiderivative = 1.11

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx =$$

$$-\frac{ie^3e^{-\frac{4ia}{b}}\left(\sqrt{2}e^{\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)-\sqrt{2}e^{\frac{6ia}{b}}\sqrt{\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},\frac{2i(a+b\arcsin(c\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
((-1/4*I)*e^3*(Sqrt[2]*E^(((2*I)*a)/b)*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))
/b]*Gamma[1/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b] - Sqrt[2]*E^(((6*I)*a)/
b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c +
 d*x]))/b] - Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-4*I)*(a
+ b*ArcSin[c + d*x]))/b] + E^(((8*I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x])
)/b]*Gamma[1/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b] - (2*I)*E^(((4*I)*a)/b)
*Sin[2*ArcSin[c + d*x]] + I*E^(((4*I)*a)/b)*Sin[4*ArcSin[c + d*x]]))/(b*d*
E^(((4*I)*a)/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

## 3.266.3 Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 263, normalized size of antiderivative = 0.97, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {5304, 27, 5142, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{e^3(c+dx)^3}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e^3 \int \frac{(c+dx)^3}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$\Big\downarrow$ 5142

$$\frac{e^3\left(\frac{2\int \left(\frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2\sqrt{a+b\arcsin(c+dx)}}-\frac{\cos\left(\frac{4a}{b}-\frac{4(a+b\arcsin(c+dx))}{b}\right)}{2\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^3\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{d}$$

$\Big\downarrow$ 2009

$$\frac{e^3\left(\frac{2\left(-\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\frac{1}{2}\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\frac{1}{2}\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(2\sqrt{\cdots}\right.\right.}{b^2}\right.}{d}$$

input
```
Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(e^3*((-2*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]
]) + (2*(-1/2*(Sqrt[b]*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt
[a + b*ArcSin[c + d*x]])/Sqrt[b]]) + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*Fresne
lC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/2 + (Sqrt[b]*Sqrt[
Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)
/b])/2 - (Sqrt[b]*Sqrt[Pi/2]*FresnelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c +
d*x]])/Sqrt[b]]*Sin[(4*a)/b])/2))/b^2))/d
```

### 3.266.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.266.4 Maple [A] (verified)

Time = 1.17 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.22

| method | result |
|---|---|
| default | $\frac{e^3\left(-2\cos\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\sqrt{-\frac{1}{b}}+2\sin\left(\frac{4a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{\right.}{}$ |

input
```
int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/4*e^3/d/b*(-2*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*(-1/b)^(
1/2)+2*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x
+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*(-1/b)^(1/2)+4*(-
1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2
)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-4*(-1/b)^(1/2)*Pi^(1/
2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)
^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)-
sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b))/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.266.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.266.6 Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = e^3\left(\int \frac{c^3}{a\sqrt{a+b\operatorname{asin}(c+dx)}+b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)}\,dx + \int \frac{d^3x^3}{a\sqrt{a+b\operatorname{asin}(c+dx)}+b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)}\,dx + \int \frac{3cd^2x^2}{a\sqrt{a+b\operatorname{asin}(c+dx)}+b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)}\,dx + \int \frac{3c^2dx}{a\sqrt{a+b\operatorname{asin}(c+dx)}+b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**(3/2),x)
```

output
```
e**3*(Integral(c**3/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d
*x))*asin(c + d*x)), x) + Integral(d**3*x**3/(a*sqrt(a + b*asin(c + d*x))
+ b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x) + Integral(3*c*d**2*x**2/
(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)),
 x) + Integral(3*c**2*d*x/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin
(c + d*x))*asin(c + d*x)), x))
```

### 3.266.7 Maxima [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.266.8 Giac [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.266.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^3}{(a+b\,\mathrm{asin}\,(c+d\,x))^{3/2}}\,dx$$

input
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(3/2), x)
```

# 3.267 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx$



## 3.267.1 Optimal result

Integrand size = 25, antiderivative size = 280

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{e^2\sqrt{\frac{\pi}{2}}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{e^2\sqrt{\frac{3\pi}{2}}\cos\left(\frac{3a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{e^2\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d} - \frac{e^2\sqrt{\frac{3\pi}{2}}\,\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{3/2}d}$$

output
```
-1/2*e^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1
/2))*2^(1/2)*Pi^(1/2)/b^(3/2)/d+1/2*e^2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d+1/2*e^2*cos
(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/
2)*Pi^(1/2)/b^(3/2)/d-1/2*e^2*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(3/2)/d-2*e^2*(d*x+c)^2*(1-
(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.267.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.45 (sec) , antiderivative size = 380, normalized size of antiderivative = 1.36

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{e^2 e^{-\frac{3i(a+b\arcsin(c+dx))}{b}}\left(e^{\frac{3ia}{b}} - e^{\frac{3ia}{b}+2i\arcsin(c+dx)} - e^{\frac{3ia}{b}+4i\arcsin(c+dx)} + e^{\frac{3i(a+2b\,\mathrm{ar}}{}}\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(e^2*(E^(((3*I)*a)/b) - E^(((3*I)*a)/b + (2*I)*ArcSin[c + d*x]) - E^(((3*I
)*a)/b + (4*I)*ArcSin[c + d*x]) + E^(((3*I)*(a + 2*b*ArcSin[c + d*x]))/b)
+ E^(((2*I)*a)/b + (3*I)*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c + d*x
]))/b]*Gamma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] + E^(((4*I)*a)/b + (3*
I)*ArcSin[c + d*x])*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, (I*(a +
 b*ArcSin[c + d*x]))/b] - Sqrt[3]*E^((3*I)*ArcSin[c + d*x])*Sqrt[((-I)*(a
+ b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c + d*x]))/b] -
Sqrt[3]*E^((3*I)*((2*a)/b + ArcSin[c + d*x]))*Sqrt[(I*(a + b*ArcSin[c + d*
x]))/b]*Gamma[1/2, ((3*I)*(a + b*ArcSin[c + d*x]))/b]))/(4*b*d*E^(((3*I)*(
a + b*ArcSin[c + d*x]))/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.267.3 Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 273, normalized size of antiderivative = 0.98, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used = {5304, 27, 5142, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int \frac{e^2(c+dx)^2}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \ 27$$

$$\frac{e^2\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$\downarrow$ 5142

$$\frac{e^2\left(\frac{2\int \left(\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\frac{3\sin\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{d}$$

$\downarrow$ 2009

$$\frac{e^2\left(\frac{2\left(\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{1}{2}\sqrt{\frac{3\pi}{2}}\sqrt{b}\sin\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\sqrt{\right.\right.}{b^2}\right.}{d}$$

input
```
Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(e^2*((-2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]
]) + (2*(-1/2*(Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b
*ArcSin[c + d*x]])/Sqrt[b]]) + (Sqrt[b]*Sqrt[(3*Pi)/2]*Cos[(3*a)/b]*Fresne
lS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/2 + (Sqrt[b]*Sqrt[Pi
/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b])/2
 - (Sqrt[b]*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]
])/Sqrt[b]]*Sin[(3*a)/b])/2))/b^2))/d
```

### 3.267.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

3.267. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.267.4 Maple [A] (verified)

Time = 1.30 (sec) , antiderivative size = 326, normalized size of antiderivative = 1.16

| method | result |
|---|---|
| default | $-\frac{e^{2}\left(-\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+\cdots}}{\sqrt{\cdots}}\right.\right.}{}$ |

input
```
int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-1/2*e^2/d/b*(-(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2
)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-
(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*
(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)+cos(3*a/b)*Fres
nelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*
Pi^(1/2)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)+sin(3*a/b)*FresnelC(3*2^(1
/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-
3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)+cos(-(a+b*arcsin(d*x+c))/b+a/b)-cos(-
3*(a+b*arcsin(d*x+c))/b+3*a/b))/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.267.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.267.6 Sympy [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = e^2\left(\int \frac{c^2}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{d^2x^2}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx + \int \frac{2cdx}{a\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)}\,dx\right)$$

input
```
integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**(3/2),x)
```

output
```
e**2*(Integral(c**2/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d
*x))*asin(c + d*x)), x) + Integral(d**2*x**2/(a*sqrt(a + b*asin(c + d*x))
+ b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x) + Integral(2*c*d*x/(a*sqr
t(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*asin(c + d*x)), x))
```

### 3.267.7 Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.267.8 Giac [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.267.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\,(c+d\,x))^{3/2}}\,dx$$

input
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(3/2), x)
```

# 3.268 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx$



## 3.268.1 Optimal result

Integrand size = 23, antiderivative size = 144

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx=-\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}}+\frac{2e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{b^{3/2}d}+\frac{2e\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{b^{3/2}d}$$

output
```
2*e*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(
1/2)/b^(3/2)/d+2*e*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*
sin(2*a/b)*Pi^(1/2)/b^(3/2)/d-2*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arc
sin(d*x+c))^(1/2)
```

## 3.268.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.17 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.17

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx=\frac{iee^{-\frac{2ia}{b}}\left(-\sqrt{2}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin(c+dx))}{b}\right)+\sqrt{2}e^{\frac{4ia}{b}}\sqrt{\frac{i(a+\cdots}{}}\right.}{2bd\sqrt{a+b\arcsin\cdots}}$$

input
```
Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
((I/2)*e*(-(Sqrt[2]*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((-2
*I)*(a + b*ArcSin[c + d*x]))/b]) + Sqrt[2]*E^(((4*I)*a)/b)*Sqrt[(I*(a + b*
ArcSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b] + (2*I)
*E^(((2*I)*a)/b)*Sin[2*ArcSin[c + d*x]]))/(b*d*E^(((2*I)*a)/b)*Sqrt[a + b*
ArcSin[c + d*x]])
```

## 3.268.3 Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.98, number of steps used = 12, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.478$, Rules used = {5304, 27, 5142, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e(c+dx)}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\int \frac{c+dx}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5142}$$

$$\frac{e\left(\frac{2\int \frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{d}$$

$$\Big\downarrow \text{3042}$$

$$\frac{e\left(\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{d}$$

$$\Big\downarrow \text{3787}$$

$$\frac{e\left(\frac{2\left(\cos\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int-\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c-}}{b\sqrt{a+b\arcsin(c}}\right.}{d}$$

$\Big\downarrow$ 25

$$\frac{e\left(\frac{2\left(\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+d}}{b\sqrt{a+b\arcsin(c+}}\right.}{d}$$

$\Big\downarrow$ 3042

$$\frac{e\left(\frac{2\left(\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(}}{b\sqrt{a+b\arcsin(}}\right.}{d}$$

$\Big\downarrow$ 3785

$$\frac{e\left(\frac{2\left(\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c-}}{b\sqrt{a+b\arcsin(c}}\right.}{d}$$

$\Big\downarrow$ 3786

$$\frac{e\left(\frac{2\left(2\sin\left(\frac{2a}{b}\right)\int\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c-}}{b\sqrt{a+b\arcsin(c}}\right.}{d}$$

$\Big\downarrow$ 3832

$$\frac{e\left(\frac{2\left(2\cos\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{d}$$

$\Big\downarrow$ 3833

---

3.268. $\int\frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

$$\frac{e\left(\frac{2\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{d}$$

input
```
Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(3/2),x]
```

output
```
(e*((-2*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) +
 (2*(Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]]
)/(Sqrt[b]*Sqrt[Pi])] + Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c +
 d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]))/b^2))/d
```

### 3.268.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.268.4 Maple [A] (verified)

Time = 0.88 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.17

| method | result |
|---|---|
| default | $\frac{e\left(2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)-2\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\ldots}{\ldots}\right.\right.}{db\sqrt{a+b\arcsin(dx+c)}}$ |

input
```
int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
e/d/b*(2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fresne
lC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)-2*(-1/b)^(
1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(
1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)+sin(-2*(a+b*arcsin(d*x+c))/
b+2*a/b))/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.268.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^{3/2}} \, dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.268.6 Sympy [F]

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^{3/2}} \, dx = e \left( \int \frac{c}{a\sqrt{a + b \operatorname{asin}(c + dx)} + b\sqrt{a + b \operatorname{asin}(c + dx)} \operatorname{asin}(c + dx)} \, dx + \int \frac{dx}{a\sqrt{a + b \operatorname{asin}(c + dx)} + b\sqrt{a + b \operatorname{asin}(c + dx)} \operatorname{asin}(c + dx)} \, dx \right)$$

input
```
integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**(3/2),x)
```

output
```
e*(Integral(c/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a + b*asin(c + d*x))*a
sin(c + d*x)), x) + Integral(d*x/(a*sqrt(a + b*asin(c + d*x)) + b*sqrt(a +
 b*asin(c + d*x))*asin(c + d*x)), x))
```

### 3.268.7 Maxima [F]

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^{3/2}} \, dx = \int \frac{dex + ce}{(b \arcsin(dx + c) + a)^{\frac{3}{2}}} \, dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.268.8 Giac [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{dex+ce}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(3/2), x)
```

### 3.268.9 Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{c\,e+d\,e\,x}{(a+b\,\mathrm{asin}\,(c+d\,x))^{3/2}}\,dx$$

input
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^(3/2), x)
```

# 3.269 $\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$



## 3.269.1 Optimal result

Integrand size = 14, antiderivative size = 144

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{bd\sqrt{a+b\arcsin(c+dx)}} - \frac{2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{3/2}d} + \frac{2\sqrt{2\pi}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{b^{3/2}d}$$

output
```
-2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2
^(1/2)*Pi^(1/2)/b^(3/2)/d+2*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^
(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(3/2)/d-2*(1-(d*x+c)^2)^(1/2)/b
/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.269.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.28

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{e^{-\frac{i(a+b\arcsin(c+dx))}{b}}\left(e^{i\arcsin(c+dx)}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\,\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c+dx))}{b}\right) -\right.}{bd\sqrt{a}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-3/2),x]
```

output
```
(E^(I*ArcSin[c + d*x])*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, (
(-I)*(a + b*ArcSin[c + d*x]))/b] + E^((I*a)/b)*(-1 - E^((2*I)*ArcSin[c + d
*x]) + E^((I*(a + b*ArcSin[c + d*x]))/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/
b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/(b*d*E^((I*(a + b*ArcSin[c
+ d*x]))/b)*Sqrt[a + b*ArcSin[c + d*x]])
```

### 3.269.3 Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.857$, Rules used = {5302, 5132, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5132}$$

$$\frac{-\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$$\Big\downarrow \text{5224}$$

$$\frac{-\frac{2\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 25

$$\frac{\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3042

$$\frac{\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3787

$$\frac{-\frac{2\left(-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 25

$$\frac{-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3042

$$\frac{-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3785

$$\frac{-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-2\sin\left(\frac{a}{b}\right)\int \cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\downarrow$ 3786

3.269. $\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

$$\frac{-\frac{2\left(2\cos\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\big\downarrow$ 3832

$$\frac{-\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

$\big\downarrow$ 3833

$$\frac{-\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-3/2),x]
```

output
```
((-2*Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) - (2*(Sqrt[b]*
Sqrt[2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt
[b]] - Sqrt[b]*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]]
)/Sqrt[b]]*Sin[a/b]))/b^2)/d
```

### 3.269.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

## 3.269. $\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx$

### 3.269.4 Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.18

| method | result |
|---|---|
| default | $-\frac{2\left(-\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{a}{b}\right)\mathrm{FresnelS}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{2}-\sqrt{a+b\arcsin(dx+c)}\,\sin\left(\frac{a}{b}\right)\mathrm{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b}}{\sqrt{\pi}}\right.\right.}{db\sqrt{a+b\arcsin(dx+c)}}$ |

input
```
int(1/(a+b*arcsin(d*x+c))^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-2/d/b*(-(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/
b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)-(a+b*a
rcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*Pi^(1/2)*2^(1/2)+cos(-(a+b*arcsin(d*x+
c))/b+a/b))/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.269.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.269.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**(3/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(-3/2), x)
```

### 3.269.7 Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-3/2), x)
```

### 3.269.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-3/2), x)
```

### 3.269.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+d\,x))^{3/2}}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^(3/2),x)
```

output
```
int(1/(a + b*asin(c + d*x))^(3/2), x)
```

# 3.270 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx$



## 3.270.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{\text{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^{3/2}},x\right)}{e}$$

output
```
Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^(3/2),x)/e
```

## 3.270.2 Mathematica [N/A]

Not integrable

Time = 0.19 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx$$

input
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2)),x]
```

output
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2)), x]
```

## 3.270.3 Rubi [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{1}{e(c+dx)(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{de}$$

$$\Big\downarrow \text{5148}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{de}$$

input
```
Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(3/2)),x]
```

output
```
$Aborted
```

### 3.270.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.270.4 Maple [N/A] (verified)

Not integrable

Time = 0.97 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(dex+ce)\left(a+b\arcsin\left(dx+c\right)\right)^{\frac{3}{2}}}dx$$

input
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x)
```

output
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x)
```

### 3.270.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.270.6 Sympy [N/A]

Not integrable

Time = 1.97 (sec) , antiderivative size = 88, normalized size of antiderivative = 3.52

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx = \frac{\int \frac{1}{ac\sqrt{a+b\operatorname{asin}(c+dx)}+adx\sqrt{a+b\operatorname{asin}(c+dx)}+bc\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+bdx}{e}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**(3/2),x)
```

output
```
Integral(1/(a*c*sqrt(a + b*asin(c + d*x)) + a*d*x*sqrt(a + b*asin(c + d*x)
) + b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + b*d*x*sqrt(a + b*asin(c
+ d*x))*asin(c + d*x)), x)/e
```

### 3.270.7 Maxima [N/A]

Not integrable

Time = 1.13 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx=\int \frac{1}{(dex+ce)(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="maxima")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(3/2)), x)
```

### 3.270.8 Giac [N/A]

Not integrable

Time = 2.56 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx=\int \frac{1}{(dex+ce)(b\arcsin{(dx+c)}+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(3/2),x, algorithm="giac")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(3/2)), x)
```

### 3.270.9 Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{3/2}}\,dx=\int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{3/2}}\,dx$$

input
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(3/2)),x)
```

output
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(3/2)), x)
```

# 3.271 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx$



## 3.271.1 Optimal result

Integrand size = 25, antiderivative size = 344

$$\begin{aligned}\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx &= -\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} \\ &-\frac{4e^3(c+dx)^2}{b^2d\sqrt{a+b\arcsin(c+dx)}}+\frac{16e^3(c+dx)^4}{3b^2d\sqrt{a+b\arcsin(c+dx)}} \\ &+\frac{4e^3\sqrt{2\pi}\cos\left(\frac{4a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} \\ &-\frac{4e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d} \\ &+\frac{4e^3\sqrt{\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{3b^{5/2}d} \\ &-\frac{4e^3\sqrt{2\pi}\operatorname{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{3b^{5/2}d}\end{aligned}$$

output
```
-4/3*e^3*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))
*Pi^(1/2)/b^(5/2)/d+4/3*e^3*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/P
i^(1/2))*sin(2*a/b)*Pi^(1/2)/b^(5/2)/d+4/3*e^3*cos(4*a/b)*FresnelS(2*2^(1/
2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(5/2)/d-
4/3*e^3*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin
(4*a/b)*2^(1/2)*Pi^(1/2)/b^(5/2)/d-2/3*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/b
/d/(a+b*arcsin(d*x+c))^(3/2)-4*e^3*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))^(1/
2)+16/3*e^3*(d*x+c)^4/b^2/d/(a+b*arcsin(d*x+c))^(1/2)
```

## 3.271.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.22 (sec) , antiderivative size = 351, normalized size of antiderivative = 1.02

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{e^3\left(-4(a+b\arcsin(c+dx))\left(e^{-2i\arcsin(c+dx)}+e^{2i\arcsin(c+dx)}-\sqrt{2}e^{-\frac{2ia}{b}}\sqrt{\cdots}\right.\right.}{\cdots}$$

input
```
Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
(e^3*(-4*(a + b*ArcSin[c + d*x])*(E^((-2*I)*ArcSin[c + d*x]) + E^((2*I)*Ar
cSin[c + d*x]) - (Sqrt[2]*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2
, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((2*I)*a)/b) - Sqrt[2]*E^(((2*I)
*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcSin
[c + d*x]))/b]) + 4*(a + b*ArcSin[c + d*x])*(E^((-4*I)*ArcSin[c + d*x]) +
E^((4*I)*ArcSin[c + d*x]) - (2*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamm
a[1/2, ((-4*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((4*I)*a)/b) - 2*E^(((4*I)*
a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((4*I)*(a + b*ArcSin[
c + d*x]))/b]) - 2*b*Sin[2*ArcSin[c + d*x]] + b*Sin[4*ArcSin[c + d*x]]))/(
12*b^2*d*(a + b*ArcSin[c + d*x])^(3/2))
```

### 3.271.3 Rubi [A] (verified)

Time = 1.82 (sec) , antiderivative size = 428, normalized size of antiderivative = 1.24, number of steps used = 18, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.680, Rules used = {5304, 27, 5144, 5222, 5146, 25, 4906, 27, 2009, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{e^3(c+dx)^3}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{e^3\int \frac{(c+dx)^3}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5144}$$

$$\frac{e^3\left(\frac{2\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{b}-\frac{8\int \frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)^3}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{d}$$

$$\Big\downarrow \text{ 5222}$$

$$\frac{e^3\left(\frac{2\left(\frac{4\int \frac{c+dx}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{8\left(\frac{8\int \frac{(c+dx)^3}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)^4}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}(c+dx}{3b(a+b\arcsin(c+dx))}\right.}{d}$$

$$\Big\downarrow \text{ 5146}$$

$$\frac{e^3\left(-\frac{8\left(\frac{8\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^4}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}+\frac{2\left(\frac{4\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\cdots}{\sqrt{a+b\,\mathrm{a}\cdots}}\cdots}{\cdots}\right.}{\cdots}\right.}{d}$$

$\downarrow$ 25

$$\frac{e^3\left(-\frac{8\left(-\frac{8\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^3\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^4}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}+\frac{2\left(-\frac{4\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\cdots}{\sqrt{a+b\,\mathrm{a}\cdots}}\cdots}{\cdots}\right.}{\cdots}\right.}{d}$$

$\downarrow$ 4906

$$\frac{e^3\left(\frac{2\left(-\frac{4\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{8\left(-\frac{8\int\left(\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\frac{\sin\left(\frac{4a}{b}-\frac{4(a+b\,\mathrm{ar}\cdots}{\cdots}\right)}{8\sqrt{a+b\,\mathrm{arcsi}\cdots}}\cdots\right.}{b^2}\cdots\right.}{3b\cdots}\right.}{d}$$

$\downarrow$ 27

$$\frac{e^3\left(\frac{2\left(-\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{8\left(-\frac{8\int\left(\frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\frac{\sin\left(\frac{4a}{b}-\frac{4(a+b\,\mathrm{ar}\cdots}{\cdots}\right)}{8\sqrt{a+b\,\mathrm{arcsi}\cdots}}\cdots\right.}{b^2}\cdots\right.}{3b\cdots}\right.}{d}$$

$\downarrow$ 2009

3.271. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$e^3\left(\frac{2\left(-\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{8\left(8\left(-\frac{1}{4}\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\frac{1}{8}\sqrt{\ldots}\right.\right.}{\ldots}\right.$$

$$\Big\downarrow \text{ 3042}$$

$$e^3\left(\frac{2\left(-\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{8\left(8\left(-\frac{1}{4}\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\frac{1}{8}\sqrt{\ldots}\right.\right.}{\ldots}\right.$$

$$\Big\downarrow \text{ 3787}$$

$$e^3\left(\frac{2\left(\frac{2\left(-\sin\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{2a}{b}\right)\int -\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}\ldots\right.$$

$$\Big\downarrow \text{ 25}$$

$$e^3\left(\frac{2\left(\frac{2\left(\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\ldots\right.$$

$$\Big\downarrow \text{ 3042}$$

3.271. $\displaystyle\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$e^3\left(\frac{2\left(\frac{2\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}\right.$$

$\downarrow$ 3785

$$e^3\left(\frac{2\left(\frac{2\left(\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-2\sin\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}\right.$$

$\downarrow$ 3786

$$e^3\left(\frac{2\left(\frac{2\left(2\cos\left(\frac{2a}{b}\right)\int\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\sin\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}\right.$$

$\downarrow$ 3832

$$e^3\left(\frac{2\left(\frac{2\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-2\sin\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{8\left(\frac{8\left(\cdots\right.}{}\right.}{}\right.$$

$\downarrow$ 3833

3.271. $\int\frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$e^3\left(\frac{2\left(\frac{2\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{8\left(\frac{8\left(-\frac{1}{4}\sqrt{\pi}\sqrt{b}\sin\right.}{}\right.}{}\right.$$

input
```
Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
(e^3*((-2*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(3*b*(a + b*ArcSin[c + d*x])^
(3/2)) + (2*((-2*(c + d*x)^2)/(b*Sqrt[a + b*ArcSin[c + d*x]]) + (2*(Sqrt[b
]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*
Sqrt[Pi])] - Sqrt[b]*Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sq
rt[b]*Sqrt[Pi])]*Sin[(2*a)/b]))/b^2))/b - (8*((-2*(c + d*x)^4)/(b*Sqrt[a +
 b*ArcSin[c + d*x]]) + (8*(-1/8*(Sqrt[b]*Sqrt[Pi/2]*Cos[(4*a)/b]*FresnelS[
(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]) + (Sqrt[b]*Sqrt[Pi]*C
os[(2*a)/b]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])])/
4 - (Sqrt[b]*Sqrt[Pi]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sq
rt[Pi])]*Sin[(2*a)/b])/4 + (Sqrt[b]*Sqrt[Pi/2]*FresnelC[(2*Sqrt[2/Pi]*Sqrt
[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(4*a)/b])/8))/b^2))/(3*b)))/d
```

### 3.271.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
 + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

## 3.271. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.271.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 732 vs. $2(284) = 568$.

Time = 1.30 (sec) , antiderivative size = 733, normalized size of antiderivative = 2.13

| method | result |
|---|---|
| default | $\frac{e^3\left(-16\cos\left(\frac{4a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,\sqrt{2}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\arcsin(dx+c)b-16\sin\left(\frac{4a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{a-}}{\sqrt{}}\right.\right.}{}$ |

input
```
int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/12*e^3/d/b^2*(-16*cos(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c
))^(1/2)*arcsin(d*x+c)*b-16*sin(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^
(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*arcs
in(d*x+c))^(1/2)*arcsin(d*x+c)*b+16*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b)*b+16*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b)*b-16*cos(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)
/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*(
a+b*arcsin(d*x+c))^(1/2)*a-16*sin(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b
)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*2^(1/2)*Pi^(1/2)*(a+b*ar
csin(d*x+c))^(1/2)*a+16*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*co
s(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)/b)*a+16*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*Fresn
elC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a-8*arcsi
n(d*x+c)*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b+8*cos(-4*(a+b*arcsin(d*x+c)
)/b+4*a/b)*arcsin(d*x+c)*b+2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b-8*cos(-
2*(a+b*arcsin(d*x+c))/b+2*a/b)*a-sin(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*b+8*c
os(-4*(a+b*arcsin(d*x+c))/b+4*a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

### 3.271.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce + dex)^3}{(a + b \arcsin(c + dx))^{5/2}} \, dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.271.6 Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx = e^3\left(\int \frac{c^3}{a^2\sqrt{a+b\operatorname{asin}(c+dx)}+2ab\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+b\right.$$
$$+\int \frac{d^3x^3}{a^2\sqrt{a+b\operatorname{asin}(c+dx)}+2ab\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+b^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)}$$
$$+\int \frac{3cd^2x^2}{a^2\sqrt{a+b\operatorname{asin}(c+dx)}+2ab\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+b^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)}$$
$$+\int \frac{3c^2dx}{a^2\sqrt{a+b\operatorname{asin}(c+dx)}+2ab\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+b^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+dx)}$$

input
```
integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**(5/2),x)
```

output
```
e**3*(Integral(c**3/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a + b*asi
n(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**
2), x) + Integral(d**3*x**3/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a
 + b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c
+ d*x)**2), x) + Integral(3*c*d**2*x**2/(a**2*sqrt(a + b*asin(c + d*x)) +
2*a*b*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d
*x))*asin(c + d*x)**2), x) + Integral(3*c**2*d*x/(a**2*sqrt(a + b*asin(c +
 d*x)) + 2*a*b*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*a
sin(c + d*x))*asin(c + d*x)**2), x))
```

### 3.271.7 Maxima [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.271.8 Giac [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.271.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^3}{(a+b\,\mathrm{asin}\,(c+d\,x))^{5/2}}\,dx$$

input
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(5/2), x)
```

# 3.272 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx$



## 3.272.1 Optimal result

Integrand size = 25, antiderivative size = 342

$$\begin{aligned}\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx &= -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} \\ &- \frac{8e^2(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}}+\frac{4e^2(c+dx)^3}{b^2d\sqrt{a+b\arcsin(c+dx)}} \\ &- \frac{e^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} \\ &+ \frac{e^2\sqrt{6\pi}\cos\left(\frac{3a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{b^{5/2}d} \\ &- \frac{e^2\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d} \\ &+ \frac{e^2\sqrt{6\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{b^{5/2}d}\end{aligned}$$

output
```
-1/3*e^2*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1
/2))*2^(1/2)*Pi^(1/2)/b^(5/2)/d-1/3*e^2*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(5/2)/d+e^2*cos(3*a
/b)*FresnelC(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*6^(1/2)*P
i^(1/2)/b^(5/2)/d+e^2*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^(5/2)/d-2/3*e^2*(d*x+c)^2*(1-(d*x+c
)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(3/2)-8/3*e^2*(d*x+c)/b^2/d/(a+b*arcsin
(d*x+c))^(1/2)+4*e^2*(d*x+c)^3/b^2/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.272.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.06 (sec) , antiderivative size = 411, normalized size of antiderivative = 1.20

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{e^2\Big(-6iae^{-3i\arcsin(c+dx)}+be^{-3i\arcsin(c+dx)}(1-6i\arcsin(c+dx))+e^{3i\arcsin(}}{}$$

input
```
Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
(e^2*(((-6*I)*a)/E^((3*I)*ArcSin[c + d*x]) + (b*(1 - (6*I)*ArcSin[c + d*x]
))/E^((3*I)*ArcSin[c + d*x]) + E^((3*I)*ArcSin[c + d*x])*((6*I)*a + b + (6
*I)*b*ArcSin[c + d*x]) - I*E^(I*ArcSin[c + d*x])*(2*a - I*b + 2*b*ArcSin[c
 + d*x]) - (2*b*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-I)*
(a + b*ArcSin[c + d*x]))/b])/E^((I*a)/b) + (I*(2*a + I*b + 2*b*ArcSin[c +
d*x] + (2*I)*b*E^((I*(a + b*ArcSin[c + d*x]))/b)*((I*(a + b*ArcSin[c + d*x
]))/b)^(3/2)*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b]))/E^(I*ArcSin[c + d
*x]) + (6*Sqrt[3]*b*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((
-3*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((3*I)*a)/b) + 6*Sqrt[3]*b*E^(((3*I)
*a)/b)*((I*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((3*I)*(a + b*ArcS
in[c + d*x]))/b]))/(12*b^2*d*(a + b*ArcSin[c + d*x])^(3/2))
```

### 3.272.3 Rubi [A] (verified)

Time = 1.89 (sec) , antiderivative size = 443, normalized size of antiderivative = 1.30, number of steps used = 17, number of rules used = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {5304, 27, 5144, 5222, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833, 5146, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e^2(c+dx)^2}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^2\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5144}$$

$$\frac{e^2\left(\frac{4\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2\int \frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{b}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)^2}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{d}$$

$$\Big\downarrow \text{5222}$$

$$\frac{e^2\left(\frac{4\left(\frac{2\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\left(\frac{6\int \frac{(c+dx)^2}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)^3}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{2\sqrt{1-(c+dx)^2}(c+dx}{3b(a+b\arcsin(c+dx))}\right.}{d}$$

$$\Big\downarrow \text{5134}$$

$$e^2\left(\frac{4\left(\frac{2\int\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\left(\frac{6\int\frac{(c+dx)^2}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)^3}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{2\ldots}{3b(\ldots}\right.$$
$$\overline{\qquad d\qquad}$$

$\downarrow$ 3042

$$e^2\left(\frac{4\left(\frac{2\int\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\left(\frac{6\int\frac{(c+dx)^2}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)^3}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\ldots\right.$$
$$\overline{\qquad d\qquad}$$

$\downarrow$ 3787

$$e^2\left(\frac{4\left(\frac{2\left(\cos\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int-\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(\ldots}{\ldots}\right.$$
$$\overline{\qquad d\qquad}$$

$\downarrow$ 25

$$e^2\left(\frac{4\left(\frac{2\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\left(\frac{6\ldots}{\ldots}\right.}{\ldots}\right.$$
$$\overline{\qquad d\qquad}$$

$\downarrow$ 3042

---

3.272. $\displaystyle\int\frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$\frac{e^2\left(\frac{4\left(\frac{2\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\cdots\right)}{d}$$

$\big\downarrow$ 3785

$$\frac{e^2\left(\frac{4\left(\frac{2\left(\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\cdots\right)}{d}$$

$\big\downarrow$ 3786

$$\frac{e^2\left(\frac{4\left(\frac{2\left(2\sin\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\cdots\right)}{d}$$

$\big\downarrow$ 3832

$$\frac{e^2\left(\frac{4\left(\frac{2\left(2\cos\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\cdots\right)}{d}$$

$\big\downarrow$ 3833

3.272. $\displaystyle\int\frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$e^2\left(-\frac{2\left(\frac{6\int \frac{(c+dx)^2}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)^3}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}+\frac{4\left(\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\cdots\right.\right.}{b^2}\right.}{3b}\right.$$
$$d$$

$\downarrow$ 5146

$$e^2\left(-\frac{2\left(\frac{6\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin^2\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^3}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}+\frac{4\left(\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\cdots}{}\right.\right.}{}\right.}{}\right.$$
$$d$$

$\downarrow$ 4906

$$e^2\left(-\frac{2\left(\frac{6\int \left(\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\frac{\cos\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^3}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}+\frac{4\left(\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{Fresne}\cdots\right.}{}\right.}{}\right.$$
$$d$$

$\downarrow$ 2009

$$e^2\left(\frac{4\left(\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\left(\frac{6\left(\frac{1}{2}\sqrt{\cdots}\right.}{}\right.}{}\right.$$

input
```
Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(5/2),x]
```

## 3.272. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

output
```
(e^2*((-2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(3*b*(a + b*ArcSin[c + d*x])^
(3/2)) + (4*((-2*(c + d*x))/(b*Sqrt[a + b*ArcSin[c + d*x]]) + (2*(Sqrt[b]*
Sqrt[2*Pi]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt
[b]] + Sqrt[b]*Sqrt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]]
)/Sqrt[b]]*Sin[a/b]))/b^2))/(3*b) - (2*((-2*(c + d*x)^3)/(b*Sqrt[a + b*Arc
Sin[c + d*x]]) + (6*((Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelC[(Sqrt[2/Pi]*Sqr
t[a + b*ArcSin[c + d*x]])/Sqrt[b]])/2 - (Sqrt[b]*Sqrt[Pi/6]*Cos[(3*a)/b]*F
resnelC[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]])/2 + (Sqrt[b]*Sq
rt[Pi/2]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/
b])/2 - (Sqrt[b]*Sqrt[Pi/6]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x
]])/Sqrt[b]]*Sin[(3*a)/b])/2))/b^2))/b))/d
```

### 3.272.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

## 3.272. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.272.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 732 vs. $2(286) = 572$.

Time = 1.18 (sec) , antiderivative size = 733, normalized size of antiderivative = 2.14

| method | result |
|---|---|
| default | $-\frac{e^{2}\left(2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+c)}\,\sqrt{2}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b-2\arcsin(dx+c)\sqrt{a+b\arcsin(dx-}\right.}{}$ |

input
```
int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-1/6*e^2/d/b^2*(2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)
*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)
/b)*(-1/b)^(1/2)*b-2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1
/2)*sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b)*(-1/b)^(1/2)*b-6*2^(1/2)*Pi^(1/2)*cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^
(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-3/b)^(1/2)*arcsin(d*x+c)
*(a+b*arcsin(d*x+c))^(1/2)*b+6*2^(1/2)*Pi^(1/2)*sin(3*a/b)*FresnelS(3*2^(1
/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-3/b)^(1/2)*arcsin
(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*b+2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi
^(1/2)*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)/b)*(-1/b)^(1/2)*a-2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*sin(
a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(
-1/b)^(1/2)*a-6*2^(1/2)*Pi^(1/2)*cos(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-
3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(
1/2)*a+6*2^(1/2)*Pi^(1/2)*sin(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1
/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a+
2*arcsin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b-6*arcsin(d*x+c)*sin(-3*(
a+b*arcsin(d*x+c))/b+3*a/b)*b+cos(-(a+b*arcsin(d*x+c))/b+a/b)*b+2*sin(-(a+
b*arcsin(d*x+c))/b+a/b)*a-cos(-3*(a+b*arcsin(d*x+c))/b+3*a/b)*b-6*sin(-3*(
a+b*arcsin(d*x+c))/b+3*a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

### 3.272.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.272.6 Sympy [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = e^2\left(\int \frac{c^2}{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+b\right.$$
$$+\int \frac{d^2x^2}{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+b^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)}$$
$$+\int \frac{2cdx}{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+b^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)}$$

input
```
integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**(5/2),x)
```

output
```
e**2*(Integral(c**2/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a + b*asi
n(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**
2), x) + Integral(d**2*x**2/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a
 + b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c
+ d*x)**2), x) + Integral(2*c*d*x/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*
sqrt(a + b*asin(c + d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*a
sin(c + d*x)**2), x))
```

### 3.272.7 Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.272.8 Giac [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.272.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\left(c+d\,x\right))^{5/2}}\,dx$$

input
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(5/2), x)
```

# 3.273 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx$



## 3.273.1 Optimal result

Integrand size = 23, antiderivative size = 207

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx=-\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}}-\frac{4e}{3b^2d\sqrt{a+b\arcsin(c+dx)}}+\frac{8e(c+dx)^2}{3b^2d\sqrt{a+b\arcsin(c+dx)}}-\frac{8e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{3b^{5/2}d}+\frac{8e\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{3b^{5/2}d}$$

output
```
-8/3*e*cos(2*a/b)*FresnelS(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*P
i^(1/2)/b^(5/2)/d+8/3*e*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1
/2))*sin(2*a/b)*Pi^(1/2)/b^(5/2)/d-2/3*e*(d*x+c)*(1-(d*x+c)^2)^(1/2)/b/d/(
a+b*arcsin(d*x+c))^(3/2)-4/3*e/b^2/d/(a+b*arcsin(d*x+c))^(1/2)+8/3*e*(d*x+
c)^2/b^2/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.273.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 1.22 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.93

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx =$$
$$-\frac{e\left(2(a+b\arcsin(c+dx))\left(e^{-2i\arcsin(c+dx)}+e^{2i\arcsin(c+dx)}-\sqrt{2}e^{-\frac{2ia}{b}}\sqrt{-\frac{i(a+b\arcsin(c+dx))}{b}}\Gamma\left(\frac{1}{2},-\frac{2i(a+b\arcsin}{b}\right.\right.\right.}{3b^2d(a+b\arcsin(c+dx}$$

input
```
Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
-1/3*(e*(2*(a + b*ArcSin[c + d*x])*(E^((-2*I)*ArcSin[c + d*x]) + E^((2*I)*
ArcSin[c + d*x]) - (Sqrt[2]*Sqrt[((-I)*(a + b*ArcSin[c + d*x]))/b]*Gamma[1
/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((2*I)*a)/b) - Sqrt[2]*E^(((2*
I)*a)/b)*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, ((2*I)*(a + b*ArcS
in[c + d*x]))/b]) + b*Sin[2*ArcSin[c + d*x]]))/(b^2*d*(a + b*ArcSin[c + d*
x])^(3/2))
```

### 3.273.3 Rubi [A] (verified)

Time = 1.32 (sec) , antiderivative size = 199, normalized size of antiderivative = 0.96, number of steps used = 18, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.739, Rules used = {5304, 27, 5144, 5152, 5222, 5146, 25, 4906, 27, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int \frac{e(c+dx)}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$
$$\Big\downarrow \text{27}$$
$$\frac{e\int \frac{c+dx}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5144}$$

$$\frac{e\left(\frac{2\int \frac{1}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{4\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{d}$$

$$\Big\downarrow \text{5152}$$

$$\frac{e\left(-\frac{4\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{4}{3b^2\sqrt{a+b\arcsin(c+dx)}}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{d}$$

$$\Big\downarrow \text{5222}$$

$$\frac{e\left(-\frac{4\left(\frac{4\int \frac{c+dx}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{4}{3b^2\sqrt{a+b\arcsin(c+dx)}}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{d}$$

$$\Big\downarrow \text{5146}$$

$$\frac{e\left(-\frac{4\left(\frac{4\int -\frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{4}{3b^2\sqrt{a+b\arcsin(c+dx)}}-\frac{2\sqrt{1-}}{3b(a+b}\right.}{d}$$

$$\Big\downarrow \text{25}$$

$$\frac{e\left(-\frac{4\left(-\frac{4\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{4}{3b^2\sqrt{a+b\arcsin(c+dx)}}-\frac{2\sqrt{1-}}{3b(a+}\right.}{d}$$

$$\Big\downarrow \text{4906}$$

3.273. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$\frac{e\left(-\frac{4\left(-\frac{4\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{2\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{4}{3b^2\sqrt{a+b\arcsin(c+dx)}}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{d}$$

$$\Big\downarrow \; 27$$

$$\frac{e\left(-\frac{4\left(-\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{4}{3b^2\sqrt{a+b\arcsin(c+dx)}}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{d}$$

$$\Big\downarrow \; 3042$$

$$\frac{e\left(-\frac{4\left(-\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{4}{3b^2\sqrt{a+b\arcsin(c+dx)}}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{d}$$

$$\Big\downarrow \; 3787$$

$$\frac{e\left(-\frac{4\left(\frac{2\left(-\sin\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{2a}{b}\right)\int -\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right.}{3b}\right.}{d}$$

$$\Big\downarrow \; 25$$

3.273. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$\frac{e\left(-\frac{4\left(\frac{2\left(\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}\right)}{d}$$

$\downarrow$ 3042

$$\frac{e\left(-\frac{4\left(\frac{2\left(\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}\right)}{d}$$

$\downarrow$ 3785

$$\frac{e\left(-\frac{4\left(\frac{2\left(\cos\left(\frac{2a}{b}\right)\int \frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-2\sin\left(\frac{2a}{b}\right)\int \cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}\right)}{d}$$

$\downarrow$ 3786

$$\frac{e\left(-\frac{4\left(\frac{2\left(2\cos\left(\frac{2a}{b}\right)\int \sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\sin\left(\frac{2a}{b}\right)\int \cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}\right)}{d}$$

$\downarrow$ 3832

---

3.273. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$\frac{e\left(-\frac{4\left(\frac{2\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-2\sin\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b^2\sqrt{}}\right.}{d}$$

$\Big\downarrow$ 3833

$$\frac{e\left(-\frac{4\left(\frac{2\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)-\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\right)}{b^2}-\frac{2(c+dx)^2}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{4}{3b^2\sqrt{a+b\arcsin}}\right.}{d}$$

input
```
Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(5/2),x]
```

output
```
(e*((-2*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(3*b*(a + b*ArcSin[c + d*x])^(3/2
)) - 4/(3*b^2*Sqrt[a + b*ArcSin[c + d*x]]) - (4*((-2*(c + d*x)^2)/(b*Sqrt[
a + b*ArcSin[c + d*x]]) + (2*(Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelS[(2*Sq
rt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] - Sqrt[b]*Sqrt[Pi]*FresnelC
[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]))/b^2))/
(3*b)))/d
```

### 3.273.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

## 3.273. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.273.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 369 vs. $2(169) = 338$.

Time = 0.98 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.79

| method | result |
|---|---|
| default | $\frac{e\left(8\arcsin(dx+c)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin(dx+c)}\,\cos\left(\frac{2a}{b}\right)\operatorname{FresnelS}\left(\frac{2\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{2}{b}}\,b}\right)b+8\arcsin(dx+c)\sqrt{-\frac{1}{b}}\,\sqrt{\pi}\,\sqrt{a+b\arcsin}\right.}{}$ |

input
```
int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/3*e/d/b^2*(8*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)*cos(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))
^(1/2)/b)*b+8*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2
)*sin(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^
(1/2)/b)*b+8*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*Fr
esnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a+8*(-
1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelC(2*2^(1/2
)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a-4*arcsin(d*x+c)*cos
(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b+sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b-4
*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

### 3.273.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.273.6 Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = e\left(\int \frac{c}{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+b^2\right.$$
$$+\int \frac{dx}{a^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+2ab\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+b^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+dx)}$$

input
```
integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**(5/2),x)
```

output
```
e*(Integral(c/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a + b*asin(c +
d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2), x)
 + Integral(d*x/(a**2*sqrt(a + b*asin(c + d*x)) + 2*a*b*sqrt(a + b*asin(c
+ d*x))*asin(c + d*x) + b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2),
x))
```

### 3.273.7 Maxima [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{dex+ce}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.273.8 Giac [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{dex+ce}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(5/2), x)
```

### 3.273.9 Mupad [F(-1)]

Timed out.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{c\,e+d\,e\,x}{(a+b\,\mathrm{asin}\,(c+d\,x))^{5/2}}\,dx$$

input
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^(5/2), x)
```

# 3.274 $\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$



## 3.274.1 Optimal result

Integrand size = 14, antiderivative size = 179

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = -\frac{2\sqrt{1-(c+dx)^2}}{3bd(a+b\arcsin(c+dx))^{3/2}} + \frac{4(c+dx)}{3b^2d\sqrt{a+b\arcsin(c+dx)}} - \frac{4\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{3b^{5/2}d} - \frac{4\sqrt{2\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{3b^{5/2}d}$$

output

```
-4/3*cos(a/b)*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))
*2^(1/2)*Pi^(1/2)/b^(5/2)/d-4/3*FresnelS(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+
c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^(1/2)/b^(5/2)/d-2/3*(1-(d*x+c)^2)^(
1/2)/b/d/(a+b*arcsin(d*x+c))^(3/2)+4/3*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(
1/2)
```

### 3.274.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.55 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.33

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{e^{-\frac{i(a+b\arcsin(c+dx))}{b}}\left(-2be^{i\arcsin(c+dx)}\left(-\frac{i(a+b\arcsin(c+dx))}{b}\right)^{3/2}\Gamma\left(\frac{1}{2},-\frac{i(a+b\arcsin(c}{b}\right.\right.}{}$$

input

```
Integrate[(a + b*ArcSin[c + d*x])^(-5/2),x]
```

output

```
(-2*b*E^(I*ArcSin[c + d*x])*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma
[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b] - I*E^((I*a)/b)*(2*a*(-1 + E^((2*I
)*ArcSin[c + d*x])) + b*(-I - 2*ArcSin[c + d*x] + E^((2*I)*ArcSin[c + d*x]
)*(-I + 2*ArcSin[c + d*x])) - (2*I)*b*E^((I*(a + b*ArcSin[c + d*x]))/b)*((
I*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))
/b]))/(3*b^2*d*E^((I*(a + b*ArcSin[c + d*x]))/b)*(a + b*ArcSin[c + d*x])^(
3/2))
```

### 3.274.3 Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.99, number of steps used = 13, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.857$, Rules used = {5302, 5132, 5222, 5134, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$$

$$\Big\downarrow \; 5302$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \; 5132$$

$$\frac{-\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$$\Big\downarrow \; 5222$$

$$\frac{-\frac{2\left(\frac{2\int \frac{1}{\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$\Big\downarrow$ 5134

$$\frac{-\frac{2\left(\frac{2\int \frac{\cos\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$\Big\downarrow$ 3042

$$\frac{-\frac{2\left(\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$\Big\downarrow$ 3787

$$\frac{-\frac{2\left(\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$\Big\downarrow$ 25

$$\frac{-\frac{2\left(\frac{2\left(\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$\Big\downarrow$ 3042

$$\frac{-\frac{2\left(\frac{2\left(\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c+dx)^2}}{3b(a+b\arcsin(c+dx))^{3/2}}}{d}$$

$\Big\downarrow$ 3785

---

## 3.274. $\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

$$-\frac{\frac{2\left(\frac{2\left(\sin\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{a}{b}\right)\int \cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{}}{3b(a+b}}{d}$$

$\Big\downarrow$ 3786

$$-\frac{\frac{2\left(\frac{2\left(2\sin\left(\frac{a}{b}\right)\int \sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{a}{b}\right)\int \cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2}{3b(a+b}}{d}$$

$\Big\downarrow$ 3832

$$-\frac{\frac{2\left(\frac{2\left(2\cos\left(\frac{a}{b}\right)\int \cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1}}{3b(a+b\text{ ar}}}{d}$$

$\Big\downarrow$ 3833

$$-\frac{\frac{2\left(\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)+\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2(c+dx)}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2\sqrt{1-(c}}{3b(a+b\arcsin}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^(-5/2),x]
```

output
```
((-2*Sqrt[1 - (c + d*x)^2])/(3*b*(a + b*ArcSin[c + d*x])^(3/2)) - (2*((-2*
(c + d*x))/(b*Sqrt[a + b*ArcSin[c + d*x]]) + (2*(Sqrt[b]*Sqrt[2*Pi]*Cos[a/
b]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] + Sqrt[b]*Sq
rt[2*Pi]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/
b]))/b^2))/(3*b))/d
```

## 3.274. $\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

### 3.274.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5134
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[1/(b*c)   Su
bst[Int[x^n*Cos[-a/b + x/b], x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b,
c, n}, x]
```

## 3.274. $\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx$

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

### 3.274.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 369 vs. $2(145) = 290$.

Time = 0.31 (sec) , antiderivative size = 370, normalized size of antiderivative = 2.07

| method | result |
|---|---|
| default | $-\frac{2\left(2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+c)}\,\sqrt{2}\,\sqrt{\pi}\,\cos\left(\frac{a}{b}\right)\operatorname{FresnelC}\left(\frac{\sqrt{2}\,\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\,\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{-\frac{1}{b}}\,b-2\arcsin(dx+c)\sqrt{a+b\arcsin(dx+\cdots}\right.}{\cdots}$ |

input
```
int(1/(a+b*arcsin(d*x+c))^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-2/3/d/b^2*(2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*cos
(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*
(-1/b)^(1/2)*b-2*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*
sin(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*(-1/b)^(1/2)*b+2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*cos(a/b)*Fr
esnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(
1/2)*a-2*(a+b*arcsin(d*x+c))^(1/2)*2^(1/2)*Pi^(1/2)*sin(a/b)*FresnelS(2^(1
/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*(-1/b)^(1/2)*a+2*ar
csin(d*x+c)*sin(-(a+b*arcsin(d*x+c))/b+a/b)*b+cos(-(a+b*arcsin(d*x+c))/b+a
/b)*b+2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a)/(a+b*arcsin(d*x+c))^(3/2)
```

### 3.274.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.274.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**(5/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(-5/2), x)
```

### 3.274.7 Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-5/2), x)
```

### 3.274.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-5/2), x)
```

### 3.274.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+d\,x))^{5/2}}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^(5/2),x)
```

output
```
int(1/(a + b*asin(c + d*x))^(5/2), x)
```

# 3.275 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx$



## 3.275.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{\text{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^{5/2}},x\right)}{e}$$

output
```
Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^(5/2),x)/e
```

## 3.275.2 Mathematica [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx$$

input
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2)),x]
```

output
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2)), x]
```

### 3.275.3 Rubi [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{1}{e(c+dx)(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{de}$$

$$\Big\downarrow \text{5148}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{de}$$

input
```
Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(5/2)),x]
```

output
```
$Aborted
```

#### 3.275.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.275.4 Maple [N/A] (verified)

Not integrable

Time = 1.07 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(dex+ce)\left(a+b\arcsin\left(dx+c\right)\right)^{\frac{5}{2}}}dx$$

input
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x)
```

output
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x)
```

### 3.275.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.275.6 Sympy [N/A]

Not integrable

Time = 8.53 (sec) , antiderivative size = 155, normalized size of antiderivative = 6.20

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \frac{\int \frac{}{a^2c\sqrt{a+b\operatorname{asin}\left(c+dx\right)}+a^2dx\sqrt{a+b\operatorname{asin}\left(c+dx\right)}+2abc\sqrt{a+b\operatorname{asin}\left(c+dx\right)}\operatorname{asin}\left(c+dx\right)}{}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**(5/2),x)
```

output
```
Integral(1/(a**2*c*sqrt(a + b*asin(c + d*x)) + a**2*d*x*sqrt(a + b*asin(c
+ d*x)) + 2*a*b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + 2*a*b*d*x*sqrt
(a + b*asin(c + d*x))*asin(c + d*x) + b**2*c*sqrt(a + b*asin(c + d*x))*asi
n(c + d*x)**2 + b**2*d*x*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2), x)/e
```

### 3.275.7 Maxima [N/A]

Not integrable

Time = 1.38 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="maxima")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(5/2)), x)
```

### 3.275.8 Giac [N/A]

Not integrable

Time = 5.95 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(5/2),x, algorithm="giac")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(5/2)), x)
```

### 3.275.9 Mupad [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{5/2}}\,dx = \int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{5/2}}\,dx$$

input
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(5/2)),x)
```

output
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(5/2)), x)
```

# 3.276 $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx$



## 3.276.1 Optimal result

Integrand size = 25, antiderivative size = 442

$$\begin{aligned}\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = &-\frac{2e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}}\\ &-\frac{4e^3(c+dx)^2}{5b^2d(a+b\arcsin(c+dx))^{3/2}}+\frac{16e^3(c+dx)^4}{15b^2d(a+b\arcsin(c+dx))^{3/2}}\\ &-\frac{16e^3(c+dx)\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}}+\frac{128e^3(c+dx)^3\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}}\\ &+\frac{32e^3\sqrt{2\pi}\cos\left(\frac{4a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d}\\ &-\frac{16e^3\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d}\\ &-\frac{16e^3\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d}\\ &+\frac{32e^3\sqrt{2\pi}\,\text{FresnelS}\left(\frac{2\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{4a}{b}\right)}{15b^{7/2}d}\end{aligned}$$

output
```
-4/5*e^3*(d*x+c)^2/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+16/15*e^3*(d*x+c)^4/b^2
/d/(a+b*arcsin(d*x+c))^(3/2)-16/15*e^3*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d
*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*Pi^(1/2)/b^(7/2)/d-16/15*e^3*FresnelS(2*(a+
b*arcsin(d*x+c))^(1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/b^(7/2)/d+32/
15*e^3*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^
(1/2))*2^(1/2)*Pi^(1/2)/b^(7/2)/d+32/15*e^3*FresnelS(2*2^(1/2)/Pi^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(4*a/b)*2^(1/2)*Pi^(1/2)/b^(7/2)/d-2/5
*e^3*(d*x+c)^3*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(5/2)-16/5*e^3*
(d*x+c)*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)+128/15*e^3*(d*
x+c)^3*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.276.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.80 (sec) , antiderivative size = 445, normalized size of antiderivative = 1.01

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{e^3\left(-4(a+b\arcsin(c+dx))\left(e^{2i\arcsin(c+dx)}(4ia+b+4ib\arcsin(c+dx))\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
(e^3*(-4*(a + b*ArcSin[c + d*x])*(E^((2*I)*ArcSin[c + d*x])*((4*I)*a + b +
 (4*I)*b*ArcSin[c + d*x]) + (4*Sqrt[2]*b*(((-I)*(a + b*ArcSin[c + d*x]))/b
)^(3/2)*Gamma[1/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/E^(((2*I)*a)/b) +
((-4*I)*a + b - (4*I)*b*ArcSin[c + d*x] + 4*Sqrt[2]*b*E^(((2*I)*(a + b*Arc
Sin[c + d*x]))/b)*((I*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((2*I)*
(a + b*ArcSin[c + d*x]))/b])/E^((2*I)*ArcSin[c + d*x])) + 4*(a + b*ArcSin[
c + d*x])*(((-8*I)*a + b - (8*I)*b*ArcSin[c + d*x])/E^((4*I)*ArcSin[c + d*
x]) + E^((4*I)*ArcSin[c + d*x])*((8*I)*a + b + (8*I)*b*ArcSin[c + d*x]) +
(16*b*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-4*I)*(a + b*A
rcSin[c + d*x]))/b])/E^(((4*I)*a)/b) + 16*b*E^(((4*I)*a)/b)*((I*(a + b*Arc
Sin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((4*I)*(a + b*ArcSin[c + d*x]))/b]) - 6
*b^2*Sin[2*ArcSin[c + d*x]] + 3*b^2*Sin[4*ArcSin[c + d*x]]))/(60*b^3*d*(a
+ b*ArcSin[c + d*x])^(5/2))
```

### 3.276.3 Rubi [A] (verified)

Time = 1.89 (sec) , antiderivative size = 529, normalized size of antiderivative = 1.20, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.560$, Rules used = {5304, 27, 5144, 5222, 5142, 2009, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e^3(c+dx)^3}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^3\int \frac{(c+dx)^3}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5144}$$

$$\frac{e^3\left(\frac{6\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{5b}-\frac{8\int \frac{(c+dx)^4}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{5b}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)^3}{5b(a+b\arcsin(c+dx))^{5/2}}\right)}{d}$$

$$\Big\downarrow \text{5222}$$

$$\frac{e^3\left(\frac{6\left(\frac{4\int \frac{c+dx}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2(c+dx)^2}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{8\left(\frac{8\int \frac{(c+dx)^3}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2(c+dx)^4}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-\cdots}}{5b(a+b\cdots}\right.}{d}$$

$$\Big\downarrow \text{5142}$$

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\int \frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)^2}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{8\left(\frac{8\left(\frac{2\int\left(\frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arc}{}\right)}{2\sqrt{a+b\arcsin}}\right.}{}\right.}{}\right.}{}\right.$$

$\downarrow$ 2009

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\int \frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)^2}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{8\left(\frac{8\left(\frac{2\left(-\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{4a}{b}\right)\right.}{}\right.}{}\right.}{}\right.$$

$\downarrow$ 3042

3.276. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)^2}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{8\left(\frac{8\left(\frac{2\left(-\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\cos\left(\frac{4a}{b}\right.\right.}{}\right.}{}\right.}{}\right.$$

$\downarrow$ 3787

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\left(\cos\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int -\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right.}{3b}\right.}{5b}\right.$$

$\downarrow$ 25

---

3.276. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\left(\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{3b}}{5b}\right.$$

$\downarrow$ 3042

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\left(\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx}}{b\sqrt{a+b\arcsin(c+d}}}{3b}}{5b}\right.$$

$\downarrow$ 3785

3.276. $\int\frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\left(\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right.}{3b}\right.}{5b}\right.$$

$\downarrow$ 3786

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\left(2\sin\left(\frac{2a}{b}\right)\int\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right.}{3b}\right.}{5b}\right.$$

$\downarrow$ 3832

3.276. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\left(2\cos\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b(a+}\right.}{5b}\right.$$

$\downarrow$ 3833

$$e^3\left(\frac{6\left(\frac{4\left(\frac{2\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)^2}{3b(a+b\arcsin(c+}\right.}{5b}\right.$$

input
```
Int[(c*e + d*e*x)^3/(a + b*ArcSin[c + d*x])^(7/2),x]
```

## 3.276. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

output
```
(e^3*((-2*(c + d*x)^3*Sqrt[1 - (c + d*x)^2])/(5*b*(a + b*ArcSin[c + d*x])^
(5/2)) + (6*((-2*(c + d*x)^2)/(3*b*(a + b*ArcSin[c + d*x])^(3/2)) + (4*((-
2*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) + (2*(S
qrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqr
t[b]*Sqrt[Pi])] + Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]]
)/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b]))/b^2))/(3*b)))/(5*b) - (8*((-2*(c + d*
x)^4)/(3*b*(a + b*ArcSin[c + d*x])^(3/2)) + (8*((-2*(c + d*x)^3*Sqrt[1 - (
c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) + (2*(-1/2*(Sqrt[b]*Sqrt[Pi/2
]*Cos[(4*a)/b]*FresnelC[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]
]) + (Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*FresnelC[(2*Sqrt[a + b*ArcSin[c + d*x]
])/(Sqrt[b]*Sqrt[Pi])])/2 + (Sqrt[b]*Sqrt[Pi]*FresnelS[(2*Sqrt[a + b*ArcSi
n[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])/2 - (Sqrt[b]*Sqrt[Pi/2]*Fre
snelS[(2*Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(4*a)/b])/2)
)/b^2))/(3*b)))/(5*b)))/d
```

### 3.276.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

3.276. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.276. $\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

### 3.276.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1246 vs. $2(368) = 736$.

Time = 1.34 (sec) , antiderivative size = 1247, normalized size of antiderivative = 2.82

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1247 |

input
```
int((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
-1/60*e^3/d/b^3*(-128*(-1/b)^(1/2)*arcsin(d*x+c)^2*cos(4*a/b)*FresnelC(2*2
^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)*b^2+128*(-1/b)^(1/2)*arcsin(d*x+c)^2*sin(4*a/b)
*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(
1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*b^2+64*arcsin(d*x+c)^2*(-1/b)^(1/2
)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2
)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-64*arcsin(d*x+c)^2*(-1/b)^
(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^
(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-256*(-1/b)^(1/2)*arcsi
n(d*x+c)*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a*b+256*(-1/b)^
(1/2)*arcsin(d*x+c)*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a
+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a*b+
128*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*cos(2*a/
b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a
*b-128*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2
*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b
)*a*b-128*(-1/b)^(1/2)*cos(4*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)
*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*a
^2+128*(-1/b)^(1/2)*sin(4*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)...
```

### 3.276.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >> Error detected within library code: inte
grate: implementation incomplete (constant residues)
```

### 3.276.6 Sympy [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = e^3\Bigg(\int \frac{}{a^3\sqrt{a+b\operatorname{asin}(c+dx)}+3a^2b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+}$$
$$+\int \frac{d^3x^3}{a^3\sqrt{a+b\operatorname{asin}(c+dx)}+3a^2b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+3ab^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+}$$
$$+\int \frac{3cd^2x^2}{a^3\sqrt{a+b\operatorname{asin}(c+dx)}+3a^2b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+3ab^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+}$$
$$+\int \frac{3c^2dx}{a^3\sqrt{a+b\operatorname{asin}(c+dx)}+3a^2b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+3ab^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+}$$

input
```
integrate((d*e*x+c*e)**3/(a+b*asin(d*x+c))**(7/2),x)
```

output
```
e**3*(Integral(c**3/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*
asin(c + d*x))*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c +
 d*x)**2 + b**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral
(d**3*x**3/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c +
d*x))*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2
+ b**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(3*c*d**2
*x**2/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x))
*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**
3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(3*c**2*d*x/(a
**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x))*asin(c
+ d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**3*sqrt(a
 + b*asin(c + d*x))*asin(c + d*x)**3), x))
```

### 3.276.7 Maxima [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.276.8 Giac [F]

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(dex+ce)^3}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^3/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^3/(b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.276.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^3}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^3}{(a+b\,\mathrm{asin}\,(c+d\,x))^{7/2}}\,dx$$

input
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(7/2),x)
```

output
```
int((c*e + d*e*x)^3/(a + b*asin(c + d*x))^(7/2), x)
```

# 3.277 $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx$



## 3.277.1 Optimal result

Integrand size = 25, antiderivative size = 441

$$\begin{aligned}\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx =& -\frac{2e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} \\ &- \frac{8e^2(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{4e^2(c+dx)^3}{5b^2d(a+b\arcsin(c+dx))^{3/2}} \\ &- \frac{16e^2\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} + \frac{24e^2(c+dx)^2\sqrt{1-(c+dx)^2}}{5b^3d\sqrt{a+b\arcsin(c+dx)}} \\ &+ \frac{2e^2\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} \\ &- \frac{6e^2\sqrt{6\pi}\cos\left(\frac{3a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{5b^{7/2}d} \\ &- \frac{2e^2\sqrt{2\pi}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d} \\ &+ \frac{6e^2\sqrt{6\pi}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{6}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{3a}{b}\right)}{5b^{7/2}d}\end{aligned}$$

output
```
-8/15*e^2*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+4/5*e^2*(d*x+c)^3/b^2/d/
(a+b*arcsin(d*x+c))^(3/2)+2/15*e^2*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)*(a+b
*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(7/2)/d-2/15*e^2*Fresnel
C(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*2^(1/2)*Pi^
(1/2)/b^(7/2)/d-6/5*e^2*cos(3*a/b)*FresnelS(6^(1/2)/Pi^(1/2)*(a+b*arcsin(d
*x+c))^(1/2)/b^(1/2))*6^(1/2)*Pi^(1/2)/b^(7/2)/d+6/5*e^2*FresnelC(6^(1/2)/
Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(3*a/b)*6^(1/2)*Pi^(1/2)/b^
(7/2)/d-2/5*e^2*(d*x+c)^2*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(5/2
)-16/15*e^2*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)+24/5*e^2*(
d*x+c)^2*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.277.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 2.16 (sec) , antiderivative size = 538, normalized size of antiderivative = 1.22

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{e^2\left(-3b^2e^{i\arcsin(c+dx)}+3b^2e^{3i\arcsin(c+dx)}+2e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))\left(e^{\frac{i(}{}}\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
(e^2*(-3*b^2*E^(I*ArcSin[c + d*x]) + 3*b^2*E^((3*I)*ArcSin[c + d*x]) + (2*
(a + b*ArcSin[c + d*x])*(E^((I*(a + b*ArcSin[c + d*x]))/b)*(2*a - I*b + 2*
b*ArcSin[c + d*x]) - (2*I)*b*(((-I)*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamm
a[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/b]))/E^((I*a)/b) + (4*a^2 + 2*a*b*(I
 + 4*ArcSin[c + d*x]) + b^2*(-3 + (2*I)*ArcSin[c + d*x] + 4*ArcSin[c + d*x
]^2) - 4*E^((I*(a + b*ArcSin[c + d*x]))/b)*(a + b*ArcSin[c + d*x])^2*Sqrt[
(I*(a + b*ArcSin[c + d*x]))/b]*Gamma[1/2, (I*(a + b*ArcSin[c + d*x]))/b])/
E^(I*ArcSin[c + d*x]) - (6*(a + b*ArcSin[c + d*x])*(E^(((3*I)*(a + b*ArcSi
n[c + d*x]))/b)*(6*a - I*b + 6*b*ArcSin[c + d*x]) - (6*I)*Sqrt[3]*b*(((-I)
*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-3*I)*(a + b*ArcSin[c + d*
x]))/b]))/E^(((3*I)*a)/b) + (3*(b^2 - 2*(a + b*ArcSin[c + d*x])*(6*a + I*b
 + 6*b*ArcSin[c + d*x] + (6*I)*Sqrt[3]*b*E^(((3*I)*(a + b*ArcSin[c + d*x])
)/b)*((I*(a + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((3*I)*(a + b*ArcSin
[c + d*x]))/b])))/E^((3*I)*ArcSin[c + d*x])))/(60*b^3*d*(a + b*ArcSin[c +
d*x])^(5/2))
```

### 3.277.3 Rubi [A] (verified)

Time = 2.27 (sec) , antiderivative size = 539, normalized size of antiderivative = 1.22, number of steps used = 18, number of rules used = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.680$, Rules used = {5304, 27, 5144, 5222, 5132, 5142, 2009, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{e^2(c+dx)^2}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{e^2\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5144}$$

$$\frac{e^2\left(\frac{4\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{5b}-\frac{6\int \frac{(c+dx)^3}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{5b}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)^2}{5b(a+b\arcsin(c+dx))^{5/2}}\right)}{d}$$

$$\Big\downarrow \text{5222}$$

$$\frac{e^2\left(\frac{4\left(\frac{2\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{6\left(\frac{2\int \frac{(c+dx)^2}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{b}-\frac{2(c+dx)^3}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-\cdots}}{5b(a+b\cdots}\right.}{d}$$

$$\Big\downarrow \text{5132}$$

$$\frac{e^2\left(-\frac{6\left(\frac{2\int\frac{(c+dx)^2}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{b}-\frac{2(c+dx)^3}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}+\frac{4\left(\frac{2\left(-\frac{2\int\frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}\right.}{5b}\right.}{d}$$

$\Big\downarrow$ 5142

$$\frac{e^2\left(-\frac{6\left(\frac{2\left(\frac{2\int\left(\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}-\frac{3\sin\left(\frac{3a}{b}-\frac{3(a+b\arcsin(c+dx))}{b}\right)}{4\sqrt{a+b\arcsin(c+dx)}}\right)d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)^2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{b}-\frac{2(c+dx)^3}{3b(a+b\arcsin(c+dx))^{3/2}}\right.}{5b}\right.}{d}$$

$\Big\downarrow$ 2009

3.277. $\int\frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^2\left(\frac{4\left(\frac{2\left(-\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{6\left(\frac{2\left(\frac{2\left(\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\cdots}{\cdots}\right.\cdots}{\cdots}\right.\cdots}{\cdots}\cdots\right.$$

$\downarrow$ 5224

$$e^2\left(\frac{4\left(\frac{2\left(-\frac{2\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{6\left(\frac{2\left(\frac{2\left(\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{Fresne}\cdots\right.}{\cdots}\right.\cdots}{\cdots}\cdots\right.$$

$\downarrow$ 25

## 3.277. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^2\left(\frac{4\left(\frac{2\left(\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{6\left(\frac{2\left(2\left(\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\cdots\right.\right.\right.}{\cdots}\right.}{\cdots}\cdots\right.$$

$\downarrow$ 3042

$$e^2\left(\frac{4\left(\frac{2\left(\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{6\left(\frac{2\left(2\left(\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\cdots\right.\right.\right.}{\cdots}\right.}{\cdots}\cdots\right.$$

$\downarrow$ 3787

---

3.277. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^2\left(\frac{4\left(\frac{2\left(-\frac{2\left(-\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int-\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\dots\right)}{5b}\dots\right.$$

$$\downarrow \ 25$$

$$e^2\left(\frac{4\left(\frac{2\left(-\frac{2\left(\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int\frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\dots}{3b(\dots}\right)}{5b}\dots\right.$$

$$\downarrow \ 3042$$

3.277. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^2\left(\frac{4\left(\frac{2\left(-\frac{2\left(\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\cdots\right)}{5b}\cdots\right.$$

$$\Big\downarrow \text{3785}$$

$$e^2\left(\frac{4\left(\frac{2\left(-\frac{2\left(\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\cdots}{3b}\cdots\right)}{5b}\cdots\right.$$

$$\Big\downarrow \text{3786}$$

---

3.277. $\displaystyle\int\frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^2\left(\frac{4\left(\frac{2\left(-\frac{2\left(2\cos\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b}\right.}{5b}\right.$$

$\downarrow$ 3832

$$e^2\left(\frac{4\left(\frac{2\left(-\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b(a+}\right.}{5b}\right.$$

$\downarrow$ 3833

3.277. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e^2\left(\frac{4\left(\frac{2\left(-\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2}{3b(a+b\,\text{ar}}\right)}{5b}\right.$$

input
```
Int[(c*e + d*e*x)^2/(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
(e^2*((-2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(5*b*(a + b*ArcSin[c + d*x])^
(5/2)) + (4*((-2*(c + d*x))/(3*b*(a + b*ArcSin[c + d*x])^(3/2)) + (2*((-2*
Sqrt[1 - (c + d*x)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) - (2*(Sqrt[b]*Sqrt[
2*Pi]*Cos[a/b]*FresnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]
- Sqrt[b]*Sqrt[2*Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqr
t[b]]*Sin[a/b]))/b^2))/(3*b)))/(5*b) - (6*((-2*(c + d*x)^3)/(3*b*(a + b*Ar
cSin[c + d*x])^(3/2)) + (2*((-2*(c + d*x)^2*Sqrt[1 - (c + d*x)^2])/(b*Sqrt
[a + b*ArcSin[c + d*x]]) + (2*(-1/2*(Sqrt[b]*Sqrt[Pi/2]*Cos[a/b]*FresnelS[
(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]) + (Sqrt[b]*Sqrt[(3*Pi)/
2]*Cos[(3*a)/b]*FresnelS[(Sqrt[6/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]
)/2 + (Sqrt[b]*Sqrt[Pi/2]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]]
)/Sqrt[b]]*Sin[a/b])/2 - (Sqrt[b]*Sqrt[(3*Pi)/2]*FresnelC[(Sqrt[6/Pi]*Sqrt
[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[(3*a)/b])/2))/b^2))/b))/(5*b)))/d
```

### 3.277.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

## 3.277. $\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.277.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1246 vs. 2(367) = 734.

Time = 1.30 (sec) , antiderivative size = 1247, normalized size of antiderivative = 2.83

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1247 |

input
```
int((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
1/30*e^2/d/b^3*(-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*Fres
nelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi
^(1/2)*(-1/b)^(1/2)*b^2-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*sin(a/
b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(
1/2)*Pi^(1/2)*(-1/b)^(1/2)*b^2+36*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/
2)*arcsin(d*x+c)^2*(-3/b)^(1/2)*cos(3*a/b)*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3
/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2+36*2^(1/2)*Pi^(1/2)*(a+b*arcsin
(d*x+c))^(1/2)*arcsin(d*x+c)^2*(-3/b)^(1/2)*sin(3*a/b)*FresnelC(3*2^(1/2)/
Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*b^2-8*arcsin(d*x+c)*(a+
b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+
b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a*b-8*arcsin(d*x+c
)*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2
)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a*b+72*2^(1/2
)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*arcsin(d*x+c)*(-3/b)^(1/2)*cos(3*a/b)
*FresnelS(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a*b
+72*2^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*arcsin(d*x+c)*(-3/b)^(1/2)*
sin(3*a/b)*FresnelC(3*2^(1/2)/Pi^(1/2)/(-3/b)^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)/b)*a*b-4*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS(2^(1/2)/Pi^(1/2)/
(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a^
2-4*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)...
```

### 3.277.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.277.6 Sympy [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = e^2\left(\int \frac{}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+\right.$$
$$+\int \frac{d^2x^2}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+3ab^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+}$$
$$+\int \frac{2cdx}{a^3\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2b\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx)+3ab^2\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}^2\,(c+}$$

input
```
integrate((d*e*x+c*e)**2/(a+b*asin(d*x+c))**(7/2),x)
```

output
```
e**2*(Integral(c**2/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*
asin(c + d*x))*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c +
 d*x)**2 + b**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral
(d**2*x**2/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c +
d*x))*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2
+ b**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(2*c*d*x/
(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x))*asin(
c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**3*sqrt
(a + b*asin(c + d*x))*asin(c + d*x)**3), x))
```

### 3.277.7 Maxima [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.277.8 Giac [F]

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(dex+ce)^2}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)^2/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^2/(b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.277.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(ce+dex)^2}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{(c\,e+d\,e\,x)^2}{(a+b\,\mathrm{asin}\,(c+d\,x))^{7/2}}\,dx$$

input
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(7/2),x)
```

output
```
int((c*e + d*e*x)^2/(a + b*asin(c + d*x))^(7/2), x)
```

# 3.278 $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx$



## 3.278.1 Optimal result

Integrand size = 23, antiderivative size = 252

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx = -\frac{2e(c+dx)\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} - \frac{4e}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{8e(c+dx)^2}{15b^2d(a+b\arcsin(c+dx))^{3/2}} + \frac{32e(c+dx)\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} - \frac{32e\sqrt{\pi}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)}{15b^{7/2}d} - \frac{32e\sqrt{\pi}\,\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\sin\left(\frac{2a}{b}\right)}{15b^{7/2}d}$$

output
```
-4/15*e/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+8/15*e*(d*x+c)^2/b^2/d/(a+b*arcsin
(d*x+c))^(3/2)-32/15*e*cos(2*a/b)*FresnelC(2*(a+b*arcsin(d*x+c))^(1/2)/b^(
1/2)/Pi^(1/2))*Pi^(1/2)/b^(7/2)/d-32/15*e*FresnelS(2*(a+b*arcsin(d*x+c))^(
1/2)/b^(1/2)/Pi^(1/2))*sin(2*a/b)*Pi^(1/2)/b^(7/2)/d-2/5*e*(d*x+c)*(1-(d*x
+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))^(5/2)+32/15*e*(d*x+c)*(1-(d*x+c)^2)^(
1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.278.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.95 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.01

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx =$$
$$-\frac{e\Bigg((a+b\arcsin(c+dx))\Bigg(e^{-\frac{2ia}{b}}\Bigg(2e^{\frac{2i(a+b\arcsin(c+dx))}{b}}(4ia+b+4ib\arcsin(c+dx))+8\sqrt{2}b\Bigg(-\frac{i(a+b\arcsin(c+dx))}{b}}{}$$

input
```
Integrate[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
-1/15*(e*((a + b*ArcSin[c + d*x])*((2*E^(((2*I)*(a + b*ArcSin[c + d*x]))/b
)*((4*I)*a + b + (4*I)*b*ArcSin[c + d*x]) + 8*Sqrt[2]*b*(((-I)*(a + b*ArcS
in[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-2*I)*(a + b*ArcSin[c + d*x]))/b])/E^(
((2*I)*a)/b) + (2*((-4*I)*a + b - (4*I)*b*ArcSin[c + d*x] + 4*Sqrt[2]*b*E^
(((2*I)*(a + b*ArcSin[c + d*x]))/b)*((I*(a + b*ArcSin[c + d*x]))/b)^(3/2)*
Gamma[1/2, ((2*I)*(a + b*ArcSin[c + d*x]))/b]))/E^((2*I)*ArcSin[c + d*x]))
 + 3*b^2*Sin[2*ArcSin[c + d*x]]))/(b^3*d*(a + b*ArcSin[c + d*x])^(5/2))
```

### 3.278.3 Rubi [A] (verified)

Time = 1.28 (sec) , antiderivative size = 247, normalized size of antiderivative = 0.98, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.609$, Rules used = {5304, 27, 5144, 5152, 5222, 5142, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx$$
$$\Big\downarrow \ 5304$$
$$\frac{\int \frac{e(c+dx)}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$
$$\Big\downarrow \ 27$$
$$\frac{e\int \frac{c+dx}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5144}$$

$$\frac{e\left(\frac{2\int \frac{1}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{5b}-\frac{4\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{5b}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{5b(a+b\arcsin(c+dx))^{5/2}}\right)}{d}$$

$$\Big\downarrow \text{5152}$$

$$\frac{e\left(-\frac{4\int \frac{(c+dx)^2}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{5b}-\frac{4}{15b^2(a+b\arcsin(c+dx))^{3/2}}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{5b(a+b\arcsin(c+dx))^{5/2}}\right)}{d}$$

$$\Big\downarrow \text{5222}$$

$$\frac{e\left(-\frac{4\left(\frac{4\int \frac{c+dx}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2(c+dx)^2}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{4}{15b^2(a+b\arcsin(c+dx))^{3/2}}-\frac{2\sqrt{1-(c+dx)^2}(c+dx)}{5b(a+b\arcsin(c+dx))^{5/2}}\right)}{d}$$

$$\Big\downarrow \text{5142}$$

$$\frac{e\left(-\frac{4\left(\frac{4\left(\frac{2\int \frac{\cos\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)^2}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{4}{15b^2(a+b\arcsin(c+dx))^{3/2}}\right.}{d}$$

$$\Big\downarrow \text{3042}$$

3.278. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$\frac{e\left(-\frac{4\left(\frac{4\left(\frac{2\int \frac{\sin\left(\frac{2a}{b}-\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)^2}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{4}{15b^2(a+b\arcsin(c+dx))}\right.}{d}$$

$\Big\downarrow$ 3787

$$\frac{e\left(-\frac{4\left(\frac{4\left(\frac{2\left(\cos\left(\frac{2a}{b}\right)\int \frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{2a}{b}\right)\int -\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx}{b\sqrt{a+b\arcsin(c+dx}\right.}{3b}\right.}{5b}\right.}{d}$$

$\Big\downarrow$ 25

3.278. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$e\left(-\frac{4\left(\frac{4\left(\frac{2\left(\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int\frac{\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}}{3b}}{5b}\right.}{d}$$

$\downarrow$ 3042

$$e\left(-\frac{4\left(\frac{4\left(\frac{2\left(\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+\cos\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+a}}{b\sqrt{a+b\arcsin(c+}}}{3b}}{5b}\right.}{d}$$

$\downarrow$ 3785

3.278. $\int\frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$\frac{e\left(-\frac{4\left(\frac{4\left(\frac{2\left(\sin\left(\frac{2a}{b}\right)\int\frac{\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))+2\cos\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)}}{b\sqrt{a+b\arcsin(c+dx}}\right.}{3b}}{5b}\right.}{d}$$

$\downarrow$ 3786

$$\frac{e\left(-\frac{4\left(\frac{4\left(\frac{2\left(2\sin\left(\frac{2a}{b}\right)\int\sin\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+2\cos\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx}}{b\sqrt{a+b\arcsin(c+dx}}\right.}{3b}}{5b}\right.}{d}$$

$\downarrow$ 3832

$$\frac{e\left(-\frac{4\left(\frac{4\left(\frac{2\left(2\cos\left(\frac{2a}{b}\right)\int\cos\left(\frac{2(a+b\arcsin(c+dx))}{b}\right)d\sqrt{a+b\arcsin(c+dx)}+\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b(a-}}{5b}\right.}{d}$$

$\downarrow$ 3833

## 3.278. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$\frac{e\left(-\frac{4\left(\frac{4\left(\frac{2\left(\sqrt{\pi}\sqrt{b}\cos\left(\frac{2a}{b}\right)\text{FresnelC}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)+\sqrt{\pi}\sqrt{b}\sin\left(\frac{2a}{b}\right)\text{FresnelS}\left(\frac{2\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}\sqrt{\pi}}\right)\right)}{b^2}-\frac{2(c+dx)\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)^2}{3b(a+b\arcsin(c+\cdots}}{5b}\cdots\right.}{d}$$

input
```
Int[(c*e + d*e*x)/(a + b*ArcSin[c + d*x])^(7/2),x]
```

output
```
(e*((-2*(c + d*x)*Sqrt[1 - (c + d*x)^2])/(5*b*(a + b*ArcSin[c + d*x])^(5/2
)) - 4/(15*b^2*(a + b*ArcSin[c + d*x])^(3/2)) - (4*((-2*(c + d*x)^2)/(3*b*
(a + b*ArcSin[c + d*x])^(3/2)) + (4*((-2*(c + d*x)*Sqrt[1 - (c + d*x)^2])/
(b*Sqrt[a + b*ArcSin[c + d*x]]) + (2*(Sqrt[b]*Sqrt[Pi]*Cos[(2*a)/b]*Fresne
lC[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])] + Sqrt[b]*Sqrt[Pi]*
FresnelS[(2*Sqrt[a + b*ArcSin[c + d*x]])/(Sqrt[b]*Sqrt[Pi])]*Sin[(2*a)/b])
)/b^2))/(3*b)))/(5*b)))/d
```

### 3.278.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785
```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

## 3.278. $\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.278.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 624 vs. 2(208) = 416.

Time = 0.85 (sec) , antiderivative size = 625, normalized size of antiderivative = 2.48

| method | result |
|---|---|
| default | $-\frac{e\left(32\arcsin(dx+c)^2\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{a+b\arcsin(dx+c)}\cos\left(\frac{2a}{b}\right)\operatorname{FresnelC}\left(\frac{2\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{2}{b}}\,b}\right)b^2-32\arcsin(dx+c)^2\sqrt{-\frac{1}{b}}\sqrt{\pi}\sqrt{a\cdots}\right.}{}$ |

input
```
int((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
-1/15*e/d/b^3*(32*arcsin(d*x+c)^2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)/b)*b^2-32*arcsin(d*x+c)^2*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*
x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)/b)*b^2+64*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(
d*x+c))^(1/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arc
sin(d*x+c))^(1/2)/b)*a*b-64*arcsin(d*x+c)*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsi
n(d*x+c))^(1/2)*sin(2*a/b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*a
rcsin(d*x+c))^(1/2)/b)*a*b+32*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1
/2)*cos(2*a/b)*FresnelC(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c)
)^(1/2)/b)*a^2-32*(-1/b)^(1/2)*Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)*sin(2*a/
b)*FresnelS(2*2^(1/2)/Pi^(1/2)/(-2/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*a
^2+16*arcsin(d*x+c)^2*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2+32*arcsin(d*
x+c)*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a*b+4*arcsin(d*x+c)*cos(-2*(a+b*a
rcsin(d*x+c))/b+2*a/b)*b^2+16*sin(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*a^2-3*si
n(-2*(a+b*arcsin(d*x+c))/b+2*a/b)*b^2+4*cos(-2*(a+b*arcsin(d*x+c))/b+2*a/b
)*a*b)/(a+b*arcsin(d*x+c))^(5/2)
```

### 3.278.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.278.6 Sympy [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx = e\left(\int \frac{}{a^3\sqrt{a+b\operatorname{asin}(c+dx)}+3a^2b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+3}\right.$$
$$+\int \frac{dx}{a^3\sqrt{a+b\operatorname{asin}(c+dx)}+3a^2b\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}(c+dx)+3ab^2\sqrt{a+b\operatorname{asin}(c+dx)}\operatorname{asin}^2(c+}$$

input
```
integrate((d*e*x+c*e)/(a+b*asin(d*x+c))**(7/2),x)
```

output
```
e*(Integral(c/(a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c
 + d*x))*asin(c + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)*
*2 + b**3*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3), x) + Integral(d*x/(
a**3*sqrt(a + b*asin(c + d*x)) + 3*a**2*b*sqrt(a + b*asin(c + d*x))*asin(c
 + d*x) + 3*a*b**2*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**2 + b**3*sqrt(
a + b*asin(c + d*x))*asin(c + d*x)**3), x))
```

### 3.278.7 Maxima [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{dex+ce}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.278.8 Giac [F]

$$\int \frac{ce+dex}{(a+b\arcsin(c+dx))^{7/2}}\,dx=\int \frac{dex+ce}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate((d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)/(b*arcsin(d*x + c) + a)^(7/2), x)
```

### 3.278.9 Mupad [F(-1)]

Timed out.

$$\int \frac{ce + dex}{(a + b \arcsin(c + dx))^{7/2}} \, dx = \int \frac{c\,e + d\,e\,x}{(a + b\,\mathrm{asin}\,(c + d\,x))^{7/2}} \, dx$$

input
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^(7/2),x)
```

output
```
int((c*e + d*e*x)/(a + b*asin(c + d*x))^(7/2), x)
```

# 3.279 $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$



## 3.279.1 Optimal result

Integrand size = 14, antiderivative size = 218

$$\begin{aligned}\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx &= -\frac{2\sqrt{1-(c+dx)^2}}{5bd(a+b\arcsin(c+dx))^{5/2}} \\ &+ \frac{4(c+dx)}{15b^2d(a+b\arcsin(c+dx))^{3/2}}+\frac{8\sqrt{1-(c+dx)^2}}{15b^3d\sqrt{a+b\arcsin(c+dx)}} \\ &+ \frac{8\sqrt{2\pi}\cos\left(\frac{a}{b}\right)\operatorname{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)}{15b^{7/2}d} \\ &- \frac{8\sqrt{2\pi}\operatorname{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\sin\left(\frac{a}{b}\right)}{15b^{7/2}d}\end{aligned}$$

output
```
4/15*(d*x+c)/b^2/d/(a+b*arcsin(d*x+c))^(3/2)+8/15*cos(a/b)*FresnelS(2^(1/2
)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*2^(1/2)*Pi^(1/2)/b^(7/2)/d-8
/15*FresnelC(2^(1/2)/Pi^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b^(1/2))*sin(a/b)*
2^(1/2)*Pi^(1/2)/b^(7/2)/d-2/5*(1-(d*x+c)^2)^(1/2)/b/d/(a+b*arcsin(d*x+c))
^(5/2)+8/15*(1-(d*x+c)^2)^(1/2)/b^3/d/(a+b*arcsin(d*x+c))^(1/2)
```

### 3.279.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.27 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.32

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{-6b^2e^{i\arcsin(c+dx)}+4e^{-\frac{ia}{b}}(a+b\arcsin(c+dx))\left(e^{\frac{i(a+b\arcsin(c+dx))}{b}}(2a+b(-\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^(-7/2),x]
```

output
```
(-6*b^2*E^(I*ArcSin[c + d*x]) + (4*(a + b*ArcSin[c + d*x])*(E^((I*(a + b*A
rcSin[c + d*x]))/b)*(2*a + b*(-I + 2*ArcSin[c + d*x])) - (2*I)*b*(((-I)*(a
 + b*ArcSin[c + d*x]))/b)^(3/2)*Gamma[1/2, ((-I)*(a + b*ArcSin[c + d*x]))/
b]))/E^((I*a)/b) + (8*a^2 + 4*a*b*(I + 4*ArcSin[c + d*x]) + 2*b^2*(-3 + (2
*I)*ArcSin[c + d*x] + 4*ArcSin[c + d*x]^2) - 8*E^((I*(a + b*ArcSin[c + d*x
]))/b)*(a + b*ArcSin[c + d*x])^2*Sqrt[(I*(a + b*ArcSin[c + d*x]))/b]*Gamma
[1/2, (I*(a + b*ArcSin[c + d*x]))/b])/E^(I*ArcSin[c + d*x]))/(30*b^3*d*(a
+ b*ArcSin[c + d*x])^(5/2))
```

### 3.279.3 Rubi [A] (verified)

Time = 1.06 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.02, number of steps used = 15, number of rules used = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5302, 5132, 5222, 5132, 5224, 25, 3042, 3787, 25, 3042, 3785, 3786, 3832, 3833}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}dx$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5132}$$

$$\frac{-\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}(a+b\arcsin(c+dx))^{5/2}}d(c+dx)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \; 5222$$

$$\frac{-\frac{2\left(\frac{2\int \frac{1}{(a+b\arcsin(c+dx))^{3/2}}d(c+dx)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \; 5132$$

$$\frac{-\frac{2\left(\frac{2\left(-\frac{2\int \frac{c+dx}{\sqrt{1-(c+dx)^2}\sqrt{a+b\arcsin(c+dx)}}d(c+dx)}{b}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \; 5224$$

$$\frac{-\frac{2\left(\frac{2\left(-\frac{2\int -\frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \; 25$$

$$\frac{-\frac{2\left(\frac{2\left(\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \; 3042$$

---

3.279. $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$\frac{-\frac{2\left(\frac{2\left(\frac{2\int \frac{\sin\left(\frac{a}{b}-\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+dx)}{3b(a+b\arcsin(c+dx))^{3/2}}\right)}{5b}-\frac{2\sqrt{1-(c+dx)^2}}{5b(a+b\arcsin(c+dx))^{5/2}}}{d}$$

$\downarrow$ 3787

$$\frac{-\frac{2\left(\frac{2\left(-\frac{2\left(-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\cos\left(\frac{a}{b}\right)\int -\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\cdots}{3b(\cdots}\cdots\right)}{5b}\cdots}{d}$$

$\downarrow$ 25

$$\frac{-\frac{2\left(\frac{2\left(-\frac{2\left(\cos\left(\frac{a}{b}\right)\int \frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int \frac{\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{\cdots}{3b(a+b\cdots}\cdots\right)}{5b}\cdots}{d}$$

$\downarrow$ 3042

---

3.279. $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$-\frac{2\left(\frac{2\left(-\frac{2\left(\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-\sin\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}+\frac{\pi}{2}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b(}\right)}{5b}}{d}$$

$\Big\downarrow$ 3785

$$-\frac{2\left(\frac{2\left(-\frac{2\left(\cos\left(\frac{a}{b}\right)\int\frac{\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)}{\sqrt{a+b\arcsin(c+dx)}}d(a+b\arcsin(c+dx))-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b(a+}\right)}{5b}}{d}$$

$\Big\downarrow$ 3786

$$-\frac{2\left(\frac{2\left(-\frac{2\left(2\cos\left(\frac{a}{b}\right)\int\sin\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b(a+}\right)}{5b}}{d}$$

$\Big\downarrow$ 3832

$$-\frac{2\left(\frac{2\left(-\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-2\sin\left(\frac{a}{b}\right)\int\cos\left(\frac{a+b\arcsin(c+dx)}{b}\right)d\sqrt{a+b\arcsin(c+dx)}\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{}{3b(a+b\,a}\right)}{5b}}{d}$$

$\Big\downarrow$ 3833

3.279. $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

$$-\frac{\frac{2\left(\frac{2\left(-\frac{2\left(\sqrt{2\pi}\sqrt{b}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)-\sqrt{2\pi}\sqrt{b}\sin\left(\frac{a}{b}\right)\text{FresnelC}\left(\frac{\sqrt{\frac{2}{\pi}}\sqrt{a+b\arcsin(c+dx)}}{\sqrt{b}}\right)\right)}{b^2}-\frac{2\sqrt{1-(c+dx)^2}}{b\sqrt{a+b\arcsin(c+dx)}}\right)}{3b}-\frac{2(c+\cdots}{3b(a+b\arcsi\cdots}\right)}{5b}}{d}$$

input

```
Int[(a + b*ArcSin[c + d*x])^(-7/2),x]
```

output

```
((-2*Sqrt[1 - (c + d*x)^2])/(5*b*(a + b*ArcSin[c + d*x])^(5/2)) - (2*((-2*
(c + d*x))/(3*b*(a + b*ArcSin[c + d*x])^(3/2)) + (2*((-2*Sqrt[1 - (c + d*x
)^2])/(b*Sqrt[a + b*ArcSin[c + d*x]]) - (2*(Sqrt[b]*Sqrt[2*Pi]*Cos[a/b]*Fr
esnelS[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]] - Sqrt[b]*Sqrt[2*
Pi]*FresnelC[(Sqrt[2/Pi]*Sqrt[a + b*ArcSin[c + d*x]])/Sqrt[b]]*Sin[a/b]))/
b^2))/(3*b)))/(5*b))/d
```

### 3.279.3.1 Defintions of rubi rules used

rule 25

```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 3042

```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3785

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> S
imp[2/d   Subst[Int[Cos[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c,
d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3786

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[2/d
   Subst[Int[Sin[f*(x^2/d)], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f
}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

rule 3787
```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Cos
[(d*e - c*f)/d]   Int[Sin[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] + Simp[Sin[(
d*e - c*f)/d]   Int[Cos[c*(f/d) + f*x]/Sqrt[c + d*x], x], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && NeQ[d*e - c*f, 0]
```

rule 3832
```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 3833
```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]/(f*Rt[
d, 2]))*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)], x] /; FreeQ[{d, e, f}, x]
```

rule 5132
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[Sqrt[1 - c^2
*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + Simp[c/(b*(n + 1))
  Int[x*((a + b*ArcSin[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x] /; FreeQ[{a
, b, c}, x] && LtQ[n, -1]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

3.279. $\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx$

### 3.279.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 623 vs. $2(178) = 356$.

Time = 0.36 (sec) , antiderivative size = 624, normalized size of antiderivative = 2.86

| method | result |
|---|---|
| default | $-\frac{8\arcsin(dx+c)^2\sqrt{a+b\arcsin(dx+c)}\cos\left(\frac{a}{b}\right)\text{FresnelS}\left(\frac{\sqrt{2}\sqrt{a+b\arcsin(dx+c)}}{\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b}\right)\sqrt{2}\sqrt{\pi}\sqrt{-\frac{1}{b}}\,b^2}{15} - \frac{8\arcsin(dx+c)^2\sqrt{a+b\arcsin(dx+c)}\sin\left(\frac{a}{b}\right)\text{Fres}}{1}$ |

input
```
int(1/(a+b*arcsin(d*x+c))^(7/2),x,method=_RETURNVERBOSE)
```

output
```
2/15/d/b^3*(-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*FresnelS
(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/
2)*(-1/b)^(1/2)*b^2-4*arcsin(d*x+c)^2*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*F
resnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)
*Pi^(1/2)*(-1/b)^(1/2)*b^2-8*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*cos(a
/b)*FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^
(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a*b-8*arcsin(d*x+c)*(a+b*arcsin(d*x+c))^(1/2)*
sin(a/b)*FresnelC(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/
b)*2^(1/2)*Pi^(1/2)*(-1/b)^(1/2)*a*b-4*(a+b*arcsin(d*x+c))^(1/2)*cos(a/b)*
FresnelS(2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2
)*Pi^(1/2)*(-1/b)^(1/2)*a^2-4*(a+b*arcsin(d*x+c))^(1/2)*sin(a/b)*FresnelC(
2^(1/2)/Pi^(1/2)/(-1/b)^(1/2)*(a+b*arcsin(d*x+c))^(1/2)/b)*2^(1/2)*Pi^(1/2
)*(-1/b)^(1/2)*a^2+4*arcsin(d*x+c)^2*cos(-(a+b*arcsin(d*x+c))/b+a/b)*b^2+8
*arcsin(d*x+c)*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a*b-2*arcsin(d*x+c)*sin(-(a
+b*arcsin(d*x+c))/b+a/b)*b^2+4*cos(-(a+b*arcsin(d*x+c))/b+a/b)*a^2-3*cos(-
(a+b*arcsin(d*x+c))/b+a/b)*b^2-2*sin(-(a+b*arcsin(d*x+c))/b+a/b)*a*b)/(a+b
*arcsin(d*x+c))^(5/2)
```

### 3.279.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >> Error detected within library code: inte
grate: implementation incomplete (constant residues)
```

### 3.279.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(a+b\operatorname{asin}(c+dx))^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x+c))**(7/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**(-7/2), x)
```

### 3.279.7 Maxima [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-7/2), x)
```

### 3.279.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^(-7/2), x)
```

### 3.279.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(c+d\,x))^{7/2}}\,dx$$

input
```
int(1/(a + b*asin(c + d*x))^(7/2),x)
```

output
```
int(1/(a + b*asin(c + d*x))^(7/2), x)
```

# 3.280 $\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx$



## 3.280.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{\text{Int}\left(\frac{1}{(c+dx)(a+b\arcsin(c+dx))^{7/2}},x\right)}{e}$$

output
```
Unintegrable(1/(d*x+c)/(a+b*arcsin(d*x+c))^(7/2),x)/e
```

## 3.280.2 Mathematica [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx$$

input
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2)),x]
```

output
```
Integrate[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2)), x]
```

### 3.280.3 Rubi [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 27, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}} \, dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{1}{e(c+dx)(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{de}$$

$$\Big\downarrow \text{5148}$$

$$\frac{\int \frac{1}{(c+dx)(a+b\arcsin(c+dx))^{7/2}}d(c+dx)}{de}$$

input
```
Int[1/((c*e + d*e*x)*(a + b*ArcSin[c + d*x])^(7/2)),x]
```

output
```
$Aborted
```

#### 3.280.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.280.4 Maple [N/A] (verified)

Not integrable

Time = 0.95 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{1}{(dex+ce)\,(a+b\arcsin\,(dx+c))^{\frac{7}{2}}}dx$$

input
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x)
```

output
```
int(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x)
```

### 3.280.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.280.6 Sympy [N/A]

Not integrable

Time = 111.31 (sec) , antiderivative size = 221, normalized size of antiderivative = 8.84

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx = \frac{\int \frac{}{a^3c\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+a^3dx\sqrt{a+b\,\mathrm{asin}\,(c+dx)}+3a^2bc\sqrt{a+b\,\mathrm{asin}\,(c+dx)}\,\mathrm{asin}\,(c+dx}}{}$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*asin(d*x+c))**(7/2),x)
```

output
```
Integral(1/(a**3*c*sqrt(a + b*asin(c + d*x)) + a**3*d*x*sqrt(a + b*asin(c
+ d*x)) + 3*a**2*b*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + 3*a**2*b*d*
x*sqrt(a + b*asin(c + d*x))*asin(c + d*x) + 3*a*b**2*c*sqrt(a + b*asin(c +
 d*x))*asin(c + d*x)**2 + 3*a*b**2*d*x*sqrt(a + b*asin(c + d*x))*asin(c +
d*x)**2 + b**3*c*sqrt(a + b*asin(c + d*x))*asin(c + d*x)**3 + b**3*d*x*sqr
t(a + b*asin(c + d*x))*asin(c + d*x)**3), x)/e
```

### 3.280.7 Maxima [N/A]

Not integrable

Time = 1.39 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="maxima")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(7/2)), x)
```

### 3.280.8 Giac [N/A]

Not integrable

Time = 15.60 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(dex+ce)(b\arcsin(dx+c)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(d*e*x+c*e)/(a+b*arcsin(d*x+c))^(7/2),x, algorithm="giac")
```

output
```
integrate(1/((d*e*x + c*e)*(b*arcsin(d*x + c) + a)^(7/2)), x)
```

### 3.280.9 Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{1}{(ce+dex)(a+b\arcsin(c+dx))^{7/2}}\,dx = \int \frac{1}{(c\,e+d\,e\,x)\,\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^{7/2}}\,dx$$

input
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(7/2)),x)
```

output
```
int(1/((c*e + d*e*x)*(a + b*asin(c + d*x))^(7/2)), x)
```

# 3.281 $\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx$



## 3.281.1 Optimal result

Integrand size = 23, antiderivative size = 156

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx = \frac{28be^2(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{405d} + \frac{4b(e(c+dx))^{7/2}\sqrt{1-(c+dx)^2}}{81d} + \frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9de} + \frac{28be^3\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{135d\sqrt{c+dx}}$$

output
```
2/9*(e*(d*x+c))^(9/2)*(a+b*arcsin(d*x+c))/d/e+28/135*b*e^3*EllipticE(1/2*(
-d*x-c+1)^(1/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/(d*x+c)^(1/2)+28/405*
b*e^2*(e*(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d+4/81*b*(e*(d*x+c))^(7/2)*(1-
(d*x+c)^2)^(1/2)/d
```

## 3.281.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.25 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.74

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx = \frac{2(e(c+dx))^{7/2}\left(45a(c+dx)^3+14b\sqrt{1-(c+dx)^2}+10b(c+dx)^2\sqrt{1-(c+dx)^2}\right.}{405d(c+d}$$

input
```
Integrate[(c*e + d*e*x)^(7/2)*(a + b*ArcSin[c + d*x]),x]
```

output
```
(2*(e*(c + d*x))^(7/2)*(45*a*(c + d*x)^3 + 14*b*Sqrt[1 - (c + d*x)^2] + 10
*b*(c + d*x)^2*Sqrt[1 - (c + d*x)^2] + 45*b*(c + d*x)^3*ArcSin[c + d*x] -
14*b*Hypergeometric2F1[1/2, 3/4, 7/4, (c + d*x)^2]))/(405*d*(c + d*x)^2)
```

## 3.281.3 Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.03, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {5304, 5138, 262, 262, 261, 259, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int (e(c+dx))^{7/2}(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9e}-\frac{2b\int \frac{(e(c+dx))^{9/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{9e}}{d}$$

$$\Big\downarrow \text{262}$$

$$\frac{\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9e}-\frac{2b\left(\frac{7}{9}e^2\int \frac{(e(c+dx))^{5/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{2}{9}e\sqrt{1-(c+dx)^2}(e(c+dx))^{7/2}\right)}{9e}}{d}$$

$$\Big\downarrow \text{262}$$

$$\frac{\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9e}-\frac{2b\left(\frac{7}{9}e^2\left(\frac{3}{5}e^2\int \frac{\sqrt{e(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{2}{5}e\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}\right)-\frac{2}{9}e\sqrt{1-(c+dx)^2}(e(c+dx))^{7/2}\right)}{9e}}{d}$$

$$\Big\downarrow \text{261}$$

$$\frac{\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9e}-\frac{2b\left(\frac{7}{9}e^2\left(\frac{3e^2\sqrt{e(c+dx)}\int\frac{\sqrt{c+dx}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{5\sqrt{c+dx}}-\frac{2}{5}e\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}\right)-\frac{2}{9}e\sqrt{1-(c+dx)^2}(e(c+dx))}{9e}}{d}$$

$\downarrow$ 259

$$\frac{\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9e}-\frac{2b\left(\frac{7}{9}e^2\left(-\frac{6e^2\sqrt{e(c+dx)}\int\frac{\sqrt{c+dx}}{\sqrt{\frac{1}{2}(c+dx-1)+1}}d\frac{\sqrt{-c-dx+1}}{\sqrt{2}}}{5\sqrt{c+dx}}-\frac{2}{5}e\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}\right)-\frac{2}{9}e\sqrt{1-(c+dx)^2}}{9e}}{d}$$

$\downarrow$ 327

$$\frac{\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{9e}-\frac{2b\left(\frac{7}{9}e^2\left(-\frac{6e^2\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{5\sqrt{c+dx}}-\frac{2}{5}e\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}\right)-\frac{2}{9}e\sqrt{1-(c+dx)^2}(e(c-}{9e}}{d}$$

input
```
Int[(c*e + d*e*x)^(7/2)*(a + b*ArcSin[c + d*x]),x]
```

output
```
((2*(e*(c + d*x))^(9/2)*(a + b*ArcSin[c + d*x]))/(9*e) - (2*b*((-2*e*(e*(c
 + d*x))^(7/2)*Sqrt[1 - (c + d*x)^2])/9 + (7*e^2*((-2*e*(e*(c + d*x))^(3/2
)*Sqrt[1 - (c + d*x)^2])/5 - (6*e^2*Sqrt[e*(c + d*x)]*EllipticE[ArcSin[Sqr
t[1 - c - d*x]/Sqrt[2]], 2])/(5*Sqrt[c + d*x])))/9))/(9*e))/d
```

### 3.281.3.1 Defintions of rubi rules used

rule 259
```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[-2/(Sqrt[a]*(-b/a
)^(3/4))   Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b
/a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

rule 261
```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[Sqrt[c*x]/
Sqrt[x]   Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ
[-b/a, 0]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.281.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.97 (sec) , antiderivative size = 228, normalized size of antiderivative = 1.46

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{2a(dex+ce)^{\frac{9}{2}}}{9}+2b\left(\frac{(dex+ce)^{\frac{9}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{9}-\frac{2\left(-\frac{e^{2}(dex+ce)^{\frac{7}{2}}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{9}-\frac{7e^{4}(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{45}-7e^{5}\sqrt{}\right.}{}\right.}{de}$ |
| default | $\frac{\frac{2a(dex+ce)^{\frac{9}{2}}}{9}+2b\left(\frac{(dex+ce)^{\frac{9}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{9}-\frac{2\left(-\frac{e^{2}(dex+ce)^{\frac{7}{2}}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{9}-\frac{7e^{4}(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{45}-7e^{5}\sqrt{}\right.}{}\right.}{de}$ |
| parts | $\frac{2a(dex+ce)^{\frac{9}{2}}}{9de}+\frac{2b\left(\frac{(dex+ce)^{\frac{9}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{9}-\frac{2\left(-\frac{e^{2}(dex+ce)^{\frac{7}{2}}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{9}-\frac{7e^{4}(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^{2}}{e^{2}}+1}}{45}-7e\right.}{}\right.}{ed}$ |

input
```
int((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*(1/9*a*(d*e*x+c*e)^(9/2)+b*(1/9*(d*e*x+c*e)^(9/2)*arcsin(1/e*(d*e*x+
c*e))-2/9/e*(-1/9*e^2*(d*e*x+c*e)^(7/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)-7/4
5*e^4*(d*e*x+c*e)^(3/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)-7/15*e^5/(1/e)^(1/2
)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e)^
2+1)^(1/2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-EllipticE((d*e*x+c*
e)^(1/2)*(1/e)^(1/2),I)))))
```

### 3.281.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.75

$$\int(ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx =$$

$$-\frac{2\left(42\sqrt{-d^3e}be^3\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)\right)-\left(45\,ad^5e^3x^4+180\,acd^4e^3x^3+2\right.\right.}{}$$

input
```
integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
-2/405*(42*sqrt(-d^3*e)*b*e^3*weierstrassZeta(4/d^2, 0, weierstrassPInvers
e(4/d^2, 0, (d*x + c)/d)) - (45*a*d^5*e^3*x^4 + 180*a*c*d^4*e^3*x^3 + 270*
a*c^2*d^3*e^3*x^2 + 180*a*c^3*d^2*e^3*x + 45*a*c^4*d*e^3 + 45*(b*d^5*e^3*x
^4 + 4*b*c*d^4*e^3*x^3 + 6*b*c^2*d^3*e^3*x^2 + 4*b*c^3*d^2*e^3*x + b*c^4*d
*e^3)*arcsin(d*x + c) + 2*(5*b*d^4*e^3*x^3 + 15*b*c*d^3*e^3*x^2 + (15*b*c^
2 + 7*b)*d^2*e^3*x + (5*b*c^3 + 7*b*c)*d*e^3)*sqrt(-d^2*x^2 - 2*c*d*x - c^
2 + 1))*sqrt(d*e*x + c*e))/d^2
```

### 3.281.6 Sympy [F(-1)]

Timed out.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx = \text{Timed out}$$

input
```
integrate((d*e*x+c*e)**(7/2)*(a+b*asin(d*x+c)),x)
```

output
```
Timed out
```

### 3.281.7 Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.281.8 Giac [F]

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx = \int (dex+ce)^{\frac{7}{2}}(b\arcsin(dx+c)+a)\,dx$$

input
```
integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^(7/2)*(b*arcsin(d*x + c) + a), x)
```

### 3.281.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))\,dx = \int (c\,e+d\,e\,x)^{7/2}\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

input
```
int((c*e + d*e*x)^(7/2)*(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^(7/2)*(a + b*asin(c + d*x)), x)
```

# 3.282 $\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx$



## 3.282.1 Optimal result

Integrand size = 23, antiderivative size = 136

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx=\frac{20be^2\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{147d}+\frac{4b(e(c+dx))^{5/2}\sqrt{1-(c+dx)^2}}{49d}+\frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7de}-\frac{20be^{5/2}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{147d}$$

output
```
2/7*(e*(d*x+c))^(7/2)*(a+b*arcsin(d*x+c))/d/e-20/147*b*e^(5/2)*EllipticF((
e*(d*x+c))^(1/2)/e^(1/2),I)/d+4/49*b*(e*(d*x+c))^(5/2)*(1-(d*x+c)^2)^(1/2)
/d+20/147*b*e^2*(e*(d*x+c))^(1/2)*(1-(d*x+c)^2)^(1/2)/d
```

## 3.282.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.19 (sec) , antiderivative size = 115, normalized size of antiderivative = 0.85

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx=\frac{2(e(c+dx))^{5/2}\left(21a(c+dx)^3+10b\sqrt{1-(c+dx)^2}+6b(c+dx)^2\sqrt{1-(c+dx)^2}+\cdots\right.}{147d(c+d\cdots}$$

input
```
Integrate[(c*e + d*e*x)^(5/2)*(a + b*ArcSin[c + d*x]),x]
```

output
```
(2*(e*(c + d*x))^(5/2)*(21*a*(c + d*x)^3 + 10*b*Sqrt[1 - (c + d*x)^2] + 6*
b*(c + d*x)^2*Sqrt[1 - (c + d*x)^2] + 21*b*(c + d*x)^3*ArcSin[c + d*x] - 1
0*b*Hypergeometric2F1[1/4, 1/2, 5/4, (c + d*x)^2]))/(147*d*(c + d*x)^2)
```

## 3.282.3 Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.04, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {5304, 5138, 262, 262, 266, 762}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int (e(c+dx))^{5/2}(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \ 5138$$

$$\frac{\frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7e}-\frac{2b\int \frac{(e(c+dx))^{7/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{7e}}{d}$$

$$\Big\downarrow \ 262$$

$$\frac{\frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7e}-\frac{2b\left(\frac{5}{7}e^2\int \frac{(e(c+dx))^{3/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{2}{7}e\sqrt{1-(c+dx)^2}(e(c+dx))^{5/2}\right)}{7e}}{d}$$

$$\Big\downarrow \ 262$$

$$\frac{\frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7e}-\frac{2b\left(\frac{5}{7}e^2\left(\frac{1}{3}e^2\int \frac{1}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{2}{3}e\sqrt{1-(c+dx)^2}\sqrt{e(c+dx)}\right)-\frac{2}{7}e\sqrt{1-(c+dx)^2}(e(c+dx))^{5/}}{7e}}{d}$$

$$\Big\downarrow \ 266$$

$$\frac{\frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7e}-\frac{2b\left(\frac{5}{7}e^2\left(\frac{2}{3}e\int\frac{1}{\sqrt{1-(c+dx)^2}}d\sqrt{e(c+dx)}-\frac{2}{3}e\sqrt{1-(c+dx)^2}\sqrt{e(c+dx)}\right)-\frac{2}{7}e\sqrt{1-(c+dx)^2}(e(c+dx))^{5/2}\right)}{7e}}{d}$$

$$\Big\downarrow \text{762}$$

$$\frac{\frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{7e}-\frac{2b\left(\frac{5}{7}e^2\left(\frac{2}{3}e^{3/2}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)-\frac{2}{3}e\sqrt{1-(c+dx)^2}\sqrt{e(c+dx)}\right)-\frac{2}{7}e\sqrt{1-(c+dx)^2}(e(c+d}{7e}}{d}$$

input
```
Int[(c*e + d*e*x)^(5/2)*(a + b*ArcSin[c + d*x]),x]
```

output
```
((2*(e*(c + d*x))^(7/2)*(a + b*ArcSin[c + d*x]))/(7*e) - (2*b*((-2*e*(e*(c
 + d*x))^(5/2)*Sqrt[1 - (c + d*x)^2])/7 + (5*e^2*((-2*e*Sqrt[e*(c + d*x)]*
Sqrt[1 - (c + d*x)^2])/3 + (2*e^(3/2)*EllipticF[ArcSin[Sqrt[e*(c + d*x)]/S
qrt[e]], -1])/3))/7))/(7*e))/d
```

### 3.282.3.1 Defintions of rubi rules used

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 266
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{k = De
nominator[m]}, Simp[k/c   Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(2*k)/c^2))
^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && FractionQ[m] && I
ntBinomialQ[a, b, c, 2, m, p, x]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.282.4 Maple [A] (verified)

Time = 2.88 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.51

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{2a(dex+ce)^{\frac{7}{2}}}{7}+2b\left(\frac{(dex+ce)^{\frac{7}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{7}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{5}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{7}-\frac{5e^4\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{21}+\frac{5e^4\sqrt{1\cdots}}{\cdots}\right)}{7e}\cdots\right)}{de}$ |
| default | $\frac{\frac{2a(dex+ce)^{\frac{7}{2}}}{7}+2b\left(\frac{(dex+ce)^{\frac{7}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{7}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{5}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{7}-\frac{5e^4\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{21}+\frac{5e^4\sqrt{1\cdots}}{\cdots}\right)}{7e}\cdots\right)}{de}$ |
| parts | $\frac{2a(dex+ce)^{\frac{7}{2}}}{7de}+\frac{2b\left(\frac{(dex+ce)^{\frac{7}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{7}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{5}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{7}-\frac{5e^4\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{21}+\frac{5e^4\cdots}{\cdots}\right)}{7e}\cdots\right)}{ed}$ |

input
```
int((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*(1/7*a*(d*e*x+c*e)^(7/2)+b*(1/7*(d*e*x+c*e)^(7/2)*arcsin(1/e*(d*e*x+
c*e))-2/7/e*(-1/7*e^2*(d*e*x+c*e)^(5/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)-5/2
1*e^4*(d*e*x+c*e)^(1/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)+5/21*e^4/(1/e)^(1/2
)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e)^
2+1)^(1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I))))
```

### 3.282.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.12 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.62

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \frac{2\left(10\sqrt{-d^3e}be^2\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)+\left(21\,ad^5e^2x^3+63\,acd^4e^2x^2+63\,ac\right.\right.}{}$$

input
```
integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
2/147*(10*sqrt(-d^3*e)*b*e^2*weierstrassPInverse(4/d^2, 0, (d*x + c)/d) +
(21*a*d^5*e^2*x^3 + 63*a*c*d^4*e^2*x^2 + 63*a*c^2*d^3*e^2*x + 21*a*c^3*d^2
*e^2 + 21*(b*d^5*e^2*x^3 + 3*b*c*d^4*e^2*x^2 + 3*b*c^2*d^3*e^2*x + b*c^3*d
^2*e^2)*arcsin(d*x + c) + 2*(3*b*d^4*e^2*x^2 + 6*b*c*d^3*e^2*x + (3*b*c^2
+ 5*b)*d^2*e^2)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))*sqrt(d*e*x + c*e))/d^3
```

### 3.282.6 Sympy [F(-1)]

Timed out.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \text{Timed out}$$

input
```
integrate((d*e*x+c*e)**(5/2)*(a+b*asin(d*x+c)),x)
```

output
```
Timed out
```

### 3.282.7 Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.282.8 Giac [F]

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \int (dex+ce)^{\frac{5}{2}}(b\arcsin(dx+c)+a)\,dx$$

input
```
integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^(5/2)*(b*arcsin(d*x + c) + a), x)
```

### 3.282.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))\,dx = \int (c\,e+d\,e\,x)^{5/2}\,(a+b\,\mathrm{asin}(c+d\,x))\,dx$$

input
```
int((c*e + d*e*x)^(5/2)*(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^(5/2)*(a + b*asin(c + d*x)), x)
```

# 3.283 $\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx$



## 3.283.1 Optimal result

Integrand size = 23, antiderivative size = 117

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx=\frac{4b(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}{25d}+\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5de}+\frac{12be\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{25d\sqrt{c+dx}}$$

output
```
2/5*(e*(d*x+c))^(5/2)*(a+b*arcsin(d*x+c))/d/e+12/25*b*e*EllipticE(1/2*(-d*
x-c+1)^(1/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/(d*x+c)^(1/2)+4/25*b*(e*
(d*x+c))^(3/2)*(1-(d*x+c)^2)^(1/2)/d
```

## 3.283.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.06 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.74

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx=\frac{2(e(c+dx))^{3/2}\left(5ac+5adx+2b\sqrt{1-(c+dx)^2}+5bc\arcsin(c+dx)+5bdx\arcsin\right.}{25d}$$

input
```
Integrate[(c*e + d*e*x)^(3/2)*(a + b*ArcSin[c + d*x]),x]
```

output
```
(2*(e*(c + d*x))^(3/2)*(5*a*c + 5*a*d*x + 2*b*Sqrt[1 - (c + d*x)^2] + 5*b*
c*ArcSin[c + d*x] + 5*b*d*x*ArcSin[c + d*x] - 2*b*Hypergeometric2F1[1/2, 3
/4, 7/4, (c + d*x)^2]))/(25*d)
```

### 3.283.3 Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.04, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {5304, 5138, 262, 261, 259, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int (e(c+dx))^{3/2}(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5e}-\frac{2b\int \frac{(e(c+dx))^{5/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{5e}}{d}$$

$$\Big\downarrow \text{262}$$

$$\frac{\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5e}-\frac{2b\left(\frac{3}{5}e^2\int \frac{\sqrt{e(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{2}{5}e\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}\right)}{5e}}{d}$$

$$\Big\downarrow \text{261}$$

$$\frac{\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5e}-\frac{2b\left(\frac{3e^2\sqrt{e(c+dx)}\int \frac{\sqrt{c+dx}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{5\sqrt{c+dx}}-\frac{2}{5}e\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}\right)}{5e}}{d}$$

$$\Big\downarrow \text{259}$$

$$\frac{\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5e}-\frac{2b\left(-\frac{6e^2\sqrt{e(c+dx)}\int \frac{\sqrt{c+dx}}{\sqrt{\frac{1}{2}(c+dx-1)+1}}d\frac{\sqrt{-c-dx+1}}{\sqrt{2}}}{5\sqrt{c+dx}}-\frac{2}{5}e\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}\right)}{5e}}{d}$$

$$\Big\downarrow \text{327}$$

$$\frac{\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{5e}-\frac{2b\left(-\frac{6e^2\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{5\sqrt{c+dx}}-\frac{2}{5}e\sqrt{1-(c+dx)^2}(e(c+dx))^{3/2}\right)}{5e}}{d}$$

input
```
Int[(c*e + d*e*x)^(3/2)*(a + b*ArcSin[c + d*x]),x]
```

output
```
((2*(e*(c + d*x))^(5/2)*(a + b*ArcSin[c + d*x]))/(5*e) - (2*b*((-2*e*(e*(c
 + d*x))^(3/2)*Sqrt[1 - (c + d*x)^2])/5 - (6*e^2*Sqrt[e*(c + d*x)]*Ellipti
cE[ArcSin[Sqrt[1 - c - d*x]/Sqrt[2]], 2])/(5*Sqrt[c + d*x])))/(5*e))/d
```

### 3.283.3.1 Defintions of rubi rules used

rule 259
```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[-2/(Sqrt[a]*(-b/a
)^(3/4))   Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b
/a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

rule 261
```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[Sqrt[c*x]/
Sqrt[x]   Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ
[-b/a, 0]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.283.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.45 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.66

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{2a(dex+ce)^{\frac{5}{2}}}{5}+2b\left(\frac{(dex+ce)^{\frac{5}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{5}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{5}-\frac{3e^3\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\right.}{5\sqrt{\frac{1}{e}}\sqrt{}}\right.}{5e}\right.}{de}$ |
| default | $\frac{\frac{2a(dex+ce)^{\frac{5}{2}}}{5}+2b\left(\frac{(dex+ce)^{\frac{5}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{5}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{5}-\frac{3e^3\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\right.}{5\sqrt{\frac{1}{e}}\sqrt{}}\right.}{5e}\right.}{de}$ |
| parts | $\frac{2a(dex+ce)^{\frac{5}{2}}}{5de}+\frac{2b\left(\frac{(dex+ce)^{\frac{5}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{5}-\frac{2\left(-\frac{e^2(dex+ce)^{\frac{3}{2}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{5}-\frac{3e^3\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{Ellip}\right.}{5\sqrt{}}\right.}{5e}\right.}{ed}$ |

input
```
int((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*(1/5*a*(d*e*x+c*e)^(5/2)+b*(1/5*(d*e*x+c*e)^(5/2)*arcsin(1/e*(d*e*x+
c*e))-2/5/e*(-1/5*e^2*(d*e*x+c*e)^(3/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)-3/5
*e^3/(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e
^2*(d*e*x+c*e)^2+1)^(1/2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-Elli
pticE((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)))))
```

### 3.283.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 152, normalized size of antiderivative = 1.30

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx =$$

$$-\frac{2\left(6\sqrt{-d^3e}be\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)\right)-\left(5ad^3ex^2+10acd^2ex+5ac^2de\right.\right.}{25\,d}$$

input
```
integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
-2/25*(6*sqrt(-d^3*e)*b*e*weierstrassZeta(4/d^2, 0, weierstrassPInverse(4/
d^2, 0, (d*x + c)/d)) - (5*a*d^3*e*x^2 + 10*a*c*d^2*e*x + 5*a*c^2*d*e + 5*
(b*d^3*e*x^2 + 2*b*c*d^2*e*x + b*c^2*d*e)*arcsin(d*x + c) + 2*(b*d^2*e*x +
 b*c*d*e)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))*sqrt(d*e*x + c*e))/d^2
```

### 3.283.6 Sympy [F]

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx = \int (e(c+dx))^{\frac{3}{2}}\,(a+b\operatorname{asin}(c+dx))\,dx$$

input
```
integrate((d*e*x+c*e)**(3/2)*(a+b*asin(d*x+c)),x)
```

output
```
Integral((e*(c + d*x))**(3/2)*(a + b*asin(c + d*x)), x)
```

### 3.283.7 Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.283.8 Giac [F]

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx=\int (dex+ce)^{\frac{3}{2}}(b\arcsin(dx+c)+a)\,dx$$

input
```
integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^(3/2)*(b*arcsin(d*x + c) + a), x)
```

### 3.283.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))\,dx=\int (c\,e+d\,e\,x)^{3/2}\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)\,dx$$

input
```
int((c*e + d*e*x)^(3/2)*(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^(3/2)*(a + b*asin(c + d*x)), x)
```

# 3.284 $\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx$



## 3.284.1 Optimal result

Integrand size = 23, antiderivative size = 99

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx=\frac{4b\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}{9d}+\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3de}-\frac{4b\sqrt{e}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{9d}$$

output
```
2/3*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))/d/e-4/9*b*EllipticF((e*(d*x+c))^
(1/2)/e^(1/2),I)*e^(1/2)/d+4/9*b*(e*(d*x+c))^(1/2)*(1-(d*x+c)^2)^(1/2)/d
```

## 3.284.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.04 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.88

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx$$
$$=\frac{2\sqrt{e(c+dx)}\left(3ac+3adx+2b\sqrt{1-(c+dx)^2}+3bc\arcsin(c+dx)+3bdx\arcsin(c+dx)-2b\,\text{Hypergeo}\right.}{9d}$$

input
```
Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x]),x]
```

output
```
(2*Sqrt[e*(c + d*x)]*(3*a*c + 3*a*d*x + 2*b*Sqrt[1 - (c + d*x)^2] + 3*b*c*
ArcSin[c + d*x] + 3*b*d*x*ArcSin[c + d*x] - 2*b*Hypergeometric2F1[1/4, 1/2
, 5/4, (c + d*x)^2]))/(9*d)
```

## 3.284.3 Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.03, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {5304, 5138, 262, 266, 762}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \sqrt{e(c+dx)}(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3e}-\frac{2b\int \frac{(e(c+dx))^{3/2}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{3e}}{d}$$

$$\Big\downarrow \text{262}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3e}-\frac{2b\left(\frac{1}{3}e^2\int \frac{1}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)-\frac{2}{3}e\sqrt{1-(c+dx)^2}\sqrt{e(c+dx)}\right)}{3e}}{d}$$

$$\Big\downarrow \text{266}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3e}-\frac{2b\left(\frac{2}{3}e\int \frac{1}{\sqrt{1-(c+dx)^2}}d\sqrt{e(c+dx)}-\frac{2}{3}e\sqrt{1-(c+dx)^2}\sqrt{e(c+dx)}\right)}{3e}}{d}$$

$$\Big\downarrow \text{762}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{3e}-\frac{2b\left(\frac{2}{3}e^{3/2}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)-\frac{2}{3}e\sqrt{1-(c+dx)^2}\sqrt{e(c+dx)}\right)}{3e}}{d}$$

input
```
Int[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x]),x]
```

output
```
((2*(e*(c + d*x))^(3/2)*(a + b*ArcSin[c + d*x]))/(3*e) - (2*b*((-2*e*Sqrt[
e*(c + d*x)]*Sqrt[1 - (c + d*x)^2])/3 + (2*e^(3/2)*EllipticF[ArcSin[Sqrt[e
*(c + d*x)]/Sqrt[e]], -1])/3))/(3*e))/d
```

#### 3.284.3.1 Defintions of rubi rules used

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 266
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{k = De
nominator[m]}, Simp[k/c   Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(2*k)/c^2))
^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && FractionQ[m] && I
ntBinomialQ[a, b, c, 2, m, p, x]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.284.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 171 vs. 2(81) = 162.

Time = 2.04 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.74

| method | result |
|---|---|
| derivativedivides | $\frac{\frac{2(dex+ce)^{\frac{3}{2}}a}{3}+2b\left(\frac{(dex+ce)^{\frac{3}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{3}-\frac{2\left(-\frac{e^2\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3}+\frac{e^2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\operatorname{EllipticF}\left(\sqrt{\cdots}\right.}{3\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\cdots\right.}{3e}\cdots\right.}{de}$ |
| default | $\frac{\frac{2(dex+ce)^{\frac{3}{2}}a}{3}+2b\left(\frac{(dex+ce)^{\frac{3}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{3}-\frac{2\left(-\frac{e^2\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3}+\frac{e^2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\operatorname{EllipticF}\left(\sqrt{\cdots}\right.}{3\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\cdots\right.}{3e}\cdots\right.}{de}$ |
| parts | $\frac{2a(dex+ce)^{\frac{3}{2}}}{3de}+\frac{2b\left(\frac{(dex+ce)^{\frac{3}{2}}\arcsin\left(\frac{dex+ce}{e}\right)}{3}-\frac{2\left(-\frac{e^2\sqrt{dex+ce}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3}+\frac{e^2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\operatorname{EllipticF}\cdots}{3\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+\cdots}}\cdots\right.}{3e}\cdots\right.}{ed}$ |

input
```
int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c)),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*(1/3*(d*e*x+c*e)^(3/2)*a+b*(1/3*(d*e*x+c*e)^(3/2)*arcsin(1/e*(d*e*x+
c*e))-2/3/e*(-1/3*e^2*(d*e*x+c*e)^(1/2)*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)+1/3
*e^2/(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e
^2*(d*e*x+c*e)^2+1)^(1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I))))
```

### 3.284.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.09

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx$$
$$= \frac{2\left(2\sqrt{-d^3e}b\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)+\left(3\,ad^3x+3\,acd^2+2\sqrt{-d^2x^2-2\,cdx-c^2+1}bd^2+3\,(bd^3\right.\right.}{9\,d^3}$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
2/9*(2*sqrt(-d^3*e)*b*weierstrassPInverse(4/d^2, 0, (d*x + c)/d) + (3*a*d^
3*x + 3*a*c*d^2 + 2*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1)*b*d^2 + 3*(b*d^3*x
+ b*c*d^2)*arcsin(d*x + c))*sqrt(d*e*x + c*e))/d^3
```

### 3.284.6 Sympy [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx = \int \sqrt{e\,(c+dx)}(a+b\,\mathrm{asin}\,(c+dx))\;dx$$

input
```
integrate((d*e*x+c*e)**(1/2)*(a+b*asin(d*x+c)),x)
```

output
```
Integral(sqrt(e*(c + d*x))*(a + b*asin(c + d*x)), x)
```

### 3.284.7 Maxima [F(-2)]

Exception generated.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.284.8 Giac [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx = \int \sqrt{dex+ce}(b\arcsin\left(dx+c\right)+a)\,dx$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
integrate(sqrt(d*e*x + c*e)*(b*arcsin(d*x + c) + a), x)
```

### 3.284.9 Mupad [F(-1)]

Timed out.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))\,dx = \int \sqrt{c\,e+d\,e\,x}\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)\,dx$$

input
```
int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x)), x)
```

# 3.285 $\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx$



## 3.285.1 Optimal result

Integrand size = 23, antiderivative size = 81

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{de} + \frac{4b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{de\sqrt{c+dx}}$$

output
```
2*(a+b*arcsin(d*x+c))*(e*(d*x+c))^(1/2)/d/e+4*b*EllipticE(1/2*(-d*x-c+1)^(
1/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/e/(d*x+c)^(1/2)
```

## 3.285.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.04 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.73

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = -\frac{2\sqrt{e(c+dx)}\left(-3(a+b\arcsin(c+dx))+2b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},(c+dx)^2\right)\right)}{3de}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/Sqrt[c*e + d*e*x],x]
```

output
```
(-2*Sqrt[e*(c + d*x)]*(-3*(a + b*ArcSin[c + d*x]) + 2*b*(c + d*x)*Hypergeo
metric2F1[1/2, 3/4, 7/4, (c + d*x)^2]))/(3*d*e)
```

### 3.285.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.98, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {5304, 5138, 261, 259, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{\sqrt{e(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \ 5138$$

$$\frac{\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{e}-\frac{2b\int \frac{\sqrt{e(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e}}{d}$$

$$\Big\downarrow \ 261$$

$$\frac{\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{e}-\frac{2b\sqrt{e(c+dx)}\int \frac{\sqrt{c+dx}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e\sqrt{c+dx}}}{d}$$

$$\Big\downarrow \ 259$$

$$\frac{\frac{4b\sqrt{e(c+dx)}\int \frac{\sqrt{c+dx}}{\sqrt{\frac{1}{2}(c+dx-1)+1}}d\frac{\sqrt{-c-dx+1}}{\sqrt{2}}}{e\sqrt{c+dx}}+\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{e}}{d}$$

$$\Big\downarrow \ 327$$

$$\frac{\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{e}+\frac{4b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{e\sqrt{c+dx}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])/Sqrt[c*e + d*e*x],x]
```

output
```
((2*Sqrt[e*(c + d*x)]*(a + b*ArcSin[c + d*x]))/e + (4*b*Sqrt[e*(c + d*x)]*
EllipticE[ArcSin[Sqrt[1 - c - d*x]/Sqrt[2]], 2])/(e*Sqrt[c + d*x]))/d
```

### 3.285.3.1 Defintions of rubi rules used

rule 259
```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[-2/(Sqrt[a]*(-b/a
)^(3/4))   Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b
/a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

rule 261
```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[Sqrt[c*x]/
Sqrt[x]   Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ
[-b/a, 0]
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.285.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.77 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.84

| method | result |
|---|---|
| derivativedivides | $\frac{2\sqrt{dex+ce}\,a+2b\left(\sqrt{dex+ce}\,\arcsin\left(\frac{dex+ce}{e}\right)+\frac{2\sqrt{1-\frac{dex+ce}{e}}\,\sqrt{1+\frac{dex+ce}{e}}\,\left(\text{EllipticF}\left(\sqrt{dex+ce}\,\sqrt{\frac{1}{e}},i\right)-\text{EllipticE}\left(\sqrt{dex+ce}\,\sqrt{\right.\right.}{\sqrt{\frac{1}{e}}\,\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right.}{de}$ |
| default | $\frac{2\sqrt{dex+ce}\,a+2b\left(\sqrt{dex+ce}\,\arcsin\left(\frac{dex+ce}{e}\right)+\frac{2\sqrt{1-\frac{dex+ce}{e}}\,\sqrt{1+\frac{dex+ce}{e}}\,\left(\text{EllipticF}\left(\sqrt{dex+ce}\,\sqrt{\frac{1}{e}},i\right)-\text{EllipticE}\left(\sqrt{dex+ce}\,\sqrt{\right.\right.}{\sqrt{\frac{1}{e}}\,\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right.}{de}$ |
| parts | $\frac{2a\sqrt{dex+ce}}{de}+\frac{2b\left(\sqrt{dex+ce}\,\arcsin\left(\frac{dex+ce}{e}\right)+\frac{2\sqrt{1-\frac{dex+ce}{e}}\,\sqrt{1+\frac{dex+ce}{e}}\,\left(\text{EllipticF}\left(\sqrt{dex+ce}\,\sqrt{\frac{1}{e}},i\right)-\text{EllipticE}\left(\sqrt{dex+c\right.\right.}{\sqrt{\frac{1}{e}}\,\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right.}{ed}$ |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*((d*e*x+c*e)^(1/2)*a+b*((d*e*x+c*e)^(1/2)*arcsin(1/e*(d*e*x+c*e))+2/
(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d
*e*x+c*e)^2+1)^(1/2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-EllipticE
((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I))))
```

### 3.285.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.09 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.84

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = -\frac{2\left(2\sqrt{-d^3e}b\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)\right)-\sqrt{dex+ce}(bd\arcsin(dx+c)+\right.}{d^2e}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(1/2),x, algorithm="fricas")
```

output
```
-2*(2*sqrt(-d^3*e)*b*weierstrassZeta(4/d^2, 0, weierstrassPInverse(4/d^2,
0, (d*x + c)/d)) - sqrt(d*e*x + c*e)*(b*d*arcsin(d*x + c) + a*d))/(d^2*e)
```

### 3.285.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.285.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(1/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.285.8 Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx = \int \frac{b\arcsin(dx+c)+a}{\sqrt{dex+ce}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(1/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)/sqrt(d*e*x + c*e), x)
```

### 3.285.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{\sqrt{ce+dex}}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{\sqrt{c\,e+d\,e\,x}}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(1/2),x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(1/2), x)
```

# 3.286 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx$



## 3.286.1 Optimal result

Integrand size = 23, antiderivative size = 61

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx=-\frac{2(a+b\arcsin(c+dx))}{de\sqrt{e(c+dx)}}+\frac{4b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{de^{3/2}}$$

output
```
4*b*EllipticF((e*(d*x+c))^(1/2)/e^(1/2),I)/d/e^(3/2)-2*(a+b*arcsin(d*x+c))
/d/e/(e*(d*x+c))^(1/2)
```

## 3.286.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.03 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.89

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx = -\frac{2\left(a+b\arcsin(c+dx)-2b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},(c+dx)^2\right)\right)}{de\sqrt{e(c+dx)}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(3/2),x]
```

output
```
(-2*(a + b*ArcSin[c + d*x] - 2*b*(c + d*x)*Hypergeometric2F1[1/4, 1/2, 5/4
, (c + d*x)^2]))/(d*e*Sqrt[e*(c + d*x)])
```

### 3.286.3 Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.97, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {5304, 5138, 266, 762}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{(e(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5138}$$

$$\frac{\frac{2b\int \frac{1}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)}{e}-\frac{2(a+b\arcsin(c+dx))}{e\sqrt{e(c+dx)}}}{d}$$

$$\Big\downarrow \text{ 266}$$

$$\frac{\frac{4b\int \frac{1}{\sqrt{1-(c+dx)^2}}d\sqrt{e(c+dx)}}{e^2}-\frac{2(a+b\arcsin(c+dx))}{e\sqrt{e(c+dx)}}}{d}$$

$$\Big\downarrow \text{ 762}$$

$$\frac{\frac{4b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{e^{3/2}}-\frac{2(a+b\arcsin(c+dx))}{e\sqrt{e(c+dx)}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(3/2),x]
```

output
```
((-2*(a + b*ArcSin[c + d*x]))/(e*Sqrt[e*(c + d*x)]) + (4*b*EllipticF[ArcSi
n[Sqrt[e*(c + d*x)]/Sqrt[e]], -1])/e^(3/2))/d
```

#### 3.286.3.1 Defintions of rubi rules used

rule 266
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{k = De
nominator[m]}, Simp[k/c   Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(2*k)/c^2))
^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && FractionQ[m] && I
ntBinomialQ[a, b, c, 2, m, p, x]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.286.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 131 vs. 2(53) = 106.

Time = 1.53 (sec) , antiderivative size = 132, normalized size of antiderivative = 2.16

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{-\frac{2a}{\sqrt{dex+ce}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\,\sqrt{1+\frac{dex+ce}{e}}\,\operatorname{EllipticF}\left(\sqrt{dex+ce}\,\sqrt{\frac{1}{e}},i\right)}{e\sqrt{\frac{1}{e}}\,\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right)}{de}$ | 132 |
| default | $\frac{-\frac{2a}{\sqrt{dex+ce}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\,\sqrt{1+\frac{dex+ce}{e}}\,\operatorname{EllipticF}\left(\sqrt{dex+ce}\,\sqrt{\frac{1}{e}},i\right)}{e\sqrt{\frac{1}{e}}\,\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right)}{de}$ | 132 |
| parts | $-\frac{2a}{\sqrt{dex+ce}\,de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\,\sqrt{1+\frac{dex+ce}{e}}\,\operatorname{EllipticF}\left(\sqrt{dex+ce}\,\sqrt{\frac{1}{e}},i\right)}{e\sqrt{\frac{1}{e}}\,\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}\right)}{ed}$ | 137 |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*(-a/(d*e*x+c*e)^(1/2)+b*(-1/(d*e*x+c*e)^(1/2)*arcsin(1/e*(d*e*x+c*e)
)+2/e/(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/
e^2*(d*e*x+c*e)^2+1)^(1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)))
```

### 3.286.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.38

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx = -\frac{2\left(2\sqrt{-d^3e}(bdx+bc)\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)+\left(bd^2\arcsin\left(dx+c\right)+ad^2\right)\sqrt{dex+ce}\right)}{d^4e^2x+cd^3e^2}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(3/2),x, algorithm="fricas")
```

output
```
-2*(2*sqrt(-d^3*e)*(b*d*x + b*c)*weierstrassPInverse(4/d^2, 0, (d*x + c)/d
) + (b*d^2*arcsin(d*x + c) + a*d^2)*sqrt(d*e*x + c*e))/(d^4*e^2*x + c*d^3*
e^2)
```

### 3.286.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{3/2}}\,dx = \int \frac{a+b\operatorname{asin}\left(c+dx\right)}{\left(e\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(3/2),x)
```

output
```
Integral((a + b*asin(c + d*x))/(e*(c + d*x))**(3/2), x)
```

### 3.286.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^{3/2}} \, dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(3/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.286.8 Giac [F]

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^{3/2}} \, dx = \int \frac{b \arcsin(dx + c) + a}{(dex + ce)^{\frac{3}{2}}} \, dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(3/2), x)
```

### 3.286.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin(c + dx)}{(ce + dex)^{3/2}} \, dx = \int \frac{a + b \operatorname{asin}(c + d x)}{(c e + d e x)^{3/2}} \, dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(3/2),x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(3/2), x)
```

# 3.287 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx$



## 3.287.1 Optimal result

Integrand size = 23, antiderivative size = 122

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx = -\frac{4b\sqrt{1-(c+dx)^2}}{3de^2\sqrt{e(c+dx)}} - \frac{2(a+b\arcsin(c+dx))}{3de(e(c+dx))^{3/2}} + \frac{4b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{3de^3\sqrt{c+dx}}$$

output
```
-2/3*(a+b*arcsin(d*x+c))/d/e/(e*(d*x+c))^(3/2)+4/3*b*EllipticE(1/2*(-d*x-c
+1)^(1/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/e^3/(d*x+c)^(1/2)-4/3*b*(1-
(d*x+c)^2)^(1/2)/d/e^2/(e*(d*x+c))^(1/2)
```

## 3.287.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.04 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.46

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx = -\frac{2\left(a+b\arcsin(c+dx)+2b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},(c+dx)^2\right)\right)}{3de(e(c+dx))^{3/2}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(5/2),x]
```

output
```
(-2*(a + b*ArcSin[c + d*x] + 2*b*(c + d*x)*Hypergeometric2F1[-1/4, 1/2, 3/
4, (c + d*x)^2]))/(3*d*e*(e*(c + d*x))^(3/2))
```

### 3.287.3 Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.98, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {5304, 5138, 264, 261, 259, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{(e(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2b\int \frac{1}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{3e}-\frac{2(a+b\arcsin(c+dx))}{3e(e(c+dx))^{3/2}}}{d}$$

$$\Big\downarrow \text{264}$$

$$\frac{\frac{2b\left(-\frac{\int \frac{\sqrt{e(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e^2}-\frac{2\sqrt{1-(c+dx)^2}}{e\sqrt{e(c+dx)}}\right)}{3e}-\frac{2(a+b\arcsin(c+dx))}{3e(e(c+dx))^{3/2}}}{d}$$

$$\Big\downarrow \text{261}$$

$$\frac{\frac{2b\left(-\frac{\sqrt{e(c+dx)}\int \frac{\sqrt{c+dx}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e^2\sqrt{c+dx}}-\frac{2\sqrt{1-(c+dx)^2}}{e\sqrt{e(c+dx)}}\right)}{3e}-\frac{2(a+b\arcsin(c+dx))}{3e(e(c+dx))^{3/2}}}{d}$$

$$\Big\downarrow \text{259}$$

$$\frac{\frac{2b\left(\frac{2\sqrt{e(c+dx)}\int \frac{\sqrt{c+dx}}{\sqrt{\frac{1}{2}(c+dx-1)+1}}d\frac{\sqrt{-c-dx+1}}{\sqrt{2}}}{e^2\sqrt{c+dx}}-\frac{2\sqrt{1-(c+dx)^2}}{e\sqrt{e(c+dx)}}\right)}{3e}-\frac{2(a+b\arcsin(c+dx))}{3e(e(c+dx))^{3/2}}}{d}$$

$$\Big\downarrow \text{327}$$

$$\frac{\frac{2b\left(\frac{2\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{e^2\sqrt{c+dx}}-\frac{2\sqrt{1-(c+dx)^2}}{e\sqrt{e(c+dx)}}\right)}{3e}-\frac{2(a+b\arcsin(c+dx))}{3e(e(c+dx))^{3/2}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(5/2),x]
```

output
```
((-2*(a + b*ArcSin[c + d*x]))/(3*e*(e*(c + d*x))^(3/2)) + (2*b*((-2*Sqrt[1
 - (c + d*x)^2])/(e*Sqrt[e*(c + d*x)]) + (2*Sqrt[e*(c + d*x)]*EllipticE[Ar
cSin[Sqrt[1 - c - d*x]/Sqrt[2]], 2])/(e^2*Sqrt[c + d*x])))/(3*e))/d
```

### 3.287.3.1 Defintions of rubi rules used

rule 259
```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[-2/(Sqrt[a]*(-b/a
)^(3/4))   Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b
/a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

rule 261
```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[Sqrt[c*x]/
Sqrt[x]   Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ
[-b/a, 0]
```

rule 264
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(c*x)^(
m + 1)*((a + b*x^2)^(p + 1)/(a*c*(m + 1))), x] - Simp[b*((m + 2*p + 3)/(a*c
^2*(m + 1)))   Int[(c*x)^(m + 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, p
}, x] && LtQ[m, -1] && IntBinomialQ[a, b, c, 2, m, p, x]
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.287.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 1.72 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.56

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{2a}{3(dex+ce)^{\frac{3}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{3(dex+ce)^{\frac{3}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)-\text{Ellipti}\cdots\right.}{3e\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right.}{de}$ |
| default | $\frac{-\frac{2a}{3(dex+ce)^{\frac{3}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{3(dex+ce)^{\frac{3}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)-\text{Ellipti}\cdots\right.}{3e\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right.}{de}$ |
| parts | $-\frac{2a}{3(dex+ce)^{\frac{3}{2}}de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{3(dex+ce)^{\frac{3}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{3\sqrt{dex+ce}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)-\cdots\right.}{3e\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right.}{ed}$ |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*(-1/3*a/(d*e*x+c*e)^(3/2)+b*(-1/3/(d*e*x+c*e)^(3/2)*arcsin(1/e*(d*e*
x+c*e))+2/3/e*(-(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(1/2)+1/e/(1/e)
^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+
c*e)^2+1)^(1/2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-EllipticE((d*e
*x+c*e)^(1/2)*(1/e)^(1/2),I)))))
```

### 3.287.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.21

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx =$$
$$-\frac{2\left(2\left(bd^2x^2+2\,bcdx+bc^2\right)\sqrt{-d^3e}\,\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)\right)+\sqrt{dex+ce}\,(bc\right.}{3\left(d^4e^3x^2+2\,cd^3e^3x+c^2d^2e^3\right)}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(5/2),x, algorithm="fricas")
```

output
```
-2/3*(2*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*sqrt(-d^3*e)*weierstrassZeta(4/d^2
, 0, weierstrassPInverse(4/d^2, 0, (d*x + c)/d)) + sqrt(d*e*x + c*e)*(b*d*
arcsin(d*x + c) + a*d + 2*(b*d^2*x + b*c*d)*sqrt(-d^2*x^2 - 2*c*d*x - c^2
+ 1)))/(d^4*e^3*x^2 + 2*c*d^3*e^3*x + c^2*d^2*e^3)
```

### 3.287.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx = \int \frac{a+b\,\text{asin}\,(c+dx)}{(e\,(c+dx))^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(5/2),x)
```

output
```
Integral((a + b*asin(c + d*x))/(e*(c + d*x))**(5/2), x)
```

### 3.287.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(5/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.287.8 Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx=\int \frac{b\arcsin\left(dx+c\right)+a}{\left(dex+ce\right)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(5/2), x)
```

### 3.287.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{5/2}}\,dx=\int \frac{a+b\,\mathrm{asin}(c+d\,x)}{{(c\,e+d\,e\,x)}^{5/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(5/2),x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(5/2), x)
```

# 3.288 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx$



## 3.288.1 Optimal result

Integrand size = 23, antiderivative size = 102

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx = -\frac{4b\sqrt{1-(c+dx)^2}}{15de^2(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{5de(e(c+dx))^{5/2}} + \frac{4b\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{15de^{7/2}}$$

output
```
-2/5*(a+b*arcsin(d*x+c))/d/e/(e*(d*x+c))^(5/2)+4/15*b*EllipticF((e*(d*x+c)
)^(1/2)/e^(1/2),I)/d/e^(7/2)-4/15*b*(1-(d*x+c)^2)^(1/2)/d/e^2/(e*(d*x+c))^
(3/2)
```

## 3.288.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.04 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.58

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx = \frac{-6(a+b\arcsin(c+dx)) - 4b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},(c+dx)^2\right.}{15de(e(c+dx))^{5/2}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(7/2),x]
```

output
```
(-6*(a + b*ArcSin[c + d*x]) - 4*b*(c + d*x)*Hypergeometric2F1[-3/4, 1/2, 1
/4, (c + d*x)^2])/(15*d*e*(e*(c + d*x))^(5/2))
```

### 3.288.3 Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.02, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$, Rules used = {5304, 5138, 264, 266, 762}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx$$

$$\Big\downarrow \ 5304$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{(e(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \ 5138$$

$$\frac{\frac{2b\int \frac{1}{(e(c+dx))^{5/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{5e}-\frac{2(a+b\arcsin(c+dx))}{5e(e(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \ 264$$

$$\frac{\frac{2b\left(\frac{\int \frac{1}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)}{3e^2}-\frac{2\sqrt{1-(c+dx)^2}}{3e(e(c+dx))^{3/2}}\right)}{5e}-\frac{2(a+b\arcsin(c+dx))}{5e(e(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \ 266$$

$$\frac{\frac{2b\left(\frac{2\int \frac{1}{\sqrt{1-(c+dx)^2}}d\sqrt{e(c+dx)}}{3e^3}-\frac{2\sqrt{1-(c+dx)^2}}{3e(e(c+dx))^{3/2}}\right)}{5e}-\frac{2(a+b\arcsin(c+dx))}{5e(e(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \ 762$$

$$\frac{\frac{2b\left(\frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{3e^{5/2}}-\frac{2\sqrt{1-(c+dx)^2}}{3e(e(c+dx))^{3/2}}\right)}{5e}-\frac{2(a+b\arcsin(c+dx))}{5e(e(c+dx))^{5/2}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(7/2),x]
```

output
```
((-2*(a + b*ArcSin[c + d*x]))/(5*e*(e*(c + d*x))^(5/2)) + (2*b*((-2*Sqrt[1
 - (c + d*x)^2])/(3*e*(e*(c + d*x))^(3/2)) + (2*EllipticF[ArcSin[Sqrt[e*(c
 + d*x)]/Sqrt[e]], -1])/(3*e^(5/2))))/(5*e))/d
```

### 3.288.3.1 Defintions of rubi rules used

rule 264
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(c*x)^(
m + 1)*((a + b*x^2)^(p + 1)/(a*c*(m + 1))), x] - Simp[b*((m + 2*p + 3)/(a*c
^2*(m + 1)))   Int[(c*x)^(m + 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, p
}, x] && LtQ[m, -1] && IntBinomialQ[a, b, c, 2, m, p, x]
```

rule 266
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{k = De
nominator[m]}, Simp[k/c   Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(2*k)/c^2))
^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && FractionQ[m] && I
ntBinomialQ[a, b, c, 2, m, p, x]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.288.4 Maple [A] (verified)

Time = 2.10 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.66

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{2a}{5(dex+ce)^{\frac{5}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{5(dex+ce)^{\frac{5}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{15(dex+ce)^{\frac{3}{2}}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\,\mathrm{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)}{15e^2\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right)}{de}$ |
| default | $\frac{-\frac{2a}{5(dex+ce)^{\frac{5}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{5(dex+ce)^{\frac{5}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{15(dex+ce)^{\frac{3}{2}}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\,\mathrm{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)}{15e^2\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right)}{de}$ |
| parts | $-\frac{2a}{5(dex+ce)^{\frac{5}{2}}de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{5(dex+ce)^{\frac{5}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{15(dex+ce)^{\frac{3}{2}}}+\frac{2\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\,\mathrm{EllipticF}\left(\sqrt{dex+ce}\sqrt{\frac{1}{e}},i\right)}{15e^2\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}\right)}{ed}$ |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(7/2),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*(-1/5*a/(d*e*x+c*e)^(5/2)+b*(-1/5/(d*e*x+c*e)^(5/2)*arcsin(1/e*(d*e*
x+c*e))+2/5/e*(-1/3*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(3/2)+1/3/e
^2/(1/e)^(1/2)*(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2
*(d*e*x+c*e)^2+1)^(1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)))
```

### 3.288.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.10 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.72

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx =$$
$$-\frac{2\left(2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\sqrt{-d^3e}\,\mathrm{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)+\left(3\,bd^2\arcsin\left(dx+c\right)+3\right.\right.}{15\left(d^6e^4x^3+3\,cd^5e^4x^2+3\,c^2d^4e^4x+c^3d^3e^4\right)}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(7/2),x, algorithm="fricas")
```

output
```
-2/15*(2*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*sqrt(-d^3*e)*we
ierstrassPInverse(4/d^2, 0, (d*x + c)/d) + (3*b*d^2*arcsin(d*x + c) + 3*a*
d^2 + 2*(b*d^3*x + b*c*d^2)*sqrt(-d^2*x^2 - 2*c*d*x - c^2 + 1))*sqrt(d*e*x
 + c*e))/(d^6*e^4*x^3 + 3*c*d^5*e^4*x^2 + 3*c^2*d^4*e^4*x + c^3*d^3*e^4)
```

### 3.288.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx=\int \frac{a+b\operatorname{asin}{(c+dx)}}{(e\,(c+dx))^{\frac{7}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(7/2),x)
```

output
```
Integral((a + b*asin(c + d*x))/(e*(c + d*x))**(7/2), x)
```

### 3.288.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(7/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.288.8 Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx = \int \frac{b\arcsin\left(dx+c\right)+a}{(dex+ce)^{\frac{7}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(7/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(7/2), x)
```

### 3.288.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{7/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{(c\,e+d\,e\,x)^{7/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(7/2),x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(7/2), x)
```

# 3.289 $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx$



## 3.289.1 Optimal result

Integrand size = 23, antiderivative size = 159

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx=-\frac{4b\sqrt{1-(c+dx)^2}}{35de^2(e(c+dx))^{5/2}}-\frac{12b\sqrt{1-(c+dx)^2}}{35de^4\sqrt{e(c+dx)}}-\frac{2(a+b\arcsin(c+dx))}{7de(e(c+dx))^{7/2}}+\frac{12b\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{1-c-dx}}{\sqrt{2}}\right)\middle|2\right)}{35de^5\sqrt{c+dx}}$$

output
```
-2/7*(a+b*arcsin(d*x+c))/d/e/(e*(d*x+c))^(7/2)+12/35*b*EllipticE(1/2*(-d*x
-c+1)^(1/2)*2^(1/2),2^(1/2))*(e*(d*x+c))^(1/2)/d/e^5/(d*x+c)^(1/2)-4/35*b*
(1-(d*x+c)^2)^(1/2)/d/e^2/(e*(d*x+c))^(5/2)-12/35*b*(1-(d*x+c)^2)^(1/2)/d/
e^4/(e*(d*x+c))^(1/2)
```

## 3.289.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.06 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.42

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx=-\frac{2\sqrt{e(c+dx)}\left(5(a+b\arcsin(c+dx))+2b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},(c+dx)^2\right)\right)}{35de^5(c+dx)^4}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(9/2),x]
```

output
```
(-2*Sqrt[e*(c + d*x)]*(5*(a + b*ArcSin[c + d*x]) + 2*b*(c + d*x)*Hypergeom
etric2F1[-5/4, 1/2, -1/4, (c + d*x)^2]))/(35*d*e^5*(c + d*x)^4)
```

### 3.289.3 Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.01, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {5304, 5138, 264, 264, 261, 259, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{(e(c+dx))^{9/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2b\int \frac{1}{(e(c+dx))^{7/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{7e}-\frac{2(a+b\arcsin(c+dx))}{7e(e(c+dx))^{7/2}}}{d}$$

$$\Big\downarrow \text{264}$$

$$\frac{\frac{2b\left(\frac{3\int \frac{1}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{5e^2}-\frac{2\sqrt{1-(c+dx)^2}}{5e(e(c+dx))^{5/2}}\right)}{7e}-\frac{2(a+b\arcsin(c+dx))}{7e(e(c+dx))^{7/2}}}{d}$$

$$\Big\downarrow \text{264}$$

$$\frac{\frac{2b\left(\frac{3\left(-\frac{\int \frac{\sqrt{e(c+dx)}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e^2}-\frac{2\sqrt{1-(c+dx)^2}}{e\sqrt{e(c+dx)}}\right)}{5e^2}-\frac{2\sqrt{1-(c+dx)^2}}{5e(e(c+dx))^{5/2}}\right)}{7e}-\frac{2(a+b\arcsin(c+dx))}{7e(e(c+dx))^{7/2}}}{d}$$

$$\Big\downarrow \text{261}$$

$$\frac{\frac{2b\left(\frac{3\left(-\frac{\sqrt{e(c+dx)}\int\frac{\sqrt{c+dx}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e^2\sqrt{c+dx}}-\frac{2\sqrt{1-(c+dx)^2}}{e\sqrt{e(c+dx)}}\right)}{5e^2}-\frac{2\sqrt{1-(c+dx)^2}}{5e(e(c+dx))^{5/2}}\right)}{7e}-\frac{2(a+b\arcsin(c+dx))}{7e(e(c+dx))^{7/2}}}{d}$$

$\downarrow$ 259

$$\frac{\frac{2b\left(\frac{3\left(\frac{2\sqrt{e(c+dx)}\int\frac{\sqrt{c+dx}}{\sqrt{\frac{1}{2}(c+dx-1)+1}}d\frac{\sqrt{-c-dx+1}}{\sqrt{2}}}{e^2\sqrt{c+dx}}-\frac{2\sqrt{1-(c+dx)^2}}{e\sqrt{e(c+dx)}}\right)}{5e^2}-\frac{2\sqrt{1-(c+dx)^2}}{5e(e(c+dx))^{5/2}}\right)}{7e}-\frac{2(a+b\arcsin(c+dx))}{7e(e(c+dx))^{7/2}}}{d}$$

$\downarrow$ 327

$$\frac{\frac{2b\left(\frac{3\left(\frac{2\sqrt{e(c+dx)}E\left(\arcsin\left(\frac{\sqrt{-c-dx+1}}{\sqrt{2}}\right)\middle|2\right)}{e^2\sqrt{c+dx}}-\frac{2\sqrt{1-(c+dx)^2}}{e\sqrt{e(c+dx)}}\right)}{5e^2}-\frac{2\sqrt{1-(c+dx)^2}}{5e(e(c+dx))^{5/2}}\right)}{7e}-\frac{2(a+b\arcsin(c+dx))}{7e(e(c+dx))^{7/2}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(9/2),x]
```

output
```
((-2*(a + b*ArcSin[c + d*x]))/(7*e*(e*(c + d*x))^(7/2)) + (2*b*((-2*Sqrt[1
 - (c + d*x)^2])/(5*e*(e*(c + d*x))^(5/2)) + (3*((-2*Sqrt[1 - (c + d*x)^2]
)/(e*Sqrt[e*(c + d*x)]) + (2*Sqrt[e*(c + d*x)]*EllipticE[ArcSin[Sqrt[1 - c
 - d*x]/Sqrt[2]], 2])/(e^2*Sqrt[c + d*x])))/(5*e^2)))/(7*e))/d
```

3.289. $\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx$

#### 3.289.3.1 Defintions of rubi rules used

rule 259
```
Int[Sqrt[x_]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[-2/(Sqrt[a]*(-b/a
)^(3/4))   Subst[Int[Sqrt[1 - 2*x^2]/Sqrt[1 - x^2], x], x, Sqrt[1 - Sqrt[-b
/a]*x]/Sqrt[2]], x] /; FreeQ[{a, b}, x] && GtQ[-b/a, 0] && GtQ[a, 0]
```

rule 261
```
Int[Sqrt[(c_)*(x_)]/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[Sqrt[c*x]/
Sqrt[x]   Int[Sqrt[x]/Sqrt[a + b*x^2], x], x] /; FreeQ[{a, b, c}, x] && GtQ
[-b/a, 0]
```

rule 264
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(c*x)^(
m + 1)*((a + b*x^2)^(p + 1)/(a*c*(m + 1))), x] - Simp[b*((m + 2*p + 3)/(a*c
^2*(m + 1)))   Int[(c*x)^(m + 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, p
}, x] && LtQ[m, -1] && IntBinomialQ[a, b, c, 2, m, p, x]
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.289.4 Maple [C] (verified)

Result contains complex when optimal does not.

Time = 2.53 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.42

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{2a}{7(dex+ce)^{\frac{7}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{7(dex+ce)^{\frac{7}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35(dex+ce)^{\frac{5}{2}}}-\frac{6\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35e^2\sqrt{dex+ce}}+\frac{6\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{d\ldots}\right.\right.}{35e^3\sqrt{\frac{1}{e}}\sqrt{-\ldots}}}{e}\right.}{de}$ |
| default | $\frac{-\frac{2a}{7(dex+ce)^{\frac{7}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{7(dex+ce)^{\frac{7}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35(dex+ce)^{\frac{5}{2}}}-\frac{6\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35e^2\sqrt{dex+ce}}+\frac{6\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{EllipticF}\left(\sqrt{d\ldots}\right.\right.}{35e^3\sqrt{\frac{1}{e}}\sqrt{-\ldots}}}{e}\right.}{de}$ |
| parts | $-\frac{2a}{7(dex+ce)^{\frac{7}{2}}de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{7(dex+ce)^{\frac{7}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35(dex+ce)^{\frac{5}{2}}}-\frac{6\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{35e^2\sqrt{dex+ce}}+\frac{6\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\left(\text{Ellipti}\ldots\right.}{35e^3\sqrt{\ldots}}}{e}\right.}{ed}$ |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(9/2),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*(-1/7*a/(d*e*x+c*e)^(7/2)+b*(-1/7/(d*e*x+c*e)^(7/2)*arcsin(1/e*(d*e*
x+c*e))+2/7/e*(-1/5*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(5/2)-3/5/e
^2*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(1/2)+3/5/e^3/(1/e)^(1/2)*(1
-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e)^2+1)
^(1/2)*(EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I)-EllipticE((d*e*x+c*e)^(
1/2)*(1/e)^(1/2),I)))))
```

## 3.289.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 236, normalized size of antiderivative = 1.48

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx =$$

$$-\frac{2\left(6\left(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4\right)\sqrt{-d^3e}\,\text{weierstrassZeta}\left(\frac{4}{d^2},0,\text{weierstrassPInverse}\left(\frac{4}{d^2},0\ldots\right.\right.}{35\left(d^6e^5x^4+4\ldots\right.}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(9/2),x, algorithm="fricas")
```

output
```
-2/35*(6*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^
4)*sqrt(-d^3*e)*weierstrassZeta(4/d^2, 0, weierstrassPInverse(4/d^2, 0, (d
*x + c)/d)) + sqrt(d*e*x + c*e)*(5*b*d*arcsin(d*x + c) + 5*a*d + 2*(3*b*d^
4*x^3 + 9*b*c*d^3*x^2 + (9*b*c^2 + b)*d^2*x + (3*b*c^3 + b*c)*d)*sqrt(-d^2
*x^2 - 2*c*d*x - c^2 + 1)))/(d^6*e^5*x^4 + 4*c*d^5*e^5*x^3 + 6*c^2*d^4*e^5
*x^2 + 4*c^3*d^3*e^5*x + c^4*d^2*e^5)
```

### 3.289.6 Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(9/2),x)
```

output
```
Timed out
```

### 3.289.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(9/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.289.8 Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx = \int \frac{b\arcsin\left(dx+c\right)+a}{(dex+ce)^{\frac{9}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(9/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(9/2), x)
```

### 3.289.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{9/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{(c\,e+d\,e\,x)^{9/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(9/2),x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(9/2), x)
```

# 3.290 $\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^{11/2}} dx$



## 3.290.1 Optimal result

Integrand size = 23, antiderivative size = 139

$$\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^{11/2}} dx = -\frac{4b\sqrt{1-(c+dx)^2}}{63de^2(e(c+dx))^{7/2}} - \frac{20b\sqrt{1-(c+dx)^2}}{189de^4(e(c+dx))^{3/2}} - \frac{2(a+b\arcsin(c+dx))}{9de(e(c+dx))^{9/2}} + \frac{20b \operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right), -1\right)}{189de^{11/2}}$$

output
```
-2/9*(a+b*arcsin(d*x+c))/d/e/(e*(d*x+c))^(9/2)+20/189*b*EllipticF((e*(d*x+
c))^(1/2)/e^(1/2),I)/d/e^(11/2)-4/63*b*(1-(d*x+c)^2)^(1/2)/d/e^2/(e*(d*x+c
))^(7/2)-20/189*b*(1-(d*x+c)^2)^(1/2)/d/e^4/(e*(d*x+c))^(3/2)
```

## 3.290.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 0.05 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.47

$$\int \frac{a+b \arcsin(c+dx)}{(ce+dex)^{11/2}} dx = -\frac{2\sqrt{e(c+dx)}\left(7(a+b\arcsin(c+dx)) + 2b(c+dx) \operatorname{Hypergeometric2F1}\left(-\frac{7}{4}, \frac{1}{2}, -\frac{3}{4}, (c+dx)^2\right)\right)}{63de^6(c+dx)^5}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(11/2),x]
```

output
```
(-2*Sqrt[e*(c + d*x)]*(7*(a + b*ArcSin[c + d*x]) + 2*b*(c + d*x)*Hypergeom
etric2F1[-7/4, 1/2, -3/4, (c + d*x)^2]))/(63*d*e^6*(c + d*x)^5)
```

### 3.290.3 Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.04, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {5304, 5138, 264, 264, 266, 762}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{a+b\arcsin(c+dx)}{(e(c+dx))^{11/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5138}$$

$$\frac{\frac{2b\int \frac{1}{(e(c+dx))^{9/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{9e}-\frac{2(a+b\arcsin(c+dx))}{9e(e(c+dx))^{9/2}}}{d}$$

$$\Big\downarrow \text{ 264}$$

$$\frac{\frac{2b\left(\frac{5\int \frac{1}{(e(c+dx))^{5/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{7e^2}-\frac{2\sqrt{1-(c+dx)^2}}{7e(e(c+dx))^{7/2}}\right)}{9e}-\frac{2(a+b\arcsin(c+dx))}{9e(e(c+dx))^{9/2}}}{d}$$

$$\Big\downarrow \text{ 264}$$

$$\frac{\frac{2b\left(\frac{5\left(\frac{\int \frac{1}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)}{3e^2}-\frac{2\sqrt{1-(c+dx)^2}}{3e(e(c+dx))^{3/2}}\right)}{7e^2}-\frac{2\sqrt{1-(c+dx)^2}}{7e(e(c+dx))^{7/2}}\right)}{9e}-\frac{2(a+b\arcsin(c+dx))}{9e(e(c+dx))^{9/2}}}{d}$$

$$\Big\downarrow \text{ 266}$$

$$\frac{\frac{2b\left(\frac{5\left(\frac{2\int \frac{1}{\sqrt{1-(c+dx)^2}}d\sqrt{e(c+dx)}}{3e^3}-\frac{2\sqrt{1-(c+dx)^2}}{3e(e(c+dx))^{3/2}}\right)}{7e^2}-\frac{2\sqrt{1-(c+dx)^2}}{7e(e(c+dx))^{7/2}}\right)}{9e}-\frac{2(a+b\arcsin(c+dx))}{9e(e(c+dx))^{9/2}}}{d}$$

$$\Big\downarrow \text{762}$$

$$\frac{\frac{2b\left(\frac{5\left(\frac{2\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{e(c+dx)}}{\sqrt{e}}\right),-1\right)}{3e^{5/2}}-\frac{2\sqrt{1-(c+dx)^2}}{3e(e(c+dx))^{3/2}}\right)}{7e^2}-\frac{2\sqrt{1-(c+dx)^2}}{7e(e(c+dx))^{7/2}}\right)}{9e}-\frac{2(a+b\arcsin(c+dx))}{9e(e(c+dx))^{9/2}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])/(c*e + d*e*x)^(11/2),x]
```

output
```
((-2*(a + b*ArcSin[c + d*x]))/(9*e*(e*(c + d*x))^(9/2)) + (2*b*((-2*Sqrt[1
 - (c + d*x)^2])/(7*e*(e*(c + d*x))^(7/2)) + (5*((-2*Sqrt[1 - (c + d*x)^2]
)/(3*e*(e*(c + d*x))^(3/2)) + (2*EllipticF[ArcSin[Sqrt[e*(c + d*x)]/Sqrt[e
]], -1])/(3*e^(5/2))))/(7*e^2)))/(9*e))/d
```

### 3.290.3.1 Defintions of rubi rules used

rule 264
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(c*x)^(
m + 1)*((a + b*x^2)^(p + 1)/(a*c*(m + 1))), x] - Simp[b*((m + 2*p + 3)/(a*c
^2*(m + 1)))   Int[(c*x)^(m + 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, p
}, x] && LtQ[m, -1] && IntBinomialQ[a, b, c, 2, m, p, x]
```

rule 266
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{k = De
nominator[m]}, Simp[k/c   Subst[Int[x^(k*(m + 1) - 1)*(a + b*(x^(2*k)/c^2))
^p, x], x, (c*x)^(1/k)], x]] /; FreeQ[{a, b, c, p}, x] && FractionQ[m] && I
ntBinomialQ[a, b, c, 2, m, p, x]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.290.4 Maple [A] (verified)

Time = 3.02 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.46

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{2a}{9(dex+ce)^{\frac{9}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{9(dex+ce)^{\frac{9}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{63(dex+ce)^{\frac{7}{2}}}-\frac{10\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{189e^2(dex+ce)^{\frac{3}{2}}}+\frac{10\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\operatorname{EllipticF}\left(\sqrt{\right.}{189e^4\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}}{de}$ |
| default | $\frac{-\frac{2a}{9(dex+ce)^{\frac{9}{2}}}+2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{9(dex+ce)^{\frac{9}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{63(dex+ce)^{\frac{7}{2}}}-\frac{10\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{189e^2(dex+ce)^{\frac{3}{2}}}+\frac{10\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\operatorname{EllipticF}\left(\sqrt{\right.}{189e^4\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}}{e}}{de}$ |
| parts | $-\frac{2a}{9(dex+ce)^{\frac{9}{2}}de}+\frac{2b\left(-\frac{\arcsin\left(\frac{dex+ce}{e}\right)}{9(dex+ce)^{\frac{9}{2}}}+\frac{-\frac{2\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{63(dex+ce)^{\frac{7}{2}}}-\frac{10\sqrt{-\frac{(dex+ce)^2}{e^2}+1}}{189e^2(dex+ce)^{\frac{3}{2}}}+\frac{10\sqrt{1-\frac{dex+ce}{e}}\sqrt{1+\frac{dex+ce}{e}}\operatorname{Ellipt}}{189e^4\sqrt{\frac{1}{e}}\sqrt{-\frac{(dex+}{e^2}}}}{e}}{ed}$ |

input
```
int((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(11/2),x,method=_RETURNVERBOSE)
```

output
```
2/d/e*(-1/9*a/(d*e*x+c*e)^(9/2)+b*(-1/9/(d*e*x+c*e)^(9/2)*arcsin(1/e*(d*e*
x+c*e))+2/9/e*(-1/7*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(7/2)-5/21/
e^2*(-1/e^2*(d*e*x+c*e)^2+1)^(1/2)/(d*e*x+c*e)^(3/2)+5/21/e^4/(1/e)^(1/2)*
(1-1/e*(d*e*x+c*e))^(1/2)*(1+1/e*(d*e*x+c*e))^(1/2)/(-1/e^2*(d*e*x+c*e)^2+
1)^(1/2)*EllipticF((d*e*x+c*e)^(1/2)*(1/e)^(1/2),I))))
```

### 3.290.5 Fricas [C] (verification not implemented)

Result contains higher order function than in optimal. Order 9 vs. order 4.

Time = 0.11 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.89

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx =$$
$$-\frac{2\left(10\left(bd^5x^5+5\,bcd^4x^4+10\,bc^2d^3x^3+10\,bc^3d^2x^2+5\,bc^4dx+bc^5\right)\sqrt{-d^3e}\,\text{weierstrassPInverse}\left(\frac{4}{d^2},0,\frac{dx+c}{d}\right)}{189\left(d^8e^6x^5+5\,cd^7e^6x\right.}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(11/2),x, algorithm="fricas")
```

output
```
-2/189*(10*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + 10*b*c^3*d^2*x^
2 + 5*b*c^4*d*x + b*c^5)*sqrt(-d^3*e)*weierstrassPInverse(4/d^2, 0, (d*x +
 c)/d) + (21*b*d^2*arcsin(d*x + c) + 21*a*d^2 + 2*(5*b*d^5*x^3 + 15*b*c*d^
4*x^2 + 3*(5*b*c^2 + b)*d^3*x + (5*b*c^3 + 3*b*c)*d^2)*sqrt(-d^2*x^2 - 2*c
*d*x - c^2 + 1))*sqrt(d*e*x + c*e))/(d^8*e^6*x^5 + 5*c*d^7*e^6*x^4 + 10*c^
2*d^6*e^6*x^3 + 10*c^3*d^5*e^6*x^2 + 5*c^4*d^4*e^6*x + c^5*d^3*e^6)
```

### 3.290.6 Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(d*x+c))/(d*e*x+c*e)**(11/2),x)
```

output
```
Timed out
```

### 3.290.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(11/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.290.8 Giac [F]

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx = \int \frac{b\arcsin(dx+c)+a}{(dex+ce)^{\frac{11}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))/(d*e*x+c*e)^(11/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)/(d*e*x + c*e)^(11/2), x)
```

### 3.290.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx)}{(ce+dex)^{11/2}}\,dx = \int \frac{a+b\,\mathrm{asin}(c+d\,x)}{(c\,e+d\,e\,x)^{11/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(11/2),x)
```

output
```
int((a + b*asin(c + d*x))/(c*e + d*e*x)^(11/2), x)
```

# 3.291 $\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx$



## 3.291.1 Optimal result

Integrand size = 25, antiderivative size = 130

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx=\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))^2}{9de}-\frac{8b(e(c+dx))^{11/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{11}{4},\frac{15}{4},(c+dx)^2\right)}{99de^2}+\frac{16b^2(e(c+dx))^{13/2}\,{}_3F_2\left(1,\frac{13}{4},\frac{13}{4};\frac{15}{4},\frac{17}{4};(c+dx)^2\right)}{1287de^3}$$

output
```
2/9*(e*(d*x+c))^(9/2)*(a+b*arcsin(d*x+c))^2/d/e-8/99*b*(e*(d*x+c))^(11/2)*
(a+b*arcsin(d*x+c))*hypergeom([1/2, 11/4],[15/4],(d*x+c)^2)/d/e^2+16/1287*
b^2*(e*(d*x+c))^(13/2)*hypergeom([1, 13/4, 13/4],[15/4, 17/4],(d*x+c)^2)/d
/e^3
```

## 3.291.2 Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.88

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx=\frac{2e^3(c+dx)^4\sqrt{e(c+dx)}\left(13(a+b\arcsin(c+dx))\left(11(a+b\arcsin(c+dx))-4b(c+\right.\right.}{}$$

input
```
Integrate[(c*e + d*e*x)^(7/2)*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(2*e^3*(c + d*x)^4*Sqrt[e*(c + d*x)]*(13*(a + b*ArcSin[c + d*x])*(11*(a +
b*ArcSin[c + d*x]) - 4*b*(c + d*x)*Hypergeometric2F1[1/2, 11/4, 15/4, (c +
 d*x)^2]) + 8*b^2*(c + d*x)^2*HypergeometricPFQ[{1, 13/4, 13/4}, {15/4, 17
/4}, (c + d*x)^2]))/(1287*d)
```

### 3.291.3 Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.01, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int (e(c+dx))^{7/2}(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))^2}{9e}-\frac{4b\int \frac{(e(c+dx))^{9/2}(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)}{9e}}{d}$$

$$\Big\downarrow \text{5220}$$

$$\frac{\frac{2(e(c+dx))^{9/2}(a+b\arcsin(c+dx))^2}{9e}-\frac{4b\left(\frac{2(e(c+dx))^{11/2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{11}{4},\frac{15}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{11e}-\frac{4b(e(c+dx))^{13/2}\,{}_3F_2\left(1,\frac{13}{4},\frac{13}{4};\frac{15}{4},\right.}{143e^2}}{9e}}{d}$$

input
```
Int[(c*e + d*e*x)^(7/2)*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
((2*(e*(c + d*x))^(9/2)*(a + b*ArcSin[c + d*x])^2)/(9*e) - (4*b*((2*(e*(c
+ d*x))^(11/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 11/4, 15/4,
(c + d*x)^2])/(11*e) - (4*b*(e*(c + d*x))^(13/2)*HypergeometricPFQ[{1, 13/
4, 13/4}, {15/4, 17/4}, (c + d*x)^2])/(143*e^2)))/(9*e))/d
```

### 3.291.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.291.4 Maple [F]

$$\int (dex+ce)^{\frac{7}{2}} (a+b\arcsin (dx+c))^2\,dx$$

input
```
int((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x)
```

output
```
int((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x)
```

## 3.291.5 Fricas [F]

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^{\frac{7}{2}}(b\arcsin (dx+c)+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral((a^2*d^3*e^3*x^3 + 3*a^2*c*d^2*e^3*x^2 + 3*a^2*c^2*d*e^3*x + a^2*
c^3*e^3 + (b^2*d^3*e^3*x^3 + 3*b^2*c*d^2*e^3*x^2 + 3*b^2*c^2*d*e^3*x + b^2
*c^3*e^3)*arcsin(d*x + c)^2 + 2*(a*b*d^3*e^3*x^3 + 3*a*b*c*d^2*e^3*x^2 + 3
*a*b*c^2*d*e^3*x + a*b*c^3*e^3)*arcsin(d*x + c))*sqrt(d*e*x + c*e), x)
```

### 3.291.6 Sympy [F(-1)]

Timed out.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx = \text{Timed out}$$

input
```
integrate((d*e*x+c*e)**(7/2)*(a+b*asin(d*x+c))**2,x)
```

output
```
Timed out
```

### 3.291.7 Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.291.8 Giac [F]

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx=\int (dex+ce)^{\frac{7}{2}}(b\arcsin{(dx+c)}+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^(7/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^(7/2)*(b*arcsin(d*x + c) + a)^2, x)
```

### 3.291.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{7/2}(a+b\arcsin(c+dx))^2\,dx=\int (c\,e+d\,e\,x)^{7/2}\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

input
```
int((c*e + d*e*x)^(7/2)*(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^(7/2)*(a + b*asin(c + d*x))^2, x)
```

# 3.292 $\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx$



## 3.292.1 Optimal result

Integrand size = 25, antiderivative size = 130

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))^2}{7de} - \frac{8b(e(c+dx))^{9/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{9}{4},\frac{13}{4},(c+dx)^2\right)}{63de^2} + \frac{16b^2(e(c+dx))^{11/2}\,{}_3F_2\left(1,\frac{11}{4},\frac{11}{4};\frac{13}{4},\frac{15}{4};(c+dx)^2\right)}{693de^3}$$

output
```
2/7*(e*(d*x+c))^(7/2)*(a+b*arcsin(d*x+c))^2/d/e-8/63*b*(e*(d*x+c))^(9/2)*(
a+b*arcsin(d*x+c))*hypergeom([1/2, 9/4],[13/4],(d*x+c)^2)/d/e^2+16/693*b^2
*(e*(d*x+c))^(11/2)*hypergeom([1, 11/4, 11/4],[13/4, 15/4],(d*x+c)^2)/d/e^
3
```

## 3.292.2 Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.82

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \frac{2(e(c+dx))^{7/2}\left(99(a+b\arcsin(c+dx))^2-44b(c+dx)(a+b\arcsin(c+dx))\,\text{Hype}\right.}{693}$$

input
```
Integrate[(c*e + d*e*x)^(5/2)*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(2*(e*(c + d*x))^(7/2)*(99*(a + b*ArcSin[c + d*x])^2 - 44*b*(c + d*x)*(a +
 b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 9/4, 13/4, (c + d*x)^2] + 8*b^2
*(c + d*x)^2*HypergeometricPFQ[{1, 11/4, 11/4}, {13/4, 15/4}, (c + d*x)^2]
))/(693*d*e)
```

## 3.292.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.01, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int (e(c+dx))^{5/2}(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))^2}{7e}-\frac{4b\int \frac{(e(c+dx))^{7/2}(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)}{7e}}{d}$$

$$\Big\downarrow \text{5220}$$

$$\frac{\frac{2(e(c+dx))^{7/2}(a+b\arcsin(c+dx))^2}{7e}-\frac{4b\left(\frac{2(e(c+dx))^{9/2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{9}{4},\frac{13}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{9e}-\frac{4b(e(c+dx))^{11/2}\,{}_3F_2\left(1,\frac{11}{4},\frac{11}{4};\frac{13}{4},\frac{15}{4}\right.}{99e^2}\right.}{7e}}{d}$$

input
```
Int[(c*e + d*e*x)^(5/2)*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
((2*(e*(c + d*x))^(7/2)*(a + b*ArcSin[c + d*x])^2)/(7*e) - (4*b*((2*(e*(c
+ d*x))^(9/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 9/4, 13/4, (c
 + d*x)^2])/(9*e) - (4*b*(e*(c + d*x))^(11/2)*HypergeometricPFQ[{1, 11/4,
11/4}, {13/4, 15/4}, (c + d*x)^2])/(99*e^2)))/(7*e))/d
```

### 3.292.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.292.4 Maple [F]

$$\int (dex+ce)^{\frac{5}{2}} (a+b\arcsin(dx+c))^2\,dx$$

input
```
int((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x)
```

output
```
int((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x)
```

## 3.292.5 Fricas [F]

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^{\frac{5}{2}}(b\arcsin(dx+c)+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral((a^2*d^2*e^2*x^2 + 2*a^2*c*d*e^2*x + a^2*c^2*e^2 + (b^2*d^2*e^2*x
^2 + 2*b^2*c*d*e^2*x + b^2*c^2*e^2)*arcsin(d*x + c)^2 + 2*(a*b*d^2*e^2*x^2
 + 2*a*b*c*d*e^2*x + a*b*c^2*e^2)*arcsin(d*x + c))*sqrt(d*e*x + c*e), x)
```

### 3.292.6 Sympy [F(-1)]

Timed out.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx=\text{Timed out}$$

input
```
integrate((d*e*x+c*e)**(5/2)*(a+b*asin(d*x+c))**2,x)
```

output
```
Timed out
```

### 3.292.7 Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.292.8 Giac [F]

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx=\int (dex+ce)^{\frac{5}{2}}(b\arcsin(dx+c)+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^(5/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^(5/2)*(b*arcsin(d*x + c) + a)^2, x)
```

### 3.292.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{5/2}(a+b\arcsin(c+dx))^2\,dx=\int (c\,e+d\,e\,x)^{5/2}\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

input
```
int((c*e + d*e*x)^(5/2)*(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^(5/2)*(a + b*asin(c + d*x))^2, x)
```

# 3.293 $\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx$



## 3.293.1 Optimal result

Integrand size = 25, antiderivative size = 130

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx=\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))^2}{5de}-\frac{8b(e(c+dx))^{7/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{4},\frac{11}{4},(c+dx)^2\right)}{35de^2}+\frac{16b^2(e(c+dx))^{9/2}\,{}_3F_2\left(1,\frac{9}{4},\frac{9}{4};\frac{11}{4},\frac{13}{4};(c+dx)^2\right)}{315de^3}$$

output
```
2/5*(e*(d*x+c))^(5/2)*(a+b*arcsin(d*x+c))^2/d/e-8/35*b*(e*(d*x+c))^(7/2)*(
a+b*arcsin(d*x+c))*hypergeom([1/2, 7/4],[11/4],(d*x+c)^2)/d/e^2+16/315*b^2
*(e*(d*x+c))^(9/2)*hypergeom([1, 9/4, 9/4],[11/4, 13/4],(d*x+c)^2)/d/e^3
```

## 3.293.2 Mathematica [A] (verified)

Time = 0.11 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.82

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx=\frac{2(e(c+dx))^{5/2}\left(9(a+b\arcsin(c+dx))\left(7(a+b\arcsin(c+dx))-4b(c+dx)\,\text{Hype}\right.\right.}{315\ldots}$$

input
```
Integrate[(c*e + d*e*x)^(3/2)*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(2*(e*(c + d*x))^(5/2)*(9*(a + b*ArcSin[c + d*x])*(7*(a + b*ArcSin[c + d*x
]) - 4*b*(c + d*x)*Hypergeometric2F1[1/2, 7/4, 11/4, (c + d*x)^2]) + 8*b^2
*(c + d*x)^2*HypergeometricPFQ[{1, 9/4, 9/4}, {11/4, 13/4}, (c + d*x)^2]))
/(315*d*e)
```

### 3.293.3 Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.01, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int (e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))^2}{5e}-\frac{4b\int \frac{(e(c+dx))^{5/2}(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)}{5e}}{d}$$

$$\Big\downarrow \text{5220}$$

$$\frac{\frac{2(e(c+dx))^{5/2}(a+b\arcsin(c+dx))^2}{5e}-\frac{4b\left(\frac{2(e(c+dx))^{7/2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{7}{4},\frac{11}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{7e}-\frac{4b(e(c+dx))^{9/2}{}_3F_2\left(1,\frac{9}{4},\frac{9}{4};\frac{11}{4},\frac{13}{4};(c\right.}{63e^2}}{5e}}{d}$$

input
```
Int[(c*e + d*e*x)^(3/2)*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
((2*(e*(c + d*x))^(5/2)*(a + b*ArcSin[c + d*x])^2)/(5*e) - (4*b*((2*(e*(c
+ d*x))^(7/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 7/4, 11/4, (c
 + d*x)^2])/(7*e) - (4*b*(e*(c + d*x))^(9/2)*HypergeometricPFQ[{1, 9/4, 9/
4}, {11/4, 13/4}, (c + d*x)^2])/(63*e^2)))/(5*e))/d
```

### 3.293.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.293.4 Maple [F]

$$\int (dex+ce)^{\frac{3}{2}} \left(a+b \arcsin \left(dx+c\right)\right)^{2}dx$$

input
```
int((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x)
```

output
```
int((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x)
```

## 3.293.5 Fricas [F]

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx=\int (dex+ce)^{\frac{3}{2}}(b\arcsin\left(dx+c\right)+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral((a^2*d*e*x + a^2*c*e + (b^2*d*e*x + b^2*c*e)*arcsin(d*x + c)^2 +
2*(a*b*d*e*x + a*b*c*e)*arcsin(d*x + c))*sqrt(d*e*x + c*e), x)
```

### 3.293.6 Sympy [F]

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx = \int (e(c+dx))^{\frac{3}{2}}\,(a+b\,\mathrm{asin}\,(c+dx))^2\,\,dx$$

input
```
integrate((d*e*x+c*e)**(3/2)*(a+b*asin(d*x+c))**2,x)
```

output
```
Integral((e*(c + d*x))**(3/2)*(a + b*asin(c + d*x))**2, x)
```

### 3.293.7 Maxima [F(-2)]

Exception generated.

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.293.8 Giac [F]

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx = \int (dex+ce)^{\frac{3}{2}}(b\arcsin(dx+c)+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^(3/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^(3/2)*(b*arcsin(d*x + c) + a)^2, x)
```

### 3.293.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^{3/2}(a+b\arcsin(c+dx))^2\,dx=\int (c\,e+d\,e\,x)^{3/2}\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

input
```
int((c*e + d*e*x)^(3/2)*(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^(3/2)*(a + b*asin(c + d*x))^2, x)
```

# 3.294 $\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx$



## 3.294.1 Optimal result

Integrand size = 25, antiderivative size = 130

$$\begin{aligned}&\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx\\&=\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{3de}\\&\quad-\frac{8b(e(c+dx))^{5/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},(c+dx)^2\right)}{15de^2}\\&\quad+\frac{16b^2(e(c+dx))^{7/2}\,{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};(c+dx)^2\right)}{105de^3}\end{aligned}$$

output
```
2/3*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))^2/d/e-8/15*b*(e*(d*x+c))^(5/2)*(
a+b*arcsin(d*x+c))*hypergeom([1/2, 5/4],[9/4],(d*x+c)^2)/d/e^2+16/105*b^2*
(e*(d*x+c))^(7/2)*hypergeom([1, 7/4, 7/4],[9/4, 11/4],(d*x+c)^2)/d/e^3
```

## 3.294.2 Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.82

$$\begin{aligned}&\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx\\&=\frac{2(e(c+dx))^{3/2}\left(7(a+b\arcsin(c+dx))\left(5(a+b\arcsin(c+dx))-4b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\right.\right.\right.}{105de}\end{aligned}$$

input
```
Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(2*(e*(c + d*x))^(3/2)*(7*(a + b*ArcSin[c + d*x])*(5*(a + b*ArcSin[c + d*x
]) - 4*b*(c + d*x)*Hypergeometric2F1[1/2, 5/4, 9/4, (c + d*x)^2]) + 8*b^2*
(c + d*x)^2*HypergeometricPFQ[{1, 7/4, 7/4}, {9/4, 11/4}, (c + d*x)^2]))/(
105*d*e)
```

### 3.294.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.01, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5138}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{3e}-\frac{4b\int \frac{(e(c+dx))^{3/2}(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)}{3e}}{d}$$

$$\Big\downarrow \text{ 5220}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{3e}-\frac{4b\left(\frac{2(e(c+dx))^{5/2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{5}{4},\frac{9}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{5e}-\frac{4b(e(c+dx))^{7/2}{}_3F_2\left(1,\frac{7}{4},\frac{7}{4};\frac{9}{4},\frac{11}{4};(c+\right.}{35e^2}\right.}{3e}}{d}$$

input
```
Int[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
((2*(e*(c + d*x))^(3/2)*(a + b*ArcSin[c + d*x])^2)/(3*e) - (4*b*((2*(e*(c
+ d*x))^(5/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 5/4, 9/4, (c
+ d*x)^2])/(5*e) - (4*b*(e*(c + d*x))^(7/2)*HypergeometricPFQ[{1, 7/4, 7/4
}, {9/4, 11/4}, (c + d*x)^2])/(35*e^2)))/(3*e))/d
```

### 3.294.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.294.4 Maple [F]

$$\int \sqrt{dex+ce}\,(a+b\arcsin(dx+c))^2\,dx$$

input
```
int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x)
```

output
```
int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x)
```

## 3.294.5 Fricas [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx = \int \sqrt{dex+ce}(b\arcsin(dx+c)+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x
+ c*e), x)
```

### 3.294.6 Sympy [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx=\int \sqrt{e\,(c+dx)}(a+b\,\mathrm{asin}\,(c+dx))^2\;dx$$

input
```
integrate((d*e*x+c*e)**(1/2)*(a+b*asin(d*x+c))**2,x)
```

output
```
Integral(sqrt(e*(c + d*x))*(a + b*asin(c + d*x))**2, x)
```

### 3.294.7 Maxima [F(-2)]

Exception generated.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.294.8 Giac [F]

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx=\int \sqrt{dex+ce}(b\arcsin\,(dx+c)+a)^2\,dx$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
integrate(sqrt(d*e*x + c*e)*(b*arcsin(d*x + c) + a)^2, x)
```

### 3.294.9 Mupad [F(-1)]

Timed out.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^2\,dx=\int \sqrt{c\,e+d\,e\,x}\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^2\,dx$$

input
```
int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^2, x)
```

# 3.295 $\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx$



## 3.295.1 Optimal result

Integrand size = 25, antiderivative size = 128

$$\begin{aligned}\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx &= \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{de} \\ &\quad - \frac{8b(e(c+dx))^{3/2}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},(c+dx)^2\right)}{3de^2} \\ &\quad + \frac{16b^2(e(c+dx))^{5/2}\,{}_3F_2\left(1,\frac{5}{4},\frac{5}{4};\frac{7}{4},\frac{9}{4};(c+dx)^2\right)}{15de^3}\end{aligned}$$

output
```
-8/3*b*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))*hypergeom([1/2, 3/4],[7/4],(d
*x+c)^2)/d/e^2+16/15*b^2*(e*(d*x+c))^(5/2)*hypergeom([1, 5/4, 5/4],[7/4, 9
/4],(d*x+c)^2)/d/e^3+2*(a+b*arcsin(d*x+c))^2*(e*(d*x+c))^(1/2)/d/e
```

## 3.295.2 Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.84

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}\left(5(a+b\arcsin(c+dx))\left(3(a+b\arcsin(c+dx))-4b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},\right.\right.\right.}{15de}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2/Sqrt[c*e + d*e*x],x]
```

output
```
(2*Sqrt[e*(c + d*x)]*(5*(a + b*ArcSin[c + d*x])*(3*(a + b*ArcSin[c + d*x])
 - 4*b*(c + d*x)*Hypergeometric2F1[1/2, 3/4, 7/4, (c + d*x)^2]) + 8*b^2*(c
 + d*x)^2*HypergeometricPFQ[{1, 5/4, 5/4}, {7/4, 9/4}, (c + d*x)^2]))/(15*
d*e)
```

## 3.295.3 Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{e(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{e}-\frac{4b\int \frac{\sqrt{e(c+dx)}(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e}}{d}$$

$$\Big\downarrow \text{5220}$$

$$\frac{\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{e}-\frac{4b\left(\frac{2(e(c+dx))^{3/2}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{3e}-\frac{4b(e(c+dx))^{5/2}{}_3F_2\left(1,\frac{5}{4},\frac{5}{4};\frac{7}{4},\frac{9}{4};(c+dx)^2\right.}{15e^2}\right.}{e}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2/Sqrt[c*e + d*e*x],x]
```

output
```
((2*Sqrt[e*(c + d*x)]*(a + b*ArcSin[c + d*x])^2)/e - (4*b*((2*(e*(c + d*x)
)^(3/2)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, 3/4, 7/4, (c + d*x)
^2])/(3*e) - (4*b*(e*(c + d*x))^(5/2)*HypergeometricPFQ[{1, 5/4, 5/4}, {7/
4, 9/4}, (c + d*x)^2])/(15*e^2)))/e)/d
```

### 3.295.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.295.4 Maple [F]

$$\int \frac{(a+b\arcsin(dx+c))^2}{\sqrt{dex+ce}}dx$$

input
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x)
```

## 3.295.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{\sqrt{dex+ce}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)/sqrt(d*e*x
+ c*e), x)
```

### 3.295.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.295.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.295.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{\sqrt{dex+ce}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(1/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^2/sqrt(d*e*x + c*e), x)
```

### 3.295.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{ce+dex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{\sqrt{c\,e+d\,e\,x}}\,dx$$

input
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(1/2),x)
```

output
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(1/2), x)
```

# 3.296 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx$



## 3.296.1 Optimal result

Integrand size = 25, antiderivative size = 126

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^2}{de\sqrt{e(c+dx)}} + \frac{8b\sqrt{e(c+dx)}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},(c+dx)^2\right)}{de^2} - \frac{16b^2(e(c+dx))^{3/2}\,{}_3F_2\left(\frac{3}{4},\frac{3}{4},1;\frac{5}{4},\frac{7}{4};(c+dx)^2\right)}{3de^3}$$

output
```
-16/3*b^2*(e*(d*x+c))^(3/2)*hypergeom([3/4, 3/4, 1],[5/4, 7/4],(d*x+c)^2)/
d/e^3-2*(a+b*arcsin(d*x+c))^2/d/e/(e*(d*x+c))^(1/2)+8*b*(a+b*arcsin(d*x+c)
)*hypergeom([1/4, 1/2],[5/4],(d*x+c)^2)*(e*(d*x+c))^(1/2)/d/e^2
```

## 3.296.2 Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.83

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = -\frac{2\left(3(a+b\arcsin(c+dx))\left(a+b\arcsin(c+dx)-4b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},(c+dx)^2\right)\right)+8b\cdots\right.}{3de\sqrt{e(c+dx)}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(3/2),x]
```

output
```
(-2*(3*(a + b*ArcSin[c + d*x])*(a + b*ArcSin[c + d*x] - 4*b*(c + d*x)*Hype
rgeometric2F1[1/4, 1/2, 5/4, (c + d*x)^2]) + 8*b^2*(c + d*x)^2*Hypergeomet
ricPFQ[{3/4, 3/4, 1}, {5/4, 7/4}, (c + d*x)^2]))/(3*d*e*Sqrt[e*(c + d*x)])
```

## 3.296.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 125, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{(e(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{4b\int \frac{a+b\arcsin(c+dx)}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)}{e}-\frac{2(a+b\arcsin(c+dx))^2}{e\sqrt{e(c+dx)}}}{d}$$

$$\Big\downarrow \text{5220}$$

$$\frac{\frac{4b\left(\frac{2\sqrt{e(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{1}{2},\frac{5}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{e}-\frac{4b(e(c+dx))^{3/2}\,{}_3F_2\left(\frac{3}{4},\frac{3}{4},1;\frac{5}{4},\frac{7}{4};(c+dx)^2\right)}{3e^2}\right)}{e}-\frac{2(a+b\arcsin(c+dx))^2}{e\sqrt{e(c+dx)}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(3/2),x]
```

output
```
((-2*(a + b*ArcSin[c + d*x])^2)/(e*Sqrt[e*(c + d*x)]) + (4*b*((2*Sqrt[e*(c
 + d*x)]*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/4, 1/2, 5/4, (c + d*x
)^2])/e - (4*b*(e*(c + d*x))^(3/2)*HypergeometricPFQ[{3/4, 3/4, 1}, {5/4,
7/4}, (c + d*x)^2])/(3*e^2)))/e)/d
```

### 3.296.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.296.4 Maple [F]

$$\int \frac{(a+b\arcsin(dx+c))^2}{(dex+ce)^{\frac{3}{2}}}dx$$

input
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x)
```

## 3.296.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x
+ c*e)/(d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2), x)
```

### 3.296.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(c+dx))^2}{(e\,(c+dx))^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(3/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**2/(e*(c + d*x))**(3/2), x)
```

### 3.296.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.296.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^(3/2), x)
```

### 3.296.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{3/2}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}(c+d\,x)\right)^2}{\left(c\,e+d\,e\,x\right)^{3/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(3/2),x)
```

output
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(3/2), x)
```

# 3.297 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx$



## 3.297.1 Optimal result

Integrand size = 25, antiderivative size = 130

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^2}{3de(e(c+dx))^{3/2}} - \frac{8b(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},(c+dx)^2\right)}{3de^2\sqrt{e(c+dx)}} + \frac{16b^2\sqrt{e(c+dx)}\,{}_3F_2\left(\frac{1}{4},\frac{1}{4},1;\frac{3}{4},\frac{5}{4};(c+dx)^2\right)}{3de^3}$$

output
```
-2/3*(a+b*arcsin(d*x+c))^2/d/e/(e*(d*x+c))^(3/2)-8/3*b*(a+b*arcsin(d*x+c))
*hypergeom([-1/4, 1/2],[3/4],(d*x+c)^2)/d/e^2/(e*(d*x+c))^(1/2)+16/3*b^2*h
ypergeom([1/4, 1/4, 1],[3/4, 5/4],(d*x+c)^2)*(e*(d*x+c))^(1/2)/d/e^3
```

## 3.297.2 Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.78

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = -\frac{2\left((a+b\arcsin(c+dx))^2+4b(c+dx)\left((a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},(c+dx)^2\right)-\right.\right.}{3de(e(c+dx))^{3/2}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(5/2),x]
```

output
```
(-2*((a + b*ArcSin[c + d*x])^2 + 4*b*(c + d*x)*((a + b*ArcSin[c + d*x])*Hy
pergeometric2F1[-1/4, 1/2, 3/4, (c + d*x)^2] - 2*b*(c + d*x)*Hypergeometri
cPFQ[{1/4, 1/4, 1}, {3/4, 5/4}, (c + d*x)^2])))/(3*d*e*(e*(c + d*x))^(3/2)
)
```

## 3.297.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.98, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{(e(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{4b\int \frac{a+b\arcsin(c+dx)}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{3e}-\frac{2(a+b\arcsin(c+dx))^2}{3e(e(c+dx))^{3/2}}}{d}$$

$$\Big\downarrow \text{5220}$$

$$\frac{\frac{4b\left(\frac{4b\sqrt{e(c+dx)}\,{}_3F_2\left(\frac{1}{4},\frac{1}{4},1;\frac{3}{4},\frac{5}{4};(c+dx)^2\right)}{e^2}-\frac{2\,\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{1}{2},\frac{3}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{e\sqrt{e(c+dx)}}\right)}{3e}-\frac{2(a+b\arcsin(c+dx))^2}{3e(e(c+dx))^{3/2}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(5/2),x]
```

output
```
((-2*(a + b*ArcSin[c + d*x])^2)/(3*e*(e*(c + d*x))^(3/2)) + (4*b*((-2*(a +
 b*ArcSin[c + d*x])*Hypergeometric2F1[-1/4, 1/2, 3/4, (c + d*x)^2])/(e*Sqr
t[e*(c + d*x)]) + (4*b*Sqrt[e*(c + d*x)]*HypergeometricPFQ[{1/4, 1/4, 1},
{3/4, 5/4}, (c + d*x)^2])/e^2))/(3*e))/d
```

#### 3.297.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[(((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.297.4 Maple [F]

$$\int \frac{(a+b\arcsin(dx+c))^2}{(dex+ce)^{\frac{5}{2}}}dx$$

input
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x)
```

### 3.297.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x
+ c*e)/(d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3), x)
```

### 3.297.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(c+dx))^2}{(e(c+dx))^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(5/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**2/(e*(c + d*x))**(5/2), x)
```

### 3.297.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.297.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^(5/2), x)
```

### 3.297.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(5/2),x)
```

output
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(5/2), x)
```

# 3.298 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx$



## 3.298.1 Optimal result

Integrand size = 25, antiderivative size = 130

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx=-\frac{2(a+b\arcsin(c+dx))^2}{5de(e(c+dx))^{5/2}}-\frac{8b(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},(c+dx)^2\right)}{15de^2(e(c+dx))^{3/2}}-\frac{16b^2\,{}_3F_2\left(-\frac{1}{4},-\frac{1}{4},1;\frac{1}{4},\frac{3}{4};(c+dx)^2\right)}{15de^3\sqrt{e(c+dx)}}$$

output
```
-2/5*(a+b*arcsin(d*x+c))^2/d/e/(e*(d*x+c))^(5/2)-8/15*b*(a+b*arcsin(d*x+c)
)*hypergeom([-3/4, 1/2],[1/4],(d*x+c)^2)/d/e^2/(e*(d*x+c))^(3/2)-16/15*b^2
*hypergeom([-1/4, -1/4, 1],[1/4, 3/4],(d*x+c)^2)/d/e^3/(e*(d*x+c))^(1/2)
```

## 3.298.2 Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.82

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx = -\frac{2\left((a+b\arcsin(c+dx))\left(3(a+b\arcsin(c+dx))+4b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},(c+dx)^2\right)\right)\right.}{15de(e(c+dx))^{5/2}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(7/2),x]
```

output
```
(-2*((a + b*ArcSin[c + d*x])*(3*(a + b*ArcSin[c + d*x]) + 4*b*(c + d*x)*Hy
pergeometric2F1[-3/4, 1/2, 1/4, (c + d*x)^2]) + 8*b^2*(c + d*x)^2*Hypergeo
metricPFQ[{-1/4, -1/4, 1}, {1/4, 3/4}, (c + d*x)^2]))/(15*d*e*(e*(c + d*x)
)^(5/2))
```

### 3.298.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.01, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{(e(c+dx))^{7/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{4b\int \frac{a+b\arcsin(c+dx)}{(e(c+dx))^{5/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{5e}-\frac{2(a+b\arcsin(c+dx))^2}{5e(e(c+dx))^{5/2}}}{d}$$

$$\Big\downarrow \text{5220}$$

$$\frac{\frac{4b\left(-\frac{4b\,{}_3F_2\left(-\frac{1}{4},-\frac{1}{4},1;\frac{1}{4},\frac{3}{4};(c+dx)^2\right)}{3e^2\sqrt{e(c+dx)}}-\frac{2\,\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{1}{2},\frac{1}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{3e(e(c+dx))^{3/2}}\right)}{5e}-\frac{2(a+b\arcsin(c+dx))^2}{5e(e(c+dx))^{5/2}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(7/2),x]
```

output
```
((-2*(a + b*ArcSin[c + d*x])^2)/(5*e*(e*(c + d*x))^(5/2)) + (4*b*((-2*(a +
 b*ArcSin[c + d*x])*Hypergeometric2F1[-3/4, 1/2, 1/4, (c + d*x)^2])/(3*e*(
e*(c + d*x))^(3/2)) - (4*b*HypergeometricPFQ[{-1/4, -1/4, 1}, {1/4, 3/4},
(c + d*x)^2])/(3*e^2*Sqrt[e*(c + d*x)])))/(5*e))/d
```

### 3.298.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.298.4 Maple [F]

$$\int \frac{\left(a+b \arcsin \left(d x+c \right)\right)^{2}}{\left(d e x +c e \right)^{\frac{7}{2}}}d x$$

input
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x)
```

## 3.298.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx = \int \frac{\left(b \arcsin \left(dx+c\right)+a\right)^{2}}{\left(dex+ce\right)^{\frac{7}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x
+ c*e)/(d^4*e^4*x^4 + 4*c*d^3*e^4*x^3 + 6*c^2*d^2*e^4*x^2 + 4*c^3*d*e^4*x
+ c^4*e^4), x)
```

### 3.298.6 Sympy [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx=\int \frac{(a+b\operatorname{asin}(c+dx))^2}{(e(c+dx))^{\frac{7}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(7/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**2/(e*(c + d*x))**(7/2), x)
```

### 3.298.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.298.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{7}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(7/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^(7/2), x)
```

### 3.298.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{7/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^{7/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(7/2),x)
```

output
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(7/2), x)
```

# 3.299 $\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx$



## 3.299.1 Optimal result

Integrand size = 25, antiderivative size = 130

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^2}{7de(e(c+dx))^{7/2}} - \frac{8b(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},(c+dx)^2\right)}{35de^2(e(c+dx))^{5/2}} - \frac{16b^2\,{}_3F_2\left(-\frac{3}{4},-\frac{3}{4},1;-\frac{1}{4},\frac{1}{4};(c+dx)^2\right)}{105de^3(e(c+dx))^{3/2}}$$

output
```
-2/7*(a+b*arcsin(d*x+c))^2/d/e/(e*(d*x+c))^(7/2)-8/35*b*(a+b*arcsin(d*x+c)
)*hypergeom([-5/4, 1/2],[-1/4],(d*x+c)^2)/d/e^2/(e*(d*x+c))^(5/2)-16/105*b
^2*hypergeom([-3/4, -3/4, 1],[-1/4, 1/4],(d*x+c)^2)/d/e^3/(e*(d*x+c))^(3/2
)
```

## 3.299.2 Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = -\frac{2\sqrt{e(c+dx)}\left(3(a+b\arcsin(c+dx))\left(5(a+b\arcsin(c+dx))+4b(c+dx)\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\right.\right.\right.}{105de^5(c+dx)^4}$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(9/2),x]
```

output
```
(-2*Sqrt[e*(c + d*x)]*(3*(a + b*ArcSin[c + d*x])*(5*(a + b*ArcSin[c + d*x]
) + 4*b*(c + d*x)*Hypergeometric2F1[-5/4, 1/2, -1/4, (c + d*x)^2]) + 8*b^2
*(c + d*x)^2*HypergeometricPFQ[{-3/4, -3/4, 1}, {-1/4, 1/4}, (c + d*x)^2])
)/(105*d*e^5*(c + d*x)^4)
```

### 3.299.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 131, normalized size of antiderivative = 1.01, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int \frac{(a+b\arcsin(c+dx))^2}{(e(c+dx))^{9/2}}d(c+dx)}{d}$$
$$\Big\downarrow \text{5138}$$
$$\frac{\frac{4b\int \frac{a+b\arcsin(c+dx)}{(e(c+dx))^{7/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{7e}-\frac{2(a+b\arcsin(c+dx))^2}{7e(e(c+dx))^{7/2}}}{d}$$
$$\Big\downarrow \text{5220}$$
$$\frac{\frac{4b\left(-\frac{4b\,{}_3F_2\left(-\frac{3}{4},-\frac{3}{4},1;-\frac{1}{4},\frac{1}{4};(c+dx)^2\right)}{15e^2(e(c+dx))^{3/2}}-\frac{2\,\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{1}{2},-\frac{1}{4},(c+dx)^2\right)(a+b\arcsin(c+dx))}{5e(e(c+dx))^{5/2}}\right)}{7e}-\frac{2(a+b\arcsin(c+dx))^2}{7e(e(c+dx))^{7/2}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^2/(c*e + d*e*x)^(9/2),x]
```

output
```
((-2*(a + b*ArcSin[c + d*x])^2)/(7*e*(e*(c + d*x))^(7/2)) + (4*b*((-2*(a +
 b*ArcSin[c + d*x])*Hypergeometric2F1[-5/4, 1/2, -1/4, (c + d*x)^2])/(5*e*
(e*(c + d*x))^(5/2)) - (4*b*HypergeometricPFQ[{-3/4, -3/4, 1}, {-1/4, 1/4}
, (c + d*x)^2])/(15*e^2*(e*(c + d*x))^(3/2))))/(7*e))/d
```

### 3.299.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.299.4 Maple [F]

$$\int \frac{(a+b\arcsin(dx+c))^2}{(dex+ce)^{\frac{9}{2}}}dx$$

input
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x)
```

## 3.299.5 Fricas [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx=\int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{9}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*sqrt(d*e*x
+ c*e)/(d^5*e^5*x^5 + 5*c*d^4*e^5*x^4 + 10*c^2*d^3*e^5*x^3 + 10*c^3*d^2*e^
5*x^2 + 5*c^4*d*e^5*x + c^5*e^5), x)
```

### 3.299.6 Sympy [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin(d*x+c))**2/(d*e*x+c*e)**(9/2),x)
```

output
```
Timed out
```

### 3.299.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.299.8 Giac [F]

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^2}{(dex+ce)^{\frac{9}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^2/(d*e*x+c*e)^(9/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^2/(d*e*x + c*e)^(9/2), x)
```

### 3.299.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(a+b\arcsin(c+dx))^2}{(ce+dex)^{9/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^2}{(c\,e+d\,e\,x)^{9/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(9/2),x)
```

output
```
int((a + b*asin(c + d*x))^2/(c*e + d*e*x)^(9/2), x)
```

# 3.300 $\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx$



## 3.300.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx = \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^3}{3de} - \frac{2b\text{Int}\left(\frac{(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}},x\right)}{e}$$

output
```
2/3*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))^3/d/e-2*b*Unintegrable((e*(d*x+c
))^(3/2)*(a+b*arcsin(d*x+c))^2/(1-(d*x+c)^2)^(1/2),x)/e
```

## 3.300.2 Mathematica [F(-1)]

Timed out.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx = \text{\$Aborted}$$

input
```
Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
$Aborted
```

## 3.300.3 Rubi [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^3}{3e}-\frac{2b\int \frac{(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e}}{d}$$

$$\Big\downarrow \text{5234}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^3}{3e}-\frac{2b\int \frac{(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e}}{d}$$

input
```
Int[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
$Aborted
```

### 3.300.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.300.4 Maple [N/A] (verified)

Not integrable

Time = 0.43 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \sqrt{dex+ce}\,(a+b\arcsin{(dx+c)})^3\,dx$$

input
```
int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x)
```

output
```
int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x)
```

### 3.300.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 55, normalized size of antiderivative = 2.20

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\int \sqrt{dex+ce}(b\arcsin{(dx+c)}+a)^3\,dx$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcs
in(d*x + c) + a^3)*sqrt(d*e*x + c*e), x)
```

### 3.300.6 Sympy [N/A]

Not integrable

Time = 70.92 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\int \sqrt{e\,(c+dx)}(a+b\operatorname{asin}{(c+dx)})^3\,dx$$

input
```
integrate((d*e*x+c*e)**(1/2)*(a+b*asin(d*x+c))**3,x)
```

output
```
Integral(sqrt(e*(c + d*x))*(a + b*asin(c + d*x))**3, x)
```

### 3.300.7 Maxima [F(-2)]

Exception generated.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.300.8 Giac [N/A]

Not integrable

Time = 0.93 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\int \sqrt{dex+ce}(b\arcsin{(dx+c)}+a)^3\,dx$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
integrate(sqrt(d*e*x + c*e)*(b*arcsin(d*x + c) + a)^3, x)
```

## 3.300.9 Mupad [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^3\,dx=\int \sqrt{c\,e+d\,e\,x}\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^3\,dx$$

input
```
int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^3, x)
```

# 3.301 $\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx$



## 3.301.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3}{de} - \frac{6b\text{Int}\left(\frac{\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}},x\right)}{e}$$

output
```
2*(a+b*arcsin(d*x+c))^3*(e*(d*x+c))^(1/2)/d/e-6*b*Unintegrable((a+b*arcsin
(d*x+c))^2*(e*(d*x+c))^(1/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

## 3.301.2 Mathematica [N/A]

Not integrable

Time = 91.05 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^3/Sqrt[c*e + d*e*x],x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^3/Sqrt[c*e + d*e*x], x]
```

### 3.301.3 Rubi [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{e(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3}{e}-\frac{6b\int \frac{\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e}}{d}$$

$$\Big\downarrow \text{5234}$$

$$\frac{\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3}{e}-\frac{6b\int \frac{\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^3/Sqrt[c*e + d*e*x],x]
```

output
```
$Aborted
```

#### 3.301.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.301.4 Maple [N/A] (verified)

Not integrable

Time = 0.11 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^3}{\sqrt{dex+ce}}dx$$

input
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x)
```

## 3.301.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 2.20

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{\sqrt{dex+ce}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x, algorithm="fricas")
```

output
```
integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcs
in(d*x + c) + a^3)/sqrt(d*e*x + c*e), x)
```

### 3.301.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.301.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.301.8 Giac [N/A]

Not integrable

Time = 0.84 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{\sqrt{dex+ce}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(1/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^3/sqrt(d*e*x + c*e), x)
```

### 3.301.9 Mupad [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{ce+dex}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{\sqrt{c\,e+d\,e\,x}}\,dx$$

input
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(1/2),x)
```

output
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(1/2), x)
```

# 3.302 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx$



## 3.302.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^3}{de\sqrt{e(c+dx)}}+\frac{6b\text{Int}\left(\frac{(a+b\arcsin(c+dx))^2}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}},x\right)}{e}$$

output
```
-2*(a+b*arcsin(d*x+c))^3/d/e/(e*(d*x+c))^(1/2)+6*b*Unintegrable((a+b*arcsi
n(d*x+c))^2/(e*(d*x+c))^(1/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

## 3.302.2 Mathematica [N/A]

Not integrable

Time = 49.63 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(3/2),x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(3/2), x]
```

### 3.302.3 Rubi [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{(e(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5138}$$

$$\frac{\frac{6b\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)}{e}-\frac{2(a+b\arcsin(c+dx))^3}{e\sqrt{e(c+dx)}}}{d}$$

$$\Big\downarrow \text{ 5234}$$

$$\frac{\frac{6b\int \frac{(a+b\arcsin(c+dx))^2}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)}{e}-\frac{2(a+b\arcsin(c+dx))^3}{e\sqrt{e(c+dx)}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(3/2),x]
```

output
```
$Aborted
```

#### 3.302.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.302.4 Maple [N/A] (verified)

Not integrable

Time = 1.30 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^3}{(dex+ce)^{\frac{3}{2}}}dx$$

input
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x)
```

## 3.302.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 83, normalized size of antiderivative = 3.32

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx=\int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x, algorithm="fricas")
```

output
```
integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcs
in(d*x + c) + a^3)*sqrt(d*e*x + c*e)/(d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)
, x)
```

### 3.302.6 Sympy [N/A]

Not integrable

Time = 20.42 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\,\text{asin}\,(c+dx))^3}{(e\,(c+dx))^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**(3/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**3/(e*(c + d*x))**(3/2), x)
```

### 3.302.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.302.8 Giac [N/A]

Not integrable

Time = 0.55 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx = \int \frac{(b\arcsin\,(dx+c)+a)^3}{(dex+ce)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^(3/2), x)
```

### 3.302.9 Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{3/2}}\,dx=\int \frac{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^3}{\left(c\,e+d\,e\,x\right)^{3/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(3/2),x)
```

output
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(3/2), x)
```

# 3.303 $\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx$



## 3.303.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx = -\frac{2(a+b\arcsin(c+dx))^3}{3de(e(c+dx))^{3/2}}+\frac{2b\mathrm{Int}\left(\frac{(a+b\arcsin(c+dx))^2}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}},x\right)}{e}$$

output
```
-2/3*(a+b*arcsin(d*x+c))^3/d/e/(e*(d*x+c))^(3/2)+2*b*Unintegrable((a+b*arc
sin(d*x+c))^2/(e*(d*x+c))^(3/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

## 3.303.2 Mathematica [N/A]

Not integrable

Time = 45.15 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx = \int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(5/2),x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(5/2), x]
```

## 3.303.3 Rubi [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^3}{(e(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2b\int \frac{(a+b\arcsin(c+dx))^2}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{e}-\frac{2(a+b\arcsin(c+dx))^3}{3e(e(c+dx))^{3/2}}}{d}$$

$$\Big\downarrow \text{5234}$$

$$\frac{\frac{2b\int \frac{(a+b\arcsin(c+dx))^2}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{e}-\frac{2(a+b\arcsin(c+dx))^3}{3e(e(c+dx))^{3/2}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^3/(c*e + d*e*x)^(5/2),x]
```

output
```
$Aborted
```

### 3.303.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.303.4 Maple [N/A] (verified)

Not integrable

Time = 0.53 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a + b \arcsin (dx + c))^3}{(dex + ce)^{\frac{5}{2}}} dx$$

input
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x)
```

### 3.303.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 97, normalized size of antiderivative = 3.88

$$\int \frac{(a + b \arcsin(c + dx))^3}{(ce + dex)^{5/2}} \, dx = \int \frac{(b \arcsin (dx + c) + a)^3}{(dex + ce)^{\frac{5}{2}}} \, dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x, algorithm="fricas")
```

output
```
integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcs
in(d*x + c) + a^3)*sqrt(d*e*x + c*e)/(d^3*e^3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^
2*d*e^3*x + c^3*e^3), x)
```

### 3.303.6 Sympy [N/A]

Not integrable

Time = 30.89 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(c+dx))^3}{(e(c+dx))^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**3/(d*e*x+c*e)**(5/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**3/(e*(c + d*x))**(5/2), x)
```

### 3.303.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.303.8 Giac [N/A]

Not integrable

Time = 0.56 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^3}{(dex+ce)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^3/(d*e*x+c*e)^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^3/(d*e*x + c*e)^(5/2), x)
```

### 3.303.9 Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^3}{(ce+dex)^{5/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^3}{(c\,e+d\,e\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(5/2),x)
```

output
```
int((a + b*asin(c + d*x))^3/(c*e + d*e*x)^(5/2), x)
```

# 3.304 $\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx$



## 3.304.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx = \frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^4}{3de} - \frac{8b\text{Int}\left(\frac{(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}},x\right)}{3e}$$

output
```
2/3*(e*(d*x+c))^(3/2)*(a+b*arcsin(d*x+c))^4/d/e-8/3*b*Unintegrable((e*(d*x
+c))^(3/2)*(a+b*arcsin(d*x+c))^3/(1-(d*x+c)^2)^(1/2),x)/e
```

## 3.304.2 Mathematica [N/A]

Not integrable

Time = 164.93 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx = \int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx$$

input
```
Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
Integrate[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^4, x]
```

### 3.304.3 Rubi [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int \sqrt{e(c+dx)}(a+b\arcsin(c+dx))^4d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5138}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^4}{3e}-\frac{8b\int \frac{(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)}{3e}}{d}$$

$$\Big\downarrow \text{ 5234}$$

$$\frac{\frac{2(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^4}{3e}-\frac{8b\int \frac{(e(c+dx))^{3/2}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)}{3e}}{d}$$

input
```
Int[Sqrt[c*e + d*e*x]*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
$Aborted
```

#### 3.304.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.304.4 Maple [N/A] (verified)

Not integrable

Time = 0.39 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \sqrt{dex+ce}\,(a+b\arcsin(dx+c))^4\,dx$$

input
```
int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x)
```

output
```
int((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x)
```

### 3.304.5 Fricas [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 71, normalized size of antiderivative = 2.84

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx=\int \sqrt{dex+ce}(b\arcsin(dx+c)+a)^4\,dx$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*ar
csin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)*sqrt(d*e*x + c*e), x)
```

### 3.304.6 Sympy [N/A]

Not integrable

Time = 73.33 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx=\int \sqrt{e\,(c+dx)}(a+b\,\mathrm{asin}\,(c+dx))^4\,dx$$

input
```
integrate((d*e*x+c*e)**(1/2)*(a+b*asin(d*x+c))**4,x)
```

output
```
Integral(sqrt(e*(c + d*x))*(a + b*asin(c + d*x))**4, x)
```

### 3.304.7 Maxima [F(-2)]

Exception generated.

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.304.8 Giac [N/A]

Not integrable

Time = 1.75 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx=\int \sqrt{dex+ce}(b\arcsin\,(dx+c)+a)^4\,dx$$

input
```
integrate((d*e*x+c*e)^(1/2)*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
integrate(sqrt(d*e*x + c*e)*(b*arcsin(d*x + c) + a)^4, x)
```

### 3.304.9 Mupad [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \sqrt{ce+dex}(a+b\arcsin(c+dx))^4\,dx=\int \sqrt{c\,e+d\,e\,x}\,\left(a+b\,\mathrm{asin}(c+d\,x)\right)^4\,dx$$

input
```
int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^4,x)
```

output
```
int((c*e + d*e*x)^(1/2)*(a + b*asin(c + d*x))^4, x)
```

# 3.305 $\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx$



## 3.305.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^4}{de} - \frac{8b\text{Int}\left(\frac{\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}},x\right)}{e}$$

output
```
2*(a+b*arcsin(d*x+c))^4*(e*(d*x+c))^(1/2)/d/e-8*b*Unintegrable((a+b*arcsin
(d*x+c))^3*(e*(d*x+c))^(1/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

## 3.305.2 Mathematica [N/A]

Not integrable

Time = 15.47 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^4/Sqrt[c*e + d*e*x],x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^4/Sqrt[c*e + d*e*x], x]
```

### 3.305.3 Rubi [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{e(c+dx)}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^4}{e}-\frac{8b\int \frac{\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e}}{d}$$

$$\Big\downarrow \text{5234}$$

$$\frac{\frac{2\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^4}{e}-\frac{8b\int \frac{\sqrt{e(c+dx)}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^4/Sqrt[c*e + d*e*x],x]
```

output
```
$Aborted
```

#### 3.305.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.305.4 Maple [N/A] (verified)

Not integrable

Time = 0.09 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a + b \arcsin(dx + c))^4}{\sqrt{dex + ce}} dx$$

input
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x)
```

### 3.305.5 Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 71, normalized size of antiderivative = 2.84

$$\int \frac{(a + b\arcsin(c + dx))^4}{\sqrt{ce + dex}} dx = \int \frac{(b \arcsin(dx + c) + a)^4}{\sqrt{dex + ce}} dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x, algorithm="fricas")
```

output
```
integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*ar
csin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)/sqrt(d*e*x + c*e), x)
```

### 3.305.6 Sympy [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**(1/2),x)
```

output
```
Exception raised: TypeError >> Invalid comparison of non-real zoo
```

### 3.305.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.305.8 Giac [N/A]

Not integrable

Time = 1.25 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{\sqrt{dex+ce}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(1/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^4/sqrt(d*e*x + c*e), x)
```

### 3.305.9 Mupad [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{\sqrt{ce+dex}}\,dx = \int \frac{\left(a+b\,\mathrm{asin}\left(c+d\,x\right)\right)^4}{\sqrt{c\,e+d\,e\,x}}\,dx$$

input
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(1/2),x)
```

output
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(1/2), x)
```

# 3.306 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx$



## 3.306.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx=-\frac{2(a+b\arcsin(c+dx))^4}{de\sqrt{e(c+dx)}}+\frac{8b\text{Int}\left(\frac{(a+b\arcsin(c+dx))^3}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}},x\right)}{e}$$

output
```
-2*(a+b*arcsin(d*x+c))^4/d/e/(e*(d*x+c))^(1/2)+8*b*Unintegrable((a+b*arcsi
n(d*x+c))^3/(e*(d*x+c))^(1/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

## 3.306.2 Mathematica [N/A]

Not integrable

Time = 27.88 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx=\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(3/2),x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(3/2), x]
```

## 3.306.3 Rubi [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{(e(c+dx))^{3/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{8b\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)}{e}-\frac{2(a+b\arcsin(c+dx))^4}{e\sqrt{e(c+dx)}}}{d}$$

$$\Big\downarrow \text{5234}$$

$$\frac{\frac{8b\int \frac{(a+b\arcsin(c+dx))^3}{\sqrt{e(c+dx)}\sqrt{1-(c+dx)^2}}d(c+dx)}{e}-\frac{2(a+b\arcsin(c+dx))^4}{e\sqrt{e(c+dx)}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(3/2),x]
```

output
```
$Aborted
```

### 3.306.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.306.4 Maple [N/A] (verified)

Not integrable

Time = 1.36 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a+b\arcsin(dx+c))^4}{(dex+ce)^{\frac{3}{2}}}dx$$

input
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x)
```

### 3.306.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 99, normalized size of antiderivative = 3.96

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x, algorithm="fricas")
```

output
```
integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*ar
csin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)*sqrt(d*e*x + c*e)/(d^2*e^
2*x^2 + 2*c*d*e^2*x + c^2*e^2), x)
```

### 3.306.6 Sympy [N/A]

Not integrable

Time = 26.31 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}\,(c+dx))^4}{(e\,(c+dx))^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**(3/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**4/(e*(c + d*x))**(3/2), x)
```

### 3.306.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.306.8 Giac [N/A]

Not integrable

Time = 0.73 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx = \int \frac{(b\arcsin\,(dx+c)+a)^4}{(dex+ce)^{\frac{3}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^(3/2), x)
```

### 3.306.9 Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{3/2}}\,dx = \int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{(c\,e+d\,e\,x)^{3/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(3/2),x)
```

output
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(3/2), x)
```

# 3.307 $\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx$



## 3.307.1 Optimal result

Integrand size = 25, antiderivative size = 25

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=-\frac{2(a+b\arcsin(c+dx))^4}{3de(e(c+dx))^{3/2}}+\frac{8b\text{Int}\left(\frac{(a+b\arcsin(c+dx))^3}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}},x\right)}{3e}$$

output
```
-2/3*(a+b*arcsin(d*x+c))^4/d/e/(e*(d*x+c))^(3/2)+8/3*b*Unintegrable((a+b*a
rcsin(d*x+c))^3/(e*(d*x+c))^(3/2)/(1-(d*x+c)^2)^(1/2),x)/e
```

## 3.307.2 Mathematica [N/A]

Not integrable

Time = 10.79 (sec) , antiderivative size = 27, normalized size of antiderivative = 1.08

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx$$

input
```
Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(5/2),x]
```

output
```
Integrate[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(5/2), x]
```

## 3.307.3 Rubi [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int \frac{(a+b\arcsin(c+dx))^4}{(e(c+dx))^{5/2}}d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{8b\int \frac{(a+b\arcsin(c+dx))^3}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{3e}-\frac{2(a+b\arcsin(c+dx))^4}{3e(e(c+dx))^{3/2}}}{d}$$

$$\Big\downarrow \text{5234}$$

$$\frac{\frac{8b\int \frac{(a+b\arcsin(c+dx))^3}{(e(c+dx))^{3/2}\sqrt{1-(c+dx)^2}}d(c+dx)}{3e}-\frac{2(a+b\arcsin(c+dx))^4}{3e(e(c+dx))^{3/2}}}{d}$$

input
```
Int[(a + b*ArcSin[c + d*x])^4/(c*e + d*e*x)^(5/2),x]
```

output
```
$Aborted
```

### 3.307.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.307.4 Maple [N/A] (verified)

Not integrable

Time = 0.80 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.92

$$\int \frac{(a + b \arcsin (dx + c))^4}{(dex + ce)^{\frac{5}{2}}} dx$$

input
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x)
```

output
```
int((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x)
```

## 3.307.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 113, normalized size of antiderivative = 4.52

$$\int \frac{(a + b \arcsin(c + dx))^4}{(ce + dex)^{5/2}} dx = \int \frac{(b \arcsin (dx + c) + a)^4}{(dex + ce)^{\frac{5}{2}}} dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x, algorithm="fricas")
```

output
```
integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*ar
csin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)*sqrt(d*e*x + c*e)/(d^3*e^
3*x^3 + 3*c*d^2*e^3*x^2 + 3*c^2*d*e^3*x + c^3*e^3), x)
```

### 3.307.6 Sympy [N/A]

Not integrable

Time = 40.21 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.88

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx = \int \frac{(a+b\operatorname{asin}(c+dx))^4}{(e(c+dx))^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*asin(d*x+c))**4/(d*e*x+c*e)**(5/2),x)
```

output
```
Integral((a + b*asin(c + d*x))**4/(e*(c + d*x))**(5/2), x)
```

### 3.307.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(e>0)', see `assume?` for more de
tails)Is e
```

### 3.307.8 Giac [N/A]

Not integrable

Time = 0.77 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx = \int \frac{(b\arcsin(dx+c)+a)^4}{(dex+ce)^{\frac{5}{2}}}\,dx$$

input
```
integrate((a+b*arcsin(d*x+c))^4/(d*e*x+c*e)^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^4/(d*e*x + c*e)^(5/2), x)
```

### 3.307.9 Mupad [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.00

$$\int \frac{(a+b\arcsin(c+dx))^4}{(ce+dex)^{5/2}}\,dx=\int \frac{(a+b\,\mathrm{asin}(c+d\,x))^4}{(c\,e+d\,e\,x)^{5/2}}\,dx$$

input
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(5/2),x)
```

output
```
int((a + b*asin(c + d*x))^4/(c*e + d*e*x)^(5/2), x)
```

# 3.308 $\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx$



## 3.308.1 Optimal result

Integrand size = 23, antiderivative size = 23

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx=\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^4}{de(1+m)}-\frac{4b\text{Int}\left(\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}},x\right)}{e(1+m)}$$

output
```
(e*(d*x+c))^(1+m)*(a+b*arcsin(d*x+c))^4/d/e/(1+m)-4*b*Unintegrable((e*(d*x
+c))^(1+m)*(a+b*arcsin(d*x+c))^3/(1-(d*x+c)^2)^(1/2),x)/e/(1+m)
```

## 3.308.2 Mathematica [N/A]

Not integrable

Time = 1.61 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx=\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx$$

input
```
Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^4, x]
```

### 3.308.3 Rubi [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx$$

$$\Big\downarrow \text{ 5304}$$

$$\frac{\int (e(c+dx))^m(a+b\arcsin(c+dx))^4d(c+dx)}{d}$$

$$\Big\downarrow \text{ 5138}$$

$$\frac{\frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^4}{e(m+1)}-\frac{4b\int \frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e(m+1)}}{d}$$

$$\Big\downarrow \text{ 5234}$$

$$\frac{\frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^4}{e(m+1)}-\frac{4b\int \frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^3}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e(m+1)}}{d}$$

input
```
Int[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^4,x]
```

output
```
$Aborted
```

#### 3.308.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.308.4 Maple [N/A] (verified)

Not integrable

Time = 2.30 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int (dex + ce)^m (a + b \arcsin (dx + c))^4 dx$$

input
```
int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x)
```

output
```
int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x)
```

## 3.308.5 Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 71, normalized size of antiderivative = 3.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4 dx = \int (b \arcsin (dx + c) + a)^4 (dex + ce)^m dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x, algorithm="fricas")
```

output
```
integral((b^4*arcsin(d*x + c)^4 + 4*a*b^3*arcsin(d*x + c)^3 + 6*a^2*b^2*ar
csin(d*x + c)^2 + 4*a^3*b*arcsin(d*x + c) + a^4)*(d*e*x + c*e)^m, x)
```

### 3.308.6 Sympy [N/A]

Not integrable

Time = 52.55 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.87

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx = \int (e(c+dx))^m\,(a+b\,\mathrm{asin}\,(c+dx))^4\;dx$$

input
```
integrate((d*e*x+c*e)**m*(a+b*asin(d*x+c))**4,x)
```

output
```
Integral((e*(c + d*x))**m*(a + b*asin(c + d*x))**4, x)
```

### 3.308.7 Maxima [N/A]

Not integrable

Time = 10.10 (sec) , antiderivative size = 618, normalized size of antiderivative = 26.87

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx = \int (b\arcsin\,(dx+c)+a)^4(dex+ce)^m\,dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x, algorithm="maxima")
```

output
```
(d*e*x + c*e)^(m + 1)*a^4/(d*e*(m + 1)) + ((b^4*d*e^m*x + b^4*c*e^m)*(d*x
+ c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^4 + (d*m + d
)*integrate(2*(2*(b^4*d*e^m*x + b^4*c*e^m)*sqrt(d*x + c + 1)*sqrt(-d*x - c
 + 1)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3
 + 2*((a*b^3*c^2 - a*b^3)*e^m*m + (a*b^3*d^2*e^m*m + a*b^3*d^2*e^m)*x^2 +
(a*b^3*c^2 - a*b^3)*e^m + 2*(a*b^3*c*d*e^m*m + a*b^3*c*d*e^m)*x)*(d*x + c)
^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + 3*((a^2*b^2*
c^2 - a^2*b^2)*e^m*m + (a^2*b^2*d^2*e^m*m + a^2*b^2*d^2*e^m)*x^2 + (a^2*b^
2*c^2 - a^2*b^2)*e^m + 2*(a^2*b^2*c*d*e^m*m + a^2*b^2*c*d*e^m)*x)*(d*x + c
)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + 2*((a^3*b*c
^2 - a^3*b)*e^m*m + (a^3*b*d^2*e^m*m + a^3*b*d^2*e^m)*x^2 + (a^3*b*c^2 - a
^3*b)*e^m + 2*(a^3*b*c*d*e^m*m + a^3*b*c*d*e^m)*x)*(d*x + c)^m*arctan2(d*x
 + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)))/((d^2*m + d^2)*x^2 + c^2 + (c
^2 - 1)*m + 2*(c*d*m + c*d)*x - 1), x))/(d*m + d)
```

### 3.308.8 Giac [N/A]

Not integrable

Time = 0.51 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx = \int (b\arcsin(dx+c)+a)^4(dex+ce)^m\,dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^4,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^4*(d*e*x + c*e)^m, x)
```

### 3.308.9 Mupad [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^4\,dx = \int (c\,e+d\,e\,x)^m\,(a+b\,\mathrm{asin}(c+d\,x))^4\,dx$$

input
```
int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^4,x)
```

output
```
int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^4, x)
```

# 3.309 $\int (ce+dex)^m (a+b\arcsin(c+dx))^3\,dx$



## 3.309.1 Optimal result

Integrand size = 23, antiderivative size = 23

$$\int (ce+dex)^m (a+b\arcsin(c+dx))^3\,dx = \frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^3}{de(1+m)} - \frac{3b\text{Int}\left(\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}},x\right)}{e(1+m)}$$

output
```
(e*(d*x+c))^(1+m)*(a+b*arcsin(d*x+c))^3/d/e/(1+m)-3*b*Unintegrable((e*(d*x
+c))^(1+m)*(a+b*arcsin(d*x+c))^2/(1-(d*x+c)^2)^(1/2),x)/e/(1+m)
```

## 3.309.2 Mathematica [N/A]

Not integrable

Time = 0.81 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m (a+b\arcsin(c+dx))^3\,dx = \int (ce+dex)^m (a+b\arcsin(c+dx))^3\,dx$$

input
```
Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^3, x]
```

## 3.309.3 Rubi [N/A]

Not integrable

Time = 0.40 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5138, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int (e(c+dx))^m(a+b\arcsin(c+dx))^3d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^3}{e(m+1)}-\frac{3b\int \frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e(m+1)}}{d}$$

$$\Big\downarrow \text{5234}$$

$$\frac{\frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^3}{e(m+1)}-\frac{3b\int \frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^2}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e(m+1)}}{d}$$

input
```
Int[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^3,x]
```

output
```
$Aborted
```

### 3.309.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.309.4 Maple [N/A] (verified)

Not integrable

Time = 2.17 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int (dex + ce)^m (a + b \arcsin (dx + c))^3 \, dx$$

input
```
int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x)
```

output
```
int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x)
```

### 3.309.5 Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 55, normalized size of antiderivative = 2.39

$$\int (ce + dex)^m (a + b \arcsin(c + dx))^3 \, dx = \int (b \arcsin (dx + c) + a)^3 (dex + ce)^m \, dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x, algorithm="fricas")
```

output
```
integral((b^3*arcsin(d*x + c)^3 + 3*a*b^2*arcsin(d*x + c)^2 + 3*a^2*b*arcs
in(d*x + c) + a^3)*(d*e*x + c*e)^m, x)
```

### 3.309.6 Sympy [N/A]

Not integrable

Time = 20.49 (sec) , antiderivative size = 20, normalized size of antiderivative = 0.87

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx=\int (e(c+dx))^m\,(a+b\operatorname{asin}\,(c+dx))^3\,dx$$

input
```
integrate((d*e*x+c*e)**m*(a+b*asin(d*x+c))**3,x)
```

output
```
Integral((e*(c + d*x))**m*(a + b*asin(c + d*x))**3, x)
```

### 3.309.7 Maxima [N/A]

Not integrable

Time = 7.43 (sec) , antiderivative size = 469, normalized size of antiderivative = 20.39

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx=\int (b\arcsin\,(dx+c)+a)^3(dex+ce)^m\,dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x, algorithm="maxima")
```

output
```
(d*e*x + c*e)^(m + 1)*a^3/(d*e*(m + 1)) + ((b^3*d*e^m*x + b^3*c*e^m)*(d*x
+ c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^3 + (d*m + d
)*integrate(3*((b^3*d*e^m*x + b^3*c*e^m)*sqrt(d*x + c + 1)*sqrt(-d*x - c +
 1)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 +
 ((a*b^2*c^2 - a*b^2)*e^m*m + (a*b^2*d^2*e^m*m + a*b^2*d^2*e^m)*x^2 + (a*b
^2*c^2 - a*b^2)*e^m + 2*(a*b^2*c*d*e^m*m + a*b^2*c*d*e^m)*x)*(d*x + c)^m*a
rctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1))^2 + ((a^2*b*c^2 - a^
2*b)*e^m*m + (a^2*b*d^2*e^m*m + a^2*b*d^2*e^m)*x^2 + (a^2*b*c^2 - a^2*b)*e
^m + 2*(a^2*b*c*d*e^m*m + a^2*b*c*d*e^m)*x)*(d*x + c)^m*arctan2(d*x + c, s
qrt(d*x + c + 1)*sqrt(-d*x - c + 1)))/((d^2*m + d^2)*x^2 + c^2 + (c^2 - 1)
*m + 2*(c*d*m + c*d)*x - 1), x))/(d*m + d)
```

### 3.309.8 Giac [N/A]

Not integrable

Time = 0.47 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx=\int (b\arcsin(dx+c)+a)^3(dex+ce)^m\,dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^3,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^3*(d*e*x + c*e)^m, x)
```

### 3.309.9 Mupad [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^3\,dx=\int (c\,e+d\,e\,x)^m\,(a+b\,\mathrm{asin}(c+d\,x))^3\,dx$$

input
```
int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^3,x)
```

output
```
int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^3, x)
```

# 3.310 $\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx$



## 3.310.1 Optimal result

Integrand size = 23, antiderivative size = 183

$$\begin{aligned}&\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx\\&=\frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))^2}{de(1+m)}\\&\quad-\frac{2b(e(c+dx))^{2+m}(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},(c+dx)^2\right)}{de^2(1+m)(2+m)}\\&\quad+\frac{2b^2(e(c+dx))^{3+m}\,{}_3F_2\left(1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2};2+\frac{m}{2},\frac{5}{2}+\frac{m}{2};(c+dx)^2\right)}{de^3(1+m)(2+m)(3+m)}\end{aligned}$$

output
```
(e*(d*x+c))^(1+m)*(a+b*arcsin(d*x+c))^2/d/e/(1+m)-2*b*(e*(d*x+c))^(2+m)*(a
+b*arcsin(d*x+c))*hypergeom([1/2, 1+1/2*m],[2+1/2*m],(d*x+c)^2)/d/e^2/(1+m
)/(2+m)+2*b^2*(e*(d*x+c))^(3+m)*hypergeom([1, 3/2+1/2*m, 3/2+1/2*m],[2+1/2
*m, 5/2+1/2*m],(d*x+c)^2)/d/e^3/(3+m)/(m^2+3*m+2)
```

## 3.310.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 151, normalized size of antiderivative = 0.83

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx$$
$$=\frac{(c+dx)(e(c+dx))^m\left((a+b\arcsin(c+dx))^2-\frac{2b(c+dx)(a+b\arcsin(c+dx))\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},(c+dx)^2\right)}{2+m}+\right.}{d(1+m)}$$

input
```
Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
((c + d*x)*(e*(c + d*x))^m*((a + b*ArcSin[c + d*x])^2 - (2*b*(c + d*x)*(a
+ b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, (c + d*x
)^2])/(2 + m) + (2*b^2*(c + d*x)^2*HypergeometricPFQ[{1, 3/2 + m/2, 3/2 +
m/2}, {2 + m/2, 5/2 + m/2}, (c + d*x)^2])/((2 + m)*(3 + m))))/(d*(1 + m))
```

## 3.310.3 Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 176, normalized size of antiderivative = 0.96, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {5304, 5138, 5220}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx$$
$$\Big\downarrow \text{5304}$$
$$\frac{\int (e(c+dx))^m(a+b\arcsin(c+dx))^2d(c+dx)}{d}$$
$$\Big\downarrow \text{5138}$$
$$\frac{\frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^2}{e(m+1)}-\frac{2b\int \frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e(m+1)}}{d}$$
$$\Big\downarrow \text{5220}$$

$$\frac{\frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))^2}{e(m+1)} - \frac{2b\left(\frac{(e(c+dx))^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},(c+dx)^2\right)(a+b\arcsin(c+dx))}{e(m+2)} - \frac{b(e(c+dx))^{m+3}\,{}_3F_2\left(1,\frac{m}{2}+\frac{3}{2},\right.}{e^2(m+2}\right.}{e(m+1)}}{d}$$

input
```
Int[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x])^2,x]
```

output
```
(((e*(c + d*x))^(1 + m)*(a + b*ArcSin[c + d*x])^2)/(e*(1 + m)) - (2*b*(((e
*(c + d*x))^(2 + m)*(a + b*ArcSin[c + d*x])*Hypergeometric2F1[1/2, (2 + m)
/2, (4 + m)/2, (c + d*x)^2])/(e*(2 + m)) - (b*(e*(c + d*x))^(3 + m)*Hyperg
eometricPFQ[{1, 3/2 + m/2, 3/2 + m/2}, {2 + m/2, 5/2 + m/2}, (c + d*x)^2])
/(e^2*(2 + m)*(3 + m))))/(e*(1 + m)))/d
```

### 3.310.3.1 Defintions of rubi rules used

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5220
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_))/Sqrt[(d_) + (e_.
)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)/(f*(m + 1)))*Simp[Sqrt[1 - c^2*
x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])*Hypergeometric2F1[1/2, (1 + m)/2,
 (3 + m)/2, c^2*x^2], x] - Simp[b*c*((f*x)^(m + 2)/(f^2*(m + 1)*(m + 2)))*S
imp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*HypergeometricPFQ[{1, 1 + m/2, 1 + m
/2}, {3/2 + m/2, 2 + m/2}, c^2*x^2], x] /; FreeQ[{a, b, c, d, e, f, m}, x]
&& EqQ[c^2*d + e, 0] &&  !IntegerQ[m]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.310.4 Maple [F]

$$\int (dex+ce)^m (a+b\arcsin (dx+c))^2 dx$$

input
```
int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x)
```

output
```
int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x)
```

### 3.310.5 Fricas [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx = \int (b\arcsin (dx+c)+a)^2(dex+ce)^m\,dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x, algorithm="fricas")
```

output
```
integral((b^2*arcsin(d*x + c)^2 + 2*a*b*arcsin(d*x + c) + a^2)*(d*e*x + c*
e)^m, x)
```

### 3.310.6 Sympy [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx = \int (e(c+dx))^m\,(a+b\,\mathrm{asin}\,(c+dx))^2\,dx$$

input
```
integrate((d*e*x+c*e)**m*(a+b*asin(d*x+c))**2,x)
```

output
```
Integral((e*(c + d*x))**m*(a + b*asin(c + d*x))**2, x)
```

### 3.310.7 Maxima [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx=\int (b\arcsin(dx+c)+a)^2(dex+ce)^m\,dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x, algorithm="maxima")
```

output
```
((b^2*d*e^m*x + b^2*c*e^m)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*
sqrt(-d*x - c + 1))^2 + (d*m + d)*integrate(2*((b^2*d*e^m*x + b^2*c*e^m)*s
qrt(d*x + c + 1)*sqrt(-d*x - c + 1)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x
+ c + 1)*sqrt(-d*x - c + 1)) + ((a*b*c^2 - a*b)*e^m*m + (a*b*d^2*e^m*m + a
*b*d^2*e^m)*x^2 + (a*b*c^2 - a*b)*e^m + 2*(a*b*c*d*e^m*m + a*b*c*d*e^m)*x)
*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*x - c + 1)))/((d^2
*m + d^2)*x^2 + c^2 + (c^2 - 1)*m + 2*(c*d*m + c*d)*x - 1), x))/(d*m + d)
+ (d*e*x + c*e)^(m + 1)*a^2/(d*e*(m + 1))
```

### 3.310.8 Giac [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx=\int (b\arcsin(dx+c)+a)^2(dex+ce)^m\,dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c))^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)^2*(d*e*x + c*e)^m, x)
```

### 3.310.9 Mupad [F(-1)]

Timed out.

$$\int (ce+dex)^m(a+b\arcsin(c+dx))^2\,dx=\int (c\,e+d\,e\,x)^m\,(a+b\,\mathrm{asin}(c+d\,x))^2\,dx$$

input
```
int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^2,x)
```

output
```
int((c*e + d*e*x)^m*(a + b*asin(c + d*x))^2, x)
```

# 3.311 $\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx$



## 3.311.1 Optimal result

Integrand size = 21, antiderivative size = 89

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx = \frac{(e(c+dx))^{1+m}(a+b\arcsin(c+dx))}{de(1+m)} - \frac{b(e(c+dx))^{2+m}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},(c+dx)^2\right)}{de^2(1+m)(2+m)}$$

output
```
(e*(d*x+c))^(1+m)*(a+b*arcsin(d*x+c))/d/e/(1+m)-b*(e*(d*x+c))^(2+m)*hyperg
eom([1/2, 1+1/2*m],[2+1/2*m],(d*x+c)^2)/d/e^2/(1+m)/(2+m)
```

## 3.311.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.87

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx = -\frac{(c+dx)(e(c+dx))^m\left(-((2+m)(a+b\arcsin(c+dx)))+b(c+dx)\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2}\right.\right.}{d(1+m)(2+m)}$$

input
```
Integrate[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x]),x]
```

output
```
-(((c + d*x)*(e*(c + d*x))^m*(-((2 + m)*(a + b*ArcSin[c + d*x])) + b*(c +
d*x)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, (c + d*x)^2]))/(d*(1 + m
)*(2 + m)))
```

### 3.311.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 87, normalized size of antiderivative = 0.98, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {5304, 5138, 278}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx$$

$$\Big\downarrow \text{5304}$$

$$\frac{\int (e(c+dx))^m(a+b\arcsin(c+dx))d(c+dx)}{d}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))}{e(m+1)}-\frac{b\int \frac{(e(c+dx))^{m+1}}{\sqrt{1-(c+dx)^2}}d(c+dx)}{e(m+1)}}{d}$$

$$\Big\downarrow \text{278}$$

$$\frac{\frac{(e(c+dx))^{m+1}(a+b\arcsin(c+dx))}{e(m+1)}-\frac{b(e(c+dx))^{m+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+2}{2},\frac{m+4}{2},(c+dx)^2\right)}{e^2(m+1)(m+2)}}{d}$$

input
```
Int[(c*e + d*e*x)^m*(a + b*ArcSin[c + d*x]),x]
```

output
```
(((e*(c + d*x))^(1 + m)*(a + b*ArcSin[c + d*x]))/(e*(1 + m)) - (b*(e*(c +
d*x))^(2 + m)*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, (c + d*x)^2])/(
e^2*(1 + m)*(2 + m)))/d
```

### 3.311.3.1 Defintions of rubi rules used

rule 278
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[a^p*((
c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/2, (m + 1)/2 + 1, (
-b)*(x^2/a)], x] /; FreeQ[{a, b, c, m, p}, x] &&  !IGtQ[p, 0] && (ILtQ[p, 0
] || GtQ[a, 0])
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

## 3.311.4 Maple [F]

$$\int (dex+ce)^m (a+b\arcsin (dx+c))\, dx$$

input
```
int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x)
```

output
```
int((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x)
```

## 3.311.5 Fricas [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\, dx = \int (b\arcsin (dx+c)+a)(dex+ce)^m\, dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x + c) + a)*(d*e*x + c*e)^m, x)
```

### 3.311.6 Sympy [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx=\int (e(c+dx))^m\,(a+b\,\mathrm{asin}\,(c+dx))\,\,dx$$

input
```
integrate((d*e*x+c*e)**m*(a+b*asin(d*x+c)),x)
```

output
```
Integral((e*(c + d*x))**m*(a + b*asin(c + d*x)), x)
```

### 3.311.7 Maxima [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx=\int (b\arcsin\,(dx+c)+a)(dex+ce)^m\,dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
((d*e^m*x + c*e^m)*(d*x + c)^m*arctan2(d*x + c, sqrt(d*x + c + 1)*sqrt(-d*
x - c + 1)) + (d*m + d)*integrate((d*e^m*x + c*e^m)*sqrt(d*x + c + 1)*sqrt
(-d*x - c + 1)*(d*x + c)^m/((d^2*m + d^2)*x^2 + c^2 + (c^2 - 1)*m + 2*(c*d
*m + c*d)*x - 1), x))*b/(d*m + d) + (d*e*x + c*e)^(m + 1)*a/(d*e*(m + 1))
```

### 3.311.8 Giac [F]

$$\int (ce+dex)^m(a+b\arcsin(c+dx))\,dx=\int (b\arcsin\,(dx+c)+a)(dex+ce)^m\,dx$$

input
```
integrate((d*e*x+c*e)^m*(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x + c) + a)*(d*e*x + c*e)^m, x)
```

### 3.311.9 Mupad [F(-1)]

Timed out.

$$\int (ce + dex)^m (a + b \arcsin(c + dx)) \, dx = \int (c e + d e x)^m \, (a + b \, \text{asin}(c + d x)) \, dx$$

input
```
int((c*e + d*e*x)^m*(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^m*(a + b*asin(c + d*x)), x)
```

# 3.312 $\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx$



## 3.312.1 Optimal result

Integrand size = 23, antiderivative size = 23

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx = \text{Int}\left(\frac{(e(c+dx))^m}{a+b\arcsin(c+dx)},x\right)$$

output
```
Unintegrable((e*(d*x+c))^m/(a+b*arcsin(d*x+c)),x)
```

## 3.312.2 Mathematica [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx = \int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx$$

input
```
Integrate[(c*e + d*e*x)^m/(a + b*ArcSin[c + d*x]),x]
```

output
```
Integrate[(c*e + d*e*x)^m/(a + b*ArcSin[c + d*x]), x]
```

## 3.312.3 Rubi [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5304, 5148}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx$$
$$\Big\downarrow \text{ 5304}$$
$$\frac{\int \frac{(e(c+dx))^m}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$
$$\Big\downarrow \text{ 5148}$$
$$\frac{\int \frac{(e(c+dx))^m}{a+b\arcsin(c+dx)}d(c+dx)}{d}$$

input
```
Int[(c*e + d*e*x)^m/(a + b*ArcSin[c + d*x]),x]
```

output
```
$Aborted
```

### 3.312.3.1 Defintions of rubi rules used

rule 5148
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Unintegrable[(d*x)^m*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, d, m,
n}, x]
```

rule 5304
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Simp[1/d   Subst[Int[((d*e - c*f)/d + f*(x/d))^m*(a + b*A
rcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x]
```

### 3.312.4 Maple [N/A] (verified)

Not integrable

Time = 4.29 (sec) , antiderivative size = 23, normalized size of antiderivative = 1.00

$$\int \frac{(dex + ce)^m}{a + b \arcsin{(dx + c)}} dx$$

input
```
int((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x)
```

output
```
int((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x)
```

### 3.312.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce + dex)^m}{a + b \arcsin(c + dx)} \, dx = \int \frac{(dex + ce)^m}{b \arcsin{(dx + c)} + a} \, dx$$

input
```
integrate((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x, algorithm="fricas")
```

output
```
integral((d*e*x + c*e)^m/(b*arcsin(d*x + c) + a), x)
```

### 3.312.6 Sympy [N/A]

Not integrable

Time = 1.02 (sec) , antiderivative size = 19, normalized size of antiderivative = 0.83

$$\int \frac{(ce + dex)^m}{a + b \arcsin(c + dx)} \, dx = \int \frac{(e(c + dx))^m}{a + b \operatorname{asin}{(c + dx)}} \, dx$$

input
```
integrate((d*e*x+c*e)**m/(a+b*asin(d*x+c)),x)
```

output
```
Integral((e*(c + d*x))**m/(a + b*asin(c + d*x)), x)
```

### 3.312.7 Maxima [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^m}{b\arcsin\left(dx+c\right)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x, algorithm="maxima")
```

output
```
integrate((d*e*x + c*e)^m/(b*arcsin(d*x + c) + a), x)
```

### 3.312.8 Giac [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx=\int \frac{(dex+ce)^m}{b\arcsin\left(dx+c\right)+a}\,dx$$

input
```
integrate((d*e*x+c*e)^m/(a+b*arcsin(d*x+c)),x, algorithm="giac")
```

output
```
integrate((d*e*x + c*e)^m/(b*arcsin(d*x + c) + a), x)
```

### 3.312.9 Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 25, normalized size of antiderivative = 1.09

$$\int \frac{(ce+dex)^m}{a+b\arcsin(c+dx)}\,dx=\int \frac{{\left(c\,e+d\,e\,x\right)}^m}{a+b\,\mathrm{asin}\left(c+d\,x\right)}\,dx$$

input
```
int((c*e + d*e*x)^m/(a + b*asin(c + d*x)),x)
```

output
```
int((c*e + d*e*x)^m/(a + b*asin(c + d*x)), x)
```

# 3.313 $\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^3 \, dx$



## 3.313.1 Optimal result

Integrand size = 33, antiderivative size = 135

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^3 \, dx = \frac{3(a+bx)^2}{8b} - \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{4b} + \frac{3\arcsin(a+bx)^2}{8b} - \frac{3(a+bx)^2\arcsin(a+bx)^2}{4b} + \frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{2b} + \frac{\arcsin(a+bx)^4}{8b}$$

output
```
3/8*(b*x+a)^2/b+3/8*arcsin(b*x+a)^2/b-3/4*(b*x+a)^2*arcsin(b*x+a)^2/b+1/8*
arcsin(b*x+a)^4/b-3/4*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1/2)/b+1/2*(b*x
+a)*arcsin(b*x+a)^3*(1-(b*x+a)^2)^(1/2)/b
```

## 3.313.2 Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 133, normalized size of antiderivative = 0.99

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^3 \, dx = \frac{3bx(2a+bx) - 6(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx) - 3(-1+2a^2+4abx+2b^2x^2)\arcsin(a+}{8b}$$

input
```
Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3,x]
```

output
```
(3*b*x*(2*a + b*x) - 6*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[
a + b*x] - 3*(-1 + 2*a^2 + 4*a*b*x + 2*b^2*x^2)*ArcSin[a + b*x]^2 + 4*(a +
 b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3 + ArcSin[a + b*x
]^4)/(8*b)
```

### 3.313.3 Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 126, normalized size of antiderivative = 0.93, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.212$, Rules used = {5306, 5156, 5138, 5152, 5210, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{-a^2-2abx-b^2x^2+1}\arcsin(a+bx)^3\,dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \sqrt{1-(a+bx)^2}\arcsin(a+bx)^3d(a+bx)}{b}$$

$$\Big\downarrow \text{5156}$$

$$\frac{-\frac{3}{2}\int (a+bx)\arcsin(a+bx)^2d(a+bx)+\frac{1}{2}\int \frac{\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{b}$$

$$\Big\downarrow \text{5138}$$

$$\frac{-\frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2-\int \frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)+\frac{1}{2}\int \frac{\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}(a+bx)\sqrt{1-(a}{b}$$

$$\Big\downarrow \text{5152}$$

$$\frac{-\frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2-\int \frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)+\frac{1}{8}\arcsin(a+bx)^4+\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}}{b}$$

$$\Big\downarrow \text{5210}$$

$$\frac{-\frac{3}{2}\left(-\frac{1}{2}\int \frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx) - \frac{1}{2}\int (a+bx)d(a+bx) + \frac{1}{2}(a+bx)^2\arcsin(a+bx)^2 + \frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\right.}{b}$$

$$\Big\downarrow 15$$

$$\frac{-\frac{3}{2}\left(-\frac{1}{2}\int \frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx) + \frac{1}{2}(a+bx)^2\arcsin(a+bx)^2 + \frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx) - \frac{1}{4}(a+b\right.}{b}$$

$$\Big\downarrow 5152$$

$$\frac{\frac{1}{8}\arcsin(a+bx)^4 + \frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3 - \frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2 + \frac{1}{2}\sqrt{1-(a+bx)^2}\right.}{b}$$

input
```
Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3,x]
```

output
```
(((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^3)/2 + ArcSin[a + b*x]^4
/8 - (3*(-1/4*(a + b*x)^2 + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*
x])/2 - ArcSin[a + b*x]^2/4 + ((a + b*x)^2*ArcSin[a + b*x]^2)/2))/2)/b
```

### 3.313.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

## 3.313.4 Maple [A] (verified)

Time = 1.85 (sec) , antiderivative size = 215, normalized size of antiderivative = 1.59

| method | result |
|---|---|
| default | $\frac{4 \arcsin(bx+a)^3 \sqrt{-b^2x^2-2abx-a^2+1}\, bx-6 \arcsin(bx+a)^2 b^2x^2+4 \arcsin(bx+a)^3 \sqrt{-b^2x^2-2abx-a^2+1}\, a-12 \arcsin(bx+a)^2 abx+\text{ar}}{}$ |

input
```
int(arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
1/8*(4*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b*x-6*arcsin(b*x+a)^
2*b^2*x^2+4*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a-12*arcsin(b*x
+a)^2*a*b*x+arcsin(b*x+a)^4-6*arcsin(b*x+a)^2*a^2-6*arcsin(b*x+a)*(-b^2*x^
2-2*a*b*x-a^2+1)^(1/2)*b*x+3*b^2*x^2-6*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2
+1)^(1/2)*a+6*a*b*x+3*arcsin(b*x+a)^2+3*a^2)/b
```

### 3.313.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.81

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3\,dx$$
$$=\frac{3\,b^2x^2+\arcsin\left(bx+a\right)^4+6\,abx-3\left(2\,b^2x^2+4\,abx+2\,a^2-1\right)\arcsin\left(bx+a\right)^2+2\,\sqrt{-b^2x^2-2\,abx-a^2}}{8\,b}$$

input
```
integrate(arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fri
cas")
```

output
```
1/8*(3*b^2*x^2 + arcsin(b*x + a)^4 + 6*a*b*x - 3*(2*b^2*x^2 + 4*a*b*x + 2*
a^2 - 1)*arcsin(b*x + a)^2 + 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(2*(b*x
+ a)*arcsin(b*x + a)^3 - 3*(b*x + a)*arcsin(b*x + a)))/b
```

### 3.313.6 Sympy [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3\,dx$$
$$=\int \sqrt{-\left(a+bx-1\right)\left(a+bx+1\right)}\operatorname{asin}^3\left(a+bx\right)dx$$

input
```
integrate(asin(b*x+a)**3*(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

output
```
Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))*asin(a + b*x)**3, x)
```

### 3.313.7 Maxima [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3\,dx$$
$$=\int \sqrt{-b^2x^2-2\,abx-a^2+1}\arcsin\left(bx+a\right)^3\,dx$$

input
```
integrate(arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="max
ima")
```

output
```
integrate(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)^3, x)
```

### 3.313.8 Giac [A] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.20

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3\,dx$$
$$=\frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin{(bx+a)}^3}{2\,b}+\frac{\arcsin{(bx+a)}^4}{8\,b}-\frac{3\,(b^2x^2+2\,abx+a^2-1)\arcsin{(bx+a)}^2}{4\,b}-\frac{3\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin{(bx+a)}}{4\,b}-\frac{3\,\arcsin{(bx+a)}^2}{8\,b}+\frac{3\,(b^2x^2+2\,abx+a^2-1)}{8\,b}+\frac{3}{16\,b}$$

input
```
integrate(arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="gia
c")
```

output
```
1/2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)^3/b + 1/8
*arcsin(b*x + a)^4/b - 3/4*(b^2*x^2 + 2*a*b*x + a^2 - 1)*arcsin(b*x + a)^2
/b - 3/4*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)/b -
3/8*arcsin(b*x + a)^2/b + 3/8*(b^2*x^2 + 2*a*b*x + a^2 - 1)/b + 3/16/b
```

### 3.313.9 Mupad [F(-1)]

Timed out.

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3\,dx=\int \mathrm{asin}(a+b\,x)^3\,\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}\,dx$$

input
```
int(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
```

output
```
int(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2), x)
```

# 3.314 $\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^2 \, dx$



## 3.314.1 Optimal result

Integrand size = 33, antiderivative size = 111

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^2 \, dx = -\frac{(a+bx)\sqrt{1-(a+bx)^2}}{4b} + \frac{\arcsin(a+bx)}{4b} - \frac{(a+bx)^2 \arcsin(a+bx)}{2b} + \frac{(a+bx)\sqrt{1-(a+bx)^2} \arcsin(a+bx)^2}{2b} + \frac{\arcsin(a+bx)^3}{6b}$$

output
```
1/4*arcsin(b*x+a)/b-1/2*(b*x+a)^2*arcsin(b*x+a)/b+1/6*arcsin(b*x+a)^3/b-1/
4*(b*x+a)*(1-(b*x+a)^2)^(1/2)/b+1/2*(b*x+a)*arcsin(b*x+a)^2*(1-(b*x+a)^2)^
(1/2)/b
```

## 3.314.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.05

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^2 \, dx$$
$$= \frac{-3(a+bx)\sqrt{1-a^2-2abx-b^2x^2} - 3(-1+2a^2+4abx+2b^2x^2)\arcsin(a+bx) + 6(a+bx)\sqrt{1-a^2-2}}{12b}$$

input
```
Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^2,x]
```

output
```
(-3*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] - 3*(-1 + 2*a^2 + 4*a*b*x
+ 2*b^2*x^2)*ArcSin[a + b*x] + 6*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^
2]*ArcSin[a + b*x]^2 + 2*ArcSin[a + b*x]^3)/(12*b)
```

## 3.314.3 Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 105, normalized size of antiderivative = 0.95, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {5306, 5156, 5138, 262, 223, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{-a^2-2abx-b^2x^2+1}\arcsin(a+bx)^2\,dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \sqrt{1-(a+bx)^2}\arcsin(a+bx)^2d(a+bx)}{b}$$

$$\Big\downarrow \text{5156}$$

$$\frac{-\int (a+bx)\arcsin(a+bx)d(a+bx)+\frac{1}{2}\int \frac{\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{b}$$

$$\Big\downarrow \text{5138}$$

$$\frac{\frac{1}{2}\int \frac{\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}\int \frac{(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}(a+bx)^2\arcsin(a+bx)+\frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\text{arcs}}{b}$$

$$\Big\downarrow \text{262}$$

$$\frac{\frac{1}{2}\int \frac{\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}\left(\frac{1}{2}\int \frac{1}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\right)-\frac{1}{2}(a+bx)^2\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{223}$$

$$\frac{\frac{1}{2}\int \frac{\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}(a+bx)^2\arcsin(a+bx)+\frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)^2+\frac{1}{2}\left(\frac{1}{2}\arcsin(a\right.}{b}$$

$$\Big\downarrow \text{5152}$$

$$\frac{\frac{1}{6}\arcsin(a+bx)^3+\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2-\frac{1}{2}(a+bx)^2\arcsin(a+bx)+\frac{1}{2}\Big(\frac{1}{2}\arcsin(a+bx)-}{b}$$

input
```
Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^2,x]
```

output
```
((-1/2*((a + b*x)*Sqrt[1 - (a + b*x)^2]) + ArcSin[a + b*x]/2)/2 - ((a + b*
x)^2*ArcSin[a + b*x])/2 + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]
^2)/2 + ArcSin[a + b*x]^3/6)/b
```

### 3.314.3.1 Defintions of rubi rules used

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.314.4 Maple [A] (verified)

Time = 1.75 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.61

| method | result |
|---|---|
| default | $\frac{6 \arcsin(bx+a)^2 \sqrt{-b^2x^2-2abx-a^2+1}\, bx - 6 \arcsin(bx+a) b^2x^2 + 6 \arcsin(bx+a)^2 \sqrt{-b^2x^2-2abx-a^2+1}\, a - 12 \arcsin(bx+a) abx + 2 \operatorname{arc}}{12b}$ |

input
```
int(arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
1/12*(6*arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b*x-6*arcsin(b*x+a)
*b^2*x^2+6*arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a-12*arcsin(b*x+
a)*a*b*x+2*arcsin(b*x+a)^3-6*a^2*arcsin(b*x+a)-3*x*b*(-b^2*x^2-2*a*b*x-a^2
+1)^(1/2)-3*a*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+3*arcsin(b*x+a))/b
```

### 3.314.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.82

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)^2 \, dx$$
$$= \frac{2 \arcsin(bx+a)^3 - 3 (2 b^2x^2 + 4 abx + 2 a^2 - 1) \arcsin(bx+a) + 3 \sqrt{-b^2x^2 - 2 abx - a^2 + 1} (2 (bx+a)}{12 b}$$

input
```
integrate(arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fri
cas")
```

output
```
1/12*(2*arcsin(b*x + a)^3 - 3*(2*b^2*x^2 + 4*a*b*x + 2*a^2 - 1)*arcsin(b*x
 + a) + 3*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(2*(b*x + a)*arcsin(b*x + a)^
2 - b*x - a))/b
```

### 3.314.6 Sympy [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2\,dx$$
$$=\int \sqrt{-(a+bx-1)(a+bx+1)}\operatorname{asin}^2(a+bx)\,dx$$

input
```
integrate(asin(b*x+a)**2*(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

output
```
Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))*asin(a + b*x)**2, x)
```

### 3.314.7 Maxima [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2\,dx$$
$$=\int \sqrt{-b^2x^2-2\,abx-a^2+1}\arcsin(bx+a)^2\,dx$$

input
```
integrate(arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="max
ima")
```

output
```
integrate(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)^2, x)
```

### 3.314.8 Giac [A] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.13

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2\,dx$$
$$= \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin(bx+a)^2}{2\,b} + \frac{\arcsin(bx+a)^3}{6\,b} - \frac{(b^2x^2+2\,abx+a^2-1)\arcsin(bx+a)}{2\,b} - \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)}{4\,b} - \frac{\arcsin(bx+a)}{4\,b}$$

input
```
integrate(arcsin(b*x+a)^2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="gia
c")
```

output
```
1/2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)^2/b + 1/6
*arcsin(b*x + a)^3/b - 1/2*(b^2*x^2 + 2*a*b*x + a^2 - 1)*arcsin(b*x + a)/b
 - 1/4*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)/b - 1/4*arcsin(b*x + a
)/b
```

### 3.314.9 Mupad [F(-1)]

Timed out.

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2\,dx = \int \operatorname{asin}(a+b\,x)^2\,\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}\,dx$$

input
```
int(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
```

output
```
int(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2), x)
```

# 3.315 $\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)\,dx$



## 3.315.1 Optimal result

Integrand size = 31, antiderivative size = 63

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)\,dx = -\frac{(a+bx)^2}{4b}+\frac{(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{2b}+\frac{\arcsin(a+bx)^2}{4b}$$

output
```
-1/4*(b*x+a)^2/b+1/4*arcsin(b*x+a)^2/b+1/2*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a
)^2)^(1/2)/b
```

## 3.315.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.02

$$\int \sqrt{1-a^2-2abx-b^2x^2} \arcsin(a+bx)\,dx = \frac{-bx(2a+bx)+2(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)+\arcsin(a+bx)^2}{4b}$$

input
```
Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x],x]
```

output
```
(-(b*x*(2*a + b*x)) + 2*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin
[a + b*x] + ArcSin[a + b*x]^2)/(4*b)
```

### 3.315.3 Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.92, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$, Rules used = {5306, 5156, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{-a^2-2abx-b^2x^2+1}\arcsin(a+bx)\,dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \sqrt{1-(a+bx)^2}\arcsin(a+bx)d(a+bx)}{b}$$

$$\Big\downarrow \text{5156}$$

$$\frac{\frac{1}{2}\int \frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}\int (a+bx)d(a+bx)+\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{15}$$

$$\frac{\frac{1}{2}\int \frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)-\frac{1}{4}(a+bx)^2}{b}$$

$$\Big\downarrow \text{5152}$$

$$\frac{\frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)+\frac{1}{4}\arcsin(a+bx)^2-\frac{1}{4}(a+bx)^2}{b}$$

input
```
Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x],x]
```

output
```
(-1/4*(a + b*x)^2 + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/2 +
ArcSin[a + b*x]^2/4)/b
```

### 3.315.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

## 3.315.4 Maple [A] (verified)

Time = 1.50 (sec) , antiderivative size = 96, normalized size of antiderivative = 1.52

| method | result | size |
|---|---|---|
| default | $\frac{2\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,bx-b^2x^2+2\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,a-2abx+\arcsin(bx+a)^2-a^2}{4b}$ | 96 |

input
```
int(arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/4*(2*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b*x-b^2*x^2+2*arcsin(b
*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a-2*a*b*x+arcsin(b*x+a)^2-a^2)/b
```

### 3.315.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx$$
$$=-\frac{b^2x^2+2\,abx-2\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin(bx+a)-\arcsin(bx+a)^2}{4\,b}$$

input
```
integrate(arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="frica
s")
```

output
```
-1/4*(b^2*x^2 + 2*a*b*x - 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*a
rcsin(b*x + a) - arcsin(b*x + a)^2)/b
```

### 3.315.6 Sympy [F]

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx$$
$$=\int \sqrt{-(a+bx-1)(a+bx+1)}\,\mathrm{asin}(a+bx)\,dx$$

input
```
integrate(asin(b*x+a)*(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

output
```
Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))*asin(a + b*x), x)
```

### 3.315.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 240 vs. 2(55) = 110.

Time = 0.31 (sec) , antiderivative size = 240, normalized size of antiderivative = 3.81

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = -\frac{1}{4}\left(x^2+\frac{2\,ax}{b}-\frac{2\,\arcsin(bx+a)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^2}-\frac{\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{b^2}\right)b -\frac{1}{2}\left(\frac{a^2\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b}-\sqrt{-b^2x^2-2\,abx-a^2+1}x-\frac{(a^2-1)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b}-\right. + a)$$

input
```
integrate(arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="maxim
a")
```

output
```
-1/4*(x^2 + 2*a*x/b - 2*arcsin(b*x + a)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2
 - (a^2 - 1)*b^2))/b^2 - arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^
2))^2/b^2)*b - 1/2*(a^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2
))/b - sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*x - (a^2 - 1)*arcsin(-(b^2*x + a
*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b - sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*
a/b)*arcsin(b*x + a)
```

### 3.315.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.25

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin(bx+a)}{2\,b} + \frac{\arcsin(bx+a)^2}{4\,b}-\frac{b^2x^2+2\,abx+a^2-1}{4\,b}-\frac{1}{8\,b}$$

input
```
integrate(arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="giac"
)
```

output
```
1/2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)/b + 1/4*a
rcsin(b*x + a)^2/b - 1/4*(b^2*x^2 + 2*a*b*x + a^2 - 1)/b - 1/8/b
```

### 3.315.9 Mupad [F(-1)]

Timed out.

$$\int \sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\,dx = \int \operatorname{asin}(a+b\,x)\,\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}\,dx$$

input
```
int(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
```

output
```
int(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2), x)
```

# 3.316 $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)} \, dx$



## 3.316.1 Optimal result

Integrand size = 33, antiderivative size = 31

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)} \, dx = \frac{\text{CosIntegral}(2\arcsin(a+bx))}{2b} + \frac{\log(\arcsin(a+bx))}{2b}$$

output
```
1/2*Ci(2*arcsin(b*x+a))/b+1/2*ln(arcsin(b*x+a))/b
```

## 3.316.2 Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.77

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)} \, dx = \frac{\text{CosIntegral}(2\arcsin(a+bx)) + \log(\arcsin(a+bx))}{2b}$$

input
```
Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x],x]
```

output
```
(CosIntegral[2*ArcSin[a + b*x]] + Log[ArcSin[a + b*x]])/(2*b)
```

### 3.316.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.94, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {5306, 5168, 3042, 3793, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{-a^2-2abx-b^2x^2+1}}{\arcsin(a+bx)}dx$$
$$\Big\downarrow \text{5306}$$
$$\frac{\int \frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d(a+bx)}{b}$$
$$\Big\downarrow \text{5168}$$
$$\frac{\int \frac{1-(a+bx)^2}{\arcsin(a+bx)}d\arcsin(a+bx)}{b}$$
$$\Big\downarrow \text{3042}$$
$$\frac{\int \frac{\sin\left(\arcsin(a+bx)+\frac{\pi}{2}\right)^2}{\arcsin(a+bx)}d\arcsin(a+bx)}{b}$$
$$\Big\downarrow \text{3793}$$
$$\frac{\int \left(\frac{\cos(2\arcsin(a+bx))}{2\arcsin(a+bx)}+\frac{1}{2\arcsin(a+bx)}\right)d\arcsin(a+bx)}{b}$$
$$\Big\downarrow \text{2009}$$
$$\frac{\frac{1}{2}\text{CosIntegral}(2\arcsin(a+bx))+\frac{1}{2}\log(\arcsin(a+bx))}{b}$$

input
```
Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x],x]
```

output
```
(CosIntegral[2*ArcSin[a + b*x]]/2 + Log[ArcSin[a + b*x]]/2)/b
```

### 3.316.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3793
```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

rule 5168
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Subst[Int[
x^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b
, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

## 3.316.4 Maple [A] (verified)

Time = 1.79 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.74

| method | result | size |
|---|---|---|
| default | $\frac{\ln(\arcsin(bx+a))+\operatorname{Ci}(2\arcsin(bx+a))}{2b}$ | 23 |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
1/2*(ln(arcsin(b*x+a))+Ci(2*arcsin(b*x+a)))/b
```

### 3.316.5 Fricas [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a),x, algorithm="frica
s")
```

output
```
integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a), x)
```

### 3.316.6 Sympy [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx = \int \frac{\sqrt{-\left(a+bx-1\right)\left(a+bx+1\right)}}{\operatorname{asin}\left(a+bx\right)}\,dx$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(1/2)/asin(b*x+a),x)
```

output
```
Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))/asin(a + b*x), x)
```

### 3.316.7 Maxima [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a),x, algorithm="maxim
a")
```

output
```
integrate(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a), x)
```

### 3.316.8 Giac [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.87

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx = \frac{\operatorname{Ci}\left(2 \arcsin\left(bx+a\right)\right)}{2\,b} + \frac{\log\left(\arcsin\left(bx+a\right)\right)}{2\,b}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a),x, algorithm="giac"
)
```

output
```
1/2*cos_integral(2*arcsin(b*x + a))/b + 1/2*log(arcsin(b*x + a))/b
```

### 3.316.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)}\,dx = \int \frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{\mathrm{asin}\left(a+b\,x\right)}\,dx$$

input
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x),x)
```

output
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x), x)
```

# 3.317 $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2} dx$



## 3.317.1 Optimal result

Integrand size = 33, antiderivative size = 39

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2} dx = -\frac{1-(a+bx)^2}{b\arcsin(a+bx)} - \frac{\mathrm{Si}(2\arcsin(a+bx))}{b}$$

output
```
(-1+(b*x+a)^2)/b/arcsin(b*x+a)-Si(2*arcsin(b*x+a))/b
```

## 3.317.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.18

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2} dx = \frac{-1+a^2+2abx+b^2x^2-\arcsin(a+bx)\mathrm{Si}(2\arcsin(a+bx))}{b\arcsin(a+bx)}$$

input
```
Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^2,x]
```

output
```
(-1 + a^2 + 2*a*b*x + b^2*x^2 - ArcSin[a + b*x]*SinIntegral[2*ArcSin[a + b
*x]])/(b*ArcSin[a + b*x])
```

### 3.317.3 Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.95, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.212, Rules used = {5306, 5166, 5146, 4906, 27, 3042, 3780}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{-a^2-2abx-b^2x^2+1}}{\arcsin(a+bx)^2}dx$$

$$\Big\downarrow \textbf{5306}$$

$$\frac{\int \frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^2}d(a+bx)}{b}$$

$$\Big\downarrow \textbf{5166}$$

$$\frac{-2\int \frac{a+bx}{\arcsin(a+bx)}d(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \textbf{5146}$$

$$\frac{-2\int \frac{(a+bx)\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \textbf{4906}$$

$$\frac{-2\int \frac{\sin(2\arcsin(a+bx))}{2\arcsin(a+bx)}d\arcsin(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \textbf{27}$$

$$\frac{-\int \frac{\sin(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \textbf{3042}$$

$$\frac{-\int \frac{\sin(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \textbf{3780}$$

$$\frac{-\text{Si}(2\arcsin(a+bx))-\frac{1-(a+bx)^2}{\arcsin(a+bx)}}{b}$$

input
```
Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^2,x]
```

output
```
(-((1 - (a + b*x)^2)/ArcSin[a + b*x]) - SinIntegral[2*ArcSin[a + b*x]])/b
```

### 3.317.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5166
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Simp[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p]   Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
 x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

---

3.317. $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx$

### 3.317.4 Maple [A] (verified)

Time = 1.76 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.08

| method | result | size |
|---|---|---|
| default | $-\frac{2\,\mathrm{Si}(2\arcsin(bx+a))\arcsin(bx+a)+\cos(2\arcsin(bx+a))+1}{2b\arcsin(bx+a)}$ | 42 |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE
)
```

output
```
-1/2/b*(2*Si(2*arcsin(b*x+a))*arcsin(b*x+a)+cos(2*arcsin(b*x+a))+1)/arcsin
(b*x+a)
```

### 3.317.5 Fricas [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx=\int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)^2}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^2,x, algorithm="fri
cas")
```

output
```
integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a)^2, x)
```

### 3.317.6 Sympy [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx=\int \frac{\sqrt{-\left(a+bx-1\right)\left(a+bx+1\right)}}{\mathrm{asin}^2\left(a+bx\right)}\,dx$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(1/2)/asin(b*x+a)**2,x)
```

output
```
Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))/asin(a + b*x)**2, x)
```

### 3.317.7 Maxima [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)^2}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^2,x, algorithm="max
ima")
```

output
```
(b^2*x^2 + 2*a*b*x - b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a +
1))*integrate(2*(b*x + a)/arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a
 + 1)), x) + a^2 - 1)/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a
+ 1)))
```

### 3.317.8 Giac [A] (verification not implemented)

Time = 0.35 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.13

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx = -\frac{\mathrm{Si}\left(2\arcsin\left(bx+a\right)\right)}{b} + \frac{b^2x^2+2\,abx+a^2-1}{b\arcsin\left(bx+a\right)}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^2,x, algorithm="gia
c")
```

output
```
-sin_integral(2*arcsin(b*x + a))/b + (b^2*x^2 + 2*a*b*x + a^2 - 1)/(b*arcs
in(b*x + a))
```

### 3.317.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^2}\,dx = \int \frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{\mathrm{asin}\left(a+b\,x\right)^2}\,dx$$

input
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^2,x)
```

output
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^2, x)
```

# 3.318 $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3} dx$



## 3.318.1 Optimal result

Integrand size = 33, antiderivative size = 71

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3} dx = \frac{-1+(a+bx)^2}{2b\arcsin(a+bx)^2} + \frac{(a+bx)\sqrt{1-(a+bx)^2}}{b\arcsin(a+bx)} - \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b}$$

output
```
1/2*(-1+(b*x+a)^2)/b/arcsin(b*x+a)^2-Ci(2*arcsin(b*x+a))/b+(b*x+a)*(1-(b*x
+a)^2)^(1/2)/b/arcsin(b*x+a)
```

## 3.318.2 Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.24

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3} dx = \frac{-1+a^2+2abx+b^2x^2+2(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)-2\arcsin(a+bx)^2\,\text{CosIntegra}}{2b\arcsin(a+bx)^2}$$

input
```
Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^3,x]
```

output
```
(-1 + a^2 + 2*a*b*x + b^2*x^2 + 2*(a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x
^2]*ArcSin[a + b*x] - 2*ArcSin[a + b*x]^2*CosIntegral[2*ArcSin[a + b*x]])/
(2*b*ArcSin[a + b*x]^2)
```

### 3.318.3 Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.96, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {5306, 5166, 5142, 3042, 3783}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{-a^2-2abx-b^2x^2+1}}{\arcsin(a+bx)^3}\,dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^3}d(a+bx)}{b}$$

$$\Big\downarrow \text{5166}$$

$$\frac{-\int \frac{a+bx}{\arcsin(a+bx)^2}d(a+bx)-\frac{1-(a+bx)^2}{2\arcsin(a+bx)^2}}{b}$$

$$\Big\downarrow \text{5142}$$

$$\frac{-\int \frac{\cos(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)+\frac{\sqrt{1-(a+bx)^2}(a+bx)}{\arcsin(a+bx)}-\frac{1-(a+bx)^2}{2\arcsin(a+bx)^2}}{b}$$

$$\Big\downarrow \text{3042}$$

$$\frac{-\int \frac{\sin\left(2\arcsin(a+bx)+\frac{\pi}{2}\right)}{\arcsin(a+bx)}d\arcsin(a+bx)+\frac{\sqrt{1-(a+bx)^2}(a+bx)}{\arcsin(a+bx)}-\frac{1-(a+bx)^2}{2\arcsin(a+bx)^2}}{b}$$

$$\Big\downarrow \text{3783}$$

$$\frac{-\text{CosIntegral}(2\arcsin(a+bx))+\frac{\sqrt{1-(a+bx)^2}(a+bx)}{\arcsin(a+bx)}-\frac{1-(a+bx)^2}{2\arcsin(a+bx)^2}}{b}$$

input
```
Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^3,x]
```

output
```
(-1/2*(1 - (a + b*x)^2)/ArcSin[a + b*x]^2 + ((a + b*x)*Sqrt[1 - (a + b*x)^
2])/ArcSin[a + b*x] - CosIntegral[2*ArcSin[a + b*x]])/b
```

### 3.318.3.1 Defintions of rubi rules used

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3783
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

rule 5142
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] - Simp
[1/(b^2*c^(m + 1)*(n + 1))   Subst[Int[ExpandTrigReduce[x^(n + 1), Sin[-a/b
 + x/b]^(m - 1)*(m - (m + 1)*Sin[-a/b + x/b]^2), x], x], x, a + b*ArcSin[c*
x]], x] /; FreeQ[{a, b, c}, x] && IGtQ[m, 0] && GeQ[n, -2] && LtQ[n, -1]
```

rule 5166
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Simp[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p]   Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
 x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

## 3.318.4 Maple [A] (verified)

Time = 1.74 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.86

| method | result | size |
|---|---|---|
| default | $-\frac{4 \operatorname{Ci}\left(2 \arcsin \left(b x +a \right)\right) \arcsin \left(b x +a \right)^{2}-2 \sin \left(2 \arcsin \left(b x +a \right)\right) \arcsin \left(b x +a \right)+\cos \left(2 \arcsin \left(b x +a \right)\right)+1}{4 b \arcsin \left(b x +a \right)^{2}}$ | 61 |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE
)
```

output
```
-1/4/b*(4*Ci(2*arcsin(b*x+a))*arcsin(b*x+a)^2-2*sin(2*arcsin(b*x+a))*arcsi
n(b*x+a)+cos(2*arcsin(b*x+a))+1)/arcsin(b*x+a)^2
```

### 3.318.5 Fricas [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)^3}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^3,x, algorithm="fri
cas")
```

output
```
integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a)^3, x)
```

### 3.318.6 Sympy [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = \int \frac{\sqrt{-\left(a+bx-1\right)\left(a+bx+1\right)}}{\operatorname{asin}^3\left(a+bx\right)}\,dx$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(1/2)/asin(b*x+a)**3,x)
```

output
```
Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))/asin(a + b*x)**3, x)
```

### 3.318.7 Maxima [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)^3}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^3,x, algorithm="max
ima")
```

output
```
1/2*(b^2*x^2 - 2*b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^
2*integrate((2*b^2*x^2 + 4*a*b*x + 2*a^2 - 1)*sqrt(b*x + a + 1)*sqrt(-b*x
- a + 1)/((b^2*x^2 + 2*a*b*x + a^2 - 1)*arctan2(b*x + a, sqrt(b*x + a + 1)
*sqrt(-b*x - a + 1))), x) + 2*a*b*x + 2*sqrt(b*x + a + 1)*(b*x + a)*sqrt(-
b*x - a + 1)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)) + a^2
- 1)/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

### 3.318.8 Giac [A] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.18

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = -\frac{\text{Ci}\left(2\arcsin\left(bx+a\right)\right)}{b} + \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)}{b\arcsin\left(bx+a\right)} + \frac{b^2x^2+2\,abx+a^2-1}{2\,b\arcsin\left(bx+a\right)^2}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^3,x, algorithm="gia
c")
```

output
```
-cos_integral(2*arcsin(b*x + a))/b + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b
*x + a)/(b*arcsin(b*x + a)) + 1/2*(b^2*x^2 + 2*a*b*x + a^2 - 1)/(b*arcsin(
b*x + a)^2)
```

### 3.318.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^3}\,dx = \int \frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{\mathrm{asin}\left(a+b\,x\right)^3}\,dx$$

input
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^3,x)
```

output
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^3, x)
```

# 3.319 $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx$



## 3.319.1 Optimal result

Integrand size = 33, antiderivative size = 115

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx = -\frac{1-(a+bx)^2}{3b\arcsin(a+bx)^3}+\frac{(a+bx)\sqrt{1-(a+bx)^2}}{3b\arcsin(a+bx)^2}+\frac{1}{3b\arcsin(a+bx)}-\frac{2(a+bx)^2}{3b\arcsin(a+bx)}+\frac{2\text{Si}(2\arcsin(a+bx))}{3b}$$

output
```
1/3*(-1+(b*x+a)^2)/b/arcsin(b*x+a)^3+1/3/b/arcsin(b*x+a)-2/3*(b*x+a)^2/b/a
rcsin(b*x+a)+2/3*Si(2*arcsin(b*x+a))/b+1/3*(b*x+a)*(1-(b*x+a)^2)^(1/2)/b/a
rcsin(b*x+a)^2
```

## 3.319.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.02

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx = \frac{-1+a^2+2abx+b^2x^2+(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)-(-1+2a^2+4abx+2b^2x^2)\,\text{ar}}{3b\arcsin(a+bx)^3}$$

input
```
Integrate[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^4,x]
```

output
```
(-1 + a^2 + 2*a*b*x + b^2*x^2 + (a + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2
]*ArcSin[a + b*x] - (-1 + 2*a^2 + 4*a*b*x + 2*b^2*x^2)*ArcSin[a + b*x]^2 +
 2*ArcSin[a + b*x]^3*SinIntegral[2*ArcSin[a + b*x]])/(3*b*ArcSin[a + b*x]^
3)
```

### 3.319.3 Rubi [A] (verified)

Time = 0.74 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.90, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.303$, Rules used = {5306, 5166, 5144, 5152, 5222, 5146, 4906, 27, 3042, 3780}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\sqrt{-a^2-2abx-b^2x^2+1}}{\arcsin(a+bx)^4}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^4}d(a+bx)}{b}$$

$$\Big\downarrow \text{5166}$$

$$\frac{-\frac{2}{3}\int \frac{a+bx}{\arcsin(a+bx)^3}d(a+bx)-\frac{1-(a+bx)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \text{5144}$$

$$\frac{-\frac{2}{3}\left(\frac{1}{2}\int \frac{1}{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}d(a+bx)-\int \frac{(a+bx)^2}{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}d(a+bx)-\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2\arcsin(a+bx)^2}\right)-\frac{1-(a+bx)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \text{5152}$$

$$\frac{-\frac{2}{3}\left(-\int \frac{(a+bx)^2}{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}d(a+bx)-\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2\arcsin(a+bx)^2}-\frac{1}{2\arcsin(a+bx)}\right)-\frac{1-(a+bx)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \text{5222}$$

$$\frac{-\frac{2}{3}\left(-2\int \frac{a+bx}{\arcsin(a+bx)}d(a+bx)+\frac{(a+bx)^2}{\arcsin(a+bx)}-\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2\arcsin(a+bx)^2}-\frac{1}{2\arcsin(a+bx)}\right)-\frac{1-(a+bx)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \text{5146}$$

$$\frac{-\frac{2}{3}\left(-2\int \frac{(a+bx)\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d\arcsin(a+bx)+\frac{(a+bx)^2}{\arcsin(a+bx)}-\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2\arcsin(a+bx)^2}-\frac{1}{2\arcsin(a+bx)}\right)-\frac{1-(a+bx)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \; 4906$$

$$\frac{-\frac{2}{3}\left(-2\int \frac{\sin(2\arcsin(a+bx))}{2\arcsin(a+bx)}d\arcsin(a+bx)+\frac{(a+bx)^2}{\arcsin(a+bx)}-\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2\arcsin(a+bx)^2}-\frac{1}{2\arcsin(a+bx)}\right)-\frac{1-(a+bx)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \; 27$$

$$\frac{-\frac{2}{3}\left(-\int \frac{\sin(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)+\frac{(a+bx)^2}{\arcsin(a+bx)}-\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2\arcsin(a+bx)^2}-\frac{1}{2\arcsin(a+bx)}\right)-\frac{1-(a+bx)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \; 3042$$

$$\frac{-\frac{2}{3}\left(-\int \frac{\sin(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)+\frac{(a+bx)^2}{\arcsin(a+bx)}-\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2\arcsin(a+bx)^2}-\frac{1}{2\arcsin(a+bx)}\right)-\frac{1-(a+bx)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \; 3780$$

$$\frac{-\frac{2}{3}\left(-\text{Si}(2\arcsin(a+bx))+\frac{(a+bx)^2}{\arcsin(a+bx)}-\frac{\sqrt{1-(a+bx)^2}(a+bx)}{2\arcsin(a+bx)^2}-\frac{1}{2\arcsin(a+bx)}\right)-\frac{1-(a+bx)^2}{3\arcsin(a+bx)^3}}{b}$$

input
```
Int[Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]/ArcSin[a + b*x]^4,x]
```

output
```
(-1/3*(1 - (a + b*x)^2)/ArcSin[a + b*x]^3 - (2*(-1/2*((a + b*x)*Sqrt[1 - (
a + b*x)^2])/ArcSin[a + b*x]^2 - 1/(2*ArcSin[a + b*x]) + (a + b*x)^2/ArcSi
n[a + b*x] - SinIntegral[2*ArcSin[a + b*x]]))/3)/b
```

### 3.319.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

3.319. $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx$

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5144
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[x
^m*Sqrt[1 - c^2*x^2]*((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (Sim
p[c*((m + 1)/(b*(n + 1)))   Int[x^(m + 1)*((a + b*ArcSin[c*x])^(n + 1)/Sqrt
[1 - c^2*x^2]), x], x] - Simp[m/(b*c*(n + 1))   Int[x^(m - 1)*((a + b*ArcSi
n[c*x])^(n + 1)/Sqrt[1 - c^2*x^2]), x], x]) /; FreeQ[{a, b, c}, x] && IGtQ[
m, 0] && LtQ[n, -2]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5166
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Simp[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p]   Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
 x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

rule 5222
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^m/(b*c*(n + 1)))*Simp[Sqrt[1 - c^
2*x^2]/Sqrt[d + e*x^2]]*(a + b*ArcSin[c*x])^(n + 1), x] - Simp[f*(m/(b*c*(n
 + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[(f*x)^(m - 1)*(a + b*
ArcSin[c*x])^(n + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[c^2*
d + e, 0] && LtQ[n, -1]
```

## 3.319. $\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx$

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

## 3.319.4 Maple [A] (verified)

Time = 1.71 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.70

| method | result |
|---|---|
| default | $\frac{4\,\mathrm{Si}(2\arcsin(bx+a))\arcsin(bx+a)^3+2\cos(2\arcsin(bx+a))\arcsin(bx+a)^2+\sin(2\arcsin(bx+a))\arcsin(bx+a)-\cos(2\arcsin(bx+a))-}{6b\arcsin(bx+a)^3}$ |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^4,x,method=_RETURNVERBOSE
)
```

output
```
1/6/b*(4*Si(2*arcsin(b*x+a))*arcsin(b*x+a)^3+2*cos(2*arcsin(b*x+a))*arcsin
(b*x+a)^2+sin(2*arcsin(b*x+a))*arcsin(b*x+a)-cos(2*arcsin(b*x+a))-1)/arcsi
n(b*x+a)^3
```

## 3.319.5 Fricas [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx = \int \frac{\sqrt{-b^2x^2-2\,abx-a^2+1}}{\arcsin\left(bx+a\right)^4}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^4,x, algorithm="fri
cas")
```

output
```
integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/arcsin(b*x + a)^4, x)
```

### 3.319.6 Sympy [F]

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx=\int \frac{\sqrt{-(a+bx-1)(a+bx+1)}}{\operatorname{asin}^4(a+bx)}\,dx$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(1/2)/asin(b*x+a)**4,x)
```

output
```
Integral(sqrt(-(a + b*x - 1)*(a + b*x + 1))/asin(a + b*x)**4, x)
```

### 3.319.7 Maxima [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx=\text{Timed out}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^4,x, algorithm="max
ima")
```

output
```
Timed out
```

### 3.319.8 Giac [A] (verification not implemented)

Time = 0.37 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.11

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx=\frac{2\,\mathrm{Si}\left(2\,\arcsin\left(bx+a\right)\right)}{3\,b}-\frac{2\left(b^2x^2+2\,abx+a^2-1\right)}{3\,b\arcsin\left(bx+a\right)}+\frac{\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)}{3\,b\arcsin\left(bx+a\right)^2}-\frac{1}{3\,b\arcsin\left(bx+a\right)}+\frac{b^2x^2+2\,abx+a^2-1}{3\,b\arcsin\left(bx+a\right)^3}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/arcsin(b*x+a)^4,x, algorithm="gia
c")
```

output
```
2/3*sin_integral(2*arcsin(b*x + a))/b - 2/3*(b^2*x^2 + 2*a*b*x + a^2 - 1)/
(b*arcsin(b*x + a)) + 1/3*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)/(b*
arcsin(b*x + a)^2) - 1/3/(b*arcsin(b*x + a)) + 1/3*(b^2*x^2 + 2*a*b*x + a^
2 - 1)/(b*arcsin(b*x + a)^3)
```

### 3.319.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\sqrt{1-a^2-2abx-b^2x^2}}{\arcsin(a+bx)^4}\,dx=\int \frac{\sqrt{-a^2-2\,a\,b\,x-b^2\,x^2+1}}{{\mathrm{asin}\left(a+b\,x\right)}^4}\,dx$$

input
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^4,x)
```

output
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)/asin(a + b*x)^4, x)
```

# 3.320 $\int (1-a^2-2abx-b^2x^2)^{3/2} \arcsin(a+bx)^3 \, dx$



## 3.320.1 Optimal result

Integrand size = 33, antiderivative size = 245

$$\int (1-a^2-2abx-b^2x^2)^{3/2} \arcsin(a+bx)^3 \, dx = \frac{51(a+bx)^2}{128b} - \frac{3(a+bx)^4}{128b} - \frac{45(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{64b} - \frac{3(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{32b} + \frac{27\arcsin(a+bx)^2}{128b} - \frac{9(a+bx)^2\arcsin(a+bx)^2}{16b} + \frac{3\left(1-(a+bx)^2\right)^2\arcsin(a+bx)^2}{16b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^3}{4b} + \frac{3\arcsin(a+bx)^4}{32b}$$

output
```
51/128*(b*x+a)^2/b-3/128*(b*x+a)^4/b-3/32*(b*x+a)*(1-(b*x+a)^2)^(3/2)*arcs
in(b*x+a)/b+27/128*arcsin(b*x+a)^2/b-9/16*(b*x+a)^2*arcsin(b*x+a)^2/b+3/16
*(1-(b*x+a)^2)^2*arcsin(b*x+a)^2/b+1/4*(b*x+a)*(1-(b*x+a)^2)^(3/2)*arcsin(
b*x+a)^3/b+3/32*arcsin(b*x+a)^4/b-45/64*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2
)^(1/2)/b+3/8*(b*x+a)*arcsin(b*x+a)^3*(1-(b*x+a)^2)^(1/2)/b
```

### 3.320.2 Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.11

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)^3\,dx = \frac{6a(17-2a^2)\,bx+3(17-6a^2)\,b^2x^2-12ab^3x^3-3b^4x^4+6\sqrt{1-a^2-2abx-b^2x^2}(-17a+2a^3-$$

input
```
Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^3,x]
```

output
```
(6*a*(17 - 2*a^2)*b*x + 3*(17 - 6*a^2)*b^2*x^2 - 12*a*b^3*x^3 - 3*b^4*x^4
+ 6*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-17*a + 2*a^3 - 17*b*x + 6*a^2*b*x
+ 6*a*b^2*x^2 + 2*b^3*x^3)*ArcSin[a + b*x] + 3*(17 + 8*a^4 + 32*a^3*b*x -
40*b^2*x^2 + 8*b^4*x^4 + 16*a*b*x*(-5 + 2*b^2*x^2) + 8*a^2*(-5 + 6*b^2*x^2
))*ArcSin[a + b*x]^2 - 16*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-5*a + 2*a^3
- 5*b*x + 6*a^2*b*x + 6*a*b^2*x^2 + 2*b^3*x^3)*ArcSin[a + b*x]^3 + 12*ArcS
in[a + b*x]^4)/(128*b)
```

### 3.320.3 Rubi [A] (verified)

Time = 1.46 (sec) , antiderivative size = 313, normalized size of antiderivative = 1.28, number of steps used = 16, number of rules used = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.455$, Rules used = {5306, 5158, 5156, 5138, 5152, 5182, 5158, 244, 2009, 5156, 15, 5152, 5210, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(-a^2-2abx-b^2x^2+1\right)^{3/2} \arcsin(a+bx)^3\,dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \left(1-(a+bx)^2\right)^{3/2} \arcsin(a+bx)^3 d(a+bx)}{b}$$

$$\Big\downarrow \text{5158}$$

$$\frac{-\frac{3}{4}\int (a+bx)\left(1-(a+bx)^2\right) \arcsin(a+bx)^2 d(a+bx)+\frac{3}{4}\int \sqrt{1-(a+bx)^2} \arcsin(a+bx)^3 d(a+bx)+\frac{1}{4}(a+bx}{b}$$

$$\Big\downarrow \text{5156}$$

$$\frac{-\frac{3}{4}\int(a+bx)\left(1-(a+bx)^2\right)\arcsin(a+bx)^2d(a+bx)+\frac{3}{4}\left(-\frac{3}{2}\int(a+bx)\arcsin(a+bx)^2d(a+bx)+\frac{1}{2}\int\frac{\arcsin(a+}{\sqrt{1-(a+}}\right.}{b}$$

$$\Big\downarrow \text{5138}$$

$$-\frac{3}{4}\int(a+bx)\left(1-(a+bx)^2\right)\arcsin(a+bx)^2d(a+bx)+\frac{3}{4}\left(-\frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2-\int\frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}\right.\right.$$

$$\Big\downarrow \text{5152}$$

$$\frac{3}{4}\left(-\frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2-\int\frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)+\frac{1}{8}\arcsin(a+bx)^4+\frac{1}{2}(a+bx)\sqrt{1-(a+bx}\right.$$

$$\Big\downarrow \text{5182}$$

$$\frac{3}{4}\left(-\frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2-\int\frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)+\frac{1}{8}\arcsin(a+bx)^4+\frac{1}{2}(a+bx)\sqrt{1-(a+bx}\right.$$

$$\Big\downarrow \text{5158}$$

$$\frac{3}{4}\left(-\frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2-\int\frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)+\frac{1}{8}\arcsin(a+bx)^4+\frac{1}{2}(a+bx)\sqrt{1-(a+ba}\right.$$

$$\Big\downarrow \text{244}$$

$$\frac{3}{4}\left(-\frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2-\int\frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)+\frac{1}{8}\arcsin(a+bx)^4+\frac{1}{2}(a+bx)\sqrt{1-(a+ba}\right.$$

$$\Big\downarrow \text{2009}$$

$$\frac{3}{4}\left(-\frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2-\int\frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)+\frac{1}{8}\arcsin(a+bx)^4+\frac{1}{2}(a+bx)\sqrt{1-(a+ba}\right.$$

$$\Big\downarrow \text{5156}$$

$$-\frac{3}{4}\left(\frac{1}{2}\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}\int(a+bx)d(a+bx)+\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)\right)+\frac{1}{4}(a+b\right.\right.$$

$$\Big\downarrow \text{15}$$

3.320. $\int\left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx$

$$-\frac{3}{4}\left(\frac{1}{2}\left(\frac{3}{4}\left(\frac{1}{2}\int\frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)-\frac{1}{4}(a+bx)^2\right)+\frac{1}{4}(a+bx)\left(1-(a\right.\right.\right.$$

$$\Big\downarrow \text{ 5152}$$

$$\frac{3}{4}\left(-\frac{3}{2}\left(\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2-\int\frac{(a+bx)^2\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)\right)+\frac{1}{8}\arcsin(a+bx)^4+\frac{1}{2}(a+bx)\sqrt{1-(a+bx\right.$$

$$\Big\downarrow \text{ 5210}$$

$$\frac{3}{4}\left(-\frac{3}{2}\left(-\frac{1}{2}\int\frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}\int(a+bx)d(a+bx)+\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2+\frac{1}{2}(a+bx)\sqrt{1-(a+bx\right.\right.$$

$$\Big\downarrow \text{ 15}$$

$$\frac{3}{4}\left(-\frac{3}{2}\left(-\frac{1}{2}\int\frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}(a+bx)^2\arcsin(a+bx)^2+\frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)-\frac{1}{4}(a\right.\right.$$

$$\Big\downarrow \text{ 5152}$$

$$\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^3+\frac{3}{4}\left(\frac{1}{8}\arcsin(a+bx)^4+\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3-\right.$$

input
```
Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^3,x]
```

output
```
(((a + b*x)*(1 - (a + b*x)^2)^(3/2)*ArcSin[a + b*x]^3)/4 + (3*(((a + b*x)*
Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^3)/2 + ArcSin[a + b*x]^4/8 - (3*(-1/
4*(a + b*x)^2 + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/2 - ArcS
in[a + b*x]^2/4 + ((a + b*x)^2*ArcSin[a + b*x]^2)/2))/2))/4 - (3*(-1/4*((1
 - (a + b*x)^2)^2*ArcSin[a + b*x]^2) + ((-1/2*(a + b*x)^2 + (a + b*x)^4/4)
/4 + ((a + b*x)*(1 - (a + b*x)^2)^(3/2)*ArcSin[a + b*x])/4 + (3*(-1/4*(a +
 b*x)^2 + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x])/2 + ArcSin[a +
 b*x]^2/4))/4)/2))/4)/b
```

## 3.320. $\int\left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx$

### 3.320.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 244
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[Expand
Integrand[(c*x)^m*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x] && IGtQ[p
, 0]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5158
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (S
imp[2*d*(p/(2*p + 1))   Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x],
x] - Simp[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[x*(1
- c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

---

## 3.320. $\int (1-a^2-2abx-b^2x^2)^{3/2} \arcsin(a+bx)^3\,dx$

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5210
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(p_), x_Symbol] :> Simp[f*(f*x)^(m - 1)*(d + e*x^2)^(p + 1)*((a +
 b*ArcSin[c*x])^n/(e*(m + 2*p + 1))), x] + (Simp[f^2*((m - 1)/(c^2*(m + 2*p
 + 1)))   Int[(f*x)^(m - 2)*(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x], x] + S
imp[b*f*(n/(c*(m + 2*p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*
x)^(m - 1)*(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /;
FreeQ[{a, b, c, d, e, f, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && IGtQ[m
, 1] && NeQ[m + 2*p + 1, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.320.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 627 vs. $2(217) = 434$.

Time = 2.60 (sec) , antiderivative size = 628, normalized size of antiderivative = 2.56

| method | result |
|---|---|
| default | $\frac{-75+408abx+204a^2+96\arcsin(bx+a)^2b^4x^4-128\arcsin(bx+a)^3\sqrt{-b^2x^2-2abx-a^2+1}\,a^3+48\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,a\ldots}{}$ |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^3,x,method=_RETURNVERBOSE
)
```

output
```
1/512*(-75+408*a*b*x+204*a^2+96*arcsin(b*x+a)^2*b^4*x^4-128*arcsin(b*x+a)^
3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^3+48*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^
2+1)^(1/2)*a^3-12*b^4*x^4-480*arcsin(b*x+a)^2*a^2+204*b^2*x^2-12*a^4+48*ar
csin(b*x+a)^4-384*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a*b^2*x^2
-384*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^2*b*x+144*arcsin(b*x
+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a*b^2*x^2+144*arcsin(b*x+a)*(-b^2*x^2-2
*a*b*x-a^2+1)^(1/2)*a^2*b*x-48*a*b^3*x^3-72*a^2*b^2*x^2-48*a^3*b*x+384*arc
sin(b*x+a)^2*a*b^3*x^3+576*arcsin(b*x+a)^2*a^2*b^2*x^2+384*arcsin(b*x+a)^2
*a^3*b*x-128*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b^3*x^3+48*arc
sin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b^3*x^3-480*arcsin(b*x+a)^2*b^2*
x^2+320*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a-408*arcsin(b*x+a)
*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a+320*arcsin(b*x+a)^3*(-b^2*x^2-2*a*b*x-a^
2+1)^(1/2)*b*x-960*arcsin(b*x+a)^2*a*b*x-408*arcsin(b*x+a)*(-b^2*x^2-2*a*b
*x-a^2+1)^(1/2)*b*x+204*arcsin(b*x+a)^2+96*arcsin(b*x+a)^2*a^4)/b
```

### 3.320.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 243, normalized size of antiderivative = 0.99

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx =$$

$$-\frac{3\,b^4x^4+12\,ab^3x^3+3\,(6\,a^2-17)b^2x^2-12\,\arcsin\left(bx+a\right)^4+6\,(2\,a^3-17\,a)bx-3\,(8\,b^4x^4+32\,ab^3x^3+8\,(}{}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^3,x, algorithm="fri
cas")
```

output
```
-1/128*(3*b^4*x^4 + 12*a*b^3*x^3 + 3*(6*a^2 - 17)*b^2*x^2 - 12*arcsin(b*x
+ a)^4 + 6*(2*a^3 - 17*a)*b*x - 3*(8*b^4*x^4 + 32*a*b^3*x^3 + 8*(6*a^2 - 5
)*b^2*x^2 + 8*a^4 + 16*(2*a^3 - 5*a)*b*x - 40*a^2 + 17)*arcsin(b*x + a)^2
+ 2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(8*(2*b^3*x^3 + 6*a*b^2*x^2 + 2*a^3
 + (6*a^2 - 5)*b*x - 5*a)*arcsin(b*x + a)^3 - 3*(2*b^3*x^3 + 6*a*b^2*x^2 +
 2*a^3 + (6*a^2 - 17)*b*x - 17*a)*arcsin(b*x + a)))/b
```

### 3.320.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 694 vs. $2(223) = 446$.

Time = 1.28 (sec) , antiderivative size = 694, normalized size of antiderivative = 2.83

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx = \begin{cases} \frac{3a^4\operatorname{asin}^2(a+bx)}{16b} + \frac{3a^3x\operatorname{asin}^2(a+bx)}{4} - \frac{3a^3x}{32} - \frac{a^3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}^3(a+bx)}{4b} + \frac{3a^3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}(a \\ x(1-a^2)^{\frac{3}{2}}\operatorname{asin}^3(a) \end{cases}$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)*asin(b*x+a)**3,x)
```

output
```
Piecewise((3*a**4*asin(a + b*x)**2/(16*b) + 3*a**3*x*asin(a + b*x)**2/4 -
3*a**3*x/32 - a**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/
(4*b) + 3*a**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(32*b)
+ 9*a**2*b*x**2*asin(a + b*x)**2/8 - 9*a**2*b*x**2/64 - 3*a**2*x*sqrt(-a**
2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/4 + 9*a**2*x*sqrt(-a**2 - 2*
a*b*x - b**2*x**2 + 1)*asin(a + b*x)/32 - 15*a**2*asin(a + b*x)**2/(16*b)
+ 3*a*b**2*x**3*asin(a + b*x)**2/4 - 3*a*b**2*x**3/32 - 3*a*b*x**2*sqrt(-a
**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/4 + 9*a*b*x**2*sqrt(-a**2
- 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/32 - 15*a*x*asin(a + b*x)**2/8 +
51*a*x/64 + 5*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/(8*
b) - 51*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/(64*b) + 3*b
**3*x**4*asin(a + b*x)**2/16 - 3*b**3*x**4/128 - b**2*x**3*sqrt(-a**2 - 2*
a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/4 + 3*b**2*x**3*sqrt(-a**2 - 2*a*b
*x - b**2*x**2 + 1)*asin(a + b*x)/32 - 15*b*x**2*asin(a + b*x)**2/16 + 51*
b*x**2/128 + 5*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**3/8
- 51*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)/64 + 3*asin(a +
 b*x)**4/(32*b) + 51*asin(a + b*x)**2/(128*b), Ne(b, 0)), (x*(1 - a**2)**(
3/2)*asin(a)**3, True))
```

### 3.320.7 Maxima [F]

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx = \int \left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}\arcsin\left(bx+a\right)^3\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^3,x, algorithm="max
ima")
```

output
```
integrate((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)^3, x)
```

### 3.320.8 Giac [A] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.21

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx = \frac{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)\arcsin\left(bx+a\right)^3}{4\,b} + \frac{3\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)^3}{8\,b} + \frac{3\left(b^2x^2+2\,abx+a^2-1\right)^2\arcsin\left(bx+a\right)^2}{16\,b} + \frac{3\,\arcsin\left(bx+a\right)^4}{32\,b} - \frac{3\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)\arcsin\left(bx+a\right)}{32\,b} - \frac{9\left(b^2x^2+2\,abx+a^2-1\right)\arcsin\left(bx+a\right)^2}{16\,b} - \frac{45\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)}{64\,b} - \frac{3\left(b^2x^2+2\,abx+a^2-1\right)^2}{128\,b} - \frac{45\,\arcsin\left(bx+a\right)^2}{128\,b} + \frac{45\left(b^2x^2+2\,abx+a^2-1\right)}{128\,b} + \frac{189}{1024\,b}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^3,x, algorithm="gia
c")
```

output
```
1/4*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x + a)^3/b + 3
/8*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)^3/b + 3/16
*(b^2*x^2 + 2*a*b*x + a^2 - 1)^2*arcsin(b*x + a)^2/b + 3/32*arcsin(b*x + a
)^4/b - 3/32*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x + a
)/b - 9/16*(b^2*x^2 + 2*a*b*x + a^2 - 1)*arcsin(b*x + a)^2/b - 45/64*sqrt(
-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)/b - 3/128*(b^2*x^2
 + 2*a*b*x + a^2 - 1)^2/b - 45/128*arcsin(b*x + a)^2/b + 45/128*(b^2*x^2 +
 2*a*b*x + a^2 - 1)/b + 189/1024/b
```

### 3.320.9 Mupad [F(-1)]

Timed out.

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^3\,dx=\int \mathrm{asin}(a+b\,x)^3\,\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)^{3/2}\,dx$$

input
```
int(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
```

output
```
int(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

# 3.321 $\int (1-a^2-2abx-b^2x^2)^{3/2} \arcsin(a+bx)^2 \, dx$



## 3.321.1 Optimal result

Integrand size = 33, antiderivative size = 199

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)^2 \, dx = -\frac{15(a+bx)\sqrt{1-(a+bx)^2}}{64b} - \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{32b} + \frac{9\arcsin(a+bx)}{64b} - \frac{3(a+bx)^2\arcsin(a+bx)}{8b} + \frac{\left(1-(a+bx)^2\right)^2\arcsin(a+bx)}{8b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2}{4b} + \frac{\arcsin(a+bx)^3}{8b}$$

output
```
-1/32*(b*x+a)*(1-(b*x+a)^2)^(3/2)/b+9/64*arcsin(b*x+a)/b-3/8*(b*x+a)^2*arc
sin(b*x+a)/b+1/8*(1-(b*x+a)^2)^2*arcsin(b*x+a)/b+1/4*(b*x+a)*(1-(b*x+a)^2)
^(3/2)*arcsin(b*x+a)^2/b+1/8*arcsin(b*x+a)^3/b-15/64*(b*x+a)*(1-(b*x+a)^2)
^(1/2)/b+3/8*(b*x+a)*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b
```

### 3.321.2 Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.09

$$\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2\,dx = \frac{\sqrt{1-a^2-2abx-b^2x^2}(-17a+2a^3-17bx+6a^2bx+6ab^2x^2+2b^3x^3)+(17-40a^2+8a^4)\,\mathrm{arcs}}{}$$

input
```
Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2,x]
```

output
```
(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-17*a + 2*a^3 - 17*b*x + 6*a^2*b*x + 6
*a*b^2*x^2 + 2*b^3*x^3) + (17 - 40*a^2 + 8*a^4)*ArcSin[a + b*x] + 8*b*x*(-
10*a + 4*a^3 - 5*b*x + 6*a^2*b*x + 4*a*b^2*x^2 + b^3*x^3)*ArcSin[a + b*x]
- 8*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*(-5*a + 2*a^3 - 5*b*x + 6*a^2*b*x +
6*a*b^2*x^2 + 2*b^3*x^3)*ArcSin[a + b*x]^2 + 8*ArcSin[a + b*x]^3)/(64*b)
```

### 3.321.3 Rubi [A] (verified)

Time = 0.67 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.20, number of steps used = 12, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {5306, 5158, 5156, 5138, 262, 223, 5152, 5182, 211, 211, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (-a^2-2abx-b^2x^2+1)^{3/2}\arcsin(a+bx)^2\,dx$$

$$\Big\downarrow \; 5306$$

$$\frac{\int (1-(a+bx)^2)^{3/2}\arcsin(a+bx)^2d(a+bx)}{b}$$

$$\Big\downarrow \; 5158$$

$$\frac{-\frac{1}{2}\int (a+bx)\left(1-(a+bx)^2\right)\arcsin(a+bx)d(a+bx)+\frac{3}{4}\int \sqrt{1-(a+bx)^2}\arcsin(a+bx)^2d(a+bx)+\frac{1}{4}(a+bx}{b}$$

$$\Big\downarrow \; 5156$$

$$-\frac{1}{2}\int (a+bx)\left(1-(a+bx)^2\right)\arcsin(a+bx)d(a+bx)+\frac{3}{4}\left(-\int (a+bx)\arcsin(a+bx)d(a+bx)+\frac{1}{2}\int \frac{\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}\right.$$
$$b$$

$\big\downarrow$ 5138

$$-\frac{1}{2}\int (a+bx)\left(1-(a+bx)^2\right)\arcsin(a+bx)d(a+bx)+\frac{3}{4}\left(\frac{1}{2}\int \frac{\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}\int \frac{(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)-\right.$$

$\big\downarrow$ 262

$$-\frac{1}{2}\int (a+bx)\left(1-(a+bx)^2\right)\arcsin(a+bx)d(a+bx)+\frac{3}{4}\left(\frac{1}{2}\int \frac{\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}\left(\frac{1}{2}\int \frac{1}{\sqrt{1-(a+bx)^2}}d(a+bx\right.\right.$$

$\big\downarrow$ 223

$$-\frac{1}{2}\int (a+bx)\left(1-(a+bx)^2\right)\arcsin(a+bx)d(a+bx)+\frac{3}{4}\left(\frac{1}{2}\int \frac{\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}(a+bx)^2\arcsin(a+bx)\right.$$

$\big\downarrow$ 5152

$$-\frac{1}{2}\int (a+bx)\left(1-(a+bx)^2\right)\arcsin(a+bx)d(a+bx)+\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2+\frac{3}{4}\left(\frac{1}{6}\arcsi\right.$$

$\big\downarrow$ 5182

$$\frac{1}{2}\left(\frac{1}{4}\left(1-(a+bx)^2\right)^2\arcsin(a+bx)-\frac{1}{4}\int \left(1-(a+bx)^2\right)^{3/2}d(a+bx)\right)+\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+$$

$\big\downarrow$ 211

$$\frac{1}{2}\left(\frac{1}{4}\left(-\frac{3}{4}\int \sqrt{1-(a+bx)^2}d(a+bx)-\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3/2}\right)+\frac{1}{4}\left(1-(a+bx)^2\right)^2\arcsin(a+bx)\right)+\frac{1}{4}(a$$

$\big\downarrow$ 211

$$\frac{1}{2}\left(\frac{1}{4}\left(-\frac{3}{4}\left(\frac{1}{2}\int \frac{1}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\right)-\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3/2}\right)+\frac{1}{4}\left(1-(a+b\right.\right.$$

$\big\downarrow$ 223

---

3.321. $\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^2\,dx$

$$\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2+\frac{1}{2}\left(\frac{1}{4}\left(1-(a+bx)^2\right)^2\arcsin(a+bx)+\frac{1}{4}\left(-\frac{3}{4}\left(\frac{1}{2}\arcsin(a+bx)+\frac{1}{2}\right.\right.\right.$$

input
```
Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2,x]
```

output
```
(((a + b*x)*(1 - (a + b*x)^2)^(3/2)*ArcSin[a + b*x]^2)/4 + ((-1/4*((a + b*
x)*(1 - (a + b*x)^2)^(3/2)) - (3*(((a + b*x)*Sqrt[1 - (a + b*x)^2])/2 + Ar
cSin[a + b*x]/2))/4)/4 + ((1 - (a + b*x)^2)^2*ArcSin[a + b*x])/4)/2 + (3*(
(-1/2*((a + b*x)*Sqrt[1 - (a + b*x)^2]) + ArcSin[a + b*x]/2)/2 - ((a + b*x
)^2*ArcSin[a + b*x])/2 + ((a + b*x)*Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^
2)/2 + ArcSin[a + b*x]^3/6))/4)/b
```

### 3.321.3.1 Defintions of rubi rules used

rule 211
```
Int[((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[x*((a + b*x^2)^p/(2*p + 1
)), x] + Simp[2*a*(p/(2*p + 1))   Int[(a + b*x^2)^(p - 1), x], x] /; FreeQ[
{a, b}, x] && GtQ[p, 0] && (IntegerQ[4*p] || IntegerQ[6*p])
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 5138
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^n/(d*(m + 1))), x] - Simp[b*c*(n
/(d*(m + 1)))   Int[(d*x)^(m + 1)*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 - c^2
*x^2]), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && NeQ[m, -1]
```

## 3.321. $\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^2\,dx$

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5158
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (S
imp[2*d*(p/(2*p + 1))   Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x],
x] - Simp[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[x*(1
- c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

rule 5182
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)*((d_) + (e_.)*(x_)^2)^(p_
.), x_Symbol] :> Simp[(d + e*x^2)^(p + 1)*((a + b*ArcSin[c*x])^n/(2*e*(p +
1))), x] + Simp[b*(n/(2*c*(p + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   I
nt[(1 - c^2*x^2)^(p + 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x] /; FreeQ[{a,
 b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && NeQ[p, -1]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

---

3.321. $\int (1-a^2-2abx-b^2x^2)^{3/2} \arcsin(a+bx)^2 \, dx$

### 3.321.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 514 vs. $2(175) = 350$.

Time = 2.62 (sec) , antiderivative size = 515, normalized size of antiderivative = 2.59

| method | result |
|---|---|
| default | $\frac{-16\sqrt{-b^2x^2-2abx-a^2+1}\ \arcsin(bx+a)^2 b^3x^3+8\arcsin(bx+a)b^4x^4-48\sqrt{-b^2x^2-2abx-a^2+1}\ \arcsin(bx+a)^2 a\,b^2x^2+32\arcsin(bx+a}{}$ |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^2,x,method=_RETURNVERBOSE
)
```

output
```
1/64*(-16*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*arcsin(b*x+a)^2*b^3*x^3+8*arcsin(
b*x+a)*b^4*x^4-48*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*arcsin(b*x+a)^2*a*b^2*x^2
+32*arcsin(b*x+a)*a*b^3*x^3-48*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*arcsin(b*x+a
)^2*a^2*b*x+2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b^3*x^3+48*arcsin(b*x+a)*a^2*
b^2*x^2-16*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*arcsin(b*x+a)^2*a^3+6*(-b^2*x^2-
2*a*b*x-a^2+1)^(1/2)*a*b^2*x^2+32*arcsin(b*x+a)*a^3*b*x+40*arcsin(b*x+a)^2
*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b*x+6*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^2*b
*x+8*arcsin(b*x+a)*a^4-40*arcsin(b*x+a)*b^2*x^2+40*arcsin(b*x+a)^2*(-b^2*x
^2-2*a*b*x-a^2+1)^(1/2)*a+2*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^3-80*arcsin(b
*x+a)*a*b*x-17*x*b*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+8*arcsin(b*x+a)^3-40*a^2
*arcsin(b*x+a)-17*a*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+17*arcsin(b*x+a))/b
```

### 3.321.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.93

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^2\,dx = \frac{8\arcsin(bx+a)^3+\left(8b^4x^4+32ab^3x^3+8(6a^2-5)b^2x^2+8a^4+16(2a^3-5a)bx-40a^2+17}{}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^2,x, algorithm="fri
cas")
```

output
```
1/64*(8*arcsin(b*x + a)^3 + (8*b^4*x^4 + 32*a*b^3*x^3 + 8*(6*a^2 - 5)*b^2*
x^2 + 8*a^4 + 16*(2*a^3 - 5*a)*b*x - 40*a^2 + 17)*arcsin(b*x + a) + (2*b^3
*x^3 + 6*a*b^2*x^2 + 2*a^3 + (6*a^2 - 17)*b*x - 8*(2*b^3*x^3 + 6*a*b^2*x^2
 + 2*a^3 + (6*a^2 - 5)*b*x - 5*a)*arcsin(b*x + a)^2 - 17*a)*sqrt(-b^2*x^2
- 2*a*b*x - a^2 + 1))/b
```

### 3.321.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 568 vs. $2(175) = 350$.

Time = 0.90 (sec) , antiderivative size = 568, normalized size of antiderivative = 2.85

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^2\,dx = \begin{cases} \frac{a^4\operatorname{asin}(a+bx)}{8b} + \frac{a^3x\operatorname{asin}(a+bx)}{2} - \frac{a^3\sqrt{-a^2-2abx-b^2x^2+1}\operatorname{asin}^2(a+bx)}{4b} + \frac{a^3\sqrt{-a^2-2abx-b^2x^2+1}}{32b} + \frac{3a^2bx^2\operatorname{asin}(a+bx)}{4} \\ x(1-a^2)^{\frac{3}{2}}\operatorname{asin}^2(a) \end{cases}$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)*asin(b*x+a)**2,x)
```

output
```
Piecewise((a**4*asin(a + b*x)/(8*b) + a**3*x*asin(a + b*x)/2 - a**3*sqrt(-
a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/(4*b) + a**3*sqrt(-a**2 -
 2*a*b*x - b**2*x**2 + 1)/(32*b) + 3*a**2*b*x**2*asin(a + b*x)/4 - 3*a**2*
x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a + b*x)**2/4 + 3*a**2*x*sqrt
(-a**2 - 2*a*b*x - b**2*x**2 + 1)/32 - 5*a**2*asin(a + b*x)/(8*b) + a*b**2
*x**3*asin(a + b*x)/2 - 3*a*b*x**2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*a
sin(a + b*x)**2/4 + 3*a*b*x**2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/32 -
5*a*x*asin(a + b*x)/4 + 5*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a +
 b*x)**2/(8*b) - 17*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/(64*b) + b**3*
x**4*asin(a + b*x)/8 - b**2*x**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asi
n(a + b*x)**2/4 + b**2*x**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/32 - 5*b
*x**2*asin(a + b*x)/8 + 5*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a +
 b*x)**2/8 - 17*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)/64 + asin(a + b*x)
**3/(8*b) + 17*asin(a + b*x)/(64*b), Ne(b, 0)), (x*(1 - a**2)**(3/2)*asin(
a)**2, True))
```

### 3.321.7 Maxima [F]

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^2\,dx=\int \left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}\arcsin\left(bx+a\right)^2\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^2,x, algorithm="max
ima")
```

output
```
integrate((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)^2, x)
```

### 3.321.8 Giac [A] (verification not implemented)

Time = 0.37 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.14

$$\begin{aligned}\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)^2\,dx &= \frac{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)\arcsin\left(bx+a\right)^2}{4\,b} \\ &+ \frac{3\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)^2}{8\,b} \\ &+ \frac{\left(b^2x^2+2\,abx+a^2-1\right)^2\arcsin\left(bx+a\right)}{8\,b}+\frac{\arcsin\left(bx+a\right)^3}{8\,b} \\ &- \frac{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)}{32\,b}-\frac{3\left(b^2x^2+2\,abx+a^2-1\right)\arcsin\left(bx+a\right)}{8\,b} \\ &- \frac{15\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)}{64\,b}-\frac{15\,\arcsin\left(bx+a\right)}{64\,b}\end{aligned}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a)^2,x, algorithm="gia
c")
```

output
```
1/4*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x + a)^2/b + 3
/8*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)^2/b + 1/8*
(b^2*x^2 + 2*a*b*x + a^2 - 1)^2*arcsin(b*x + a)/b + 1/8*arcsin(b*x + a)^3/
b - 1/32*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)/b - 3/8*(b^2*x^2 +
 2*a*b*x + a^2 - 1)*arcsin(b*x + a)/b - 15/64*sqrt(-b^2*x^2 - 2*a*b*x - a^
2 + 1)*(b*x + a)/b - 15/64*arcsin(b*x + a)/b
```

### 3.321.9 Mupad [F(-1)]

Timed out.

$$\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2\,dx=\int \mathrm{asin}(a+b\,x)^2\,\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)^{3/2}\,dx$$

input
```
int(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
```

output
```
int(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

# 3.322 $\int (1-a^2-2abx-b^2x^2)^{3/2} \arcsin(a+bx)\, dx$



## 3.322.1 Optimal result

Integrand size = 31, antiderivative size = 110

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)\, dx = -\frac{5(a+bx)^2}{16b} + \frac{(a+bx)^4}{16b} + \frac{3(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)}{8b} + \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)}{4b} + \frac{3\arcsin(a+bx)^2}{16b}$$

output
```
-5/16*(b*x+a)^2/b+1/16*(b*x+a)^4/b+1/4*(b*x+a)*(1-(b*x+a)^2)^(3/2)*arcsin(
b*x+a)/b+3/16*arcsin(b*x+a)^2/b+3/8*(b*x+a)*arcsin(b*x+a)*(1-(b*x+a)^2)^(1
/2)/b
```

## 3.322.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 129, normalized size of antiderivative = 1.17

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2} \arcsin(a+bx)\, dx = \frac{1}{16}\left(2a\left(-5+2a^2\right)x + \left(-5+6a^2\right)bx^2 + 4ab^2x^3 + b^3x^4 - \frac{2\sqrt{1-a^2-2abx-b^2x^2}\left(-5a+2a^3-5bx+6a^2bx+6ab^2x^2+2b^3x^3\right)\arcsin(a+bx)}{b} + \frac{3\arcsin(a+bx)^2}{b}\right)$$

input
```
Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x],x]
```

output
```
(2*a*(-5 + 2*a^2)*x + (-5 + 6*a^2)*b*x^2 + 4*a*b^2*x^3 + b^3*x^4 - (2*Sqrt
[1 - a^2 - 2*a*b*x - b^2*x^2]*(-5*a + 2*a^3 - 5*b*x + 6*a^2*b*x + 6*a*b^2*
x^2 + 2*b^3*x^3)*ArcSin[a + b*x])/b + (3*ArcSin[a + b*x]^2)/b)/16
```

## 3.322.3 Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.09, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.226$, Rules used = {5306, 5158, 244, 2009, 5156, 15, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(-a^2-2abx-b^2x^2+1\right)^{3/2}\arcsin(a+bx)\,dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)d(a+bx)}{b}$$

$$\Big\downarrow \text{5158}$$

$$\frac{\frac{3}{4}\int \sqrt{1-(a+bx)^2}\arcsin(a+bx)d(a+bx)-\frac{1}{4}\int (a+bx)\left(1-(a+bx)^2\right)d(a+bx)+\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3}}{b}$$

$$\Big\downarrow \text{244}$$

$$\frac{\frac{3}{4}\int \sqrt{1-(a+bx)^2}\arcsin(a+bx)d(a+bx)-\frac{1}{4}\int \left(-(a+bx)^3+a+bx\right)d(a+bx)+\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3/}}{b}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\frac{3}{4}\int \sqrt{1-(a+bx)^2}\arcsin(a+bx)d(a+bx)+\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)+\frac{1}{4}\left(\frac{1}{4}(a+bx)^4-\frac{1}{2}(a\right.}{b}$$

$$\Big\downarrow \text{5156}$$

$$\frac{\frac{3}{4}\left(\frac{1}{2}\int \frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)-\frac{1}{2}\int (a+bx)d(a+bx)+\frac{1}{2}(a+bx)\sqrt{1-(a+bx)^2}\arcsin(a+bx)\right)+\frac{1}{4}(a+bx)\left(1-\right.}{b}$$

$\downarrow$ 15

$$\frac{\frac{3}{4}\left(\frac{1}{2}\int \frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)+\frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)-\frac{1}{4}(a+bx)^2\right)+\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)}{b}$$

$\downarrow$ 5152

$$\frac{\frac{1}{4}(a+bx)\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)+\frac{3}{4}\left(\frac{1}{2}\sqrt{1-(a+bx)^2}(a+bx)\arcsin(a+bx)+\frac{1}{4}\arcsin(a+bx)^2-\frac{1}{4}\right.}{b}$$

input
```
Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x],x]
```

output
```
((-1/2*(a + b*x)^2 + (a + b*x)^4/4)/4 + ((a + b*x)*(1 - (a + b*x)^2)^(3/2)
*ArcSin[a + b*x])/4 + (3*(-1/4*(a + b*x)^2 + ((a + b*x)*Sqrt[1 - (a + b*x)
^2]*ArcSin[a + b*x])/2 + ArcSin[a + b*x]^2/4))/4)/b
```

### 3.322.3.1 Defintions of rubi rules used

rule 15
```
Int[(a_.)*(x_)^(m_.), x_Symbol] :> Simp[a*(x^(m + 1)/(m + 1)), x] /; FreeQ[
{a, m}, x] && NeQ[m, -1]
```

rule 244
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[Expand
Integrand[(c*x)^m*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x] && IGtQ[p
, 0]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5156
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[x*Sqrt[d + e*x^2]*((a + b*ArcSin[c*x])^n/2), x] + (Simp[(1/2
)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2]]   Int[(a + b*ArcSin[c*x])^n/Sqrt[
1 - c^2*x^2], x], x] - Simp[b*c*(n/2)*Simp[Sqrt[d + e*x^2]/Sqrt[1 - c^2*x^2
]]   Int[x*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[c^2*d + e, 0] && GtQ[n, 0]
```

rule 5158
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[x*(d + e*x^2)^p*((a + b*ArcSin[c*x])^n/(2*p + 1)), x] + (S
imp[2*d*(p/(2*p + 1))   Int[(d + e*x^2)^(p - 1)*(a + b*ArcSin[c*x])^n, x],
x] - Simp[b*c*(n/(2*p + 1))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[x*(1
- c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n - 1), x], x]) /; FreeQ[{a, b, c
, d, e}, x] && EqQ[c^2*d + e, 0] && GtQ[n, 0] && GtQ[p, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.322.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 279 vs. $2(96) = 192$.

Time = 1.99 (sec) , antiderivative size = 280, normalized size of antiderivative = 2.55

| method | result |
|---|---|
| default | $\frac{-16\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,b^3x^3+4b^4x^4-48\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,a\,b^2x^2+16a\,b^3x^3-48\arcsin(bx+a)\sqrt{-}}{}$ |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
1/64*(-16*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b^3*x^3+4*b^4*x^4-4
8*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a*b^2*x^2+16*a*b^3*x^3-48*a
rcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^2*b*x+24*a^2*b^2*x^2-16*arcs
in(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*a^3+16*a^3*b*x+40*arcsin(b*x+a)*(
-b^2*x^2-2*a*b*x-a^2+1)^(1/2)*b*x+4*a^4-20*b^2*x^2+40*arcsin(b*x+a)*(-b^2*
x^2-2*a*b*x-a^2+1)^(1/2)*a-40*a*b*x+12*arcsin(b*x+a)^2-20*a^2+25)/b
```

### 3.322.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.14

$$\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)\,dx = \frac{b^4x^4+4\,ab^3x^3+(6\,a^2-5)b^2x^2+2\,(2\,a^3-5\,a)bx-2\,(2\,b^3x^3+6\,ab^2x^2+2\,a^3+(6\,a^2-5)bx-5}{16\,b}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a),x, algorithm="frica
s")
```

output
```
1/16*(b^4*x^4 + 4*a*b^3*x^3 + (6*a^2 - 5)*b^2*x^2 + 2*(2*a^3 - 5*a)*b*x -
2*(2*b^3*x^3 + 6*a*b^2*x^2 + 2*a^3 + (6*a^2 - 5)*b*x - 5*a)*sqrt(-b^2*x^2
- 2*a*b*x - a^2 + 1)*arcsin(b*x + a) + 3*arcsin(b*x + a)^2)/b
```

### 3.322.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 298 vs. $2(95) = 190$.

Time = 0.62 (sec) , antiderivative size = 298, normalized size of antiderivative = 2.71

$$\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)\,dx = \begin{cases} \frac{a^3x}{4} - \frac{a^3\sqrt{-a^2-2abx-b^2x^2+1}\,\mathrm{asin}\,(a+bx)}{4b} + \frac{3a^2bx^2}{8} - \frac{3a^2x\sqrt{-a^2-2abx-b^2x^2+1}\,\mathrm{asin}\,(a+bx)}{4} + \frac{ab^2x^3}{4} - \frac{3abx^2\sqrt{-a^2-2} \\ x(1-a^2)^{\frac{3}{2}}\,\mathrm{asin}\,(a) \end{cases}$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)*asin(b*x+a),x)
```

output
```
Piecewise((a**3*x/4 - a**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*asin(a +
b*x)/(4*b) + 3*a**2*b*x**2/8 - 3*a**2*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 +
 1)*asin(a + b*x)/4 + a*b**2*x**3/4 - 3*a*b*x**2*sqrt(-a**2 - 2*a*b*x - b*
*2*x**2 + 1)*asin(a + b*x)/4 - 5*a*x/8 + 5*a*sqrt(-a**2 - 2*a*b*x - b**2*x
**2 + 1)*asin(a + b*x)/(8*b) + b**3*x**4/16 - b**2*x**3*sqrt(-a**2 - 2*a*b
*x - b**2*x**2 + 1)*asin(a + b*x)/4 - 5*b*x**2/16 + 5*x*sqrt(-a**2 - 2*a*b
*x - b**2*x**2 + 1)*asin(a + b*x)/8 + 3*asin(a + b*x)**2/(16*b), Ne(b, 0))
, (x*(1 - a**2)**(3/2)*asin(a), True))
```

### 3.322.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 402 vs. 2(96) = 192.

Time = 0.30 (sec) , antiderivative size = 402, normalized size of antiderivative = 3.65

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)\,dx=\frac{1}{16}\left(b^2x^4+4\,abx^3+6\,a^2x^2+\frac{4\,a^3x}{b}-5\,x^2-\frac{10\,ax}{b}+\frac{6\,\arcsin\left(bx+a\right)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b^2}\right.$$
$$+\frac{1}{8}\left(2\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}x+\frac{2\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}a}{b}-\frac{3\left(a^2b^2-(a^2-1)b^2\right)a^2\arcsin\left(-\frac{\cdots}{\sqrt{a\cdots}}\right)}{b^3}\right.$$
$$+a)$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a),x, algorithm="maxim
a")
```

output
```
1/16*(b^2*x^4 + 4*a*b*x^3 + 6*a^2*x^2 + 4*a^3*x/b - 5*x^2 - 10*a*x/b + 6*a
rcsin(b*x + a)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^2 +
3*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/b^2)*b + 1/8*(2*(
-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*x + 2*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(
3/2)*a/b - 3*(a^2*b^2 - (a^2 - 1)*b^2)*a^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*
b^2 - (a^2 - 1)*b^2))/b^3 + 3*(a^2*b^2 - (a^2 - 1)*b^2)*sqrt(-b^2*x^2 - 2*
a*b*x - a^2 + 1)*x/b^2 + 3*(a^2*b^2 - (a^2 - 1)*b^2)*(a^2 - 1)*arcsin(-(b^
2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b^3 + 3*(a^2*b^2 - (a^2 - 1)*b^2
)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*a/b^3)*arcsin(b*x + a)
```

### 3.322.8 Giac [A] (verification not implemented)

Time = 0.35 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.28

$$\int \left(1-a^2-2abx-b^2x^2\right)^{3/2}\arcsin(a+bx)\,dx=\frac{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)\arcsin\left(bx+a\right)}{4\,b}+\frac{3\,\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin\left(bx+a\right)}{8\,b}+\frac{\left(b^2x^2+2\,abx+a^2-1\right)^2}{16\,b}+\frac{3\,\arcsin\left(bx+a\right)^2}{16\,b}-\frac{3\left(b^2x^2+2\,abx+a^2-1\right)}{16\,b}-\frac{15}{128\,b}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)*arcsin(b*x+a),x, algorithm="giac"
)
```

output
```
1/4*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)*arcsin(b*x + a)/b + 3/8
*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a)/b + 1/16*(b^
2*x^2 + 2*a*b*x + a^2 - 1)^2/b + 3/16*arcsin(b*x + a)^2/b - 3/16*(b^2*x^2
+ 2*a*b*x + a^2 - 1)/b - 15/128/b
```

### 3.322.9 Mupad [F(-1)]

Timed out.

$$\int (1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)\,dx=\int \mathrm{asin}(a+b\,x)\,\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)^{3/2}\,dx$$

input
```
int(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
```

output
```
int(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

# 3.323 $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx$



## 3.323.1 Optimal result

Integrand size = 33, antiderivative size = 47

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \frac{\text{CosIntegral}(2\arcsin(a+bx))}{2b} + \frac{\text{CosIntegral}(4\arcsin(a+bx))}{8b} + \frac{3\log(\arcsin(a+bx))}{8b}$$

output
```
1/2*Ci(2*arcsin(b*x+a))/b+1/8*Ci(4*arcsin(b*x+a))/b+3/8*ln(arcsin(b*x+a))/
b
```

## 3.323.2 Mathematica [A] (verified)

Time = 0.52 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.79

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \frac{4\,\text{CosIntegral}(2\arcsin(a+bx)) + \text{CosIntegral}(4\arcsin(a+bx)) + 3\log(a}{8b}$$

input
```
Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x],x]
```

output
```
(4*CosIntegral[2*ArcSin[a + b*x]] + CosIntegral[4*ArcSin[a + b*x]] + 3*Log
[ArcSin[a + b*x]])/(8*b)
```

### 3.323.3 Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.89, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {5306, 5168, 3042, 3793, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(-a^2-2abx-b^2x^2+1)^{3/2}}{\arcsin(a+bx)}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{(1-(a+bx)^2)^{3/2}}{\arcsin(a+bx)}d(a+bx)}{b}$$

$$\Big\downarrow \text{5168}$$

$$\frac{\int \frac{(1-(a+bx)^2)^2}{\arcsin(a+bx)}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int \frac{\sin\left(\arcsin(a+bx)+\frac{\pi}{2}\right)^4}{\arcsin(a+bx)}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{3793}$$

$$\frac{\int \left(\frac{\cos(2\arcsin(a+bx))}{2\arcsin(a+bx)}+\frac{\cos(4\arcsin(a+bx))}{8\arcsin(a+bx)}+\frac{3}{8\arcsin(a+bx)}\right)d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\frac{1}{2}\text{CosIntegral}(2\arcsin(a+bx))+\frac{1}{8}\text{CosIntegral}(4\arcsin(a+bx))+\frac{3}{8}\log(\arcsin(a+bx))}{b}$$

input
```
Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x],x]
```

output
```
(CosIntegral[2*ArcSin[a + b*x]]/2 + CosIntegral[4*ArcSin[a + b*x]]/8 + (3*
Log[ArcSin[a + b*x]])/8)/b
```

#### 3.323.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3793
```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

rule 5168
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Subst[Int[
x^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b
, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.323.4 Maple [A] (verified)

Time = 1.79 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.77

| method | result | size |
|---|---|---|
| default | $\frac{3 \ln(\arcsin(bx+a))+4\ \mathrm{Ci}(2 \arcsin(bx+a))+\mathrm{Ci}(4 \arcsin(bx+a))}{8b}$ | 36 |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x,method=_RETURNVERBOSE)
```

output
```
1/8*(3*ln(arcsin(b*x+a))+4*Ci(2*arcsin(b*x+a))+Ci(4*arcsin(b*x+a)))/b
```

### 3.323.5 Fricas [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="frica
s")
```

output
```
integral((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a), x)
```

### 3.323.6 Sympy [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \int \frac{(-(a+bx-1)\,(a+bx+1))^{\frac{3}{2}}}{\operatorname{asin}\left(a+bx\right)}\,dx$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a),x)
```

output
```
Integral((-(a + b*x - 1)*(a + b*x + 1))**(3/2)/asin(a + b*x), x)
```

### 3.323.7 Maxima [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="maxim
a")
```

output
```
integrate((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a), x)
```

### 3.323.8 Giac [A] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.87

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \frac{\text{Ci}\,(4\,\arcsin\,(bx+a))}{8\,b} + \frac{\text{Ci}\,(2\,\arcsin\,(bx+a))}{2\,b} + \frac{3\,\log\,(\arcsin\,(bx+a))}{8\,b}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="giac"
)
```

output
```
1/8*cos_integral(4*arcsin(b*x + a))/b + 1/2*cos_integral(2*arcsin(b*x + a)
)/b + 3/8*log(arcsin(b*x + a))/b
```

### 3.323.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)}\,dx = \int \frac{(-a^2-2\,a\,b\,x-b^2\,x^2+1)^{3/2}}{\text{asin}\,(a+b\,x)}\,dx$$

input
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x),x)
```

output
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x), x)
```

# 3.324 $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx$



## 3.324.1 Optimal result

Integrand size = 33, antiderivative size = 57

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx = -\frac{(1-(a+bx)^2)^2}{b\arcsin(a+bx)} - \frac{\operatorname{Si}(2\arcsin(a+bx))}{b} - \frac{\operatorname{Si}(4\arcsin(a+bx))}{2b}$$

output
```
-(1-(b*x+a)^2)^2/b/arcsin(b*x+a)-Si(2*arcsin(b*x+a))/b-1/2*Si(4*arcsin(b*x
+a))/b
```

## 3.324.2 Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.23

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx = -\frac{2(-1+a^2+2abx+b^2x^2)^2 + 2\arcsin(a+bx)\operatorname{Si}(2\arcsin(a+bx)) + \arcsin(a+bx)\operatorname{Si}(4\arcsin(a+bx))}{2b\arcsin(a+bx)}$$

input
```
Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^2,x]
```

output
```
-1/2*(2*(-1 + a^2 + 2*a*b*x + b^2*x^2)^2 + 2*ArcSin[a + b*x]*SinIntegral[2
*ArcSin[a + b*x]] + ArcSin[a + b*x]*SinIntegral[4*ArcSin[a + b*x]])/(b*Arc
Sin[a + b*x])
```

### 3.324.3 Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$, Rules used = {5306, 5166, 5224, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(-a^2-2abx-b^2x^2+1\right)^{3/2}}{\arcsin(a+bx)^2}dx$$

$$\Big\downarrow \text{ 5306}$$

$$\frac{\int \frac{\left(1-(a+bx)^2\right)^{3/2}}{\arcsin(a+bx)^2}d(a+bx)}{b}$$

$$\Big\downarrow \text{ 5166}$$

$$\frac{-4\int \frac{(a+bx)\left(1-(a+bx)^2\right)}{\arcsin(a+bx)}d(a+bx)-\frac{\left(1-(a+bx)^2\right)^2}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \text{ 5224}$$

$$\frac{-4\int \frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{\left(1-(a+bx)^2\right)^2}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \text{ 4906}$$

$$\frac{-4\int \left(\frac{\sin(2\arcsin(a+bx))}{4\arcsin(a+bx)}+\frac{\sin(4\arcsin(a+bx))}{8\arcsin(a+bx)}\right)d\arcsin(a+bx)-\frac{\left(1-(a+bx)^2\right)^2}{\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{-4\left(\frac{1}{4}\text{Si}(2\arcsin(a+bx))+\frac{1}{8}\text{Si}(4\arcsin(a+bx))\right)-\frac{\left(1-(a+bx)^2\right)^2}{\arcsin(a+bx)}}{b}$$

input
```
Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^2,x]
```

output
```
(-((1 - (a + b*x)^2)^2/ArcSin[a + b*x]) - 4*(SinIntegral[2*ArcSin[a + b*x]
]/4 + SinIntegral[4*ArcSin[a + b*x]]/8))/b
```

### 3.324.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5166
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Simp[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p]   Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
 x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

## 3.324.4 Maple [A] (verified)

Time = 1.78 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.23

| method | result | size |
|---|---|---|
| default | $-\frac{8 \,\operatorname{Si}\left(2 \arcsin \left(b x +a \right)\right) \arcsin \left(b x +a \right)+4 \,\operatorname{Si}\left(4 \arcsin \left(b x +a \right)\right) \arcsin \left(b x +a \right)+4 \cos \left(2 \arcsin \left(b x +a \right)\right)+\cos \left(4 \arcsin \left(b x +a \right)\right)+3}{8 b \arcsin \left(b x +a \right)}$ | 70 |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x,method=_RETURNVERBOSE
)
```

output
```
-1/8/b*(8*Si(2*arcsin(b*x+a))*arcsin(b*x+a)+4*Si(4*arcsin(b*x+a))*arcsin(b
*x+a)+4*cos(2*arcsin(b*x+a))+cos(4*arcsin(b*x+a))+3)/arcsin(b*x+a)
```

### 3.324.5 Fricas [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx = \int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin{(bx+a)}^2}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="fri
cas")
```

output
```
integral((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a)^2, x)
```

### 3.324.6 Sympy [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx = \int \frac{(-(a+bx-1)\,(a+bx+1))^{\frac{3}{2}}}{\operatorname{asin}^2{(a+bx)}}\,dx$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a)**2,x)
```

output
```
Integral((-(a + b*x - 1)*(a + b*x + 1))**(3/2)/asin(a + b*x)**2, x)
```

### 3.324.7 Maxima [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx = \int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin{(bx+a)}^2}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="max
ima")
```

output
```
-(b^4*x^4 + 4*a*b^3*x^3 + 2*(3*a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x -
b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))*integrate(4*(b^3*
x^3 + 3*a*b^2*x^2 + a^3 + (3*a^2 - 1)*b*x - a)/arctan2(b*x + a, sqrt(b*x +
 a + 1)*sqrt(-b*x - a + 1)), x) - 2*a^2 + 1)/(b*arctan2(b*x + a, sqrt(b*x
+ a + 1)*sqrt(-b*x - a + 1)))
```

### 3.324.8 Giac [A] (verification not implemented)

Time = 0.35 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.07

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx = -\frac{(b^2x^2+2\,abx+a^2-1)^2}{b\arcsin(bx+a)} - \frac{\mathrm{Si}\,(4\,\arcsin(bx+a))}{2\,b} - \frac{\mathrm{Si}\,(2\,\arcsin(bx+a))}{b}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="gia
c")
```

output
```
-(b^2*x^2 + 2*a*b*x + a^2 - 1)^2/(b*arcsin(b*x + a)) - 1/2*sin_integral(4*
arcsin(b*x + a))/b - sin_integral(2*arcsin(b*x + a))/b
```

### 3.324.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^2}\,dx = \int \frac{(-a^2-2\,a\,b\,x-b^2\,x^2+1)^{3/2}}{\mathrm{asin}\,(a+b\,x)^2}\,dx$$

input
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^2,x)
```

output
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^2, x)
```

# 3.325 $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx$



## 3.325.1 Optimal result

Integrand size = 33, antiderivative size = 90

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = -\frac{(1-(a+bx)^2)^2}{2b\arcsin(a+bx)^2}+\frac{2(a+bx)\,(1-(a+bx)^2)^{3/2}}{b\arcsin(a+bx)} - \frac{\text{CosIntegral}(2\arcsin(a+bx))}{b}-\frac{\text{CosIntegral}(4\arcsin(a+bx))}{b}$$

output
```
-1/2*(1-(b*x+a)^2)^2/b/arcsin(b*x+a)^2+2*(b*x+a)*(1-(b*x+a)^2)^(3/2)/b/arc
sin(b*x+a)-Ci(2*arcsin(b*x+a))/b-Ci(4*arcsin(b*x+a))/b
```

## 3.325.2 Mathematica [A] (verified)

Time = 0.25 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.22

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = -\frac{\frac{(-1+a^2+2abx+b^2x^2)\left(-1+a^2+2abx+b^2x^2+4(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)\right)}{\arcsin(a+bx)^2}+2\,\text{CosIntegral}(2\arcsin(a+bx))+2\,\text{C}}{2b}$$

input
```
Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^3,x]
```

output
```
-1/2*(((-1 + a^2 + 2*a*b*x + b^2*x^2)*(-1 + a^2 + 2*a*b*x + b^2*x^2 + 4*(a
 + b*x)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]))/ArcSin[a + b*x
]^2 + 2*CosIntegral[2*ArcSin[a + b*x]] + 2*CosIntegral[4*ArcSin[a + b*x]])
/b
```

### 3.325.3 Rubi [A] (verified)

Time = 0.93 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.27, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.303$, Rules used = {5306, 5166, 5214, 5168, 3042, 3793, 2009, 5224, 4906, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(-a^2-2abx-b^2x^2+1\right)^{3/2}}{\arcsin(a+bx)^3}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{\left(1-(a+bx)^2\right)^{3/2}}{\arcsin(a+bx)^3}d(a+bx)}{b}$$

$$\Big\downarrow \text{5166}$$

$$\frac{-2\int \frac{(a+bx)\left(1-(a+bx)^2\right)}{\arcsin(a+bx)^2}d(a+bx)-\frac{\left(1-(a+bx)^2\right)^2}{2\arcsin(a+bx)^2}}{b}$$

$$\Big\downarrow \text{5214}$$

$$\frac{-2\left(\int \frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d(a+bx)-4\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d(a+bx)-\frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{\arcsin(a+bx)}\right)-\frac{\left(1-(a+bx)^2\right)^2}{2\arcsin(a+bx)^2}}{b}$$

$$\Big\downarrow \text{5168}$$

$$\frac{-2\left(-4\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d(a+bx)+\int \frac{1-(a+bx)^2}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{\arcsin(a+bx)}\right)-\frac{\left(1-(a+bx)^2\right)^2}{2\arcsin(a+bx)^2}}{b}$$

$$\Big\downarrow \text{3042}$$

$$\frac{-2\left(-4\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d(a+bx)+\int \frac{\sin\left(\arcsin(a+bx)+\frac{\pi}{2}\right)^2}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{\arcsin(a+bx)}\right)-\frac{(1-(a+bx)^{2}}{2\arcsin(a+b}}{b}$$

$\Big\downarrow$ 3793

$$\frac{-2\left(-4\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d(a+bx)+\int \left(\frac{\cos(2\arcsin(a+bx))}{2\arcsin(a+bx)}+\frac{1}{2\arcsin(a+bx)}\right)d\arcsin(a+bx)-\frac{(a+bx)(1-(a+bx)^2)^{3/2}}{\arcsin(a+bx)}\right.}{b}$$

$\Big\downarrow$ 2009

$$\frac{-2\left(-4\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d(a+bx)+\frac{1}{2}\text{CosIntegral}(2\arcsin(a+bx))-\frac{(a+bx)(1-(a+bx)^2)^{3/2}}{\arcsin(a+bx)}+\frac{1}{2}\log(\arcsin(a+\right.}{b}$$

$\Big\downarrow$ 5224

$$\frac{-2\left(-4\int \frac{(a+bx)^2(1-(a+bx)^2)}{\arcsin(a+bx)}d\arcsin(a+bx)+\frac{1}{2}\text{CosIntegral}(2\arcsin(a+bx))-\frac{(a+bx)(1-(a+bx)^2)^{3/2}}{\arcsin(a+bx)}+\frac{1}{2}\log(\text{arcsi}\right.}{b}$$

$\Big\downarrow$ 4906

$$\frac{-2\left(-4\int \left(\frac{1}{8\arcsin(a+bx)}-\frac{\cos(4\arcsin(a+bx))}{8\arcsin(a+bx)}\right)d\arcsin(a+bx)+\frac{1}{2}\text{CosIntegral}(2\arcsin(a+bx))-\frac{(a+bx)(1-(a+bx)^2)}{\arcsin(a+bx)}\right.}{b}$$

$\Big\downarrow$ 2009

$$\frac{-2\left(\frac{1}{2}\text{CosIntegral}(2\arcsin(a+bx))-4\left(\frac{1}{8}\log(\arcsin(a+bx))-\frac{1}{8}\text{CosIntegral}(4\arcsin(a+bx))\right)-\frac{(a+bx)(1-(a+b}{\arcsin(a+b}\right.}{b}$$

input
```
Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^3,x]
```

output
```
(-1/2*(1 - (a + b*x)^2)^2/ArcSin[a + b*x]^2 - 2*(-(((a + b*x)*(1 - (a + b*
x)^2)^(3/2))/ArcSin[a + b*x]) + CosIntegral[2*ArcSin[a + b*x]]/2 - 4*(-1/8
*CosIntegral[4*ArcSin[a + b*x]] + Log[ArcSin[a + b*x]]/8) + Log[ArcSin[a +
 b*x]]/2))/b
```

---

3.325. $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx$

### 3.325.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3793
```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5166
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Simp[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p]   Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
 x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

rule 5168
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Simp[(1/(b*c))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Subst[Int[
x^n*Cos[-a/b + x/b]^(2*p + 1), x], x, a + b*ArcSin[c*x]], x] /; FreeQ[{a, b
, c, d, e, n}, x] && EqQ[c^2*d + e, 0] && IGtQ[2*p, 0]
```

rule 5214
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Simp[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p
- 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Simp[c*((m + 2*p + 1)/(b*f*(n
+ 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m + 1)*(1 - c^2*x^2
)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1
, 0] && IGtQ[m, -3]
```

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3.325. $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx$

rule 5224
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(p_.), x_Symbol] :> Simp[(1/(b*c^(m + 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x
^2)^p]   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b]^(2*p + 1), x], x,
a + b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d + e, 0]
 && IGtQ[2*p + 2, 0] && IGtQ[m, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.325.4 Maple [A] (verified)

Time = 1.88 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.20

| method | result |
|---|---|
| default | $-\frac{16\ \mathrm{Ci}(2\arcsin(bx+a))\arcsin(bx+a)^2+16\ \mathrm{Ci}(4\arcsin(bx+a))\arcsin(bx+a)^2-8\sin(2\arcsin(bx+a))\arcsin(bx+a)-4\sin(4\arcsin(b}{16b\arcsin(bx+a)^2}$ |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^3,x,method=_RETURNVERBOSE
)
```

output
```
-1/16/b*(16*Ci(2*arcsin(b*x+a))*arcsin(b*x+a)^2+16*Ci(4*arcsin(b*x+a))*arc
sin(b*x+a)^2-8*sin(2*arcsin(b*x+a))*arcsin(b*x+a)-4*sin(4*arcsin(b*x+a))*a
rcsin(b*x+a)+4*cos(2*arcsin(b*x+a))+cos(4*arcsin(b*x+a))+3)/arcsin(b*x+a)^
2
```

### 3.325.5 Fricas [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx=\int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)^3}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^3,x, algorithm="fri
cas")
```

output
```
integral((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a)^3, x)
```

### 3.325.6 Sympy [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = \int \frac{(-(a+bx-1)(a+bx+1))^{\frac{3}{2}}}{\operatorname{asin}^3(a+bx)}\,dx$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a)**3,x)
```

output
```
Integral((-(a + b*x - 1)*(a + b*x + 1))**(3/2)/asin(a + b*x)**3, x)
```

### 3.325.7 Maxima [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = \int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin(bx+a)^3}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^3,x, algorithm="max
ima")
```

output
```
-1/2*(b^4*x^4 + 4*a*b^3*x^3 + 2*(3*a^2 - 1)*b^2*x^2 + a^4 - 2*b*arctan2(b*
x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2*integrate(2*(4*b^2*x^2 + 8*
a*b*x + 4*a^2 - 1)*sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)/arctan2(b*x + a, s
qrt(b*x + a + 1)*sqrt(-b*x - a + 1)), x) + 4*(a^3 - a)*b*x + 4*(b^3*x^3 +
3*a*b^2*x^2 + a^3 + (3*a^2 - 1)*b*x - a)*sqrt(b*x + a + 1)*sqrt(-b*x - a +
 1)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)) - 2*a^2 + 1)/(b
*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

### 3.325.8 Giac [A] (verification not implemented)

Time = 0.37 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.12

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = \frac{2\,(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}(bx+a)}{b\arcsin(bx+a)} - \frac{\operatorname{Ci}(4\arcsin(bx+a))}{b} - \frac{\operatorname{Ci}(2\arcsin(bx+a))}{b} - \frac{(b^2x^2+2\,abx+a^2-1)^2}{2\,b\arcsin(bx+a)^2}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^3,x, algorithm="gia
c")
```

output
```
2*(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)/(b*arcsin(b*x + a)) - cos
_integral(4*arcsin(b*x + a))/b - cos_integral(2*arcsin(b*x + a))/b - 1/2*(
b^2*x^2 + 2*a*b*x + a^2 - 1)^2/(b*arcsin(b*x + a)^2)
```

### 3.325.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^3}\,dx = \int \frac{{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}{{\mathrm{asin}\left(a+b\,x\right)}^3}\,dx$$

input
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^3,x)
```

output
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^3, x)
```

# 3.326 $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx$



## 3.326.1 Optimal result

Integrand size = 33, antiderivative size = 155

$$\begin{aligned}\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx &= -\frac{(1-(a+bx)^2)^2}{3b\arcsin(a+bx)^3} \\ &+ \frac{2(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{3b\arcsin(a+bx)^2} + \frac{2(1-(a+bx)^2)}{3b\arcsin(a+bx)} \\ &- \frac{8(a+bx)^2\left(1-(a+bx)^2\right)}{3b\arcsin(a+bx)} + \frac{2\mathrm{Si}(2\arcsin(a+bx))}{3b} + \frac{4\mathrm{Si}(4\arcsin(a+bx))}{3b}\end{aligned}$$

output
```
-1/3*(1-(b*x+a)^2)^2/b/arcsin(b*x+a)^3+2/3*(b*x+a)*(1-(b*x+a)^2)^(3/2)/b/a
rcsin(b*x+a)^2+2/3*(1-(b*x+a)^2)/b/arcsin(b*x+a)-8/3*(b*x+a)^2*(1-(b*x+a)^
2)/b/arcsin(b*x+a)+2/3*Si(2*arcsin(b*x+a))/b+4/3*Si(4*arcsin(b*x+a))/b
```

## 3.326.2 Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.92

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx = \frac{\frac{(-1+a^2+2abx+b^2x^2)\left(1-a^2-2abx-b^2x^2-2(a+bx)\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)+2(-1+4a^2\right.}{\arcsin(a+bx)^3}}{3b}$$

input
```
Integrate[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^4,x]
```

output
```
(((-1 + a^2 + 2*a*b*x + b^2*x^2)*(1 - a^2 - 2*a*b*x - b^2*x^2 - 2*(a + b*x
)*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x] + 2*(-1 + 4*a^2 + 8*a*
b*x + 4*b^2*x^2)*ArcSin[a + b*x]^2))/ArcSin[a + b*x]^3 + 2*SinIntegral[2*A
rcSin[a + b*x]] + 4*SinIntegral[4*ArcSin[a + b*x]])/(3*b)
```

### 3.326.3 Rubi [A] (verified)

Time = 1.36 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.12, number of steps used = 17, number of rules used = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.485$, Rules used = {5306, 5166, 5214, 5166, 5146, 4906, 27, 3042, 3780, 5214, 5146, 4906, 27, 2009, 3042, 3780}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(-a^2-2abx-b^2x^2+1\right)^{3/2}}{\arcsin(a+bx)^4}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{\left(1-(a+bx)^2\right)^{3/2}}{\arcsin(a+bx)^4}d(a+bx)}{b}$$

$$\Big\downarrow \text{5166}$$

$$\frac{-\frac{4}{3}\int \frac{(a+bx)\left(1-(a+bx)^2\right)}{\arcsin(a+bx)^3}d(a+bx)-\frac{\left(1-(a+bx)^2\right)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \text{5214}$$

$$\frac{-\frac{4}{3}\left(\frac{1}{2}\int \frac{\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^2}d(a+bx)-2\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^2}d(a+bx)-\frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{2\arcsin(a+bx)^2}\right)-\frac{\left(1-(a+bx)^2\right)^2}{3\arcsin(a+bx)^3}}{b}$$

$$\Big\downarrow \text{5166}$$

$$\frac{-\frac{4}{3}\left(-2\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^2}d(a+bx)+\frac{1}{2}\left(-2\int \frac{a+bx}{\arcsin(a+bx)}d(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}\right)-\frac{(a+bx)\left(1-(a+bx)^2\right)^{3/2}}{2\arcsin(a+bx)^2}\right)-\frac{(1}{3\,\mathrm{ar}}}{b}$$

$$\Big\downarrow \text{5146}$$

$$-\frac{4}{3}\left(-2\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^2}d(a+bx)+\frac{1}{2}\left(-2\int \frac{(a+bx)\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}\right)-\frac{(a+bx)(1-(a+bx}{2\arcsin(a+bx}\right.$$
$$b$$

$\downarrow$ 4906

$$-\frac{4}{3}\left(-2\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^2}d(a+bx)+\frac{1}{2}\left(-2\int \frac{\sin(2\arcsin(a+bx))}{2\arcsin(a+bx)}d\arcsin(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}\right)-\frac{(a+bx)(1-(a+bx)^2}{2\arcsin(a+bx)}\right.$$
$$b$$

$\downarrow$ 27

$$-\frac{4}{3}\left(-2\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^2}d(a+bx)+\frac{1}{2}\left(-\int \frac{\sin(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}\right)-\frac{(a+bx)(1-(a+bx)^2)}{2\arcsin(a+bx)^2}\right.$$
$$b$$

$\downarrow$ 3042

$$-\frac{4}{3}\left(-2\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^2}d(a+bx)+\frac{1}{2}\left(-\int \frac{\sin(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{1-(a+bx)^2}{\arcsin(a+bx)}\right)-\frac{(a+bx)(1-(a+bx)^2)}{2\arcsin(a+bx)^2}\right.$$
$$b$$

$\downarrow$ 3780

$$-\frac{4}{3}\left(-2\int \frac{(a+bx)^2\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)^2}d(a+bx)+\frac{1}{2}\left(-\text{Si}(2\arcsin(a+bx))-\frac{1-(a+bx)^2}{\arcsin(a+bx)}\right)-\frac{(a+bx)(1-(a+bx)^2)^{3/2}}{2\arcsin(a+bx)^2}\right)-\frac{(1-(a+}{3\arcsin(}$$
$$b$$

$\downarrow$ 5214

$$-\frac{4}{3}\left(-2\left(2\int \frac{a+bx}{\arcsin(a+bx)}d(a+bx)-4\int \frac{(a+bx)^3}{\arcsin(a+bx)}d(a+bx)-\frac{(1-(a+bx)^2)(a+bx)^2}{\arcsin(a+bx)}\right)+\frac{1}{2}\left(-\text{Si}(2\arcsin(a+bx))-\frac{1}{\text{ar}}\right.\right.$$
$$b$$

$\downarrow$ 5146

$$-\frac{4}{3}\left(-2\left(2\int \frac{(a+bx)\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d\arcsin(a+bx)-4\int \frac{(a+bx)^3\sqrt{1-(a+bx)^2}}{\arcsin(a+bx)}d\arcsin(a+bx)-\frac{(1-(a+bx)^2)(a+bx)^2}{\arcsin(a+bx)}\right)+\frac{1}{2}\left(\right.\right.$$
$$b$$

$\downarrow$ 4906

$$-\frac{4}{3}\left(-2\left(2\int \frac{\sin(2\arcsin(a+bx))}{2\arcsin(a+bx)}d\arcsin(a+bx)-4\int\left(\frac{\sin(2\arcsin(a+bx))}{4\arcsin(a+bx)}-\frac{\sin(4\arcsin(a+bx))}{8\arcsin(a+bx)}\right)d\arcsin(a+bx)-\frac{(1-(a+}{\text{arc}}\right.\right.$$
$$b$$

3.326. $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx$

$\downarrow$ 27

$$-\frac{4}{3}\left(-2\left(\int \frac{\sin(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)-4\int\left(\frac{\sin(2\arcsin(a+bx))}{4\arcsin(a+bx)}-\frac{\sin(4\arcsin(a+bx))}{8\arcsin(a+bx)}\right)d\arcsin(a+bx)-\frac{(1-(a+b}{\arcsin}\right.\right.$$
$$b$$

$\downarrow$ 2009

$$-\frac{4}{3}\left(-2\left(\int \frac{\sin(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)-4\left(\frac{1}{4}\text{Si}(2\arcsin(a+bx))-\frac{1}{8}\text{Si}(4\arcsin(a+bx))\right)-\frac{(1-(a+bx)^2)(a+bx)}{\arcsin(a+bx)}\right.\right.$$
$$b$$

$\downarrow$ 3042

$$-\frac{4}{3}\left(-2\left(\int \frac{\sin(2\arcsin(a+bx))}{\arcsin(a+bx)}d\arcsin(a+bx)-4\left(\frac{1}{4}\text{Si}(2\arcsin(a+bx))-\frac{1}{8}\text{Si}(4\arcsin(a+bx))\right)-\frac{(1-(a+bx)^2)(a+bx)}{\arcsin(a+bx)}\right.\right.$$
$$b$$

$\downarrow$ 3780

$$-\frac{4}{3}\left(\frac{1}{2}\left(-\text{Si}(2\arcsin(a+bx))-\frac{1-(a+bx)^2}{\arcsin(a+bx)}\right)-2\left(\text{Si}(2\arcsin(a+bx))-4\left(\frac{1}{4}\text{Si}(2\arcsin(a+bx))-\frac{1}{8}\text{Si}(4\arcsin(a\right.\right.\right.$$
$$b$$

input
```
Int[(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)/ArcSin[a + b*x]^4,x]
```

output
```
(-1/3*(1 - (a + b*x)^2)^2/ArcSin[a + b*x]^3 - (4*(-1/2*((a + b*x)*(1 - (a
+ b*x)^2)^(3/2))/ArcSin[a + b*x]^2 + (-((1 - (a + b*x)^2)/ArcSin[a + b*x])
 - SinIntegral[2*ArcSin[a + b*x]])/2 - 2*(-(((a + b*x)^2*(1 - (a + b*x)^2)
)/ArcSin[a + b*x]) + SinIntegral[2*ArcSin[a + b*x]] - 4*(SinIntegral[2*Arc
Sin[a + b*x]]/4 - SinIntegral[4*ArcSin[a + b*x]]/8))))/3)/b
```

### 3.326.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

3.326. $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx$

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 3780
```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

rule 4906
```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

rule 5146
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*(x_)^(m_.), x_Symbol] :> Simp[1
/(b*c^(m + 1))   Subst[Int[x^n*Sin[-a/b + x/b]^m*Cos[-a/b + x/b], x], x, a
+ b*ArcSin[c*x]], x] /; FreeQ[{a, b, c, n}, x] && IGtQ[m, 0]
```

rule 5166
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Simp[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p]   Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
 x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

rule 5214
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(p_.), x_Symbol] :> Simp[(f*x)^m*Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*
((a + b*ArcSin[c*x])^(n + 1)/(b*c*(n + 1))), x] + (-Simp[f*(m/(b*c*(n + 1))
)*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m - 1)*(1 - c^2*x^2)^(p
- 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x] + Simp[c*((m + 2*p + 1)/(b*f*(n
+ 1)))*Simp[(d + e*x^2)^p/(1 - c^2*x^2)^p]   Int[(f*x)^(m + 1)*(1 - c^2*x^2
)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1), x], x]) /; FreeQ[{a, b, c, d, e, f
}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1] && IGtQ[2*p, 0] && NeQ[m + 2*p + 1
, 0] && IGtQ[m, -3]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

---

3.326. $\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4} \, dx$

### 3.326.4 Maple [A] (verified)

Time = 1.84 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.95

| method | result |
|---|---|
| default | $\frac{16\,\mathrm{Si}(2\arcsin(bx+a))\arcsin(bx+a)^3+32\,\mathrm{Si}(4\arcsin(bx+a))\arcsin(bx+a)^3+8\cos(2\arcsin(bx+a))\arcsin(bx+a)^2+8\cos(4\arcsin(bx\text{-}}{24b\,a}$ |

input
```
int((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^4,x,method=_RETURNVERBOSE
)
```

output
```
1/24/b*(16*Si(2*arcsin(b*x+a))*arcsin(b*x+a)^3+32*Si(4*arcsin(b*x+a))*arcs
in(b*x+a)^3+8*cos(2*arcsin(b*x+a))*arcsin(b*x+a)^2+8*cos(4*arcsin(b*x+a))*
arcsin(b*x+a)^2+4*sin(2*arcsin(b*x+a))*arcsin(b*x+a)+2*sin(4*arcsin(b*x+a)
)*arcsin(b*x+a)-4*cos(2*arcsin(b*x+a))-cos(4*arcsin(b*x+a))-3)/arcsin(b*x+
a)^3
```

### 3.326.5 Fricas [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx=\int \frac{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}{\arcsin\left(bx+a\right)^4}\,dx$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^4,x, algorithm="fri
cas")
```

output
```
integral((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)/arcsin(b*x + a)^4, x)
```

### 3.326.6 Sympy [F]

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx=\int \frac{(-(a+bx-1)\,(a+bx+1))^{\frac{3}{2}}}{\operatorname{asin}^4\left(a+bx\right)}\,dx$$

input
```
integrate((-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a)**4,x)
```

output
```
Integral((-(a + b*x - 1)*(a + b*x + 1))**(3/2)/asin(a + b*x)**4, x)
```

### 3.326.7 Maxima [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx = \text{Timed out}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^4,x, algorithm="max
ima")
```

output
```
Timed out
```

### 3.326.8 Giac [A] (verification not implemented)

Time = 0.40 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.05

$$\begin{aligned}\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx &= \frac{8\left(b^2x^2+2\,abx+a^2-1\right)^2}{3\,b\arcsin\left(bx+a\right)} \\ &+ \frac{4\,\mathrm{Si}\left(4\,\arcsin\left(bx+a\right)\right)}{3\,b} + \frac{2\,\mathrm{Si}\left(2\,\arcsin\left(bx+a\right)\right)}{3\,b} \\ &+ \frac{2\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}(bx+a)}{3\,b\arcsin\left(bx+a\right)^2} \\ &+ \frac{2\left(b^2x^2+2\,abx+a^2-1\right)}{b\arcsin\left(bx+a\right)} - \frac{\left(b^2x^2+2\,abx+a^2-1\right)^2}{3\,b\arcsin\left(bx+a\right)^3}\end{aligned}$$

input
```
integrate((-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^4,x, algorithm="gia
c")
```

output
```
8/3*(b^2*x^2 + 2*a*b*x + a^2 - 1)^2/(b*arcsin(b*x + a)) + 4/3*sin_integral
(4*arcsin(b*x + a))/b + 2/3*sin_integral(2*arcsin(b*x + a))/b + 2/3*(-b^2*
x^2 - 2*a*b*x - a^2 + 1)^(3/2)*(b*x + a)/(b*arcsin(b*x + a)^2) + 2*(b^2*x^
2 + 2*a*b*x + a^2 - 1)/(b*arcsin(b*x + a)) - 1/3*(b^2*x^2 + 2*a*b*x + a^2
- 1)^2/(b*arcsin(b*x + a)^3)
```

### 3.326.9 Mupad [F(-1)]

Timed out.

$$\int \frac{(1-a^2-2abx-b^2x^2)^{3/2}}{\arcsin(a+bx)^4}\,dx=\int \frac{{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}{{\mathrm{asin}\left(a+b\,x\right)}^4} \,dx$$

input
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^4,x)
```

output
```
int((1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)/asin(a + b*x)^4, x)
```

# 3.327 $\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}} dx$



## 3.327.1 Optimal result

Integrand size = 33, antiderivative size = 19

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}} dx = \frac{\arcsin(a+bx)^{1+n}}{b(1+n)}$$

output
```
arcsin(b*x+a)^(1+n)/b/(1+n)
```

## 3.327.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}} dx = \frac{\arcsin(a+bx)^{1+n}}{b(1+n)}$$

input
```
Integrate[ArcSin[a + b*x]^n/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
```

output
```
ArcSin[a + b*x]^(1 + n)/(b*(1 + n))
```

## 3.327.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.061$, Rules used = {5306, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{-a^2-2abx-b^2x^2+1}}dx$$

$$\Big\downarrow \text{ 5306}$$

$$\frac{\int \frac{\arcsin(a+bx)^n}{\sqrt{1-(a+bx)^2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{ 5152}$$

$$\frac{\arcsin(a+bx)^{n+1}}{b(n+1)}$$

input
```
Int[ArcSin[a + b*x]^n/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
```

output
```
ArcSin[a + b*x]^(1 + n)/(b*(1 + n))
```

### 3.327.3.1 Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.327.4 Maple [A] (verified)

Time = 1.88 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.05

| method | result | size |
|---|---|---|
| default | $\frac{\arcsin(bx+a)^{1+n}}{b(1+n)}$ | 20 |

input
```
int(arcsin(b*x+a)^n/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
arcsin(b*x+a)^(1+n)/b/(1+n)
```

### 3.327.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.16

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin\left(bx+a\right)^n\arcsin\left(bx+a\right)}{bn+b}$$

input
```
integrate(arcsin(b*x+a)^n/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fri
cas")
```

output
```
arcsin(b*x + a)^n*arcsin(b*x + a)/(b*n + b)
```

### 3.327.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 60 vs. 2(14) = 28.

Time = 0.45 (sec) , antiderivative size = 60, normalized size of antiderivative = 3.16

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \begin{cases} \frac{x}{\sqrt{1-a^2}\operatorname{asin}(a)} & \text{for}\ b=0\wedge n=-1 \\ \frac{x\operatorname{asin}^n(a)}{\sqrt{1-a^2}} & \text{for}\ b=0 \\ \frac{\log(\operatorname{asin}(a+bx))}{b} & \text{for}\ n=-1 \\ \frac{\operatorname{asin}(a+bx)\operatorname{asin}^n(a+bx)}{bn+b} & \text{otherwise} \end{cases}$$

input
```
integrate(asin(b*x+a)**n/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

output
```
Piecewise((x/(sqrt(1 - a**2)*asin(a)), Eq(b, 0) & Eq(n, -1)), (x*asin(a)**
n/sqrt(1 - a**2), Eq(b, 0)), (log(asin(a + b*x))/b, Eq(n, -1)), (asin(a +
b*x)*asin(a + b*x)**n/(b*n + b), True))
```

### 3.327.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(arcsin(b*x+a)^n/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="max
ima")
```

output
```
Exception raised: RuntimeError >> ECL says: expt: undefined: 0 to a negati
ve exponent.
```

### 3.327.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 19, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin{(bx+a)}^{n+1}}{b(n+1)}$$

input
```
integrate(arcsin(b*x+a)^n/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="gia
c")
```

output
```
arcsin(b*x + a)^(n + 1)/(b*(n + 1))
```

### 3.327.9 Mupad [B] (verification not implemented)

Time = 0.53 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.95

$$\int \frac{\arcsin(a+bx)^n}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \begin{cases} \frac{\ln(\mathrm{asin}(a+b\,x))}{b} & \text{if } n=-1 \\ \frac{\mathrm{asin}(a+b\,x)^{n+1}}{b\,(n+1)} & \text{if } n\neq -1 \end{cases}$$

input
```
int(asin(a + b*x)^n/(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
```

output
```
piecewise(n == -1, log(asin(a + b*x))/b, n ~= -1, asin(a + b*x)^(n + 1)/(b
*(n + 1)))
```

# 3.328 $\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx$



## 3.328.1 Optimal result

Integrand size = 33, antiderivative size = 15

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^3}{3b}$$

output
```
1/3*arcsin(b*x+a)^3/b
```

## 3.328.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(a+bx)^3}{3b}$$

input
```
Integrate[ArcSin[a + b*x]^2/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
```

output
```
ArcSin[a + b*x]^3/(3*b)
```

### 3.328.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {5306, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{-a^2-2abx-b^2x^2+1}}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{5152}$$

$$\frac{\arcsin(a+bx)^3}{3b}$$

input
```
Int[ArcSin[a + b*x]^2/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
```

output
```
ArcSin[a + b*x]^3/(3*b)
```

#### 3.328.3.1 Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.328.4 Maple [A] (verified)

Time = 1.76 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.93

| method | result | size |
|---|---|---|
| default | $\frac{\arcsin(bx+a)^3}{3b}$ | 14 |

input
```
int(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
1/3*arcsin(b*x+a)^3/b
```

### 3.328.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin(bx+a)^3}{3\,b}$$

input
```
integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fri
cas")
```

output
```
1/3*arcsin(b*x + a)^3/b
```

### 3.328.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 26 vs. 2(10) = 20.

Time = 0.30 (sec) , antiderivative size = 26, normalized size of antiderivative = 1.73

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \begin{cases} \frac{\operatorname{asin}^3(a+bx)}{3b} & \text{for } b \neq 0 \\ \frac{x\operatorname{asin}^2(a)}{\sqrt{1-a^2}} & \text{otherwise} \end{cases}$$

input
```
integrate(asin(b*x+a)**2/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

output
```
Piecewise((asin(a + b*x)**3/(3*b), Ne(b, 0)), (x*asin(a)**2/sqrt(1 - a**2)
, True))
```

### 3.328.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 130 vs. 2(13) = 26.

Time = 0.29 (sec) , antiderivative size = 130, normalized size of antiderivative = 8.67

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = -\frac{\arcsin\left(bx+a\right)^2\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b} - \frac{\arcsin\left(bx+a\right)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{b} - \frac{\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^3}{3\,b}$$

input
```
integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="max
ima")
```

output
```
-arcsin(b*x + a)^2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b
- arcsin(b*x + a)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/b
 - 1/3*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^3/b
```

### 3.328.8 Giac [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin\left(bx+a\right)^3}{3\,b}$$

input
```
integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="gia
c")
```

output
```
1/3*arcsin(b*x + a)^3/b
```

### 3.328.9 Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)^2}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\operatorname{asin}(a+b\,x)^3}{3\,b}$$

input
```
int(asin(a + b*x)^2/(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
```

output
```
asin(a + b*x)^3/(3*b)
```

# 3.329 $\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx$



## 3.329.1 Optimal result

Integrand size = 31, antiderivative size = 15

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx=\frac{\arcsin(a+bx)^2}{2b}$$

output
```
1/2*arcsin(b*x+a)^2/b
```

## 3.329.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx=\frac{\arcsin(a+bx)^2}{2b}$$

input
```
Integrate[ArcSin[a + b*x]/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
```

output
```
ArcSin[a + b*x]^2/(2*b)
```

### 3.329.3 Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.065, Rules used = {5306, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)}{\sqrt{-a^2-2abx-b^2x^2+1}}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{5152}$$

$$\frac{\arcsin(a+bx)^2}{2b}$$

input
```
Int[ArcSin[a + b*x]/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2],x]
```

output
```
ArcSin[a + b*x]^2/(2*b)
```

#### 3.329.3.1 Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.329.4 Maple [A] (verified)

Time = 1.76 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.93

| method | result | size |
|---|---|---|
| default | $\frac{\arcsin(bx+a)^2}{2b}$ | 14 |

input
```
int(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/2*arcsin(b*x+a)^2/b
```

### 3.329.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin{(bx+a)}^2}{2\,b}$$

input
```
integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="frica
s")
```

output
```
1/2*arcsin(b*x + a)^2/b
```

### 3.329.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 24 vs. $2(10) = 20$.

Time = 0.25 (sec) , antiderivative size = 24, normalized size of antiderivative = 1.60

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \begin{cases} \frac{\operatorname{asin}^2{(a+bx)}}{2b} & \text{for}\ b\neq 0 \\ \frac{x\operatorname{asin}{(a)}}{\sqrt{1-a^2}} & \text{otherwise} \end{cases}$$

input
```
integrate(asin(b*x+a)/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

output
```
Piecewise((asin(a + b*x)**2/(2*b), Ne(b, 0)), (x*asin(a)/sqrt(1 - a**2), T
rue))
```

### 3.329.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 83 vs. 2(13) = 26.

Time = 0.28 (sec) , antiderivative size = 83, normalized size of antiderivative = 5.53

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = -\frac{\arcsin\left(bx+a\right)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b} - \frac{\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{2\,b}$$

input
```
integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="maxim
a")
```

output
```
-arcsin(b*x + a)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))/b -
1/2*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/b
```

### 3.329.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\arcsin\left(bx+a\right)^2}{2\,b}$$

input
```
integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="giac"
)
```

output
```
1/2*arcsin(b*x + a)^2/b
```

### 3.329.9 Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}\,dx = \frac{\mathrm{asin}(a+b\,x)^2}{2\,b}$$

input
```
int(asin(a + b*x)/(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2),x)
```

output
```
asin(a + b*x)^2/(2*b)
```

# 3.330 $\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx$



## 3.330.1 Optimal result

Integrand size = 33, antiderivative size = 11

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\log(\arcsin(a+bx))}{b}$$

output
```
ln(arcsin(b*x+a))/b
```

## 3.330.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\log(\arcsin(a+bx))}{b}$$

input
```
Integrate[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]),x]
```

output
```
Log[ArcSin[a + b*x]]/b
```

### 3.330.3 Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {5306, 5150}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\sqrt{-a^2-2abx-b^2x^2+1}\arcsin(a+bx)}dx$$
$$\Big\downarrow \text{5306}$$
$$\frac{\int \frac{1}{\sqrt{1-(a+bx)^2}\arcsin(a+bx)}d(a+bx)}{b}$$
$$\Big\downarrow \text{5150}$$
$$\frac{\log(\arcsin(a+bx))}{b}$$

input
```
Int[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]),x]
```

output
```
Log[ArcSin[a + b*x]]/b
```

#### 3.330.3.1 Defintions of rubi rules used

rule 5150
```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[(1/(b*c))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*Log[a + b*Ar
cSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.330.4 Maple [A] (verified)

Time = 1.69 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.09

| method | result | size |
|---|---|---|
| default | $\frac{\ln(\arcsin(bx+a))}{b}$ | 12 |

input
```
int(1/arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBOSE
)
```

output
```
ln(arcsin(b*x+a))/b
```

### 3.330.5 Fricas [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.18

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\log\left(-\arcsin\left(bx+a\right)\right)}{b}$$

input
```
integrate(1/arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="fri
cas")
```

output
```
log(-arcsin(b*x + a))/b
```

### 3.330.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 22 vs. 2(8) = 16.

Time = 0.28 (sec) , antiderivative size = 22, normalized size of antiderivative = 2.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \begin{cases} \frac{\log\left(\operatorname{asin}\left(a+bx\right)\right)}{b} & \text{for } b \neq 0 \\ \frac{x}{\sqrt{1-a^2}\operatorname{asin}\left(a\right)} & \text{otherwise} \end{cases}$$

input
```
integrate(1/asin(b*x+a)/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

output
```
Piecewise((log(asin(a + b*x))/b, Ne(b, 0)), (x/(sqrt(1 - a**2)*asin(a)), T
rue))
```

### 3.330.7 Maxima [F]

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \int \frac{1}{\sqrt{-b^2x^2-2\,abx-a^2+1}\arcsin\left(bx+a\right)}\,dx$$

input
```
integrate(1/arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="max
ima")
```

output
```
integrate(1/(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)), x)
```

### 3.330.8 Giac [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.09

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\log\left(\left|\arcsin\left(bx+a\right)\right|\right)}{b}$$

input
```
integrate(1/arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="gia
c")
```

output
```
log(abs(arcsin(b*x + a)))/b
```

### 3.330.9 Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 11, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)}\,dx = \frac{\ln\left(\mathrm{asin}(a+b\,x)\right)}{b}$$

input
```
int(1/(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)),x)
```

output
```
log(asin(a + b*x))/b
```

# 3.331 $\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx$



## 3.331.1 Optimal result

Integrand size = 33, antiderivative size = 13

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\arcsin(a+bx)}$$

output
```
-1/b/arcsin(b*x+a)
```

## 3.331.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\arcsin(a+bx)}$$

input
```
Integrate[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^2),x]
```

output
```
-(1/(b*ArcSin[a + b*x]))
```

### 3.331.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {5306, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\sqrt{-a^2-2abx-b^2x^2+1}\arcsin(a+bx)^2}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{1}{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}d(a+bx)}{b}$$

$$\Big\downarrow \text{5152}$$

$$-\frac{1}{b\arcsin(a+bx)}$$

input
```
Int[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^2),x]
```

output
```
-(1/(b*ArcSin[a + b*x]))
```

#### 3.331.3.1 Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.331.4 Maple [A] (verified)

Time = 1.82 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.08

| method | result | size |
|---|---|---|
| default | $-\frac{1}{b \arcsin(bx+a)}$ | 14 |

input
```
int(1/arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
-1/b/arcsin(b*x+a)
```

### 3.331.5 Fricas [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\arcsin(bx+a)}$$

input
```
integrate(1/arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="f
ricas")
```

output
```
-1/(b*arcsin(b*x + a))
```

### 3.331.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 26 vs. 2(10) = 20.

Time = 0.46 (sec) , antiderivative size = 26, normalized size of antiderivative = 2.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = \begin{cases} -\frac{1}{b\,\mathrm{asin}\,(a+bx)} & \text{for } b \neq 0 \\ \frac{x}{\sqrt{1-a^2}\,\mathrm{asin}^2\,(a)} & \text{otherwise} \end{cases}$$

input
```
integrate(1/asin(b*x+a)**2/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

output
```
Piecewise((-1/(b*asin(a + b*x)), Ne(b, 0)), (x/(sqrt(1 - a**2)*asin(a)**2)
, True))
```

### 3.331.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 33 vs. $2(13) = 26$.

Time = 0.61 (sec) , antiderivative size = 33, normalized size of antiderivative = 2.54

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\arctan\left(bx+a,\sqrt{bx+a+1}\sqrt{-bx-a+1}\right)}$$

input
```
integrate(1/arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="m
axima")
```

output
```
-1/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))
```

### 3.331.8 Giac [A] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\arcsin(bx+a)}$$

input
```
integrate(1/arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="g
iac")
```

output
```
-1/(b*arcsin(b*x + a))
```

### 3.331.9 Mupad [B] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b\,\mathrm{asin}\left(a+b\,x\right)}$$

input
```
int(1/(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)),x)
```

output
```
-1/(b*asin(a + b*x))
```

# 3.332 $\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx$



## 3.332.1 Optimal result

Integrand size = 33, antiderivative size = 15

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx=-\frac{1}{2b\arcsin(a+bx)^2}$$

output
```
-1/2/b/arcsin(b*x+a)^2
```

## 3.332.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx=-\frac{1}{2b\arcsin(a+bx)^2}$$

input
```
Integrate[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3),x]
```

output
```
-1/2*1/(b*ArcSin[a + b*x]^2)
```

### 3.332.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.061, Rules used = {5306, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\sqrt{-a^2-2abx-b^2x^2+1}\arcsin(a+bx)^3}dx$$

$$\Big\downarrow \ 5306$$

$$\frac{\int \frac{1}{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^3}d(a+bx)}{b}$$

$$\Big\downarrow \ 5152$$

$$-\frac{1}{2b\arcsin(a+bx)^2}$$

input
```
Int[1/(Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2]*ArcSin[a + b*x]^3),x]
```

output
```
-1/2*1/(b*ArcSin[a + b*x]^2)
```

#### 3.332.3.1 Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.332.4 Maple [A] (verified)

Time = 1.82 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.93

| method | result | size |
|---|---|---|
| default | $-\frac{1}{2b\arcsin(bx+a)^2}$ | 14 |

input
```
int(1/arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x,method=_RETURNVERBO
SE)
```

output
```
-1/2/b/arcsin(b*x+a)^2
```

### 3.332.5 Fricas [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2\,b\arcsin\left(bx+a\right)^2}$$

input
```
integrate(1/arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="f
ricas")
```

output
```
-1/2/(b*arcsin(b*x + a)^2)
```

### 3.332.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 29 vs. 2(14) = 28.

Time = 0.65 (sec) , antiderivative size = 29, normalized size of antiderivative = 1.93

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = \begin{cases} -\frac{1}{2b\operatorname{asin}^2(a+bx)} & \text{for } b \neq 0 \\ \frac{x}{\sqrt{1-a^2}\operatorname{asin}^3(a)} & \text{otherwise} \end{cases}$$

input
```
integrate(1/asin(b*x+a)**3/(-b**2*x**2-2*a*b*x-a**2+1)**(1/2),x)
```

output
```
Piecewise((-1/(2*b*asin(a + b*x)**2), Ne(b, 0)), (x/(sqrt(1 - a**2)*asin(a
)**3), True))
```

### 3.332.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 33 vs. $2(13) = 26$.

Time = 17.15 (sec) , antiderivative size = 33, normalized size of antiderivative = 2.20

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2\,b\arctan\left(bx+a,\sqrt{bx+a+1}\sqrt{-bx-a+1}\right)^2}$$

input
```
integrate(1/arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="m
axima")
```

output
```
-1/2/(b*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1))^2)
```

### 3.332.8 Giac [A] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2\,b\arcsin\left(bx+a\right)^2}$$

input
```
integrate(1/arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(1/2),x, algorithm="g
iac")
```

output
```
-1/2/(b*arcsin(b*x + a)^2)
```

### 3.332.9 Mupad [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1-a^2-2abx-b^2x^2}\arcsin(a+bx)^3}\,dx = -\frac{1}{2\,b\,\mathrm{asin}\left(a+b\,x\right)^2}$$

input
```
int(1/(asin(a + b*x)^3*(1 - b^2*x^2 - 2*a*b*x - a^2)^(1/2)),x)
```

output
```
-1/(2*b*asin(a + b*x)^2)
```

# 3.333 $\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx$



## 3.333.1 Optimal result

Integrand size = 33, antiderivative size = 128

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{i\arcsin(a+bx)^3}{b} + \frac{(a+bx)\arcsin(a+bx)^3}{b\sqrt{1-(a+bx)^2}} + \frac{3\arcsin(a+bx)^2\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b} - \frac{3i\arcsin(a+bx)\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right)}{b} + \frac{3\,\mathrm{PolyLog}\left(3,-e^{2i\arcsin(a+bx)}\right)}{2b}$$

output
```
-I*arcsin(b*x+a)^3/b+3*arcsin(b*x+a)^2*ln(1+(I*(b*x+a)+(1-(b*x+a)^2)^(1/2)
)^2)/b-3*I*arcsin(b*x+a)*polylog(2,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)/b+3
/2*polylog(3,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)/b+(b*x+a)*arcsin(b*x+a)^3
/b/(1-(b*x+a)^2)^(1/2)
```

## 3.333.2 Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.12

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{2\arcsin(a+bx)^2\left(\frac{\left(a+bx-i\sqrt{1-a^2-2abx-b^2x^2}\right)\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}+3\log\left(1+e^{2i\arcsin}\right.\right.}{}$$

input
```
Integrate[ArcSin[a + b*x]^3/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

output
```
(2*ArcSin[a + b*x]^2*(((a + b*x - I*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])*Arc
Sin[a + b*x])/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + 3*Log[1 + E^((2*I)*ArcSi
n[a + b*x])]) - (6*I)*ArcSin[a + b*x]*PolyLog[2, -E^((2*I)*ArcSin[a + b*x]
)] + 3*PolyLog[3, -E^((2*I)*ArcSin[a + b*x])])/(2*b)
```

## 3.333.3 Rubi [A] (warning: unable to verify)

Time = 0.65 (sec) , antiderivative size = 132, normalized size of antiderivative = 1.03, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {5306, 5160, 5180, 3042, 4202, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)^3}{(-a^2-2abx-b^2x^2+1)^{3/2}}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{\arcsin(a+bx)^3}{(1-(a+bx)^2)^{3/2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{5160}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}}-3\int \frac{(a+bx)\arcsin(a+bx)^2}{1-(a+bx)^2}d(a+bx)}{b}$$

$$\Big\downarrow \text{5180}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}}-3\int \frac{(a+bx)\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}}-3\int \arcsin(a+bx)^2\tan(\arcsin(a+bx))d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{4202}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}}-3\left(\frac{1}{3}i\arcsin(a+bx)^3-2i\int \frac{e^{2i\arcsin(a+bx)}\arcsin(a+bx)^2}{1+e^{2i\arcsin(a+bx)}}d\arcsin(a+bx)\right)}{b}$$

$$\Big\downarrow \text{2620}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}} - 3\left(\frac{1}{3}i\arcsin(a+bx)^3 - 2i\left(i\int \arcsin(a+bx)\log\left(1+e^{2i\arcsin(a+bx)}\right)d\arcsin(a+bx) - \frac{1}{2}i\arcs\right.\right.}{b}$$

$\Big\downarrow$ 3011

$$\frac{\frac{(a+bx)\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}} - 3\left(\frac{1}{3}i\arcsin(a+bx)^3 - 2i\left(i\left(\frac{1}{2}i\arcsin(a+bx)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right) - \frac{1}{2}i\int \operatorname{PolyLog}(2,\right.\right.\right.}{b}$$

$\Big\downarrow$ 2720

$$\frac{\frac{(a+bx)\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}} - 3\left(\frac{1}{3}i\arcsin(a+bx)^3 - 2i\left(i\left(\frac{1}{2}i\arcsin(a+bx)\operatorname{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right) - \frac{1}{4}\int e^{-2i\arcsin(a+\right.\right.\right.}{b}$$

$\Big\downarrow$ 7143

$$\frac{\frac{(a+bx)\arcsin(a+bx)^3}{\sqrt{1-(a+bx)^2}} - 3\left(\frac{1}{3}i\arcsin(a+bx)^3 - 2i\left(i\left(-\frac{1}{4}\operatorname{PolyLog}(3,-a-bx) + \frac{1}{2}i\arcsin(a+bx)\operatorname{PolyLog}\left(2,-e^{2i\arcs}\right.\right.\right.\right.}{b}$$

input
```
Int[ArcSin[a + b*x]^3/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

output
```
(((a + b*x)*ArcSin[a + b*x]^3)/Sqrt[1 - (a + b*x)^2] - 3*((I/3)*ArcSin[a +
 b*x]^3 - (2*I)*((-1/2*I)*ArcSin[a + b*x]^2*Log[1 + E^((2*I)*ArcSin[a + b*
x])] + I*((I/2)*ArcSin[a + b*x]*PolyLog[2, -E^((2*I)*ArcSin[a + b*x])] - P
olyLog[3, -a - b*x]/4))))/b
```

### 3.333.3.1 Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

3.333. $\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx$

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4202
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^m*(E^(2*I*(
e + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGt
Q[m, 0]
```

rule 5160
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Simp[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[x*((a + b*ArcSin[c*x
])^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

rule 5180
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[-e^(-1)   Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x
]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

## 3.333. $\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx$

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

### 3.333.4 Maple [A] (verified)

Time = 3.27 (sec) , antiderivative size = 229, normalized size of antiderivative = 1.79

| method | result |
|---|---|
| default | $\frac{\left(-xb\sqrt{-b^2x^2-2abx-a^2+1}+ib^2x^2-a\sqrt{-b^2x^2-2abx-a^2+1}+2iabx+ia^2-i\right)\arcsin(bx+a)^3}{b(b^2x^2+2abx+a^2-1)}+\frac{-4i\arcsin(bx+a)^3+6\arcsin(bx+a)}{}$ |

input
```
int(arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x,method=_RETURNVERBOSE
)
```

output
```
(-x*b*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+I*b^2*x^2-a*(-b^2*x^2-2*a*b*x-a^2+1)^
(1/2)+2*I*a*b*x+I*a^2-I)/b/(b^2*x^2+2*a*b*x+a^2-1)*arcsin(b*x+a)^3+1/2*(-4
*I*arcsin(b*x+a)^3+6*arcsin(b*x+a)^2*ln(1+(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^
2)-6*I*arcsin(b*x+a)*polylog(2,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)+3*polyl
og(3,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2))/b
```

### 3.333.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\arcsin\left(bx+a\right)^3}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}\,dx$$

input
```
integrate(arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)^3/(b^4*x^4 + 4
*a*b^3*x^3 + 2*(3*a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1), x
)
```

### 3.333.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\operatorname{asin}^3(a+bx)}{\left(-(a+bx-1)(a+bx+1)\right)^{\frac{3}{2}}}\,dx$$

input
```
integrate(asin(b*x+a)**3/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2),x)
```

output
```
Integral(asin(a + b*x)**3/(-(a + b*x - 1)*(a + b*x + 1))**(3/2), x)
```

### 3.333.7 Maxima [A] (verification not implemented)

Time = 0.48 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.07

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{3}{2}b\left(\frac{\log(bx+a+1)}{b^2}+\frac{\log(bx+a-1)}{b^2}\right)\arcsin(bx+a)^2 + \left(\frac{b^2x}{(a^2b^2-(a^2-1)b^2)\sqrt{-b^2x^2-2\,abx-a^2+1}}+\frac{ab}{(a^2b^2-(a^2-1)b^2)\sqrt{-b^2x^2-2\,abx-a^2+1}}\right)\arcsin(bx+a)^3$$

input
```
integrate(arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="max
ima")
```

output
```
3/2*b*(log(b*x + a + 1)/b^2 + log(b*x + a - 1)/b^2)*arcsin(b*x + a)^2 + (b
^2*x/((a^2*b^2 - (a^2 - 1)*b^2)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)) + a*b/
((a^2*b^2 - (a^2 - 1)*b^2)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)))*arcsin(b*x
 + a)^3
```

### 3.333.8 Giac [F]

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\arcsin(bx+a)^3}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}\,dx$$

input
```
integrate(arcsin(b*x+a)^3/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="gia
c")
```

output
```
integrate(arcsin(b*x + a)^3/(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2), x)
```

### 3.333.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^3}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\operatorname{asin}(a+b\,x)^3}{(-a^2-2\,a\,b\,x-b^2\,x^2+1)^{3/2}}\,dx$$

input
```
int(asin(a + b*x)^3/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
```

output
```
int(asin(a + b*x)^3/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

# 3.334 $\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx$



## 3.334.1 Optimal result

Integrand size = 33, antiderivative size = 97

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{i\arcsin(a+bx)^2}{b}+\frac{(a+bx)\arcsin(a+bx)^2}{b\sqrt{1-(a+bx)^2}} + \frac{2\arcsin(a+bx)\log\left(1+e^{2i\arcsin(a+bx)}\right)}{b}-\frac{i\,\mathrm{PolyLog}\left(2,-e^{2i\arcsin(a+bx)}\right)}{b}$$

output
```
-I*arcsin(b*x+a)^2/b+2*arcsin(b*x+a)*ln(1+(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^
2)/b-I*polylog(2,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)/b+(b*x+a)*arcsin(b*x+
a)^2/b/(1-(b*x+a)^2)^(1/2)
```

## 3.334.2 Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.18

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{\arcsin(a+bx)\left(\frac{\left(a+bx-i\sqrt{1-a^2-2abx-b^2x^2}\right)\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}}+2\log\left(1+e^{2i\arcsin(a+}\right.\right.}{b}$$

input
```
Integrate[ArcSin[a + b*x]^2/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

output
```
(ArcSin[a + b*x]*(((a + b*x - I*Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2])*ArcSin[
a + b*x])/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + 2*Log[1 + E^((2*I)*ArcSin[a
+ b*x])]) - I*PolyLog[2, -E^((2*I)*ArcSin[a + b*x])])/b
```

### 3.334.3 Rubi [A] (warning: unable to verify)

Time = 0.54 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {5306, 5160, 5180, 3042, 4202, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)^2}{(-a^2-2abx-b^2x^2+1)^{3/2}}\,dx$$

$$\Big\downarrow \text{ 5306}$$

$$\frac{\int \frac{\arcsin(a+bx)^2}{(1-(a+bx)^2)^{3/2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{ 5160}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}-2\int \frac{(a+bx)\arcsin(a+bx)}{1-(a+bx)^2}d(a+bx)}{b}$$

$$\Big\downarrow \text{ 5180}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}-2\int \frac{(a+bx)\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{ 3042}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}-2\int \arcsin(a+bx)\tan(\arcsin(a+bx))d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{ 4202}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}-2\left(\frac{1}{2}i\arcsin(a+bx)^2-2i\int \frac{e^{2i\arcsin(a+bx)}\arcsin(a+bx)}{1+e^{2i\arcsin(a+bx)}}d\arcsin(a+bx)\right)}{b}$$

$$\Big\downarrow \text{ 2620}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}-2\left(\frac{1}{2}i\arcsin(a+bx)^2-2i\left(\frac{1}{2}i\int \log\left(1+e^{2i\arcsin(a+bx)}\right)d\arcsin(a+bx)-\frac{1}{2}i\arcsin(a+bx)\log\right.\right.}{b}$$

$$\Big\downarrow \text{ 2715}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}}-2\left(\frac{1}{2}i\arcsin(a+bx)^2-2i\left(\frac{1}{4}\int e^{-2i\arcsin(a+bx)}\log\left(1+e^{2i\arcsin(a+bx)}\right)de^{2i\arcsin(a+bx)}-\frac{1}{2}i\arcsin\right.\right.}{b}$$

$$\downarrow \text{2838}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)^2}{\sqrt{1-(a+bx)^2}} - 2\left(\frac{1}{2}i\arcsin(a+bx)^2 - 2i\left(-\frac{1}{4}\operatorname{PolyLog}(2,-a-bx) - \frac{1}{2}i\arcsin(a+bx)\log\left(1+e^{2i\arcsin(a+bx)}\right.\right.\right.}{b}$$

input
```
Int[ArcSin[a + b*x]^2/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

output
```
(((a + b*x)*ArcSin[a + b*x]^2)/Sqrt[1 - (a + b*x)^2] - 2*((I/2)*ArcSin[a +
 b*x]^2 - (2*I)*((-1/2*I)*ArcSin[a + b*x]*Log[1 + E^((2*I)*ArcSin[a + b*x]
)] - PolyLog[2, -a - b*x]/4)))/b
```

### 3.334.3.1 Defintions of rubi rules used

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4202
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + (f_.)*(x_)], x_Symbol] :> Simp[I
*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^m*(E^(2*I*(
e + f*x))/(1 + E^(2*I*(e + f*x)))), x], x] /; FreeQ[{c, d, e, f}, x] && IGt
Q[m, 0]
```

## 3.334. $\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx$

rule 5160
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Simp[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[x*((a + b*ArcSin[c*x
])^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

rule 5180
```
Int[(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[-e^(-1)   Subst[Int[(a + b*x)^n*Tan[x], x], x, ArcSin[c*x
]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0] && IGtQ[n, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

## 3.334.4 Maple [A] (verified)

Time = 2.88 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.95

| method | result |
|---|---|
| default | $\frac{\left(-xb\sqrt{-b^2x^2-2abx-a^2+1}+ib^2x^2-a\sqrt{-b^2x^2-2abx-a^2+1}+2iabx+ia^2-i\right)\arcsin(bx+a)^2}{(b^2x^2+2abx+a^2-1)b} - \frac{i\left(2i\arcsin(bx+a)\ln\left(1+\left(i(bx+a)\right.\right.\right.}{}$ |

input
```
int(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x,method=_RETURNVERBOSE
)
```

output
```
(-x*b*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)+I*b^2*x^2-a*(-b^2*x^2-2*a*b*x-a^2+1)^
(1/2)+2*I*a*b*x+I*a^2-I)/(b^2*x^2+2*a*b*x+a^2-1)/b*arcsin(b*x+a)^2-I*(2*I*
arcsin(b*x+a)*ln(1+(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2)+2*arcsin(b*x+a)^2+po
lylog(2,-(I*(b*x+a)+(1-(b*x+a)^2)^(1/2))^2))/b
```

### 3.334.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}} \, dx = \int \frac{\arcsin\left(bx+a\right)^2}{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}} \, dx$$

input
```
integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*arcsin(b*x + a)^2/(b^4*x^4 + 4
*a*b^3*x^3 + 2*(3*a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1), x
)
```

### 3.334.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}} \, dx = \int \frac{\operatorname{asin}^2\left(a+bx\right)}{\left(-\left(a+bx-1\right)\left(a+bx+1\right)\right)^{\frac{3}{2}}} \, dx$$

input
```
integrate(asin(b*x+a)**2/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2),x)
```

output
```
Integral(asin(a + b*x)**2/(-(a + b*x - 1)*(a + b*x + 1))**(3/2), x)
```

### 3.334.7 Maxima [F]

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}} \, dx = \int \frac{\arcsin\left(bx+a\right)^2}{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}} \, dx$$

input
```
integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="max
ima")
```

output
```
integrate(arcsin(b*x + a)^2/(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2), x)
```

### 3.334.8 Giac [F]

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\arcsin\left(bx+a\right)^2}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}}\,dx$$

input
```
integrate(arcsin(b*x+a)^2/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="gia
c")
```

output
```
integrate(arcsin(b*x + a)^2/(-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2), x)
```

### 3.334.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)^2}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\mathrm{asin}(a+b\,x)^2}{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)^{3/2}}\,dx$$

input
```
int(asin(a + b*x)^2/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
```

output
```
int(asin(a + b*x)^2/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

# 3.335 $\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx$



## 3.335.1 Optimal result

Integrand size = 31, antiderivative size = 50

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{(a+bx)\arcsin(a+bx)}{b\sqrt{1-(a+bx)^2}} + \frac{\log(1-(a+bx)^2)}{2b}$$

output
```
1/2*ln(1-(b*x+a)^2)/b+(b*x+a)*arcsin(b*x+a)/b/(1-(b*x+a)^2)^(1/2)
```

## 3.335.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.32

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \frac{\frac{2(a+bx)\arcsin(a+bx)}{\sqrt{1-a^2-2abx-b^2x^2}} + \log(1-a^2-2abx-b^2x^2)}{2b}$$

input
```
Integrate[ArcSin[a + b*x]/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

output
```
((2*(a + b*x)*ArcSin[a + b*x])/Sqrt[1 - a^2 - 2*a*b*x - b^2*x^2] + Log[1 -
 a^2 - 2*a*b*x - b^2*x^2])/(2*b)
```

### 3.335.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.96, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {5306, 5160, 240}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)}{(-a^2-2abx-b^2x^2+1)^{3/2}}\,dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{\arcsin(a+bx)}{(1-(a+bx)^2)^{3/2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{5160}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}-\int \frac{a+bx}{1-(a+bx)^2}d(a+bx)}{b}$$

$$\Big\downarrow \text{240}$$

$$\frac{\frac{(a+bx)\arcsin(a+bx)}{\sqrt{1-(a+bx)^2}}+\frac{1}{2}\log\left(1-(a+bx)^2\right)}{b}$$

input
```
Int[ArcSin[a + b*x]/(1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2),x]
```

output
```
(((a + b*x)*ArcSin[a + b*x])/Sqrt[1 - (a + b*x)^2] + Log[1 - (a + b*x)^2]/
2)/b
```

#### 3.335.3.1 Defintions of rubi rules used

rule 240
```
Int[(x_)/((a_) + (b_.)*(x_)^2), x_Symbol] :> Simp[Log[RemoveContent[a + b*x
^2, x]]/(2*b), x] /; FreeQ[{a, b}, x]
```

rule 5160
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/((d_) + (e_.)*(x_)^2)^(3/2), x
_Symbol] :> Simp[x*((a + b*ArcSin[c*x])^n/(d*Sqrt[d + e*x^2])), x] - Simp[b
*c*(n/d)*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]   Int[x*((a + b*ArcSin[c*x
])^(n - 1)/(1 - c^2*x^2)), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d
 + e, 0] && GtQ[n, 0]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.335.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 154 vs. 2(46) = 92.

Time = 2.00 (sec) , antiderivative size = 155, normalized size of antiderivative = 3.10

| method | result |
|---|---|
| default | $-\frac{-\ln\left(1-(bx+a)^2\right)b^2x^2+2\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,bx-2\ln\left(1-(bx+a)^2\right)abx+2\arcsin(bx+a)\sqrt{-b^2x^2-2abx-a^2+1}\,a-}{2b(b^2x^2+2abx+a^2-1)}$ |

input
```
int(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-1/2/b*(-ln(1-(b*x+a)^2)*b^2*x^2+2*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)^
(1/2)*b*x-2*ln(1-(b*x+a)^2)*a*b*x+2*arcsin(b*x+a)*(-b^2*x^2-2*a*b*x-a^2+1)
^(1/2)*a-ln(1-(b*x+a)^2)*a^2+ln(1-(b*x+a)^2))/(b^2*x^2+2*a*b*x+a^2-1)
```

### 3.335.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 99 vs. 2(46) = 92.

Time = 0.26 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.98

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx =$$
$$-\frac{2\sqrt{-b^2x^2-2\,abx-a^2+1}(bx+a)\arcsin(bx+a)-(b^2x^2+2\,abx+a^2-1)\log(b^2x^2+2\,abx+a^2-1)}{2\,(b^3x^2+2\,ab^2x+(a^2-1)b)}$$

input
```
integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="frica
s")
```

output
```
-1/2*(2*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(b*x + a)*arcsin(b*x + a) - (b^
2*x^2 + 2*a*b*x + a^2 - 1)*log(b^2*x^2 + 2*a*b*x + a^2 - 1))/(b^3*x^2 + 2*
a*b^2*x + (a^2 - 1)*b)
```

### 3.335.6 Sympy [F]

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\operatorname{asin}(a+bx)}{(-(a+bx-1)(a+bx+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate(asin(b*x+a)/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2),x)
```

output
```
Integral(asin(a + b*x)/(-(a + b*x - 1)*(a + b*x + 1))**(3/2), x)
```

### 3.335.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 160 vs. $2(46) = 92$.

Time = 0.33 (sec) , antiderivative size = 160, normalized size of antiderivative = 3.20

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{1}{2}\left(a\left(\frac{\log(bx+a+1)}{b^2}-\frac{\log(bx+a-1)}{b^2}\right)-\frac{(a+1)\log(bx+a+1)}{b^2}+\frac{(a-1)\log(bx+a-1)}{b^2}\right)b + \left(\frac{b^2x}{(a^2b^2-(a^2-1)b^2)\sqrt{-b^2x^2-2\,abx-a^2+1}}+\frac{ab}{(a^2b^2-(a^2-1)b^2)\sqrt{-b^2x^2-2\,abx-a^2+1}}\right)\arcsin(bx+a)$$

input
```
integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="maxim
a")
```

output
```
-1/2*(a*(log(b*x + a + 1)/b^2 - log(b*x + a - 1)/b^2) - (a + 1)*log(b*x +
a + 1)/b^2 + (a - 1)*log(b*x + a - 1)/b^2)*b + (b^2*x/((a^2*b^2 - (a^2 - 1
)*b^2)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)) + a*b/((a^2*b^2 - (a^2 - 1)*b^2
)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)))*arcsin(b*x + a)
```

### 3.335.8 Giac [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.66

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = -\frac{\sqrt{-b^2x^2-2\,abx-a^2+1}\left(x+\frac{a}{b}\right)\arcsin\left(bx+a\right)}{b^2x^2+2\,abx+a^2-1} + \frac{\log\left(|bx+a+1|\right)}{2\,b} + \frac{\log\left(|bx+a-1|\right)}{2\,b}$$

input
```
integrate(arcsin(b*x+a)/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2),x, algorithm="giac"
)
```

output
```
-sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(x + a/b)*arcsin(b*x + a)/(b^2*x^2 + 2
*a*b*x + a^2 - 1) + 1/2*log(abs(b*x + a + 1))/b + 1/2*log(abs(b*x + a - 1)
)/b
```

### 3.335.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{(1-a^2-2abx-b^2x^2)^{3/2}}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{(-a^2-2\,a\,b\,x-b^2\,x^2+1)^{3/2}}\,dx$$

input
```
int(asin(a + b*x)/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2),x)
```

output
```
int(asin(a + b*x)/(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2), x)
```

# 3.336 $\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx$



## 3.336.1 Optimal result

Integrand size = 33, antiderivative size = 33

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx = \operatorname{Int}\left(\frac{1}{(1-(a+bx)^2)^{3/2}\arcsin(a+bx)},x\right)$$

output
```
Unintegrable(1/(1-(b*x+a)^2)^(3/2)/arcsin(b*x+a),x)
```

## 3.336.2 Mathematica [N/A]

Not integrable

Time = 0.85 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.06

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx = \int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx$$

input
```
Integrate[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]),x]
```

output
```
Integrate[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]), x]
```

## 3.336.3 Rubi [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5306, 5174}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(-a^2-2abx-b^2x^2+1)^{3/2}\arcsin(a+bx)}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{1}{(1-(a+bx)^2)^{3/2}\arcsin(a+bx)}d(a+bx)}{b}$$

$$\Big\downarrow \text{5174}$$

$$\frac{\int \frac{1}{(1-(a+bx)^2)^{3/2}\arcsin(a+bx)}d(a+bx)}{b}$$

input
```
Int[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]),x]
```

output
```
$Aborted
```

### 3.336.3.1 Defintions of rubi rules used

rule 5174
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((d_) + (e_.)*(x_)^2)^(p_.), x
_Symbol] :> Unintegrable[(d + e*x^2)^p*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{
a, b, c, d, e, n, p}, x]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.336.4 Maple [N/A] (verified)

Not integrable

Time = 2.74 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.94

$$\int \frac{1}{\left(-b^{2} x^{2}-2 a b x -a^{2}+1\right)^{\frac{3}{2}} \arcsin \left(b x +a \right)}d x$$

input
```
int(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x)
```

output
```
int(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x)
```

### 3.336.5 Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 87, normalized size of antiderivative = 2.64

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx=\int \frac{1}{\left(-b^{2} x^{2}-2 \, a b x -a^{2}+1\right)^{\frac{3}{2}} \arcsin \left(b x +a \right)}\,dx$$

input
```
integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="fri
cas")
```

output
```
integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/((b^4*x^4 + 4*a*b^3*x^3 + 2*(3
*a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1)*arcsin(b*x + a)), x
)
```

### 3.336.6 Sympy [N/A]

Not integrable

Time = 3.32 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.82

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx=\int \frac{1}{\left(- \left(a + b x - 1\right) \left(a + b x + 1\right)\right)^{\frac{3}{2}} \operatorname{asin}{\left(a + b x \right)}}\, dx$$

input
```
integrate(1/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a),x)
```

output
```
Integral(1/((-(a + b*x - 1)*(a + b*x + 1))**(3/2)*asin(a + b*x)), x)
```

### 3.336.7 Maxima [N/A]

Not integrable

Time = 0.44 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx=\int \frac{1}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}\arcsin{(bx+a)}}\,dx$$

input
```
integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="max
ima")
```

output
```
integrate(1/((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)), x)
```

### 3.336.8 Giac [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx=\int \frac{1}{(-b^2x^2-2\,abx-a^2+1)^{\frac{3}{2}}\arcsin{(bx+a)}}\,dx$$

input
```
integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a),x, algorithm="gia
c")
```

output
```
integrate(1/((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)), x)
```

### 3.336.9 Mupad [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)}\,dx=\int \frac{1}{\mathrm{asin}\left(a+b\,x\right)\,{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}\,dx$$

input
```
int(1/(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)),x)
```

output
```
int(1/(asin(a + b*x)*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)), x)
```

# 3.337 $\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx$



## 3.337.1 Optimal result

Integrand size = 33, antiderivative size = 33

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = -\frac{1}{b(1-(a+bx)^2)\arcsin(a+bx)}+2\text{Int}\left(\frac{a+bx}{(1-(a+bx)^2)^2\arcsin(a+bx)},x\right)$$

output
```
-1/b/(1-(b*x+a)^2)/arcsin(b*x+a)+2*Unintegrable((b*x+a)/(1-(b*x+a)^2)^2/ar
csin(b*x+a),x)
```

## 3.337.2 Mathematica [N/A]

Not integrable

Time = 8.40 (sec) , antiderivative size = 35, normalized size of antiderivative = 1.06

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = \int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx$$

input
```
Integrate[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2),x]
```

output
```
Integrate[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2), x]
```

## 3.337.3 Rubi [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5306, 5166, 5234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\left(-a^2-2abx-b^2x^2+1\right)^{3/2}\arcsin(a+bx)^2}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{1}{\left(1-(a+bx)^2\right)^{3/2}\arcsin(a+bx)^2}d(a+bx)}{b}$$

$$\Big\downarrow \text{5166}$$

$$\frac{2\int \frac{a+bx}{\left(1-(a+bx)^2\right)^2\arcsin(a+bx)}d(a+bx)-\frac{1}{\left(1-(a+bx)^2\right)\arcsin(a+bx)}}{b}$$

$$\Big\downarrow \text{5234}$$

$$\frac{2\int \frac{a+bx}{\left(1-(a+bx)^2\right)^2\arcsin(a+bx)}d(a+bx)-\frac{1}{\left(1-(a+bx)^2\right)\arcsin(a+bx)}}{b}$$

input
```
Int[1/((1 - a^2 - 2*a*b*x - b^2*x^2)^(3/2)*ArcSin[a + b*x]^2),x]
```

output
```
$Aborted
```

### 3.337.3.1 Defintions of rubi rules used

rule 5166
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_)*((d_) + (e_.)*(x_)^2)^(p_.), x_
Symbol] :> Simp[Sqrt[1 - c^2*x^2]*(d + e*x^2)^p*((a + b*ArcSin[c*x])^(n + 1
)/(b*c*(n + 1))), x] + Simp[c*((2*p + 1)/(b*(n + 1)))*Simp[(d + e*x^2)^p/(1
 - c^2*x^2)^p]   Int[x*(1 - c^2*x^2)^(p - 1/2)*(a + b*ArcSin[c*x])^(n + 1),
 x], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[c^2*d + e, 0] && LtQ[n, -1]
```

rule 5234
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(p_.), x_Symbol] :> Unintegrable[(f*x)^m*(d + e*x^2)^p*(a + b*Ar
cSin[c*x])^n, x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.337.4 Maple [N/A] (verified)

Not integrable

Time = 2.75 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.94

$$\int \frac{1}{\left(-b^{2} x^{2}-2 a b x -a^{2}+1\right)^{\frac{3}{2}} \arcsin \left(b x +a \right)^{2}}d x$$

input
```
int(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x)
```

output
```
int(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x)
```

### 3.337.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 87, normalized size of antiderivative = 2.64

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx=\int \frac{1}{\left(-b^{2} x^{2}-2\,a b x-a^{2}+1\right)^{\frac{3}{2}} \arcsin \left(b x+a\right)^{2}}\,dx$$

input
```
integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="f
ricas")
```

output
```
integral(sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)/((b^4*x^4 + 4*a*b^3*x^3 + 2*(3
*a^2 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1)*arcsin(b*x + a)^2),
 x)
```

### 3.337.6 Sympy [N/A]

Not integrable

Time = 3.24 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.88

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = \int \frac{1}{\left(-\left(a+bx-1\right)\left(a+bx+1\right)\right)^{\frac{3}{2}}\operatorname{asin}^2\left(a+bx\right)}\,dx$$

input
```
integrate(1/(-b**2*x**2-2*a*b*x-a**2+1)**(3/2)/asin(b*x+a)**2,x)
```

output
```
Integral(1/((-(a + b*x - 1)*(a + b*x + 1))**(3/2)*asin(a + b*x)**2), x)
```

### 3.337.7 Maxima [N/A]

Not integrable

Time = 6.53 (sec) , antiderivative size = 195, normalized size of antiderivative = 5.91

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = \int \frac{1}{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}\arcsin\left(bx+a\right)^2}\,dx$$

input
```
integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="m
axima")
```

output
```
((b^3*x^2 + 2*a*b^2*x + (a^2 - 1)*b)*arctan2(b*x + a, sqrt(b*x + a + 1)*sq
rt(-b*x - a + 1))*integrate(2*(b*x + a)/((b^4*x^4 + 4*a*b^3*x^3 + 2*(3*a^2
 - 1)*b^2*x^2 + a^4 + 4*(a^3 - a)*b*x - 2*a^2 + 1)*arctan2(b*x + a, sqrt(b
*x + a + 1)*sqrt(-b*x - a + 1))), x) + 1)/((b^3*x^2 + 2*a*b^2*x + (a^2 - 1
)*b)*arctan2(b*x + a, sqrt(b*x + a + 1)*sqrt(-b*x - a + 1)))
```

### 3.337.8 Giac [N/A]

Not integrable

Time = 0.43 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx = \int \frac{1}{\left(-b^2x^2-2\,abx-a^2+1\right)^{\frac{3}{2}}\arcsin\left(bx+a\right)^2}\,dx$$

input
```
integrate(1/(-b^2*x^2-2*a*b*x-a^2+1)^(3/2)/arcsin(b*x+a)^2,x, algorithm="g
iac")
```

output
```
integrate(1/((-b^2*x^2 - 2*a*b*x - a^2 + 1)^(3/2)*arcsin(b*x + a)^2), x)
```

### 3.337.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 33, normalized size of antiderivative = 1.00

$$\int \frac{1}{(1-a^2-2abx-b^2x^2)^{3/2}\arcsin(a+bx)^2}\,dx=\int \frac{1}{\mathrm{asin}\left(a+b\,x\right)^2\,{\left(-a^2-2\,a\,b\,x-b^2\,x^2+1\right)}^{3/2}}\,dx$$

input
```
int(1/(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)),x)
```

output
```
int(1/(asin(a + b*x)^2*(1 - b^2*x^2 - 2*a*b*x - a^2)^(3/2)), x)
```

# 3.338 $\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx$



## 3.338.1 Optimal result

Integrand size = 23, antiderivative size = 46

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx=\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}$$

output
```
1/2*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b/(c-c*(b*x+a)^2)^(1/2)
```

## 3.338.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx=\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{-c\,(-1+(a+bx)^2)}}$$

input
```
Integrate[ArcSin[a + b*x]/Sqrt[c - c*(a + b*x)^2],x]
```

output
```
(Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(2*b*Sqrt[-(c*(-1 + (a + b*x)^2)
)])
```

### 3.338.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {7281, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx$$

$$\Big\downarrow \text{ 7281}$$

$$\frac{\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{ 5152}$$

$$\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}$$

input
```
Int[ArcSin[a + b*x]/Sqrt[c - c*(a + b*x)^2],x]
```

output
```
(Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(2*b*Sqrt[c - c*(a + b*x)^2])
```

#### 3.338.3.1 Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 7281
```
Int[u_, x_Symbol] :> With[{lst = FunctionOfLinear[u, x]}, Simp[1/lst[[3]]
 Subst[Int[lst[[1]], x], x, lst[[2]] + lst[[3]]*x], x] /;  !FalseQ[lst]]
```

### 3.338.4 Maple [A] (verified)

Time = 0.95 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.74

| method | result | size |
|---|---|---|
| default | $-\frac{\sqrt{-c(b^2x^2+2abx+a^2-1)}\,\sqrt{-b^2x^2-2abx-a^2+1}\,\arcsin(bx+a)^2}{2c(b^2x^2+2abx+a^2-1)b}$ | 80 |

input
```
int(arcsin(b*x+a)/(c-c*(b*x+a)^2)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/2*(-c*(b^2*x^2+2*a*b*x+a^2-1))^(1/2)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/c/(
b^2*x^2+2*a*b*x+a^2-1)/b*arcsin(b*x+a)^2
```

### 3.338.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \int \frac{\arcsin(bx+a)}{\sqrt{-(bx+a)^2c+c}}\,dx$$

input
```
integrate(arcsin(b*x+a)/(c-c*(b*x+a)^2)^(1/2),x, algorithm="fricas")
```

output
```
integral(-sqrt(-b^2*c*x^2 - 2*a*b*c*x - (a^2 - 1)*c)*arcsin(b*x + a)/(b^2*
c*x^2 + 2*a*b*c*x + (a^2 - 1)*c), x)
```

### 3.338.6 Sympy [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \text{Timed out}$$

input
```
integrate(asin(b*x+a)/(c-c*(b*x+a)**2)**(1/2),x)
```

output
```
Timed out
```

### 3.338.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 206 vs. 2(40) = 80.

Time = 0.29 (sec) , antiderivative size = 206, normalized size of antiderivative = 4.48

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \frac{\sqrt{c}\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{2\sqrt{a^2b^2c^2-(a^2c-c)b^2c}} - \frac{\arcsin\left(bx+a\right)\arcsin\left(-\frac{b^2cx+abc}{\sqrt{a^2b^2c^2-(a^2c-c)b^2c}}\right)}{b\sqrt{c}} - \frac{\arcsin\left(-\frac{b^2cx+abc}{\sqrt{a^2b^2c^2-(a^2c-c)b^2c}}\right)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b\sqrt{c}}$$

input
```
integrate(arcsin(b*x+a)/(c-c*(b*x+a)^2)^(1/2),x, algorithm="maxima")
```

output
```
1/2*sqrt(c)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/sqrt(a^
2*b^2*c^2 - (a^2*c - c)*b^2*c) - arcsin(b*x + a)*arcsin(-(b^2*c*x + a*b*c)
/sqrt(a^2*b^2*c^2 - (a^2*c - c)*b^2*c))/(b*sqrt(c)) - arcsin(-(b^2*c*x + a
*b*c)/sqrt(a^2*b^2*c^2 - (a^2*c - c)*b^2*c))*arcsin(-(b^2*x + a*b)/sqrt(a^
2*b^2 - (a^2 - 1)*b^2))/(b*sqrt(c))
```

### 3.338.8 Giac [F]

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \int \frac{\arcsin\left(bx+a\right)}{\sqrt{-\left(bx+a\right)^2c+c}}\,dx$$

input
```
integrate(arcsin(b*x+a)/(c-c*(b*x+a)^2)^(1/2),x, algorithm="giac")
```

output
```
integrate(arcsin(b*x + a)/sqrt(-(b*x + a)^2*c + c), x)
```

### 3.338.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}\,dx = \int \frac{\mathrm{asin}(a+b\,x)}{\sqrt{c-c\,{(a+b\,x)}^2}}\,dx$$

input
```
int(asin(a + b*x)/(c - c*(a + b*x)^2)^(1/2),x)
```

output
```
int(asin(a + b*x)/(c - c*(a + b*x)^2)^(1/2), x)
```

# 3.339 $\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)c-2abcx-b^2cx^2}} dx$



## 3.339.1 Optimal result

Integrand size = 36, antiderivative size = 46

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx=\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}$$

output
```
1/2*arcsin(b*x+a)^2*(1-(b*x+a)^2)^(1/2)/b/(c-c*(b*x+a)^2)^(1/2)
```

## 3.339.2 Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.17

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx=\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{-c\left(-1+a^2+2abx+b^2x^2\right)}}$$

input
```
Integrate[ArcSin[a + b*x]/Sqrt[(1 - a^2)*c - 2*a*b*c*x - b^2*c*x^2],x]
```

output
```
(Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(2*b*Sqrt[-(c*(-1 + a^2 + 2*a*b*
x + b^2*x^2))])
```

### 3.339.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {5306, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}dx$$

$$\Big\downarrow \text{5306}$$

$$\frac{\int \frac{\arcsin(a+bx)}{\sqrt{c-c(a+bx)^2}}d(a+bx)}{b}$$

$$\Big\downarrow \text{5152}$$

$$\frac{\sqrt{1-(a+bx)^2}\arcsin(a+bx)^2}{2b\sqrt{c-c(a+bx)^2}}$$

input
```
Int[ArcSin[a + b*x]/Sqrt[(1 - a^2)*c - 2*a*b*c*x - b^2*c*x^2],x]
```

output
```
(Sqrt[1 - (a + b*x)^2]*ArcSin[a + b*x]^2)/(2*b*Sqrt[c - c*(a + b*x)^2])
```

#### 3.339.3.1 Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5306
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[1/d   Subst[Int[(-C/d^2 + (C/d^2)*x^2
)^p*(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C,
 n, p}, x] && EqQ[B*(1 - c^2) + 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

### 3.339.4 Maple [A] (verified)

Time = 0.89 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.74

| method | result | size |
|---|---|---|
| default | $-\frac{\sqrt{-c(b^2x^2+2abx+a^2-1)}\,\sqrt{-b^2x^2-2abx-a^2+1}\,\arcsin(bx+a)^2}{2c(b^2x^2+2abx+a^2-1)b}$ | 80 |

input
```
int(arcsin(b*x+a)/((-a^2+1)*c-2*a*b*c*x-b^2*c*x^2)^(1/2),x,method=_RETURNV
ERBOSE)
```

output
```
-1/2*(-c*(b^2*x^2+2*a*b*x+a^2-1))^(1/2)*(-b^2*x^2-2*a*b*x-a^2+1)^(1/2)/c/(
b^2*x^2+2*a*b*x+a^2-1)/b*arcsin(b*x+a)^2
```

### 3.339.5 Fricas [F]

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx=\int \frac{\arcsin{(bx+a)}}{\sqrt{-b^2cx^2-2\,abcx-(a^2-1)c}}\,dx$$

input
```
integrate(arcsin(b*x+a)/((-a^2+1)*c-2*a*b*c*x-b^2*c*x^2)^(1/2),x, algorith
m="fricas")
```

output
```
integral(-sqrt(-b^2*c*x^2 - 2*a*b*c*x - (a^2 - 1)*c)*arcsin(b*x + a)/(b^2*
c*x^2 + 2*a*b*c*x + (a^2 - 1)*c), x)
```

### 3.339.6 Sympy [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx=\text{Timed out}$$

input
```
integrate(asin(b*x+a)/((-a**2+1)*c-2*a*b*c*x-b**2*c*x**2)**(1/2),x)
```

output
```
Timed out
```

### 3.339.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 200 vs. 2(40) = 80.

Time = 0.31 (sec) , antiderivative size = 200, normalized size of antiderivative = 4.35

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx$$
$$=\frac{\sqrt{c}\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)^2}{2\sqrt{a^2b^2c^2-(a^2-1)b^2c^2}}-\frac{\arcsin\left(bx+a\right)\arcsin\left(-\frac{b^2cx+abc}{\sqrt{a^2b^2c^2-(a^2-1)b^2c^2}}\right)}{b\sqrt{c}}$$
$$-\frac{\arcsin\left(-\frac{b^2cx+abc}{\sqrt{a^2b^2c^2-(a^2-1)b^2c^2}}\right)\arcsin\left(-\frac{b^2x+ab}{\sqrt{a^2b^2-(a^2-1)b^2}}\right)}{b\sqrt{c}}$$

input
```
integrate(arcsin(b*x+a)/((-a^2+1)*c-2*a*b*c*x-b^2*c*x^2)^(1/2),x, algorith
m="maxima")
```

output
```
1/2*sqrt(c)*arcsin(-(b^2*x + a*b)/sqrt(a^2*b^2 - (a^2 - 1)*b^2))^2/sqrt(a^
2*b^2*c^2 - (a^2 - 1)*b^2*c^2) - arcsin(b*x + a)*arcsin(-(b^2*c*x + a*b*c)
/sqrt(a^2*b^2*c^2 - (a^2 - 1)*b^2*c^2))/(b*sqrt(c)) - arcsin(-(b^2*c*x + a
*b*c)/sqrt(a^2*b^2*c^2 - (a^2 - 1)*b^2*c^2))*arcsin(-(b^2*x + a*b)/sqrt(a^
2*b^2 - (a^2 - 1)*b^2))/(b*sqrt(c))
```

### 3.339.8 Giac [F]

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx=\int \frac{\arcsin\left(bx+a\right)}{\sqrt{-b^2cx^2-2\,abcx-(a^2-1)c}}\,dx$$

input
```
integrate(arcsin(b*x+a)/((-a^2+1)*c-2*a*b*c*x-b^2*c*x^2)^(1/2),x, algorith
m="giac")
```

output
```
integrate(arcsin(b*x + a)/sqrt(-b^2*c*x^2 - 2*a*b*c*x - (a^2 - 1)*c), x)
```

### 3.339.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin(a+bx)}{\sqrt{(1-a^2)\,c-2abcx-b^2cx^2}}\,dx=\int \frac{\mathrm{asin}(a+b\,x)}{\sqrt{-c\,b^2\,x^2-2\,a\,c\,b\,x-c\,\left(a^2-1\right)}}\,dx$$

input
```
int(asin(a + b*x)/(- c*(a^2 - 1) - b^2*c*x^2 - 2*a*b*c*x)^(1/2),x)
```

output
```
int(asin(a + b*x)/(- c*(a^2 - 1) - b^2*c*x^2 - 2*a*b*c*x)^(1/2), x)
```

# 3.340 $\int x^9(a+b\arcsin(cx^2))\,dx$



## 3.340.1 Optimal result

Integrand size = 14, antiderivative size = 84

$$\int x^9(a+b\arcsin(cx^2))\,dx=\frac{b\sqrt{1-c^2x^4}}{10c^5}-\frac{b(1-c^2x^4)^{3/2}}{15c^5}+\frac{b(1-c^2x^4)^{5/2}}{50c^5}+\frac{1}{10}x^{10}(a+b\arcsin(cx^2))$$

output
```
-1/15*b*(-c^2*x^4+1)^(3/2)/c^5+1/50*b*(-c^2*x^4+1)^(5/2)/c^5+1/10*x^10*(a+
b*arcsin(c*x^2))+1/10*b*(-c^2*x^4+1)^(1/2)/c^5
```

## 3.340.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.71

$$\int x^9(a+b\arcsin(cx^2))\,dx=\frac{1}{150}\left(15ax^{10}+\frac{b\sqrt{1-c^2x^4}(8+4c^2x^4+3c^4x^8)}{c^5}+15bx^{10}\arcsin(cx^2)\right)$$

input
```
Integrate[x^9*(a + b*ArcSin[c*x^2]),x]
```

output
```
(15*a*x^10 + (b*Sqrt[1 - c^2*x^4]*(8 + 4*c^2*x^4 + 3*c^4*x^8))/c^5 + 15*b*
x^10*ArcSin[c*x^2])/150
```

### 3.340.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.02, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {5341, 27, 798, 53, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^9(a+b\arcsin(cx^2))\,dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{10}x^{10}(a+b\arcsin(cx^2))-\frac{1}{10}b\int\frac{2cx^{11}}{\sqrt{1-c^2x^4}}dx$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{10}x^{10}(a+b\arcsin(cx^2))-\frac{1}{5}bc\int\frac{x^{11}}{\sqrt{1-c^2x^4}}dx$$

$$\Big\downarrow \text{798}$$

$$\frac{1}{10}x^{10}(a+b\arcsin(cx^2))-\frac{1}{20}bc\int\frac{x^8}{\sqrt{1-c^2x^4}}dx^4$$

$$\Big\downarrow \text{53}$$

$$\frac{1}{10}x^{10}(a+b\arcsin(cx^2))-\frac{1}{20}bc\int\left(\frac{(1-c^2x^4)^{3/2}}{c^4}-\frac{2\sqrt{1-c^2x^4}}{c^4}+\frac{1}{c^4\sqrt{1-c^2x^4}}\right)dx^4$$

$$\Big\downarrow \text{2009}$$

$$\frac{1}{10}x^{10}(a+b\arcsin(cx^2))-\frac{1}{20}bc\left(-\frac{2(1-c^2x^4)^{5/2}}{5c^6}+\frac{4(1-c^2x^4)^{3/2}}{3c^6}-\frac{2\sqrt{1-c^2x^4}}{c^6}\right)$$

input
```
Int[x^9*(a + b*ArcSin[c*x^2]),x]
```

output
```
-1/20*(b*c*((-2*Sqrt[1 - c^2*x^4])/c^6 + (4*(1 - c^2*x^4)^(3/2))/(3*c^6) -
 (2*(1 - c^2*x^4)^(5/2))/(5*c^6))) + (x^10*(a + b*ArcSin[c*x^2]))/10
```

### 3.340.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 53
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0])
|| LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

rule 798
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[1/n   Subst
[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a,
b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.340.4 Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.85

| method | result | size |
|---|---|---|
| default | $\frac{a\,x^{10}}{10}+b\left(\frac{x^{10}\arcsin\left(c\,x^{2}\right)}{10}-\frac{\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(3c^{4}x^{8}+4c^{2}x^{4}+8\right)}{150c^{5}\sqrt{-c^{2}x^{4}+1}}\right)$ | 71 |
| parts | $\frac{a\,x^{10}}{10}+b\left(\frac{x^{10}\arcsin\left(c\,x^{2}\right)}{10}-\frac{\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(3c^{4}x^{8}+4c^{2}x^{4}+8\right)}{150c^{5}\sqrt{-c^{2}x^{4}+1}}\right)$ | 71 |

input
```
int(x^9*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

output
```
1/10*a*x^10+b*(1/10*x^10*arcsin(c*x^2)-1/150/c^5*(c*x^2-1)*(c*x^2+1)*(3*c^
4*x^8+4*c^2*x^4+8)/(-c^2*x^4+1)^(1/2))
```

### 3.340.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.77

$$\int x^9\left(a+b\arcsin\left(cx^2\right)\right)\,dx$$
$$=\frac{15\,bc^5x^{10}\arcsin\left(cx^2\right)+15\,ac^5x^{10}+\left(3\,bc^4x^8+4\,bc^2x^4+8\,b\right)\sqrt{-c^2x^4+1}}{150\,c^5}$$

input
```
integrate(x^9*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

output
```
1/150*(15*b*c^5*x^10*arcsin(c*x^2) + 15*a*c^5*x^10 + (3*b*c^4*x^8 + 4*b*c^
2*x^4 + 8*b)*sqrt(-c^2*x^4 + 1))/c^5
```

### 3.340.6 Sympy [A] (verification not implemented)

Time = 1.48 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.07

$$\int x^9\left(a+b\arcsin\left(cx^2\right)\right)\,dx$$
$$=\begin{cases}\frac{ax^{10}}{10}+\frac{bx^{10}\operatorname{asin}\left(cx^2\right)}{10}+\frac{bx^8\sqrt{-c^2x^4+1}}{50c}+\frac{2bx^4\sqrt{-c^2x^4+1}}{75c^3}+\frac{4b\sqrt{-c^2x^4+1}}{75c^5} & \text{for } c\neq 0\\ \frac{ax^{10}}{10} & \text{otherwise}\end{cases}$$

input
```
integrate(x**9*(a+b*asin(c*x**2)),x)
```

output
```
Piecewise((a*x**10/10 + b*x**10*asin(c*x**2)/10 + b*x**8*sqrt(-c**2*x**4 +
 1)/(50*c) + 2*b*x**4*sqrt(-c**2*x**4 + 1)/(75*c**3) + 4*b*sqrt(-c**2*x**4
 + 1)/(75*c**5), Ne(c, 0)), (a*x**10/10, True))
```

### 3.340.7 Maxima [A] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.90

$$\int x^9 \left(a + b \arcsin \left(cx^2\right)\right) \, dx = \frac{1}{10} \, ax^{10} + \frac{1}{150} \left(15 \, x^{10} \arcsin \left(cx^2\right) + c \left(\frac{3 \left(-c^2x^4 + 1\right)^{\frac{5}{2}}}{c^6} - \frac{10 \left(-c^2x^4 + 1\right)^{\frac{3}{2}}}{c^6} + \frac{15 \sqrt{-c^2x^4 + 1}}{c^6}\right)\right) b$$

input
```
integrate(x^9*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

output
```
1/10*a*x^10 + 1/150*(15*x^10*arcsin(c*x^2) + c*(3*(-c^2*x^4 + 1)^(5/2)/c^6
 - 10*(-c^2*x^4 + 1)^(3/2)/c^6 + 15*sqrt(-c^2*x^4 + 1)/c^6))*b
```

### 3.340.8 Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.67

$$\int x^9 \left(a + b \arcsin \left(cx^2\right)\right) \, dx = \frac{15 \, acx^{10} + \left(\frac{15 \left(c^2x^4-1\right)^2 x^2 \arcsin\left(cx^2\right)}{c^3} + \frac{30 \left(c^2x^4-1\right) x^2 \arcsin\left(cx^2\right)}{c^3} + \frac{15 \, x^2 \arcsin\left(cx^2\right)}{c^3} + \frac{3 \left(c^2x^4-1\right)^2 \sqrt{-c^2x^4+1}}{c^4} - \frac{10 \left(-c^2x^4+\right.}{c^4}}{150 \, c}$$

input
```
integrate(x^9*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

output
```
1/150*(15*a*c*x^10 + (15*(c^2*x^4 - 1)^2*x^2*arcsin(c*x^2)/c^3 + 30*(c^2*x
^4 - 1)*x^2*arcsin(c*x^2)/c^3 + 15*x^2*arcsin(c*x^2)/c^3 + 3*(c^2*x^4 - 1)
^2*sqrt(-c^2*x^4 + 1)/c^4 - 10*(-c^2*x^4 + 1)^(3/2)/c^4 + 15*sqrt(-c^2*x^4
 + 1)/c^4)*b)/c
```

### 3.340.9 Mupad [F(-1)]

Timed out.

$$\int x^9(a+b\arcsin(cx^2))\,dx=\int x^9\,(a+b\,\mathrm{asin}(c\,x^2))\,dx$$

input
```
int(x^9*(a + b*asin(c*x^2)),x)
```

output
```
int(x^9*(a + b*asin(c*x^2)), x)
```

# 3.341 $\int x^7(a+b\arcsin(cx^2))\,dx$



## 3.341.1 Optimal result

Integrand size = 14, antiderivative size = 82

$$\int x^7\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{3bx^2\sqrt{1-c^2x^4}}{64c^3}+\frac{bx^6\sqrt{1-c^2x^4}}{32c}-\frac{3b\arcsin\left(cx^2\right)}{64c^4}+\frac{1}{8}x^8\left(a+b\arcsin\left(cx^2\right)\right)$$

output
```
-3/64*b*arcsin(c*x^2)/c^4+1/8*x^8*(a+b*arcsin(c*x^2))+3/64*b*x^2*(-c^2*x^4
+1)^(1/2)/c^3+1/32*b*x^6*(-c^2*x^4+1)^(1/2)/c
```

## 3.341.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.06

$$\int x^7\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{ax^8}{8}+\frac{3bx^2\sqrt{1-c^2x^4}}{64c^3}+\frac{bx^6\sqrt{1-c^2x^4}}{32c}-\frac{3b\arcsin\left(cx^2\right)}{64c^4}+\frac{1}{8}bx^8\arcsin\left(cx^2\right)$$

input
```
Integrate[x^7*(a + b*ArcSin[c*x^2]),x]
```

output
```
(a*x^8)/8 + (3*b*x^2*Sqrt[1 - c^2*x^4])/(64*c^3) + (b*x^6*Sqrt[1 - c^2*x^4
])/(32*c) - (3*b*ArcSin[c*x^2])/(64*c^4) + (b*x^8*ArcSin[c*x^2])/8
```

### 3.341.3 Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.15, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {5341, 27, 807, 262, 262, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^7 \left(a+b \arcsin \left(c x^2\right)\right) \, dx$$

$$\Big\downarrow \ 5341$$

$$\frac{1}{8} x^8 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{8} b \int \frac{2 c x^9}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \ 27$$

$$\frac{1}{8} x^8 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{4} b c \int \frac{x^9}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \ 807$$

$$\frac{1}{8} x^8 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{8} b c \int \frac{x^8}{\sqrt{1-c^2 x^4}}dx^2$$

$$\Big\downarrow \ 262$$

$$\frac{1}{8} x^8 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{8} b c \left(\frac{3 \int \frac{x^4}{\sqrt{1-c^2 x^4}}dx^2}{4 c^2}-\frac{x^6 \sqrt{1-c^2 x^4}}{4 c^2}\right)$$

$$\Big\downarrow \ 262$$

$$\frac{1}{8} x^8 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{8} b c \left(\frac{3 \left(\frac{\int \frac{1}{\sqrt{1-c^2 x^4}}dx^2}{2 c^2}-\frac{x^2 \sqrt{1-c^2 x^4}}{2 c^2}\right)}{4 c^2}-\frac{x^6 \sqrt{1-c^2 x^4}}{4 c^2}\right)$$

$$\Big\downarrow \ 223$$

$$\frac{1}{8} x^8 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{8} b c \left(\frac{3 \left(\frac{\arcsin \left(c x^2\right)}{2 c^3}-\frac{x^2 \sqrt{1-c^2 x^4}}{2 c^2}\right)}{4 c^2}-\frac{x^6 \sqrt{1-c^2 x^4}}{4 c^2}\right)$$

input
```
Int[x^7*(a + b*ArcSin[c*x^2]),x]
```

output
```
(x^8*(a + b*ArcSin[c*x^2]))/8 - (b*c*(-1/4*(x^6*Sqrt[1 - c^2*x^4])/c^2 + (
3*(-1/2*(x^2*Sqrt[1 - c^2*x^4])/c^2 + ArcSin[c*x^2]/(2*c^3)))/(4*c^2)))/8
```

### 3.341.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 807
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k = GCD[m
+ 1, n]}, Simp[1/k   Subst[Int[x^((m + 1)/k - 1)*(a + b*x^(n/k))^p, x], x,
x^k], x] /; k != 1] /; FreeQ[{a, b, p}, x] && IGtQ[n, 0] && IntegerQ[m]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.341.4 Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.16

| method | result | size |
|---|---|---|
| default | $\frac{a\,x^{8}}{8}+\frac{b\,x^{8}\arcsin\left(c\,x^{2}\right)}{8}+\frac{b\,x^{6}\sqrt{-c^{2}x^{4}+1}}{32c}+\frac{3b\,x^{2}\sqrt{-c^{2}x^{4}+1}}{64c^{3}}-\frac{3b\arctan\left(\frac{\sqrt{c^{2}}\,x^{2}}{\sqrt{-c^{2}x^{4}+1}}\right)}{64c^{3}\sqrt{c^{2}}}$ | 95 |
| parts | $\frac{a\,x^{8}}{8}+\frac{b\,x^{8}\arcsin\left(c\,x^{2}\right)}{8}+\frac{b\,x^{6}\sqrt{-c^{2}x^{4}+1}}{32c}+\frac{3b\,x^{2}\sqrt{-c^{2}x^{4}+1}}{64c^{3}}-\frac{3b\arctan\left(\frac{\sqrt{c^{2}}\,x^{2}}{\sqrt{-c^{2}x^{4}+1}}\right)}{64c^{3}\sqrt{c^{2}}}$ | 95 |

input
```
int(x^7*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

output
```
1/8*a*x^8+1/8*b*x^8*arcsin(c*x^2)+1/32*b*x^6*(-c^2*x^4+1)^(1/2)/c+3/64*b*x
^2*(-c^2*x^4+1)^(1/2)/c^3-3/64*b/c^3/(c^2)^(1/2)*arctan((c^2)^(1/2)*x^2/(-
c^2*x^4+1)^(1/2))
```

### 3.341.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.79

$$\int x^7(a+b\arcsin(cx^2))\,dx = \frac{8\,ac^4x^8+(8\,bc^4x^8-3\,b)\arcsin(cx^2)+(2\,bc^3x^6+3\,bcx^2)\sqrt{-c^2x^4+1}}{64\,c^4}$$

input
```
integrate(x^7*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

output
```
1/64*(8*a*c^4*x^8 + (8*b*c^4*x^8 - 3*b)*arcsin(c*x^2) + (2*b*c^3*x^6 + 3*b
*c*x^2)*sqrt(-c^2*x^4 + 1))/c^4
```

### 3.341.6 Sympy [A] (verification not implemented)

Time = 0.94 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.04

$$\int x^7\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \begin{cases} \frac{ax^8}{8}+\frac{bx^8\operatorname{asin}\left(cx^2\right)}{8}+\frac{bx^6\sqrt{-c^2x^4+1}}{32c}+\frac{3bx^2\sqrt{-c^2x^4+1}}{64c^3}-\frac{3b\operatorname{asin}\left(cx^2\right)}{64c^4} & \text{for } c\neq 0 \\ \frac{ax^8}{8} & \text{otherwise} \end{cases}$$

input
```
integrate(x**7*(a+b*asin(c*x**2)),x)
```

output
```
Piecewise((a*x**8/8 + b*x**8*asin(c*x**2)/8 + b*x**6*sqrt(-c**2*x**4 + 1)/
(32*c) + 3*b*x**2*sqrt(-c**2*x**4 + 1)/(64*c**3) - 3*b*asin(c*x**2)/(64*c*
*4), Ne(c, 0)), (a*x**8/8, True))
```

### 3.341.7 Maxima [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.59

$$\int x^7\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \frac{1}{8}\,ax^8 + \frac{1}{64}\left(8\,x^8\arcsin\left(cx^2\right)+c\left(\frac{\frac{5\sqrt{-c^2x^4+1}c^2}{x^2}+\frac{3\left(-c^2x^4+1\right)^{\frac{3}{2}}}{x^6}}{c^8-\frac{2\left(c^2x^4-1\right)c^6}{x^4}+\frac{\left(c^2x^4-1\right)^2c^4}{x^8}}+\frac{3\,\arctan\left(\frac{\sqrt{-c^2x^4+1}}{cx^2}\right)}{c^5}\right)\right)b$$

input
```
integrate(x^7*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

output
```
1/8*a*x^8 + 1/64*(8*x^8*arcsin(c*x^2) + c*((5*sqrt(-c^2*x^4 + 1)*c^2/x^2 +
 3*(-c^2*x^4 + 1)^(3/2)/x^6)/(c^8 - 2*(c^2*x^4 - 1)*c^6/x^4 + (c^2*x^4 - 1
)^2*c^4/x^8) + 3*arctan(sqrt(-c^2*x^4 + 1)/(c*x^2))/c^5))*b
```

### 3.341.8 Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.34

$$\int x^7\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \frac{8\,acx^8-\left(\frac{2\,\left(-c^2x^4+1\right)^{\frac{3}{2}}x^2}{c^2}-\frac{5\,\sqrt{-c^2x^4+1}x^2}{c^2}-\frac{8\,\left(c^2x^4-1\right)^2\arcsin\left(cx^2\right)}{c^3}-\frac{16\,\left(c^2x^4-1\right)\arcsin\left(cx^2\right)}{c^3}-\frac{5\,\arcsin\left(cx^2\right)}{c^3}\right)b}{64\,c}$$

input
```
integrate(x^7*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

output
```
1/64*(8*a*c*x^8 - (2*(-c^2*x^4 + 1)^(3/2)*x^2/c^2 - 5*sqrt(-c^2*x^4 + 1)*x
^2/c^2 - 8*(c^2*x^4 - 1)^2*arcsin(c*x^2)/c^3 - 16*(c^2*x^4 - 1)*arcsin(c*x
^2)/c^3 - 5*arcsin(c*x^2)/c^3)*b)/c
```

### 3.341.9 Mupad [F(-1)]

Timed out.

$$\int x^7\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \int x^7\,\left(a+b\,\mathrm{asin}\left(c\,x^2\right)\right)\,dx$$

input
```
int(x^7*(a + b*asin(c*x^2)),x)
```

output
```
int(x^7*(a + b*asin(c*x^2)), x)
```

# 3.342 $\int x^5(a+b\arcsin(cx^2))\,dx$



## 3.342.1 Optimal result

Integrand size = 14, antiderivative size = 62

$$\int x^5(a+b\arcsin(cx^2))\,dx=\frac{b\sqrt{1-c^2x^4}}{6c^3}-\frac{b(1-c^2x^4)^{3/2}}{18c^3}+\frac{1}{6}x^6(a+b\arcsin(cx^2))$$

output
```
-1/18*b*(-c^2*x^4+1)^(3/2)/c^3+1/6*x^6*(a+b*arcsin(c*x^2))+1/6*b*(-c^2*x^4
+1)^(1/2)/c^3
```

## 3.342.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.13

$$\int x^5(a+b\arcsin(cx^2))\,dx=\frac{ax^6}{6}+\frac{b\sqrt{1-c^2x^4}}{9c^3}+\frac{bx^4\sqrt{1-c^2x^4}}{18c}+\frac{1}{6}bx^6\arcsin(cx^2)$$

input
```
Integrate[x^5*(a + b*ArcSin[c*x^2]),x]
```

output
```
(a*x^6)/6 + (b*Sqrt[1 - c^2*x^4])/(9*c^3) + (b*x^4*Sqrt[1 - c^2*x^4])/(18*
c) + (b*x^6*ArcSin[c*x^2])/6
```

### 3.342.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.05, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {5341, 27, 798, 53, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^5 (a + b \arcsin(cx^2)) \, dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{6}x^6 (a + b \arcsin(cx^2)) - \frac{1}{6}b \int \frac{2cx^7}{\sqrt{1-c^2x^4}}dx$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{6}x^6 (a + b \arcsin(cx^2)) - \frac{1}{3}bc \int \frac{x^7}{\sqrt{1-c^2x^4}}dx$$

$$\Big\downarrow \text{798}$$

$$\frac{1}{6}x^6 (a + b \arcsin(cx^2)) - \frac{1}{12}bc \int \frac{x^4}{\sqrt{1-c^2x^4}}dx^4$$

$$\Big\downarrow \text{53}$$

$$\frac{1}{6}x^6 (a + b \arcsin(cx^2)) - \frac{1}{12}bc \int \left(\frac{1}{c^2\sqrt{1-c^2x^4}} - \frac{\sqrt{1-c^2x^4}}{c^2}\right) dx^4$$

$$\Big\downarrow \text{2009}$$

$$\frac{1}{6}x^6 (a + b \arcsin(cx^2)) - \frac{1}{12}bc \left(\frac{2(1-c^2x^4)^{3/2}}{3c^4} - \frac{2\sqrt{1-c^2x^4}}{c^4}\right)$$

input
```
Int[x^5*(a + b*ArcSin[c*x^2]),x]
```

output
```
-1/12*(b*c*((-2*Sqrt[1 - c^2*x^4])/c^4 + (2*(1 - c^2*x^4)^(3/2))/(3*c^4)))
 + (x^6*(a + b*ArcSin[c*x^2]))/6
```

### 3.342.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 53
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0])
|| LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

rule 798
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[1/n   Subst
[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a,
b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.342.4 Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.00

| method | result | size |
|---|---|---|
| default | $\frac{a\,x^{6}}{6}+b\left(\frac{x^{6}\arcsin\left(c\,x^{2}\right)}{6}-\frac{\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(c^{2}x^{4}+2\right)}{18c^{3}\sqrt{-c^{2}x^{4}+1}}\right)$ | 62 |
| parts | $\frac{a\,x^{6}}{6}+b\left(\frac{x^{6}\arcsin\left(c\,x^{2}\right)}{6}-\frac{\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(c^{2}x^{4}+2\right)}{18c^{3}\sqrt{-c^{2}x^{4}+1}}\right)$ | 62 |

input
```
int(x^5*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

output
```
1/6*a*x^6+b*(1/6*x^6*arcsin(c*x^2)-1/18/c^3*(c*x^2-1)*(c*x^2+1)*(c^2*x^4+2
)/(-c^2*x^4+1)^(1/2))
```

### 3.342.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.89

$$\int x^5\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{3\,bc^3x^6\arcsin\left(cx^2\right)+3\,ac^3x^6+\left(bc^2x^4+2\,b\right)\sqrt{-c^2x^4+1}}{18\,c^3}$$

input
```
integrate(x^5*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

output
```
1/18*(3*b*c^3*x^6*arcsin(c*x^2) + 3*a*c^3*x^6 + (b*c^2*x^4 + 2*b)*sqrt(-c^
2*x^4 + 1))/c^3
```

### 3.342.6 Sympy [A] (verification not implemented)

Time = 0.47 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.05

$$\int x^5\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\begin{cases}\frac{ax^6}{6}+\frac{bx^6\operatorname{asin}\left(cx^2\right)}{6}+\frac{bx^4\sqrt{-c^2x^4+1}}{18c}+\frac{b\sqrt{-c^2x^4+1}}{9c^3} & \text{for } c\neq 0\\ \frac{ax^6}{6} & \text{otherwise}\end{cases}$$

input
```
integrate(x**5*(a+b*asin(c*x**2)),x)
```

output
```
Piecewise((a*x**6/6 + b*x**6*asin(c*x**2)/6 + b*x**4*sqrt(-c**2*x**4 + 1)/
(18*c) + b*sqrt(-c**2*x**4 + 1)/(9*c**3), Ne(c, 0)), (a*x**6/6, True))
```

### 3.342.7 Maxima [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.95

$$\int x^5\left(a+b\arcsin\left(cx^2\right)\right)\,dx$$
$$=\frac{1}{6}\,ax^6+\frac{1}{18}\left(3\,x^6\arcsin\left(cx^2\right)-c\left(\frac{\left(-c^2x^4+1\right)^{\frac{3}{2}}}{c^4}-\frac{3\,\sqrt{-c^2x^4+1}}{c^4}\right)\right)b$$

input
```
integrate(x^5*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

output
```
1/6*a*x^6 + 1/18*(3*x^6*arcsin(c*x^2) - c*((-c^2*x^4 + 1)^(3/2)/c^4 - 3*sq
rt(-c^2*x^4 + 1)/c^4))*b
```

### 3.342.8 Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.40

$$\int x^5(a+b\arcsin(cx^2))\,dx = \frac{3\,acx^6+\left(\frac{3\,(c^2x^4-1)x^2\arcsin(cx^2)}{c}+\frac{3\,x^2\arcsin(cx^2)}{c}-\frac{(-c^2x^4+1)^{\frac{3}{2}}}{c^2}+\frac{3\,\sqrt{-c^2x^4+1}}{c^2}\right)b}{18\,c}$$

input
```
integrate(x^5*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

output
```
1/18*(3*a*c*x^6 + (3*(c^2*x^4 - 1)*x^2*arcsin(c*x^2)/c + 3*x^2*arcsin(c*x^
2)/c - (-c^2*x^4 + 1)^(3/2)/c^2 + 3*sqrt(-c^2*x^4 + 1)/c^2)*b)/c
```

### 3.342.9 Mupad [F(-1)]

Timed out.

$$\int x^5(a+b\arcsin(cx^2))\,dx = \int x^5\,(a+b\,\mathrm{asin}(c\,x^2))\,dx$$

input
```
int(x^5*(a + b*asin(c*x^2)),x)
```

output
```
int(x^5*(a + b*asin(c*x^2)), x)
```

# 3.343 $\int x^3(a+b\arcsin(cx^2))\,dx$



## 3.343.1 Optimal result

Integrand size = 14, antiderivative size = 57

$$\int x^3(a+b\arcsin(cx^2))\,dx=\frac{bx^2\sqrt{1-c^2x^4}}{8c}-\frac{b\arcsin(cx^2)}{8c^2}+\frac{1}{4}x^4(a+b\arcsin(cx^2))$$

output
```
-1/8*b*arcsin(c*x^2)/c^2+1/4*x^4*(a+b*arcsin(c*x^2))+1/8*b*x^2*(-c^2*x^4+1
)^(1/2)/c
```

## 3.343.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.09

$$\int x^3(a+b\arcsin(cx^2))\,dx=\frac{ax^4}{4}+\frac{bx^2\sqrt{1-c^2x^4}}{8c}-\frac{b\arcsin(cx^2)}{8c^2}+\frac{1}{4}bx^4\arcsin(cx^2)$$

input
```
Integrate[x^3*(a + b*ArcSin[c*x^2]),x]
```

output
```
(a*x^4)/4 + (b*x^2*Sqrt[1 - c^2*x^4])/(8*c) - (b*ArcSin[c*x^2])/(8*c^2) +
(b*x^4*ArcSin[c*x^2])/4
```

### 3.343.3 Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.09, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {5341, 27, 807, 262, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3 \left(a+b \arcsin \left(c x^2\right)\right) \, dx$$

$$\Big\downarrow \text{ 5341}$$

$$\frac{1}{4} x^4 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{4} b \int \frac{2 c x^5}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \text{ 27}$$

$$\frac{1}{4} x^4 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{2} b c \int \frac{x^5}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \text{ 807}$$

$$\frac{1}{4} x^4 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{4} b c \int \frac{x^4}{\sqrt{1-c^2 x^4}}dx^2$$

$$\Big\downarrow \text{ 262}$$

$$\frac{1}{4} x^4 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{4} b c \left(\frac{\int \frac{1}{\sqrt{1-c^2 x^4}}dx^2}{2 c^2}-\frac{x^2 \sqrt{1-c^2 x^4}}{2 c^2}\right)$$

$$\Big\downarrow \text{ 223}$$

$$\frac{1}{4} x^4 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{4} b c \left(\frac{\arcsin \left(c x^2\right)}{2 c^3}-\frac{x^2 \sqrt{1-c^2 x^4}}{2 c^2}\right)$$

input
```
Int[x^3*(a + b*ArcSin[c*x^2]),x]
```

output
```
(x^4*(a + b*ArcSin[c*x^2]))/4 - (b*c*(-1/2*(x^2*Sqrt[1 - c^2*x^4])/c^2 + A
rcSin[c*x^2]/(2*c^3)))/4
```

### 3.343.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 807
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k = GCD[m
+ 1, n]}, Simp[1/k   Subst[Int[x^((m + 1)/k - 1)*(a + b*x^(n/k))^p, x], x,
x^k], x] /; k != 1] /; FreeQ[{a, b, p}, x] && IGtQ[n, 0] && IntegerQ[m]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.343.4 Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.30

| method | result | size |
|---|---|---|
| default | $\frac{a\,x^{4}}{4}+\frac{b\,x^{4}\arcsin\left(c\,x^{2}\right)}{4}+\frac{b\,x^{2}\sqrt{-c^{2}x^{4}+1}}{8c}-\frac{b\arctan\left(\frac{\sqrt{c^{2}}\,x^{2}}{\sqrt{-c^{2}x^{4}+1}}\right)}{8c\sqrt{c^{2}}}$ | 74 |
| parts | $\frac{a\,x^{4}}{4}+\frac{b\,x^{4}\arcsin\left(c\,x^{2}\right)}{4}+\frac{b\,x^{2}\sqrt{-c^{2}x^{4}+1}}{8c}-\frac{b\arctan\left(\frac{\sqrt{c^{2}}\,x^{2}}{\sqrt{-c^{2}x^{4}+1}}\right)}{8c\sqrt{c^{2}}}$ | 74 |

input
```
int(x^3*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

output
```
1/4*a*x^4+1/4*b*x^4*arcsin(c*x^2)+1/8*b*x^2*(-c^2*x^4+1)^(1/2)/c-1/8*b/c/(
c^2)^(1/2)*arctan((c^2)^(1/2)*x^2/(-c^2*x^4+1)^(1/2))
```

### 3.343.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.93

$$\int x^3(a+b\arcsin(cx^2))\,dx=\frac{2\,ac^2x^4+\sqrt{-c^2x^4+1}bcx^2+(2\,bc^2x^4-b)\arcsin(cx^2)}{8\,c^2}$$

input
```
integrate(x^3*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

output
```
1/8*(2*a*c^2*x^4 + sqrt(-c^2*x^4 + 1)*b*c*x^2 + (2*b*c^2*x^4 - b)*arcsin(c
*x^2))/c^2
```

### 3.343.6 Sympy [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.05

$$\int x^3(a+b\arcsin(cx^2))\,dx=\begin{cases}\frac{ax^4}{4}+\frac{bx^4\operatorname{asin}(cx^2)}{4}+\frac{bx^2\sqrt{-c^2x^4+1}}{8c}-\frac{b\operatorname{asin}(cx^2)}{8c^2} & \text{for } c\neq 0\\ \frac{ax^4}{4} & \text{otherwise}\end{cases}$$

input
```
integrate(x**3*(a+b*asin(c*x**2)),x)
```

output
```
Piecewise((a*x**4/4 + b*x**4*asin(c*x**2)/4 + b*x**2*sqrt(-c**2*x**4 + 1)/
(8*c) - b*asin(c*x**2)/(8*c**2), Ne(c, 0)), (a*x**4/4, True))
```

### 3.343.7 Maxima [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.54

$$\int x^3(a+b\arcsin(cx^2))\,dx$$
$$=\frac{1}{4}ax^4+\frac{1}{8}\left(2\,x^4\arcsin(cx^2)+c\left(\frac{\arctan\left(\frac{\sqrt{-c^2x^4+1}}{cx^2}\right)}{c^3}+\frac{\sqrt{-c^2x^4+1}}{\left(c^4-\frac{(c^2x^4-1)c^2}{x^4}\right)x^2}\right)\right)b$$

input
```
integrate(x^3*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

output
```
1/4*a*x^4 + 1/8*(2*x^4*arcsin(c*x^2) + c*(arctan(sqrt(-c^2*x^4 + 1)/(c*x^2
))/c^3 + sqrt(-c^2*x^4 + 1)/((c^4 - (c^2*x^4 - 1)*c^2/x^4)*x^2)))*b
```

### 3.343.8 Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 59, normalized size of antiderivative = 1.04

$$\int x^3(a+b\arcsin(cx^2))\,dx=\frac{2\,acx^4+\frac{\left(\sqrt{-c^2x^4+1}cx^2+2\,(c^2x^4-1)\arcsin(cx^2)+\arcsin(cx^2)\right)b}{c}}{8\,c}$$

input
```
integrate(x^3*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

output
```
1/8*(2*a*c*x^4 + (sqrt(-c^2*x^4 + 1)*c*x^2 + 2*(c^2*x^4 - 1)*arcsin(c*x^2)
 + arcsin(c*x^2))*b/c)/c
```

### 3.343.9 Mupad [B] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.88

$$\int x^3(a+b\arcsin(cx^2))\,dx=\frac{a\,x^4}{4}+\frac{b\left(\frac{\mathrm{asin}(c\,x^2)\,(2\,c^2\,x^4-1)}{4}+\frac{c\,x^2\,\sqrt{1-c^2\,x^4}}{4}\right)}{2\,c^2}$$

input
```
int(x^3*(a + b*asin(c*x^2)),x)
```

output
```
(a*x^4)/4 + (b*((asin(c*x^2)*(2*c^2*x^4 - 1))/4 + (c*x^2*(1 - c^2*x^4)^(1/
2))/4))/(2*c^2)
```

# 3.344 $\int x(a+b\arcsin(cx^2))\,dx$



## 3.344.1 Optimal result

Integrand size = 12, antiderivative size = 45

$$\int x(a+b\arcsin(cx^2))\,dx=\frac{ax^2}{2}+\frac{b\sqrt{1-c^2x^4}}{2c}+\frac{1}{2}bx^2\arcsin(cx^2)$$

output
```
1/2*a*x^2+1/2*b*x^2*arcsin(c*x^2)+1/2*b*(-c^2*x^4+1)^(1/2)/c
```

## 3.344.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.96

$$\int x(a+b\arcsin(cx^2))\,dx=\frac{ax^2}{2}+\frac{1}{2}b\left(\frac{\sqrt{1-c^2x^4}}{c}+x^2\arcsin(cx^2)\right)$$

input
```
Integrate[x*(a + b*ArcSin[c*x^2]),x]
```

output
```
(a*x^2)/2 + (b*(Sqrt[1 - c^2*x^4]/c + x^2*ArcSin[c*x^2]))/2
```

### 3.344.3 Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.89, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {7266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x(a+b\arcsin(cx^2))\,dx$$

$$\Big\downarrow \text{7266}$$

$$\frac{1}{2}\int (a+b\arcsin(cx^2))\,dx^2$$

$$\Big\downarrow \text{2009}$$

$$\frac{1}{2}\left(ax^2+bx^2\arcsin(cx^2)+\frac{b\sqrt{1-c^2x^4}}{c}\right)$$

input
```
Int[x*(a + b*ArcSin[c*x^2]),x]
```

output
```
(a*x^2 + (b*Sqrt[1 - c^2*x^4])/c + b*x^2*ArcSin[c*x^2])/2
```

#### 3.344.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 7266
```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Simp[1/(m + 1)   Subst[Int[SubstFor[x^(m
+ 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && Function
OfQ[x^(m + 1), u, x]
```

### 3.344.4 Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.84

| method | result | size |
|---|---|---|
| parts | $\frac{a x^2}{2}+\frac{b\left(c x^2 \arcsin\left(c x^2\right)+\sqrt{-c^2 x^4+1}\right)}{2c}$ | 38 |
| derivativedivides | $\frac{c x^2 a+b\left(c x^2 \arcsin\left(c x^2\right)+\sqrt{-c^2 x^4+1}\right)}{2c}$ | 39 |
| default | $\frac{c x^2 a+b\left(c x^2 \arcsin\left(c x^2\right)+\sqrt{-c^2 x^4+1}\right)}{2c}$ | 39 |

input
```
int(x*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

output
```
1/2*a*x^2+1/2*b/c*(c*x^2*arcsin(c*x^2)+(-c^2*x^4+1)^(1/2))
```

### 3.344.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.84

$$\int x\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{bcx^2\arcsin\left(cx^2\right)+acx^2+\sqrt{-c^2x^4+1}b}{2\,c}$$

input
```
integrate(x*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

output
```
1/2*(b*c*x^2*arcsin(c*x^2) + a*c*x^2 + sqrt(-c^2*x^4 + 1)*b)/c
```

### 3.344.6 Sympy [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.93

$$\int x\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\begin{cases}\frac{ax^2}{2}+\frac{bx^2\operatorname{asin}\left(cx^2\right)}{2}+\frac{b\sqrt{-c^2x^4+1}}{2c} & \text{for } c\neq 0\\ \frac{ax^2}{2} & \text{otherwise}\end{cases}$$

input
```
integrate(x*(a+b*asin(c*x**2)),x)
```

output
```
Piecewise((a*x**2/2 + b*x**2*asin(c*x**2)/2 + b*sqrt(-c**2*x**4 + 1)/(2*c)
, Ne(c, 0)), (a*x**2/2, True))
```

### 3.344.7 Maxima [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.82

$$\int x\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{1}{2}\,ax^2+\frac{\left(cx^2\arcsin\left(cx^2\right)+\sqrt{-c^2x^4+1}\right)b}{2\,c}$$

input
```
integrate(x*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

output
```
1/2*a*x^2 + 1/2*(c*x^2*arcsin(c*x^2) + sqrt(-c^2*x^4 + 1))*b/c
```

### 3.344.8 Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.84

$$\int x\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{acx^2+\left(cx^2\arcsin\left(cx^2\right)+\sqrt{-c^2x^4+1}\right)b}{2\,c}$$

input
```
integrate(x*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

output
```
1/2*(a*c*x^2 + (c*x^2*arcsin(c*x^2) + sqrt(-c^2*x^4 + 1))*b)/c
```

### 3.344.9 Mupad [B] (verification not implemented)

Time = 0.38 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.82

$$\int x\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{a\,x^2}{2}+\frac{b\,\sqrt{1-c^2\,x^4}}{2\,c}+\frac{b\,x^2\,\mathrm{asin}(c\,x^2)}{2}$$

input
```
int(x*(a + b*asin(c*x^2)),x)
```

output
```
(a*x^2)/2 + (b*(1 - c^2*x^4)^(1/2))/(2*c) + (b*x^2*asin(c*x^2))/2
```

# 3.345 $\int \frac{a+b\arcsin(cx^2)}{x}\,dx$



## 3.345.1 Optimal result

Integrand size = 14, antiderivative size = 69

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = -\frac{1}{4}ib\arcsin(cx^2)^2+\frac{1}{2}b\arcsin(cx^2)\log\left(1-e^{2i\arcsin(cx^2)}\right)+a\log(x)-\frac{1}{4}ib\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx^2)}\right)$$

output
```
-1/4*I*b*arcsin(c*x^2)^2+1/2*b*arcsin(c*x^2)*ln(1-(I*c*x^2+(-c^2*x^4+1)^(1
/2))^2)+a*ln(x)-1/4*I*b*polylog(2,(I*c*x^2+(-c^2*x^4+1)^(1/2))^2)
```

## 3.345.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.93

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = a\log(x)+\frac{1}{2}b\left(\arcsin(cx^2)\log\left(1-e^{2i\arcsin(cx^2)}\right)-\frac{1}{2}i\left(\arcsin(cx^2)^2+\mathrm{PolyLog}\left(2,e^{2i\arcsin(cx^2)}\right)\right)\right)$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x,x]
```

output
```
a*Log[x] + (b*(ArcSin[c*x^2]*Log[1 - E^((2*I)*ArcSin[c*x^2])] - (I/2)*(Arc
Sin[c*x^2]^2 + PolyLog[2, E^((2*I)*ArcSin[c*x^2])])))/2
```

### 3.345.3 Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx$$

$$\Big\downarrow \text{7293}$$

$$\int \left(\frac{a}{x}+\frac{b\arcsin(cx^2)}{x}\right)dx$$

$$\Big\downarrow \text{2009}$$

$$a\log(x)-\frac{1}{4}ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx^2)}\right)-\frac{1}{4}ib\arcsin(cx^2)^2+\frac{1}{2}b\arcsin(cx^2)\log\left(1-e^{2i\arcsin(cx^2)}\right)$$

input
```
Int[(a + b*ArcSin[c*x^2])/x,x]
```

output
```
(-1/4*I)*b*ArcSin[c*x^2]^2 + (b*ArcSin[c*x^2]*Log[1 - E^((2*I)*ArcSin[c*x^
2])])/2 + a*Log[x] - (I/4)*b*PolyLog[2, E^((2*I)*ArcSin[c*x^2])]
```

#### 3.345.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.345.4 Maple [F]

$$\int \frac{a+b\arcsin\left(c\,x^{2}\right)}{x}dx$$

input
```
int((a+b*arcsin(c*x^2))/x,x)
```

output
```
int((a+b*arcsin(c*x^2))/x,x)
```

### 3.345.5 Fricas [F]

$$\int \frac{a+b\arcsin\left(cx^{2}\right)}{x}\,dx=\int \frac{b\arcsin\left(cx^{2}\right)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x,x, algorithm="fricas")
```

output
```
integral((b*arcsin(c*x^2) + a)/x, x)
```

### 3.345.6 Sympy [F]

$$\int \frac{a+b\arcsin\left(cx^{2}\right)}{x}\,dx=\int \frac{a+b\,\mathrm{asin}\left(cx^{2}\right)}{x}\,dx$$

input
```
integrate((a+b*asin(c*x**2))/x,x)
```

output
```
Integral((a + b*asin(c*x**2))/x, x)
```

### 3.345.7 Maxima [F]

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = \int \frac{b\arcsin(cx^2)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x,x, algorithm="maxima")
```

output
```
b*integrate(arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1))/x, x) + a*log
(x)
```

### 3.345.8 Giac [F]

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = \int \frac{b\arcsin(cx^2)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x,x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^2) + a)/x, x)
```

### 3.345.9 Mupad [B] (verification not implemented)

Time = 0.45 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.83

$$\int \frac{a+b\arcsin(cx^2)}{x}\,dx = a\,\ln(x) - \frac{b\,\mathrm{asin}(c\,x^2)^2\,1\mathrm{i}}{4} - \frac{b\,\mathrm{polylog}\left(2, \mathrm{e}^{\mathrm{asin}(c\,x^2)\,2\mathrm{i}}\right)\,1\mathrm{i}}{4} + \frac{b\,\ln\left(1-\mathrm{e}^{\mathrm{asin}(c\,x^2)\,2\mathrm{i}}\right)\,\mathrm{asin}(c\,x^2)}{2}$$

input
```
int((a + b*asin(c*x^2))/x,x)
```

output
```
a*log(x) - (b*asin(c*x^2)^2*1i)/4 - (b*polylog(2, exp(asin(c*x^2)*2i))*1i)
/4 + (b*log(1 - exp(asin(c*x^2)*2i))*asin(c*x^2))/2
```

# 3.346 $\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx$



## 3.346.1 Optimal result

Integrand size = 14, antiderivative size = 39

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{a+b\arcsin(cx^2)}{2x^2} - \frac{1}{2}bc\,\text{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

output
```
1/2*(-a-b*arcsin(c*x^2))/x^2-1/2*b*c*arctanh((-c^2*x^4+1)^(1/2))
```

## 3.346.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.13

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{a}{2x^2} - \frac{b\arcsin(cx^2)}{2x^2} - \frac{1}{2}bc\,\text{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^3,x]
```

output
```
-1/2*a/x^2 - (b*ArcSin[c*x^2])/(2*x^2) - (b*c*ArcTanh[Sqrt[1 - c^2*x^4]])/
2
```

### 3.346.3 Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.357$, Rules used = {5341, 27, 798, 73, 221}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^3}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{2}b\int \frac{2c}{x\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{2x^2}$$

$$\Big\downarrow \text{27}$$

$$bc\int \frac{1}{x\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{2x^2}$$

$$\Big\downarrow \text{798}$$

$$\frac{1}{4}bc\int \frac{1}{x^4\sqrt{1-c^2x^4}}dx^4-\frac{a+b\arcsin\left(cx^2\right)}{2x^2}$$

$$\Big\downarrow \text{73}$$

$$-\frac{b\int \frac{1}{\frac{1}{c^2}-\frac{x^8}{c^2}}d\sqrt{1-c^2x^4}}{2c}-\frac{a+b\arcsin\left(cx^2\right)}{2x^2}$$

$$\Big\downarrow \text{221}$$

$$-\frac{a+b\arcsin\left(cx^2\right)}{2x^2}-\frac{1}{2}bc\text{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^3,x]
```

output
```
-1/2*(a + b*ArcSin[c*x^2])/x^2 - (b*c*ArcTanh[Sqrt[1 - c^2*x^4]])/2
```

### 3.346.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 798
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[1/n   Subst
[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a,
b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.346.4 Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.97

| method | result | size |
|---|---|---|
| default | $-\frac{a}{2x^2}+b\left(-\frac{\arcsin(c\,x^2)}{2x^2}-\frac{c\,\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{2}\right)$ | 38 |
| parts | $-\frac{a}{2x^2}+b\left(-\frac{\arcsin(c\,x^2)}{2x^2}-\frac{c\,\operatorname{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{2}\right)$ | 38 |

input
```
int((a+b*arcsin(c*x^2))/x^3,x,method=_RETURNVERBOSE)
```

output
```
-1/2*a/x^2+b*(-1/2/x^2*arcsin(c*x^2)-1/2*c*arctanh(1/(-c^2*x^4+1)^(1/2)))
```

## 3.346.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.56

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{bcx^2\log\left(\sqrt{-c^2x^4+1}+1\right)-bcx^2\log\left(\sqrt{-c^2x^4+1}-1\right)+2\,b\arcsin(cx^2)+2\,a}{4\,x^2}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^3,x, algorithm="fricas")
```

output
```
-1/4*(b*c*x^2*log(sqrt(-c^2*x^4 + 1) + 1) - b*c*x^2*log(sqrt(-c^2*x^4 + 1)
 - 1) + 2*b*arcsin(c*x^2) + 2*a)/x^2
```

## 3.346.6 Sympy [A] (verification not implemented)

Time = 1.18 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.38

$$\int \frac{a+b\arcsin(cx^2)}{x^3}\,dx = -\frac{a}{2x^2}+bc\left(\begin{cases} -\frac{\operatorname{acosh}\left(\frac{1}{cx^2}\right)}{2} & \text{for } \frac{1}{|c^2x^4|}>1 \\ \frac{i\operatorname{asin}\left(\frac{1}{cx^2}\right)}{2} & \text{otherwise} \end{cases}\right)-\frac{b\operatorname{asin}(cx^2)}{2x^2}$$

input
```
integrate((a+b*asin(c*x**2))/x**3,x)
```

output
```
-a/(2*x**2) + b*c*Piecewise((-acosh(1/(c*x**2))/2, 1/Abs(c**2*x**4) > 1),
(I*asin(1/(c*x**2))/2, True)) - b*asin(c*x**2)/(2*x**2)
```

### 3.346.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.46

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^3}\,dx$$
$$=-\frac{1}{4}\left(c\left(\log\left(\sqrt{-c^2x^4+1}+1\right)-\log\left(\sqrt{-c^2x^4+1}-1\right)\right)+\frac{2\arcsin\left(cx^2\right)}{x^2}\right)b-\frac{a}{2x^2}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^3,x, algorithm="maxima")
```

output
```
-1/4*(c*(log(sqrt(-c^2*x^4 + 1) + 1) - log(sqrt(-c^2*x^4 + 1) - 1)) + 2*ar
csin(c*x^2)/x^2)*b - 1/2*a/x^2
```

### 3.346.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 354 vs. 2(33) = 66.

Time = 0.32 (sec) , antiderivative size = 354, normalized size of antiderivative = 9.08

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^3}\,dx =$$
$$-\frac{\frac{\sqrt{-c^2x^4+1}bc^3x^2\arcsin\left(cx^2\right)}{\left(\sqrt{-c^2x^4+1}+1\right)^2}+\frac{bc^3x^2\arcsin\left(cx^2\right)}{\left(\sqrt{-c^2x^4+1}+1\right)^2}+\frac{\sqrt{-c^2x^4+1}ac^3x^2}{\left(\sqrt{-c^2x^4+1}+1\right)^2}+\frac{ac^3x^2}{\left(\sqrt{-c^2x^4+1}+1\right)^2}-\frac{2\sqrt{-c^2x^4+1}bc^2\log\left(x^2|c|\right)}{\sqrt{-c^2x^4+1}+1}+\frac{2\sqrt{-c}}{}}{}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^3,x, algorithm="giac")
```

output
```
-1/4*(sqrt(-c^2*x^4 + 1)*b*c^3*x^2*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^
2 + b*c^3*x^2*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^2 + sqrt(-c^2*x^4 + 1
)*a*c^3*x^2/(sqrt(-c^2*x^4 + 1) + 1)^2 + a*c^3*x^2/(sqrt(-c^2*x^4 + 1) + 1
)^2 - 2*sqrt(-c^2*x^4 + 1)*b*c^2*log(x^2*abs(c))/(sqrt(-c^2*x^4 + 1) + 1)
+ 2*sqrt(-c^2*x^4 + 1)*b*c^2*log(sqrt(-c^2*x^4 + 1) + 1)/(sqrt(-c^2*x^4 +
1) + 1) - 2*b*c^2*log(x^2*abs(c))/(sqrt(-c^2*x^4 + 1) + 1) + 2*b*c^2*log(s
qrt(-c^2*x^4 + 1) + 1)/(sqrt(-c^2*x^4 + 1) + 1) + sqrt(-c^2*x^4 + 1)*b*c*a
rcsin(c*x^2)/x^2 + b*c*arcsin(c*x^2)/x^2 + sqrt(-c^2*x^4 + 1)*a*c/x^2 + a*
c/x^2)/c
```

### 3.346.9 Mupad [B] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.92

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^3}\,dx=-\frac{a}{2\,x^2}-\frac{b\,c\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-c^2\,x^4}}\right)}{2}-\frac{b\,\mathrm{asin}\left(c\,x^2\right)}{2\,x^2}$$

input
```
int((a + b*asin(c*x^2))/x^3,x)
```

output
```
- a/(2*x^2) - (b*c*atanh(1/(1 - c^2*x^4)^(1/2)))/2 - (b*asin(c*x^2))/(2*x^
2)
```

# 3.347 $\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx$



## 3.347.1 Optimal result

Integrand size = 14, antiderivative size = 41

$$\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx = -\frac{bc\sqrt{1-c^2x^4}}{4x^2} - \frac{a+b\arcsin(cx^2)}{4x^4}$$

output
```
1/4*(-a-b*arcsin(c*x^2))/x^4-1/4*b*c*(-c^2*x^4+1)^(1/2)/x^2
```

## 3.347.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.12

$$\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx = -\frac{a}{4x^4} - \frac{bc\sqrt{1-c^2x^4}}{4x^2} - \frac{b\arcsin(cx^2)}{4x^4}$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^5,x]
```

output
```
-1/4*a/x^4 - (b*c*Sqrt[1 - c^2*x^4])/(4*x^2) - (b*ArcSin[c*x^2])/(4*x^4)
```

### 3.347.3 Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {5341, 27, 796}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^5}dx$$

$$\Big\downarrow \ 5341$$

$$\frac{1}{4}b\int \frac{2c}{x^3\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{4x^4}$$

$$\Big\downarrow \ 27$$

$$\frac{1}{2}bc\int \frac{1}{x^3\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{4x^4}$$

$$\Big\downarrow \ 796$$

$$-\frac{a+b\arcsin\left(cx^2\right)}{4x^4}-\frac{bc\sqrt{1-c^2x^4}}{4x^2}$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^5,x]
```

output
```
-1/4*(b*c*Sqrt[1 - c^2*x^4])/x^2 - (a + b*ArcSin[c*x^2])/(4*x^4)
```

#### 3.347.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 796
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.347.4 Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 54, normalized size of antiderivative = 1.32

| method | result | size |
|---|---|---|
| default | $-\frac{a}{4x^4}+b\left(-\frac{\arcsin(c\,x^2)}{4x^4}+\frac{c(c\,x^2-1)\,(c\,x^2+1)}{4x^2\sqrt{-c^2x^4+1}}\right)$ | 54 |
| parts | $-\frac{a}{4x^4}+b\left(-\frac{\arcsin(c\,x^2)}{4x^4}+\frac{c(c\,x^2-1)\,(c\,x^2+1)}{4x^2\sqrt{-c^2x^4+1}}\right)$ | 54 |

input
```
int((a+b*arcsin(c*x^2))/x^5,x,method=_RETURNVERBOSE)
```

output
```
-1/4*a/x^4+b*(-1/4/x^4*arcsin(c*x^2)+1/4*c/x^2*(c*x^2-1)*(c*x^2+1)/(-c^2*x
^4+1)^(1/2))
```

## 3.347.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.02

$$\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx = \frac{ax^4-\sqrt{-c^2x^4+1}bcx^2-b\arcsin(cx^2)-a}{4\,x^4}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^5,x, algorithm="fricas")
```

output
```
1/4*(a*x^4 - sqrt(-c^2*x^4 + 1)*b*c*x^2 - b*arcsin(c*x^2) - a)/x^4
```

### 3.347.6 Sympy [A] (verification not implemented)

Time = 0.98 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.71

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^5}\,dx=-\frac{a}{4x^4}+\frac{bc\left(\begin{cases}-\frac{i\sqrt{c^2x^4-1}}{2x^2} & \text{for } \left|c^2x^4\right|>1\\ -\frac{\sqrt{-c^2x^4+1}}{2x^2} & \text{otherwise}\end{cases}\right)}{2}-\frac{b\,\mathrm{asin}\left(cx^2\right)}{4x^4}$$

input
```
integrate((a+b*asin(c*x**2))/x**5,x)
```

output
```
-a/(4*x**4) + b*c*Piecewise((-I*sqrt(c**2*x**4 - 1)/(2*x**2), Abs(c**2*x**
4) > 1), (-sqrt(-c**2*x**4 + 1)/(2*x**2), True))/2 - b*asin(c*x**2)/(4*x**
4)
```

### 3.347.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.93

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^5}\,dx=-\frac{1}{4}\,b\left(\frac{\sqrt{-c^2x^4+1}c}{x^2}+\frac{\arcsin\left(cx^2\right)}{x^4}\right)-\frac{a}{4\,x^4}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^5,x, algorithm="maxima")
```

output
```
-1/4*b*(sqrt(-c^2*x^4 + 1)*c/x^2 + arcsin(c*x^2)/x^4) - 1/4*a/x^4
```

### 3.347.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 176 vs. $2(35) = 70$.

Time = 0.29 (sec) , antiderivative size = 176, normalized size of antiderivative = 4.29

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^5}\,dx=$$
$$-\frac{\frac{bc^5x^4\arcsin\left(cx^2\right)}{\left(\sqrt{-c^2x^4+1}+1\right)^2}+\frac{ac^5x^4}{\left(\sqrt{-c^2x^4+1}+1\right)^2}-\frac{2\,bc^4x^2}{\sqrt{-c^2x^4+1}+1}+2\,bc^3\arcsin\left(cx^2\right)+2\,ac^3+\frac{2\,bc^2\left(\sqrt{-c^2x^4+1}+1\right)}{x^2}+\frac{bc\left(\sqrt{-c^2x^4\right.}{}}{}}{16\,c}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^5,x, algorithm="giac")
```

output
```
-1/16*(b*c^5*x^4*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^2 + a*c^5*x^4/(sqr
t(-c^2*x^4 + 1) + 1)^2 - 2*b*c^4*x^2/(sqrt(-c^2*x^4 + 1) + 1) + 2*b*c^3*ar
csin(c*x^2) + 2*a*c^3 + 2*b*c^2*(sqrt(-c^2*x^4 + 1) + 1)/x^2 + b*c*(sqrt(-
c^2*x^4 + 1) + 1)^2*arcsin(c*x^2)/x^4 + a*c*(sqrt(-c^2*x^4 + 1) + 1)^2/x^4
)/c
```

## 3.347.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx^2)}{x^5}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^5}\,dx$$

input
```
int((a + b*asin(c*x^2))/x^5,x)
```

output
```
int((a + b*asin(c*x^2))/x^5, x)
```

# 3.348 $\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx$



## 3.348.1 Optimal result

Integrand size = 14, antiderivative size = 64

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{bc\sqrt{1-c^2x^4}}{12x^4} - \frac{a+b\arcsin(cx^2)}{6x^6} - \frac{1}{12}bc^3\operatorname{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

output
```
1/6*(-a-b*arcsin(c*x^2))/x^6-1/12*b*c^3*arctanh((-c^2*x^4+1)^(1/2))-1/12*b
*c*(-c^2*x^4+1)^(1/2)/x^4
```

## 3.348.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.08

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{a}{6x^6} - \frac{bc\sqrt{1-c^2x^4}}{12x^4} - \frac{b\arcsin(cx^2)}{6x^6} - \frac{1}{12}bc^3\operatorname{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^7,x]
```

output
```
-1/6*a/x^6 - (b*c*Sqrt[1 - c^2*x^4])/(12*x^4) - (b*ArcSin[c*x^2])/(6*x^6)
- (b*c^3*ArcTanh[Sqrt[1 - c^2*x^4]])/12
```

### 3.348.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {5341, 27, 798, 52, 73, 221}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{6}b\int \frac{2c}{x^5\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin(cx^2)}{6x^6}$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{3}bc\int \frac{1}{x^5\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin(cx^2)}{6x^6}$$

$$\Big\downarrow \text{798}$$

$$\frac{1}{12}bc\int \frac{1}{x^8\sqrt{1-c^2x^4}}dx^4-\frac{a+b\arcsin(cx^2)}{6x^6}$$

$$\Big\downarrow \text{52}$$

$$\frac{1}{12}bc\left(\frac{1}{2}c^2\int \frac{1}{x^4\sqrt{1-c^2x^4}}dx^4-\frac{\sqrt{1-c^2x^4}}{x^4}\right)-\frac{a+b\arcsin(cx^2)}{6x^6}$$

$$\Big\downarrow \text{73}$$

$$\frac{1}{12}bc\left(-\int \frac{1}{\frac{1}{c^2}-\frac{x^8}{c^2}}d\sqrt{1-c^2x^4}-\frac{\sqrt{1-c^2x^4}}{x^4}\right)-\frac{a+b\arcsin(cx^2)}{6x^6}$$

$$\Big\downarrow \text{221}$$

$$\frac{1}{12}bc\left(c^2\left(-\text{arctanh}\left(\sqrt{1-c^2x^4}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x^4}\right)-\frac{a+b\arcsin(cx^2)}{6x^6}$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^7,x]
```

output
```
-1/6*(a + b*ArcSin[c*x^2])/x^6 + (b*c*(-(Sqrt[1 - c^2*x^4]/x^4) - c^2*ArcT
anh[Sqrt[1 - c^2*x^4]]))/12
```

### 3.348.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 52
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Simp[d*((
m + n + 2)/((b*c - a*d)*(m + 1)))   Int[(a + b*x)^(m + 1)*(c + d*x)^n, x],
x] /; FreeQ[{a, b, c, d, n}, x] && ILtQ[m, -1] && FractionQ[n] && LtQ[n, 0]
```

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 798
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[1/n   Subst
[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a,
b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.348. $\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx$

### 3.348.4 Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.95

| method | result | size |
|---|---|---|
| default | $-\frac{a}{6x^6}+b\left(-\frac{\arcsin(c\,x^2)}{6x^6}+\frac{c\left(-\frac{\sqrt{-c^2x^4+1}}{4x^4}-\frac{c^2\,\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{4}\right)}{3}\right)$ | 61 |
| parts | $-\frac{a}{6x^6}+b\left(-\frac{\arcsin(c\,x^2)}{6x^6}+\frac{c\left(-\frac{\sqrt{-c^2x^4+1}}{4x^4}-\frac{c^2\,\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^2x^4+1}}\right)}{4}\right)}{3}\right)$ | 61 |

input
```
int((a+b*arcsin(c*x^2))/x^7,x,method=_RETURNVERBOSE)
```

output
```
-1/6*a/x^6+b*(-1/6/x^6*arcsin(c*x^2)+1/3*c*(-1/4/x^4*(-c^2*x^4+1)^(1/2)-1/
4*c^2*arctanh(1/(-c^2*x^4+1)^(1/2))))
```

### 3.348.5 Fricas [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 84, normalized size of antiderivative = 1.31

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{bc^3x^6\log\left(\sqrt{-c^2x^4+1}+1\right)-bc^3x^6\log\left(\sqrt{-c^2x^4+1}-1\right)+2\sqrt{-c^2x^4+1}bcx^2+4\,b\arcsin(cx^2)+4\,a}{24\,x^6}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^7,x, algorithm="fricas")
```

output
```
-1/24*(b*c^3*x^6*log(sqrt(-c^2*x^4 + 1) + 1) - b*c^3*x^6*log(sqrt(-c^2*x^4
 + 1) - 1) + 2*sqrt(-c^2*x^4 + 1)*b*c*x^2 + 4*b*arcsin(c*x^2) + 4*a)/x^6
```

### 3.348.6 Sympy [A] (verification not implemented)

Time = 2.10 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.97

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{a}{6x^6} + \frac{bc\left(\begin{cases} -\frac{c^2\operatorname{acosh}\left(\frac{1}{cx^2}\right)}{4} + \frac{c}{4x^2\sqrt{-1+\frac{1}{c^2x^4}}} - \frac{1}{4cx^6\sqrt{-1+\frac{1}{c^2x^4}}} & \text{for } \frac{1}{|c^2x^4|} > 1 \\ \frac{ic^2\operatorname{asin}\left(\frac{1}{cx^2}\right)}{4} - \frac{ic\sqrt{1-\frac{1}{c^2x^4}}}{4x^2} & \text{otherwise} \end{cases}\right)}{3} - \frac{b\operatorname{asin}(cx^2)}{6x^6}$$

input
```
integrate((a+b*asin(c*x**2))/x**7,x)
```

output
```
-a/(6*x**6) + b*c*Piecewise((-c**2*acosh(1/(c*x**2))/4 + c/(4*x**2*sqrt(-1
 + 1/(c**2*x**4))) - 1/(4*c*x**6*sqrt(-1 + 1/(c**2*x**4))), 1/Abs(c**2*x**
4) > 1), (I*c**2*asin(1/(c*x**2))/4 - I*c*sqrt(1 - 1/(c**2*x**4))/(4*x**2)
, True))/3 - b*asin(c*x**2)/(6*x**6)
```

### 3.348.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.27

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = -\frac{1}{24}\left(\left(c^2\log\left(\sqrt{-c^2x^4+1}+1\right) - c^2\log\left(\sqrt{-c^2x^4+1}-1\right) + \frac{2\sqrt{-c^2x^4+1}}{x^4}\right)c + \frac{4\arcsin(cx^2)}{x^6}\right)b - \frac{a}{6\,x^6}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^7,x, algorithm="maxima")
```

output
```
-1/24*((c^2*log(sqrt(-c^2*x^4 + 1) + 1) - c^2*log(sqrt(-c^2*x^4 + 1) - 1)
+ 2*sqrt(-c^2*x^4 + 1)/x^4)*c + 4*arcsin(c*x^2)/x^6)*b - 1/6*a/x^6
```

### 3.348.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 301 vs. 2(54) = 108.

Time = 0.48 (sec) , antiderivative size = 301, normalized size of antiderivative = 4.70

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx =$$

$$-\frac{\frac{bc^7x^6\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^3}+\frac{ac^7x^6}{\left(\sqrt{-c^2x^4+1}+1\right)^3}-\frac{bc^6x^4}{\left(\sqrt{-c^2x^4+1}+1\right)^2}+\frac{3bc^5x^2\arcsin(cx^2)}{\sqrt{-c^2x^4+1}+1}+\frac{3ac^5x^2}{\sqrt{-c^2x^4+1}+1}-4bc^4\log(x^2|c|)+4bc}{}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^7,x, algorithm="giac")
```

output
```
-1/48*(b*c^7*x^6*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^3 + a*c^7*x^6/(sqr
t(-c^2*x^4 + 1) + 1)^3 - b*c^6*x^4/(sqrt(-c^2*x^4 + 1) + 1)^2 + 3*b*c^5*x^
2*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1) + 3*a*c^5*x^2/(sqrt(-c^2*x^4 + 1)
 + 1) - 4*b*c^4*log(x^2*abs(c)) + 4*b*c^4*log(sqrt(-c^2*x^4 + 1) + 1) + 3*
b*c^3*(sqrt(-c^2*x^4 + 1) + 1)*arcsin(c*x^2)/x^2 + 3*a*c^3*(sqrt(-c^2*x^4
+ 1) + 1)/x^2 + b*c^2*(sqrt(-c^2*x^4 + 1) + 1)^2/x^4 + b*c*(sqrt(-c^2*x^4
+ 1) + 1)^3*arcsin(c*x^2)/x^6 + a*c*(sqrt(-c^2*x^4 + 1) + 1)^3/x^6)/c
```

### 3.348.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx^2)}{x^7}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^7}\,dx$$

input
```
int((a + b*asin(c*x^2))/x^7,x)
```

output
```
int((a + b*asin(c*x^2))/x^7, x)
```

# 3.349 $\int \frac{a+b\arcsin(cx^2)}{x^9}\,dx$



## 3.349.1 Optimal result

Integrand size = 14, antiderivative size = 66

$$\int \frac{a+b\arcsin(cx^2)}{x^9}\,dx = -\frac{bc\sqrt{1-c^2x^4}}{24x^6}-\frac{bc^3\sqrt{1-c^2x^4}}{12x^2}-\frac{a+b\arcsin(cx^2)}{8x^8}$$

output
```
1/8*(-a-b*arcsin(c*x^2))/x^8-1/24*b*c*(-c^2*x^4+1)^(1/2)/x^6-1/12*b*c^3*(-
c^2*x^4+1)^(1/2)/x^2
```

## 3.349.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.91

$$\int \frac{a+b\arcsin(cx^2)}{x^9}\,dx = -\frac{a}{8x^8}+\frac{1}{2}b\left(-\frac{c\sqrt{1-c^2x^4}(1+2c^2x^4)}{12x^6}-\frac{\arcsin(cx^2)}{4x^8}\right)$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^9,x]
```

output
```
-1/8*a/x^8 + (b*(-1/12*(c*Sqrt[1 - c^2*x^4]*(1 + 2*c^2*x^4))/x^6 - ArcSin[
c*x^2]/(4*x^8)))/2
```

### 3.349.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.06, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {5341, 27, 803, 796}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b \arcsin \left(c x^2\right)}{x^9} \, dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{8} b \int \frac{2 c}{x^7 \sqrt{1-c^2 x^4}}dx-\frac{a+b \arcsin \left(c x^2\right)}{8 x^8}$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{4} b c \int \frac{1}{x^7 \sqrt{1-c^2 x^4}}dx-\frac{a+b \arcsin \left(c x^2\right)}{8 x^8}$$

$$\Big\downarrow \text{803}$$

$$\frac{1}{4} b c \left(\frac{2}{3} c^2 \int \frac{1}{x^3 \sqrt{1-c^2 x^4}}dx-\frac{\sqrt{1-c^2 x^4}}{6 x^6}\right)-\frac{a+b \arcsin \left(c x^2\right)}{8 x^8}$$

$$\Big\downarrow \text{796}$$

$$\frac{1}{4} b c \left(-\frac{\sqrt{1-c^2 x^4}}{6 x^6}-\frac{c^2 \sqrt{1-c^2 x^4}}{3 x^2}\right)-\frac{a+b \arcsin \left(c x^2\right)}{8 x^8}$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^9,x]
```

output
```
(b*c*(-1/6*Sqrt[1 - c^2*x^4]/x^6 - (c^2*Sqrt[1 - c^2*x^4])/(3*x^2)))/4 - (
a + b*ArcSin[c*x^2])/(8*x^8)
```

### 3.349.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 796
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

rule 803
```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Simp[b*((m + n*(p + 1) + 1)/(a*(m + 1
)))   Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && I
LtQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.349.4 Maple [A] (verified)

Time = 0.10 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.97

| method | result | size |
|---|---|---|
| default | $-\frac{a}{8x^8}+b\left(-\frac{\arcsin\left(c\,x^2\right)}{8x^8}+\frac{c\left(c\,x^2-1\right)\left(c\,x^2+1\right)\left(2c^2x^4+1\right)}{24x^6\sqrt{-c^2x^4+1}}\right)$ | 64 |
| parts | $-\frac{a}{8x^8}+b\left(-\frac{\arcsin\left(c\,x^2\right)}{8x^8}+\frac{c\left(c\,x^2-1\right)\left(c\,x^2+1\right)\left(2c^2x^4+1\right)}{24x^6\sqrt{-c^2x^4+1}}\right)$ | 64 |

input
```
int((a+b*arcsin(c*x^2))/x^9,x,method=_RETURNVERBOSE)
```

output
```
-1/8*a/x^8+b*(-1/8/x^8*arcsin(c*x^2)+1/24*c*(c*x^2-1)*(c*x^2+1)*(2*c^2*x^4
+1)/x^6/(-c^2*x^4+1)^(1/2))
```

### 3.349.5 Fricas [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.82

$$\int \frac{a + b\arcsin\left(cx^{2}\right)}{x^{9}}\,dx = \frac{3\,ax^{8} - 3\,b\arcsin\left(cx^{2}\right) - \left(2\,bc^{3}x^{6} + bcx^{2}\right)\sqrt{-c^{2}x^{4} + 1} - 3\,a}{24\,x^{8}}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^9,x, algorithm="fricas")
```

output
```
1/24*(3*a*x^8 - 3*b*arcsin(c*x^2) - (2*b*c^3*x^6 + b*c*x^2)*sqrt(-c^2*x^4
+ 1) - 3*a)/x^8
```

### 3.349.6 Sympy [A] (verification not implemented)

Time = 1.91 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.70

$$\int \frac{a + b\arcsin\left(cx^{2}\right)}{x^{9}}\,dx = -\frac{a}{8x^{8}} + \frac{bc\left(\begin{cases} -\frac{ic^{2}\sqrt{c^{2}x^{4}-1}}{3x^{2}} - \frac{i\sqrt{c^{2}x^{4}-1}}{6x^{6}} & \text{for}\ \left|c^{2}x^{4}\right| > 1 \\ -\frac{c^{2}\sqrt{-c^{2}x^{4}+1}}{3x^{2}} - \frac{\sqrt{-c^{2}x^{4}+1}}{6x^{6}} & \text{otherwise} \end{cases}\right)}{4} - \frac{b\,\mathrm{asin}\left(cx^{2}\right)}{8x^{8}}$$

input
```
integrate((a+b*asin(c*x**2))/x**9,x)
```

output
```
-a/(8*x**8) + b*c*Piecewise((-I*c**2*sqrt(c**2*x**4 - 1)/(3*x**2) - I*sqrt
(c**2*x**4 - 1)/(6*x**6), Abs(c**2*x**4) > 1), (-c**2*sqrt(-c**2*x**4 + 1)
/(3*x**2) - sqrt(-c**2*x**4 + 1)/(6*x**6), True))/4 - b*asin(c*x**2)/(8*x*
*8)
```

### 3.349.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.92

$$\int \frac{a + b\arcsin\left(cx^{2}\right)}{x^{9}}\,dx = -\frac{1}{24}\left(c\left(\frac{3\sqrt{-c^{2}x^{4} + 1}c^{2}}{x^{2}} + \frac{\left(-c^{2}x^{4} + 1\right)^{\frac{3}{2}}}{x^{6}}\right) + \frac{3\,\arcsin\left(cx^{2}\right)}{x^{8}}\right)b - \frac{a}{8\,x^{8}}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^9,x, algorithm="maxima")
```

output
```
-1/24*(c*(3*sqrt(-c^2*x^4 + 1)*c^2/x^2 + (-c^2*x^4 + 1)^(3/2)/x^6) + 3*arc
sin(c*x^2)/x^8)*b - 1/8*a/x^8
```

### 3.349.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 342 vs. $2(56) = 112$.

Time = 0.29 (sec) , antiderivative size = 342, normalized size of antiderivative = 5.18

$$\int \frac{a + b\arcsin(cx^2)}{x^9} dx =$$

$$-\frac{\frac{3 bc^9x^8 \arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^4} + \frac{3 ac^9x^8}{\left(\sqrt{-c^2x^4+1}+1\right)^4} - \frac{2 bc^8x^6}{\left(\sqrt{-c^2x^4+1}+1\right)^3} + \frac{12 bc^7x^4 \arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^2} + \frac{12 ac^7x^4}{\left(\sqrt{-c^2x^4+1}+1\right)^2} - \frac{18 bc^6x^2}{\sqrt{-c^2x^4+1}+1} + 18}{}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^9,x, algorithm="giac")
```

output
```
-1/384*(3*b*c^9*x^8*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^4 + 3*a*c^9*x^8
/(sqrt(-c^2*x^4 + 1) + 1)^4 - 2*b*c^8*x^6/(sqrt(-c^2*x^4 + 1) + 1)^3 + 12*
b*c^7*x^4*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^2 + 12*a*c^7*x^4/(sqrt(-c
^2*x^4 + 1) + 1)^2 - 18*b*c^6*x^2/(sqrt(-c^2*x^4 + 1) + 1) + 18*b*c^5*arcs
in(c*x^2) + 18*a*c^5 + 18*b*c^4*(sqrt(-c^2*x^4 + 1) + 1)/x^2 + 12*b*c^3*(s
qrt(-c^2*x^4 + 1) + 1)^2*arcsin(c*x^2)/x^4 + 12*a*c^3*(sqrt(-c^2*x^4 + 1)
+ 1)^2/x^4 + 2*b*c^2*(sqrt(-c^2*x^4 + 1) + 1)^3/x^6 + 3*b*c*(sqrt(-c^2*x^4
 + 1) + 1)^4*arcsin(c*x^2)/x^8 + 3*a*c*(sqrt(-c^2*x^4 + 1) + 1)^4/x^8)/c
```

### 3.349.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin(cx^2)}{x^9} dx = \int \frac{a + b\,\mathrm{asin}(c\,x^2)}{x^9} dx$$

input
```
int((a + b*asin(c*x^2))/x^9,x)
```

output
```
int((a + b*asin(c*x^2))/x^9, x)
```

# 3.350 $\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx$



## 3.350.1 Optimal result

Integrand size = 14, antiderivative size = 89

$$\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{bc\sqrt{1-c^2x^4}}{40x^8}-\frac{3bc^3\sqrt{1-c^2x^4}}{80x^4}-\frac{a+b\arcsin(cx^2)}{10x^{10}}-\frac{3}{80}bc^5\operatorname{arctanh}\left(\sqrt{1-c^2x^4}\right)$$

output
```
1/10*(-a-b*arcsin(c*x^2))/x^10-3/80*b*c^5*arctanh((-c^2*x^4+1)^(1/2))-1/40
*b*c*(-c^2*x^4+1)^(1/2)/x^8-3/80*b*c^3*(-c^2*x^4+1)^(1/2)/x^4
```

## 3.350.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 3 in optimal.

Time = 0.02 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.71

$$\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{a}{10x^{10}}-\frac{b\arcsin(cx^2)}{10x^{10}}-\frac{1}{10}bc^5\sqrt{1-c^2x^4}\,\text{Hypergeometric2F1}\left(\frac{1}{2},3,\frac{3}{2},1-c^2x^4\right)$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^11,x]
```

output
```
-1/10*a/x^10 - (b*ArcSin[c*x^2])/(10*x^10) - (b*c^5*Sqrt[1 - c^2*x^4]*Hype
rgeometric2F1[1/2, 3, 3/2, 1 - c^2*x^4])/10
```

### 3.350.3 Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.04, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5341, 27, 798, 52, 52, 73, 221}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^{11}}dx$$

$$\Big\downarrow \text{ 5341}$$

$$\frac{1}{10}b\int \frac{2c}{x^9\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{1}{5}bc\int \frac{1}{x^9\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}$$

$$\Big\downarrow \text{ 798}$$

$$\frac{1}{20}bc\int \frac{1}{x^{12}\sqrt{1-c^2x^4}}dx^4-\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}$$

$$\Big\downarrow \text{ 52}$$

$$\frac{1}{20}bc\left(\frac{3}{4}c^2\int \frac{1}{x^8\sqrt{1-c^2x^4}}dx^4-\frac{\sqrt{1-c^2x^4}}{2x^8}\right)-\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}$$

$$\Big\downarrow \text{ 52}$$

$$\frac{1}{20}bc\left(\frac{3}{4}c^2\left(\frac{1}{2}c^2\int \frac{1}{x^4\sqrt{1-c^2x^4}}dx^4-\frac{\sqrt{1-c^2x^4}}{x^4}\right)-\frac{\sqrt{1-c^2x^4}}{2x^8}\right)-\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}$$

$$\Big\downarrow \text{ 73}$$

$$\frac{1}{20}bc\left(\frac{3}{4}c^2\left(-\int \frac{1}{\frac{1}{c^2}-\frac{x^8}{c^2}}d\sqrt{1-c^2x^4}-\frac{\sqrt{1-c^2x^4}}{x^4}\right)-\frac{\sqrt{1-c^2x^4}}{2x^8}\right)-\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}$$

$$\Big\downarrow \text{ 221}$$

$$\frac{1}{20}bc\left(\frac{3}{4}c^2\left(c^2\left(-\text{arctanh}\left(\sqrt{1-c^2x^4}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x^4}\right)-\frac{\sqrt{1-c^2x^4}}{2x^8}\right)-\frac{a+b\arcsin\left(cx^2\right)}{10x^{10}}$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^11,x]
```

3.350. $\int \frac{a+b\arcsin\left(cx^2\right)}{x^{11}}dx$

output
```
-1/10*(a + b*ArcSin[c*x^2])/x^10 + (b*c*(-1/2*Sqrt[1 - c^2*x^4]/x^8 + (3*c
^2*(-(Sqrt[1 - c^2*x^4]/x^4) - c^2*ArcTanh[Sqrt[1 - c^2*x^4]]))/4))/20
```

### 3.350.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 52
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Simp[d*((
m + n + 2)/((b*c - a*d)*(m + 1)))   Int[(a + b*x)^(m + 1)*(c + d*x)^n, x],
x] /; FreeQ[{a, b, c, d, n}, x] && ILtQ[m, -1] && FractionQ[n] && LtQ[n, 0]
```

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 798
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[1/n   Subst
[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a,
b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u]))/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

3.350. $\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx$

### 3.350.4 Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.94

| method | result | size |
|---|---|---|
| default | $-\frac{a}{10x^{10}}+b\left(-\frac{\arcsin(c\,x^{2})}{10x^{10}}+\frac{c\left(-\frac{\sqrt{-c^{2}x^{4}+1}}{8x^{8}}+\frac{3c^{2}\left(-\frac{\sqrt{-c^{2}x^{4}+1}}{2x^{4}}-\frac{c^{2}\,\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^{2}x^{4}+1}}\right)}{2}\right)}{8}\right)}{5}\right)$ | 84 |
| parts | $-\frac{a}{10x^{10}}+b\left(-\frac{\arcsin(c\,x^{2})}{10x^{10}}+\frac{c\left(-\frac{\sqrt{-c^{2}x^{4}+1}}{8x^{8}}+\frac{3c^{2}\left(-\frac{\sqrt{-c^{2}x^{4}+1}}{2x^{4}}-\frac{c^{2}\,\mathrm{arctanh}\left(\frac{1}{\sqrt{-c^{2}x^{4}+1}}\right)}{2}\right)}{8}\right)}{5}\right)$ | 84 |

input
```
int((a+b*arcsin(c*x^2))/x^11,x,method=_RETURNVERBOSE)
```

output
```
-1/10*a/x^10+b*(-1/10/x^10*arcsin(c*x^2)+1/5*c*(-1/8/x^8*(-c^2*x^4+1)^(1/2
)+3/8*c^2*(-1/2/x^4*(-c^2*x^4+1)^(1/2)-1/2*c^2*arctanh(1/(-c^2*x^4+1)^(1/2
)))))
```

### 3.350.5 Fricas [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.09

$$\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx =$$
$$-\frac{3\,bc^5x^{10}\log\left(\sqrt{-c^2x^4+1}+1\right)-3\,bc^5x^{10}\log\left(\sqrt{-c^2x^4+1}-1\right)+16\,b\arcsin(cx^2)+2\,(3\,bc^3x^6+2\,bcx^2}{160\,x^{10}}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^11,x, algorithm="fricas")
```

output
```
-1/160*(3*b*c^5*x^10*log(sqrt(-c^2*x^4 + 1) + 1) - 3*b*c^5*x^10*log(sqrt(-
c^2*x^4 + 1) - 1) + 16*b*arcsin(c*x^2) + 2*(3*b*c^3*x^6 + 2*b*c*x^2)*sqrt(
-c^2*x^4 + 1) + 16*a)/x^10
```

## 3.350.6 Sympy [A] (verification not implemented)

Time = 5.12 (sec) , antiderivative size = 201, normalized size of antiderivative = 2.26

$$\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{a}{10x^{10}} + \frac{bc\left(\begin{cases} -\frac{3c^4\operatorname{acosh}\left(\frac{1}{cx^2}\right)}{16} + \frac{3c^3}{16x^2\sqrt{-1+\frac{1}{c^2x^4}}} - \frac{c}{16x^6\sqrt{-1+\frac{1}{c^2x^4}}} - \frac{1}{8cx^{10}\sqrt{-1+\frac{1}{c^2x^4}}} & \text{for } \frac{1}{|c^2x^4|} > 1 \\ \frac{3ic^4\operatorname{asin}\left(\frac{1}{cx^2}\right)}{16} - \frac{3ic^3}{16x^2\sqrt{1-\frac{1}{c^2x^4}}} + \frac{ic}{16x^6\sqrt{1-\frac{1}{c^2x^4}}} + \frac{i}{8cx^{10}\sqrt{1-\frac{1}{c^2x^4}}} & \text{otherwise} \end{cases}\right)}{5} - \frac{b\operatorname{asin}(cx^2)}{10x^{10}}$$

input
```
integrate((a+b*asin(c*x**2))/x**11,x)
```

output
```
-a/(10*x**10) + b*c*Piecewise((-3*c**4*acosh(1/(c*x**2))/16 + 3*c**3/(16*x
**2*sqrt(-1 + 1/(c**2*x**4))) - c/(16*x**6*sqrt(-1 + 1/(c**2*x**4))) - 1/(
8*c*x**10*sqrt(-1 + 1/(c**2*x**4))), 1/Abs(c**2*x**4) > 1), (3*I*c**4*asin
(1/(c*x**2))/16 - 3*I*c**3/(16*x**2*sqrt(1 - 1/(c**2*x**4))) + I*c/(16*x**
6*sqrt(1 - 1/(c**2*x**4))) + I/(8*c*x**10*sqrt(1 - 1/(c**2*x**4))), True))
/5 - b*asin(c*x**2)/(10*x**10)
```

## 3.350.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.40

$$\int \frac{a+b\arcsin(cx^2)}{x^{11}}\,dx = -\frac{1}{160}\left(\left(3\,c^4\log\left(\sqrt{-c^2x^4+1}+1\right) - 3\,c^4\log\left(\sqrt{-c^2x^4+1}-1\right) - \frac{2\left(3\left(-c^2x^4+1\right)^{\frac{3}{2}}c^4 - 5\sqrt{-c^2x^4+\right.}{2\,c^2x^4+\left(c^2x^4-1\right)^2-1}\right.\right. - \frac{a}{10\,x^{10}}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^11,x, algorithm="maxima")
```

output
```
-1/160*((3*c^4*log(sqrt(-c^2*x^4 + 1) + 1) - 3*c^4*log(sqrt(-c^2*x^4 + 1)
- 1) - 2*(3*(-c^2*x^4 + 1)^(3/2)*c^4 - 5*sqrt(-c^2*x^4 + 1)*c^4)/(2*c^2*x^
4 + (c^2*x^4 - 1)^2 - 1))*c + 16*arcsin(c*x^2)/x^10)*b - 1/10*a/x^10
```

### 3.350.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 467 vs. $2(75) = 150$.

Time = 1.00 (sec) , antiderivative size = 467, normalized size of antiderivative = 5.25

$$\int \frac{a + b \arcsin(cx^2)}{x^{11}}\, dx =$$

$$-\frac{\frac{2\,bc^{11}x^{10}\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^5} + \frac{2\,ac^{11}x^{10}}{\left(\sqrt{-c^2x^4+1}+1\right)^5} - \frac{bc^{10}x^8}{\left(\sqrt{-c^2x^4+1}+1\right)^4} + \frac{10\,bc^9x^6\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^3} + \frac{10\,ac^9x^6}{\left(\sqrt{-c^2x^4+1}+1\right)^3} - \frac{8\,bc^8x^4}{\left(\sqrt{-c^2x^4+1}+1\right)^2} - \cdots}{\cdots}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^11,x, algorithm="giac")
```

output
```
-1/640*(2*b*c^11*x^10*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^5 + 2*a*c^11*
x^10/(sqrt(-c^2*x^4 + 1) + 1)^5 - b*c^10*x^8/(sqrt(-c^2*x^4 + 1) + 1)^4 +
10*b*c^9*x^6*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^3 + 10*a*c^9*x^6/(sqrt
(-c^2*x^4 + 1) + 1)^3 - 8*b*c^8*x^4/(sqrt(-c^2*x^4 + 1) + 1)^2 + 20*b*c^7*
x^2*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1) + 20*a*c^7*x^2/(sqrt(-c^2*x^4 +
 1) + 1) - 24*b*c^6*log(x^2*abs(c)) + 24*b*c^6*log(sqrt(-c^2*x^4 + 1) + 1)
 + 20*b*c^5*(sqrt(-c^2*x^4 + 1) + 1)*arcsin(c*x^2)/x^2 + 20*a*c^5*(sqrt(-c
^2*x^4 + 1) + 1)/x^2 + 8*b*c^4*(sqrt(-c^2*x^4 + 1) + 1)^2/x^4 + 10*b*c^3*(
sqrt(-c^2*x^4 + 1) + 1)^3*arcsin(c*x^2)/x^6 + 10*a*c^3*(sqrt(-c^2*x^4 + 1)
 + 1)^3/x^6 + b*c^2*(sqrt(-c^2*x^4 + 1) + 1)^4/x^8 + 2*b*c*(sqrt(-c^2*x^4
+ 1) + 1)^5*arcsin(c*x^2)/x^10 + 2*a*c*(sqrt(-c^2*x^4 + 1) + 1)^5/x^10)/c
```

### 3.350.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^{11}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^{11}}\,dx$$

input
```
int((a + b*asin(c*x^2))/x^11,x)
```

output
```
int((a + b*asin(c*x^2))/x^11, x)
```

# 3.351 $\int \frac{a+b\arcsin(cx^2)}{x^{13}}\,dx$



## 3.351.1 Optimal result

Integrand size = 14, antiderivative size = 91

$$\int \frac{a+b\arcsin(cx^2)}{x^{13}}\,dx=-\frac{bc\sqrt{1-c^2x^4}}{60x^{10}}-\frac{bc^3\sqrt{1-c^2x^4}}{45x^6}-\frac{2bc^5\sqrt{1-c^2x^4}}{45x^2}-\frac{a+b\arcsin(cx^2)}{12x^{12}}$$

output
```
1/12*(-a-b*arcsin(c*x^2))/x^12-1/60*b*c*(-c^2*x^4+1)^(1/2)/x^10-1/45*b*c^3
*(-c^2*x^4+1)^(1/2)/x^6-2/45*b*c^5*(-c^2*x^4+1)^(1/2)/x^2
```

## 3.351.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.75

$$\int \frac{a+b\arcsin(cx^2)}{x^{13}}\,dx=-\frac{a}{12x^{12}}+\frac{1}{2}b\left(-\frac{c\sqrt{1-c^2x^4}(3+4c^2x^4+8c^4x^8)}{90x^{10}}-\frac{\arcsin(cx^2)}{6x^{12}}\right)$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^13,x]
```

output
```
-1/12*a/x^12 + (b*(-1/90*(c*Sqrt[1 - c^2*x^4]*(3 + 4*c^2*x^4 + 8*c^4*x^8))
/x^10 - ArcSin[c*x^2]/(6*x^12)))/2
```

### 3.351.3 Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.09, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {5341, 27, 803, 803, 796}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^{13}}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{12}b\int \frac{2c}{x^{11}\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{6}bc\int \frac{1}{x^{11}\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}$$

$$\Big\downarrow \text{803}$$

$$\frac{1}{6}bc\left(\frac{4}{5}c^2\int \frac{1}{x^7\sqrt{1-c^2x^4}}dx-\frac{\sqrt{1-c^2x^4}}{10x^{10}}\right)-\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}$$

$$\Big\downarrow \text{803}$$

$$\frac{1}{6}bc\left(\frac{4}{5}c^2\left(\frac{2}{3}c^2\int \frac{1}{x^3\sqrt{1-c^2x^4}}dx-\frac{\sqrt{1-c^2x^4}}{6x^6}\right)-\frac{\sqrt{1-c^2x^4}}{10x^{10}}\right)-\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}$$

$$\Big\downarrow \text{796}$$

$$\frac{1}{6}bc\left(\frac{4}{5}c^2\left(-\frac{\sqrt{1-c^2x^4}}{6x^6}-\frac{c^2\sqrt{1-c^2x^4}}{3x^2}\right)-\frac{\sqrt{1-c^2x^4}}{10x^{10}}\right)-\frac{a+b\arcsin\left(cx^2\right)}{12x^{12}}$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^13,x]
```

output
```
(b*c*(-1/10*Sqrt[1 - c^2*x^4]/x^10 + (4*c^2*(-1/6*Sqrt[1 - c^2*x^4]/x^6 -
(c^2*Sqrt[1 - c^2*x^4])/(3*x^2)))/5))/6 - (a + b*ArcSin[c*x^2])/(12*x^12)
```

### 3.351.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 796
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*
x)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

rule 803
```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Simp[b*((m + n*(p + 1) + 1)/(a*(m + 1
)))   Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && I
LtQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.351.4 Maple [A] (verified)

Time = 0.11 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.79

| method | result | size |
|---|---|---|
| default | $-\frac{a}{12x^{12}}+b\left(-\frac{\arcsin\left(c\,x^{2}\right)}{12x^{12}}+\frac{c\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(8c^{4}x^{8}+4c^{2}x^{4}+3\right)}{180x^{10}\sqrt{-c^{2}x^{4}+1}}\right)$ | 72 |
| parts | $-\frac{a}{12x^{12}}+b\left(-\frac{\arcsin\left(c\,x^{2}\right)}{12x^{12}}+\frac{c\left(c\,x^{2}-1\right)\left(c\,x^{2}+1\right)\left(8c^{4}x^{8}+4c^{2}x^{4}+3\right)}{180x^{10}\sqrt{-c^{2}x^{4}+1}}\right)$ | 72 |

input
```
int((a+b*arcsin(c*x^2))/x^13,x,method=_RETURNVERBOSE)
```

output
```
-1/12*a/x^12+b*(-1/12/x^12*arcsin(c*x^2)+1/180*c*(c*x^2-1)*(c*x^2+1)*(8*c^
4*x^8+4*c^2*x^4+3)/x^10/(-c^2*x^4+1)^(1/2))
```

### 3.351.5 Fricas [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.70

$$\int \frac{a + b \arcsin(cx^2)}{x^{13}} dx = \frac{15 ax^{12} - 15 b \arcsin(cx^2) - (8 bc^5 x^{10} + 4 bc^3 x^6 + 3 bcx^2)\sqrt{-c^2 x^4 + 1} - 15 a}{180 x^{12}}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^13,x, algorithm="fricas")
```

output
```
1/180*(15*a*x^12 - 15*b*arcsin(c*x^2) - (8*b*c^5*x^10 + 4*b*c^3*x^6 + 3*b*
c*x^2)*sqrt(-c^2*x^4 + 1) - 15*a)/x^12
```

### 3.351.6 Sympy [A] (verification not implemented)

Time = 5.26 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.87

$$\int \frac{a + b \arcsin(cx^2)}{x^{13}} dx = -\frac{a}{12x^{12}} + \frac{bc \left( \begin{cases} -\frac{4c^5\sqrt{-1+\frac{1}{c^2x^4}}}{15} - \frac{2c^3\sqrt{-1+\frac{1}{c^2x^4}}}{15x^4} - \frac{c\sqrt{-1+\frac{1}{c^2x^4}}}{10x^8} & \text{for } \frac{1}{|c^2x^4|} > 1 \\ -\frac{4ic^5\sqrt{1-\frac{1}{c^2x^4}}}{15} - \frac{2ic^3\sqrt{1-\frac{1}{c^2x^4}}}{15x^4} - \frac{ic\sqrt{1-\frac{1}{c^2x^4}}}{10x^8} & \text{otherwise} \end{cases} \right)}{6} - \frac{b \operatorname{asin}(cx^2)}{12x^{12}}$$

input
```
integrate((a+b*asin(c*x**2))/x**13,x)
```

output
```
-a/(12*x**12) + b*c*Piecewise((-4*c**5*sqrt(-1 + 1/(c**2*x**4))/15 - 2*c**
3*sqrt(-1 + 1/(c**2*x**4))/(15*x**4) - c*sqrt(-1 + 1/(c**2*x**4))/(10*x**8
), 1/Abs(c**2*x**4) > 1), (-4*I*c**5*sqrt(1 - 1/(c**2*x**4))/15 - 2*I*c**3
*sqrt(1 - 1/(c**2*x**4))/(15*x**4) - I*c*sqrt(1 - 1/(c**2*x**4))/(10*x**8)
, True))/6 - b*asin(c*x**2)/(12*x**12)
```

### 3.351.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.90

$$\int \frac{a+b\arcsin(cx^2)}{x^{13}}\,dx = -\frac{1}{180}\left(\left(\frac{15\sqrt{-c^2x^4+1}c^4}{x^2}+\frac{10(-c^2x^4+1)^{\frac{3}{2}}c^2}{x^6}+\frac{3(-c^2x^4+1)^{\frac{5}{2}}}{x^{10}}\right)c+\frac{15\arcsin(cx^2)}{x^{12}}\right)b - \frac{a}{12x^{12}}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^13,x, algorithm="maxima")
```

output
```
-1/180*((15*sqrt(-c^2*x^4 + 1)*c^4/x^2 + 10*(-c^2*x^4 + 1)^(3/2)*c^2/x^6 +
 3*(-c^2*x^4 + 1)^(5/2)/x^10)*c + 15*arcsin(c*x^2)/x^12)*b - 1/12*a/x^12
```

### 3.351.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 504 vs. 2(77) = 154.

Time = 0.31 (sec) , antiderivative size = 504, normalized size of antiderivative = 5.54

$$\int \frac{a+b\arcsin(cx^2)}{x^{13}}\,dx = -\frac{\frac{15bc^{13}x^{12}\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^6}+\frac{15ac^{13}x^{12}}{\left(\sqrt{-c^2x^4+1}+1\right)^6}-\frac{6bc^{12}x^{10}}{\left(\sqrt{-c^2x^4+1}+1\right)^5}+\frac{90bc^{11}x^8\arcsin(cx^2)}{\left(\sqrt{-c^2x^4+1}+1\right)^4}+\frac{90ac^{11}x^8}{\left(\sqrt{-c^2x^4+1}+1\right)^4}-\frac{50bc^{10}x^6}{\left(\sqrt{-c^2x^4+1}+1\right)^3}}{}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^13,x, algorithm="giac")
```

output
```
-1/11520*(15*b*c^13*x^12*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^6 + 15*a*c
^13*x^12/(sqrt(-c^2*x^4 + 1) + 1)^6 - 6*b*c^12*x^10/(sqrt(-c^2*x^4 + 1) +
1)^5 + 90*b*c^11*x^8*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^4 + 90*a*c^11*
x^8/(sqrt(-c^2*x^4 + 1) + 1)^4 - 50*b*c^10*x^6/(sqrt(-c^2*x^4 + 1) + 1)^3
+ 225*b*c^9*x^4*arcsin(c*x^2)/(sqrt(-c^2*x^4 + 1) + 1)^2 + 225*a*c^9*x^4/(
sqrt(-c^2*x^4 + 1) + 1)^2 - 300*b*c^8*x^2/(sqrt(-c^2*x^4 + 1) + 1) + 300*b
*c^7*arcsin(c*x^2) + 300*a*c^7 + 300*b*c^6*(sqrt(-c^2*x^4 + 1) + 1)/x^2 +
225*b*c^5*(sqrt(-c^2*x^4 + 1) + 1)^2*arcsin(c*x^2)/x^4 + 225*a*c^5*(sqrt(-
c^2*x^4 + 1) + 1)^2/x^4 + 50*b*c^4*(sqrt(-c^2*x^4 + 1) + 1)^3/x^6 + 90*b*c
^3*(sqrt(-c^2*x^4 + 1) + 1)^4*arcsin(c*x^2)/x^8 + 90*a*c^3*(sqrt(-c^2*x^4
+ 1) + 1)^4/x^8 + 6*b*c^2*(sqrt(-c^2*x^4 + 1) + 1)^5/x^10 + 15*b*c*(sqrt(-
c^2*x^4 + 1) + 1)^6*arcsin(c*x^2)/x^12 + 15*a*c*(sqrt(-c^2*x^4 + 1) + 1)^6
/x^12)/c
```

### 3.351.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx^2)}{x^{13}}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^{13}}\,dx$$

input
```
int((a + b*asin(c*x^2))/x^13,x)
```

output
```
int((a + b*asin(c*x^2))/x^13, x)
```

# 3.352 $\int x^6(a+b\arcsin(cx^2))\,dx$



## 3.352.1 Optimal result

Integrand size = 14, antiderivative size = 86

$$\int x^6\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{10bx\sqrt{1-c^2x^4}}{147c^3}+\frac{2bx^5\sqrt{1-c^2x^4}}{49c}+\frac{1}{7}x^7\left(a+b\arcsin\left(cx^2\right)\right)-\frac{10b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{147c^{7/2}}$$

output
```
1/7*x^7*(a+b*arcsin(c*x^2))-10/147*b*EllipticF(x*c^(1/2),I)/c^(7/2)+10/147
*b*x*(-c^2*x^4+1)^(1/2)/c^3+2/49*b*x^5*(-c^2*x^4+1)^(1/2)/c
```

## 3.352.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 82, normalized size of antiderivative = 0.95

$$\int x^6\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{1}{147}\left(21ax^7+\frac{2bx\sqrt{1-c^2x^4}(5+3c^2x^4)}{c^3}+21bx^7\arcsin\left(cx^2\right)-\frac{10ib\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c}x\right),-1\right)}{(-c)^{7/2}}\right)$$

input
```
Integrate[x^6*(a + b*ArcSin[c*x^2]),x]
```

output
```
(21*a*x^7 + (2*b*x*Sqrt[1 - c^2*x^4]*(5 + 3*c^2*x^4))/c^3 + 21*b*x^7*ArcSi
n[c*x^2] - ((10*I)*b*EllipticF[I*ArcSinh[Sqrt[-c]*x], -1])/(-c)^(7/2))/147
```

### 3.352.3 Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 98, normalized size of antiderivative = 1.14, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {5341, 27, 843, 843, 762}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^6 \left(a+b \arcsin \left(c x^2\right)\right) \, dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{7} x^7 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{7} b \int \frac{2 c x^8}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{7} x^7 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{7} b c \int \frac{x^8}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \text{843}$$

$$\frac{1}{7} x^7 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{7} b c \left(\frac{5 \int \frac{x^4}{\sqrt{1-c^2 x^4}}dx}{7 c^2}-\frac{x^5 \sqrt{1-c^2 x^4}}{7 c^2}\right)$$

$$\Big\downarrow \text{843}$$

$$\frac{1}{7} x^7 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{7} b c \left(\frac{5 \left(\frac{\int \frac{1}{\sqrt{1-c^2 x^4}}dx}{3 c^2}-\frac{x \sqrt{1-c^2 x^4}}{3 c^2}\right)}{7 c^2}-\frac{x^5 \sqrt{1-c^2 x^4}}{7 c^2}\right)$$

$$\Big\downarrow \text{762}$$

$$\frac{1}{7} x^7 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{7} b c \left(\frac{5 \left(\frac{\text{EllipticF}\left(\arcsin \left(\sqrt{c} x\right),-1\right)}{3 c^{5/2}}-\frac{x \sqrt{1-c^2 x^4}}{3 c^2}\right)}{7 c^2}-\frac{x^5 \sqrt{1-c^2 x^4}}{7 c^2}\right)$$

input

```
Int[x^6*(a + b*ArcSin[c*x^2]),x]
```

output

```
(x^7*(a + b*ArcSin[c*x^2]))/7 - (2*b*c*(-1/7*(x^5*Sqrt[1 - c^2*x^4])/c^2 +
 (5*(-1/3*(x*Sqrt[1 - c^2*x^4])/c^2 + EllipticF[ArcSin[Sqrt[c]*x], -1]/(3*
c^(5/2))))/(7*c^2)))/7
```

#### 3.352.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 843
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Simp[
a*c^n*((m - n + 1)/(b*(m + n*p + 1)))   Int[(c*x)^(m - n)*(a + b*x^n)^p, x]
, x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*
p + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.352.4 Maple [A] (verified)

Time = 0.94 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.26

| method | result | size |
|---|---|---|
| default | $\frac{x^7 a}{7}+b\left(\frac{x^7 \arcsin\left(c\,x^2\right)}{7}-\frac{2c\left(-\frac{x^5\sqrt{-c^2x^4+1}}{7c^2}-\frac{5x\sqrt{-c^2x^4+1}}{21c^4}+\frac{5\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\ \operatorname{EllipticF}\left(x\sqrt{c}, i\right)}{21c^{\frac{9}{2}}\sqrt{-c^2x^4+1}}\right)}{7}\right)$ | 108 |
| parts | $\frac{x^7 a}{7}+b\left(\frac{x^7 \arcsin\left(c\,x^2\right)}{7}-\frac{2c\left(-\frac{x^5\sqrt{-c^2x^4+1}}{7c^2}-\frac{5x\sqrt{-c^2x^4+1}}{21c^4}+\frac{5\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\ \operatorname{EllipticF}\left(x\sqrt{c}, i\right)}{21c^{\frac{9}{2}}\sqrt{-c^2x^4+1}}\right)}{7}\right)$ | 108 |

input
```
int(x^6*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

output
```
1/7*x^7*a+b*(1/7*x^7*arcsin(c*x^2)-2/7*c*(-1/7/c^2*x^5*(-c^2*x^4+1)^(1/2)-
5/21/c^4*x*(-c^2*x^4+1)^(1/2)+5/21/c^(9/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2
)/(-c^2*x^4+1)^(1/2)*EllipticF(x*c^(1/2),I)))
```

### 3.352.5 Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.67

$$\int x^6\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \frac{21\,bc^3x^7\arcsin\left(cx^2\right)+21\,ac^3x^7+2\,(3\,bc^2x^5+5\,bx)\sqrt{-c^2x^4+1}}{147\,c^3}$$

input
```
integrate(x^6*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

output
```
1/147*(21*b*c^3*x^7*arcsin(c*x^2) + 21*a*c^3*x^7 + 2*(3*b*c^2*x^5 + 5*b*x)
*sqrt(-c^2*x^4 + 1))/c^3
```

### 3.352.6 Sympy [A] (verification not implemented)

Time = 1.36 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.67

$$\int x^6\left(a+b\arcsin\left(cx^2\right)\right)\,dx = \frac{ax^7}{7} - \frac{bcx^9\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\middle|\,c^2x^4e^{2i\pi}\right)}{14\Gamma\left(\frac{13}{4}\right)} + \frac{bx^7\operatorname{asin}\left(cx^2\right)}{7}$$

input
```
integrate(x**6*(a+b*asin(c*x**2)),x)
```

output
```
a*x**7/7 - b*c*x**9*gamma(9/4)*hyper((1/2, 9/4), (13/4,), c**2*x**4*exp_po
lar(2*I*pi))/(14*gamma(13/4)) + b*x**7*asin(c*x**2)/7
```

### 3.352.7 Maxima [F]

$$\int x^6(a+b\arcsin(cx^2))\,dx=\int(b\arcsin(cx^2)+a)x^6\,dx$$

input
```
integrate(x^6*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

output
```
1/7*a*x^7 + 1/7*(x^7*arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)) + 14
*c*integrate(1/7*x^8*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8
 - c^2*x^4 + (c^2*x^4 - 1)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))), x))*b
```

### 3.352.8 Giac [F]

$$\int x^6(a+b\arcsin(cx^2))\,dx=\int(b\arcsin(cx^2)+a)x^6\,dx$$

input
```
integrate(x^6*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^2) + a)*x^6, x)
```

### 3.352.9 Mupad [F(-1)]

Timed out.

$$\int x^6(a+b\arcsin(cx^2))\,dx=\int x^6\,(a+b\,\mathrm{asin}(c\,x^2))\,dx$$

input
```
int(x^6*(a + b*asin(c*x^2)),x)
```

output
```
int(x^6*(a + b*asin(c*x^2)), x)
```

# 3.353 $\int x^4(a+b\arcsin(cx^2))\,dx$



## 3.353.1 Optimal result

Integrand size = 14, antiderivative size = 83

$$\int x^4(a+b\arcsin(cx^2))\,dx=\frac{2bx^3\sqrt{1-c^2x^4}}{25c}+\frac{1}{5}x^5(a+b\arcsin(cx^2))-\frac{6bE\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)}{25c^{5/2}}+\frac{6b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{25c^{5/2}}$$

output
```
1/5*x^5*(a+b*arcsin(c*x^2))-6/25*b*EllipticE(x*c^(1/2),I)/c^(5/2)+6/25*b*E
llipticF(x*c^(1/2),I)/c^(5/2)+2/25*b*x^3*(-c^2*x^4+1)^(1/2)/c
```

## 3.353.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.12

$$\int x^4(a+b\arcsin(cx^2))\,dx=\frac{1}{25}\left(5ax^5+\frac{2bx^3\sqrt{1-c^2x^4}}{c}+5bx^5\arcsin(cx^2)+\frac{6ib\left(E\left(i\text{arcsinh}\left(\sqrt{-c}x\right)\middle|-1\right)-\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c}x\right),-1\right)\right)}{(-c)^{5/2}}\right)$$

input
```
Integrate[x^4*(a + b*ArcSin[c*x^2]),x]
```

output
```
(5*a*x^5 + (2*b*x^3*Sqrt[1 - c^2*x^4])/c + 5*b*x^5*ArcSin[c*x^2] + ((6*I)*
b*(EllipticE[I*ArcSinh[Sqrt[-c]*x], -1] - EllipticF[I*ArcSinh[Sqrt[-c]*x],
 -1]))/(-c)^(5/2))/25
```

### 3.353.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.08, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5341, 27, 843, 836, 762, 1388, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^4 \left(a+b \arcsin \left(c x^2\right)\right) \, dx$$

$$\Big\downarrow \text{ 5341}$$

$$\frac{1}{5} x^5 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{5} b \int \frac{2 c x^6}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \text{ 27}$$

$$\frac{1}{5} x^5 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{5} b c \int \frac{x^6}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \text{ 843}$$

$$\frac{1}{5} x^5 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{5} b c \left(\frac{3 \int \frac{x^2}{\sqrt{1-c^2 x^4}}dx}{5 c^2}-\frac{x^3 \sqrt{1-c^2 x^4}}{5 c^2}\right)$$

$$\Big\downarrow \text{ 836}$$

$$\frac{1}{5} x^5 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{5} b c \left(\frac{3 \left(\frac{\int \frac{c x^2+1}{\sqrt{1-c^2 x^4}}dx}{c}-\frac{\int \frac{1}{\sqrt{1-c^2 x^4}}dx}{c}\right)}{5 c^2}-\frac{x^3 \sqrt{1-c^2 x^4}}{5 c^2}\right)$$

$$\Big\downarrow \text{ 762}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(cx^2\right)\right)-\frac{2}{5}bc\left(\frac{3\left(\frac{\int\frac{cx^2+1}{\sqrt{1-c^2x^4}}dx}{c}-\frac{\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{c^{3/2}}\right)}{5c^2}-\frac{x^3\sqrt{1-c^2x^4}}{5c^2}\right)$$

$$\Big\downarrow \text{1388}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(cx^2\right)\right)-\frac{2}{5}bc\left(\frac{3\left(\frac{\int\frac{\sqrt{cx^2+1}}{\sqrt{1-cx^2}}dx}{c}-\frac{\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{c^{3/2}}\right)}{5c^2}-\frac{x^3\sqrt{1-c^2x^4}}{5c^2}\right)$$

$$\Big\downarrow \text{327}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(cx^2\right)\right)-\frac{2}{5}bc\left(\frac{3\left(\frac{E\left(\arcsin\left(\sqrt{c}x\right)|-1\right)}{c^{3/2}}-\frac{\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{c^{3/2}}\right)}{5c^2}-\frac{x^3\sqrt{1-c^2x^4}}{5c^2}\right)$$

input
```
Int[x^4*(a + b*ArcSin[c*x^2]),x]
```

output
```
(x^5*(a + b*ArcSin[c*x^2]))/5 - (2*b*c*(-1/5*(x^3*Sqrt[1 - c^2*x^4])/c^2 +
 (3*(EllipticE[ArcSin[Sqrt[c]*x], -1]/c^(3/2) - EllipticF[ArcSin[Sqrt[c]*x
], -1]/c^(3/2)))/(5*c^2)))/5
```

### 3.353.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 836
```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> With[{q = Rt[-b/a, 2]},
Simp[-q^(-1)   Int[1/Sqrt[a + b*x^4], x], x] + Simp[1/q   Int[(1 + q*x^2)/S
qrt[a + b*x^4], x], x]] /; FreeQ[{a, b}, x] && NegQ[b/a]
```

rule 843
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Simp[
a*c^n*((m - n + 1)/(b*(m + n*p + 1)))   Int[(c*x)^(m - n)*(a + b*x^n)^p, x]
, x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*
p + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

rule 1388
```
Int[(u_.)*((a_) + (c_.)*(x_)^(n2_.))^(p_.)*((d_) + (e_.)*(x_)^(n_))^(q_.),
x_Symbol] :> Int[u*(d + e*x^n)^(p + q)*(a/d + (c/e)*x^n)^p, x] /; FreeQ[{a,
 c, d, e, n, p, q}, x] && EqQ[n2, 2*n] && EqQ[c*d^2 + a*e^2, 0] && (Integer
Q[p] || (GtQ[a, 0] && GtQ[d, 0]))
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.353.4 Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.22

| method | result | size |
|---|---|---|
| default | $\frac{a\,x^{5}}{5}+b\left(\frac{x^{5}\arcsin\left(c\,x^{2}\right)}{5}-\frac{2c\left(-\frac{x^{3}\sqrt{-c^{2}x^{4}+1}}{5c^{2}}-\frac{3\sqrt{-c\,x^{2}+1}\,\sqrt{c\,x^{2}+1}\,\left(\operatorname{EllipticF}\left(x\sqrt{c},i\right)-\operatorname{EllipticE}\left(x\sqrt{c},i\right)\right)}{5c^{\frac{7}{2}}\sqrt{-c^{2}x^{4}+1}}\right)}{5}\right)$ | 101 |
| parts | $\frac{a\,x^{5}}{5}+b\left(\frac{x^{5}\arcsin\left(c\,x^{2}\right)}{5}-\frac{2c\left(-\frac{x^{3}\sqrt{-c^{2}x^{4}+1}}{5c^{2}}-\frac{3\sqrt{-c\,x^{2}+1}\,\sqrt{c\,x^{2}+1}\,\left(\operatorname{EllipticF}\left(x\sqrt{c},i\right)-\operatorname{EllipticE}\left(x\sqrt{c},i\right)\right)}{5c^{\frac{7}{2}}\sqrt{-c^{2}x^{4}+1}}\right)}{5}\right)$ | 101 |

input
```
int(x^4*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

output
```
1/5*a*x^5+b*(1/5*x^5*arcsin(c*x^2)-2/5*c*(-1/5/c^2*x^3*(-c^2*x^4+1)^(1/2)-
3/5/c^(7/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*(EllipticF
(x*c^(1/2),I)-EllipticE(x*c^(1/2),I))))
```

### 3.353.5 Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.71

$$\int x^4\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{5\,bc^3x^6\arcsin\left(cx^2\right)+5\,ac^3x^6+2\,\left(bc^2x^4+3\,b\right)\sqrt{-c^2x^4+1}}{25\,c^3x}$$

input
```
integrate(x^4*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

output
```
1/25*(5*b*c^3*x^6*arcsin(c*x^2) + 5*a*c^3*x^6 + 2*(b*c^2*x^4 + 3*b)*sqrt(-
c^2*x^4 + 1))/(c^3*x)
```

### 3.353.6 Sympy [A] (verification not implemented)

Time = 1.14 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.70

$$\int x^4\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{ax^5}{5}-\frac{bcx^7\Gamma\left(\frac{7}{4}\right){}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{7}{4}\\\frac{11}{4}\end{matrix}\right|c^2x^4e^{2i\pi}\right)}{10\Gamma\left(\frac{11}{4}\right)}+\frac{bx^5\operatorname{asin}\left(cx^2\right)}{5}$$

input
```
integrate(x**4*(a+b*asin(c*x**2)),x)
```

output
```
a*x**5/5 - b*c*x**7*gamma(7/4)*hyper((1/2, 7/4), (11/4,), c**2*x**4*exp_po
lar(2*I*pi))/(10*gamma(11/4)) + b*x**5*asin(c*x**2)/5
```

### 3.353.7 Maxima [F]

$$\int x^4(a+b\arcsin (cx^2))\ dx = \int (b\arcsin (cx^2)+a)x^4\,dx$$

input
```
integrate(x^4*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

output
```
1/5*a*x^5 + 1/5*(x^5*arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)) + 10
*c*integrate(1/5*x^6*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8
 - c^2*x^4 + (c^2*x^4 - 1)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))), x))*b
```

### 3.353.8 Giac [F]

$$\int x^4(a+b\arcsin (cx^2))\ dx = \int (b\arcsin (cx^2)+a)x^4\,dx$$

input
```
integrate(x^4*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^2) + a)*x^4, x)
```

### 3.353.9 Mupad [F(-1)]

Timed out.

$$\int x^4(a+b\arcsin (cx^2))\ dx = \int x^4\,\left(a+b\,\mathrm{asin}\left(c\,x^2\right)\right)\,dx$$

input
```
int(x^4*(a + b*asin(c*x^2)),x)
```

output
```
int(x^4*(a + b*asin(c*x^2)), x)
```

# 3.354 $\int x^2(a+b\arcsin(cx^2))\,dx$



## 3.354.1 Optimal result

Integrand size = 14, antiderivative size = 61

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{2bx\sqrt{1-c^2x^4}}{9c}+\frac{1}{3}x^3\left(a+b\arcsin\left(cx^2\right)\right)-\frac{2b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{9c^{3/2}}$$

output
```
1/3*x^3*(a+b*arcsin(c*x^2))-2/9*b*EllipticF(x*c^(1/2),I)/c^(3/2)+2/9*b*x*(
-c^2*x^4+1)^(1/2)/c
```

## 3.354.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.11 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.18

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{1}{9}\left(3ax^3+\frac{2bx\sqrt{1-c^2x^4}}{c}+3bx^3\arcsin\left(cx^2\right)-\frac{2ib\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c}x\right),-1\right)}{(-c)^{3/2}}\right)$$

input
```
Integrate[x^2*(a + b*ArcSin[c*x^2]),x]
```

output
```
(3*a*x^3 + (2*b*x*Sqrt[1 - c^2*x^4])/c + 3*b*x^3*ArcSin[c*x^2] - ((2*I)*b*
EllipticF[I*ArcSinh[Sqrt[-c]*x], -1])/(-c)^(3/2))/9
```

### 3.354.3 Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.08, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {5341, 27, 843, 762}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2 \left(a+b \arcsin \left(c x^2\right)\right) \, dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{3} x^3 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{1}{3} b \int \frac{2 c x^4}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{3} x^3 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{3} b c \int \frac{x^4}{\sqrt{1-c^2 x^4}}dx$$

$$\Big\downarrow \text{843}$$

$$\frac{1}{3} x^3 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{3} b c \left(\frac{\int \frac{1}{\sqrt{1-c^2 x^4}}dx}{3 c^2}-\frac{x \sqrt{1-c^2 x^4}}{3 c^2}\right)$$

$$\Big\downarrow \text{762}$$

$$\frac{1}{3} x^3 \left(a+b \arcsin \left(c x^2\right)\right)-\frac{2}{3} b c \left(\frac{\text{EllipticF}\left(\arcsin \left(\sqrt{c} x\right),-1\right)}{3 c^{5/2}}-\frac{x \sqrt{1-c^2 x^4}}{3 c^2}\right)$$

input
```
Int[x^2*(a + b*ArcSin[c*x^2]),x]
```

output
```
(x^3*(a + b*ArcSin[c*x^2]))/3 - (2*b*c*(-1/3*(x*Sqrt[1 - c^2*x^4])/c^2 + E
llipticF[ArcSin[Sqrt[c]*x], -1]/(3*c^(5/2))))/3
```

### 3.354.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 843
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[c^(n
 - 1)*(c*x)^(m - n + 1)*((a + b*x^n)^(p + 1)/(b*(m + n*p + 1))), x] - Simp[
a*c^n*((m - n + 1)/(b*(m + n*p + 1)))   Int[(c*x)^(m - n)*(a + b*x^n)^p, x]
, x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*
p + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.354.4 Maple [A] (verified)

Time = 0.54 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.44

| method | result | size |
|---|---|---|
| default | $\frac{x^3 a}{3}+b\left(\frac{x^3 \arcsin\left(c\,x^2\right)}{3}-\frac{2c\left(-\frac{x\sqrt{-c^2x^4+1}}{3c^2}+\frac{\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\operatorname{EllipticF}\left(x\sqrt{c}, i\right)}{3c^{\frac{5}{2}}\sqrt{-c^2x^4+1}}\right)}{3}\right)$ | 88 |
| parts | $\frac{x^3 a}{3}+b\left(\frac{x^3 \arcsin\left(c\,x^2\right)}{3}-\frac{2c\left(-\frac{x\sqrt{-c^2x^4+1}}{3c^2}+\frac{\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\operatorname{EllipticF}\left(x\sqrt{c}, i\right)}{3c^{\frac{5}{2}}\sqrt{-c^2x^4+1}}\right)}{3}\right)$ | 88 |

input
```
int(x^2*(a+b*arcsin(c*x^2)),x,method=_RETURNVERBOSE)
```

output
```
1/3*x^3*a+b*(1/3*x^3*arcsin(c*x^2)-2/3*c*(-1/3/c^2*x*(-c^2*x^4+1)^(1/2)+1/
3/c^(5/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*EllipticF(x*
c^(1/2),I)))
```

## 3.354.5 Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.69

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{3\,bcx^3\arcsin\left(cx^2\right)+3\,acx^3+2\,\sqrt{-c^2x^4+1}bx}{9\,c}$$

input
```
integrate(x^2*(a+b*arcsin(c*x^2)),x, algorithm="fricas")
```

output
```
1/9*(3*b*c*x^3*arcsin(c*x^2) + 3*a*c*x^3 + 2*sqrt(-c^2*x^4 + 1)*b*x)/c
```

## 3.354.6 Sympy [A] (verification not implemented)

Time = 0.93 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.95

$$\int x^2\left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{ax^3}{3}-\frac{bcx^5\Gamma\left(\frac{5}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{4}\\\frac{9}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{6\Gamma\left(\frac{9}{4}\right)}+\frac{bx^3\operatorname{asin}\left(cx^2\right)}{3}$$

input
```
integrate(x**2*(a+b*asin(c*x**2)),x)
```

output
```
a*x**3/3 - b*c*x**5*gamma(5/4)*hyper((1/2, 5/4), (9/4,), c**2*x**4*exp_pol
ar(2*I*pi))/(6*gamma(9/4)) + b*x**3*asin(c*x**2)/3
```

### 3.354.7 Maxima [F]

$$\int x^2(a+b\arcsin(cx^2))\,dx = \int (b\arcsin(cx^2)+a)x^2\,dx$$

input
```
integrate(x^2*(a+b*arcsin(c*x^2)),x, algorithm="maxima")
```

output
```
1/3*a*x^3 + 1/3*(x^3*arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)) + 6*
c*integrate(1/3*x^4*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8
- c^2*x^4 + (c^2*x^4 - 1)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))), x))*b
```

### 3.354.8 Giac [F]

$$\int x^2(a+b\arcsin(cx^2))\,dx = \int (b\arcsin(cx^2)+a)x^2\,dx$$

input
```
integrate(x^2*(a+b*arcsin(c*x^2)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^2) + a)*x^2, x)
```

### 3.354.9 Mupad [F(-1)]

Timed out.

$$\int x^2(a+b\arcsin(cx^2))\,dx = \int x^2\,(a+b\,\mathrm{asin}(c\,x^2))\,dx$$

input
```
int(x^2*(a + b*asin(c*x^2)),x)
```

output
```
int(x^2*(a + b*asin(c*x^2)), x)
```

# 3.355 $\int (a+b\arcsin(cx^2))\,dx$



## 3.355.1 Optimal result

Integrand size = 10, antiderivative size = 49

$$\int (a+b\arcsin(cx^2))\,dx = ax+bx\arcsin(cx^2)-\frac{2bE\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)}{\sqrt{c}}+\frac{2b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{\sqrt{c}}$$

output
```
a*x+b*x*arcsin(c*x^2)-2*b*EllipticE(x*c^(1/2),I)/c^(1/2)+2*b*EllipticF(x*c
^(1/2),I)/c^(1/2)
```

## 3.355.2 Mathematica [C] (verified)

Result contains higher order function than in optimal. Order 5 vs. order 4 in optimal.

Time = 10.01 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.80

$$\int (a+b\arcsin(cx^2))\,dx = ax+bx\arcsin(cx^2)-\frac{2}{3}bcx^3\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3}{4},\frac{7}{4},c^2x^4\right)$$

input
```
Integrate[a + b*ArcSin[c*x^2],x]
```

output
```
a*x + b*x*ArcSin[c*x^2] - (2*b*c*x^3*Hypergeometric2F1[1/2, 3/4, 7/4, c^2*
x^4])/3
```

## 3.355.3 Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a+b\arcsin\left(cx^2\right)\right)\,dx$$

$$\Big\downarrow \text{2009}$$

$$ax+bx\arcsin\left(cx^2\right)+\frac{2b\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{\sqrt{c}}-\frac{2bE\left(\arcsin\left(\sqrt{c}x\right)|-1\right)}{\sqrt{c}}$$

input
```
Int[a + b*ArcSin[c*x^2],x]
```

output
```
a*x + b*x*ArcSin[c*x^2] - (2*b*EllipticE[ArcSin[Sqrt[c]*x], -1])/Sqrt[c] +
 (2*b*EllipticF[ArcSin[Sqrt[c]*x], -1])/Sqrt[c]
```

### 3.355.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

## 3.355.4 Maple [A] (verified)

Time = 0.54 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.45

| method | result | size |
|---|---|---|
| default | $ax+b\left(x\arcsin\left(c\,x^2\right)+\frac{2\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\left(\text{EllipticF}\left(x\sqrt{c},i\right)-\text{EllipticE}\left(x\sqrt{c},i\right)\right)}{\sqrt{c}\,\sqrt{-c^2x^4+1}}\right)$ | 71 |
| parts | $ax+b\left(x\arcsin\left(c\,x^2\right)+\frac{2\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\left(\text{EllipticF}\left(x\sqrt{c},i\right)-\text{EllipticE}\left(x\sqrt{c},i\right)\right)}{\sqrt{c}\,\sqrt{-c^2x^4+1}}\right)$ | 71 |

input
```
int(a+b*arcsin(c*x^2),x,method=_RETURNVERBOSE)
```

output
```
a*x+b*(x*arcsin(c*x^2)+2/c^(1/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^
4+1)^(1/2)*(EllipticF(x*c^(1/2),I)-EllipticE(x*c^(1/2),I)))
```

### 3.355.5 Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.84

$$\int \left(a+b\arcsin\left(cx^2\right)\right)\,dx=\frac{bcx^2\arcsin\left(cx^2\right)+acx^2+2\sqrt{-c^2x^4+1}b}{cx}$$

input
```
integrate(a+b*arcsin(c*x^2),x, algorithm="fricas")
```

output
```
(b*c*x^2*arcsin(c*x^2) + a*c*x^2 + 2*sqrt(-c^2*x^4 + 1)*b)/(c*x)
```

### 3.355.6 Sympy [A] (verification not implemented)

Time = 0.59 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.00

$$\int \left(a+b\arcsin\left(cx^2\right)\right)\,dx=ax+b\left(-\frac{cx^3\Gamma\left(\frac{3}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\\frac{7}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{2\Gamma\left(\frac{7}{4}\right)}+x\operatorname{asin}\left(cx^2\right)\right)$$

input
```
integrate(a+b*asin(c*x**2),x)
```

output
```
a*x + b*(-c*x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), c**2*x**4*exp_polar(
2*I*pi))/(2*gamma(7/4)) + x*asin(c*x**2))
```

### 3.355.7 Maxima [F]

$$\int \left(a+b\arcsin\left(cx^2\right)\right)\,dx=\int b\arcsin\left(cx^2\right)+a\,dx$$

input
```
integrate(a+b*arcsin(c*x^2),x, algorithm="maxima")
```

output
```
(x*arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)) + 2*c*integrate(x^2*e^
(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8 - c^2*x^4 + (c^2*x^4 -
 1)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))), x))*b + a*x
```

### 3.355.8 Giac [F]

$$\int (a + b \arcsin (cx^2)) \, dx = \int b \arcsin (cx^2) + a \, dx$$

input
```
integrate(a+b*arcsin(c*x^2),x, algorithm="giac")
```

output
```
integrate(b*arcsin(c*x^2) + a, x)
```

### 3.355.9 Mupad [F(-1)]

Timed out.

$$\int (a + b \arcsin (cx^2)) \, dx = \int a + b \operatorname{asin}(c x^2) \, dx$$

input
```
int(a + b*asin(c*x^2),x)
```

output
```
int(a + b*asin(c*x^2), x)
```

# 3.356 $\int \frac{a+b\arcsin(cx^2)}{x^2}\,dx$



## 3.356.1 Optimal result

Integrand size = 14, antiderivative size = 34

$$\int \frac{a+b\arcsin(cx^2)}{x^2}\,dx = -\frac{a+b\arcsin(cx^2)}{x} + 2b\sqrt{c}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)$$

output
```
(-a-b*arcsin(c*x^2))/x+2*b*EllipticF(x*c^(1/2),I)*c^(1/2)
```

## 3.356.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.05 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.29

$$\int \frac{a+b\arcsin(cx^2)}{x^2}\,dx = -\frac{a+b\arcsin(cx^2) - 2ib\sqrt{-c}x\,\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-c}x\right),-1\right)}{x}$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^2,x]
```

output
```
-((a + b*ArcSin[c*x^2] - (2*I)*b*Sqrt[-c]*x*EllipticF[I*ArcSinh[Sqrt[-c]*x
], -1])/x)
```

## 3.356.3 Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {5341, 27, 762}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^2}dx$$

$$\Big\downarrow \text{5341}$$

$$b\int \frac{2c}{\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{x}$$

$$\Big\downarrow \text{27}$$

$$2bc\int \frac{1}{\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{x}$$

$$\Big\downarrow \text{762}$$

$$2b\sqrt{c}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)-\frac{a+b\arcsin\left(cx^2\right)}{x}$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^2,x]
```

output
```
-((a + b*ArcSin[c*x^2])/x) + 2*b*Sqrt[c]*EllipticF[ArcSin[Sqrt[c]*x], -1]
```

### 3.356.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.356.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 65 vs. $2(32) = 64$.

Time = 0.39 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.94

| method | result | size |
|---|---|---|
| default | $-\frac{a}{x}+b\left(-\frac{\arcsin\left(c\,x^{2}\right)}{x}+\frac{2\sqrt{c}\,\sqrt{-c\,x^{2}+1}\,\sqrt{c\,x^{2}+1}\,\operatorname{EllipticF}\left(x\sqrt{c},i\right)}{\sqrt{-c^{2}x^{4}+1}}\right)$ | 66 |
| parts | $-\frac{a}{x}+b\left(-\frac{\arcsin\left(c\,x^{2}\right)}{x}+\frac{2\sqrt{c}\,\sqrt{-c\,x^{2}+1}\,\sqrt{c\,x^{2}+1}\,\operatorname{EllipticF}\left(x\sqrt{c},i\right)}{\sqrt{-c^{2}x^{4}+1}}\right)$ | 66 |

input
```
int((a+b*arcsin(c*x^2))/x^2,x,method=_RETURNVERBOSE)
```

output
```
-a/x+b*(-1/x*arcsin(c*x^2)+2*c^(1/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^
2*x^4+1)^(1/2)*EllipticF(x*c^(1/2),I))
```

### 3.356.5 Fricas [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.32

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^2}\,dx=\frac{bx\arctan\left(\frac{\sqrt{-c^2x^4+1}}{cx^2}\right)+(bx-b)\arcsin\left(cx^2\right)-a}{x}$$

input
```
integrate((a+b*arcsin(c*x^2))/x^2,x, algorithm="fricas")
```

output
```
(b*x*arctan(sqrt(-c^2*x^4 + 1)/(c*x^2)) + (b*x - b)*arcsin(c*x^2) - a)/x
```

### 3.356.6 Sympy [A] (verification not implemented)

Time = 0.76 (sec) , antiderivative size = 49, normalized size of antiderivative = 1.44

$$\int \frac{a+b\arcsin(cx^2)}{x^2}\,dx = -\frac{a}{x} + \frac{bcx\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\ \frac{5}{4}\end{matrix}\middle|\,c^2x^4e^{2i\pi}\right)}{2\Gamma\left(\frac{5}{4}\right)} - \frac{b\,\mathrm{asin}(cx^2)}{x}$$

input
```
integrate((a+b*asin(c*x**2))/x**2,x)
```

output
```
-a/x + b*c*x*gamma(1/4)*hyper((1/4, 1/2), (5/4,), c**2*x**4*exp_polar(2*I*
pi))/(2*gamma(5/4)) - b*asin(c*x**2)/x
```

### 3.356.7 Maxima [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^2}\,dx = \int \frac{b\arcsin(cx^2)+a}{x^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^2,x, algorithm="maxima")
```

output
```
-(2*c*x*integrate(e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(c^4*x^8 -
c^2*x^4 + (c^2*x^4 - 1)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))), x) + arctan
2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)))*b/x - a/x
```

### 3.356.8 Giac [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^2}\,dx = \int \frac{b\arcsin(cx^2)+a}{x^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^2) + a)/x^2, x)
```

### 3.356.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a + b \arcsin{(cx^2)}}{x^2} \, dx = \int \frac{a + b \operatorname{asin}(c\,x^2)}{x^2} \, dx$$

input
```
int((a + b*asin(c*x^2))/x^2,x)
```

output
```
int((a + b*asin(c*x^2))/x^2, x)
```

# 3.357 $\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx$



## 3.357.1 Optimal result

Integrand size = 14, antiderivative size = 81

$$\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx = -\frac{2bc\sqrt{1-c^2x^4}}{3x} - \frac{a+b\arcsin(cx^2)}{3x^3} - \frac{2}{3}bc^{3/2}E\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right) + \frac{2}{3}bc^{3/2}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)$$

output
```
1/3*(-a-b*arcsin(c*x^2))/x^3-2/3*b*c^(3/2)*EllipticE(x*c^(1/2),I)+2/3*b*c^
(3/2)*EllipticF(x*c^(1/2),I)-2/3*b*c*(-c^2*x^4+1)^(1/2)/x
```

## 3.357.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.14 (sec) , antiderivative size = 89, normalized size of antiderivative = 1.10

$$\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx = -\frac{a+2bcx^2\sqrt{1-c^2x^4}+b\arcsin(cx^2)+2ib\sqrt{-c}cx^3\left(E\left(i\text{arcsinh}\left(\sqrt{-c}x\right)\middle|-1\right)-\text{EllipticF}\left(i\text{arcsinh}\left(\sqrt{-\right.\right.\right.}{3x^3}$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^4,x]
```

output
```
-1/3*(a + 2*b*c*x^2*Sqrt[1 - c^2*x^4] + b*ArcSin[c*x^2] + (2*I)*b*Sqrt[-c]
*c*x^3*(EllipticE[I*ArcSinh[Sqrt[-c]*x], -1] - EllipticF[I*ArcSinh[Sqrt[-c
]*x], -1]))/x^3
```

### 3.357.3 Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.02, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5341, 27, 847, 836, 762, 1388, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx^2)}{x^4}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{3}b\int \frac{2c}{x^2\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin(cx^2)}{3x^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{2}{3}bc\int \frac{1}{x^2\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin(cx^2)}{3x^3}$$

$$\Big\downarrow \text{847}$$

$$\frac{2}{3}bc\left(c^2\left(-\int \frac{x^2}{\sqrt{1-c^2x^4}}dx\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{a+b\arcsin(cx^2)}{3x^3}$$

$$\Big\downarrow \text{836}$$

$$\frac{2}{3}bc\left(-\left(c^2\left(\frac{\int \frac{cx^2+1}{\sqrt{1-c^2x^4}}dx}{c}-\frac{\int \frac{1}{\sqrt{1-c^2x^4}}dx}{c}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{a+b\arcsin(cx^2)}{3x^3}$$

$$\Big\downarrow \text{762}$$

$$\frac{2}{3}bc\left(-\left(c^2\left(\frac{\int \frac{cx^2+1}{\sqrt{1-c^2x^4}}dx}{c}-\frac{\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{c^{3/2}}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{a+b\arcsin(cx^2)}{3x^3}$$

$$\Big\downarrow \text{1388}$$

$$\frac{2}{3}bc\left(-\left(c^2\left(\frac{\int \frac{\sqrt{cx^2+1}}{\sqrt{1-cx^2}}dx}{c}-\frac{\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{c^{3/2}}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{a+b\arcsin(cx^2)}{3x^3}$$

$$\Big\downarrow \text{327}$$

$$\frac{2}{3}bc\left(-\left(c^2\left(\frac{E\left(\arcsin\left(\sqrt{c}x\right)|-1\right)}{c^{3/2}}-\frac{\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{c^{3/2}}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{a+b\arcsin(cx^2)}{3x^3}$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^4,x]
```

output
```
-1/3*(a + b*ArcSin[c*x^2])/x^3 + (2*b*c*(-(Sqrt[1 - c^2*x^4]/x) - c^2*(Ell
ipticE[ArcSin[Sqrt[c]*x], -1]/c^(3/2) - EllipticF[ArcSin[Sqrt[c]*x], -1]/c
^(3/2))))/3
```

### 3.357.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 836
```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> With[{q = Rt[-b/a, 2]},
Simp[-q^(-1)   Int[1/Sqrt[a + b*x^4], x], x] + Simp[1/q   Int[(1 + q*x^2)/S
qrt[a + b*x^4], x], x]] /; FreeQ[{a, b}, x] && NegQ[b/a]
```

rule 847
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Simp[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1)))   Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a
, b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p
, x]
```

rule 1388
```
Int[(u_.)*((a_) + (c_.)*(x_)^(n2_.))^(p_.)*((d_) + (e_.)*(x_)^(n_))^(q_.),
x_Symbol] :> Int[u*(d + e*x^n)^(p + q)*(a/d + (c/e)*x^n)^p, x] /; FreeQ[{a,
 c, d, e, n, p, q}, x] && EqQ[n2, 2*n] && EqQ[c*d^2 + a*e^2, 0] && (Integer
Q[p] || (GtQ[a, 0] && GtQ[d, 0]))
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.357.4 Maple [A] (verified)

Time = 0.50 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.20

| method | result | size |
|---|---|---|
| default | $-\frac{a}{3x^3}+b\left(-\frac{\arcsin(c\,x^2)}{3x^3}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{x}+\frac{\sqrt{c}\,\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\mathrm{EllipticF}(x\sqrt{c},i)-\mathrm{EllipticE}(x\sqrt{c},i))}{\sqrt{-c^2x^4+1}}\right)}{3}\right)$ | 97 |
| parts | $-\frac{a}{3x^3}+b\left(-\frac{\arcsin(c\,x^2)}{3x^3}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{x}+\frac{\sqrt{c}\,\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\mathrm{EllipticF}(x\sqrt{c},i)-\mathrm{EllipticE}(x\sqrt{c},i))}{\sqrt{-c^2x^4+1}}\right)}{3}\right)$ | 97 |

input
```
int((a+b*arcsin(c*x^2))/x^4,x,method=_RETURNVERBOSE)
```

output
```
-1/3*a/x^3+b*(-1/3/x^3*arcsin(c*x^2)+2/3*c*(-(-c^2*x^4+1)^(1/2)/x+c^(1/2)*
(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*(EllipticF(x*c^(1/2),I
)-EllipticE(x*c^(1/2),I))))
```

## 3.357.5 Fricas [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx=\int \frac{b\arcsin(cx^2)+a}{x^4}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^4,x, algorithm="fricas")
```

output
```
integral((b*arcsin(c*x^2) + a)/x^4, x)
```

### 3.357.6 Sympy [A] (verification not implemented)

Time = 0.97 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.74

$$\int \frac{a + b\arcsin(cx^2)}{x^4}\,dx = -\frac{a}{3x^3} + \frac{bc\Gamma\left(-\frac{1}{4}\right){}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{1}{2} \\ \frac{3}{4} \end{matrix}\middle| c^2x^4e^{2i\pi}\right)}{6x\Gamma\left(\frac{3}{4}\right)} - \frac{b\,\mathrm{asin}(cx^2)}{3x^3}$$

input
```
integrate((a+b*asin(c*x**2))/x**4,x)
```

output
```
-a/(3*x**3) + b*c*gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), c**2*x**4*exp_pol
ar(2*I*pi))/(6*x*gamma(3/4)) - b*asin(c*x**2)/(3*x**3)
```

### 3.357.7 Maxima [F]

$$\int \frac{a + b\arcsin(cx^2)}{x^4}\,dx = \int \frac{b\arcsin(cx^2) + a}{x^4}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^4,x, algorithm="maxima")
```

output
```
-1/3*(6*c*x^3*integrate(1/3*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/(
c^4*x^10 - c^2*x^6 + (c^2*x^6 - x^2)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1)))
, x) + arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)))*b/x^3 - 1/3*a/x^3
```

### 3.357.8 Giac [F]

$$\int \frac{a + b\arcsin(cx^2)}{x^4}\,dx = \int \frac{b\arcsin(cx^2) + a}{x^4}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^4,x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^2) + a)/x^4, x)
```

### 3.357.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx^2)}{x^4}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^4}\,dx$$

input
```
int((a + b*asin(c*x^2))/x^4,x)
```

output
```
int((a + b*asin(c*x^2))/x^4, x)
```

# 3.358 $\int \frac{a+b \arcsin(cx^2)}{x^6} dx$



## 3.358.1 Optimal result

Integrand size = 14, antiderivative size = 61

$$\int \frac{a+b\arcsin(cx^2)}{x^6}\,dx = -\frac{2bc\sqrt{1-c^2x^4}}{15x^3} - \frac{a+b\arcsin(cx^2)}{5x^5} + \frac{2}{15}bc^{5/2}\operatorname{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)$$

output
```
1/5*(-a-b*arcsin(c*x^2))/x^5+2/15*b*c^(5/2)*EllipticF(x*c^(1/2),I)-2/15*b*
c*(-c^2*x^4+1)^(1/2)/x^3
```

## 3.358.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.11 (sec) , antiderivative size = 72, normalized size of antiderivative = 1.18

$$\int \frac{a+b\arcsin(cx^2)}{x^6}\,dx = -\frac{3a+2bcx^2\sqrt{1-c^2x^4}+3b\arcsin(cx^2)-2ib(-c)^{5/2}x^5\operatorname{EllipticF}\left(i\operatorname{arcsinh}\left(\sqrt{-c}x\right),-1\right)}{15x^5}$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^6,x]
```

output
```
-1/15*(3*a + 2*b*c*x^2*Sqrt[1 - c^2*x^4] + 3*b*ArcSin[c*x^2] - (2*I)*b*(-c
)^(5/2)*x^5*EllipticF[I*ArcSinh[Sqrt[-c]*x], -1])/x^5
```

### 3.358.3 Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.07, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {5341, 27, 847, 762}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^6}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{5}b\int \frac{2c}{x^4\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{5x^5}$$

$$\Big\downarrow \text{27}$$

$$\frac{2}{5}bc\int \frac{1}{x^4\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin\left(cx^2\right)}{5x^5}$$

$$\Big\downarrow \text{847}$$

$$\frac{2}{5}bc\left(\frac{1}{3}c^2\int \frac{1}{\sqrt{1-c^2x^4}}dx-\frac{\sqrt{1-c^2x^4}}{3x^3}\right)-\frac{a+b\arcsin\left(cx^2\right)}{5x^5}$$

$$\Big\downarrow \text{762}$$

$$\frac{2}{5}bc\left(\frac{1}{3}c^{3/2}\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)-\frac{\sqrt{1-c^2x^4}}{3x^3}\right)-\frac{a+b\arcsin\left(cx^2\right)}{5x^5}$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^6,x]
```

output
```
-1/5*(a + b*ArcSin[c*x^2])/x^5 + (2*b*c*(-1/3*Sqrt[1 - c^2*x^4]/x^3 + (c^(
3/2)*EllipticF[ArcSin[Sqrt[c]*x], -1])/3))/5
```

### 3.358.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 847
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Simp[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1)))   Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a
, b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p
, x]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.358.4 Maple [A] (verified)

Time = 0.60 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.43

| method | result | size |
|---|---|---|
| default | $-\frac{a}{5x^5}+b\left(-\frac{\arcsin\left(c\,x^2\right)}{5x^5}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{3x^3}+\frac{c^{\frac{3}{2}}\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\operatorname{EllipticF}\left(x\sqrt{c},i\right)}{3\sqrt{-c^2x^4+1}}\right)}{5}\right)$ | 87 |
| parts | $-\frac{a}{5x^5}+b\left(-\frac{\arcsin\left(c\,x^2\right)}{5x^5}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{3x^3}+\frac{c^{\frac{3}{2}}\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,\operatorname{EllipticF}\left(x\sqrt{c},i\right)}{3\sqrt{-c^2x^4+1}}\right)}{5}\right)$ | 87 |

input
```
int((a+b*arcsin(c*x^2))/x^6,x,method=_RETURNVERBOSE)
```

output
```
-1/5*a/x^5+b*(-1/5/x^5*arcsin(c*x^2)+2/5*c*(-1/3*(-c^2*x^4+1)^(1/2)/x^3+1/
3*c^(3/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-c^2*x^4+1)^(1/2)*EllipticF(x*
c^(1/2),I)))
```

### 3.358.5 Fricas [F]

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^6}\,dx=\int \frac{b\arcsin\left(cx^2\right)+a}{x^6}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^6,x, algorithm="fricas")
```

output
```
integral((b*arcsin(c*x^2) + a)/x^6, x)
```

### 3.358.6 Sympy [A] (verification not implemented)

Time = 1.25 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^6}\,dx=-\frac{a}{5x^5}+\frac{bc\Gamma\left(-\frac{3}{4}\right){}_2F_1\left(\begin{matrix}-\frac{3}{4},\frac{1}{2}\\ \frac{1}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{10x^3\Gamma\left(\frac{1}{4}\right)}-\frac{b\,\mathrm{asin}\left(cx^2\right)}{5x^5}$$

input
```
integrate((a+b*asin(c*x**2))/x**6,x)
```

output
```
-a/(5*x**5) + b*c*gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), c**2*x**4*exp_pol
ar(2*I*pi))/(10*x**3*gamma(1/4)) - b*asin(c*x**2)/(5*x**5)
```

### 3.358.7 Maxima [F]

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^6}\,dx=\int \frac{b\arcsin\left(cx^2\right)+a}{x^6}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^6,x, algorithm="maxima")
```

output
```
-1/5*(10*c*x^5*integrate(1/5*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/
(c^4*x^12 - c^2*x^8 + (c^2*x^8 - x^4)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1))
), x) + arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)))*b/x^5 - 1/5*a/x^
5
```

### 3.358.8 Giac [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^6}\,dx = \int \frac{b\arcsin(cx^2)+a}{x^6}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^6,x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^2) + a)/x^6, x)
```

### 3.358.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx^2)}{x^6}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^6}\,dx$$

input
```
int((a + b*asin(c*x^2))/x^6,x)
```

output
```
int((a + b*asin(c*x^2))/x^6, x)
```

# 3.359 $\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx$



## 3.359.1 Optimal result

Integrand size = 14, antiderivative size = 106

$$\begin{aligned}\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx = & -\frac{2bc\sqrt{1-c^2x^4}}{35x^5}-\frac{6bc^3\sqrt{1-c^2x^4}}{35x} \\ & -\frac{a+b\arcsin(cx^2)}{7x^7}-\frac{6}{35}bc^{7/2}E\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right) \\ & +\frac{6}{35}bc^{7/2}\,\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)\end{aligned}$$

output
```
1/7*(-a-b*arcsin(c*x^2))/x^7-6/35*b*c^(7/2)*EllipticE(x*c^(1/2),I)+6/35*b*
c^(7/2)*EllipticF(x*c^(1/2),I)-2/35*b*c*(-c^2*x^4+1)^(1/2)/x^5-6/35*b*c^3*
(-c^2*x^4+1)^(1/2)/x
```

## 3.359.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.16 (sec) , antiderivative size = 100, normalized size of antiderivative = 0.94

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx = -\frac{5a+2bx^2\sqrt{1-c^2x^4}(c+3c^3x^4)+5b\arcsin(cx^2)-6ib(-c)^{7/2}x^7\left(E\left(i\,\text{arcsinh}\left(\sqrt{-c}x\right)\middle|-1\right)-\text{EllipticF}\right.}{35x^7}$$

input
```
Integrate[(a + b*ArcSin[c*x^2])/x^8,x]
```

output
```
-1/35*(5*a + 2*b*x^2*Sqrt[1 - c^2*x^4]*(c + 3*c^3*x^4) + 5*b*ArcSin[c*x^2]
 - (6*I)*b*(-c)^(7/2)*x^7*(EllipticE[I*ArcSinh[Sqrt[-c]*x], -1] - Elliptic
F[I*ArcSinh[Sqrt[-c]*x], -1]))/x^7
```

## 3.359.3 Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.06, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {5341, 27, 847, 847, 836, 762, 1388, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx$$

$$\Big\downarrow \ 5341$$

$$\frac{1}{7}b\int \frac{2c}{x^6\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin(cx^2)}{7x^7}$$

$$\Big\downarrow \ 27$$

$$\frac{2}{7}bc\int \frac{1}{x^6\sqrt{1-c^2x^4}}dx-\frac{a+b\arcsin(cx^2)}{7x^7}$$

$$\Big\downarrow \ 847$$

$$\frac{2}{7}bc\left(\frac{3}{5}c^2\int \frac{1}{x^2\sqrt{1-c^2x^4}}dx-\frac{\sqrt{1-c^2x^4}}{5x^5}\right)-\frac{a+b\arcsin(cx^2)}{7x^7}$$

$$\Big\downarrow \ 847$$

$$\frac{2}{7}bc\left(\frac{3}{5}c^2\left(c^2\left(-\int \frac{x^2}{\sqrt{1-c^2x^4}}dx\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{\sqrt{1-c^2x^4}}{5x^5}\right)-\frac{a+b\arcsin(cx^2)}{7x^7}$$

$$\Big\downarrow \ 836$$

$$\frac{2}{7}bc\left(\frac{3}{5}c^2\left(-\left(c^2\left(\frac{\int \frac{cx^2+1}{\sqrt{1-c^2x^4}}dx}{c}-\frac{\int \frac{1}{\sqrt{1-c^2x^4}}dx}{c}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{\sqrt{1-c^2x^4}}{5x^5}\right)-\frac{a+b\arcsin(cx^2)}{7x^7}$$

$$\Big\downarrow \text{762}$$

$$\frac{2}{7}bc\left(\frac{3}{5}c^2\left(-\left(c^2\left(\frac{\int \frac{cx^2+1}{\sqrt{1-c^2x^4}}dx}{c}-\frac{\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{c^{3/2}}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{\sqrt{1-c^2x^4}}{5x^5}\right)-\frac{a+b\arcsin\left(cx^2\right)}{7x^7}$$

$$\Big\downarrow \text{1388}$$

$$\frac{2}{7}bc\left(\frac{3}{5}c^2\left(-\left(c^2\left(\frac{\int \frac{\sqrt{cx^2+1}}{\sqrt{1-cx^2}}dx}{c}-\frac{\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{c^{3/2}}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{\sqrt{1-c^2x^4}}{5x^5}\right)-\frac{a+b\arcsin\left(cx^2\right)}{7x^7}$$

$$\Big\downarrow \text{327}$$

$$\frac{2}{7}bc\left(\frac{3}{5}c^2\left(-\left(c^2\left(\frac{E\left(\arcsin\left(\sqrt{c}x\right)\middle|-1\right)}{c^{3/2}}-\frac{\text{EllipticF}\left(\arcsin\left(\sqrt{c}x\right),-1\right)}{c^{3/2}}\right)\right)-\frac{\sqrt{1-c^2x^4}}{x}\right)-\frac{\sqrt{1-c^2x^4}}{5x^5}\right)-\frac{a+b\arcsin\left(cx^2\right)}{7x^7}$$

input
```
Int[(a + b*ArcSin[c*x^2])/x^8,x]
```

output
```
-1/7*(a + b*ArcSin[c*x^2])/x^7 + (2*b*c*(-1/5*Sqrt[1 - c^2*x^4]/x^5 + (3*c
^2*(-(Sqrt[1 - c^2*x^4]/x) - c^2*(EllipticE[ArcSin[Sqrt[c]*x], -1]/c^(3/2)
 - EllipticF[ArcSin[Sqrt[c]*x], -1]/c^(3/2))))/5))/7
```

### 3.359.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 762
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> Simp[(1/(Sqrt[a]*Rt[-b/a, 4])
)*EllipticF[ArcSin[Rt[-b/a, 4]*x], -1], x] /; FreeQ[{a, b}, x] && NegQ[b/a]
 && GtQ[a, 0]
```

rule 836
```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^4], x_Symbol] :> With[{q = Rt[-b/a, 2]},
Simp[-q^(-1)   Int[1/Sqrt[a + b*x^4], x], x] + Simp[1/q   Int[(1 + q*x^2)/S
qrt[a + b*x^4], x], x]] /; FreeQ[{a, b}, x] && NegQ[b/a]
```

rule 847
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c*x
)^(m + 1)*((a + b*x^n)^(p + 1)/(a*c*(m + 1))), x] - Simp[b*((m + n*(p + 1)
+ 1)/(a*c^n*(m + 1)))   Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a
, b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p
, x]
```

rule 1388
```
Int[(u_.)*((a_) + (c_.)*(x_)^(n2_.))^(p_.)*((d_) + (e_.)*(x_)^(n_))^(q_.),
x_Symbol] :> Int[u*(d + e*x^n)^(p + q)*(a/d + (c/e)*x^n)^p, x] /; FreeQ[{a,
 c, d, e, n, p, q}, x] && EqQ[n2, 2*n] && EqQ[c*d^2 + a*e^2, 0] && (Integer
Q[p] || (GtQ[a, 0] && GtQ[d, 0]))
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.359. $\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx$

### 3.359.4 Maple [A] (verified)

Time = 0.72 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.11

| method | result |
|---|---|
| default | $-\frac{a}{7x^7}+b\left(-\frac{\arcsin(c\,x^2)}{7x^7}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{5x^5}-\frac{3c^2\sqrt{-c^2x^4+1}}{5x}+\frac{3c^{\frac{5}{2}}\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\mathrm{EllipticF}(x\sqrt{c},i)-\mathrm{EllipticE}(x\sqrt{c},i))}{5\sqrt{-c^2x^4+1}}\right)}{7}\right)$ |
| parts | $-\frac{a}{7x^7}+b\left(-\frac{\arcsin(c\,x^2)}{7x^7}+\frac{2c\left(-\frac{\sqrt{-c^2x^4+1}}{5x^5}-\frac{3c^2\sqrt{-c^2x^4+1}}{5x}+\frac{3c^{\frac{5}{2}}\sqrt{-c\,x^2+1}\,\sqrt{c\,x^2+1}\,(\mathrm{EllipticF}(x\sqrt{c},i)-\mathrm{EllipticE}(x\sqrt{c},i))}{5\sqrt{-c^2x^4+1}}\right)}{7}\right)$ |

input
```
int((a+b*arcsin(c*x^2))/x^8,x,method=_RETURNVERBOSE)
```

output
```
-1/7*a/x^7+b*(-1/7/x^7*arcsin(c*x^2)+2/7*c*(-1/5/x^5*(-c^2*x^4+1)^(1/2)-3/
5*c^2*(-c^2*x^4+1)^(1/2)/x+3/5*c^(5/2)*(-c*x^2+1)^(1/2)*(c*x^2+1)^(1/2)/(-
c^2*x^4+1)^(1/2)*(EllipticF(x*c^(1/2),I)-EllipticE(x*c^(1/2),I))))
```

### 3.359.5 Fricas [F]

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx=\int \frac{b\arcsin(cx^2)+a}{x^8}\,dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^8,x, algorithm="fricas")
```

output
```
integral((b*arcsin(c*x^2) + a)/x^8, x)
```

### 3.359.6 Sympy [A] (verification not implemented)

Time = 1.74 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.61

$$\int \frac{a+b\arcsin(cx^2)}{x^8}\,dx=-\frac{a}{7x^7}+\frac{bc\Gamma\left(-\frac{5}{4}\right){}_2F_1\left(\begin{matrix}-\frac{5}{4},\frac{1}{2}\\-\frac{1}{4}\end{matrix}\middle|c^2x^4e^{2i\pi}\right)}{14x^5\Gamma\left(-\frac{1}{4}\right)}-\frac{b\operatorname{asin}(cx^2)}{7x^7}$$

input
```
integrate((a+b*asin(c*x**2))/x**8,x)
```

output
```
-a/(7*x**7) + b*c*gamma(-5/4)*hyper((-5/4, 1/2), (-1/4,), c**2*x**4*exp_po
lar(2*I*pi))/(14*x**5*gamma(-1/4)) - b*asin(c*x**2)/(7*x**7)
```

### 3.359.7 Maxima [F]

$$\int \frac{a + b \arcsin(cx^2)}{x^8} \, dx = \int \frac{b \arcsin(cx^2) + a}{x^8} \, dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^8,x, algorithm="maxima")
```

output
```
-1/7*(14*c*x^7*integrate(1/7*e^(1/2*log(c*x^2 + 1) + 1/2*log(-c*x^2 + 1))/
(c^4*x^14 - c^2*x^10 + (c^2*x^10 - x^6)*e^(log(c*x^2 + 1) + log(-c*x^2 + 1
))), x) + arctan2(c*x^2, sqrt(c*x^2 + 1)*sqrt(-c*x^2 + 1)))*b/x^7 - 1/7*a/
x^7
```

### 3.359.8 Giac [F]

$$\int \frac{a + b \arcsin(cx^2)}{x^8} \, dx = \int \frac{b \arcsin(cx^2) + a}{x^8} \, dx$$

input
```
integrate((a+b*arcsin(c*x^2))/x^8,x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^2) + a)/x^8, x)
```

### 3.359.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(cx^2\right)}{x^8}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x^2)}{x^8}\,dx$$

input
```
int((a + b*asin(c*x^2))/x^8,x)
```

output
```
int((a + b*asin(c*x^2))/x^8, x)
```

# 3.360 $\int \frac{\arcsin(ax^5)}{x} dx$



## 3.360.1 Optimal result

Integrand size = 10, antiderivative size = 62

$$\int \frac{\arcsin(ax^5)}{x} dx = -\frac{1}{10} i \arcsin(ax^5)^2 + \frac{1}{5} \arcsin(ax^5) \log\left(1 - e^{2i \arcsin(ax^5)}\right) - \frac{1}{10} i \operatorname{PolyLog}\left(2, e^{2i \arcsin(ax^5)}\right)$$

output
```
-1/10*I*arcsin(a*x^5)^2+1/5*arcsin(a*x^5)*ln(1-(I*a*x^5+(-a^2*x^10+1)^(1/2
))^2)-1/10*I*polylog(2,(I*a*x^5+(-a^2*x^10+1)^(1/2))^2)
```

## 3.360.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.94

$$\int \frac{\arcsin(ax^5)}{x} dx = \frac{1}{5}\left(\arcsin(ax^5) \log\left(1 - e^{2i \arcsin(ax^5)}\right) - \frac{1}{2} i \left(\arcsin(ax^5)^2 + \operatorname{PolyLog}\left(2, e^{2i \arcsin(ax^5)}\right)\right)\right)$$

input
```
Integrate[ArcSin[a*x^5]/x,x]
```

output
```
(ArcSin[a*x^5]*Log[1 - E^((2*I)*ArcSin[a*x^5])] - (I/2)*(ArcSin[a*x^5]^2 +
 PolyLog[2, E^((2*I)*ArcSin[a*x^5])]))/5
```

### 3.360.3 Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.15, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.800, Rules used = {5329, 3042, 25, 4200, 25, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin(ax^5)}{x}\,dx$$

$$\Big\downarrow \text{5329}$$

$$\frac{1}{5}\int \frac{\sqrt{1-a^2x^{10}}\arcsin(ax^5)}{ax^5}d\arcsin(ax^5)$$

$$\Big\downarrow \text{3042}$$

$$\frac{1}{5}\int -\arcsin(ax^5)\tan\left(\arcsin(ax^5)+\frac{\pi}{2}\right)d\arcsin(ax^5)$$

$$\Big\downarrow \text{25}$$

$$-\frac{1}{5}\int \arcsin(ax^5)\tan\left(\arcsin(ax^5)+\frac{\pi}{2}\right)d\arcsin(ax^5)$$

$$\Big\downarrow \text{4200}$$

$$\frac{1}{5}\left(2i\int -\frac{e^{2i\arcsin(ax^5)}\arcsin(ax^5)}{1-e^{2i\arcsin(ax^5)}}d\arcsin(ax^5)-\frac{1}{2}i\arcsin(ax^5)^2\right)$$

$$\Big\downarrow \text{25}$$

$$\frac{1}{5}\left(-2i\int \frac{e^{2i\arcsin(ax^5)}\arcsin(ax^5)}{1-e^{2i\arcsin(ax^5)}}d\arcsin(ax^5)-\frac{1}{2}i\arcsin(ax^5)^2\right)$$

$$\Big\downarrow \text{2620}$$

$$\frac{1}{5}\left(-2i\left(\frac{1}{2}i\arcsin(ax^5)\log\left(1-e^{2i\arcsin(ax^5)}\right)-\frac{1}{2}i\int \log\left(1-e^{2i\arcsin(ax^5)}\right)d\arcsin(ax^5)\right)-\frac{1}{2}i\arcsin(ax^5)^2\right)$$

$$\Big\downarrow \text{2715}$$

$$\frac{1}{5}\left(-2i\left(\frac{1}{2}i\arcsin(ax^5)\log\left(1-e^{2i\arcsin(ax^5)}\right)-\frac{1}{4}\int e^{-2i\arcsin(ax^5)}\log\left(1-e^{2i\arcsin(ax^5)}\right)de^{2i\arcsin(ax^5)}\right)-\frac{1}{2}i\,a$$

$$\Big\downarrow \text{2838}$$

$$\frac{1}{5}\left(-2i\left(\frac{1}{4}\,\mathrm{PolyLog}\left(2,e^{2i\arcsin(ax^5)}\right)+\frac{1}{2}i\arcsin\left(ax^5\right)\log\left(1-e^{2i\arcsin(ax^5)}\right)\right)-\frac{1}{2}i\arcsin\left(ax^5\right)^2\right)$$

input
```
Int[ArcSin[a*x^5]/x,x]
```

output
```
((-1/2*I)*ArcSin[a*x^5]^2 - (2*I)*((I/2)*ArcSin[a*x^5]*Log[1 - E^((2*I)*Ar
cSin[a*x^5])] + PolyLog[2, E^((2*I)*ArcSin[a*x^5])]/4))/5
```

### 3.360.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5329
```
Int[ArcSin[(a_.)*(x_)^(p_)]^(n_.)/(x_), x_Symbol] :> Simp[1/p   Subst[Int[x
^n*Cot[x], x], x, ArcSin[a*x^p]], x] /; FreeQ[{a, p}, x] && IGtQ[n, 0]
```

### 3.360.4 Maple [F]

$$\int \frac{\arcsin(a\,x^5)}{x}dx$$

input
```
int(arcsin(a*x^5)/x,x)
```

output
```
int(arcsin(a*x^5)/x,x)
```

### 3.360.5 Fricas [F]

$$\int \frac{\arcsin(ax^5)}{x}\,dx = \int \frac{\arcsin(ax^5)}{x}\,dx$$

input
```
integrate(arcsin(a*x^5)/x,x, algorithm="fricas")
```

output
```
integral(arcsin(a*x^5)/x, x)
```

### 3.360.6 Sympy [F]

$$\int \frac{\arcsin(ax^5)}{x}\,dx = \int \frac{\operatorname{asin}(ax^5)}{x}\,dx$$

input
```
integrate(asin(a*x**5)/x,x)
```

output
```
Integral(asin(a*x**5)/x, x)
```

### 3.360.7 Maxima [F]

$$\int \frac{\arcsin(ax^5)}{x}\,dx = \int \frac{\arcsin(ax^5)}{x}\,dx$$

input
```
integrate(arcsin(a*x^5)/x,x, algorithm="maxima")
```

output
```
integrate(arcsin(a*x^5)/x, x)
```

### 3.360.8 Giac [F]

$$\int \frac{\arcsin(ax^5)}{x}\,dx = \int \frac{\arcsin(ax^5)}{x}\,dx$$

input
```
integrate(arcsin(a*x^5)/x,x, algorithm="giac")
```

output
```
integrate(arcsin(a*x^5)/x, x)
```

### 3.360.9 Mupad [B] (verification not implemented)

Time = 0.40 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.81

$$\int \frac{\arcsin(ax^5)}{x}\,dx = -\frac{\mathrm{polylog}\left(2, \mathrm{e}^{\mathrm{asin}(a\,x^5)\,2\mathrm{i}}\right)\,1\mathrm{i}}{10} + \frac{\ln\left(1-\mathrm{e}^{\mathrm{asin}(a\,x^5)\,2\mathrm{i}}\right)\,\mathrm{asin}(a\,x^5)}{5} - \frac{\mathrm{asin}(a\,x^5)^2\,1\mathrm{i}}{10}$$

input
```
int(asin(a*x^5)/x,x)
```

output
```
(log(1 - exp(asin(a*x^5)*2i))*asin(a*x^5))/5 - (polylog(2, exp(asin(a*x^5)
*2i))*1i)/10 - (asin(a*x^5)^2*1i)/10
```

# 3.361 $\int x^2 \arcsin\left(\sqrt{x}\right)\,dx$



## 3.361.1 Optimal result

Integrand size = 10, antiderivative size = 78

$$\int x^2 \arcsin\left(\sqrt{x}\right)\,dx = \frac{5}{48}\sqrt{1-x}\sqrt{x}+\frac{5}{72}\sqrt{1-x}x^{3/2}+\frac{1}{18}\sqrt{1-x}x^{5/2}+\frac{5}{96}\arcsin(1-2x)+\frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)$$

output
```
-5/96*arcsin(-1+2*x)+1/3*x^3*arcsin(x^(1/2))+5/72*x^(3/2)*(1-x)^(1/2)+1/18
*x^(5/2)*(1-x)^(1/2)+5/48*(1-x)^(1/2)*x^(1/2)
```

## 3.361.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 64, normalized size of antiderivative = 0.82

$$\int x^2 \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{144}\left(10\sqrt{1-x}x^{3/2}+8\sqrt{1-x}x^{5/2}+15\sqrt{-((-1+x)x)}+3\left(-5+16x^3\right)\arcsin\left(\sqrt{x}\right)\right)$$

input
```
Integrate[x^2*ArcSin[Sqrt[x]],x]
```

output
```
(10*Sqrt[1 - x]*x^(3/2) + 8*Sqrt[1 - x]*x^(5/2) + 15*Sqrt[-((-1 + x)*x)] +
 3*(-5 + 16*x^3)*ArcSin[Sqrt[x]])/144
```

### 3.361.3 Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.17, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.800$, Rules used = {5341, 27, 60, 60, 60, 62, 1090, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2 \arcsin\left(\sqrt{x}\right) \, dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{3}x^3 \arcsin\left(\sqrt{x}\right) - \frac{1}{3}\int \frac{x^{5/2}}{2\sqrt{1-x}}dx$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{3}x^3 \arcsin\left(\sqrt{x}\right) - \frac{1}{6}\int \frac{x^{5/2}}{\sqrt{1-x}}dx$$

$$\Big\downarrow \text{60}$$

$$\frac{1}{6}\left(\frac{1}{3}\sqrt{1-x}x^{5/2} - \frac{5}{6}\int \frac{x^{3/2}}{\sqrt{1-x}}dx\right) + \frac{1}{3}x^3 \arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{60}$$

$$\frac{1}{6}\left(\frac{1}{3}\sqrt{1-x}x^{5/2} - \frac{5}{6}\left(\frac{3}{4}\int \frac{\sqrt{x}}{\sqrt{1-x}}dx - \frac{1}{2}\sqrt{1-x}x^{3/2}\right)\right) + \frac{1}{3}x^3 \arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{60}$$

$$\frac{1}{6}\left(\frac{1}{3}\sqrt{1-x}x^{5/2} - \frac{5}{6}\left(\frac{3}{4}\left(\frac{1}{2}\int \frac{1}{\sqrt{1-x}\sqrt{x}}dx - \sqrt{1-x}\sqrt{x}\right) - \frac{1}{2}\sqrt{1-x}x^{3/2}\right)\right) + \frac{1}{3}x^3 \arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{62}$$

$$\frac{1}{6}\left(\frac{1}{3}\sqrt{1-x}x^{5/2} - \frac{5}{6}\left(\frac{3}{4}\left(\frac{1}{2}\int \frac{1}{\sqrt{x-x^2}}dx - \sqrt{1-x}\sqrt{x}\right) - \frac{1}{2}\sqrt{1-x}x^{3/2}\right)\right) + \frac{1}{3}x^3 \arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{1090}$$

$$\frac{1}{6}\left(\frac{1}{3}\sqrt{1-x}x^{5/2} - \frac{5}{6}\left(\frac{3}{4}\left(-\frac{1}{2}\int \frac{1}{\sqrt{1-(1-2x)^2}}d(1-2x) - \sqrt{1-x}\sqrt{x}\right) - \frac{1}{2}\sqrt{1-x}x^{3/2}\right)\right) + \frac{1}{3}x^3 \arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{223}$$

$$\frac{1}{6}\left(\frac{1}{3}\sqrt{1-x}x^{5/2}-\frac{5}{6}\left(\frac{3}{4}\left(-\frac{1}{2}\arcsin(1-2x)-\sqrt{1-x}\sqrt{x}\right)-\frac{1}{2}\sqrt{1-x}x^{3/2}\right)\right)+\frac{1}{3}x^3\arcsin\left(\sqrt{x}\right)$$

input
```
Int[x^2*ArcSin[Sqrt[x]],x]
```

output
```
((Sqrt[1 - x]*x^(5/2))/3 - (5*(-1/2*(Sqrt[1 - x]*x^(3/2)) + (3*(-(Sqrt[1 -
 x]*Sqrt[x]) - ArcSin[1 - 2*x]/2))/4))/6)/6 + (x^3*ArcSin[Sqrt[x]])/3
```

### 3.361.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 60
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^n/(b*(m + n + 1))), x] + Simp[n*((b*c - a*d)/(
b*(m + n + 1)))   Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
 c, d}, x] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ[m, 0] && ( !Integer
Q[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n + 2, 0] && IntLinear
Q[a, b, c, d, m, n, x]
```

rule 62
```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] :> Int[
1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b
+ d, 0] && GtQ[a + c, 0]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 1090
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p)   Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x,
b + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.361.4 Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.68

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{x^3 \arcsin(\sqrt{x})}{3}+\frac{x^{\frac{5}{2}}\sqrt{1-x}}{18}+\frac{5x^{\frac{3}{2}}\sqrt{1-x}}{72}+\frac{5\sqrt{1-x}\,\sqrt{x}}{48}-\frac{5\arcsin(\sqrt{x})}{48}$ | 53 |
| default | $\frac{x^3 \arcsin(\sqrt{x})}{3}+\frac{x^{\frac{5}{2}}\sqrt{1-x}}{18}+\frac{5x^{\frac{3}{2}}\sqrt{1-x}}{72}+\frac{5\sqrt{1-x}\,\sqrt{x}}{48}-\frac{5\arcsin(\sqrt{x})}{48}$ | 53 |
| parts | $\frac{x^3 \arcsin(\sqrt{x})}{3}+\frac{x^{\frac{5}{2}}\sqrt{1-x}}{18}+\frac{5x^{\frac{3}{2}}\sqrt{1-x}}{72}+\frac{5\sqrt{1-x}\,\sqrt{x}}{48}-\frac{5\sqrt{x(1-x)}\,\arcsin(-1+2x)}{96\sqrt{x}\,\sqrt{1-x}}$ | 74 |

input
```
int(x^2*arcsin(x^(1/2)),x,method=_RETURNVERBOSE)
```

output
```
1/3*x^3*arcsin(x^(1/2))+1/18*x^(5/2)*(1-x)^(1/2)+5/72*x^(3/2)*(1-x)^(1/2)+
5/48*(1-x)^(1/2)*x^(1/2)-5/48*arcsin(x^(1/2))
```

## 3.361.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.46

$$\int x^2 \arcsin\left(\sqrt{x}\right)\,dx=\frac{1}{144}\left(8\,x^2+10\,x+15\right)\sqrt{x}\sqrt{-x+1}+\frac{1}{48}\left(16\,x^3-5\right)\arcsin\left(\sqrt{x}\right)$$

input
```
integrate(x^2*arcsin(x^(1/2)),x, algorithm="fricas")
```

output
```
1/144*(8*x^2 + 10*x + 15)*sqrt(x)*sqrt(-x + 1) + 1/48*(16*x^3 - 5)*arcsin(
sqrt(x))
```

### 3.361.6 Sympy [A] (verification not implemented)

Time = 1.25 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.69

$$\int x^2 \arcsin\left(\sqrt{x}\right) dx = \frac{x^3 \operatorname{asin}\left(\sqrt{x}\right)}{3} - \frac{\sqrt{1-x}\left(-\frac{x^{\frac{5}{2}}}{6} - \frac{5x^{\frac{3}{2}}}{24} - \frac{5\sqrt{x}}{16}\right)}{3} - \frac{5 \operatorname{asin}\left(\sqrt{x}\right)}{48}$$

input
```
integrate(x**2*asin(x**(1/2)),x)
```

output
```
x**3*asin(sqrt(x))/3 - sqrt(1 - x)*(-x**(5/2)/6 - 5*x**(3/2)/24 - 5*sqrt(x
)/16)/3 - 5*asin(sqrt(x))/48
```

### 3.361.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.67

$$\int x^2 \arcsin\left(\sqrt{x}\right) dx = \frac{1}{3} x^3 \arcsin\left(\sqrt{x}\right) + \frac{1}{18} x^{\frac{5}{2}} \sqrt{-x+1} + \frac{5}{72} x^{\frac{3}{2}} \sqrt{-x+1} + \frac{5}{48} \sqrt{x}\sqrt{-x+1} - \frac{5}{48} \arcsin\left(\sqrt{x}\right)$$

input
```
integrate(x^2*arcsin(x^(1/2)),x, algorithm="maxima")
```

output
```
1/3*x^3*arcsin(sqrt(x)) + 1/18*x^(5/2)*sqrt(-x + 1) + 5/72*x^(3/2)*sqrt(-x
 + 1) + 5/48*sqrt(x)*sqrt(-x + 1) - 5/48*arcsin(sqrt(x))
```

### 3.361.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.99

$$\int x^2 \arcsin\left(\sqrt{x}\right) dx = \frac{1}{3} (x-1)^3 \arcsin\left(\sqrt{x}\right) + \frac{1}{18} (x-1)^2 \sqrt{x}\sqrt{-x+1} + (x-1)^2 \arcsin\left(\sqrt{x}\right) - \frac{13}{72} \sqrt{x}(-x+1)^{\frac{3}{2}} + (x-1) \arcsin\left(\sqrt{x}\right) + \frac{11}{48} \sqrt{x}\sqrt{-x+1} + \frac{11}{48} \arcsin\left(\sqrt{x}\right)$$

input
```
integrate(x^2*arcsin(x^(1/2)),x, algorithm="giac")
```

output
```
1/3*(x - 1)^3*arcsin(sqrt(x)) + 1/18*(x - 1)^2*sqrt(x)*sqrt(-x + 1) + (x -
 1)^2*arcsin(sqrt(x)) - 13/72*sqrt(x)*(-x + 1)^(3/2) + (x - 1)*arcsin(sqrt
(x)) + 11/48*sqrt(x)*sqrt(-x + 1) + 11/48*arcsin(sqrt(x))
```

### 3.361.9 Mupad [F(-1)]

Timed out.

$$\int x^2 \arcsin \left(\sqrt{x}\right) \, dx = \int x^2 \operatorname{asin}\left(\sqrt{x}\right) \, dx$$

input
```
int(x^2*asin(x^(1/2)),x)
```

output
```
int(x^2*asin(x^(1/2)), x)
```

# 3.362 $\int x \arcsin\left(\sqrt{x}\right) dx$



## 3.362.1 Optimal result

Integrand size = 8, antiderivative size = 60

$$\int x \arcsin\left(\sqrt{x}\right) dx = \frac{3}{16}\sqrt{1-x}\sqrt{x} + \frac{1}{8}\sqrt{1-x}x^{3/2} + \frac{3}{32}\arcsin(1-2x) + \frac{1}{2}x^2\arcsin\left(\sqrt{x}\right)$$

output
```
-3/32*arcsin(-1+2*x)+1/2*x^2*arcsin(x^(1/2))+1/8*x^(3/2)*(1-x)^(1/2)+3/16*
(1-x)^(1/2)*x^(1/2)
```

## 3.362.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.78

$$\int x \arcsin\left(\sqrt{x}\right) dx = \frac{1}{16}\left(2\sqrt{1-x}x^{3/2} + 3\sqrt{-((-1+x)x)} + \left(-3+8x^2\right)\arcsin\left(\sqrt{x}\right)\right)$$

input
```
Integrate[x*ArcSin[Sqrt[x]],x]
```

output
```
(2*Sqrt[1 - x]*x^(3/2) + 3*Sqrt[-((-1 + x)*x)] + (-3 + 8*x^2)*ArcSin[Sqrt[
x]])/16
```

### 3.362.3 Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.13, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.875, Rules used = {5341, 27, 60, 60, 62, 1090, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x \arcsin\left(\sqrt{x}\right) \, dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{2}x^2 \arcsin\left(\sqrt{x}\right)-\frac{1}{2}\int \frac{x^{3/2}}{2\sqrt{1-x}}dx$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{2}x^2 \arcsin\left(\sqrt{x}\right)-\frac{1}{4}\int \frac{x^{3/2}}{\sqrt{1-x}}dx$$

$$\Big\downarrow \text{60}$$

$$\frac{1}{4}\left(\frac{1}{2}\sqrt{1-x}x^{3/2}-\frac{3}{4}\int \frac{\sqrt{x}}{\sqrt{1-x}}dx\right)+\frac{1}{2}x^2 \arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{60}$$

$$\frac{1}{4}\left(\frac{1}{2}\sqrt{1-x}x^{3/2}-\frac{3}{4}\left(\frac{1}{2}\int \frac{1}{\sqrt{1-x}\sqrt{x}}dx-\sqrt{1-x}\sqrt{x}\right)\right)+\frac{1}{2}x^2 \arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{62}$$

$$\frac{1}{4}\left(\frac{1}{2}\sqrt{1-x}x^{3/2}-\frac{3}{4}\left(\frac{1}{2}\int \frac{1}{\sqrt{x-x^2}}dx-\sqrt{1-x}\sqrt{x}\right)\right)+\frac{1}{2}x^2 \arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{1090}$$

$$\frac{1}{4}\left(\frac{1}{2}\sqrt{1-x}x^{3/2}-\frac{3}{4}\left(-\frac{1}{2}\int \frac{1}{\sqrt{1-(1-2x)^2}}d(1-2x)-\sqrt{1-x}\sqrt{x}\right)\right)+\frac{1}{2}x^2 \arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{223}$$

$$\frac{1}{4}\left(\frac{1}{2}\sqrt{1-x}x^{3/2}-\frac{3}{4}\left(-\frac{1}{2}\arcsin(1-2x)-\sqrt{1-x}\sqrt{x}\right)\right)+\frac{1}{2}x^2 \arcsin\left(\sqrt{x}\right)$$

input
```
Int[x*ArcSin[Sqrt[x]],x]
```

output
```
((Sqrt[1 - x]*x^(3/2))/2 - (3*(-(Sqrt[1 - x]*Sqrt[x]) - ArcSin[1 - 2*x]/2)
)/4)/4 + (x^2*ArcSin[Sqrt[x]])/2
```

### 3.362.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 60
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^n/(b*(m + n + 1))), x] + Simp[n*((b*c - a*d)/(
b*(m + n + 1)))   Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
 c, d}, x] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ[m, 0] && ( !Integer
Q[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n + 2, 0] && IntLinear
Q[a, b, c, d, m, n, x]
```

rule 62
```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] :> Int[
1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b
+ d, 0] && GtQ[a + c, 0]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 1090
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p)   Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x,
b + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.362.4 Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.68

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{x^{2} \arcsin\left(\sqrt{x}\right)}{2}+\frac{x^{\frac{3}{2}} \sqrt{1-x}}{8}+\frac{3 \sqrt{1-x}\, \sqrt{x}}{16}-\frac{3 \arcsin\left(\sqrt{x}\right)}{16}$ | 41 |
| default | $\frac{x^{2} \arcsin\left(\sqrt{x}\right)}{2}+\frac{x^{\frac{3}{2}} \sqrt{1-x}}{8}+\frac{3 \sqrt{1-x}\, \sqrt{x}}{16}-\frac{3 \arcsin\left(\sqrt{x}\right)}{16}$ | 41 |
| parts | $\frac{x^{2} \arcsin\left(\sqrt{x}\right)}{2}+\frac{x^{\frac{3}{2}} \sqrt{1-x}}{8}+\frac{3 \sqrt{1-x}\, \sqrt{x}}{16}-\frac{3 \sqrt{x(1-x)}\, \arcsin(-1+2x)}{32 \sqrt{x}\, \sqrt{1-x}}$ | 62 |

input
```
int(x*arcsin(x^(1/2)),x,method=_RETURNVERBOSE)
```

output
```
1/2*x^2*arcsin(x^(1/2))+1/8*x^(3/2)*(1-x)^(1/2)+3/16*(1-x)^(1/2)*x^(1/2)-3
/16*arcsin(x^(1/2))
```

### 3.362.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.52

$$\int x \arcsin\left(\sqrt{x}\right)\, dx = \frac{1}{16}\,(2\,x+3)\sqrt{x}\sqrt{-x+1} + \frac{1}{16}\,(8\,x^2-3)\arcsin\left(\sqrt{x}\right)$$

input
```
integrate(x*arcsin(x^(1/2)),x, algorithm="fricas")
```

output
```
1/16*(2*x + 3)*sqrt(x)*sqrt(-x + 1) + 1/16*(8*x^2 - 3)*arcsin(sqrt(x))
```

### 3.362.6 Sympy [A] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.77

$$\int x \arcsin\left(\sqrt{x}\right)\, dx = \frac{x^2 \operatorname{asin}\left(\sqrt{x}\right)}{2} - \frac{\sqrt{1-x}\left(-\frac{x^{\frac{3}{2}}}{4} - \frac{3\sqrt{x}}{8}\right)}{2} - \frac{3 \operatorname{asin}\left(\sqrt{x}\right)}{16}$$

input
```
integrate(x*asin(x**(1/2)),x)
```

output
```
x**2*asin(sqrt(x))/2 - sqrt(1 - x)*(-x**(3/2)/4 - 3*sqrt(x)/8)/2 - 3*asin(
sqrt(x))/16
```

### 3.362.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 40, normalized size of antiderivative = 0.67

$$\int x \arcsin\left(\sqrt{x}\right) dx = \frac{1}{2} x^2 \arcsin\left(\sqrt{x}\right) + \frac{1}{8} x^{\frac{3}{2}} \sqrt{-x+1} + \frac{3}{16} \sqrt{x}\sqrt{-x+1} - \frac{3}{16} \arcsin\left(\sqrt{x}\right)$$

input
```
integrate(x*arcsin(x^(1/2)),x, algorithm="maxima")
```

output
```
1/2*x^2*arcsin(sqrt(x)) + 1/8*x^(3/2)*sqrt(-x + 1) + 3/16*sqrt(x)*sqrt(-x
+ 1) - 3/16*arcsin(sqrt(x))
```

### 3.362.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.83

$$\int x \arcsin\left(\sqrt{x}\right) dx = \frac{1}{2} (x-1)^2 \arcsin\left(\sqrt{x}\right) - \frac{1}{8} \sqrt{x}(-x+1)^{\frac{3}{2}} + (x-1) \arcsin\left(\sqrt{x}\right) + \frac{5}{16} \sqrt{x}\sqrt{-x+1} + \frac{5}{16} \arcsin\left(\sqrt{x}\right)$$

input
```
integrate(x*arcsin(x^(1/2)),x, algorithm="giac")
```

output
```
1/2*(x - 1)^2*arcsin(sqrt(x)) - 1/8*sqrt(x)*(-x + 1)^(3/2) + (x - 1)*arcsi
n(sqrt(x)) + 5/16*sqrt(x)*sqrt(-x + 1) + 5/16*arcsin(sqrt(x))
```

### 3.362.9 Mupad [F(-1)]

Timed out.

$$\int x \arcsin\left(\sqrt{x}\right) dx = \int x \operatorname{asin}\left(\sqrt{x}\right) dx$$

input
```
int(x*asin(x^(1/2)),x)
```

output
```
int(x*asin(x^(1/2)), x)
```

# 3.363 $\int \arcsin\left(\sqrt{x}\right)\,dx$



## 3.363.1 Optimal result

Integrand size = 6, antiderivative size = 37

$$\int \arcsin\left(\sqrt{x}\right)\,dx = \frac{1}{2}\sqrt{1-x}\sqrt{x} + \frac{1}{4}\arcsin(1-2x) + x\arcsin\left(\sqrt{x}\right)$$

output
```
-1/4*arcsin(-1+2*x)+x*arcsin(x^(1/2))+1/2*(1-x)^(1/2)*x^(1/2)
```

## 3.363.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.24

$$\int \arcsin\left(\sqrt{x}\right)\,dx = x\arcsin\left(\sqrt{x}\right) + \frac{1}{2}\left(\sqrt{-((-1+x)x)} - 2\arctan\left(\frac{\sqrt{x}}{-1+\sqrt{1-x}}\right)\right)$$

input
```
Integrate[ArcSin[Sqrt[x]],x]
```

output
```
x*ArcSin[Sqrt[x]] + (Sqrt[-((-1 + x)*x)] - 2*ArcTan[Sqrt[x]/(-1 + Sqrt[1 -
 x])])/2
```

### 3.363.3 Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.05, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {5339, 27, 60, 62, 1090, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \arcsin\left(\sqrt{x}\right)dx$$

$$\Big\downarrow \; 5339$$

$$x\arcsin\left(\sqrt{x}\right)-\int \frac{\sqrt{x}}{2\sqrt{1-x}}dx$$

$$\Big\downarrow \; 27$$

$$x\arcsin\left(\sqrt{x}\right)-\frac{1}{2}\int \frac{\sqrt{x}}{\sqrt{1-x}}dx$$

$$\Big\downarrow \; 60$$

$$\frac{1}{2}\left(\sqrt{1-x}\sqrt{x}-\frac{1}{2}\int \frac{1}{\sqrt{1-x}\sqrt{x}}dx\right)+x\arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \; 62$$

$$\frac{1}{2}\left(\sqrt{1-x}\sqrt{x}-\frac{1}{2}\int \frac{1}{\sqrt{x-x^2}}dx\right)+x\arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \; 1090$$

$$\frac{1}{2}\left(\frac{1}{2}\int \frac{1}{\sqrt{1-(1-2x)^2}}d(1-2x)+\sqrt{1-x}\sqrt{x}\right)+x\arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \; 223$$

$$\frac{1}{2}\left(\frac{1}{2}\arcsin(1-2x)+\sqrt{1-x}\sqrt{x}\right)+x\arcsin\left(\sqrt{x}\right)$$

input
```
Int[ArcSin[Sqrt[x]],x]
```

output
```
(Sqrt[1 - x]*Sqrt[x] + ArcSin[1 - 2*x]/2)/2 + x*ArcSin[Sqrt[x]]
```

### 3.363.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 60
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^n/(b*(m + n + 1))), x] + Simp[n*((b*c - a*d)/(
b*(m + n + 1)))   Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
 c, d}, x] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ[m, 0] && ( !Integer
Q[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n + 2, 0] && IntLinear
Q[a, b, c, d, m, n, x]
```

rule 62
```
Int[1/(Sqrt[(a_.) + (b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_Symbol] :> Int[
1/Sqrt[a*c - b*(a - c)*x - b^2*x^2], x] /; FreeQ[{a, b, c, d}, x] && EqQ[b
+ d, 0] && GtQ[a + c, 0]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 1090
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p)   Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x,
b + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

rule 5339
```
Int[ArcSin[u_], x_Symbol] :> Simp[x*ArcSin[u], x] - Int[SimplifyIntegrand[x
*(D[u, x]/Sqrt[1 - u^2]), x], x] /; InverseFunctionFreeQ[u, x] &&  !Functio
nOfExponentialQ[u, x]
```

## 3.363.4 Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.70

| method | result | size |
|---|---|---|
| derivativedivides | $x \arcsin\left(\sqrt{x}\right)+\frac{\sqrt{1-x}\,\sqrt{x}}{2}-\frac{\arcsin\left(\sqrt{x}\right)}{2}$ | 26 |
| default | $x \arcsin\left(\sqrt{x}\right)+\frac{\sqrt{1-x}\,\sqrt{x}}{2}-\frac{\arcsin\left(\sqrt{x}\right)}{2}$ | 26 |
| parts | $x \arcsin\left(\sqrt{x}\right)+\frac{\sqrt{1-x}\,\sqrt{x}}{2}-\frac{\sqrt{x(1-x)}\,\arcsin(-1+2x)}{4\sqrt{x}\,\sqrt{1-x}}$ | 47 |

input
```
int(arcsin(x^(1/2)),x,method=_RETURNVERBOSE)
```

output
```
x*arcsin(x^(1/2))+1/2*(1-x)^(1/2)*x^(1/2)-1/2*arcsin(x^(1/2))
```

### 3.363.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 24, normalized size of antiderivative = 0.65

$$\int \arcsin\left(\sqrt{x}\right)\, dx = \frac{1}{2}\,(2\,x-1)\arcsin\left(\sqrt{x}\right) + \frac{1}{2}\,\sqrt{x}\sqrt{-x+1}$$

input
```
integrate(arcsin(x^(1/2)),x, algorithm="fricas")
```

output
```
1/2*(2*x - 1)*arcsin(sqrt(x)) + 1/2*sqrt(x)*sqrt(-x + 1)
```

### 3.363.6 Sympy [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 29, normalized size of antiderivative = 0.78

$$\int \arcsin\left(\sqrt{x}\right)\, dx = \frac{\sqrt{x}\sqrt{1-x}}{2} + x\,\text{asin}\left(\sqrt{x}\right) - \frac{\text{asin}\left(\sqrt{x}\right)}{2}$$

input
```
integrate(asin(x**(1/2)),x)
```

output
```
sqrt(x)*sqrt(1 - x)/2 + x*asin(sqrt(x)) - asin(sqrt(x))/2
```

### 3.363.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 25, normalized size of antiderivative = 0.68

$$\int \arcsin\left(\sqrt{x}\right)\, dx = x\arcsin\left(\sqrt{x}\right) + \frac{1}{2}\,\sqrt{x}\sqrt{-x+1} - \frac{1}{2}\,\arcsin\left(\sqrt{x}\right)$$

input
```
integrate(arcsin(x^(1/2)),x, algorithm="maxima")
```

output
```
x*arcsin(sqrt(x)) + 1/2*sqrt(x)*sqrt(-x + 1) - 1/2*arcsin(sqrt(x))
```

### 3.363.8 Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 27, normalized size of antiderivative = 0.73

$$\int \arcsin\left(\sqrt{x}\right)\,dx = (x-1)\arcsin\left(\sqrt{x}\right) + \frac{1}{2}\sqrt{x}\sqrt{-x+1} + \frac{1}{2}\arcsin\left(\sqrt{x}\right)$$

input
```
integrate(arcsin(x^(1/2)),x, algorithm="giac")
```

output
```
(x - 1)*arcsin(sqrt(x)) + 1/2*sqrt(x)*sqrt(-x + 1) + 1/2*arcsin(sqrt(x))
```

### 3.363.9 Mupad [B] (verification not implemented)

Time = 0.77 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.00

$$\int \arcsin\left(\sqrt{x}\right)\,dx = x\,\mathrm{asin}\left(\sqrt{x}\right) - \mathrm{atan}\left(\frac{\sqrt{x}}{\sqrt{1-x}-1}\right) + \frac{\sqrt{x}\,\sqrt{1-x}}{2}$$

input
```
int(asin(x^(1/2)),x)
```

output
```
x*asin(x^(1/2)) - atan(x^(1/2)/((1 - x)^(1/2) - 1)) + (x^(1/2)*(1 - x)^(1/
2))/2
```

# 3.364 $\int \frac{\arcsin(\sqrt{x})}{x}\,dx$



## 3.364.1 Optimal result

Integrand size = 10, antiderivative size = 56

$$\int \frac{\arcsin(\sqrt{x})}{x}\,dx = -i\arcsin\left(\sqrt{x}\right)^2 + 2\arcsin\left(\sqrt{x}\right)\log\left(1-e^{2i\arcsin(\sqrt{x})}\right) - i\,\text{PolyLog}\left(2,e^{2i\arcsin(\sqrt{x})}\right)$$

output
```
-I*arcsin(x^(1/2))^2+2*arcsin(x^(1/2))*ln(1-(I*x^(1/2)+(1-x)^(1/2))^2)-I*p
olylog(2,(I*x^(1/2)+(1-x)^(1/2))^2)
```

## 3.364.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 53, normalized size of antiderivative = 0.95

$$\int \frac{\arcsin(\sqrt{x})}{x}\,dx = 2\arcsin\left(\sqrt{x}\right)\log\left(1-e^{2i\arcsin(\sqrt{x})}\right) - i\left(\arcsin\left(\sqrt{x}\right)^2 + \text{PolyLog}\left(2,e^{2i\arcsin(\sqrt{x})}\right)\right)$$

input
```
Integrate[ArcSin[Sqrt[x]]/x,x]
```

output
```
2*ArcSin[Sqrt[x]]*Log[1 - E^((2*I)*ArcSin[Sqrt[x]])] - I*(ArcSin[Sqrt[x]]^
2 + PolyLog[2, E^((2*I)*ArcSin[Sqrt[x]])])
```

### 3.364.3 Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.23, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.800, Rules used = {5329, 3042, 25, 4200, 25, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}dx$$

$$\Big\downarrow \text{5329}$$

$$2\int \frac{\sqrt{1-x}\arcsin\left(\sqrt{x}\right)}{\sqrt{x}}d\arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{3042}$$

$$2\int -\arcsin\left(\sqrt{x}\right)\tan\left(\arcsin\left(\sqrt{x}\right)+\frac{\pi}{2}\right)d\arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{25}$$

$$-2\int \arcsin\left(\sqrt{x}\right)\tan\left(\arcsin\left(\sqrt{x}\right)+\frac{\pi}{2}\right)d\arcsin\left(\sqrt{x}\right)$$

$$\Big\downarrow \text{4200}$$

$$2\left(2i\int -\frac{e^{2i\arcsin\left(\sqrt{x}\right)}\arcsin\left(\sqrt{x}\right)}{1-e^{2i\arcsin\left(\sqrt{x}\right)}}d\arcsin\left(\sqrt{x}\right)-\frac{1}{2}i\arcsin\left(\sqrt{x}\right)^2\right)$$

$$\Big\downarrow \text{25}$$

$$2\left(-2i\int \frac{e^{2i\arcsin\left(\sqrt{x}\right)}\arcsin\left(\sqrt{x}\right)}{1-e^{2i\arcsin\left(\sqrt{x}\right)}}d\arcsin\left(\sqrt{x}\right)-\frac{1}{2}i\arcsin\left(\sqrt{x}\right)^2\right)$$

$$\Big\downarrow \text{2620}$$

$$2\left(-2i\left(\frac{1}{2}i\arcsin\left(\sqrt{x}\right)\log\left(1-e^{2i\arcsin\left(\sqrt{x}\right)}\right)-\frac{1}{2}i\int \log\left(1-e^{2i\arcsin\left(\sqrt{x}\right)}\right)d\arcsin\left(\sqrt{x}\right)\right)-\frac{1}{2}i\arcsin\left(\sqrt{x}\right)^2\right)$$

$$\Big\downarrow \text{2715}$$

$$2\left(-2i\left(\frac{1}{2}i\arcsin\left(\sqrt{x}\right)\log\left(1-e^{2i\arcsin\left(\sqrt{x}\right)}\right)-\frac{1}{4}\int e^{-2i\arcsin\left(\sqrt{x}\right)}\log\left(1-e^{2i\arcsin\left(\sqrt{x}\right)}\right)de^{2i\arcsin\left(\sqrt{x}\right)}\right)-\frac{1}{2}i\,\text{arc}$$

$$\Big\downarrow \text{2838}$$

$$2\left(-2i\left(\frac{1}{4}\operatorname{PolyLog}\left(2,e^{2i\arcsin(\sqrt{x})}\right)+\frac{1}{2}i\arcsin\left(\sqrt{x}\right)\log\left(1-e^{2i\arcsin(\sqrt{x})}\right)\right)-\frac{1}{2}i\arcsin\left(\sqrt{x}\right)^2\right)$$

input
```
Int[ArcSin[Sqrt[x]]/x,x]
```

output
```
2*((-1/2*I)*ArcSin[Sqrt[x]]^2 - (2*I)*((I/2)*ArcSin[Sqrt[x]]*Log[1 - E^((2
*I)*ArcSin[Sqrt[x]])] + PolyLog[2, E^((2*I)*ArcSin[Sqrt[x]])]/4))
```

### 3.364.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

3.364. $\int \frac{\arcsin(\sqrt{x})}{x}\,dx$

rule 5329
```
Int[ArcSin[(a_.)*(x_)^(p_)]^(n_.)/(x_), x_Symbol] :> Simp[1/p   Subst[Int[x
^n*Cot[x], x], x, ArcSin[a*x^p]], x] /; FreeQ[{a, p}, x] && IGtQ[n, 0]
```

### 3.364.4 Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.73

| method | result |
|---|---|
| derivativedivides | $-i\arcsin\left(\sqrt{x}\right)^{2}+2\arcsin\left(\sqrt{x}\right)\ln\left(1+i\sqrt{x}+\sqrt{1-x}\right)-2i\,\mathrm{polylog}\left(2,-i\sqrt{x}-\sqrt{1-}\right.$ |
| default | $-i\arcsin\left(\sqrt{x}\right)^{2}+2\arcsin\left(\sqrt{x}\right)\ln\left(1+i\sqrt{x}+\sqrt{1-x}\right)-2i\,\mathrm{polylog}\left(2,-i\sqrt{x}-\sqrt{1-}\right.$ |

input
```
int(arcsin(x^(1/2))/x,x,method=_RETURNVERBOSE)
```

output
```
-I*arcsin(x^(1/2))^2+2*arcsin(x^(1/2))*ln(1+I*x^(1/2)+(1-x)^(1/2))-2*I*pol
ylog(2,-I*x^(1/2)-(1-x)^(1/2))+2*arcsin(x^(1/2))*ln(1-I*x^(1/2)-(1-x)^(1/2
))-2*I*polylog(2,I*x^(1/2)+(1-x)^(1/2))
```

### 3.364.5 Fricas [F]

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = \int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx$$

input
```
integrate(arcsin(x^(1/2))/x,x, algorithm="fricas")
```

output
```
integral(arcsin(sqrt(x))/x, x)
```

### 3.364.6 Sympy [F]

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = \int \frac{\operatorname{asin}\left(\sqrt{x}\right)}{x}\,dx$$

input
```
integrate(asin(x**(1/2))/x,x)
```

output
```
Integral(asin(sqrt(x))/x, x)
```

### 3.364.7 Maxima [F]

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = \int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx$$

input
```
integrate(arcsin(x^(1/2))/x,x, algorithm="maxima")
```

output
```
integrate(arcsin(sqrt(x))/x, x)
```

### 3.364.8 Giac [F]

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = \int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx$$

input
```
integrate(arcsin(x^(1/2))/x,x, algorithm="giac")
```

output
```
integrate(arcsin(sqrt(x))/x, x)
```

### 3.364.9 Mupad [B] (verification not implemented)

Time = 0.54 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.75

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x}\,dx = -\mathrm{polylog}\left(2, \mathrm{e}^{\mathrm{asin}\left(\sqrt{x}\right)\,2\mathrm{i}}\right)\,1\mathrm{i} - \mathrm{asin}\left(\sqrt{x}\right)^2\,1\mathrm{i} + 2\,\ln\left(1 - \mathrm{e}^{\mathrm{asin}\left(\sqrt{x}\right)\,2\mathrm{i}}\right)\,\mathrm{asin}\left(\sqrt{x}\right)$$

input
```
int(asin(x^(1/2))/x,x)
```

output
```
2*log(1 - exp(asin(x^(1/2))*2i))*asin(x^(1/2)) - asin(x^(1/2))^2*1i - poly
log(2, exp(asin(x^(1/2))*2i))*1i
```

# 3.365 $\int \frac{\arcsin(\sqrt{x})}{x^2} dx$



## 3.365.1 Optimal result

Integrand size = 10, antiderivative size = 28

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2} dx = -\frac{\sqrt{1-x}}{\sqrt{x}} - \frac{\arcsin\left(\sqrt{x}\right)}{x}$$

output
```
-arcsin(x^(1/2))/x-(1-x)^(1/2)/x^(1/2)
```

## 3.365.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.82

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2} dx = -\frac{\sqrt{x-x^2} + \arcsin\left(\sqrt{x}\right)}{x}$$

input
```
Integrate[ArcSin[Sqrt[x]]/x^2,x]
```

output
```
-((Sqrt[x - x^2] + ArcSin[Sqrt[x]])/x)
```

### 3.365.3 Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {5341, 27, 48}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}dx$$
$$\Big\downarrow \text{5341}$$
$$\int \frac{1}{2\sqrt{1-x}x^{3/2}}dx-\frac{\arcsin\left(\sqrt{x}\right)}{x}$$
$$\Big\downarrow \text{27}$$
$$\frac{1}{2}\int \frac{1}{\sqrt{1-x}x^{3/2}}dx-\frac{\arcsin\left(\sqrt{x}\right)}{x}$$
$$\Big\downarrow \text{48}$$
$$-\frac{\arcsin\left(\sqrt{x}\right)}{x}-\frac{\sqrt{1-x}}{\sqrt{x}}$$

input
```
Int[ArcSin[Sqrt[x]]/x^2,x]
```

output
```
-(Sqrt[1 - x]/Sqrt[x]) - ArcSin[Sqrt[x]]/x
```

#### 3.365.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 48
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && EqQ[m + n + 2, 0] && NeQ[m, -1]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.365.4 Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 23, normalized size of antiderivative = 0.82

| method | result | size |
|---|---|---|
| derivativedivides | $-\frac{\arcsin(\sqrt{x})}{x}-\frac{\sqrt{1-x}}{\sqrt{x}}$ | 23 |
| default | $-\frac{\arcsin(\sqrt{x})}{x}-\frac{\sqrt{1-x}}{\sqrt{x}}$ | 23 |
| parts | $-\frac{\arcsin(\sqrt{x})}{x}-\frac{\sqrt{1-x}}{\sqrt{x}}$ | 23 |

input
```
int(arcsin(x^(1/2))/x^2,x,method=_RETURNVERBOSE)
```

output
```
-arcsin(x^(1/2))/x-(1-x)^(1/2)/x^(1/2)
```

## 3.365.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 21, normalized size of antiderivative = 0.75

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = -\frac{\sqrt{x}\sqrt{-x+1}+\arcsin\left(\sqrt{x}\right)}{x}$$

input
```
integrate(arcsin(x^(1/2))/x^2,x, algorithm="fricas")
```

output
```
-(sqrt(x)*sqrt(-x + 1) + arcsin(sqrt(x)))/x
```

### 3.365.6 Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.58 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.50

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = \frac{\begin{cases} -\frac{2i\sqrt{x-1}}{\sqrt{x}} & \text{for } |x|>1 \\ -\frac{2\sqrt{1-x}}{\sqrt{x}} & \text{otherwise} \end{cases}}{2} - \frac{\operatorname{asin}\left(\sqrt{x}\right)}{x}$$

input
```
integrate(asin(x**(1/2))/x**2,x)
```

output
```
Piecewise((-2*I*sqrt(x - 1)/sqrt(x), Abs(x) > 1), (-2*sqrt(1 - x)/sqrt(x),
 True))/2 - asin(sqrt(x))/x
```

### 3.365.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 22, normalized size of antiderivative = 0.79

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = -\frac{\sqrt{-x+1}}{\sqrt{x}} - \frac{\arcsin\left(\sqrt{x}\right)}{x}$$

input
```
integrate(arcsin(x^(1/2))/x^2,x, algorithm="maxima")
```

output
```
-sqrt(-x + 1)/sqrt(x) - arcsin(sqrt(x))/x
```

### 3.365.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.43

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = -\frac{\sqrt{-x+1}-1}{2\sqrt{x}} - \frac{\arcsin\left(\sqrt{x}\right)}{x} + \frac{\sqrt{x}}{2\left(\sqrt{-x+1}-1\right)}$$

input
```
integrate(arcsin(x^(1/2))/x^2,x, algorithm="giac")
```

output
```
-1/2*(sqrt(-x + 1) - 1)/sqrt(x) - arcsin(sqrt(x))/x + 1/2*sqrt(x)/(sqrt(-x
 + 1) - 1)
```

### 3.365.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^2}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{x}\right)}{x^2}\,dx$$

input
```
int(asin(x^(1/2))/x^2,x)
```

output
```
int(asin(x^(1/2))/x^2, x)
```

# 3.366 $\int \frac{\arcsin(\sqrt{x})}{x^3} dx$



## 3.366.1 Optimal result

Integrand size = 10, antiderivative size = 50

$$\int \frac{\arcsin(\sqrt{x})}{x^3} dx = -\frac{\sqrt{1-x}}{6x^{3/2}} - \frac{\sqrt{1-x}}{3\sqrt{x}} - \frac{\arcsin(\sqrt{x})}{2x^2}$$

output
```
-1/2*arcsin(x^(1/2))/x^2-1/6*(1-x)^(1/2)/x^(3/2)-1/3*(1-x)^(1/2)/x^(1/2)
```

## 3.366.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.64

$$\int \frac{\arcsin(\sqrt{x})}{x^3} dx = -\frac{\sqrt{-((-1+x)x)}(1+2x) + 3\arcsin(\sqrt{x})}{6x^2}$$

input
```
Integrate[ArcSin[Sqrt[x]]/x^3,x]
```

output
```
-1/6*(Sqrt[-((-1 + x)*x)]*(1 + 2*x) + 3*ArcSin[Sqrt[x]])/x^2
```

### 3.366.3 Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.10, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {5341, 27, 55, 48}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}dx$$

$$\Big\downarrow \text{ 5341}$$

$$\frac{1}{2}\int \frac{1}{2\sqrt{1-x}x^{5/2}}dx-\frac{\arcsin\left(\sqrt{x}\right)}{2x^2}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{1}{4}\int \frac{1}{\sqrt{1-x}x^{5/2}}dx-\frac{\arcsin\left(\sqrt{x}\right)}{2x^2}$$

$$\Big\downarrow \text{ 55}$$

$$\frac{1}{4}\left(\frac{2}{3}\int \frac{1}{\sqrt{1-x}x^{3/2}}dx-\frac{2\sqrt{1-x}}{3x^{3/2}}\right)-\frac{\arcsin\left(\sqrt{x}\right)}{2x^2}$$

$$\Big\downarrow \text{ 48}$$

$$\frac{1}{4}\left(-\frac{2\sqrt{1-x}}{3x^{3/2}}-\frac{4\sqrt{1-x}}{3\sqrt{x}}\right)-\frac{\arcsin\left(\sqrt{x}\right)}{2x^2}$$

input
```
Int[ArcSin[Sqrt[x]]/x^3,x]
```

output
```
((-2*Sqrt[1 - x])/(3*x^(3/2)) - (4*Sqrt[1 - x])/(3*Sqrt[x]))/4 - ArcSin[Sq
rt[x]]/(2*x^2)
```

### 3.366.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 48
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && EqQ[m + n + 2, 0] && NeQ[m, -1]
```

rule 55
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Simp[d*(S
implify[m + n + 2]/((b*c - a*d)*(m + 1)))   Int[(a + b*x)^Simplify[m + 1]*(
c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && ILtQ[Simplify[m + n +
 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] && (EqQ[a, 0] || (NeQ[
c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimplerQ[m, 1] ||  !SumSimp
lerQ[n, 1])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.366.4 Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.70

| method | result | size |
|---|---|---|
| derivativedivides | $-\frac{\arcsin\left(\sqrt{x}\right)}{2x^{2}}-\frac{\sqrt{1-x}}{6x^{\frac{3}{2}}}-\frac{\sqrt{1-x}}{3\sqrt{x}}$ | 35 |
| default | $-\frac{\arcsin\left(\sqrt{x}\right)}{2x^{2}}-\frac{\sqrt{1-x}}{6x^{\frac{3}{2}}}-\frac{\sqrt{1-x}}{3\sqrt{x}}$ | 35 |
| parts | $-\frac{\arcsin\left(\sqrt{x}\right)}{2x^{2}}-\frac{\sqrt{1-x}}{6x^{\frac{3}{2}}}-\frac{\sqrt{1-x}}{3\sqrt{x}}$ | 35 |

input
```
int(arcsin(x^(1/2))/x^3,x,method=_RETURNVERBOSE)
```

output
```
-1/2*arcsin(x^(1/2))/x^2-1/6*(1-x)^(1/2)/x^(3/2)-1/3*(1-x)^(1/2)/x^(1/2)
```

## 3.366.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.56

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx = -\frac{(2\,x+1)\sqrt{x}\sqrt{-x+1}+3\,\arcsin\left(\sqrt{x}\right)}{6\,x^2}$$

input
```
integrate(arcsin(x^(1/2))/x^3,x, algorithm="fricas")
```

output
```
-1/6*((2*x + 1)*sqrt(x)*sqrt(-x + 1) + 3*arcsin(sqrt(x)))/x^2
```

## 3.366.6 Sympy [A] (verification not implemented)

Time = 2.73 (sec) , antiderivative size = 51, normalized size of antiderivative = 1.02

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx = \frac{\begin{cases} -\frac{\sqrt{1-x}}{\sqrt{x}} - \frac{(1-x)^{\frac{3}{2}}}{3x^{\frac{3}{2}}} & \text{for } \sqrt{x} > -1 \wedge \sqrt{x} < 1 \end{cases}}{2} - \frac{\operatorname{asin}\left(\sqrt{x}\right)}{2x^2}$$

input
```
integrate(asin(x**(1/2))/x**3,x)
```

output
```
Piecewise((-sqrt(1 - x)/sqrt(x) - (1 - x)**(3/2)/(3*x**(3/2)), (sqrt(x) >
-1) & (sqrt(x) < 1)))/2 - asin(sqrt(x))/(2*x**2)
```

## 3.366.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 34, normalized size of antiderivative = 0.68

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx = -\frac{\sqrt{-x+1}}{3\,\sqrt{x}} - \frac{\sqrt{-x+1}}{6\,x^{\frac{3}{2}}} - \frac{\arcsin\left(\sqrt{x}\right)}{2\,x^2}$$

input
```
integrate(arcsin(x^(1/2))/x^3,x, algorithm="maxima")
```

output
```
-1/3*sqrt(-x + 1)/sqrt(x) - 1/6*sqrt(-x + 1)/x^(3/2) - 1/2*arcsin(sqrt(x))
/x^2
```

### 3.366.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 74 vs. 2(34) = 68.

Time = 0.28 (sec) , antiderivative size = 74, normalized size of antiderivative = 1.48

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx = -\frac{\left(\sqrt{-x+1}-1\right)^3}{48\,x^{\frac{3}{2}}} - \frac{3\left(\sqrt{-x+1}-1\right)}{16\sqrt{x}} + \frac{x^{\frac{3}{2}}\left(\frac{9\left(\sqrt{-x+1}-1\right)^2}{x}+1\right)}{48\left(\sqrt{-x+1}-1\right)^3} - \frac{\arcsin\left(\sqrt{x}\right)}{2\,x^2}$$

input
```
integrate(arcsin(x^(1/2))/x^3,x, algorithm="giac")
```

output
```
-1/48*(sqrt(-x + 1) - 1)^3/x^(3/2) - 3/16*(sqrt(-x + 1) - 1)/sqrt(x) + 1/4
8*x^(3/2)*(9*(sqrt(-x + 1) - 1)^2/x + 1)/(sqrt(-x + 1) - 1)^3 - 1/2*arcsin
(sqrt(x))/x^2
```

### 3.366.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^3}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{x}\right)}{x^3}\,dx$$

input
```
int(asin(x^(1/2))/x^3,x)
```

output
```
int(asin(x^(1/2))/x^3, x)
```

# 3.367 $\int \frac{\arcsin(\sqrt{x})}{x^4}\,dx$



## 3.367.1 Optimal result

Integrand size = 10, antiderivative size = 68

$$\int \frac{\arcsin(\sqrt{x})}{x^4}\,dx = -\frac{\sqrt{1-x}}{15x^{5/2}} - \frac{4\sqrt{1-x}}{45x^{3/2}} - \frac{8\sqrt{1-x}}{45\sqrt{x}} - \frac{\arcsin(\sqrt{x})}{3x^3}$$

output
```
-1/3*arcsin(x^(1/2))/x^3-1/15*(1-x)^(1/2)/x^(5/2)-4/45*(1-x)^(1/2)/x^(3/2)
-8/45*(1-x)^(1/2)/x^(1/2)
```

## 3.367.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 44, normalized size of antiderivative = 0.65

$$\int \frac{\arcsin(\sqrt{x})}{x^4}\,dx = 2\left(-\frac{\sqrt{1-x}(3+4x+8x^2)}{90x^{5/2}} - \frac{\arcsin(\sqrt{x})}{6x^3}\right)$$

input
```
Integrate[ArcSin[Sqrt[x]]/x^4,x]
```

output
```
2*(-1/90*(Sqrt[1 - x]*(3 + 4*x + 8*x^2))/x^(5/2) - ArcSin[Sqrt[x]]/(6*x^3)
)
```

### 3.367.3 Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 78, normalized size of antiderivative = 1.15, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5341, 27, 55, 55, 48}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}dx$$

$$\Big\downarrow \text{ 5341}$$

$$\frac{1}{3}\int \frac{1}{2\sqrt{1-x}x^{7/2}}dx-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{1}{6}\int \frac{1}{\sqrt{1-x}x^{7/2}}dx-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}$$

$$\Big\downarrow \text{ 55}$$

$$\frac{1}{6}\left(\frac{4}{5}\int \frac{1}{\sqrt{1-x}x^{5/2}}dx-\frac{2\sqrt{1-x}}{5x^{5/2}}\right)-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}$$

$$\Big\downarrow \text{ 55}$$

$$\frac{1}{6}\left(\frac{4}{5}\left(\frac{2}{3}\int \frac{1}{\sqrt{1-x}x^{3/2}}dx-\frac{2\sqrt{1-x}}{3x^{3/2}}\right)-\frac{2\sqrt{1-x}}{5x^{5/2}}\right)-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}$$

$$\Big\downarrow \text{ 48}$$

$$\frac{1}{6}\left(\frac{4}{5}\left(-\frac{2\sqrt{1-x}}{3x^{3/2}}-\frac{4\sqrt{1-x}}{3\sqrt{x}}\right)-\frac{2\sqrt{1-x}}{5x^{5/2}}\right)-\frac{\arcsin\left(\sqrt{x}\right)}{3x^3}$$

input
```
Int[ArcSin[Sqrt[x]]/x^4,x]
```

output
```
((4*((-2*Sqrt[1 - x])/(3*x^(3/2)) - (4*Sqrt[1 - x])/(3*Sqrt[x])))/5 - (2*S
qrt[1 - x])/(5*x^(5/2)))/6 - ArcSin[Sqrt[x]]/(3*x^3)
```

### 3.367.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 48
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && EqQ[m + n + 2, 0] && NeQ[m, -1]
```

rule 55
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Simp[d*(S
implify[m + n + 2]/((b*c - a*d)*(m + 1)))   Int[(a + b*x)^Simplify[m + 1]*(
c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && ILtQ[Simplify[m + n +
 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] && (EqQ[a, 0] || (NeQ[
c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimplerQ[m, 1] ||  !SumSimp
lerQ[n, 1])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.367.4 Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.69

| method | result | size |
|---|---|---|
| derivativedivides | $-\frac{\arcsin\left(\sqrt{x}\right)}{3x^{3}}-\frac{\sqrt{1-x}}{15x^{\frac{5}{2}}}-\frac{4\sqrt{1-x}}{45x^{\frac{3}{2}}}-\frac{8\sqrt{1-x}}{45\sqrt{x}}$ | 47 |
| default | $-\frac{\arcsin\left(\sqrt{x}\right)}{3x^{3}}-\frac{\sqrt{1-x}}{15x^{\frac{5}{2}}}-\frac{4\sqrt{1-x}}{45x^{\frac{3}{2}}}-\frac{8\sqrt{1-x}}{45\sqrt{x}}$ | 47 |
| parts | $-\frac{\arcsin\left(\sqrt{x}\right)}{3x^{3}}-\frac{\sqrt{1-x}}{15x^{\frac{5}{2}}}-\frac{4\sqrt{1-x}}{45x^{\frac{3}{2}}}-\frac{8\sqrt{1-x}}{45\sqrt{x}}$ | 47 |

input
```
int(arcsin(x^(1/2))/x^4,x,method=_RETURNVERBOSE)
```

output
```
-1/3*arcsin(x^(1/2))/x^3-1/15*(1-x)^(1/2)/x^(5/2)-4/45*(1-x)^(1/2)/x^(3/2)
-8/45*(1-x)^(1/2)/x^(1/2)
```

### 3.367.5 Fricas [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 33, normalized size of antiderivative = 0.49

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = -\frac{(8\,x^2+4\,x+3)\sqrt{x}\sqrt{-x+1}+15\,\arcsin\left(\sqrt{x}\right)}{45\,x^3}$$

input
```
integrate(arcsin(x^(1/2))/x^4,x, algorithm="fricas")
```

output
```
-1/45*((8*x^2 + 4*x + 3)*sqrt(x)*sqrt(-x + 1) + 15*arcsin(sqrt(x)))/x^3
```

### 3.367.6 Sympy [A] (verification not implemented)

Time = 8.50 (sec) , antiderivative size = 66, normalized size of antiderivative = 0.97

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = \frac{\begin{cases} -\frac{\sqrt{1-x}}{\sqrt{x}} - \frac{2(1-x)^{\frac{3}{2}}}{3x^{\frac{3}{2}}} - \frac{(1-x)^{\frac{5}{2}}}{5x^{\frac{5}{2}}} & \text{for } \sqrt{x} > -1 \wedge \sqrt{x} < 1 \end{cases}}{3} - \frac{\operatorname{asin}\left(\sqrt{x}\right)}{3x^3}$$

input
```
integrate(asin(x**(1/2))/x**4,x)
```

output
```
Piecewise((-sqrt(1 - x)/sqrt(x) - 2*(1 - x)**(3/2)/(3*x**(3/2)) - (1 - x)*
*(5/2)/(5*x**(5/2)), (sqrt(x) > -1) & (sqrt(x) < 1)))/3 - asin(sqrt(x))/(3
*x**3)
```

### 3.367.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.68

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = -\frac{8\,\sqrt{-x+1}}{45\,\sqrt{x}} - \frac{4\,\sqrt{-x+1}}{45\,x^{\frac{3}{2}}} - \frac{\sqrt{-x+1}}{15\,x^{\frac{5}{2}}} - \frac{\arcsin\left(\sqrt{x}\right)}{3\,x^3}$$

input
```
integrate(arcsin(x^(1/2))/x^4,x, algorithm="maxima")
```

output
```
-8/45*sqrt(-x + 1)/sqrt(x) - 4/45*sqrt(-x + 1)/x^(3/2) - 1/15*sqrt(-x + 1)
/x^(5/2) - 1/3*arcsin(sqrt(x))/x^3
```

### 3.367.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 106 vs. $2(46) = 92$.

Time = 0.28 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.56

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = -\frac{\left(\sqrt{-x+1}-1\right)^5}{480\,x^{\frac{5}{2}}} - \frac{5\left(\sqrt{-x+1}-1\right)^3}{288\,x^{\frac{3}{2}}} - \frac{5\left(\sqrt{-x+1}-1\right)}{48\sqrt{x}} + \frac{\left(\frac{150\left(\sqrt{-x+1}-1\right)^4}{x^2} + \frac{25\left(\sqrt{-x+1}-1\right)^2}{x} + 3\right)x^{\frac{5}{2}}}{1440\left(\sqrt{-x+1}-1\right)^5} - \frac{\arcsin\left(\sqrt{x}\right)}{3\,x^3}$$

input
```
integrate(arcsin(x^(1/2))/x^4,x, algorithm="giac")
```

output
```
-1/480*(sqrt(-x + 1) - 1)^5/x^(5/2) - 5/288*(sqrt(-x + 1) - 1)^3/x^(3/2) -
 5/48*(sqrt(-x + 1) - 1)/sqrt(x) + 1/1440*(150*(sqrt(-x + 1) - 1)^4/x^2 +
25*(sqrt(-x + 1) - 1)^2/x + 3)*x^(5/2)/(sqrt(-x + 1) - 1)^5 - 1/3*arcsin(s
qrt(x))/x^3
```

### 3.367.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^4}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{x}\right)}{x^4}\,dx$$

input
```
int(asin(x^(1/2))/x^4,x)
```

output
```
int(asin(x^(1/2))/x^4, x)
```

# 3.368 $\int \frac{\arcsin(\sqrt{x})}{x^5} dx$



## 3.368.1 Optimal result

Integrand size = 10, antiderivative size = 86

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5} dx = -\frac{\sqrt{1-x}}{28x^{7/2}} - \frac{3\sqrt{1-x}}{70x^{5/2}} - \frac{2\sqrt{1-x}}{35x^{3/2}} - \frac{4\sqrt{1-x}}{35\sqrt{x}} - \frac{\arcsin\left(\sqrt{x}\right)}{4x^4}$$

output
```
-1/4*arcsin(x^(1/2))/x^4-1/28*(1-x)^(1/2)/x^(7/2)-3/70*(1-x)^(1/2)/x^(5/2)
-2/35*(1-x)^(1/2)/x^(3/2)-4/35*(1-x)^(1/2)/x^(1/2)
```

## 3.368.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.57

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5} dx = 2\left(-\frac{\sqrt{1-x}(5+6x+8x^2+16x^3)}{280x^{7/2}} - \frac{\arcsin\left(\sqrt{x}\right)}{8x^4}\right)$$

input
```
Integrate[ArcSin[Sqrt[x]]/x^5,x]
```

output
```
2*(-1/280*(Sqrt[1 - x]*(5 + 6*x + 8*x^2 + 16*x^3))/x^(7/2) - ArcSin[Sqrt[x
]]/(8*x^4))
```

### 3.368.3 Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.17, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {5341, 27, 55, 55, 55, 48}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{4}\int \frac{1}{2\sqrt{1-x}x^{9/2}}dx-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{8}\int \frac{1}{\sqrt{1-x}x^{9/2}}dx-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}$$

$$\Big\downarrow \text{55}$$

$$\frac{1}{8}\left(\frac{6}{7}\int \frac{1}{\sqrt{1-x}x^{7/2}}dx-\frac{2\sqrt{1-x}}{7x^{7/2}}\right)-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}$$

$$\Big\downarrow \text{55}$$

$$\frac{1}{8}\left(\frac{6}{7}\left(\frac{4}{5}\int \frac{1}{\sqrt{1-x}x^{5/2}}dx-\frac{2\sqrt{1-x}}{5x^{5/2}}\right)-\frac{2\sqrt{1-x}}{7x^{7/2}}\right)-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}$$

$$\Big\downarrow \text{55}$$

$$\frac{1}{8}\left(\frac{6}{7}\left(\frac{4}{5}\left(\frac{2}{3}\int \frac{1}{\sqrt{1-x}x^{3/2}}dx-\frac{2\sqrt{1-x}}{3x^{3/2}}\right)-\frac{2\sqrt{1-x}}{5x^{5/2}}\right)-\frac{2\sqrt{1-x}}{7x^{7/2}}\right)-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}$$

$$\Big\downarrow \text{48}$$

$$\frac{1}{8}\left(\frac{6}{7}\left(\frac{4}{5}\left(-\frac{2\sqrt{1-x}}{3x^{3/2}}-\frac{4\sqrt{1-x}}{3\sqrt{x}}\right)-\frac{2\sqrt{1-x}}{5x^{5/2}}\right)-\frac{2\sqrt{1-x}}{7x^{7/2}}\right)-\frac{\arcsin\left(\sqrt{x}\right)}{4x^4}$$

input
```
Int[ArcSin[Sqrt[x]]/x^5,x]
```

output
```
((6*((4*((-2*Sqrt[1 - x])/(3*x^(3/2)) - (4*Sqrt[1 - x])/(3*Sqrt[x])))/5 -
(2*Sqrt[1 - x])/(5*x^(5/2))))/7 - (2*Sqrt[1 - x])/(7*x^(7/2)))/8 - ArcSin[
Sqrt[x]]/(4*x^4)
```

---

3.368. $\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}dx$

### 3.368.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 48
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] /; FreeQ[{
a, b, c, d, m, n}, x] && EqQ[m + n + 2, 0] && NeQ[m, -1]
```

rule 55
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Simp[d*(S
implify[m + n + 2]/((b*c - a*d)*(m + 1)))   Int[(a + b*x)^Simplify[m + 1]*(
c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && ILtQ[Simplify[m + n +
 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] && (EqQ[a, 0] || (NeQ[
c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimplerQ[m, 1] ||  !SumSimp
lerQ[n, 1])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u]))/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.368.4 Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.69

| method | result | size |
|---|---|---|
| derivativedivides | $-\frac{\arcsin\left(\sqrt{x}\right)}{4x^{4}}-\frac{\sqrt{1-x}}{28x^{\frac{7}{2}}}-\frac{3\sqrt{1-x}}{70x^{\frac{5}{2}}}-\frac{2\sqrt{1-x}}{35x^{\frac{3}{2}}}-\frac{4\sqrt{1-x}}{35\sqrt{x}}$ | 59 |
| default | $-\frac{\arcsin\left(\sqrt{x}\right)}{4x^{4}}-\frac{\sqrt{1-x}}{28x^{\frac{7}{2}}}-\frac{3\sqrt{1-x}}{70x^{\frac{5}{2}}}-\frac{2\sqrt{1-x}}{35x^{\frac{3}{2}}}-\frac{4\sqrt{1-x}}{35\sqrt{x}}$ | 59 |
| parts | $-\frac{\arcsin\left(\sqrt{x}\right)}{4x^{4}}-\frac{\sqrt{1-x}}{28x^{\frac{7}{2}}}-\frac{3\sqrt{1-x}}{70x^{\frac{5}{2}}}-\frac{2\sqrt{1-x}}{35x^{\frac{3}{2}}}-\frac{4\sqrt{1-x}}{35\sqrt{x}}$ | 59 |

input
```
int(arcsin(x^(1/2))/x^5,x,method=_RETURNVERBOSE)
```

output
```
-1/4*arcsin(x^(1/2))/x^4-1/28*(1-x)^(1/2)/x^(7/2)-3/70*(1-x)^(1/2)/x^(5/2)
-2/35*(1-x)^(1/2)/x^(3/2)-4/35*(1-x)^(1/2)/x^(1/2)
```

### 3.368.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.44

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = -\frac{(16\,x^3+8\,x^2+6\,x+5)\sqrt{x}\sqrt{-x+1}+35\,\arcsin\left(\sqrt{x}\right)}{140\,x^4}$$

input
```
integrate(arcsin(x^(1/2))/x^5,x, algorithm="fricas")
```

output
```
-1/140*((16*x^3 + 8*x^2 + 6*x + 5)*sqrt(x)*sqrt(-x + 1) + 35*arcsin(sqrt(x
)))/x^4
```

### 3.368.6 Sympy [A] (verification not implemented)

Time = 25.75 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.91

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = \frac{\begin{cases} -\frac{\sqrt{1-x}}{\sqrt{x}} - \frac{(1-x)^{\frac{3}{2}}}{x^{\frac{3}{2}}} - \frac{3(1-x)^{\frac{5}{2}}}{5x^{\frac{5}{2}}} - \frac{(1-x)^{\frac{7}{2}}}{7x^{\frac{7}{2}}} & \text{for } \sqrt{x} > -1 \wedge \sqrt{x} < 1 \end{cases}}{4} - \frac{\operatorname{asin}\left(\sqrt{x}\right)}{4x^4}$$

input
```
integrate(asin(x**(1/2))/x**5,x)
```

output
```
Piecewise((-sqrt(1 - x)/sqrt(x) - (1 - x)**(3/2)/x**(3/2) - 3*(1 - x)**(5/
2)/(5*x**(5/2)) - (1 - x)**(7/2)/(7*x**(7/2)), (sqrt(x) > -1) & (sqrt(x) <
 1)))/4 - asin(sqrt(x))/(4*x**4)
```

### 3.368.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.67

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = -\frac{4\sqrt{-x+1}}{35\sqrt{x}} - \frac{2\sqrt{-x+1}}{35\,x^{\frac{3}{2}}} - \frac{3\sqrt{-x+1}}{70\,x^{\frac{5}{2}}} - \frac{\sqrt{-x+1}}{28\,x^{\frac{7}{2}}} - \frac{\arcsin\left(\sqrt{x}\right)}{4\,x^4}$$

input
```
integrate(arcsin(x^(1/2))/x^5,x, algorithm="maxima")
```

output
```
-4/35*sqrt(-x + 1)/sqrt(x) - 2/35*sqrt(-x + 1)/x^(3/2) - 3/70*sqrt(-x + 1)
/x^(5/2) - 1/28*sqrt(-x + 1)/x^(7/2) - 1/4*arcsin(sqrt(x))/x^4
```

### 3.368.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 138 vs. 2(58) = 116.

Time = 0.27 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.60

$$\begin{aligned}\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = & -\frac{\left(\sqrt{-x+1}-1\right)^7}{3584\,x^{\frac{7}{2}}} - \frac{7\left(\sqrt{-x+1}-1\right)^5}{2560\,x^{\frac{5}{2}}} \\ & - \frac{7\left(\sqrt{-x+1}-1\right)^3}{512\,x^{\frac{3}{2}}} - \frac{35\left(\sqrt{-x+1}-1\right)}{512\sqrt{x}} \\ & + \frac{\left(\frac{1225\left(\sqrt{-x+1}-1\right)^6}{x^3} + \frac{245\left(\sqrt{-x+1}-1\right)^4}{x^2} + \frac{49\left(\sqrt{-x+1}-1\right)^2}{x} + 5\right)x^{\frac{7}{2}}}{17920\left(\sqrt{-x+1}-1\right)^7} \\ & - \frac{\arcsin\left(\sqrt{x}\right)}{4\,x^4}\end{aligned}$$

input
```
integrate(arcsin(x^(1/2))/x^5,x, algorithm="giac")
```

output
```
-1/3584*(sqrt(-x + 1) - 1)^7/x^(7/2) - 7/2560*(sqrt(-x + 1) - 1)^5/x^(5/2)
 - 7/512*(sqrt(-x + 1) - 1)^3/x^(3/2) - 35/512*(sqrt(-x + 1) - 1)/sqrt(x)
+ 1/17920*(1225*(sqrt(-x + 1) - 1)^6/x^3 + 245*(sqrt(-x + 1) - 1)^4/x^2 +
49*(sqrt(-x + 1) - 1)^2/x + 5)*x^(7/2)/(sqrt(-x + 1) - 1)^7 - 1/4*arcsin(s
qrt(x))/x^4
```

### 3.368.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{x}\right)}{x^5}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{x}\right)}{x^5}\,dx$$

input
```
int(asin(x^(1/2))/x^5,x)
```

output
```
int(asin(x^(1/2))/x^5, x)
```

# 3.369 $\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$



## 3.369.1 Optimal result

Integrand size = 14, antiderivative size = 89

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{3}{40}bc^3\sqrt{1-\frac{c^2}{x^2}}x^2+\frac{1}{20}bc\sqrt{1-\frac{c^2}{x^2}}x^4+\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{3}{40}bc^5\text{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)$$

output
```
1/5*x^5*(a+b*arcsin(c/x))+3/40*b*c^5*arctanh((1-c^2/x^2)^(1/2))+3/40*b*c^3
*x^2*(1-c^2/x^2)^(1/2)+1/20*b*c*x^4*(1-c^2/x^2)^(1/2)
```

## 3.369.2 Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.02

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^5}{5}+b\sqrt{\frac{-c^2+x^2}{x^2}}\left(\frac{3c^3x^2}{40}+\frac{cx^4}{20}\right)+\frac{1}{5}bx^5\arcsin\left(\frac{c}{x}\right)+\frac{3}{40}bc^5\log\left(x\left(1+\sqrt{\frac{-c^2+x^2}{x^2}}\right)\right)$$

input
```
Integrate[x^4*(a + b*ArcSin[c/x]),x]
```

output
```
(a*x^5)/5 + b*Sqrt[(-c^2 + x^2)/x^2]*((3*c^3*x^2)/40 + (c*x^4)/20) + (b*x^
5*ArcSin[c/x])/5 + (3*b*c^5*Log[x*(1 + Sqrt[(-c^2 + x^2)/x^2])])/40
```

### 3.369.3 Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 93, normalized size of antiderivative = 1.04, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {5341, 25, 27, 798, 52, 52, 73, 221}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)-\frac{1}{5}b\int -\frac{cx^3}{\sqrt{1-\frac{c^2}{x^2}}}dx$$

$$\Big\downarrow \text{25}$$

$$\frac{1}{5}b\int \frac{cx^3}{\sqrt{1-\frac{c^2}{x^2}}}dx+\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{5}bc\int \frac{x^3}{\sqrt{1-\frac{c^2}{x^2}}}dx+\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)$$

$$\Big\downarrow \text{798}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)-\frac{1}{10}bc\int \frac{x^6}{\sqrt{1-\frac{c^2}{x^2}}}d\frac{1}{x^2}$$

$$\Big\downarrow \text{52}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)-\frac{1}{10}bc\left(\frac{3}{4}c^2\int \frac{x^4}{\sqrt{1-\frac{c^2}{x^2}}}d\frac{1}{x^2}-\frac{1}{2}x^4\sqrt{1-\frac{c^2}{x^2}}\right)$$

$$\Big\downarrow \text{52}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)-\frac{1}{10}bc\left(\frac{3}{4}c^2\left(\frac{1}{2}c^2\int \frac{x^2}{\sqrt{1-\frac{c^2}{x^2}}}d\frac{1}{x^2}-x^2\sqrt{1-\frac{c^2}{x^2}}\right)-\frac{1}{2}x^4\sqrt{1-\frac{c^2}{x^2}}\right)$$

$$\Big\downarrow \text{73}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)-$$
$$\frac{1}{10}bc\left(\frac{3}{4}c^2\left(x^2\left(-\sqrt{1-\frac{c^2}{x^2}}\right)-\int\frac{1}{\frac{1}{c^2}-\frac{1}{c^2x^4}}d\sqrt{1-\frac{c^2}{x^2}}\right)-\frac{1}{2}x^4\sqrt{1-\frac{c^2}{x^2}}\right)$$

$$\Big\downarrow \text{ 221}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(\frac{c}{x}\right)\right)-$$
$$\frac{1}{10}bc\left(\frac{3}{4}c^2\left(c^2\left(-\text{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)\right)-x^2\sqrt{1-\frac{c^2}{x^2}}\right)-\frac{1}{2}x^4\sqrt{1-\frac{c^2}{x^2}}\right)$$

input
```
Int[x^4*(a + b*ArcSin[c/x]),x]
```

output
```
(x^5*(a + b*ArcSin[c/x]))/5 - (b*c*(-1/2*(Sqrt[1 - c^2/x^2]*x^4) + (3*c^2*
(-(Sqrt[1 - c^2/x^2]*x^2) - c^2*ArcTanh[Sqrt[1 - c^2/x^2]]))/4))/10
```

### 3.369.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 52
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Simp[d*((
m + n + 2)/((b*c - a*d)*(m + 1)))   Int[(a + b*x)^(m + 1)*(c + d*x)^n, x],
x] /; FreeQ[{a, b, c, d, n}, x] && ILtQ[m, -1] && FractionQ[n] && LtQ[n, 0]
```

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 798
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[1/n   Subst
[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a,
b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.369.4 Maple [A] (verified)

Time = 0.46 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.94

| method | result | size |
|---|---|---|
| parts | $\frac{a\,x^{5}}{5}-b\,c^{5}\left(-\frac{x^{5}\arcsin\left(\frac{c}{x}\right)}{5c^{5}}-\frac{x^{4}\sqrt{1-\frac{c^{2}}{x^{2}}}}{20c^{4}}-\frac{3x^{2}\sqrt{1-\frac{c^{2}}{x^{2}}}}{40c^{2}}-\frac{3\,\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^{2}}{x^{2}}}}\right)}{40}\right)$ | 84 |
| derivativedivides | $-c^{5}\left(-\frac{a\,x^{5}}{5c^{5}}+b\left(-\frac{x^{5}\arcsin\left(\frac{c}{x}\right)}{5c^{5}}-\frac{x^{4}\sqrt{1-\frac{c^{2}}{x^{2}}}}{20c^{4}}-\frac{3x^{2}\sqrt{1-\frac{c^{2}}{x^{2}}}}{40c^{2}}-\frac{3\,\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^{2}}{x^{2}}}}\right)}{40}\right)\right)$ | 88 |
| default | $-c^{5}\left(-\frac{a\,x^{5}}{5c^{5}}+b\left(-\frac{x^{5}\arcsin\left(\frac{c}{x}\right)}{5c^{5}}-\frac{x^{4}\sqrt{1-\frac{c^{2}}{x^{2}}}}{20c^{4}}-\frac{3x^{2}\sqrt{1-\frac{c^{2}}{x^{2}}}}{40c^{2}}-\frac{3\,\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^{2}}{x^{2}}}}\right)}{40}\right)\right)$ | 88 |

input
```
int(x^4*(a+b*arcsin(c/x)),x,method=_RETURNVERBOSE)
```

output
```
1/5*a*x^5-b*c^5*(-1/5/c^5*x^5*arcsin(c/x)-1/20/c^4*x^4*(1-c^2/x^2)^(1/2)-3
/40/c^2*x^2*(1-c^2/x^2)^(1/2)-3/40*arctanh(1/(1-c^2/x^2)^(1/2)))
```

### 3.369.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.33

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=-\frac{3}{40}\,bc^5\log\left(x\sqrt{-\frac{c^2-x^2}{x^2}}-x\right)+\frac{1}{5}\,ax^5+\frac{1}{5}\left(bx^5-b\right)\arcsin\left(\frac{c}{x}\right)-\frac{2}{5}\,b\arctan\left(\frac{x\sqrt{-\frac{c^2-x^2}{x^2}}-x}{c}\right)+\frac{1}{40}\left(3\,bc^3x^2+2\,bcx^4\right)\sqrt{-\frac{c^2-x^2}{x^2}}$$

input
```
integrate(x^4*(a+b*arcsin(c/x)),x, algorithm="fricas")
```

output
```
-3/40*b*c^5*log(x*sqrt(-(c^2 - x^2)/x^2) - x) + 1/5*a*x^5 + 1/5*(b*x^5 - b
)*arcsin(c/x) - 2/5*b*arctan((x*sqrt(-(c^2 - x^2)/x^2) - x)/c) + 1/40*(3*b
*c^3*x^2 + 2*b*c*x^4)*sqrt(-(c^2 - x^2)/x^2)
```

### 3.369.6 Sympy [A] (verification not implemented)

Time = 3.73 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.97

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^5}{5}+\frac{bc\left(\begin{cases}\frac{3c^4\operatorname{acosh}\left(\frac{x}{c}\right)}{8}-\frac{3c^3x}{8\sqrt{-1+\frac{x^2}{c^2}}}+\frac{cx^3}{8\sqrt{-1+\frac{x^2}{c^2}}}+\frac{x^5}{4c\sqrt{-1+\frac{x^2}{c^2}}} & \text{for}\ \left|\frac{x^2}{c^2}\right|>1\\ -\frac{3ic^4\operatorname{asin}\left(\frac{x}{c}\right)}{8}+\frac{3ic^3x}{8\sqrt{1-\frac{x^2}{c^2}}}-\frac{icx^3}{8\sqrt{1-\frac{x^2}{c^2}}}-\frac{ix^5}{4c\sqrt{1-\frac{x^2}{c^2}}} & \text{otherwise}\end{cases}\right)}{5}+\frac{bx^5\operatorname{asin}\left(\frac{c}{x}\right)}{5}$$

input
```
integrate(x**4*(a+b*asin(c/x)),x)
```

output
```
a*x**5/5 + b*c*Piecewise((3*c**4*acosh(x/c)/8 - 3*c**3*x/(8*sqrt(-1 + x**2
/c**2)) + c*x**3/(8*sqrt(-1 + x**2/c**2)) + x**5/(4*c*sqrt(-1 + x**2/c**2)
), Abs(x**2/c**2) > 1), (-3*I*c**4*asin(x/c)/8 + 3*I*c**3*x/(8*sqrt(1 - x*
*2/c**2)) - I*c*x**3/(8*sqrt(1 - x**2/c**2)) - I*x**5/(4*c*sqrt(1 - x**2/c
**2)), True))/5 + b*x**5*asin(c/x)/5
```

### 3.369.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.40

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{5}\,ax^5$$
$$+\frac{1}{80}\left(16\,x^5\arcsin\left(\frac{c}{x}\right)+\left(3\,c^4\log\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)-3\,c^4\log\left(\sqrt{-\frac{c^2}{x^2}+1}-1\right)-\frac{2\left(3\,c^4\left(-\frac{c^2}{x^2}+1\right.\right.}{\left(\frac{c^2}{x^2}-1\right.}\right.\right.$$

input
```
integrate(x^4*(a+b*arcsin(c/x)),x, algorithm="maxima")
```

output
```
1/5*a*x^5 + 1/80*(16*x^5*arcsin(c/x) + (3*c^4*log(sqrt(-c^2/x^2 + 1) + 1)
- 3*c^4*log(sqrt(-c^2/x^2 + 1) - 1) - 2*(3*c^4*(-c^2/x^2 + 1)^(3/2) - 5*c^
4*sqrt(-c^2/x^2 + 1))/((c^2/x^2 - 1)^2 + 2*c^2/x^2 - 1))*c)*b
```

### 3.369.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 464 vs. $2(75) = 150$.

Time = 1.01 (sec) , antiderivative size = 464, normalized size of antiderivative = 5.21

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$$
$$=\frac{2\,bcx^5\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^5\arcsin\left(\frac{c}{x}\right)+2\,acx^5\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^5+bc^2x^4\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^4+10\,bc^3x^3\left(\right.}{}$$

input
```
integrate(x^4*(a+b*arcsin(c/x)),x, algorithm="giac")
```

output
```
1/320*(2*b*c*x^5*(sqrt(-c^2/x^2 + 1) + 1)^5*arcsin(c/x) + 2*a*c*x^5*(sqrt(
-c^2/x^2 + 1) + 1)^5 + b*c^2*x^4*(sqrt(-c^2/x^2 + 1) + 1)^4 + 10*b*c^3*x^3
*(sqrt(-c^2/x^2 + 1) + 1)^3*arcsin(c/x) + 10*a*c^3*x^3*(sqrt(-c^2/x^2 + 1)
 + 1)^3 + 8*b*c^4*x^2*(sqrt(-c^2/x^2 + 1) + 1)^2 + 20*b*c^5*x*(sqrt(-c^2/x
^2 + 1) + 1)*arcsin(c/x) + 20*a*c^5*x*(sqrt(-c^2/x^2 + 1) + 1) + 24*b*c^6*
log(sqrt(-c^2/x^2 + 1) + 1) - 24*b*c^6*log(abs(c)/abs(x)) + 20*b*c^7*arcsi
n(c/x)/(x*(sqrt(-c^2/x^2 + 1) + 1)) + 20*a*c^7/(x*(sqrt(-c^2/x^2 + 1) + 1)
) - 8*b*c^8/(x^2*(sqrt(-c^2/x^2 + 1) + 1)^2) + 10*b*c^9*arcsin(c/x)/(x^3*(
sqrt(-c^2/x^2 + 1) + 1)^3) + 10*a*c^9/(x^3*(sqrt(-c^2/x^2 + 1) + 1)^3) - b
*c^10/(x^4*(sqrt(-c^2/x^2 + 1) + 1)^4) + 2*b*c^11*arcsin(c/x)/(x^5*(sqrt(-
c^2/x^2 + 1) + 1)^5) + 2*a*c^11/(x^5*(sqrt(-c^2/x^2 + 1) + 1)^5))/c
```

### 3.369.9 Mupad [F(-1)]

Timed out.

$$\int x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\int x^4\left(a+b\,\mathrm{asin}\left(\frac{c}{x}\right)\right)\,dx$$

input
```
int(x^4*(a + b*asin(c/x)),x)
```

output
```
int(x^4*(a + b*asin(c/x)), x)
```

# 3.370 $\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$



## 3.370.1 Optimal result

Integrand size = 14, antiderivative size = 64

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{6}bc^3\sqrt{1-\frac{c^2}{x^2}}x+\frac{1}{12}bc\sqrt{1-\frac{c^2}{x^2}}x^3+\frac{1}{4}x^4\left(a+b\arcsin\left(\frac{c}{x}\right)\right)$$

output
```
1/4*x^4*(a+b*arcsin(c/x))+1/6*b*c^3*x*(1-c^2/x^2)^(1/2)+1/12*b*c*x^3*(1-c^
2/x^2)^(1/2)
```

## 3.370.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.92

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^4}{4}+b\sqrt{\frac{-c^2+x^2}{x^2}}\left(\frac{c^3x}{6}+\frac{cx^3}{12}\right)+\frac{1}{4}bx^4\arcsin\left(\frac{c}{x}\right)$$

input
```
Integrate[x^3*(a + b*ArcSin[c/x]),x]
```

output
```
(a*x^4)/4 + b*Sqrt[(-c^2 + x^2)/x^2]*((c^3*x)/6 + (c*x^3)/12) + (b*x^4*Arc
Sin[c/x])/4
```

### 3.370.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.06, number of steps used = 5, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {5341, 25, 27, 803, 746}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3 \left(a+b \arcsin \left(\frac{c}{x}\right)\right) \, dx$$

$$\Big\downarrow \text{ 5341}$$

$$\frac{1}{4} x^4 \left(a+b \arcsin \left(\frac{c}{x}\right)\right)-\frac{1}{4} b \int -\frac{c x^2}{\sqrt{1-\frac{c^2}{x^2}}}dx$$

$$\Big\downarrow \text{ 25}$$

$$\frac{1}{4} b \int \frac{c x^2}{\sqrt{1-\frac{c^2}{x^2}}}dx+\frac{1}{4} x^4 \left(a+b \arcsin \left(\frac{c}{x}\right)\right)$$

$$\Big\downarrow \text{ 27}$$

$$\frac{1}{4} b c \int \frac{x^2}{\sqrt{1-\frac{c^2}{x^2}}}dx+\frac{1}{4} x^4 \left(a+b \arcsin \left(\frac{c}{x}\right)\right)$$

$$\Big\downarrow \text{ 803}$$

$$\frac{1}{4} b c \left(\frac{2}{3} c^2 \int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}}dx+\frac{1}{3} x^3 \sqrt{1-\frac{c^2}{x^2}}\right)+\frac{1}{4} x^4 \left(a+b \arcsin \left(\frac{c}{x}\right)\right)$$

$$\Big\downarrow \text{ 746}$$

$$\frac{1}{4} x^4 \left(a+b \arcsin \left(\frac{c}{x}\right)\right)+\frac{1}{4} b c \left(\frac{2}{3} c^2 x \sqrt{1-\frac{c^2}{x^2}}+\frac{1}{3} x^3 \sqrt{1-\frac{c^2}{x^2}}\right)$$

input
```
Int[x^3*(a + b*ArcSin[c/x]),x]
```

output
```
(b*c*((2*c^2*Sqrt[1 - c^2/x^2]*x)/3 + (Sqrt[1 - c^2/x^2]*x^3)/3))/4 + (x^4
*(a + b*ArcSin[c/x]))/4
```

### 3.370.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 746
```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

rule 803
```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x^(m + 1)*((
a + b*x^n)^(p + 1)/(a*(m + 1))), x] - Simp[b*((m + n*(p + 1) + 1)/(a*(m + 1
)))   Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && I
LtQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.370.4 Maple [A] (verified)

Time = 0.31 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.05

| method | result | size |
|---|---|---|
| parts | $\frac{a\,x^{4}}{4}-b\,c^{4}\left(-\frac{x^{4}\arcsin\left(\frac{c}{x}\right)}{4c^{4}}-\frac{x^{3}\sqrt{1-\frac{c^{2}}{x^{2}}}}{12c^{3}}-\frac{x\sqrt{1-\frac{c^{2}}{x^{2}}}}{6c}\right)$ | 67 |
| derivativedivides | $-c^{4}\left(-\frac{a\,x^{4}}{4c^{4}}+b\left(-\frac{x^{4}\arcsin\left(\frac{c}{x}\right)}{4c^{4}}-\frac{x^{3}\sqrt{1-\frac{c^{2}}{x^{2}}}}{12c^{3}}-\frac{x\sqrt{1-\frac{c^{2}}{x^{2}}}}{6c}\right)\right)$ | 71 |
| default | $-c^{4}\left(-\frac{a\,x^{4}}{4c^{4}}+b\left(-\frac{x^{4}\arcsin\left(\frac{c}{x}\right)}{4c^{4}}-\frac{x^{3}\sqrt{1-\frac{c^{2}}{x^{2}}}}{12c^{3}}-\frac{x\sqrt{1-\frac{c^{2}}{x^{2}}}}{6c}\right)\right)$ | 71 |

input
```
int(x^3*(a+b*arcsin(c/x)),x,method=_RETURNVERBOSE)
```

output
```
1/4*a*x^4-b*c^4*(-1/4/c^4*x^4*arcsin(c/x)-1/12/c^3*x^3*(1-c^2/x^2)^(1/2)-1
/6/c*x*(1-c^2/x^2)^(1/2))
```

### 3.370.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.80

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{4}\,bx^4\arcsin\left(\frac{c}{x}\right)+\frac{1}{4}\,ax^4+\frac{1}{12}\,\left(2\,bc^3x+bcx^3\right)\sqrt{-\frac{c^2-x^2}{x^2}}$$

input
```
integrate(x^3*(a+b*arcsin(c/x)),x, algorithm="fricas")
```

output
```
1/4*b*x^4*arcsin(c/x) + 1/4*a*x^4 + 1/12*(2*b*c^3*x + b*c*x^3)*sqrt(-(c^2
- x^2)/x^2)
```

### 3.370.6 Sympy [A] (verification not implemented)

Time = 1.43 (sec) , antiderivative size = 107, normalized size of antiderivative = 1.67

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^4}{4}+\frac{bc\left(\begin{cases}\frac{2c^3\sqrt{-1+\frac{x^2}{c^2}}}{3}+\frac{cx^2\sqrt{-1+\frac{x^2}{c^2}}}{3} & \text{for }\left|\frac{x^2}{c^2}\right|>1\\ \frac{2ic^3\sqrt{1-\frac{x^2}{c^2}}}{3}+\frac{icx^2\sqrt{1-\frac{x^2}{c^2}}}{3} & \text{otherwise}\end{cases}\right)}{4}+\frac{bx^4\operatorname{asin}\left(\frac{c}{x}\right)}{4}$$

input
```
integrate(x**3*(a+b*asin(c/x)),x)
```

output
```
a*x**4/4 + b*c*Piecewise((2*c**3*sqrt(-1 + x**2/c**2)/3 + c*x**2*sqrt(-1 +
 x**2/c**2)/3, Abs(x**2/c**2) > 1), (2*I*c**3*sqrt(1 - x**2/c**2)/3 + I*c*
x**2*sqrt(1 - x**2/c**2)/3, True))/4 + b*x**4*asin(c/x)/4
```

### 3.370.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.92

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = \frac{1}{4}\,ax^4+\frac{1}{12}\left(3\,x^4\arcsin\left(\frac{c}{x}\right)+\left(x^3\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}}+3\,c^2x\sqrt{-\frac{c^2}{x^2}+1}\right)c\right)b$$

input
```
integrate(x^3*(a+b*arcsin(c/x)),x, algorithm="maxima")
```

output
```
1/4*a*x^4 + 1/12*(3*x^4*arcsin(c/x) + (x^3*(-c^2/x^2 + 1)^(3/2) + 3*c^2*x*
sqrt(-c^2/x^2 + 1))*c)*b
```

### 3.370.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 340 vs. 2(54) = 108.

Time = 0.29 (sec) , antiderivative size = 340, normalized size of antiderivative = 5.31

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = \frac{3\,bcx^4\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^4\arcsin\left(\frac{c}{x}\right)+3\,acx^4\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^4+2\,bc^2x^3\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^3+12\,bc^3x^2\left(\right.}{}$$

input
```
integrate(x^3*(a+b*arcsin(c/x)),x, algorithm="giac")
```

output
```
1/192*(3*b*c*x^4*(sqrt(-c^2/x^2 + 1) + 1)^4*arcsin(c/x) + 3*a*c*x^4*(sqrt(
-c^2/x^2 + 1) + 1)^4 + 2*b*c^2*x^3*(sqrt(-c^2/x^2 + 1) + 1)^3 + 12*b*c^3*x
^2*(sqrt(-c^2/x^2 + 1) + 1)^2*arcsin(c/x) + 12*a*c^3*x^2*(sqrt(-c^2/x^2 +
1) + 1)^2 + 18*b*c^4*x*(sqrt(-c^2/x^2 + 1) + 1) + 18*b*c^5*arcsin(c/x) + 1
8*a*c^5 - 18*b*c^6/(x*(sqrt(-c^2/x^2 + 1) + 1)) + 12*b*c^7*arcsin(c/x)/(x^
2*(sqrt(-c^2/x^2 + 1) + 1)^2) + 12*a*c^7/(x^2*(sqrt(-c^2/x^2 + 1) + 1)^2)
- 2*b*c^8/(x^3*(sqrt(-c^2/x^2 + 1) + 1)^3) + 3*b*c^9*arcsin(c/x)/(x^4*(sqr
t(-c^2/x^2 + 1) + 1)^4) + 3*a*c^9/(x^4*(sqrt(-c^2/x^2 + 1) + 1)^4))/c
```

### 3.370.9 Mupad [F(-1)]

Timed out.

$$\int x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\int x^3\left(a+b\,\mathrm{asin}\left(\frac{c}{x}\right)\right)\,dx$$

input
```
int(x^3*(a + b*asin(c/x)),x)
```

output
```
int(x^3*(a + b*asin(c/x)), x)
```

# 3.371 $\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$



## 3.371.1 Optimal result

Integrand size = 14, antiderivative size = 64

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{6}bc\sqrt{1-\frac{c^2}{x^2}}x^2+\frac{1}{3}x^3\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{6}bc^3\text{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)$$

output
```
1/3*x^3*(a+b*arcsin(c/x))+1/6*b*c^3*arctanh((1-c^2/x^2)^(1/2))+1/6*b*c*x^2
*(1-c^2/x^2)^(1/2)
```

## 3.371.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 79, normalized size of antiderivative = 1.23

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^3}{3}+\frac{1}{6}bcx^2\sqrt{\frac{-c^2+x^2}{x^2}}+\frac{1}{3}bx^3\arcsin\left(\frac{c}{x}\right)+\frac{1}{6}bc^3\log\left(x\left(1+\sqrt{\frac{-c^2+x^2}{x^2}}\right)\right)$$

input
```
Integrate[x^2*(a + b*ArcSin[c/x]),x]
```

output
```
(a*x^3)/3 + (b*c*x^2*Sqrt[(-c^2 + x^2)/x^2])/6 + (b*x^3*ArcSin[c/x])/3 + (
b*c^3*Log[x*(1 + Sqrt[(-c^2 + x^2)/x^2])])/6
```

### 3.371.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5341, 25, 27, 798, 52, 73, 221}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) dx$$

$$\Big\downarrow \; 5341$$

$$\frac{1}{3} x^3 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{3} b \int -\frac{cx}{\sqrt{1-\frac{c^2}{x^2}}} dx$$

$$\Big\downarrow \; 25$$

$$\frac{1}{3} b \int \frac{cx}{\sqrt{1-\frac{c^2}{x^2}}} dx + \frac{1}{3} x^3 \left(a + b \arcsin\left(\frac{c}{x}\right)\right)$$

$$\Big\downarrow \; 27$$

$$\frac{1}{3} bc \int \frac{x}{\sqrt{1-\frac{c^2}{x^2}}} dx + \frac{1}{3} x^3 \left(a + b \arcsin\left(\frac{c}{x}\right)\right)$$

$$\Big\downarrow \; 798$$

$$\frac{1}{3} x^3 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{6} bc \int \frac{x^4}{\sqrt{1-\frac{c^2}{x^2}}} d\frac{1}{x^2}$$

$$\Big\downarrow \; 52$$

$$\frac{1}{3} x^3 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{6} bc \left(\frac{1}{2} c^2 \int \frac{x^2}{\sqrt{1-\frac{c^2}{x^2}}} d\frac{1}{x^2} - x^2 \sqrt{1-\frac{c^2}{x^2}}\right)$$

$$\Big\downarrow \; 73$$

$$\frac{1}{3} x^3 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{6} bc \left(x^2 \left(-\sqrt{1-\frac{c^2}{x^2}}\right) - \int \frac{1}{\frac{1}{c^2} - \frac{1}{c^2 x^4}} d\sqrt{1-\frac{c^2}{x^2}}\right)$$

$$\Big\downarrow \; 221$$

$$\frac{1}{3} x^3 \left(a + b \arcsin\left(\frac{c}{x}\right)\right) - \frac{1}{6} bc \left(c^2 \left(-\text{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)\right) - x^2 \sqrt{1-\frac{c^2}{x^2}}\right)$$

input
```
Int[x^2*(a + b*ArcSin[c/x]),x]
```

output
```
(x^3*(a + b*ArcSin[c/x]))/3 - (b*c*(-(Sqrt[1 - c^2/x^2]*x^2) - c^2*ArcTanh
[Sqrt[1 - c^2/x^2]]))/6
```

### 3.371.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 52
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
(a + b*x)^(m + 1)*((c + d*x)^(n + 1)/((b*c - a*d)*(m + 1))), x] - Simp[d*((
m + n + 2)/((b*c - a*d)*(m + 1)))   Int[(a + b*x)^(m + 1)*(c + d*x)^n, x],
x] /; FreeQ[{a, b, c, d, n}, x] && ILtQ[m, -1] && FractionQ[n] && LtQ[n, 0]
```

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 798
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[1/n   Subst
[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a,
b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.371.4 Maple [A] (verified)

Time = 0.36 (sec) , antiderivative size = 64, normalized size of antiderivative = 1.00

| method | result | size |
|---|---|---|
| parts | $\frac{x^3 a}{3}-b\,c^3\left(-\frac{x^3\arcsin\left(\frac{c}{x}\right)}{3c^3}-\frac{x^2\sqrt{1-\frac{c^2}{x^2}}}{6c^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)}{6}\right)$ | 64 |
| derivativedivides | $-c^3\left(-\frac{a\,x^3}{3c^3}+b\left(-\frac{x^3\arcsin\left(\frac{c}{x}\right)}{3c^3}-\frac{x^2\sqrt{1-\frac{c^2}{x^2}}}{6c^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)}{6}\right)\right)$ | 68 |
| default | $-c^3\left(-\frac{a\,x^3}{3c^3}+b\left(-\frac{x^3\arcsin\left(\frac{c}{x}\right)}{3c^3}-\frac{x^2\sqrt{1-\frac{c^2}{x^2}}}{6c^2}-\frac{\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)}{6}\right)\right)$ | 68 |

input
```
int(x^2*(a+b*arcsin(c/x)),x,method=_RETURNVERBOSE)
```

output
```
1/3*x^3*a-b*c^3*(-1/3/c^3*x^3*arcsin(c/x)-1/6/c^2*x^2*(1-c^2/x^2)^(1/2)-1/
6*arctanh(1/(1-c^2/x^2)^(1/2)))
```

### 3.371.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.66

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=-\frac{1}{6}\,bc^3\log\left(x\sqrt{-\frac{c^2-x^2}{x^2}}-x\right)+\frac{1}{6}\,bcx^2\sqrt{-\frac{c^2-x^2}{x^2}}+\frac{1}{3}\,ax^3+\frac{1}{3}\,(bx^3-b)\arcsin\left(\frac{c}{x}\right)-\frac{2}{3}\,b\arctan\left(\frac{x\sqrt{-\frac{c^2-x^2}{x^2}}-x}{c}\right)$$

input
```
integrate(x^2*(a+b*arcsin(c/x)),x, algorithm="fricas")
```

output
```
-1/6*b*c^3*log(x*sqrt(-(c^2 - x^2)/x^2) - x) + 1/6*b*c*x^2*sqrt(-(c^2 - x^
2)/x^2) + 1/3*a*x^3 + 1/3*(b*x^3 - b)*arcsin(c/x) - 2/3*b*arctan((x*sqrt(-
(c^2 - x^2)/x^2) - x)/c)
```

### 3.371.6 Sympy [A] (verification not implemented)

Time = 1.96 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.64

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^3}{3}+\frac{bc\left(\begin{cases}\frac{c^2\operatorname{acosh}\left(\frac{x}{c}\right)}{2}-\frac{cx}{2\sqrt{-1+\frac{x^2}{c^2}}}+\frac{x^3}{2c\sqrt{-1+\frac{x^2}{c^2}}} & \text{for}\ \left|\frac{x^2}{c^2}\right|>1\\ -\frac{ic^2\operatorname{asin}\left(\frac{x}{c}\right)}{2}+\frac{icx\sqrt{1-\frac{x^2}{c^2}}}{2} & \text{otherwise}\end{cases}\right)}{3}+\frac{bx^3\operatorname{asin}\left(\frac{c}{x}\right)}{3}$$

input
```
integrate(x**2*(a+b*asin(c/x)),x)
```

output
```
a*x**3/3 + b*c*Piecewise((c**2*acosh(x/c)/2 - c*x/(2*sqrt(-1 + x**2/c**2))
 + x**3/(2*c*sqrt(-1 + x**2/c**2)), Abs(x**2/c**2) > 1), (-I*c**2*asin(x/c
)/2 + I*c*x*sqrt(1 - x**2/c**2)/2, True))/3 + b*x**3*asin(c/x)/3
```

### 3.371.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.27

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{3}\,ax^3$$
$$+\frac{1}{12}\left(4\,x^3\arcsin\left(\frac{c}{x}\right)+\left(c^2\log\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)-c^2\log\left(\sqrt{-\frac{c^2}{x^2}+1}-1\right)+2\,x^2\sqrt{-\frac{c^2}{x^2}+1}\right)c\right)b$$

input
```
integrate(x^2*(a+b*arcsin(c/x)),x, algorithm="maxima")
```

output
```
1/3*a*x^3 + 1/12*(4*x^3*arcsin(c/x) + (c^2*log(sqrt(-c^2/x^2 + 1) + 1) - c
^2*log(sqrt(-c^2/x^2 + 1) - 1) + 2*x^2*sqrt(-c^2/x^2 + 1))*c)*b
```

### 3.371.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 298 vs. 2(54) = 108.

Time = 0.49 (sec) , antiderivative size = 298, normalized size of antiderivative = 4.66

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$$
$$=\frac{bcx^3\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^3\arcsin\left(\frac{c}{x}\right)+acx^3\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^3+bc^2x^2\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^2+3\,bc^3x\left(\sqrt{-\frac{c^2}{x^2}}\right.}{}$$

input
```
integrate(x^2*(a+b*arcsin(c/x)),x, algorithm="giac")
```

output
```
1/24*(b*c*x^3*(sqrt(-c^2/x^2 + 1) + 1)^3*arcsin(c/x) + a*c*x^3*(sqrt(-c^2/
x^2 + 1) + 1)^3 + b*c^2*x^2*(sqrt(-c^2/x^2 + 1) + 1)^2 + 3*b*c^3*x*(sqrt(-
c^2/x^2 + 1) + 1)*arcsin(c/x) + 3*a*c^3*x*(sqrt(-c^2/x^2 + 1) + 1) + 4*b*c
^4*log(sqrt(-c^2/x^2 + 1) + 1) - 4*b*c^4*log(abs(c)/abs(x)) + 3*b*c^5*arcs
in(c/x)/(x*(sqrt(-c^2/x^2 + 1) + 1)) + 3*a*c^5/(x*(sqrt(-c^2/x^2 + 1) + 1)
) - b*c^6/(x^2*(sqrt(-c^2/x^2 + 1) + 1)^2) + b*c^7*arcsin(c/x)/(x^3*(sqrt(
-c^2/x^2 + 1) + 1)^3) + a*c^7/(x^3*(sqrt(-c^2/x^2 + 1) + 1)^3))/c
```

### 3.371.9 Mupad [F(-1)]

Timed out.

$$\int x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\int x^2\left(a+b\,\mathrm{asin}\left(\frac{c}{x}\right)\right)\,dx$$

input
```
int(x^2*(a + b*asin(c/x)),x)
```

output
```
int(x^2*(a + b*asin(c/x)), x)
```

# 3.372 $\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$



## 3.372.1 Optimal result

Integrand size = 12, antiderivative size = 39

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{2}bc\sqrt{1-\frac{c^2}{x^2}}x+\frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)$$

output
```
1/2*x^2*(a+b*arcsin(c/x))+1/2*b*c*x*(1-c^2/x^2)^(1/2)
```

## 3.372.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.21

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^2}{2}+\frac{1}{2}bcx\sqrt{\frac{-c^2+x^2}{x^2}}+\frac{1}{2}bx^2\arcsin\left(\frac{c}{x}\right)$$

input
```
Integrate[x*(a + b*ArcSin[c/x]),x]
```

output
```
(a*x^2)/2 + (b*c*x*Sqrt[(-c^2 + x^2)/x^2])/2 + (b*x^2*ArcSin[c/x])/2
```

### 3.372.3 Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5341, 25, 27, 746}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)-\frac{1}{2}b\int -\frac{c}{\sqrt{1-\frac{c^2}{x^2}}}dx$$

$$\Big\downarrow \text{25}$$

$$\frac{1}{2}b\int \frac{c}{\sqrt{1-\frac{c^2}{x^2}}}dx+\frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{2}bc\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}}dx+\frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)$$

$$\Big\downarrow \text{746}$$

$$\frac{1}{2}x^2\left(a+b\arcsin\left(\frac{c}{x}\right)\right)+\frac{1}{2}bcx\sqrt{1-\frac{c^2}{x^2}}$$

input
```
Int[x*(a + b*ArcSin[c/x]),x]
```

output
```
(b*c*Sqrt[1 - c^2/x^2]*x)/2 + (x^2*(a + b*ArcSin[c/x]))/2
```

### 3.372.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 746
```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[x*((a + b*x^n)^(p + 1)
/a), x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.372.4 Maple [A] (verified)

Time = 0.32 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.21

| method | result | size |
|---|---|---|
| parts | $\frac{a\,x^2}{2}-b\,c^2\left(-\frac{x^2\arcsin\left(\frac{c}{x}\right)}{2c^2}-\frac{x\sqrt{1-\frac{c^2}{x^2}}}{2c}\right)$ | 47 |
| derivativedivides | $-c^2\left(-\frac{a\,x^2}{2c^2}+b\left(-\frac{x^2\arcsin\left(\frac{c}{x}\right)}{2c^2}-\frac{x\sqrt{1-\frac{c^2}{x^2}}}{2c}\right)\right)$ | 51 |
| default | $-c^2\left(-\frac{a\,x^2}{2c^2}+b\left(-\frac{x^2\arcsin\left(\frac{c}{x}\right)}{2c^2}-\frac{x\sqrt{1-\frac{c^2}{x^2}}}{2c}\right)\right)$ | 51 |

input
```
int(x*(a+b*arcsin(c/x)),x,method=_RETURNVERBOSE)
```

output
```
1/2*a*x^2-b*c^2*(-1/2/c^2*x^2*arcsin(c/x)-1/2/c*x*(1-c^2/x^2)^(1/2))
```

### 3.372.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.03

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{2}\,bx^2\arcsin\left(\frac{c}{x}\right)+\frac{1}{2}\,bcx\sqrt{-\frac{c^2-x^2}{x^2}}+\frac{1}{2}\,ax^2$$

input
```
integrate(x*(a+b*arcsin(c/x)),x, algorithm="fricas")
```

output
```
1/2*b*x^2*arcsin(c/x) + 1/2*b*c*x*sqrt(-(c^2 - x^2)/x^2) + 1/2*a*x^2
```

### 3.372.6 Sympy [A] (verification not implemented)

Time = 0.91 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.49

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{ax^2}{2}+\frac{bc\left(\begin{cases}c\sqrt{-1+\frac{x^2}{c^2}} & \text{for } \left|\frac{x^2}{c^2}\right|>1\\ ic\sqrt{1-\frac{x^2}{c^2}} & \text{otherwise}\end{cases}\right)}{2}+\frac{bx^2\operatorname{asin}\left(\frac{c}{x}\right)}{2}$$

input
```
integrate(x*(a+b*asin(c/x)),x)
```

output
```
a*x**2/2 + b*c*Piecewise((c*sqrt(-1 + x**2/c**2), Abs(x**2/c**2) > 1), (I*
c*sqrt(1 - x**2/c**2), True))/2 + b*x**2*asin(c/x)/2
```

### 3.372.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.92

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{1}{2}\,ax^2+\frac{1}{2}\left(x^2\arcsin\left(\frac{c}{x}\right)+cx\sqrt{-\frac{c^2}{x^2}+1}\right)b$$

input
```
integrate(x*(a+b*arcsin(c/x)),x, algorithm="maxima")
```

output
```
1/2*a*x^2 + 1/2*(x^2*arcsin(c/x) + c*x*sqrt(-c^2/x^2 + 1))*b
```

### 3.372.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 174 vs. 2(33) = 66.

Time = 0.28 (sec) , antiderivative size = 174, normalized size of antiderivative = 4.46

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx$$
$$=\frac{bcx^2\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^2\arcsin\left(\frac{c}{x}\right)+acx^2\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)^2+2\,bc^2x\left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)+2\,bc^3\arcsin\left(\frac{c}{x}\right.}{8\,c}$$

input
```
integrate(x*(a+b*arcsin(c/x)),x, algorithm="giac")
```

output
```
1/8*(b*c*x^2*(sqrt(-c^2/x^2 + 1) + 1)^2*arcsin(c/x) + a*c*x^2*(sqrt(-c^2/x
^2 + 1) + 1)^2 + 2*b*c^2*x*(sqrt(-c^2/x^2 + 1) + 1) + 2*b*c^3*arcsin(c/x)
+ 2*a*c^3 - 2*b*c^4/(x*(sqrt(-c^2/x^2 + 1) + 1)) + b*c^5*arcsin(c/x)/(x^2*
(sqrt(-c^2/x^2 + 1) + 1)^2) + a*c^5/(x^2*(sqrt(-c^2/x^2 + 1) + 1)^2))/c
```

### 3.372.9 Mupad [B] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.92

$$\int x\left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx=\frac{a\,x^2}{2}+\frac{b\,x^2\,\mathrm{asin}\left(\frac{c}{x}\right)}{2}+\frac{b\,c\,x\,\sqrt{1-\frac{c^2}{x^2}}}{2}$$

input
```
int(x*(a + b*asin(c/x)),x)
```

output
```
(a*x^2)/2 + (b*x^2*asin(c/x))/2 + (b*c*x*(1 - c^2/x^2)^(1/2))/2
```

# 3.373 $\int \left(a+b \arcsin \left(\frac{c}{x}\right)\right) \, dx$



## 3.373.1 Optimal result

Integrand size = 10, antiderivative size = 31

$$\int \left(a+b \arcsin \left(\frac{c}{x}\right)\right) \, dx=a x+b x \csc ^{-1}\left(\frac{x}{c}\right)+b c \operatorname{arctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)$$

output
```
a*x+b*x*arccsc(x/c)+b*c*arctanh((1-c^2/x^2)^(1/2))
```

## 3.373.2 Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 89 vs. 2(31) = 62.

Time = 0.06 (sec) , antiderivative size = 89, normalized size of antiderivative = 2.87

$$\int \left(a+b \arcsin \left(\frac{c}{x}\right)\right) \, dx=a x+b x \arcsin \left(\frac{c}{x}\right)+\frac{b c \sqrt{-c^2+x^2} \left(-\log \left(1-\frac{x}{\sqrt{-c^2+x^2}}\right)+\log \left(1+\frac{x}{\sqrt{-c^2+x^2}}\right)\right)}{2 \sqrt{1-\frac{c^2}{x^2}} x}$$

input
```
Integrate[a + b*ArcSin[c/x],x]
```

output
```
a*x + b*x*ArcSin[c/x] + (b*c*Sqrt[-c^2 + x^2]*(-Log[1 - x/Sqrt[-c^2 + x^2]
] + Log[1 + x/Sqrt[-c^2 + x^2]]))/(2*Sqrt[1 - c^2/x^2]*x)
```

## 3.373.3 Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)dx$$

$$\Big\downarrow \ 2009$$

$$ax+b\text{carctanh}\left(\sqrt{1-\frac{c^2}{x^2}}\right)+bx\csc^{-1}\left(\frac{x}{c}\right)$$

input
```
Int[a + b*ArcSin[c/x],x]
```

output
```
a*x + b*x*ArcCsc[x/c] + b*c*ArcTanh[Sqrt[1 - c^2/x^2]]
```

### 3.373.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

## 3.373.4 Maple [A] (verified)

Time = 0.31 (sec) , antiderivative size = 37, normalized size of antiderivative = 1.19

| method | result | size |
|---|---|---|
| default | $ax-bc\left(-\frac{x\arcsin\left(\frac{c}{x}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)\right)$ | 37 |
| parts | $ax-bc\left(-\frac{x\arcsin\left(\frac{c}{x}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)\right)$ | 37 |
| derivativedivides | $-c\left(-\frac{ax}{c}+b\left(-\frac{x\arcsin\left(\frac{c}{x}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{x^2}}}\right)\right)\right)$ | 42 |

input
```
int(a+b*arcsin(c/x),x,method=_RETURNVERBOSE)
```

output
```
a*x-b*c*(-1/c*x*arcsin(c/x)-arctanh(1/(1-c^2/x^2)^(1/2)))
```

### 3.373.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 75 vs. $2(29) = 58$.

Time = 0.26 (sec) , antiderivative size = 75, normalized size of antiderivative = 2.42

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = -bc\log\left(x\sqrt{-\frac{c^2-x^2}{x^2}}-x\right)+ax+(bx-b)\arcsin\left(\frac{c}{x}\right)-2\,b\arctan\left(\frac{x\sqrt{-\frac{c^2-x^2}{x^2}}-x}{c}\right)$$

input
```
integrate(a+b*arcsin(c/x),x, algorithm="fricas")
```

output
```
-b*c*log(x*sqrt(-(c^2 - x^2)/x^2) - x) + a*x + (b*x - b)*arcsin(c/x) - 2*b
*arctan((x*sqrt(-(c^2 - x^2)/x^2) - x)/c)
```

### 3.373.6 Sympy [A] (verification not implemented)

Time = 0.98 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.03

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = ax+b\left(c\left(\begin{cases}\operatorname{acosh}\left(\frac{x}{c}\right) & \text{for } \left|\frac{x^2}{c^2}\right|>1\\ -i\operatorname{asin}\left(\frac{x}{c}\right) & \text{otherwise}\end{cases}\right)+x\operatorname{asin}\left(\frac{c}{x}\right)\right)$$

input
```
integrate(a+b*asin(c/x),x)
```

output
```
a*x + b*(c*Piecewise((acosh(x/c), Abs(x**2/c**2) > 1), (-I*asin(x/c), True
)) + x*asin(c/x))
```

### 3.373.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 52, normalized size of antiderivative = 1.68

$$\int \left(a+b \arcsin \left(\frac{c}{x}\right)\right) dx$$
$$=\frac{1}{2}\left(c\left(\log \left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)-\log \left(\sqrt{-\frac{c^2}{x^2}+1}-1\right)\right)+2 x \arcsin \left(\frac{c}{x}\right)\right) b+a x$$

input
```
integrate(a+b*arcsin(c/x),x, algorithm="maxima")
```

output
```
1/2*(c*(log(sqrt(-c^2/x^2 + 1) + 1) - log(sqrt(-c^2/x^2 + 1) - 1)) + 2*x*a
rcsin(c/x))*b + a*x
```

### 3.373.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 60 vs. 2(29) = 58.

Time = 0.28 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.94

$$\int \left(a+b \arcsin \left(\frac{c}{x}\right)\right) dx$$
$$=a x+\frac{\left(c^2\left(\log \left(\sqrt{-\frac{c^2}{x^2}+1}+1\right)-\log \left(-\sqrt{-\frac{c^2}{x^2}+1}+1\right)\right)+2 c x \arcsin \left(\frac{c}{x}\right)\right) b}{2 c}$$

input
```
integrate(a+b*arcsin(c/x),x, algorithm="giac")
```

output
```
a*x + 1/2*(c^2*(log(sqrt(-c^2/x^2 + 1) + 1) - log(-sqrt(-c^2/x^2 + 1) + 1)
) + 2*c*x*arcsin(c/x))*b/c
```

### 3.373.9 Mupad [B] (verification not implemented)

Time = 0.78 (sec) , antiderivative size = 32, normalized size of antiderivative = 1.03

$$\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)\,dx = a\,x+b\,x\,\mathrm{asin}\left(\frac{c}{x}\right)+b\,c\,\mathrm{sign}(x)\,\ln\left(x+\sqrt{x^2-c^2}\right)$$

input
```
int(a + b*asin(c/x),x)
```

output
```
a*x + b*x*asin(c/x) + b*c*sign(x)*log(x + (x^2 - c^2)^(1/2))
```

# 3.374 $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx$



## 3.374.1 Optimal result

Integrand size = 14, antiderivative size = 67

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx = \frac{1}{2}ib\arcsin\left(\frac{c}{x}\right)^2 - b\arcsin\left(\frac{c}{x}\right)\log\left(1-e^{2i\arcsin\left(\frac{c}{x}\right)}\right) + a\log(x) + \frac{1}{2}ib\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{c}{x}\right)}\right)$$

output
```
1/2*I*b*arcsin(c/x)^2-b*arcsin(c/x)*ln(1-(I*c/x+(1-c^2/x^2)^(1/2))^2)+a*ln
(x)+1/2*I*b*polylog(2,(I*c/x+(1-c^2/x^2)^(1/2))^2)
```

## 3.374.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.91

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx = -b\arcsin\left(\frac{c}{x}\right)\log\left(1-e^{2i\arcsin\left(\frac{c}{x}\right)}\right) + a\log(x) + \frac{1}{2}ib\left(\arcsin\left(\frac{c}{x}\right)^2 + \text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{c}{x}\right)}\right)\right)$$

input
```
Integrate[(a + b*ArcSin[c/x])/x,x]
```

output
```
-(b*ArcSin[c/x]*Log[1 - E^((2*I)*ArcSin[c/x])]) + a*Log[x] + (I/2)*b*(ArcS
in[c/x]^2 + PolyLog[2, E^((2*I)*ArcSin[c/x])])
```

### 3.374.3 Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx$$

$$\Big\downarrow \text{7293}$$

$$\int \left(\frac{a}{x}+\frac{b\arcsin\left(\frac{c}{x}\right)}{x}\right)dx$$

$$\Big\downarrow \text{2009}$$

$$a\log(x)+\frac{1}{2}ib\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{c}{x}\right)}\right)+\frac{1}{2}ib\arcsin\left(\frac{c}{x}\right)^2-b\arcsin\left(\frac{c}{x}\right)\log\left(1-e^{2i\arcsin\left(\frac{c}{x}\right)}\right)$$

input
```
Int[(a + b*ArcSin[c/x])/x,x]
```

output
```
(I/2)*b*ArcSin[c/x]^2 - b*ArcSin[c/x]*Log[1 - E^((2*I)*ArcSin[c/x])] + a*L
og[x] + (I/2)*b*PolyLog[2, E^((2*I)*ArcSin[c/x])]
```

#### 3.374.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.374.4 Maple [A] (verified)

Time = 1.02 (sec) , antiderivative size = 134, normalized size of antiderivative = 2.00

| method | result |
|---|---|
| parts | $a\ln\left(x\right)+b\left(\frac{i\arcsin\left(\frac{c}{x}\right)^{2}}{2}-\arcsin\left(\frac{c}{x}\right)\ln\left(1+\frac{ic}{x}+\sqrt{1-\frac{c^{2}}{x^{2}}}\right)-\arcsin\left(\frac{c}{x}\right)\ln\left(1-\frac{ic}{x}-\right.\right.$ |
| derivativedivides | $-a\ln\left(\frac{c}{x}\right)-b\left(-\frac{i\arcsin\left(\frac{c}{x}\right)^{2}}{2}+\arcsin\left(\frac{c}{x}\right)\ln\left(1+\frac{ic}{x}+\sqrt{1-\frac{c^{2}}{x^{2}}}\right)-i\,\mathrm{polylog}\left(2,-\frac{ic}{x}-\right.\right.$ |
| default | $-a\ln\left(\frac{c}{x}\right)-b\left(-\frac{i\arcsin\left(\frac{c}{x}\right)^{2}}{2}+\arcsin\left(\frac{c}{x}\right)\ln\left(1+\frac{ic}{x}+\sqrt{1-\frac{c^{2}}{x^{2}}}\right)-i\,\mathrm{polylog}\left(2,-\frac{ic}{x}-\right.\right.$ |

input
```
int((a+b*arcsin(c/x))/x,x,method=_RETURNVERBOSE)
```

output
```
a*ln(x)+b*(1/2*I*arcsin(c/x)^2-arcsin(c/x)*ln(1+I*c/x+(1-c^2/x^2)^(1/2))-a
rcsin(c/x)*ln(1-I*c/x-(1-c^2/x^2)^(1/2))+I*polylog(2,-I*c/x-(1-c^2/x^2)^(1
/2))+I*polylog(2,I*c/x+(1-c^2/x^2)^(1/2)))
```

### 3.374.5 Fricas [F]

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx=\int \frac{b\arcsin\left(\frac{c}{x}\right)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(c/x))/x,x, algorithm="fricas")
```

output
```
integral((b*arcsin(c/x) + a)/x, x)
```

### 3.374.6 Sympy [F]

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx=\int \frac{a+b\,\mathrm{asin}\left(\frac{c}{x}\right)}{x}\,dx$$

input
```
integrate((a+b*asin(c/x))/x,x)
```

output
```
Integral((a + b*asin(c/x))/x, x)
```

### 3.374.7 Maxima [F]

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx=\int \frac{b\arcsin\left(\frac{c}{x}\right)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(c/x))/x,x, algorithm="maxima")
```

output
```
(c*integrate(-sqrt(c + x)*sqrt(-c + x)*log(x)/(c^2*x - x^3), x) + arctan2(
c, sqrt(c + x)*sqrt(-c + x))*log(x))*b + a*log(x)
```

### 3.374.8 Giac [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(c/x))/x,x, algorithm="giac")
```

output
```
Exception raised: RuntimeError >> an error occurred running a Giac command
:INPUT:sage2OUTPUT:Limit: Max order reached or unable to make series expan
sion Error: Bad Argument Value
```

### 3.374.9 Mupad [B] (verification not implemented)

Time = 0.46 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.85

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x}\,dx=\frac{b\,\mathrm{asin}\left(\frac{c}{x}\right)^2\,1\mathrm{i}}{2}+a\,\ln(x)+\frac{b\,\mathrm{polylog}\left(2,\mathrm{e}^{\mathrm{asin}\left(\frac{c}{x}\right)\,2\mathrm{i}}\right)\,1\mathrm{i}}{2}-b\,\ln\left(1-\mathrm{e}^{\mathrm{asin}\left(\frac{c}{x}\right)\,2\mathrm{i}}\right)\,\mathrm{asin}\left(\frac{c}{x}\right)$$

input
```
int((a + b*asin(c/x))/x,x)
```

output
```
(b*asin(c/x)^2*1i)/2 + a*log(x) + (b*polylog(2, exp(asin(c/x)*2i))*1i)/2 -
 b*log(1 - exp(asin(c/x)*2i))*asin(c/x)
```

# 3.375 $\int \frac{a+b \arcsin\left(\frac{c}{x}\right)}{x^2}\,dx$



## 3.375.1 Optimal result

Integrand size = 14, antiderivative size = 39

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}\,dx=-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{c}-\frac{a}{x}-\frac{b\csc^{-1}\left(\frac{x}{c}\right)}{x}$$

output
```
-a/x-b*arccsc(x/c)/x-b*(1-c^2/x^2)^(1/2)/c
```

## 3.375.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}\,dx=-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{c}-\frac{a}{x}-\frac{b\arcsin\left(\frac{c}{x}\right)}{x}$$

input
```
Integrate[(a + b*ArcSin[c/x])/x^2,x]
```

output
```
-((b*Sqrt[1 - c^2/x^2])/c) - a/x - (b*ArcSin[c/x])/x
```

### 3.375.3 Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {7266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}dx$$

$$\Big\downarrow \text{7266}$$

$$-\int \left(a+b\arcsin\left(\frac{c}{x}\right)\right)d\frac{1}{x}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{a}{x}-\frac{b\arcsin\left(\frac{c}{x}\right)}{x}-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{c}$$

input
```
Int[(a + b*ArcSin[c/x])/x^2,x]
```

output
```
-((b*Sqrt[1 - c^2/x^2])/c) - a/x - (b*ArcSin[c/x])/x
```

#### 3.375.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 7266
```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Simp[1/(m + 1)   Subst[Int[SubstFor[x^(m
+ 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && Function
OfQ[x^(m + 1), u, x]
```

### 3.375.4 Maple [A] (verified)

Time = 0.18 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.97

| method | result | size |
|---|---|---|
| parts | $-\frac{a}{x}-\frac{b\left(\frac{c\arcsin\left(\frac{c}{x}\right)}{x}+\sqrt{1-\frac{c^{2}}{x^{2}}}\right)}{c}$ | 38 |
| derivativedivides | $-\frac{\frac{ca}{x}+b\left(\frac{c\arcsin\left(\frac{c}{x}\right)}{x}+\sqrt{1-\frac{c^{2}}{x^{2}}}\right)}{c}$ | 39 |
| default | $-\frac{\frac{ca}{x}+b\left(\frac{c\arcsin\left(\frac{c}{x}\right)}{x}+\sqrt{1-\frac{c^{2}}{x^{2}}}\right)}{c}$ | 39 |

input
```
int((a+b*arcsin(c/x))/x^2,x,method=_RETURNVERBOSE)
```

output
```
-a/x-b/c*(c/x*arcsin(c/x)+(1-c^2/x^2)^(1/2))
```

### 3.375.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.03

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^{2}}\,dx=-\frac{bc\arcsin\left(\frac{c}{x}\right)+bx\sqrt{-\frac{c^{2}-x^{2}}{x^{2}}}+ac}{cx}$$

input
```
integrate((a+b*arcsin(c/x))/x^2,x, algorithm="fricas")
```

output
```
-(b*c*arcsin(c/x) + b*x*sqrt(-(c^2 - x^2)/x^2) + a*c)/(c*x)
```

### 3.375.6 Sympy [A] (verification not implemented)

Time = 0.41 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.82

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^{2}}\,dx=\begin{cases}-\frac{a}{x}-\frac{b\operatorname{asin}\left(\frac{c}{x}\right)}{x}-\frac{b\sqrt{-\frac{c^{2}}{x^{2}}+1}}{c} & \text{for}\ c\neq 0\\ -\frac{a}{x} & \text{otherwise}\end{cases}$$

input
```
integrate((a+b*asin(c/x))/x**2,x)
```

output
```
Piecewise((-a/x - b*asin(c/x)/x - b*sqrt(-c**2/x**2 + 1)/c, Ne(c, 0)), (-a
/x, True))
```

### 3.375.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.95

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}\,dx = -\frac{b\left(\frac{c\arcsin\left(\frac{c}{x}\right)}{x}+\sqrt{-\frac{c^2}{x^2}+1}\right)}{c}-\frac{a}{x}$$

input
```
integrate((a+b*arcsin(c/x))/x^2,x, algorithm="maxima")
```

output
```
-b*(c*arcsin(c/x)/x + sqrt(-c^2/x^2 + 1))/c - a/x
```

### 3.375.8 Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.97

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}\,dx = -\frac{\frac{bc\arcsin\left(\frac{c}{x}\right)}{x}+b\sqrt{-\frac{c^2}{x^2}+1}+\frac{ac}{x}}{c}$$

input
```
integrate((a+b*arcsin(c/x))/x^2,x, algorithm="giac")
```

output
```
-(b*c*arcsin(c/x)/x + b*sqrt(-c^2/x^2 + 1) + a*c/x)/c
```

### 3.375.9 Mupad [B] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.95

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^2}\,dx=-\frac{a}{x}-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{c}-\frac{b\,\mathrm{asin}\left(\frac{c}{x}\right)}{x}$$

input
```
int((a + b*asin(c/x))/x^2,x)
```

output
```
- a/x - (b*(1 - c^2/x^2)^(1/2))/c - (b*asin(c/x))/x
```

# 3.376 $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx$



## 3.376.1 Optimal result

Integrand size = 14, antiderivative size = 57

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{b\sqrt{1-\frac{c^2}{x^2}}}{4cx}+\frac{b\csc^{-1}\left(\frac{x}{c}\right)}{4c^2}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

output
```
1/4*b*arccsc(x/c)/c^2+1/2*(-a-b*arcsin(c/x))/x^2-1/4*b*(1-c^2/x^2)^(1/2)/c
/x
```

## 3.376.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.14

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{a}{2x^2}-\frac{b\sqrt{\frac{-c^2+x^2}{x^2}}}{4cx}+\frac{b\arcsin\left(\frac{c}{x}\right)}{4c^2}-\frac{b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

input
```
Integrate[(a + b*ArcSin[c/x])/x^3,x]
```

output
```
-1/2*a/x^2 - (b*Sqrt[(-c^2 + x^2)/x^2])/(4*c*x) + (b*ArcSin[c/x])/(4*c^2)
- (b*ArcSin[c/x])/(2*x^2)
```

### 3.376.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 62, normalized size of antiderivative = 1.09, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {5341, 25, 27, 858, 262, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{2}b\int -\frac{c}{\sqrt{1-\frac{c^2}{x^2}}x^4}dx-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

$$\Big\downarrow \text{25}$$

$$-\frac{1}{2}b\int \frac{c}{\sqrt{1-\frac{c^2}{x^2}}x^4}dx-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{2}bc\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^4}dx-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

$$\Big\downarrow \text{858}$$

$$\frac{1}{2}bc\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^2}d\frac{1}{x}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

$$\Big\downarrow \text{262}$$

$$\frac{1}{2}bc\left(\frac{\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}}d\frac{1}{x}}{2c^2}-\frac{\sqrt{1-\frac{c^2}{x^2}}}{2c^2x}\right)-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

$$\Big\downarrow \text{223}$$

$$\frac{1}{2}bc\left(\frac{\arcsin\left(\frac{c}{x}\right)}{2c^3}-\frac{\sqrt{1-\frac{c^2}{x^2}}}{2c^2x}\right)-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{2x^2}$$

input
```
Int[(a + b*ArcSin[c/x])/x^3,x]
```

output
```
-1/2*(a + b*ArcSin[c/x])/x^2 + (b*c*(-1/2*Sqrt[1 - c^2/x^2]/(c^2*x) + ArcS
in[c/x]/(2*c^3)))/2
```

### 3.376.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 858
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Subst[Int[(a +
b/x^n)^p/x^(m + 2), x], x, 1/x] /; FreeQ[{a, b, p}, x] && ILtQ[n, 0] && Int
egerQ[m]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.376. $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx$

### 3.376.4 Maple [A] (verified)

Time = 0.35 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.96

| method | result | size |
|---|---|---|
| parts | $-\frac{a}{2x^{2}}-\frac{b\left(\frac{c^{2}\arcsin\left(\frac{c}{x}\right)}{2x^{2}}+\frac{c\sqrt{1-\frac{c^{2}}{x^{2}}}}{4x}-\frac{\arcsin\left(\frac{c}{x}\right)}{4}\right)}{c^{2}}$ | 55 |
| derivativedivides | $-\frac{\frac{a\,c^{2}}{2x^{2}}+b\left(\frac{c^{2}\arcsin\left(\frac{c}{x}\right)}{2x^{2}}+\frac{c\sqrt{1-\frac{c^{2}}{x^{2}}}}{4x}-\frac{\arcsin\left(\frac{c}{x}\right)}{4}\right)}{c^{2}}$ | 59 |
| default | $-\frac{\frac{a\,c^{2}}{2x^{2}}+b\left(\frac{c^{2}\arcsin\left(\frac{c}{x}\right)}{2x^{2}}+\frac{c\sqrt{1-\frac{c^{2}}{x^{2}}}}{4x}-\frac{\arcsin\left(\frac{c}{x}\right)}{4}\right)}{c^{2}}$ | 59 |

input
```
int((a+b*arcsin(c/x))/x^3,x,method=_RETURNVERBOSE)
```

output
```
-1/2*a/x^2-b/c^2*(1/2*c^2/x^2*arcsin(c/x)+1/4*c/x*(1-c^2/x^2)^(1/2)-1/4*ar
csin(c/x))
```

### 3.376.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.96

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^{3}}\,dx=-\frac{bcx\sqrt{-\frac{c^{2}-x^{2}}{x^{2}}}+2\,ac^{2}+\left(2\,bc^{2}-bx^{2}\right)\arcsin\left(\frac{c}{x}\right)}{4\,c^{2}x^{2}}$$

input
```
integrate((a+b*arcsin(c/x))/x^3,x, algorithm="fricas")
```

output
```
-1/4*(b*c*x*sqrt(-(c^2 - x^2)/x^2) + 2*a*c^2 + (2*b*c^2 - b*x^2)*arcsin(c/
x))/(c^2*x^2)
```

### 3.376.6 Sympy [A] (verification not implemented)

Time = 1.94 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.96

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{a}{2x^2} - \frac{bc\left(\begin{cases} \frac{i\sqrt{\frac{c^2}{x^2}-1}}{2c^2x} + \frac{i\operatorname{acosh}\left(\frac{c}{x}\right)}{2c^3} & \text{for } \left|\frac{c^2}{x^2}\right| > 1 \\ -\frac{1}{2x^3\sqrt{-\frac{c^2}{x^2}+1}} + \frac{1}{2c^2x\sqrt{-\frac{c^2}{x^2}+1}} - \frac{\operatorname{asin}\left(\frac{c}{x}\right)}{2c^3} & \text{otherwise} \end{cases}\right)}{2} - \frac{b\operatorname{asin}\left(\frac{c}{x}\right)}{2x^2}$$

input
```
integrate((a+b*asin(c/x))/x**3,x)
```

output
```
-a/(2*x**2) - b*c*Piecewise((I*sqrt(c**2/x**2 - 1)/(2*c**2*x) + I*acosh(c/
x)/(2*c**3), Abs(c**2/x**2) > 1), (-1/(2*x**3*sqrt(-c**2/x**2 + 1)) + 1/(2
*c**2*x*sqrt(-c**2/x**2 + 1)) - asin(c/x)/(2*c**3), True))/2 - b*asin(c/x)
/(2*x**2)
```

### 3.376.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.51

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = \frac{1}{4}\left(c\left(\frac{x\sqrt{-\frac{c^2}{x^2}+1}}{c^2x^2\left(\frac{c^2}{x^2}-1\right)-c^4} - \frac{\arctan\left(\frac{x\sqrt{-\frac{c^2}{x^2}+1}}{c}\right)}{c^3}\right) - \frac{2\arcsin\left(\frac{c}{x}\right)}{x^2}\right)b - \frac{a}{2\,x^2}$$

input
```
integrate((a+b*arcsin(c/x))/x^3,x, algorithm="maxima")
```

output
```
1/4*(c*(x*sqrt(-c^2/x^2 + 1)/(c^2*x^2*(c^2/x^2 - 1) - c^4) - arctan(x*sqrt
(-c^2/x^2 + 1)/c)/c^3) - 2*arcsin(c/x)/x^2)*b - 1/2*a/x^2
```

### 3.376.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 70, normalized size of antiderivative = 1.23

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{\frac{2\,b\left(\frac{c^2}{x^2}-1\right)\arcsin\left(\frac{c}{x}\right)}{c}+\frac{2\,a\left(\frac{c^2}{x^2}-1\right)}{c}+\frac{b\arcsin\left(\frac{c}{x}\right)}{c}+\frac{b\sqrt{-\frac{c^2}{x^2}+1}}{x}}{4\,c}$$

input
```
integrate((a+b*arcsin(c/x))/x^3,x, algorithm="giac")
```

output
```
-1/4*(2*b*(c^2/x^2 - 1)*arcsin(c/x)/c + 2*a*(c^2/x^2 - 1)/c + b*arcsin(c/x
)/c + b*sqrt(-c^2/x^2 + 1)/x)/c
```

### 3.376.9 Mupad [B] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.88

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^3}\,dx = -\frac{a}{2\,x^2}-\frac{b\,\sqrt{1-\frac{c^2}{x^2}}}{4\,c\,x}-\frac{b\,\mathrm{asin}\left(\frac{c}{x}\right)\,\left(\frac{2\,c^2}{x^2}-1\right)}{4\,c^2}$$

input
```
int((a + b*asin(c/x))/x^3,x)
```

output
```
- a/(2*x^2) - (b*(1 - c^2/x^2)^(1/2))/(4*c*x) - (b*asin(c/x)*((2*c^2)/x^2
- 1))/(4*c^2)
```

# 3.377 $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx$



## 3.377.1 Optimal result

Integrand size = 14, antiderivative size = 62

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx=-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{3c^3}+\frac{b\left(1-\frac{c^2}{x^2}\right)^{3/2}}{9c^3}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

output
```
1/9*b*(1-c^2/x^2)^(3/2)/c^3+1/3*(-a-b*arcsin(c/x))/x^3-1/3*b*(1-c^2/x^2)^(
1/2)/c^3
```

## 3.377.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 60, normalized size of antiderivative = 0.97

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx=-\frac{a}{3x^3}+b\left(-\frac{2}{9c^3}-\frac{1}{9cx^2}\right)\sqrt{\frac{-c^2+x^2}{x^2}}-\frac{b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

input
```
Integrate[(a + b*ArcSin[c/x])/x^4,x]
```

output
```
-1/3*a/x^3 + b*(-2/(9*c^3) - 1/(9*c*x^2))*Sqrt[(-c^2 + x^2)/x^2] - (b*ArcS
in[c/x])/(3*x^3)
```

### 3.377.3 Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.05, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {5341, 25, 27, 798, 53, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{3}b\int -\frac{c}{\sqrt{1-\frac{c^2}{x^2}}x^5}dx-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

$$\Big\downarrow \text{25}$$

$$-\frac{1}{3}b\int \frac{c}{\sqrt{1-\frac{c^2}{x^2}}x^5}dx-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{3}bc\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^5}dx-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

$$\Big\downarrow \text{798}$$

$$\frac{1}{6}bc\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^2}d\frac{1}{x^2}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

$$\Big\downarrow \text{53}$$

$$\frac{1}{6}bc\int \left(\frac{1}{c^2\sqrt{1-\frac{c^2}{x^2}}}-\frac{\sqrt{1-\frac{c^2}{x^2}}}{c^2}\right)d\frac{1}{x^2}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

$$\Big\downarrow \text{2009}$$

$$\frac{1}{6}bc\left(\frac{2\left(1-\frac{c^2}{x^2}\right)^{3/2}}{3c^4}-\frac{2\sqrt{1-\frac{c^2}{x^2}}}{c^4}\right)-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{3x^3}$$

input
```
Int[(a + b*ArcSin[c/x])/x^4,x]
```

output
```
(b*c*((-2*Sqrt[1 - c^2/x^2])/c^4 + (2*(1 - c^2/x^2)^(3/2))/(3*c^4)))/6 - (
a + b*ArcSin[c/x])/(3*x^3)
```

### 3.377.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 53
```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0])
|| LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

rule 798
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[1/n   Subst
[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a,
b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.377. $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx$

### 3.377.4 Maple [A] (verified)

Time = 0.36 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.02

| method | result | size |
|---|---|---|
| parts | $-\frac{a}{3x^3}-\frac{b\left(\frac{c^3\arcsin\left(\frac{c}{x}\right)}{3x^3}+\frac{c^2\sqrt{1-\frac{c^2}{x^2}}}{9x^2}+\frac{2\sqrt{1-\frac{c^2}{x^2}}}{9}\right)}{c^3}$ | 63 |
| derivativedivides | $-\frac{\frac{a\,c^3}{3x^3}+b\left(\frac{c^3\arcsin\left(\frac{c}{x}\right)}{3x^3}+\frac{c^2\sqrt{1-\frac{c^2}{x^2}}}{9x^2}+\frac{2\sqrt{1-\frac{c^2}{x^2}}}{9}\right)}{c^3}$ | 67 |
| default | $-\frac{\frac{a\,c^3}{3x^3}+b\left(\frac{c^3\arcsin\left(\frac{c}{x}\right)}{3x^3}+\frac{c^2\sqrt{1-\frac{c^2}{x^2}}}{9x^2}+\frac{2\sqrt{1-\frac{c^2}{x^2}}}{9}\right)}{c^3}$ | 67 |

input
```
int((a+b*arcsin(c/x))/x^4,x,method=_RETURNVERBOSE)
```

output
```
-1/3*a/x^3-b/c^3*(1/3*c^3/x^3*arcsin(c/x)+1/9*c^2/x^2*(1-c^2/x^2)^(1/2)+2/
9*(1-c^2/x^2)^(1/2))
```

### 3.377.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.92

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx=-\frac{3\,bc^3\arcsin\left(\frac{c}{x}\right)+3\,ac^3+(bc^2x+2\,bx^3)\sqrt{-\frac{c^2-x^2}{x^2}}}{9\,c^3x^3}$$

input
```
integrate((a+b*arcsin(c/x))/x^4,x, algorithm="fricas")
```

output
```
-1/9*(3*b*c^3*arcsin(c/x) + 3*a*c^3 + (b*c^2*x + 2*b*x^3)*sqrt(-(c^2 - x^2
)/x^2))/(c^3*x^3)
```

### 3.377.6 Sympy [A] (verification not implemented)

Time = 1.67 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.81

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx = -\frac{a}{3x^3} - \frac{bc\left(\begin{cases}\frac{\sqrt{-1+\frac{x^2}{c^2}}}{3cx^3}+\frac{2\sqrt{-1+\frac{x^2}{c^2}}}{3c^3x} & \text{for}\ \left|\frac{x^2}{c^2}\right|>1\\ \frac{i\sqrt{1-\frac{x^2}{c^2}}}{3cx^3}+\frac{2i\sqrt{1-\frac{x^2}{c^2}}}{3c^3x} & \text{otherwise}\end{cases}\right)}{3} - \frac{b\,\mathrm{asin}\left(\frac{c}{x}\right)}{3x^3}$$

input
```
integrate((a+b*asin(c/x))/x**4,x)
```

output
```
-a/(3*x**3) - b*c*Piecewise((sqrt(-1 + x**2/c**2)/(3*c*x**3) + 2*sqrt(-1 +
 x**2/c**2)/(3*c**3*x), Abs(x**2/c**2) > 1), (I*sqrt(1 - x**2/c**2)/(3*c*x
**3) + 2*I*sqrt(1 - x**2/c**2)/(3*c**3*x), True))/3 - b*asin(c/x)/(3*x**3)
```

### 3.377.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 58, normalized size of antiderivative = 0.94

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx = \frac{1}{9}\left(c\left(\frac{\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}}}{c^4} - \frac{3\sqrt{-\frac{c^2}{x^2}+1}}{c^4}\right) - \frac{3\arcsin\left(\frac{c}{x}\right)}{x^3}\right)b - \frac{a}{3x^3}$$

input
```
integrate((a+b*arcsin(c/x))/x^4,x, algorithm="maxima")
```

output
```
1/9*(c*((-c^2/x^2 + 1)^(3/2)/c^4 - 3*sqrt(-c^2/x^2 + 1)/c^4) - 3*arcsin(c/
x)/x^3)*b - 1/3*a/x^3
```

### 3.377.8 Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.42

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx = -\frac{\frac{3b\left(\frac{c^2}{x^2}-1\right)\arcsin\left(\frac{c}{x}\right)}{cx} - \frac{b\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}}}{c^2} + \frac{3b\arcsin\left(\frac{c}{x}\right)}{cx} + \frac{3b\sqrt{-\frac{c^2}{x^2}+1}}{c^2} + \frac{3ac}{x^3}}{9c}$$

input
```
integrate((a+b*arcsin(c/x))/x^4,x, algorithm="giac")
```

output
```
-1/9*(3*b*(c^2/x^2 - 1)*arcsin(c/x)/(c*x) - b*(-c^2/x^2 + 1)^(3/2)/c^2 + 3
*b*arcsin(c/x)/(c*x) + 3*b*sqrt(-c^2/x^2 + 1)/c^2 + 3*a*c/x^3)/c
```

### 3.377.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^4}\,dx=\int \frac{a+b\,\mathrm{asin}\left(\frac{c}{x}\right)}{x^4}\,dx$$

input
```
int((a + b*asin(c/x))/x^4,x)
```

output
```
int((a + b*asin(c/x))/x^4, x)
```

# 3.378 $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx$



## 3.378.1 Optimal result

Integrand size = 14, antiderivative size = 82

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx=-\frac{b\sqrt{1-\frac{c^2}{x^2}}}{16cx^3}-\frac{3b\sqrt{1-\frac{c^2}{x^2}}}{32c^3x}+\frac{3b\csc^{-1}\left(\frac{x}{c}\right)}{32c^4}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

output
```
3/32*b*arccsc(x/c)/c^4+1/4*(-a-b*arcsin(c/x))/x^4-1/16*b*(1-c^2/x^2)^(1/2)
/c/x^3-3/32*b*(1-c^2/x^2)^(1/2)/c^3/x
```

## 3.378.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 77, normalized size of antiderivative = 0.94

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx=-\frac{a}{4x^4}+b\left(-\frac{1}{16cx^3}-\frac{3}{32c^3x}\right)\sqrt{\frac{-c^2+x^2}{x^2}}+\frac{3b\arcsin\left(\frac{c}{x}\right)}{32c^4}-\frac{b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

input
```
Integrate[(a + b*ArcSin[c/x])/x^5,x]
```

output
```
-1/4*a/x^4 + b*(-1/16*1/(c*x^3) - 3/(32*c^3*x))*Sqrt[(-c^2 + x^2)/x^2] + (
3*b*ArcSin[c/x])/(32*c^4) - (b*ArcSin[c/x])/(4*x^4)
```

### 3.378.3 Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 94, normalized size of antiderivative = 1.15, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5341, 25, 27, 858, 262, 262, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{4}b\int -\frac{c}{\sqrt{1-\frac{c^2}{x^2}}x^6}dx-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

$$\Big\downarrow \text{25}$$

$$-\frac{1}{4}b\int \frac{c}{\sqrt{1-\frac{c^2}{x^2}}x^6}dx-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

$$\Big\downarrow \text{27}$$

$$-\frac{1}{4}bc\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^6}dx-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

$$\Big\downarrow \text{858}$$

$$\frac{1}{4}bc\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^4}d\frac{1}{x}-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

$$\Big\downarrow \text{262}$$

$$\frac{1}{4}bc\left(\frac{3\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}x^2}d\frac{1}{x}}{4c^2}-\frac{\sqrt{1-\frac{c^2}{x^2}}}{4c^2x^3}\right)-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

$$\Big\downarrow \text{262}$$

$$\frac{1}{4}bc\left(\frac{3\left(\frac{\int \frac{1}{\sqrt{1-\frac{c^2}{x^2}}}d\frac{1}{x}}{2c^2}-\frac{\sqrt{1-\frac{c^2}{x^2}}}{2c^2x}\right)}{4c^2}-\frac{\sqrt{1-\frac{c^2}{x^2}}}{4c^2x^3}\right)-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

$$\Big\downarrow 223$$

$$\frac{1}{4}bc\left(\frac{3\left(\frac{\arcsin\left(\frac{c}{x}\right)}{2c^3}-\frac{\sqrt{1-\frac{c^2}{x^2}}}{2c^2x}\right)}{4c^2}-\frac{\sqrt{1-\frac{c^2}{x^2}}}{4c^2x^3}\right)-\frac{a+b\arcsin\left(\frac{c}{x}\right)}{4x^4}$$

input
```
Int[(a + b*ArcSin[c/x])/x^5,x]
```

output
```
-1/4*(a + b*ArcSin[c/x])/x^4 + (b*c*(-1/4*Sqrt[1 - c^2/x^2]/(c^2*x^3) + (3
*(-1/2*Sqrt[1 - c^2/x^2]/(c^2*x) + ArcSin[c/x]/(2*c^3)))/(4*c^2)))/4
```

### 3.378.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 262
```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[c*(c*x)
^(m - 1)*((a + b*x^2)^(p + 1)/(b*(m + 2*p + 1))), x] - Simp[a*c^2*((m - 1)/
(b*(m + 2*p + 1)))   Int[(c*x)^(m - 2)*(a + b*x^2)^p, x], x] /; FreeQ[{a, b
, c, p}, x] && GtQ[m, 2 - 1] && NeQ[m + 2*p + 1, 0] && IntBinomialQ[a, b, c
, 2, m, p, x]
```

rule 858
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Subst[Int[(a +
b/x^n)^p/x^(m + 2), x], x, 1/x] /; FreeQ[{a, b, p}, x] && ILtQ[n, 0] && Int
egerQ[m]
```

---

3.378. $\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx$

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.378.4 Maple [A] (verified)

Time = 0.33 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.91

| method | result | size |
|---|---|---|
| parts | $-\frac{a}{4x^4}-\frac{b\left(\frac{c^4 \arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{c^3\sqrt{1-\frac{c^2}{x^2}}}{16x^3}+\frac{3c\sqrt{1-\frac{c^2}{x^2}}}{32x}-\frac{3\arcsin\left(\frac{c}{x}\right)}{32}\right)}{c^4}$ | 75 |
| derivativedivides | $-\frac{\frac{a\,c^4}{4x^4}+b\left(\frac{c^4 \arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{c^3\sqrt{1-\frac{c^2}{x^2}}}{16x^3}+\frac{3c\sqrt{1-\frac{c^2}{x^2}}}{32x}-\frac{3\arcsin\left(\frac{c}{x}\right)}{32}\right)}{c^4}$ | 79 |
| default | $-\frac{\frac{a\,c^4}{4x^4}+b\left(\frac{c^4 \arcsin\left(\frac{c}{x}\right)}{4x^4}+\frac{c^3\sqrt{1-\frac{c^2}{x^2}}}{16x^3}+\frac{3c\sqrt{1-\frac{c^2}{x^2}}}{32x}-\frac{3\arcsin\left(\frac{c}{x}\right)}{32}\right)}{c^4}$ | 79 |

input
```
int((a+b*arcsin(c/x))/x^5,x,method=_RETURNVERBOSE)
```

output
```
-1/4*a/x^4-b/c^4*(1/4*c^4/x^4*arcsin(c/x)+1/16*c^3/x^3*(1-c^2/x^2)^(1/2)+3
/32*c/x*(1-c^2/x^2)^(1/2)-3/32*arcsin(c/x))
```

## 3.378.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.82

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx = -\frac{8\,ac^4+\left(8\,bc^4-3\,bx^4\right)\arcsin\left(\frac{c}{x}\right)+\left(2\,bc^3x+3\,bcx^3\right)\sqrt{-\frac{c^2-x^2}{x^2}}}{32\,c^4x^4}$$

input
```
integrate((a+b*arcsin(c/x))/x^5,x, algorithm="fricas")
```

output
```
-1/32*(8*a*c^4 + (8*b*c^4 - 3*b*x^4)*arcsin(c/x) + (2*b*c^3*x + 3*b*c*x^3)
*sqrt(-(c^2 - x^2)/x^2))/(c^4*x^4)
```

### 3.378.6 Sympy [A] (verification not implemented)

Time = 3.78 (sec) , antiderivative size = 180, normalized size of antiderivative = 2.20

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx$$

$$= -\frac{a}{4x^4} - \frac{bc\left(\begin{cases} \frac{i}{4x^5\sqrt{\frac{c^2}{x^2}-1}} + \frac{i}{8c^2x^3\sqrt{\frac{c^2}{x^2}-1}} - \frac{3i}{8c^4x\sqrt{\frac{c^2}{x^2}-1}} + \frac{3i\operatorname{acosh}\left(\frac{c}{x}\right)}{8c^5} & \text{for } \left|\frac{c^2}{x^2}\right| > 1 \\ -\frac{1}{4x^5\sqrt{-\frac{c^2}{x^2}+1}} - \frac{1}{8c^2x^3\sqrt{-\frac{c^2}{x^2}+1}} + \frac{3}{8c^4x\sqrt{-\frac{c^2}{x^2}+1}} - \frac{3\operatorname{asin}\left(\frac{c}{x}\right)}{8c^5} & \text{otherwise} \end{cases}\right)}{4}$$
$$- \frac{b\operatorname{asin}\left(\frac{c}{x}\right)}{4x^4}$$

input
```
integrate((a+b*asin(c/x))/x**5,x)
```

output
```
-a/(4*x**4) - b*c*Piecewise((I/(4*x**5*sqrt(c**2/x**2 - 1)) + I/(8*c**2*x*
*3*sqrt(c**2/x**2 - 1)) - 3*I/(8*c**4*x*sqrt(c**2/x**2 - 1)) + 3*I*acosh(c
/x)/(8*c**5), Abs(c**2/x**2) > 1), (-1/(4*x**5*sqrt(-c**2/x**2 + 1)) - 1/(
8*c**2*x**3*sqrt(-c**2/x**2 + 1)) + 3/(8*c**4*x*sqrt(-c**2/x**2 + 1)) - 3*
asin(c/x)/(8*c**5), True))/4 - b*asin(c/x)/(4*x**4)
```

### 3.378.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.54

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx =$$
$$-\frac{1}{32}\left(c\left(\frac{3\,x^3\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}} + 5\,c^2x\sqrt{-\frac{c^2}{x^2}+1}}{c^4x^4\left(\frac{c^2}{x^2}-1\right)^2 - 2\,c^6x^2\left(\frac{c^2}{x^2}-1\right) + c^8} + \frac{3\,\arctan\left(\frac{x\sqrt{-\frac{c^2}{x^2}+1}}{c}\right)}{c^5}\right) + \frac{8\,\arcsin\left(\frac{c}{x}\right)}{x^4}\right)b$$
$$-\frac{a}{4\,x^4}$$

input
```
integrate((a+b*arcsin(c/x))/x^5,x, algorithm="maxima")
```

output
```
-1/32*(c*((3*x^3*(-c^2/x^2 + 1)^(3/2) + 5*c^2*x*sqrt(-c^2/x^2 + 1))/(c^4*x
^4*(c^2/x^2 - 1)^2 - 2*c^6*x^2*(c^2/x^2 - 1) + c^8) + 3*arctan(x*sqrt(-c^2
/x^2 + 1)/c)/c^5) + 8*arcsin(c/x)/x^4)*b - 1/4*a/x^4
```

### 3.378.8 Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.35

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx = -\frac{\frac{8\,b\left(\frac{c^2}{x^2}-1\right)^2\arcsin\left(\frac{c}{x}\right)}{c^3}+\frac{16\,b\left(\frac{c^2}{x^2}-1\right)\arcsin\left(\frac{c}{x}\right)}{c^3}-\frac{2\,b\left(-\frac{c^2}{x^2}+1\right)^{\frac{3}{2}}}{c^2x}+\frac{5\,b\arcsin\left(\frac{c}{x}\right)}{c^3}+\frac{5\,b\sqrt{-\frac{c^2}{x^2}+1}}{c^2x}+\frac{8\,ac}{x^4}}{32\,c}$$

input
```
integrate((a+b*arcsin(c/x))/x^5,x, algorithm="giac")
```

output
```
-1/32*(8*b*(c^2/x^2 - 1)^2*arcsin(c/x)/c^3 + 16*b*(c^2/x^2 - 1)*arcsin(c/x
)/c^3 - 2*b*(-c^2/x^2 + 1)^(3/2)/(c^2*x) + 5*b*arcsin(c/x)/c^3 + 5*b*sqrt(
-c^2/x^2 + 1)/(c^2*x) + 8*a*c/x^4)/c
```

### 3.378.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(\frac{c}{x}\right)}{x^5}\,dx = \int \frac{a+b\,\mathrm{asin}\left(\frac{c}{x}\right)}{x^5}\,dx$$

input
```
int((a + b*asin(c/x))/x^5,x)
```

output
```
int((a + b*asin(c/x))/x^5, x)
```

# 3.379 $\int x^m(a+b\arcsin(cx^n))\,dx$



## 3.379.1 Optimal result

Integrand size = 14, antiderivative size = 81

$$\int x^m(a+b\arcsin(cx^n))\,dx=\frac{x^{1+m}(a+b\arcsin(cx^n))}{1+m}-\frac{bcnx^{1+m+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m+n}{2n},\frac{1+m+3n}{2n},c^2x^{2n}\right)}{(1+m)(1+m+n)}$$

output
```
x^(1+m)*(a+b*arcsin(c*x^n))/(1+m)-b*c*n*x^(1+m+n)*hypergeom([1/2, 1/2*(1+m
+n)/n],[1/2*(1+m+3*n)/n],c^2*x^(2*n))/(1+m)/(1+m+n)
```

## 3.379.2 Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.96

$$\int x^m(a+b\arcsin(cx^n))\,dx=\frac{x^{1+m}\left((1+m+n)(a+b\arcsin(cx^n))-bcnx^n\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+m+n}{2n},\frac{1+m+3n}{2n},c^2x^{2n}\right)\right)}{(1+m)(1+m+n)}$$

input
```
Integrate[x^m*(a + b*ArcSin[c*x^n]),x]
```

output
```
(x^(1 + m)*((1 + m + n)*(a + b*ArcSin[c*x^n]) - b*c*n*x^n*Hypergeometric2F
1[1/2, (1 + m + n)/(2*n), (1 + m + 3*n)/(2*n), c^2*x^(2*n)]))/((1 + m)*(1
+ m + n))
```

## 3.379.3 Rubi [A] (verified)

Time = 0.23 (sec) , antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {5341, 27, 888}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^m(a+b\arcsin(cx^n))\,dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{x^{m+1}(a+b\arcsin(cx^n))}{m+1}-\frac{b\int\frac{cnx^{m+n}}{\sqrt{1-c^2x^{2n}}}dx}{m+1}$$

$$\Big\downarrow \text{27}$$

$$\frac{x^{m+1}(a+b\arcsin(cx^n))}{m+1}-\frac{bcn\int\frac{x^{m+n}}{\sqrt{1-c^2x^{2n}}}dx}{m+1}$$

$$\Big\downarrow \text{888}$$

$$\frac{x^{m+1}(a+b\arcsin(cx^n))}{m+1}-\frac{bcnx^{m+n+1}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{m+n+1}{2n},\frac{m+3n+1}{2n},c^2x^{2n}\right)}{(m+1)(m+n+1)}$$

input
```
Int[x^m*(a + b*ArcSin[c*x^n]),x]
```

output
```
(x^(1 + m)*(a + b*ArcSin[c*x^n]))/(1 + m) - (b*c*n*x^(1 + m + n)*Hypergeom
etric2F1[1/2, (1 + m + n)/(2*n), (1 + m + 3*n)/(2*n), c^2*x^(2*n)])/((1 +
m)*(1 + m + n))
```

### 3.379.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 888
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.379.4 Maple [F]

$$\int x^m(a+b\arcsin(c\,x^n))\,dx$$

input
```
int(x^m*(a+b*arcsin(c*x^n)),x)
```

output
```
int(x^m*(a+b*arcsin(c*x^n)),x)
```

### 3.379.5 Fricas [F(-2)]

Exception generated.

$$\int x^m(a+b\arcsin(cx^n))\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x^m*(a+b*arcsin(c*x^n)),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (has polynomial part)
```

### 3.379.6 Sympy [F]

$$\int x^m(a+b\arcsin(cx^n))\,dx = \int x^m(a+b\,\mathrm{asin}(cx^n))\,dx$$

input
```
integrate(x**m*(a+b*asin(c*x**n)),x)
```

output
```
Integral(x**m*(a + b*asin(c*x**n)), x)
```

### 3.379.7 Maxima [F]

$$\int x^m(a+b\arcsin(cx^n))\,dx=\int(b\arcsin(cx^n)+a)x^m\,dx$$

input
```
integrate(x^m*(a+b*arcsin(c*x^n)),x, algorithm="maxima")
```

output
```
(x*x^m*arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)) + (c*m + c)*n*inte
grate(sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*e^(m*log(x) + n*log(x))/((c^2*m + c
^2)*x^(2*n) - m - 1), x))*b/(m + 1) + a*x^(m + 1)/(m + 1)
```

### 3.379.8 Giac [F]

$$\int x^m(a+b\arcsin(cx^n))\,dx=\int(b\arcsin(cx^n)+a)x^m\,dx$$

input
```
integrate(x^m*(a+b*arcsin(c*x^n)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^n) + a)*x^m, x)
```

### 3.379.9 Mupad [F(-1)]

Timed out.

$$\int x^m(a+b\arcsin(cx^n))\,dx=\int x^m\,(a+b\,\mathrm{asin}(c\,x^n))\,dx$$

input
```
int(x^m*(a + b*asin(c*x^n)),x)
```

output
```
int(x^m*(a + b*asin(c*x^n)), x)
```

# 3.380 $\int x^2(a+b\arcsin(cx^n))\,dx$



## 3.380.1 Optimal result

Integrand size = 14, antiderivative size = 68

$$\int x^2(a+b\arcsin(cx^n))\,dx=\frac{1}{3}x^3(a+b\arcsin(cx^n))-\frac{bcnx^{3+n}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2n},\frac{3(1+n)}{2n},c^2x^{2n}\right)}{3(3+n)}$$

output
```
1/3*x^3*(a+b*arcsin(c*x^n))-1/3*b*c*n*x^(3+n)*hypergeom([1/2, 1/2*(3+n)/n]
,[3/2*(1+n)/n],c^2*x^(2*n))/(3+n)
```

## 3.380.2 Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.10

$$\int x^2(a+b\arcsin(cx^n))\,dx=\frac{ax^3}{3}+\frac{1}{3}bx^3\arcsin(cx^n)-\frac{bcnx^{3+n}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{3+n}{2n},1+\frac{3+n}{2n},c^2x^{2n}\right)}{3(3+n)}$$

input
```
Integrate[x^2*(a + b*ArcSin[c*x^n]),x]
```

output
```
(a*x^3)/3 + (b*x^3*ArcSin[c*x^n])/3 - (b*c*n*x^(3 + n)*Hypergeometric2F1[1
/2, (3 + n)/(2*n), 1 + (3 + n)/(2*n), c^2*x^(2*n)])/(3*(3 + n))
```

### 3.380.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {5341, 27, 888}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2(a+b\arcsin(cx^n))\,dx$$

$$\Big\downarrow \ 5341$$

$$\frac{1}{3}x^3(a+b\arcsin(cx^n))-\frac{1}{3}b\int \frac{cnx^{n+2}}{\sqrt{1-c^2x^{2n}}}dx$$

$$\Big\downarrow \ 27$$

$$\frac{1}{3}x^3(a+b\arcsin(cx^n))-\frac{1}{3}bcn\int \frac{x^{n+2}}{\sqrt{1-c^2x^{2n}}}dx$$

$$\Big\downarrow \ 888$$

$$\frac{1}{3}x^3(a+b\arcsin(cx^n))-\frac{bcnx^{n+3}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+3}{2n},\frac{3(n+1)}{2n},c^2x^{2n}\right)}{3(n+3)}$$

input
```
Int[x^2*(a + b*ArcSin[c*x^n]),x]
```

output
```
(x^3*(a + b*ArcSin[c*x^n]))/3 - (b*c*n*x^(3 + n)*Hypergeometric2F1[1/2, (3
 + n)/(2*n), (3*(1 + n))/(2*n), c^2*x^(2*n)])/(3*(3 + n))
```

#### 3.380.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 888
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.380.4 Maple [F]

$$\int x^2(a + b\arcsin(c\,x^n))\,dx$$

input
```
int(x^2*(a+b*arcsin(c*x^n)),x)
```

output
```
int(x^2*(a+b*arcsin(c*x^n)),x)
```

## 3.380.5 Fricas [F(-2)]

Exception generated.

$$\int x^2(a + b\arcsin(cx^n))\ dx = \text{Exception raised: TypeError}$$

input
```
integrate(x^2*(a+b*arcsin(c*x^n)),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (has polynomial part)
```

## 3.380.6 Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 3.95 (sec) , antiderivative size = 82, normalized size of antiderivative = 1.21

$$\int x^2(a+b\arcsin(cx^n))\ dx = \frac{ax^3}{3} + \frac{ibcc^{\frac{3}{n}}c^{-1-\frac{3}{n}}x^3\Gamma\left(\frac{3}{2n}\right){}_2F_1\left(\begin{matrix}\frac{1}{2}, -\frac{3}{2n} \\ 1-\frac{3}{2n}\end{matrix}\middle|\frac{x^{-2n}}{c^2}\right)}{6\Gamma\left(1+\frac{3}{2n}\right)} + \frac{bx^3\operatorname{asin}(cx^n)}{3}$$

input
```
integrate(x**2*(a+b*asin(c*x**n)),x)
```

output
```
a*x**3/3 + I*b*c*c**(3/n)*c**(-1 - 3/n)*x**3*gamma(3/(2*n))*hyper((1/2, -3
/(2*n)), (1 - 3/(2*n),), 1/(c**2*x**(2*n)))/(6*gamma(1 + 3/(2*n))) + b*x**
3*asin(c*x**n)/3
```

### 3.380.7 Maxima [F]

$$\int x^2(a + b\arcsin(cx^n))\, dx = \int (b\arcsin(cx^n) + a)x^2\, dx$$

input
```
integrate(x^2*(a+b*arcsin(c*x^n)),x, algorithm="maxima")
```

output
```
1/3*a*x^3 + 1/3*(x^3*arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)) + 3*
c*n*integrate(1/3*sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^2*x^n/(c^2*x^(2*n) -
1), x))*b
```

### 3.380.8 Giac [F]

$$\int x^2(a + b\arcsin(cx^n))\, dx = \int (b\arcsin(cx^n) + a)x^2\, dx$$

input
```
integrate(x^2*(a+b*arcsin(c*x^n)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^n) + a)*x^2, x)
```

### 3.380.9 Mupad [F(-1)]

Timed out.

$$\int x^2(a + b\arcsin(cx^n))\, dx = \int x^2\,(a + b\,\mathrm{asin}(c\,x^n))\, dx$$

input
```
int(x^2*(a + b*asin(c*x^n)),x)
```

output
```
int(x^2*(a + b*asin(c*x^n)), x)
```

# 3.381 $\int x(a+b\arcsin(cx^n))\,dx$



## 3.381.1 Optimal result

Integrand size = 12, antiderivative size = 69

$$\int x(a+b\arcsin(cx^n))\,dx=\frac{1}{2}x^2(a+b\arcsin(cx^n))-\frac{bcnx^{2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2n},\frac{1}{2}\left(3+\frac{2}{n}\right),c^2x^{2n}\right)}{2(2+n)}$$

output
```
1/2*x^2*(a+b*arcsin(c*x^n))-1/2*b*c*n*x^(2+n)*hypergeom([1/2, 1/2*(2+n)/n]
,[3/2+1/n],c^2*x^(2*n))/(2+n)
```

## 3.381.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.09

$$\int x(a+b\arcsin(cx^n))\,dx=\frac{ax^2}{2}+\frac{1}{2}bx^2\arcsin(cx^n)-\frac{bcnx^{2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2+n}{2n},1+\frac{2+n}{2n},c^2x^{2n}\right)}{2(2+n)}$$

input
```
Integrate[x*(a + b*ArcSin[c*x^n]),x]
```

output
```
(a*x^2)/2 + (b*x^2*ArcSin[c*x^n])/2 - (b*c*n*x^(2 + n)*Hypergeometric2F1[1
/2, (2 + n)/(2*n), 1 + (2 + n)/(2*n), c^2*x^(2*n)])/(2*(2 + n))
```

### 3.381.3 Rubi [A] (verified)

Time = 0.21 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {5341, 27, 888}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x(a+b\arcsin(cx^n))\,dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{2}x^2(a+b\arcsin(cx^n))-\frac{1}{2}b\int \frac{cnx^{n+1}}{\sqrt{1-c^2x^{2n}}}dx$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{2}x^2(a+b\arcsin(cx^n))-\frac{1}{2}bcn\int \frac{x^{n+1}}{\sqrt{1-c^2x^{2n}}}dx$$

$$\Big\downarrow \text{888}$$

$$\frac{1}{2}x^2(a+b\arcsin(cx^n))-\frac{bcnx^{n+2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+2}{2n},\frac{1}{2}\left(3+\frac{2}{n}\right),c^2x^{2n}\right)}{2(n+2)}$$

input
```
Int[x*(a + b*ArcSin[c*x^n]),x]
```

output
```
(x^2*(a + b*ArcSin[c*x^n]))/2 - (b*c*n*x^(2 + n)*Hypergeometric2F1[1/2, (2
 + n)/(2*n), (3 + 2/n)/2, c^2*x^(2*n)])/(2*(2 + n))
```

#### 3.381.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 888
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.381.4 Maple [F]

$$\int x(a+b\arcsin(c\,x^{n}))\,dx$$

input
```
int(x*(a+b*arcsin(c*x^n)),x)
```

output
```
int(x*(a+b*arcsin(c*x^n)),x)
```

### 3.381.5 Fricas [F(-2)]

Exception generated.

$$\int x(a+b\arcsin(cx^n))\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(x*(a+b*arcsin(c*x^n)),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (has polynomial part)
```

### 3.381.6 Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 2.22 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.09

$$\int x(a+b\arcsin(cx^n))\,dx = \frac{ax^2}{2} + \frac{ibcc^{\frac{2}{n}}c^{-1-\frac{2}{n}}x^2\Gamma\left(\frac{1}{n}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},-\frac{1}{n}\\1-\frac{1}{n}\end{matrix}\middle|\frac{x^{-2n}}{c^2}\right)}{4\Gamma\left(1+\frac{1}{n}\right)} + \frac{bx^2\operatorname{asin}(cx^n)}{2}$$

input
```
integrate(x*(a+b*asin(c*x**n)),x)
```

output
```
a*x**2/2 + I*b*c*c**(2/n)*c**(-1 - 2/n)*x**2*gamma(1/n)*hyper((1/2, -1/n),
 (1 - 1/n,), 1/(c**2*x**(2*n)))/(4*gamma(1 + 1/n)) + b*x**2*asin(c*x**n)/2
```

### 3.381.7 Maxima [F]

$$\int x(a + b \arcsin(cx^n)) \, dx = \int (b \arcsin(cx^n) + a)x \, dx$$

input
```
integrate(x*(a+b*arcsin(c*x^n)),x, algorithm="maxima")
```

output
```
1/2*a*x^2 + 1/2*(x^2*arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)) + 2*
c*n*integrate(1/2*sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x*x^n/(c^2*x^(2*n) - 1)
, x))*b
```

### 3.381.8 Giac [F]

$$\int x(a + b \arcsin(cx^n)) \, dx = \int (b \arcsin(cx^n) + a)x \, dx$$

input
```
integrate(x*(a+b*arcsin(c*x^n)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^n) + a)*x, x)
```

### 3.381.9 Mupad [F(-1)]

Timed out.

$$\int x(a + b \arcsin(cx^n)) \, dx = \int x (a + b \operatorname{asin}(c x^n)) \, dx$$

input
```
int(x*(a + b*asin(c*x^n)),x)
```

output
```
int(x*(a + b*asin(c*x^n)), x)
```

# 3.382 $\int (a+b\arcsin(cx^n))\,dx$



## 3.382.1 Optimal result

Integrand size = 10, antiderivative size = 60

$$\int (a+b\arcsin(cx^n))\,dx = ax+bx\arcsin(cx^n) - \frac{bcnx^{1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2n},\frac{1}{2}\left(3+\frac{1}{n}\right),c^2x^{2n}\right)}{1+n}$$

output
```
a*x+b*x*arcsin(c*x^n)-b*c*n*x^(1+n)*hypergeom([1/2, 1/2*(1+n)/n],[3/2+1/2/
n],c^2*x^(2*n))/(1+n)
```

## 3.382.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00

$$\int (a+b\arcsin(cx^n))\,dx = ax+bx\arcsin(cx^n) - \frac{bcnx^{1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1+n}{2n},\frac{1}{2}\left(3+\frac{1}{n}\right),c^2x^{2n}\right)}{1+n}$$

input
```
Integrate[a + b*ArcSin[c*x^n],x]
```

output
```
a*x + b*x*ArcSin[c*x^n] - (b*c*n*x^(1 + n)*Hypergeometric2F1[1/2, (1 + n)/
(2*n), (3 + n^(-1))/2, c^2*x^(2*n)])/(1 + n)
```

### 3.382.3 Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(cx^n))\,dx$$
$$\Big\downarrow \text{2009}$$
$$ax+bx\arcsin(cx^n)-\frac{bcnx^{n+1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{n+1}{2n},\frac{1}{2}\left(3+\frac{1}{n}\right),c^2x^{2n}\right)}{n+1}$$

input
```
Int[a + b*ArcSin[c*x^n],x]
```

output
```
a*x + b*x*ArcSin[c*x^n] - (b*c*n*x^(1 + n)*Hypergeometric2F1[1/2, (1 + n)/
(2*n), (3 + n^(-1))/2, c^2*x^(2*n)])/(1 + n)
```

#### 3.382.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

### 3.382.4 Maple [F]

$$\int (a+b\arcsin(c\,x^n))\,dx$$

input
```
int(a+b*arcsin(c*x^n),x)
```

output
```
int(a+b*arcsin(c*x^n),x)
```

### 3.382.5 Fricas [F(-2)]

Exception generated.

$$\int (a + b \arcsin(cx^n)) \, dx = \text{Exception raised: TypeError}$$

input
```
integrate(a+b*arcsin(c*x^n),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (has polynomial part)
```

### 3.382.6 Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 1.31 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.18

$$\int (a + b \arcsin(cx^n)) \, dx = ax + b \left( \frac{icc^{\frac{1}{n}} c^{-1-\frac{1}{n}} x \Gamma\left(\frac{1}{2n}\right) {}_2F_1\left(\begin{matrix} \frac{1}{2}, -\frac{1}{2n} \\ 1 - \frac{1}{2n} \end{matrix} \middle| \frac{x^{-2n}}{c^2}\right)}{2\Gamma\left(1 + \frac{1}{2n}\right)} + x \operatorname{asin}(cx^n) \right)$$

input
```
integrate(a+b*asin(c*x**n),x)
```

output
```
a*x + b*(I*c*c**(1/n)*c**(-1 - 1/n)*x*gamma(1/(2*n))*hyper((1/2, -1/(2*n))
, (1 - 1/(2*n),), 1/(c**2*x**(2*n)))/(2*gamma(1 + 1/(2*n))) + x*asin(c*x**
n))
```

### 3.382.7 Maxima [F]

$$\int (a + b \arcsin(cx^n)) \, dx = \int b \arcsin(cx^n) + a \, dx$$

input
```
integrate(a+b*arcsin(c*x^n),x, algorithm="maxima")
```

output
```
(c*n*integrate(sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^n/(c^2*x^(2*n) - 1), x)
+ x*arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)))*b + a*x
```

### 3.382.8 Giac [F]

$$\int (a + b \arcsin(cx^n)) \, dx = \int b \arcsin(cx^n) + a \, dx$$

input
```
integrate(a+b*arcsin(c*x^n),x, algorithm="giac")
```

output
```
integrate(b*arcsin(c*x^n) + a, x)
```

### 3.382.9 Mupad [F(-1)]

Timed out.

$$\int (a + b \arcsin(cx^n)) \, dx = \int a + b \operatorname{asin}(c\,x^n) \, dx$$

input
```
int(a + b*asin(c*x^n),x)
```

output
```
int(a + b*asin(c*x^n), x)
```

# 3.383 $\int \frac{a+b \arcsin(cx^n)}{x} \, dx$



## 3.383.1 Optimal result

Integrand size = 14, antiderivative size = 75

$$\int \frac{a+b \arcsin(cx^n)}{x} \, dx = -\frac{ib \arcsin(cx^n)^2}{2n} + \frac{b \arcsin(cx^n) \log\left(1-e^{2i \arcsin(cx^n)}\right)}{n} + a \log(x) - \frac{ib \operatorname{PolyLog}\left(2, e^{2i \arcsin(cx^n)}\right)}{2n}$$

output
```
-1/2*I*b*arcsin(c*x^n)^2/n+b*arcsin(c*x^n)*ln(1-(I*c*x^n+(1-c^2*(x^n)^2)^(
1/2))^2)/n+a*ln(x)-1/2*I*b*polylog(2,(I*c*x^n+(1-c^2*(x^n)^2)^(1/2))^2)/n
```

## 3.383.2 Mathematica [B] (verified)

Both result and optimal contain complex but leaf count is larger than twice the leaf count of optimal. 157 vs. 2(75) = 150.

Time = 0.15 (sec) , antiderivative size = 157, normalized size of antiderivative = 2.09

$$\int \frac{a+b \arcsin(cx^n)}{x} \, dx = a \log(x) + b \arcsin(cx^n) \log(x) - \frac{bc\left(\log(x) \log\left(\sqrt{-c^2}x^n + \sqrt{1-c^2x^{2n}}\right) + \frac{i\left(i \operatorname{arcsinh}\left(\sqrt{-c^2}x^n\right) \log\left(1-e^{-2 \operatorname{arcsinh}\left(\sqrt{-c^2}x^n\right)}\right) - \frac{1}{2}i\left(-\operatorname{arcsinh}\left(\sqrt{-c^2}x\right.\right.\right.}{n}\right.}{\sqrt{-c^2}}$$

input
```
Integrate[(a + b*ArcSin[c*x^n])/x,x]
```

output
```
a*Log[x] + b*ArcSin[c*x^n]*Log[x] - (b*c*(Log[x]*Log[Sqrt[-c^2]*x^n + Sqrt
[1 - c^2*x^(2*n)]] + (I*(I*ArcSinh[Sqrt[-c^2]*x^n]*Log[1 - E^(-2*ArcSinh[S
qrt[-c^2]*x^n])] - (I/2)*(-ArcSinh[Sqrt[-c^2]*x^n]^2 + PolyLog[2, E^(-2*Ar
cSinh[Sqrt[-c^2]*x^n])])))/n))/Sqrt[-c^2]
```

## 3.383.3 Rubi [A] (verified)

Time = 0.30 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx^n)}{x}\,dx$$
$$\Big\downarrow \text{7293}$$
$$\int \left(\frac{a}{x}+\frac{b\arcsin(cx^n)}{x}\right)dx$$
$$\Big\downarrow \text{2009}$$
$$a\log(x)-\frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin(cx^n)}\right)}{2n}-\frac{ib\arcsin(cx^n)^2}{2n}+\frac{b\arcsin(cx^n)\log\left(1-e^{2i\arcsin(cx^n)}\right)}{n}$$

input
```
Int[(a + b*ArcSin[c*x^n])/x,x]
```

output
```
((-1/2*I)*b*ArcSin[c*x^n]^2)/n + (b*ArcSin[c*x^n]*Log[1 - E^((2*I)*ArcSin[
c*x^n])])/n + a*Log[x] - ((I/2)*b*PolyLog[2, E^((2*I)*ArcSin[c*x^n])])/n
```

### 3.383.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

## 3.383.4 Maple [A] (verified)

Time = 0.97 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.91

| method | result |
|---|---|
| parts | $a\ln(x)+\frac{b\left(-\frac{i\arcsin(cx^n)^2}{2}+\arcsin(cx^n)\ln\left(1+icx^n+\sqrt{1-c^2x^{2n}}\right)-i\,\mathrm{polylog}\left(2,-icx^n-\sqrt{1-c^2x^{2n}}\right)+\arcsin(cx^n\right.}{n}$ |
| derivativedivides | $\frac{a\ln(cx^n)+b\left(-\frac{i\arcsin(cx^n)^2}{2}+\arcsin(cx^n)\ln\left(1+icx^n+\sqrt{1-c^2x^{2n}}\right)-i\,\mathrm{polylog}\left(2,-icx^n-\sqrt{1-c^2x^{2n}}\right)+\arcsin(cx^n)\right.}{n}$ |
| default | $\frac{a\ln(cx^n)+b\left(-\frac{i\arcsin(cx^n)^2}{2}+\arcsin(cx^n)\ln\left(1+icx^n+\sqrt{1-c^2x^{2n}}\right)-i\,\mathrm{polylog}\left(2,-icx^n-\sqrt{1-c^2x^{2n}}\right)+\arcsin(cx^n)\right.}{n}$ |

input
```
int((a+b*arcsin(c*x^n))/x,x,method=_RETURNVERBOSE)
```

output
```
a*ln(x)+b/n*(-1/2*I*arcsin(c*x^n)^2+arcsin(c*x^n)*ln(1+I*c*x^n+(1-c^2*(x^n
)^2)^(1/2))-I*polylog(2,-I*c*x^n-(1-c^2*(x^n)^2)^(1/2))+arcsin(c*x^n)*ln(1
-I*c*x^n-(1-c^2*(x^n)^2)^(1/2))-I*polylog(2,I*c*x^n+(1-c^2*(x^n)^2)^(1/2))
)
```

## 3.383.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx^n)}{x}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x^n))/x,x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (has polynomial part)
```

### 3.383.6 Sympy [F]

$$\int \frac{a+b\arcsin(cx^n)}{x}\,dx=\int \frac{a+b\operatorname{asin}(cx^n)}{x}\,dx$$

input
```
integrate((a+b*asin(c*x**n))/x,x)
```

output
```
Integral((a + b*asin(c*x**n))/x, x)
```

### 3.383.7 Maxima [F]

$$\int \frac{a+b\arcsin(cx^n)}{x}\,dx=\int \frac{b\arcsin(cx^n)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(c*x^n))/x,x, algorithm="maxima")
```

output
```
(c*n*integrate(sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^n*log(x)/(c^2*x*x^(2*n)
- x), x) + arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1))*log(x))*b + a*
log(x)
```

### 3.383.8 Giac [F]

$$\int \frac{a+b\arcsin(cx^n)}{x}\,dx=\int \frac{b\arcsin(cx^n)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(c*x^n))/x,x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^n) + a)/x, x)
```

### 3.383.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(cx^n\right)}{x}\,dx = \int \frac{a+b\,\mathrm{asin}(c\,x^n)}{x}\,dx$$

input
```
int((a + b*asin(c*x^n))/x,x)
```

output
```
int((a + b*asin(c*x^n))/x, x)
```

# 3.384 $\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx$



## 3.384.1 Optimal result

Integrand size = 14, antiderivative size = 69

$$\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx = -\frac{a+b\arcsin(cx^n)}{x} - \frac{bcnx^{-1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},-\frac{1-n}{2n},\frac{1}{2}\left(3-\frac{1}{n}\right),c^2x^{2n}\right)}{1-n}$$

output
```
(-a-b*arcsin(c*x^n))/x-b*c*n*x^(-1+n)*hypergeom([1/2, 1/2*(-1+n)/n],[3/2-1
/2/n],c^2*x^(2*n))/(1-n)
```

## 3.384.2 Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 68, normalized size of antiderivative = 0.99

$$\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx = -\frac{a}{x} - \frac{b\arcsin(cx^n)}{x} + \frac{bcnx^{-1+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{-1+n}{2n},1+\frac{-1+n}{2n},c^2x^{2n}\right)}{-1+n}$$

input
```
Integrate[(a + b*ArcSin[c*x^n])/x^2,x]
```

output
```
-(a/x) - (b*ArcSin[c*x^n])/x + (b*c*n*x^(-1 + n)*Hypergeometric2F1[1/2, (-
1 + n)/(2*n), 1 + (-1 + n)/(2*n), c^2*x^(2*n)])/(-1 + n)
```

### 3.384.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {5341, 27, 888}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx$$

$$\Big\downarrow \text{5341}$$

$$b\int \frac{cnx^{n-2}}{\sqrt{1-c^2x^{2n}}}dx-\frac{a+b\arcsin(cx^n)}{x}$$

$$\Big\downarrow \text{27}$$

$$bcn\int \frac{x^{n-2}}{\sqrt{1-c^2x^{2n}}}dx-\frac{a+b\arcsin(cx^n)}{x}$$

$$\Big\downarrow \text{888}$$

$$-\frac{a+b\arcsin(cx^n)}{x}-\frac{bcnx^{n-1}\,\text{Hypergeometric2F1}\left(\frac{1}{2},-\frac{1-n}{2n},\frac{1}{2}\left(3-\frac{1}{n}\right),c^2x^{2n}\right)}{1-n}$$

input
```
Int[(a + b*ArcSin[c*x^n])/x^2,x]
```

output
```
-((a + b*ArcSin[c*x^n])/x) - (b*c*n*x^(-1 + n)*Hypergeometric2F1[1/2, -1/2
*(1 - n)/n, (3 - n^(-1))/2, c^2*x^(2*n)])/(1 - n)
```

#### 3.384.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 888
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.384.4 Maple [F]

$$\int \frac{a+b\arcsin\left(c\,x^{n}\right)}{x^{2}}dx$$

input
```
int((a+b*arcsin(c*x^n))/x^2,x)
```

output
```
int((a+b*arcsin(c*x^n))/x^2,x)
```

## 3.384.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin\left(cx^{n}\right)}{x^{2}}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x^n))/x^2,x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (has polynomial part)
```

## 3.384.6 Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 2.27 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.06

$$\int \frac{a+b\arcsin\left(cx^{n}\right)}{x^{2}}\,dx=-\frac{a}{x}-\frac{ibcc^{-\frac{1}{n}}c^{-1+\frac{1}{n}}\Gamma\left(-\frac{1}{2n}\right){}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{1}{2n}\\1+\frac{1}{2n}\end{matrix}\middle|\frac{x^{-2n}}{c^{2}}\right)}{2x\Gamma\left(1-\frac{1}{2n}\right)}-\frac{b\,\text{asin}\left(cx^{n}\right)}{x}$$

input
```
integrate((a+b*asin(c*x**n))/x**2,x)
```

output
```
-a/x - I*b*c*c**(-1 + 1/n)*gamma(-1/(2*n))*hyper((1/2, 1/(2*n)), (1 + 1/(2
*n),), 1/(c**2*x**(2*n)))/(2*c**(1/n)*x*gamma(1 - 1/(2*n))) - b*asin(c*x**
n)/x
```

### 3.384.7 Maxima [F]

$$\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx=\int \frac{b\arcsin(cx^n)+a}{x^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x^n))/x^2,x, algorithm="maxima")
```

output
```
-(c*n*x*integrate(sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^n/(c^2*x^2*x^(2*n) -
x^2), x) + arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)))*b/x - a/x
```

### 3.384.8 Giac [F]

$$\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx=\int \frac{b\arcsin(cx^n)+a}{x^2}\,dx$$

input
```
integrate((a+b*arcsin(c*x^n))/x^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^n) + a)/x^2, x)
```

### 3.384.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(cx^n)}{x^2}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x^n)}{x^2}\,dx$$

input
```
int((a + b*asin(c*x^n))/x^2,x)
```

output
```
int((a + b*asin(c*x^n))/x^2, x)
```

# 3.385 $\int \frac{a+b\arcsin(cx^n)}{x^3}\,dx$



## 3.385.1 Optimal result

Integrand size = 14, antiderivative size = 72

$$\int \frac{a+b\arcsin(cx^n)}{x^3}\,dx = -\frac{a+b\arcsin(cx^n)}{2x^2} - \frac{bcnx^{-2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}\left(1-\frac{2}{n}\right),\frac{1}{2}\left(3-\frac{2}{n}\right),c^2x^{2n}\right)}{2(2-n)}$$

output
```
1/2*(-a-b*arcsin(c*x^n))/x^2-1/2*b*c*n*x^(-2+n)*hypergeom([1/2, 1/2-1/n],[
3/2-1/n],c^2*x^(2*n))/(2-n)
```

## 3.385.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.04

$$\int \frac{a+b\arcsin(cx^n)}{x^3}\,dx = -\frac{a}{2x^2} - \frac{b\arcsin(cx^n)}{2x^2} + \frac{bcnx^{-2+n}\,\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{-2+n}{2n},1+\frac{-2+n}{2n},c^2x^{2n}\right)}{2(-2+n)}$$

input
```
Integrate[(a + b*ArcSin[c*x^n])/x^3,x]
```

output
```
-1/2*a/x^2 - (b*ArcSin[c*x^n])/(2*x^2) + (b*c*n*x^(-2 + n)*Hypergeometric2
F1[1/2, (-2 + n)/(2*n), 1 + (-2 + n)/(2*n), c^2*x^(2*n)])/(2*(-2 + n))
```

### 3.385.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 73, normalized size of antiderivative = 1.01, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {5341, 27, 888}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(cx^n)}{x^3}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{2}b\int \frac{cnx^{n-3}}{\sqrt{1-c^2x^{2n}}}dx-\frac{a+b\arcsin(cx^n)}{2x^2}$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{2}bcn\int \frac{x^{n-3}}{\sqrt{1-c^2x^{2n}}}dx-\frac{a+b\arcsin(cx^n)}{2x^2}$$

$$\Big\downarrow \text{888}$$

$$-\frac{a+b\arcsin(cx^n)}{2x^2}-\frac{bcnx^{n-2}\,\text{Hypergeometric2F1}\left(\frac{1}{2},-\frac{2-n}{2n},\frac{1}{2}\left(3-\frac{2}{n}\right),c^2x^{2n}\right)}{2(2-n)}$$

input
```
Int[(a + b*ArcSin[c*x^n])/x^3,x]
```

output
```
-1/2*(a + b*ArcSin[c*x^n])/x^2 - (b*c*n*x^(-2 + n)*Hypergeometric2F1[1/2,
-1/2*(2 - n)/n, (3 - 2/n)/2, c^2*x^(2*n)])/(2*(2 - n))
```

#### 3.385.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 888
```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p
*((c*x)^(m + 1)/(c*(m + 1)))*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1
, (-b)*(x^n/a)], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.385.4 Maple [F]

$$\int \frac{a+b\arcsin\left(c\,x^{n}\right)}{x^{3}}dx$$

input
```
int((a+b*arcsin(c*x^n))/x^3,x)
```

output
```
int((a+b*arcsin(c*x^n))/x^3,x)
```

### 3.385.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(cx^n)}{x^3}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(c*x^n))/x^3,x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (has polynomial part)
```

### 3.385.6 Sympy [C] (verification not implemented)

Result contains complex when optimal does not.

Time = 4.23 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.04

$$\int \frac{a+b\arcsin(cx^n)}{x^3}\,dx = -\frac{a}{2x^2} - \frac{ibcc^{-\frac{2}{n}}c^{-1+\frac{2}{n}}\Gamma\left(-\frac{1}{n}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|\frac{x^{-2n}}{c^2}\right)}{4x^2\Gamma\left(1-\frac{1}{n}\right)} - \frac{b\,\mathrm{asin}\,(cx^n)}{2x^2}$$

input
```
integrate((a+b*asin(c*x**n))/x**3,x)
```

output
```
-a/(2*x**2) - I*b*c*c**(-1 + 2/n)*gamma(-1/n)*hyper((1/2, 1/n), (1 + 1/n,)
, 1/(c**2*x**(2*n)))/(4*c**(2/n)*x**2*gamma(1 - 1/n)) - b*asin(c*x**n)/(2*
x**2)
```

### 3.385.7 Maxima [F]

$$\int \frac{a+b\arcsin\left(cx^n\right)}{x^3}\,dx=\int \frac{b\arcsin\left(cx^n\right)+a}{x^3}\,dx$$

input
```
integrate((a+b*arcsin(c*x^n))/x^3,x, algorithm="maxima")
```

output
```
-1/2*(2*c*n*x^2*integrate(1/2*sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)*x^n/(c^2*x^
3*x^(2*n) - x^3), x) + arctan2(c*x^n, sqrt(c*x^n + 1)*sqrt(-c*x^n + 1)))*b
/x^2 - 1/2*a/x^2
```

### 3.385.8 Giac [F]

$$\int \frac{a+b\arcsin\left(cx^n\right)}{x^3}\,dx=\int \frac{b\arcsin\left(cx^n\right)+a}{x^3}\,dx$$

input
```
integrate((a+b*arcsin(c*x^n))/x^3,x, algorithm="giac")
```

output
```
integrate((b*arcsin(c*x^n) + a)/x^3, x)
```

### 3.385.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(cx^n\right)}{x^3}\,dx=\int \frac{a+b\,\mathrm{asin}(c\,x^n)}{x^3}\,dx$$

input
```
int((a + b*asin(c*x^n))/x^3,x)
```

output
```
int((a + b*asin(c*x^n))/x^3, x)
```

# 3.386 $\int x^5(a+b\arcsin(c+dx^2))\,dx$



## 3.386.1 Optimal result

Integrand size = 16, antiderivative size = 129

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{bx^4\sqrt{1-c^2-2cdx^2-d^2x^4}}{18d}+\frac{b(4+11c^2-5cdx^2)\sqrt{1-c^2-2cdx^2-d^2x^4}}{36d^3}+\frac{bc(3+2c^2)\arcsin(c+dx^2)}{12d^3}+\frac{1}{6}x^6\left(a+b\arcsin\left(c+dx^2\right)\right)$$

output
```
1/12*b*c*(2*c^2+3)*arcsin(d*x^2+c)/d^3+1/6*x^6*(a+b*arcsin(d*x^2+c))+1/18*
b*x^4*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d+1/36*b*(-5*c*d*x^2+11*c^2+4)*(-d^
2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d^3
```

## 3.386.2 Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 116, normalized size of antiderivative = 0.90

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{ax^6}{6}+\frac{1}{2}b\left(\frac{4+11c^2}{18d^3}-\frac{5cx^2}{18d^2}+\frac{x^4}{9d}\right)\sqrt{1-c^2-2cdx^2-d^2x^4}+\frac{bc(3+2c^2)\arcsin(c+dx^2)}{12d^3}+\frac{1}{6}bx^6\arcsin\left(c+dx^2\right)$$

input
```
Integrate[x^5*(a + b*ArcSin[c + d*x^2]),x]
```

output
```
(a*x^6)/6 + (b*((4 + 11*c^2)/(18*d^3) - (5*c*x^2)/(18*d^2) + x^4/(9*d))*Sq
rt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/2 + (b*c*(3 + 2*c^2)*ArcSin[c + d*x^2])
/(12*d^3) + (b*x^6*ArcSin[c + d*x^2])/6
```

## 3.386.3 Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.19, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5341, 27, 1434, 1166, 25, 1225, 1090, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^5 (a + b \arcsin (c + dx^2)) \, dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{6}x^6 (a + b \arcsin (c + dx^2)) - \frac{1}{6}b \int \frac{2dx^7}{\sqrt{-d^2x^4 - 2cdx^2 - c^2 + 1}}dx$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{6}x^6 (a + b \arcsin (c + dx^2)) - \frac{1}{3}bd \int \frac{x^7}{\sqrt{-d^2x^4 - 2cdx^2 - c^2 + 1}}dx$$

$$\Big\downarrow \text{1434}$$

$$\frac{1}{6}x^6 (a + b \arcsin (c + dx^2)) - \frac{1}{6}bd \int \frac{x^6}{\sqrt{-d^2x^4 - 2cdx^2 - c^2 + 1}}dx^2$$

$$\Big\downarrow \text{1166}$$

$$\frac{1}{6}x^6 (a + b \arcsin (c + dx^2)) - \frac{1}{6}bd \left( -\frac{\int -\frac{x^2(2(1-c^2)-5cdx^2)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2}{3d^2} - \frac{x^4\sqrt{-c^2 - 2cdx^2 - d^2x^4 + 1}}{3d^2} \right)$$

$$\Big\downarrow \text{25}$$

$$\frac{1}{6}x^6 (a + b \arcsin (c + dx^2)) - \frac{1}{6}bd \left( \frac{\int \frac{x^2(2(1-c^2)-5cdx^2)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2}{3d^2} - \frac{x^4\sqrt{-c^2 - 2cdx^2 - d^2x^4 + 1}}{3d^2} \right)$$

$$\Big\downarrow \text{1225}$$

$$\frac{1}{6}x^6(a+b\arcsin(c+dx^2)) - \frac{1}{6}bd\left(\frac{-\frac{3c(2c^2+3)\int\frac{1}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2}{2d}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}(11c^2-5cdx^2+4)}{2d^2}}{3d^2}-\frac{x^4\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d^2}\right)$$

$\big\downarrow$ 1090

$$\frac{1}{6}x^6(a+b\arcsin(c+dx^2)) - \frac{1}{6}bd\left(\frac{\frac{3c(2c^2+3)\int\frac{1}{\sqrt{1-\frac{x^4}{4d^2}}}d(-2d^2x^2-2cd)}{4d^3}-\frac{(11c^2-5cdx^2+4)\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2d^2}}{3d^2}-\frac{x^4\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d^2}\right)$$

$\big\downarrow$ 223

$$\frac{1}{6}x^6(a+b\arcsin(c+dx^2)) - \frac{1}{6}bd\left(\frac{\frac{3c(2c^2+3)\arcsin\left(\frac{-2cd-2d^2x^2}{2d}\right)}{2d^2}-\frac{(11c^2-5cdx^2+4)\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2d^2}}{3d^2}-\frac{x^4\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d^2}\right)$$

input
```
Int[x^5*(a + b*ArcSin[c + d*x^2]),x]
```

output
```
(x^6*(a + b*ArcSin[c + d*x^2]))/6 - (b*d*(-1/3*(x^4*Sqrt[1 - c^2 - 2*c*d*x
^2 - d^2*x^4])/d^2 + (-1/2*((4 + 11*c^2 - 5*c*d*x^2)*Sqrt[1 - c^2 - 2*c*d*
x^2 - d^2*x^4])/d^2 + (3*c*(3 + 2*c^2)*ArcSin[(-2*c*d - 2*d^2*x^2)/(2*d)])
/(2*d^2))/(3*d^2)))/6
```

### 3.386.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 1090
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p)   Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x,
b + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

rule 1166
```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*((a + b*x + c*x^2)^(p + 1)/(c*(m + 2*p +
 1))), x] + Simp[1/(c*(m + 2*p + 1))   Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m
+ 2*p + 1) - e*(a*e*(m - 1) + b*d*(p + 1)) + e*(2*c*d - b*e)*(m + p)*x, x]*
(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && If[Ration
alQ[m], GtQ[m, 1], SumSimplerQ[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadrat
icQ[a, b, c, d, e, m, p, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

rule 1434
```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp
[1/2   Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.386. $\int x^5(a + b \arcsin(c + dx^2))\, dx$

### 3.386.4 Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 257 vs. $2(117) = 234$.

Time = 0.18 (sec) , antiderivative size = 258, normalized size of antiderivative = 2.00

| method | result |
|---|---|
| default | $\frac{a x^6}{6} + b\left(\frac{x^6 \arcsin(d x^2+c)}{6} - \frac{d\left(-\frac{x^4\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{6d^2} + \frac{5c\,x^2\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{12d^3} - \frac{11c^2\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{12d^4} - \frac{c^3 \arctan}{}\right.}{3}\right.$ |
| parts | $\frac{a x^6}{6} + b\left(\frac{x^6 \arcsin(d x^2+c)}{6} - \frac{d\left(-\frac{x^4\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{6d^2} + \frac{5c\,x^2\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{12d^3} - \frac{11c^2\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{12d^4} - \frac{c^3 \arctan}{}\right.}{3}\right.$ |

input
```
int(x^5*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)
```

output
```
1/6*a*x^6+b*(1/6*x^6*arcsin(d*x^2+c)-1/3*d*(-1/6*x^4/d^2*(-d^2*x^4-2*c*d*x
^2-c^2+1)^(1/2)+5/12*c/d^3*x^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-11/12*c^2/
d^4*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-1/2*c^3/d^3/(d^2)^(1/2)*arctan((d^2)^
(1/2)*(x^2+c/d)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))-3/4*c/d^3/(d^2)^(1/2)*ar
ctan((d^2)^(1/2)*(x^2+c/d)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))-1/3/d^4*(-d^2
*x^4-2*c*d*x^2-c^2+1)^(1/2)))
```

### 3.386.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.75

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$
$$= \frac{6\,ad^3x^6 + 3\left(2\,bd^3x^6 + 2\,bc^3 + 3\,bc\right)\arcsin\left(dx^2+c\right) + \left(2\,bd^2x^4 - 5\,bcdx^2 + 11\,bc^2 + 4\,b\right)\sqrt{-d^2x^4 - 2\,cdx^2}}{36\,d^3}$$

input
```
integrate(x^5*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
```

output
```
1/36*(6*a*d^3*x^6 + 3*(2*b*d^3*x^6 + 2*b*c^3 + 3*b*c)*arcsin(d*x^2 + c) +
(2*b*d^2*x^4 - 5*b*c*d*x^2 + 11*b*c^2 + 4*b)*sqrt(-d^2*x^4 - 2*c*d*x^2 - c
^2 + 1))/d^3
```

## 3.386.6 Sympy [A] (verification not implemented)

Time = 0.57 (sec) , antiderivative size = 204, normalized size of antiderivative = 1.58

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$
$$=\begin{cases}\frac{ax^6}{6}+\frac{bc^3\operatorname{asin}(c+dx^2)}{6d^3}+\frac{11bc^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{36d^3}-\frac{5bcx^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{36d^2}+\frac{bc\operatorname{asin}(c+dx^2)}{4d^3}+\frac{bx^6\operatorname{asin}(c+dx^2)}{6}+bx \\ \frac{x^6(a+b\operatorname{asin}(c))}{6}\end{cases}$$

input
```
integrate(x**5*(a+b*asin(d*x**2+c)),x)
```

output
```
Piecewise((a*x**6/6 + b*c**3*asin(c + d*x**2)/(6*d**3) + 11*b*c**2*sqrt(-c
**2 - 2*c*d*x**2 - d**2*x**4 + 1)/(36*d**3) - 5*b*c*x**2*sqrt(-c**2 - 2*c*
d*x**2 - d**2*x**4 + 1)/(36*d**2) + b*c*asin(c + d*x**2)/(4*d**3) + b*x**6
*asin(c + d*x**2)/6 + b*x**4*sqrt(-c**2 - 2*c*d*x**2 - d**2*x**4 + 1)/(18*
d) + b*sqrt(-c**2 - 2*c*d*x**2 - d**2*x**4 + 1)/(9*d**3), Ne(d, 0)), (x**6
*(a + b*asin(c))/6, True))
```

## 3.386.7 Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 245 vs. $2(117) = 234$.

Time = 0.27 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.90

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{1}{6}ax^6$$
$$+\frac{1}{36}\left(6x^6\arcsin\left(dx^2+c\right)+\left(\frac{2\sqrt{-d^2x^4-2cdx^2-c^2+1}x^4}{d^2}-\frac{5\sqrt{-d^2x^4-2cdx^2-c^2+1}cx^2}{d^3}-\frac{15c}{}\right.\right.$$

input
```
integrate(x^5*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

output
```
1/6*a*x^6 + 1/36*(6*x^6*arcsin(d*x^2 + c) + (2*sqrt(-d^2*x^4 - 2*c*d*x^2 -
 c^2 + 1)*x^4/d^2 - 5*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*c*x^2/d^3 - 15*
c^3*arcsin(-(d^2*x^2 + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 9*(c^2 -
1)*c*arcsin(-(d^2*x^2 + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2))/d^4 + 15*sqrt(
-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*c^2/d^4 - 4*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^
2 + 1)*(c^2 - 1)/d^4)*d)*b
```

### 3.386.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 254 vs. $2(117) = 234$.

Time = 0.28 (sec) , antiderivative size = 254, normalized size of antiderivative = 1.97

$$\int x^5\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$
$$= \frac{(dx^2+c)^3a}{6\,d^3} + \frac{(dx^2+c)\left((dx^2+c)^2-1\right)b\arcsin\left(dx^2+c\right)}{6\,d^3} - \frac{\left((dx^2+c)^2-1\right)bc\arcsin\left(dx^2+c\right)}{2\,d^3} - \frac{(dx^2+c)\sqrt{-(dx^2+c)^2+1}bc}{4\,d^3} - \frac{\left((dx^2+c)^2-1\right)ac}{2\,d^3} + \frac{(dx^2+c)b\arcsin\left(dx^2+c\right)}{6\,d^3} - \frac{bc\arcsin\left(dx^2+c\right)}{4\,d^3} - \frac{\left(-(dx^2+c)^2+1\right)^{\frac{3}{2}}b}{18\,d^3} + \frac{\sqrt{-(dx^2+c)^2+1}b}{6\,d^3} + \frac{(dx^2+c)ac^2+\left((dx^2+c)\arcsin\left(dx^2+c\right)+\sqrt{-(dx^2+c)^2+1}\right)bc^2}{2\,d^3}$$

input
```
integrate(x^5*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
```

output
```
1/6*(d*x^2 + c)^3*a/d^3 + 1/6*(d*x^2 + c)*((d*x^2 + c)^2 - 1)*b*arcsin(d*x
^2 + c)/d^3 - 1/2*((d*x^2 + c)^2 - 1)*b*c*arcsin(d*x^2 + c)/d^3 - 1/4*(d*x
^2 + c)*sqrt(-(d*x^2 + c)^2 + 1)*b*c/d^3 - 1/2*((d*x^2 + c)^2 - 1)*a*c/d^3
 + 1/6*(d*x^2 + c)*b*arcsin(d*x^2 + c)/d^3 - 1/4*b*c*arcsin(d*x^2 + c)/d^3
 - 1/18*(-(d*x^2 + c)^2 + 1)^(3/2)*b/d^3 + 1/6*sqrt(-(d*x^2 + c)^2 + 1)*b/
d^3 + 1/2*((d*x^2 + c)*a*c^2 + ((d*x^2 + c)*arcsin(d*x^2 + c) + sqrt(-(d*x
^2 + c)^2 + 1))*b*c^2)/d^3
```

### 3.386.9 Mupad [F(-1)]

Timed out.

$$\int x^5(a + b\arcsin(c + dx^2)) \, dx = \int x^5 \, (a + b\,\mathrm{asin}(d\,x^2 + c)) \, dx$$

input
```
int(x^5*(a + b*asin(c + d*x^2)),x)
```

output
```
int(x^5*(a + b*asin(c + d*x^2)), x)
```

# 3.387 $\int x^3(a+b\arcsin(c+dx^2))\,dx$



## 3.387.1 Optimal result

Integrand size = 16, antiderivative size = 115

$$\int x^3(a+b\arcsin(c+dx^2))\,dx=-\frac{3bc\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d^2}+\frac{bx^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{8d}-\frac{b(1+2c^2)\arcsin(c+dx^2)}{8d^2}+\frac{1}{4}x^4(a+b\arcsin(c+dx^2))$$

output
```
-1/8*b*(2*c^2+1)*arcsin(d*x^2+c)/d^2+1/4*x^4*(a+b*arcsin(d*x^2+c))-3/8*b*c
*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d^2+1/8*b*x^2*(-d^2*x^4-2*c*d*x^2-c^2+1)
^(1/2)/d
```

## 3.387.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 98, normalized size of antiderivative = 0.85

$$\int x^3(a+b\arcsin(c+dx^2))\,dx=\frac{ax^4}{4}+\frac{1}{2}b\left(-\frac{3c}{4d^2}+\frac{x^2}{4d}\right)\sqrt{1-c^2-2cdx^2-d^2x^4}-\frac{b(1+2c^2)\arcsin(c+dx^2)}{8d^2}+\frac{1}{4}bx^4\arcsin(c+dx^2)$$

input
```
Integrate[x^3*(a + b*ArcSin[c + d*x^2]),x]
```

output
```
(a*x^4)/4 + (b*((-3*c)/(4*d^2) + x^2/(4*d))*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2
*x^4])/2 - (b*(1 + 2*c^2)*ArcSin[c + d*x^2])/(8*d^2) + (b*x^4*ArcSin[c + d
*x^2])/4
```

### 3.387.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.18, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5341, 27, 1434, 1166, 25, 1160, 1090, 223}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3 (a + b \arcsin(c + dx^2)) \, dx$$

$$\Big\downarrow \; 5341$$

$$\frac{1}{4} x^4 (a + b \arcsin(c + dx^2)) - \frac{1}{4} b \int \frac{2dx^5}{\sqrt{-d^2x^4 - 2cdx^2 - c^2 + 1}} dx$$

$$\Big\downarrow \; 27$$

$$\frac{1}{4} x^4 (a + b \arcsin(c + dx^2)) - \frac{1}{2} bd \int \frac{x^5}{\sqrt{-d^2x^4 - 2cdx^2 - c^2 + 1}} dx$$

$$\Big\downarrow \; 1434$$

$$\frac{1}{4} x^4 (a + b \arcsin(c + dx^2)) - \frac{1}{4} bd \int \frac{x^4}{\sqrt{-d^2x^4 - 2cdx^2 - c^2 + 1}} dx^2$$

$$\Big\downarrow \; 1166$$

$$\frac{1}{4} x^4 (a + b \arcsin(c + dx^2)) - \frac{1}{4} bd \left( -\frac{\int -\frac{-c^2 - 3dx^2c + 1}{\sqrt{-d^2x^4 - 2cdx^2 - c^2 + 1}} dx^2}{2d^2} - \frac{x^2 \sqrt{-c^2 - 2cdx^2 - d^2x^4 + 1}}{2d^2} \right)$$

$$\Big\downarrow \; 25$$

$$\frac{1}{4} x^4 (a + b \arcsin(c + dx^2)) - \frac{1}{4} bd \left( \frac{\int \frac{-c^2 - 3dx^2c + 1}{\sqrt{-d^2x^4 - 2cdx^2 - c^2 + 1}} dx^2}{2d^2} - \frac{x^2 \sqrt{-c^2 - 2cdx^2 - d^2x^4 + 1}}{2d^2} \right)$$

$$\Big\downarrow \; 1160$$

$$\frac{1}{4} x^4 (a + b \arcsin(c + dx^2)) - \frac{1}{4} bd \left( \frac{(2c^2 + 1) \int \frac{1}{\sqrt{-d^2x^4 - 2cdx^2 - c^2 + 1}} dx^2 + \frac{3c\sqrt{-c^2 - 2cdx^2 - d^2x^4 + 1}}{d}}{2d^2} - \frac{x^2 \sqrt{-c^2 - 2cdx^2 - d^2x^4 + 1}}{2d^2} \right)$$

$$\Big\downarrow \; 1090$$

$$\frac{1}{4}x^4(a+b\arcsin(c+dx^2)) - \frac{1}{4}bd\left(\frac{\frac{3c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{d}-\frac{(2c^2+1)\int\frac{1}{\sqrt{1-\frac{x^4}{4d^2}}}d(-2d^2x^2-2cd)}{2d^2}}{2d^2}-\frac{x^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2d^2}\right)$$

$$\Big\downarrow \text{223}$$

$$\frac{1}{4}x^4(a+b\arcsin(c+dx^2)) - \frac{1}{4}bd\left(\frac{\frac{3c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{d}-\frac{(2c^2+1)\arcsin\left(\frac{-2cd-2d^2x^2}{2d}\right)}{d}}{2d^2}-\frac{x^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2d^2}\right)$$

input
```
Int[x^3*(a + b*ArcSin[c + d*x^2]),x]
```

output
```
(x^4*(a + b*ArcSin[c + d*x^2]))/4 - (b*d*(-1/2*(x^2*Sqrt[1 - c^2 - 2*c*d*x
^2 - d^2*x^4])/d^2 + ((3*c*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/d - ((1 +
2*c^2)*ArcSin[(-2*c*d - 2*d^2*x^2)/(2*d)])/d)/(2*d^2)))/4
```

### 3.387.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 223
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[Rt[-b, 2]*(x/Sqrt
[a])]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

rule 1090
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[1/(2*c*(-4*
(c/(b^2 - 4*a*c)))^p)   Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x,
b + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

rule 1160
```
Int[((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol
] :> Simp[e*((a + b*x + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Simp[(2*c*d - b
*e)/(2*c)   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x]
 && NeQ[p, -1]
```

rule 1166
```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[e*(d + e*x)^(m - 1)*((a + b*x + c*x^2)^(p + 1)/(c*(m + 2*p +
 1))), x] + Simp[1/(c*(m + 2*p + 1))   Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m
+ 2*p + 1) - e*(a*e*(m - 1) + b*d*(p + 1)) + e*(2*c*d - b*e)*(m + p)*x, x]*
(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && If[Ration
alQ[m], GtQ[m, 1], SumSimplerQ[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadrat
icQ[a, b, c, d, e, m, p, x]
```

rule 1434
```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp
[1/2   Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.387.4 Maple [A] (verified)

Time = 0.13 (sec) , antiderivative size = 191, normalized size of antiderivative = 1.66

| method | result |
|---|---|
| default | $\frac{a x^4}{4}+\frac{b x^4 \arcsin\left(d x^2+c\right)}{4}+\frac{b x^2 \sqrt{-d^2 x^4-2 c d x^2-c^2+1}}{8 d}-\frac{3 b c \sqrt{-d^2 x^4-2 c d x^2-c^2+1}}{8 d^2}-\frac{b c^2 \arctan\left(\frac{\sqrt{d^2}\left(x^2+\frac{c}{d}\right)}{\sqrt{-d^2 x^4-2 c d x^2-c^2+1}}\right)}{4 d \sqrt{d^2}}$ |
| parts | $\frac{a x^4}{4}+\frac{b x^4 \arcsin\left(d x^2+c\right)}{4}+\frac{b x^2 \sqrt{-d^2 x^4-2 c d x^2-c^2+1}}{8 d}-\frac{3 b c \sqrt{-d^2 x^4-2 c d x^2-c^2+1}}{8 d^2}-\frac{b c^2 \arctan\left(\frac{\sqrt{d^2}\left(x^2+\frac{c}{d}\right)}{\sqrt{-d^2 x^4-2 c d x^2-c^2+1}}\right)}{4 d \sqrt{d^2}}$ |

input
```
int(x^3*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)
```

output
```
1/4*a*x^4+1/4*b*x^4*arcsin(d*x^2+c)+1/8*b*x^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(
1/2)/d-3/8*b*c*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d^2-1/4*b*c^2/d/(d^2)^(1/2
)*arctan((d^2)^(1/2)*(x^2+c/d)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))-1/8*b/d/(
d^2)^(1/2)*arctan((d^2)^(1/2)*(x^2+c/d)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))
```

### 3.387.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 79, normalized size of antiderivative = 0.69

$$\int x^3(a+b\arcsin(c+dx^2))\,dx = \frac{2\,ad^2x^4+(2\,bd^2x^4-2\,bc^2-b)\arcsin(dx^2+c)+\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(bdx^2-3\,bc)}{8\,d^2}$$

input
```
integrate(x^3*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
```

output
```
1/8*(2*a*d^2*x^4 + (2*b*d^2*x^4 - 2*b*c^2 - b)*arcsin(d*x^2 + c) + sqrt(-d
^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(b*d*x^2 - 3*b*c))/d^2
```

### 3.387.6 Sympy [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.16

$$\int x^3(a+b\arcsin(c+dx^2))\,dx = \begin{cases} \frac{ax^4}{4}-\frac{bc^2\operatorname{asin}(c+dx^2)}{4d^2}-\frac{3bc\sqrt{-c^2-2cdx^2-d^2x^4+1}}{8d^2}+\frac{bx^4\operatorname{asin}(c+dx^2)}{4}+\frac{bx^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}{8d}-\frac{b\operatorname{asin}(c+dx^2)}{8d^2} & \text{for } d \neq \\ \frac{x^4(a+b\operatorname{asin}(c))}{4} & \text{otherw} \end{cases}$$

input
```
integrate(x**3*(a+b*asin(d*x**2+c)),x)
```

output
```
Piecewise((a*x**4/4 - b*c**2*asin(c + d*x**2)/(4*d**2) - 3*b*c*sqrt(-c**2
- 2*c*d*x**2 - d**2*x**4 + 1)/(8*d**2) + b*x**4*asin(c + d*x**2)/4 + b*x**
2*sqrt(-c**2 - 2*c*d*x**2 - d**2*x**4 + 1)/(8*d) - b*asin(c + d*x**2)/(8*d
**2), Ne(d, 0)), (x**4*(a + b*asin(c))/4, True))
```

### 3.387.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 174, normalized size of antiderivative = 1.51

$$\int x^3\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{1}{4}\,ax^4+\frac{1}{8}\left(2\,x^4\arcsin\left(dx^2+c\right)+d\left(\frac{\sqrt{-d^2x^4-2\,cdx^2-c^2+1}x^2}{d^2}+\frac{3\,c^2\arcsin\left(-\frac{d^2x^2+cd}{\sqrt{c^2d^2-(c^2-1)d^2}}\right)}{d^3}-\frac{(c^2-1)}{}\right.\right.$$

input
```
integrate(x^3*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

output
```
1/4*a*x^4 + 1/8*(2*x^4*arcsin(d*x^2 + c) + d*(sqrt(-d^2*x^4 - 2*c*d*x^2 -
c^2 + 1)*x^2/d^2 + 3*c^2*arcsin(-(d^2*x^2 + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*
d^2))/d^3 - (c^2 - 1)*arcsin(-(d^2*x^2 + c*d)/sqrt(c^2*d^2 - (c^2 - 1)*d^2
))/d^3 - 3*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*c/d^3))*b
```

### 3.387.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.11

$$\int x^3\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$
$$=-\frac{(dx^2+c)ac+\left((dx^2+c)\arcsin\left(dx^2+c\right)+\sqrt{-(dx^2+c)^2+1}\right)bc}{2\,d^2}$$
$$+\frac{2\left((dx^2+c)^2-1\right)b\arcsin\left(dx^2+c\right)+(dx^2+c)\sqrt{-(dx^2+c)^2+1}b+2\left((dx^2+c)^2-1\right)a+b\arcsin\left(\right.}{8\,d^2}$$

input
```
integrate(x^3*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
```

output
```
-1/2*((d*x^2 + c)*a*c + ((d*x^2 + c)*arcsin(d*x^2 + c) + sqrt(-(d*x^2 + c)
^2 + 1))*b*c)/d^2 + 1/8*(2*((d*x^2 + c)^2 - 1)*b*arcsin(d*x^2 + c) + (d*x^
2 + c)*sqrt(-(d*x^2 + c)^2 + 1)*b + 2*((d*x^2 + c)^2 - 1)*a + b*arcsin(d*x
^2 + c))/d^2
```

### 3.387.9 Mupad [F(-1)]

Timed out.

$$\int x^3(a+b\arcsin(c+dx^2))\,dx=\int x^3\left(a+b\,\mathrm{asin}\left(d\,x^2+c\right)\right)\,dx$$

input
```
int(x^3*(a + b*asin(c + d*x^2)),x)
```

output
```
int(x^3*(a + b*asin(c + d*x^2)), x)
```

# 3.388 $\int x(a + b \arcsin(c + dx^2)) \, dx$



## 3.388.1 Optimal result

Integrand size = 14, antiderivative size = 57

$$\int x(a + b \arcsin(c + dx^2)) \, dx = \frac{ax^2}{2} + \frac{b\sqrt{1 - (c + dx^2)^2}}{2d} + \frac{b(c + dx^2) \arcsin(c + dx^2)}{2d}$$

output
```
1/2*a*x^2+1/2*b*(d*x^2+c)*arcsin(d*x^2+c)/d+1/2*b*(1-(d*x^2+c)^2)^(1/2)/d
```

## 3.388.2 Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 183 vs. 2(57) = 114.

Time = 0.10 (sec) , antiderivative size = 183, normalized size of antiderivative = 3.21

$$\int x(a + b \arcsin(c + dx^2)) \, dx = \frac{ax^2}{2} + \frac{1}{2}bx^2 \arcsin(c + dx^2) + \frac{b\left(2d\sqrt{1 - c^2 - 2cdx^2 - d^2x^4} + 2cd \arctan\left(\frac{\sqrt{-d^2}x^2 - \sqrt{1 - c^2 - 2cdx^2 - d^2x^4}}{c}\right) + c\sqrt{-d^2} \log\left(-1 + 2cdx^2 + 2d^2 \cdots\right.\right.}{4d^2}$$

input
```
Integrate[x*(a + b*ArcSin[c + d*x^2]),x]
```

output
```
(a*x^2)/2 + (b*x^2*ArcSin[c + d*x^2])/2 + (b*(2*d*Sqrt[1 - c^2 - 2*c*d*x^2
 - d^2*x^4] + 2*c*d*ArcTan[(Sqrt[-d^2]*x^2 - Sqrt[1 - c^2 - 2*c*d*x^2 - d^
2*x^4])/c] + c*Sqrt[-d^2]*Log[-1 + 2*c*d*x^2 + 2*d^2*x^4 + 2*Sqrt[-d^2]*x^
2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]]))/(4*d^2)
```

### 3.388.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.91, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {7266, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$

$$\Big\downarrow \text{7266}$$

$$\frac{1}{2}\int \left(a+b\arcsin\left(dx^2+c\right)\right)dx^2$$

$$\Big\downarrow \text{2009}$$

$$\frac{1}{2}\left(ax^2+\frac{b\left(c+dx^2\right)\arcsin\left(c+dx^2\right)}{d}+\frac{b\sqrt{1-\left(c+dx^2\right)^2}}{d}\right)$$

input
```
Int[x*(a + b*ArcSin[c + d*x^2]),x]
```

output
```
(a*x^2 + (b*Sqrt[1 - (c + d*x^2)^2])/d + (b*(c + d*x^2)*ArcSin[c + d*x^2])
/d)/2
```

#### 3.388.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 7266
```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Simp[1/(m + 1)   Subst[Int[SubstFor[x^(m
+ 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && Function
OfQ[x^(m + 1), u, x]
```

### 3.388.4 Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.81

| method | result | size |
|---|---|---|
| parts | $\frac{a\,x^{2}}{2}+\frac{b\left(\left(d\,x^{2}+c\right)\arcsin\left(d\,x^{2}+c\right)+\sqrt{1-\left(d\,x^{2}+c\right)^{2}}\right)}{2d}$ | 46 |
| derivativedivides | $\frac{\left(d\,x^{2}+c\right)a+b\left(\left(d\,x^{2}+c\right)\arcsin\left(d\,x^{2}+c\right)+\sqrt{1-\left(d\,x^{2}+c\right)^{2}}\right)}{2d}$ | 50 |
| default | $\frac{\left(d\,x^{2}+c\right)a+b\left(\left(d\,x^{2}+c\right)\arcsin\left(d\,x^{2}+c\right)+\sqrt{1-\left(d\,x^{2}+c\right)^{2}}\right)}{2d}$ | 50 |

input
```
int(x*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)
```

output
```
1/2*a*x^2+1/2*b/d*((d*x^2+c)*arcsin(d*x^2+c)+(1-(d*x^2+c)^2)^(1/2))
```

### 3.388.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.00

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx$$
$$=\frac{adx^2+\left(bdx^2+bc\right)\arcsin\left(dx^2+c\right)+\sqrt{-d^2x^4-2\,cdx^2-c^2+1}b}{2\,d}$$

input
```
integrate(x*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
```

output
```
1/2*(a*d*x^2 + (b*d*x^2 + b*c)*arcsin(d*x^2 + c) + sqrt(-d^2*x^4 - 2*c*d*x
^2 - c^2 + 1)*b)/d
```

### 3.388.6 Sympy [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 76, normalized size of antiderivative = 1.33

$$\int x(a+b\arcsin(c+dx^2))\,dx$$
$$=\begin{cases}\frac{ax^2}{2}+\frac{bc\,\mathrm{asin}\,(c+dx^2)}{2d}+\frac{bx^2\,\mathrm{asin}\,(c+dx^2)}{2}+\frac{b\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2d} & \text{for } d\neq 0\\ \frac{x^2(a+b\,\mathrm{asin}\,(c))}{2} & \text{otherwise}\end{cases}$$

input
```
integrate(x*(a+b*asin(d*x**2+c)),x)
```

output
```
Piecewise((a*x**2/2 + b*c*asin(c + d*x**2)/(2*d) + b*x**2*asin(c + d*x**2)
/2 + b*sqrt(-c**2 - 2*c*d*x**2 - d**2*x**4 + 1)/(2*d), Ne(d, 0)), (x**2*(a
 + b*asin(c))/2, True))
```

### 3.388.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.79

$$\int x(a+b\arcsin(c+dx^2))\,dx=\frac{1}{2}\,ax^2+\frac{\left((dx^2+c)\arcsin(dx^2+c)+\sqrt{-(dx^2+c)^2+1}\right)b}{2\,d}$$

input
```
integrate(x*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

output
```
1/2*a*x^2 + 1/2*((d*x^2 + c)*arcsin(d*x^2 + c) + sqrt(-(d*x^2 + c)^2 + 1))
*b/d
```

### 3.388.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.86

$$\int x(a+b\arcsin(c+dx^2))\,dx$$
$$=\frac{(dx^2+c)a+\left((dx^2+c)\arcsin(dx^2+c)+\sqrt{-(dx^2+c)^2+1}\right)b}{2\,d}$$

input
```
integrate(x*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
```

output
```
1/2*((d*x^2 + c)*a + ((d*x^2 + c)*arcsin(d*x^2 + c) + sqrt(-(d*x^2 + c)^2
+ 1))*b)/d
```

## 3.388.9 Mupad [B] (verification not implemented)

Time = 0.79 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.89

$$\int x\left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{a\,x^2}{2}+\frac{b\,x^2\,\mathrm{asin}(d\,x^2+c)}{2}+\frac{b\,\sqrt{-c^2-2\,c\,d\,x^2-d^2\,x^4+1}}{2\,d}+\frac{b\,c\,\ln\left(\sqrt{-c^2-2\,c\,d\,x^2-d^2\,x^4+1}-\frac{d^2\,x^2+c\,d}{\sqrt{-d^2}}\right)}{2\,\sqrt{-d^2}}$$

input
```
int(x*(a + b*asin(c + d*x^2)),x)
```

output
```
(a*x^2)/2 + (b*x^2*asin(c + d*x^2))/2 + (b*(1 - d^2*x^4 - 2*c*d*x^2 - c^2)
^(1/2))/(2*d) + (b*c*log((1 - d^2*x^4 - 2*c*d*x^2 - c^2)^(1/2) - (c*d + d^
2*x^2)/(-d^2)^(1/2)))/(2*(-d^2)^(1/2))
```

# 3.389 $\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx$



## 3.389.1 Optimal result

Integrand size = 16, antiderivative size = 214

$$\begin{aligned}\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx = & -\frac{1}{4}ib\arcsin\left(c+dx^2\right)^2 \\ & +\frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin(c+dx^2)}}{ic-\sqrt{1-c^2}}\right) \\ & +\frac{1}{2}b\arcsin\left(c+dx^2\right)\log\left(1-\frac{e^{i\arcsin(c+dx^2)}}{ic+\sqrt{1-c^2}}\right) \\ & +a\log(x)-\frac{1}{2}ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(c+dx^2)}}{ic-\sqrt{1-c^2}}\right) \\ & -\frac{1}{2}ib\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(c+dx^2)}}{ic+\sqrt{1-c^2}}\right)\end{aligned}$$

output
```
-1/4*I*b*arcsin(d*x^2+c)^2+a*ln(x)+1/2*b*arcsin(d*x^2+c)*ln(1-(I*(d*x^2+c)
+(1-(d*x^2+c)^2)^(1/2))/(I*c-(-c^2+1)^(1/2)))+1/2*b*arcsin(d*x^2+c)*ln(1-(
I*(d*x^2+c)+(1-(d*x^2+c)^2)^(1/2))/(I*c+(-c^2+1)^(1/2)))-1/2*I*b*polylog(2
,(I*(d*x^2+c)+(1-(d*x^2+c)^2)^(1/2))/(I*c-(-c^2+1)^(1/2)))-1/2*I*b*polylog
(2,(I*(d*x^2+c)+(1-(d*x^2+c)^2)^(1/2))/(I*c+(-c^2+1)^(1/2)))
```

### 3.389.2 Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 221, normalized size of antiderivative = 1.03

$$\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx = a\log(x)+\frac{1}{2}b\left(-\frac{1}{2}i\arcsin\left(c+dx^2\right)^2 + \arcsin\left(c+dx^2\right)\log\left(1+\frac{e^{i\arcsin(c+dx^2)}}{\left(-\frac{ic}{d}-\frac{\sqrt{1-c^2}}{d}\right)d}\right) + \arcsin\left(c+dx^2\right)\log\left(1+\frac{e^{i\arcsin(c+dx^2)}}{\left(-\frac{ic}{d}+\frac{\sqrt{1-c^2}}{d}\right)d}\right) - i\,\text{PolyLog}\left(2,-\frac{e^{i\arcsin(c+dx^2)}}{-ic+\sqrt{1-c^2}}\right) - i\,\text{PolyLog}\left(2,\frac{e^{i\arcsin(c+dx^2)}}{ic+\sqrt{1-c^2}}\right)\right)$$

input
```
Integrate[(a + b*ArcSin[c + d*x^2])/x,x]
```

output
```
a*Log[x] + (b*((-1/2*I)*ArcSin[c + d*x^2]^2 + ArcSin[c + d*x^2]*Log[1 + E^
(I*ArcSin[c + d*x^2])/((((-I)*c)/d - Sqrt[1 - c^2]/d)*d)] + ArcSin[c + d*x
^2]*Log[1 + E^(I*ArcSin[c + d*x^2])/((((-I)*c)/d + Sqrt[1 - c^2]/d)*d)] -
I*PolyLog[2, -(E^(I*ArcSin[c + d*x^2])/((-I)*c + Sqrt[1 - c^2]))] - I*Poly
Log[2, E^(I*ArcSin[c + d*x^2])/(I*c + Sqrt[1 - c^2])]))/2
```

### 3.389.3 Rubi [A] (verified)

Time = 0.67 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx$$

$$\Big\downarrow \text{7293}$$

$$\int \left(\frac{a}{x}+\frac{b \arcsin \left(c+d x^2\right)}{x}\right) d x$$

$$\Big\downarrow \text{ 2009}$$

$$a \log(x)-\frac{1}{2} i b \operatorname{PolyLog}\left(2, \frac{e^{i \arcsin \left(d x^2+c\right)}}{i c-\sqrt{1-c^2}}\right)-\frac{1}{2} i b \operatorname{PolyLog}\left(2, \frac{e^{i \arcsin \left(d x^2+c\right)}}{i c+\sqrt{1-c^2}}\right)+\frac{1}{2} b \arcsin \left(c+d x^2\right) \log \left(1-\frac{e^{i \arcsin \left(c+d x^2\right)}}{-\sqrt{1-c^2}+i c}\right)+\frac{1}{2} b \arcsin \left(c+d x^2\right) \log \left(1-\frac{e^{i \arcsin \left(c+d x^2\right)}}{\sqrt{1-c^2}+i c}\right)-\frac{1}{4} i b \arcsin \left(c+d x^2\right)^2$$

input
```
Int[(a + b*ArcSin[c + d*x^2])/x,x]
```

output
```
(-1/4*I)*b*ArcSin[c + d*x^2]^2 + (b*ArcSin[c + d*x^2]*Log[1 - E^(I*ArcSin[
c + d*x^2])/(I*c - Sqrt[1 - c^2])])/2 + (b*ArcSin[c + d*x^2]*Log[1 - E^(I*
ArcSin[c + d*x^2])/(I*c + Sqrt[1 - c^2])])/2 + a*Log[x] - (I/2)*b*PolyLog[
2, E^(I*ArcSin[c + d*x^2])/(I*c - Sqrt[1 - c^2])] - (I/2)*b*PolyLog[2, E^(
I*ArcSin[c + d*x^2])/(I*c + Sqrt[1 - c^2])]
```

### 3.389.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

## 3.389.4 Maple [F]

$$\int \frac{a+b \arcsin \left(d\,x^2+c\right)}{x} d x$$

input
```
int((a+b*arcsin(d*x^2+c))/x,x)
```

output
```
int((a+b*arcsin(d*x^2+c))/x,x)
```

### 3.389.5 Fricas [F]

$$\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx=\int \frac{b\arcsin(dx^2+c)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x,x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x^2 + c) + a)/x, x)
```

### 3.389.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx=\int \frac{a+b\operatorname{asin}(c+dx^2)}{x}\,dx$$

input
```
integrate((a+b*asin(d*x**2+c))/x,x)
```

output
```
Integral((a + b*asin(c + d*x**2))/x, x)
```

### 3.389.7 Maxima [F]

$$\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx=\int \frac{b\arcsin(dx^2+c)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x,x, algorithm="maxima")
```

output
```
b*integrate(arctan2(d*x^2 + c, sqrt(d*x^2 + c + 1)*sqrt(-d*x^2 - c + 1))/x
, x) + a*log(x)
```

### 3.389.8 Giac [F]

$$\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx = \int \frac{b\arcsin(dx^2+c)+a}{x}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + c) + a)/x, x)
```

### 3.389.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx^2)}{x}\,dx = \int \frac{a+b\,\mathrm{asin}(d\,x^2+c)}{x}\,dx$$

input
```
int((a + b*asin(c + d*x^2))/x,x)
```

output
```
int((a + b*asin(c + d*x^2))/x, x)
```

# 3.390 $\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx$



## 3.390.1 Optimal result

Integrand size = 16, antiderivative size = 90

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx=-\frac{a+b\arcsin(c+dx^2)}{2x^2}-\frac{bd\,\mathrm{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{2\sqrt{1-c^2}}$$

output
```
1/2*(-a-b*arcsin(d*x^2+c))/x^2-1/2*b*d*arctanh((-c*d*x^2-c^2+1)/(-c^2+1)^(
1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/(-c^2+1)^(1/2)
```

## 3.390.2 Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 81, normalized size of antiderivative = 0.90

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx=\frac{1}{2}\left(-\frac{a+b\arcsin(c+dx^2)}{x^2}-\frac{bd\,\mathrm{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-(c+dx^2)^2}}\right)}{\sqrt{1-c^2}}\right)$$

input
```
Integrate[(a + b*ArcSin[c + d*x^2])/x^3,x]
```

output
```
(-((a + b*ArcSin[c + d*x^2])/x^2) - (b*d*ArcTanh[(1 - c^2 - c*d*x^2)/(Sqrt
[1 - c^2]*Sqrt[1 - (c + d*x^2)^2]])])/Sqrt[1 - c^2])/2
```

### 3.390.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {5341, 27, 1434, 1154, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{2}b\int \frac{2d}{x\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin(c+dx^2)}{2x^2}$$

$$\Big\downarrow \text{27}$$

$$bd\int \frac{1}{x\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin(c+dx^2)}{2x^2}$$

$$\Big\downarrow \text{1434}$$

$$\frac{1}{2}bd\int \frac{1}{x^2\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2-\frac{a+b\arcsin(c+dx^2)}{2x^2}$$

$$\Big\downarrow \text{1154}$$

$$-bd\int \frac{1}{4(1-c^2)-x^4}d\frac{2(-c^2-dx^2c+1)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}-\frac{a+b\arcsin(c+dx^2)}{2x^2}$$

$$\Big\downarrow \text{219}$$

$$-\frac{a+b\arcsin(c+dx^2)}{2x^2}-\frac{bd\text{arctanh}\left(\frac{-c^2-cdx^2+1}{\sqrt{1-c^2}\sqrt{-c^2-2cdx^2-d^2x^4+1}}\right)}{2\sqrt{1-c^2}}$$

input
```
Int[(a + b*ArcSin[c + d*x^2])/x^3,x]
```

output
```
-1/2*(a + b*ArcSin[c + d*x^2])/x^2 - (b*d*ArcTanh[(1 - c^2 - c*d*x^2)/(Sqr
t[1 - c^2]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])])/(2*Sqrt[1 - c^2])
```

### 3.390.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1434
```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp
[1/2   Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.390.4 Maple [A] (verified)

Time = 0.14 (sec) , antiderivative size = 89, normalized size of antiderivative = 0.99

| method | result | size |
|---|---|---|
| default | $-\frac{a}{2x^{2}}-\frac{b \arcsin\left(d \,x^{2}+c \right)}{2x^{2}}-\frac{b d \ln\left(\frac{-2 c^{2}+2-2 c d \,x^{2}+2 \sqrt{-c^{2}+1}\, \sqrt{-d^{2} x^{4}-2 c d \,x^{2}-c^{2}+1}}{x^{2}}\right)}{2 \sqrt{-c^{2}+1}}$ | 89 |
| parts | $-\frac{a}{2x^{2}}-\frac{b \arcsin\left(d \,x^{2}+c \right)}{2x^{2}}-\frac{b d \ln\left(\frac{-2 c^{2}+2-2 c d \,x^{2}+2 \sqrt{-c^{2}+1}\, \sqrt{-d^{2} x^{4}-2 c d \,x^{2}-c^{2}+1}}{x^{2}}\right)}{2 \sqrt{-c^{2}+1}}$ | 89 |

input
```
int((a+b*arcsin(d*x^2+c))/x^3,x,method=_RETURNVERBOSE)
```

output
```
-1/2*a/x^2-1/2*b/x^2*arcsin(d*x^2+c)-1/2*b*d/(-c^2+1)^(1/2)*ln((-2*c^2+2-2
*c*d*x^2+2*(-c^2+1)^(1/2)*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/x^2)
```

## 3.390.5 Fricas [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 280, normalized size of antiderivative = 3.11

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx$$
$$= \left[-\frac{\sqrt{-c^2+1}bdx^2\log\left(\frac{(2c^2-1)d^2x^4+2c^4+4(c^3-c)dx^2+2\sqrt{-d^2x^4-2cdx^2-c^2+1}(cdx^2+c^2-1)\sqrt{-c^2+1}-4c^2+2}{x^4}\right)+2ac^2+2(}{4(c^2-1)x^2}\right.$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^3,x, algorithm="fricas")
```

output
```
[-1/4*(sqrt(-c^2 + 1)*b*d*x^2*log(((2*c^2 - 1)*d^2*x^4 + 2*c^4 + 4*(c^3 -
c)*d*x^2 + 2*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2 + c^2 - 1)*sqrt
(-c^2 + 1) - 4*c^2 + 2)/x^4) + 2*a*c^2 + 2*(b*c^2 - b)*arcsin(d*x^2 + c) -
 2*a)/((c^2 - 1)*x^2), 1/2*(sqrt(c^2 - 1)*b*d*x^2*arctan(sqrt(-d^2*x^4 - 2
*c*d*x^2 - c^2 + 1)*(c*d*x^2 + c^2 - 1)*sqrt(c^2 - 1)/((c^2 - 1)*d^2*x^4 +
 c^4 + 2*(c^3 - c)*d*x^2 - 2*c^2 + 1)) - a*c^2 - (b*c^2 - b)*arcsin(d*x^2
+ c) + a)/((c^2 - 1)*x^2)]
```

## 3.390.6 Sympy [F]

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx = \int \frac{a+b\operatorname{asin}(c+dx^2)}{x^3}\,dx$$

input
```
integrate((a+b*asin(d*x**2+c))/x**3,x)
```

output
```
Integral((a + b*asin(c + d*x**2))/x**3, x)
```

### 3.390.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^3,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(c-1>0)', see `assume?` for more
details)Is
```

### 3.390.8 Giac [F]

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx = \int \frac{b\arcsin(dx^2+c)+a}{x^3}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^3,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + c) + a)/x^3, x)
```

### 3.390.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx^2)}{x^3}\,dx = \int \frac{a+b\,\mathrm{asin}(d\,x^2+c)}{x^3}\,dx$$

input
```
int((a + b*asin(c + d*x^2))/x^3,x)
```

output
```
int((a + b*asin(c + d*x^2))/x^3, x)
```

# 3.391 $\int \frac{a+b\arcsin(c+dx^2)}{x^5}\,dx$



## 3.391.1 Optimal result

Integrand size = 16, antiderivative size = 137

$$\int \frac{a+b\arcsin(c+dx^2)}{x^5}\,dx = -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{4(1-c^2)x^2} - \frac{a+b\arcsin(c+dx^2)}{4x^4} - \frac{bcd^2\operatorname{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{4(1-c^2)^{3/2}}$$

output
```
1/4*(-a-b*arcsin(d*x^2+c))/x^4-1/4*b*c*d^2*arctanh((-c*d*x^2-c^2+1)/(-c^2+
1)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/(-c^2+1)^(3/2)-1/4*b*d*(-d^2*x^
4-2*c*d*x^2-c^2+1)^(1/2)/(-c^2+1)/x^2
```

## 3.391.2 Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.08

$$\int \frac{a+b\arcsin(c+dx^2)}{x^5}\,dx = -\frac{a}{4x^4} + \frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{4(-1+c^2)x^2} - \frac{b\arcsin(c+dx^2)}{4x^4} + \frac{bcd^2\arctan\left(\frac{\sqrt{-d^2}x^2-\sqrt{1-c^2-2cdx^2-d^2x^4}}{\sqrt{-1+c^2}}\right)}{2(-1+c)(1+c)\sqrt{-1+c^2}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x^2])/x^5,x]
```

output
```
-1/4*a/x^4 + (b*d*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(4*(-1 + c^2)*x^2)
- (b*ArcSin[c + d*x^2])/(4*x^4) + (b*c*d^2*ArcTan[(Sqrt[-d^2]*x^2 - Sqrt[1
 - c^2 - 2*c*d*x^2 - d^2*x^4])/Sqrt[-1 + c^2]])/(2*(-1 + c)*(1 + c)*Sqrt[-
1 + c^2])
```

### 3.391.3 Rubi [A] (verified)

Time = 0.33 (sec) , antiderivative size = 135, normalized size of antiderivative = 0.99, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {5341, 27, 1434, 1157, 1154, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^5}dx$$

$$\Big\downarrow \text{ 5341}$$

$$\frac{1}{4}b\int \frac{2d}{x^3\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{1}{2}bd\int \frac{1}{x^3\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}$$

$$\Big\downarrow \text{ 1434}$$

$$\frac{1}{4}bd\int \frac{1}{x^4\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2-\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}$$

$$\Big\downarrow \text{ 1157}$$

$$\frac{1}{4}bd\left(\frac{cd\int \frac{1}{x^2\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2}{1-c^2}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{\left(1-c^2\right)x^2}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}$$

$$\Big\downarrow \text{ 1154}$$

$$\frac{1}{4}bd\left(-\frac{2cd\int \frac{1}{4(1-c^2)-x^4}d\frac{2\left(-c^2-dx^2c+1\right)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}}{1-c^2}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{\left(1-c^2\right)x^2}\right)-$$
$$\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}$$

$$\Big\downarrow \text{ 219}$$

$$\frac{1}{4}bd\left(-\frac{cd\operatorname{arctanh}\left(\frac{-c^2-cdx^2+1}{\sqrt{1-c^2}\sqrt{-c^2-2cdx^2-d^2x^4+1}}\right)}{(1-c^2)^{3/2}}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)\,x^2}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{4x^4}$$

input
```
Int[(a + b*ArcSin[c + d*x^2])/x^5,x]
```

output
```
-1/4*(a + b*ArcSin[c + d*x^2])/x^4 + (b*d*(-(Sqrt[1 - c^2 - 2*c*d*x^2 - d^
2*x^4]/((1 - c^2)*x^2)) - (c*d*ArcTanh[(1 - c^2 - c*d*x^2)/(Sqrt[1 - c^2]*
Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])])/(1 - c^2)^(3/2)))/4
```

### 3.391.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1157
```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[e*(d + e*x)^(m + 1)*((a + b*x + c*x^2)^(p + 1)/((m + 1)*(c*d
^2 - b*d*e + a*e^2))), x] + Simp[(2*c*d - b*e)/(2*(c*d^2 - b*d*e + a*e^2))
  Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e
, m, p}, x] && EqQ[m + 2*p + 3, 0]
```

rule 1434
```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp
[1/2   Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

3.391. $\int \frac{a+b\arcsin(c+dx^2)}{x^5}\,dx$

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.391.4 Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 132, normalized size of antiderivative = 0.96

| method | result | size |
|---|---|---|
| default | $-\frac{a}{4x^4}-\frac{b\arcsin\left(d\,x^2+c\right)}{4x^4}-\frac{bd\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{4(-c^2+1)x^2}-\frac{b\,d^2c\ln\left(\frac{-2c^2+2-2cd\,x^2+2\sqrt{-c^2+1}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{x^2}\right)}{4(-c^2+1)^{\frac{3}{2}}}$ | 132 |
| parts | $-\frac{a}{4x^4}-\frac{b\arcsin\left(d\,x^2+c\right)}{4x^4}-\frac{bd\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{4(-c^2+1)x^2}-\frac{b\,d^2c\ln\left(\frac{-2c^2+2-2cd\,x^2+2\sqrt{-c^2+1}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{x^2}\right)}{4(-c^2+1)^{\frac{3}{2}}}$ | 132 |

input
```
int((a+b*arcsin(d*x^2+c))/x^5,x,method=_RETURNVERBOSE)
```

output
```
-1/4*a/x^4-1/4*b/x^4*arcsin(d*x^2+c)-1/4*b*d*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1
/2)/(-c^2+1)/x^2-1/4*b*d^2*c/(-c^2+1)^(3/2)*ln((-2*c^2+2-2*c*d*x^2+2*(-c^2
+1)^(1/2)*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/x^2)
```

### 3.391.5 Fricas [A] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 392, normalized size of antiderivative = 2.86

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^5}\,dx$$
$$= \left[-\frac{\sqrt{-c^2+1}bcd^2x^4\log\left(\frac{(2\,c^2-1)d^2x^4+2\,c^4+4\,(c^3-c)dx^2-2\,\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(cdx^2+c^2-1)\sqrt{-c^2+1}-4\,c^2+2}{x^4}\right)+2\,ac^4-}{8\,(c^4-2\,c^2+1}\right.$$
$$-\frac{\sqrt{c^2-1}bcd^2x^4\arctan\left(\frac{\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(cdx^2+c^2-1)\sqrt{c^2-1}}{(c^2-1)d^2x^4+c^4+2\,(c^3-c)dx^2-2\,c^2+1}\right)+ac^4-\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(bc^2-b)}{4\,(c^4-2\,c^2+1)x^4}$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^5,x, algorithm="fricas")
```

output
```
[-1/8*(sqrt(-c^2 + 1)*b*c*d^2*x^4*log(((2*c^2 - 1)*d^2*x^4 + 2*c^4 + 4*(c^
3 - c)*d*x^2 - 2*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2 + c^2 - 1)*
sqrt(-c^2 + 1) - 4*c^2 + 2)/x^4) + 2*a*c^4 - 2*sqrt(-d^2*x^4 - 2*c*d*x^2 -
 c^2 + 1)*(b*c^2 - b)*d*x^2 - 4*a*c^2 + 2*(b*c^4 - 2*b*c^2 + b)*arcsin(d*x
^2 + c) + 2*a)/((c^4 - 2*c^2 + 1)*x^4), -1/4*(sqrt(c^2 - 1)*b*c*d^2*x^4*ar
ctan(sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2 + c^2 - 1)*sqrt(c^2 - 1
)/((c^2 - 1)*d^2*x^4 + c^4 + 2*(c^3 - c)*d*x^2 - 2*c^2 + 1)) + a*c^4 - sqr
t(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(b*c^2 - b)*d*x^2 - 2*a*c^2 + (b*c^4 - 2
*b*c^2 + b)*arcsin(d*x^2 + c) + a)/((c^4 - 2*c^2 + 1)*x^4)]
```

## 3.391.6 Sympy [F]

$$\int \frac{a + b\arcsin(c + dx^2)}{x^5}\,dx = \int \frac{a + b\,\mathrm{asin}\,(c + dx^2)}{x^5}\,dx$$

input
```
integrate((a+b*asin(d*x**2+c))/x**5,x)
```

output
```
Integral((a + b*asin(c + d*x**2))/x**5, x)
```

## 3.391.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b\arcsin(c + dx^2)}{x^5}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^5,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(c-1>0)', see `assume?` for more
details)Is
```

### 3.391.8 Giac [F]

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^5}\,dx = \int \frac{b\arcsin\left(dx^2+c\right)+a}{x^5}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^5,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + c) + a)/x^5, x)
```

### 3.391.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^5}\,dx = \int \frac{a+b\,\mathrm{asin}\left(d\,x^2+c\right)}{x^5}\,dx$$

input
```
int((a + b*asin(c + d*x^2))/x^5,x)
```

output
```
int((a + b*asin(c + d*x^2))/x^5, x)
```

# 3.392 $\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx$



## 3.392.1 Optimal result

Integrand size = 16, antiderivative size = 190

$$\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx = -\frac{bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{12(1-c^2)x^4} - \frac{bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{4(1-c^2)^2x^2} - \frac{a+b\arcsin(c+dx^2)}{6x^6} - \frac{b(1+2c^2)d^3\text{arctanh}\left(\frac{1-c^2-cdx^2}{\sqrt{1-c^2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\right)}{12(1-c^2)^{5/2}}$$

output
```
1/6*(-a-b*arcsin(d*x^2+c))/x^6-1/12*b*(2*c^2+1)*d^3*arctanh((-c*d*x^2-c^2+
1)/(-c^2+1)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/(-c^2+1)^(5/2)-1/12*b*
d*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-c^2+1)/x^4-1/4*b*c*d^2*(-d^2*x^4-2*c*
d*x^2-c^2+1)^(1/2)/(-c^2+1)^2/x^2
```

### 3.392.2 Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 174, normalized size of antiderivative = 0.92

$$\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx = -\frac{a}{6x^6}+b\left(\frac{d}{12(-1+c^2)x^4}-\frac{cd^2}{4(-1+c^2)^2x^2}\right)\sqrt{1-c^2-2cdx^2-d^2x^4}-\frac{b\arcsin(c+dx^2)}{6x^6}-\frac{b(1+2c^2)d^3\arctan\left(\frac{\sqrt{-d^2}x^2-\sqrt{1-c^2-2cdx^2-d^2x^4}}{\sqrt{-1+c^2}}\right)}{6(-1+c)^2(1+c)^2\sqrt{-1+c^2}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x^2])/x^7,x]
```

output
```
-1/6*a/x^6 + b*(d/(12*(-1 + c^2)*x^4) - (c*d^2)/(4*(-1 + c^2)^2*x^2))*Sqrt
[1 - c^2 - 2*c*d*x^2 - d^2*x^4] - (b*ArcSin[c + d*x^2])/(6*x^6) - (b*(1 +
2*c^2)*d^3*ArcTan[(Sqrt[-d^2]*x^2 - Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/S
qrt[-1 + c^2]])/(6*(-1 + c)^2*(1 + c)^2*Sqrt[-1 + c^2])
```

### 3.392.3 Rubi [A] (verified)

Time = 0.41 (sec) , antiderivative size = 199, normalized size of antiderivative = 1.05, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562, Rules used = {5341, 27, 1434, 1167, 25, 27, 1228, 1154, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx$$

$$\Big\downarrow \text{5341}$$

$$\frac{1}{6}b\int \frac{2d}{x^5\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin(c+dx^2)}{6x^6}$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{3}bd\int \frac{1}{x^5\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin(c+dx^2)}{6x^6}$$

$$\Big\downarrow \text{1434}$$

$$\frac{1}{6}bd\int \frac{1}{x^6\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2-\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}$$

$$\Big\downarrow \text{1167}$$

$$\frac{1}{6}bd\left(-\frac{\int -\frac{d(dx^2+3c)}{x^4\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2}{2\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2\left(1-c^2\right)x^4}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}$$

$$\Big\downarrow \text{25}$$

$$\frac{1}{6}bd\left(\frac{\int \frac{d(dx^2+3c)}{x^4\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2}{2\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2\left(1-c^2\right)x^4}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{6}bd\left(\frac{d\int \frac{dx^2+3c}{x^4\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2}{2\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2\left(1-c^2\right)x^4}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}$$

$$\Big\downarrow \text{1228}$$

$$\frac{1}{6}bd\left(\frac{d\left(\frac{(2c^2+1)d\int \frac{1}{x^2\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx^2}{1-c^2}-\frac{3c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)x^2}\right)}{2\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2\left(1-c^2\right)x^4}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}$$

$$\Big\downarrow \text{1154}$$

$$\frac{1}{6}bd\left(\frac{d\left(-\frac{2(2c^2+1)d\int \frac{1}{4\left(1-c^2\right)-x^4}d\frac{2\left(-c^2-dx^2c+1\right)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}}{1-c^2}-\frac{3c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)x^2}\right)}{2\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2\left(1-c^2\right)x^4}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{6x^6}$$

$$\Big\downarrow \text{219}$$

3.392. $\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^7}\,dx$

$$\frac{1}{6}bd\left(\frac{d\left(-\frac{(2c^2+1)d\operatorname{arctanh}\left(\frac{-c^2-cdx^2+1}{\sqrt{1-c^2}\sqrt{-c^2-2cdx^2-d^2x^4+1}}\right)}{(1-c^2)^{3/2}}-\frac{3c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)x^2}\right)}{2(1-c^2)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{2(1-c^2)x^4}\right)-\frac{a+b\arcsin(c+dx^2)}{6x^6}$$

input
```
Int[(a + b*ArcSin[c + d*x^2])/x^7,x]
```

output
```
-1/6*(a + b*ArcSin[c + d*x^2])/x^6 + (b*d*(-1/2*Sqrt[1 - c^2 - 2*c*d*x^2 -
 d^2*x^4]/((1 - c^2)*x^4) + (d*((-3*c*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])
/((1 - c^2)*x^2) - ((1 + 2*c^2)*d*ArcTanh[(1 - c^2 - c*d*x^2)/(Sqrt[1 - c^
2]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])])/(1 - c^2)^(3/2)))/(2*(1 - c^2)))
)/6
```

### 3.392.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1167
```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[e*(d + e*x)^(m + 1)*((a + b*x + c*x^2)^(p + 1)/((m + 1)*(c*d
^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)*(c*d^2 - b*d*e + a*e^2))   Int[
(d + e*x)^(m + 1)*Simp[c*d*(m + 1) - b*e*(m + p + 2) - c*e*(m + 2*p + 3)*x,
 x]*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && NeQ[m
, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, b, c, d, e, m, p, x]) || (SumSimp
lerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[m + 2*p + 3], 0])
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1434
```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.), x_Symbol] :> Simp
[1/2   Subst[Int[x^((m - 1)/2)*(a + b*x + c*x^2)^p, x], x, x^2], x] /; Free
Q[{a, b, c, p}, x] && IntegerQ[(m - 1)/2]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.392.4 Maple [A] (verified)

Time = 0.12 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.29

| method | result |
|---|---|
| default | $-\frac{a}{6x^6}+b\left(-\frac{\arcsin(dx^2+c)}{6x^6}+\frac{d\left(-\frac{\sqrt{-d^2x^4-2cdx^2-c^2+1}}{4(-c^2+1)x^4}-\frac{3dc\sqrt{-d^2x^4-2cdx^2-c^2+1}}{4(-c^2+1)^2x^2}-\frac{3d^2c^2\ln\left(\frac{-2c^2+2-2cdx^2+2\sqrt{-c^2+1}\sqrt{-}}{x^2}\right.}{4(-c^2+1)^{\frac{5}{2}}}\right.}{3}\right.$ |
| parts | $-\frac{a}{6x^6}+b\left(-\frac{\arcsin(dx^2+c)}{6x^6}+\frac{d\left(-\frac{\sqrt{-d^2x^4-2cdx^2-c^2+1}}{4(-c^2+1)x^4}-\frac{3dc\sqrt{-d^2x^4-2cdx^2-c^2+1}}{4(-c^2+1)^2x^2}-\frac{3d^2c^2\ln\left(\frac{-2c^2+2-2cdx^2+2\sqrt{-c^2+1}\sqrt{-}}{x^2}\right.}{4(-c^2+1)^{\frac{5}{2}}}\right.}{3}\right.$ |

input
```
int((a+b*arcsin(d*x^2+c))/x^7,x,method=_RETURNVERBOSE)
```

output
```
-1/6*a/x^6+b*(-1/6/x^6*arcsin(d*x^2+c)+1/3*d*(-1/4/(-c^2+1)/x^4*(-d^2*x^4-
2*c*d*x^2-c^2+1)^(1/2)-3/4*d*c/(-c^2+1)^2/x^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(
1/2)-3/4*d^2*c^2/(-c^2+1)^(5/2)*ln((-2*c^2+2-2*c*d*x^2+2*(-c^2+1)^(1/2)*(-
d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/x^2)-1/4*d^2/(-c^2+1)^(3/2)*ln((-2*c^2+2-2
*c*d*x^2+2*(-c^2+1)^(1/2)*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2))/x^2)))
```

### 3.392.5 Fricas [A] (verification not implemented)

Time = 0.39 (sec) , antiderivative size = 496, normalized size of antiderivative = 2.61

$$\int \frac{a+b\arcsin(c+dx^2)}{x^7}\,dx$$
$$=\left[-\frac{(2\,bc^2+b)\sqrt{-c^2+1}d^3x^6\log\left(\frac{(2\,c^2-1)d^2x^4+2\,c^4+4\,(c^3-c)dx^2+2\,\sqrt{-d^2x^4-2\,cdx^2-c^2+1}(cdx^2+c^2-1)\sqrt{-c^2+1}-4\,c^2+2}{x^4}\right)+}{}\right.$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^7,x, algorithm="fricas")
```

output
```
[-1/24*((2*b*c^2 + b)*sqrt(-c^2 + 1)*d^3*x^6*log(((2*c^2 - 1)*d^2*x^4 + 2*
c^4 + 4*(c^3 - c)*d*x^2 + 2*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2
+ c^2 - 1)*sqrt(-c^2 + 1) - 4*c^2 + 2)/x^4) + 4*a*c^6 - 12*a*c^4 + 12*a*c^
2 + 4*(b*c^6 - 3*b*c^4 + 3*b*c^2 - b)*arcsin(d*x^2 + c) + 2*(3*(b*c^3 - b*
c)*d^2*x^4 - (b*c^4 - 2*b*c^2 + b)*d*x^2)*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2
+ 1) - 4*a)/((c^6 - 3*c^4 + 3*c^2 - 1)*x^6), 1/12*((2*b*c^2 + b)*sqrt(c^2
- 1)*d^3*x^6*arctan(sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1)*(c*d*x^2 + c^2 -
1)*sqrt(c^2 - 1)/((c^2 - 1)*d^2*x^4 + c^4 + 2*(c^3 - c)*d*x^2 - 2*c^2 + 1)
) - 2*a*c^6 + 6*a*c^4 - 6*a*c^2 - 2*(b*c^6 - 3*b*c^4 + 3*b*c^2 - b)*arcsin
(d*x^2 + c) - (3*(b*c^3 - b*c)*d^2*x^4 - (b*c^4 - 2*b*c^2 + b)*d*x^2)*sqrt
(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1) + 2*a)/((c^6 - 3*c^4 + 3*c^2 - 1)*x^6)]
```

### 3.392.6 Sympy [F]

$$\int \frac{a + b\arcsin\left(c + dx^2\right)}{x^7}\,dx = \int \frac{a + b\,\mathrm{asin}\left(c + dx^2\right)}{x^7}\,dx$$

input
```
integrate((a+b*asin(d*x**2+c))/x**7,x)
```

output
```
Integral((a + b*asin(c + d*x**2))/x**7, x)
```

### 3.392.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b\arcsin\left(c + dx^2\right)}{x^7}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^7,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(c-1>0)', see `assume?` for more
details)Is
```

### 3.392.8 Giac [F]

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^7}\,dx=\int \frac{b\arcsin\left(dx^2+c\right)+a}{x^7}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^7,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + c) + a)/x^7, x)
```

### 3.392.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^7}\,dx=\int \frac{a+b\,\mathrm{asin}(d\,x^2+c)}{x^7}\,dx$$

input
```
int((a + b*asin(c + d*x^2))/x^7,x)
```

output
```
int((a + b*asin(c + d*x^2))/x^7, x)
```

# 3.393 $\int x^4(a+b\arcsin(c+dx^2))\,dx$



## 3.393.1 Optimal result

Integrand size = 16, antiderivative size = 336

$$\begin{aligned}\int x^4(a+b\arcsin(c+dx^2))\,dx &= -\frac{16bcx\sqrt{1-c^2-2cdx^2-d^2x^4}}{75d^2} \\ &+ \frac{2bx^3\sqrt{1-c^2-2cdx^2-d^2x^4}}{25d} + \frac{1}{5}x^5(a+b\arcsin(c+dx^2)) \\ &- \frac{2b\sqrt{1-c}(1+c)(9+23c^2)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)\middle|-\frac{1-c}{1+c}\right)}{75d^{5/2}\sqrt{1-c^2-2cdx^2-d^2x^4}} \\ &+ \frac{2b\sqrt{1-c}(1+c)(9+8c+15c^2)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{75d^{5/2}\sqrt{1-c^2-2cdx^2-d^2x^4}}\end{aligned}$$

output
```
1/5*x^5*(a+b*arcsin(d*x^2+c))-2/75*b*(1+c)*(23*c^2+9)*EllipticE(x*d^(1/2)/
(1-c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x
^2/(1+c))^(1/2)/d^(5/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2/75*b*(1+c)*(15*
c^2+8*c+9)*EllipticF(x*d^(1/2)/(1-c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-c)^(1/
2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/d^(5/2)/(-d^2*x^4-2*c*d*x^2
-c^2+1)^(1/2)-16/75*b*c*x*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d^2+2/25*b*x^3*
(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d
```

### 3.393.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.43 (sec) , antiderivative size = 349, normalized size of antiderivative = 1.04

$$\int x^4(a+b\arcsin(c+dx^2))\,dx$$
$$= \frac{\sqrt{\frac{d}{1+c}}x\left(15ad^2x^4\sqrt{1-c^2-2cdx^2-d^2x^4}+2b(-8c+8c^3+3dx^2+13c^2dx^2+2cd^2x^4-3d^3x^6)+15bd^2x^4\right.}{}$$

input
```
Integrate[x^4*(a + b*ArcSin[c + d*x^2]),x]
```

output
```
(Sqrt[d/(1 + c)]*x*(15*a*d^2*x^4*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4] + 2*b
*(-8*c + 8*c^3 + 3*d*x^2 + 13*c^2*d*x^2 + 2*c*d^2*x^4 - 3*d^3*x^6) + 15*b*
d^2*x^4*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]*ArcSin[c + d*x^2]) + (2*I)*b*(
-9 + 9*c - 23*c^2 + 23*c^3)*Sqrt[(-1 + c + d*x^2)/(-1 + c)]*Sqrt[(1 + c +
d*x^2)/(1 + c)]*EllipticE[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1 + c)/(-1 + c)]
- (2*I)*b*(-9 + 17*c - 23*c^2 + 15*c^3)*Sqrt[(-1 + c + d*x^2)/(-1 + c)]*Sq
rt[(1 + c + d*x^2)/(1 + c)]*EllipticF[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1 + c
)/(-1 + c)])/(75*d^2*Sqrt[d/(1 + c)]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])
```

### 3.393.3 Rubi [A] (verified)

Time = 0.56 (sec) , antiderivative size = 289, normalized size of antiderivative = 0.86, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {5341, 27, 1442, 1602, 25, 27, 1514, 399, 321, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^4(a+b\arcsin(c+dx^2))\,dx$$
$$\Big\downarrow \text{5341}$$
$$\frac{1}{5}x^5(a+b\arcsin(c+dx^2))-\frac{1}{5}b\int\frac{2dx^6}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx$$
$$\Big\downarrow \text{27}$$
$$\frac{1}{5}x^5(a+b\arcsin(c+dx^2))-\frac{2}{5}bd\int\frac{x^6}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx$$

$$\Big\downarrow \text{1442}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{2}{5}bd\left(\frac{\int\frac{x^2\left(3\left(1-c^2\right)-8cdx^2\right)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{5d^2}-\frac{x^3\sqrt{-c^2-2cdx^2-d^2x^4+1}}{5d^2}\right)$$

$$\Big\downarrow \text{1602}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{2}{5}bd\left(\frac{\frac{\int-\frac{d\left(8c\left(1-c^2\right)-\left(23c^2+9\right)dx^2\right)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{3d^2}+\frac{8cx\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d}}{5d^2}-\frac{x^3\sqrt{-c^2-2cdx^2-d^2x^4+1}}{5d^2}\right)$$

$$\Big\downarrow \text{25}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{2}{5}bd\left(\frac{\frac{8cx\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d}-\frac{\int\frac{d\left(8c\left(1-c^2\right)-\left(23c^2+9\right)dx^2\right)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{3d^2}}{5d^2}-\frac{x^3\sqrt{-c^2-2cdx^2-d^2x^4+1}}{5d^2}\right)$$

$$\Big\downarrow \text{27}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{2}{5}bd\left(\frac{\frac{8cx\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d}-\frac{\int\frac{8c\left(1-c^2\right)-\left(23c^2+9\right)dx^2}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{3d}}{5d^2}-\frac{x^3\sqrt{-c^2-2cdx^2-d^2x^4+1}}{5d^2}\right)$$

$$\Big\downarrow \text{1514}$$

$$\frac{1}{5}x^5\left(a+b\arcsin\left(c+dx^2\right)\right)-\frac{2}{5}bd\left(\frac{\frac{8cx\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d}-\frac{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\int\frac{8c\left(1-c^2\right)-\left(23c^2+9\right)dx^2}{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}}dx}{3d\sqrt{-c^2-2cdx^2-d^2x^4+1}}}{5d^2}-\frac{x^3\sqrt{-c^2-2cdx^2-d^2x^4+1}}{5d^2}\right)$$

$$\Big\downarrow \text{399}$$

---

3.393. $\int x^4(a+b\arcsin\left(c+dx^2\right))\,dx$

$$\frac{1}{5}x^5(a+b\arcsin(c+dx^2)) - \frac{2}{5}bd\left(\frac{\frac{8cx\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d}-\frac{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left((c+1)(15c^2+8c+9)\int\frac{1}{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}}dx-(c+1)(23c^2+9)\int\frac{\sqrt{\frac{dx^2}{c+1}+1}}{\sqrt{1-\frac{dx^2}{1-c}}}dx\right)}{3d\sqrt{-c^2-2cdx^2-d^2x^4+1}}}{5d^2}-\frac{x^3\sqrt{}\right.$$

$\downarrow$ 321

$$\frac{1}{5}x^5(a+b\arcsin(c+dx^2)) - \frac{2}{5}bd\left(\frac{\frac{8cx\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d}-\frac{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left(\frac{\sqrt{1-c}(c+1)(15c^2+8c+9)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{d}}-(c+1)(23c^2+9)\int\frac{\sqrt{\frac{dx^2}{c+1}+1}}{\sqrt{1-\frac{dx^2}{1-c}}}d\right.}{3d\sqrt{-c^2-2cdx^2-d^2x^4+1}}}{5d^2}\right.$$

$\downarrow$ 327

$$\frac{1}{5}x^5(a+b\arcsin(c+dx^2)) - \frac{2}{5}bd\left(\frac{\frac{8cx\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d}-\frac{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left(\frac{\sqrt{1-c}(c+1)(15c^2+8c+9)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{d}}-\frac{\sqrt{1-c}(c+1)(23c^2+9)E\left(\arcsin\right.}{\sqrt{d}}\right.}{3d\sqrt{-c^2-2cdx^2-d^2x^4+1}}}{5d^2}\right.$$

input
```
Int[x^4*(a + b*ArcSin[c + d*x^2]),x]
```

output
```
(x^5*(a + b*ArcSin[c + d*x^2]))/5 - (2*b*d*(-1/5*(x^3*Sqrt[1 - c^2 - 2*c*d
*x^2 - d^2*x^4])/d^2 + ((8*c*x*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(3*d)
- (Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*(-((Sqrt[1 - c]*(1
+ c)*(9 + 23*c^2)*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1
+ c))])/Sqrt[d]) + (Sqrt[1 - c]*(1 + c)*(9 + 8*c + 15*c^2)*EllipticF[ArcSi
n[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))])/Sqrt[d]))/(3*d*Sqrt[1 - c
^2 - 2*c*d*x^2 - d^2*x^4]))/(5*d^2)))/5
```

## 3.393. $\int x^4(a+b\arcsin(c+dx^2))\,dx$

### 3.393.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 321
```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 399
```
Int[((e_) + (f_.)*(x_)^2)/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)
^2]), x_Symbol] :> Simp[f/b   Int[Sqrt[a + b*x^2]/Sqrt[c + d*x^2], x], x] +
 Simp[(b*e - a*f)/b   Int[1/(Sqrt[a + b*x^2]*Sqrt[c + d*x^2]), x], x] /; Fr
eeQ[{a, b, c, d, e, f}, x] &&  !((PosQ[b/a] && PosQ[d/c]) || (NegQ[b/a] &&
(PosQ[d/c] || (GtQ[a, 0] && ( !GtQ[c, 0] || SimplerSqrtQ[-b/a, -d/c])))))
```

rule 1442
```
Int[((d_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_), x_Symbol]
:> Simp[d^3*(d*x)^(m - 3)*((a + b*x^2 + c*x^4)^(p + 1)/(c*(m + 4*p + 1))),
x] - Simp[d^4/(c*(m + 4*p + 1))   Int[(d*x)^(m - 4)*Simp[a*(m - 3) + b*(m +
 2*p - 1)*x^2, x]*(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, p}, x
] && NeQ[b^2 - 4*a*c, 0] && GtQ[m, 3] && NeQ[m + 4*p + 1, 0] && IntegerQ[2*
p] && (IntegerQ[p] || IntegerQ[m])
```

rule 1514
```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbo
l] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt
[1 + 2*c*(x^2/(b + q))]/Sqrt[a + b*x^2 + c*x^4])   Int[(d + e*x^2)/(Sqrt[1
+ 2*c*(x^2/(b - q))]*Sqrt[1 + 2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b,
c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[c/a]
```

## 3.393. $\int x^4(a + b \arcsin(c + dx^2)) \, dx$

rule 1602
```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)*((a_) + (b_.)*(x_)^2 + (c_.)*(
x_)^4)^(p_), x_Symbol] :> Simp[e*f*(f*x)^(m - 1)*((a + b*x^2 + c*x^4)^(p +
1)/(c*(m + 4*p + 3))), x] - Simp[f^2/(c*(m + 4*p + 3))   Int[(f*x)^(m - 2)*
(a + b*x^2 + c*x^4)^p*Simp[a*e*(m - 1) + (b*e*(m + 2*p + 1) - c*d*(m + 4*p
+ 3))*x^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, p}, x] && NeQ[b^2 - 4*a*c
, 0] && GtQ[m, 1] && NeQ[m + 4*p + 3, 0] && IntegerQ[2*p] && (IntegerQ[p] |
| IntegerQ[m])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.393.4 Maple [A] (verified)

Time = 1.19 (sec) , antiderivative size = 346, normalized size of antiderivative = 1.03

| method | result |
|---|---|
| default | $\frac{a\,x^5}{5}+b\left(\frac{x^5\arcsin\left(d\,x^2+c\right)}{5}-\frac{2d\left(-\frac{x^3\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{5d^2}+\frac{8cx\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{15d^3}-\frac{8c\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\ \mathrm{Ellipti}}{15d^3\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4}}\right.}{}\right.$ |
| parts | $\frac{a\,x^5}{5}+b\left(\frac{x^5\arcsin\left(d\,x^2+c\right)}{5}-\frac{2d\left(-\frac{x^3\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{5d^2}+\frac{8cx\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{15d^3}-\frac{8c\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\ \mathrm{Ellipti}}{15d^3\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4}}\right.}{}\right.$ |

input
```
int(x^4*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)
```

output
```
1/5*a*x^5+b*(1/5*x^5*arcsin(d*x^2+c)-2/5*d*(-1/5*x^3/d^2*(-d^2*x^4-2*c*d*x
^2-c^2+1)^(1/2)+8/15*c/d^3*x*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-8/15*c/d^3*(
-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d
^2*x^4-2*c*d*x^2-c^2+1)^(1/2)*EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))
^(1/2))-2*(1/5/d^2*(-3*c^2+3)+32/15*c^2/d^2)*(-c^2+1)/(-d/(-1+c))^(1/2)*(1
+d/(-1+c)*x^2)^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2
)/(-2*c*d+2*d)*(EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-Ellipt
icE(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2)))))
```

## 3.393.5 Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.26

$$\int x^4(a+b\arcsin(c+dx^2))\,dx$$
$$=\frac{15\,bd^3x^6\arcsin(dx^2+c)+15\,ad^3x^6+2\,(3\,bd^2x^4-8\,bcdx^2+23\,bc^2+9\,b)\sqrt{-d^2x^4-2\,cdx^2-c^2+1}}{75\,d^3x}$$

input
```
integrate(x^4*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
```

output
```
1/75*(15*b*d^3*x^6*arcsin(d*x^2 + c) + 15*a*d^3*x^6 + 2*(3*b*d^2*x^4 - 8*b
*c*d*x^2 + 23*b*c^2 + 9*b)*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 + 1))/(d^3*x)
```

## 3.393.6 Sympy [F]

$$\int x^4(a+b\arcsin(c+dx^2))\,dx=\int x^4(a+b\,\mathrm{asin}(c+dx^2))\,dx$$

input
```
integrate(x**4*(a+b*asin(d*x**2+c)),x)
```

output
```
Integral(x**4*(a + b*asin(c + d*x**2)), x)
```

### 3.393.7 Maxima [F(-2)]

Exception generated.

$$\int x^4(a + b \arcsin(c + dx^2)) \, dx = \text{Exception raised: ValueError}$$

input
```
integrate(x^4*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(c-1>0)', see `assume?` for more
details)Is
```

### 3.393.8 Giac [F]

$$\int x^4(a + b \arcsin(c + dx^2)) \, dx = \int (b \arcsin(dx^2 + c) + a)x^4 \, dx$$

input
```
integrate(x^4*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + c) + a)*x^4, x)
```

### 3.393.9 Mupad [F(-1)]

Timed out.

$$\int x^4(a + b \arcsin(c + dx^2)) \, dx = \int x^4 \left(a + b \operatorname{asin}(d x^2 + c)\right) \, dx$$

input
```
int(x^4*(a + b*asin(c + d*x^2)),x)
```

output
```
int(x^4*(a + b*asin(c + d*x^2)), x)
```

# 3.394 $\int x^2(a + b \arcsin(c + dx^2)) \, dx$



## 3.394.1 Optimal result

Integrand size = 16, antiderivative size = 287

$$\begin{aligned}
&\int x^2(a + b \arcsin(c + dx^2)) \, dx \\
&= \frac{2bx\sqrt{1-c^2-2cdx^2-d^2x^4}}{9d} + \frac{1}{3}x^3(a + b \arcsin(c + dx^2)) \\
&\quad + \frac{8b\sqrt{1-c}c(1+c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{9d^{3/2}\sqrt{1-c^2-2cdx^2-d^2x^4}} \\
&\quad - \frac{2b\sqrt{1-c}(1+c)(1+3c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{9d^{3/2}\sqrt{1-c^2-2cdx^2-d^2x^4}}
\end{aligned}$$

output
```
1/3*x^3*(a+b*arcsin(d*x^2+c))+8/9*b*c*(1+c)*EllipticE(x*d^(1/2)/(1-c)^(1/2
),((-1+c)/(1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^
(1/2)/d^(3/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-2/9*b*(1+c)*(1+3*c)*Ellipti
cF(x*d^(1/2)/(1-c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))
^(1/2)*(1+d*x^2/(1+c))^(1/2)/d^(3/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2/9*
b*x*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/d
```

### 3.394.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.37 (sec) , antiderivative size = 307, normalized size of antiderivative = 1.07

$$\int x^2(a+b\arcsin(c+dx^2))\,dx$$
$$=\frac{\sqrt{\frac{d}{1+c}}x\big(3adx^2\sqrt{1-c^2-2cdx^2-d^2x^4}-2b(-1+c^2+2cdx^2+d^2x^4)+3bdx^2\sqrt{1-c^2-2cdx^2-d^2x^4}\,\text{arc}}{}$$

input
```
Integrate[x^2*(a + b*ArcSin[c + d*x^2]),x]
```

output
```
(Sqrt[d/(1 + c)]*x*(3*a*d*x^2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4] - 2*b*(-
1 + c^2 + 2*c*d*x^2 + d^2*x^4) + 3*b*d*x^2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*
x^4]*ArcSin[c + d*x^2]) - (8*I)*b*(-1 + c)*c*Sqrt[(-1 + c + d*x^2)/(-1 + c
)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*EllipticE[I*ArcSinh[Sqrt[d/(1 + c)]*x], (
1 + c)/(-1 + c)] + (2*I)*b*(1 - 4*c + 3*c^2)*Sqrt[(-1 + c + d*x^2)/(-1 + c
)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*EllipticF[I*ArcSinh[Sqrt[d/(1 + c)]*x], (
1 + c)/(-1 + c)])/(9*d*Sqrt[d/(1 + c)]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]
)
```

### 3.394.3 Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 233, normalized size of antiderivative = 0.81, number of steps used = 7, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {5341, 27, 1442, 1514, 399, 321, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2(a+b\arcsin(c+dx^2))\,dx$$
$$\Big\downarrow \text{5341}$$
$$\frac{1}{3}x^3(a+b\arcsin(c+dx^2))-\frac{1}{3}b\int\frac{2dx^4}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx$$
$$\Big\downarrow \text{27}$$
$$\frac{1}{3}x^3(a+b\arcsin(c+dx^2))-\frac{2}{3}bd\int\frac{x^4}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx$$

$$\Big\downarrow \text{1442}$$

$$\frac{1}{3}x^3(a+b\arcsin(c+dx^2))-\frac{2}{3}bd\left(\frac{\int\frac{-c^2-4dx^2c+1}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{3d^2}-\frac{x\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d^2}\right)$$

$$\Big\downarrow \text{1514}$$

$$\frac{1}{3}x^3(a+b\arcsin(c+dx^2))-\frac{2}{3}bd\left(\frac{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\int\frac{-c^2-4dx^2c+1}{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}}dx}{3d^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{x\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3d^2}\right)$$

$$\Big\downarrow \text{399}$$

$$\frac{1}{3}x^3(a+b\arcsin(c+dx^2))-\frac{2}{3}bd\left(\frac{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left((c+1)(3c+1)\int\frac{1}{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}}dx-4c(c+1)\int\frac{\sqrt{\frac{dx^2}{c+1}+1}}{\sqrt{1-\frac{dx^2}{1-c}}}dx\right)}{3d^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{x\sqrt{-c^2-2cdx^2-d^2}}{3d^2}\right.$$

$$\Big\downarrow \text{321}$$

$$\frac{1}{3}x^3(a+b\arcsin(c+dx^2))-\frac{2}{3}bd\left(\frac{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left(\frac{\sqrt{1-c}(c+1)(3c+1)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{d}}-4c(c+1)\int\frac{\sqrt{\frac{dx^2}{c+1}+1}}{\sqrt{1-\frac{dx^2}{1-c}}}dx\right)}{3d^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{x\sqrt{-c^2-2cd}}{3d}\right.$$

$$\Big\downarrow \text{327}$$

$$\frac{1}{3}x^3(a+b\arcsin(c+dx^2))-\frac{2}{3}bd\left(\frac{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left(\frac{\sqrt{1-c}(c+1)(3c+1)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{d}}-\frac{4\sqrt{1-c}c(c+1)E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{c+1}\right)}{\sqrt{d}}\right)}{3d^2\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{x\sqrt{-}}{}\right.$$

input
```
Int[x^2*(a + b*ArcSin[c + d*x^2]),x]
```

3.394. $\int x^2(a+b\arcsin(c+dx^2))\,dx$

output
```
(x^3*(a + b*ArcSin[c + d*x^2]))/3 - (2*b*d*(-1/3*(x*Sqrt[1 - c^2 - 2*c*d*x
^2 - d^2*x^4])/d^2 + (Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*
((-4*Sqrt[1 - c]*c*(1 + c)*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1
 - c)/(1 + c))])/Sqrt[d] + (Sqrt[1 - c]*(1 + c)*(1 + 3*c)*EllipticF[ArcSin
[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))])/Sqrt[d]))/(3*d^2*Sqrt[1 -
c^2 - 2*c*d*x^2 - d^2*x^4])))/3
```

### 3.394.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 321
```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 399
```
Int[((e_) + (f_.)*(x_)^2)/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)
^2]), x_Symbol] :> Simp[f/b   Int[Sqrt[a + b*x^2]/Sqrt[c + d*x^2], x], x] +
 Simp[(b*e - a*f)/b   Int[1/(Sqrt[a + b*x^2]*Sqrt[c + d*x^2]), x], x] /; Fr
eeQ[{a, b, c, d, e, f}, x] &&  !((PosQ[b/a] && PosQ[d/c]) || (NegQ[b/a] &&
(PosQ[d/c] || (GtQ[a, 0] && ( !GtQ[c, 0] || SimplerSqrtQ[-b/a, -d/c])))))
```

rule 1442
```
Int[((d_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_), x_Symbol]
:> Simp[d^3*(d*x)^(m - 3)*((a + b*x^2 + c*x^4)^(p + 1)/(c*(m + 4*p + 1))),
x] - Simp[d^4/(c*(m + 4*p + 1))   Int[(d*x)^(m - 4)*Simp[a*(m - 3) + b*(m +
 2*p - 1)*x^2, x]*(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, p}, x
] && NeQ[b^2 - 4*a*c, 0] && GtQ[m, 3] && NeQ[m + 4*p + 1, 0] && IntegerQ[2*
p] && (IntegerQ[p] || IntegerQ[m])
```

## 3.394. $\int x^2(a + b \arcsin(c + dx^2))\,dx$

rule 1514
```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbo
l] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt
[1 + 2*c*(x^2/(b + q))]/Sqrt[a + b*x^2 + c*x^4])   Int[(d + e*x^2)/(Sqrt[1
+ 2*c*(x^2/(b - q))]*Sqrt[1 + 2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b,
c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[c/a]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

### 3.394.4 Maple [A] (verified)

Time = 0.81 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.03

| method | result |
|---|---|
| default | $\frac{x^3 a}{3}+b\left(\frac{x^3\arcsin\left(d\,x^2+c\right)}{3}-\frac{2d\left(-\frac{x\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3d^2}+\frac{\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\operatorname{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)}{3d^2\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}+\frac{8c}{\cdots}\right.}{\cdots}\right.$ |
| parts | $\frac{x^3 a}{3}+b\left(\frac{x^3\arcsin\left(d\,x^2+c\right)}{3}-\frac{2d\left(-\frac{x\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3d^2}+\frac{\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\operatorname{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)}{3d^2\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}+\frac{8c}{\cdots}\right.}{\cdots}\right.$ |

input
```
int(x^2*(a+b*arcsin(d*x^2+c)),x,method=_RETURNVERBOSE)
```

output
```
1/3*x^3*a+b*(1/3*x^3*arcsin(d*x^2+c)-2/3*d*(-1/3/d^2*x*(-d^2*x^4-2*c*d*x^2
-c^2+1)^(1/2)+1/3/d^2*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(1/2)*(1
+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)*EllipticF(x*(-d/(-1+c
))^(1/2),(-1+2*c/(1+c))^(1/2))+8/3*c/d*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1
+c)*x^2)^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-2*
c*d+2*d)*(EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-EllipticE(x*
(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2)))))
```

### 3.394.5 Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 72, normalized size of antiderivative = 0.25

$$\int x^2 (a + b \arcsin(c + dx^2)) \, dx = \frac{3 bd^2x^4 \arcsin(dx^2 + c) + 3 ad^2x^4 + 2\sqrt{-d^2x^4 - 2 cdx^2 - c^2 + 1}(bdx^2 - 4 bc)}{9 d^2x}$$

input
```
integrate(x^2*(a+b*arcsin(d*x^2+c)),x, algorithm="fricas")
```

output
```
1/9*(3*b*d^2*x^4*arcsin(d*x^2 + c) + 3*a*d^2*x^4 + 2*sqrt(-d^2*x^4 - 2*c*d
*x^2 - c^2 + 1)*(b*d*x^2 - 4*b*c))/(d^2*x)
```

### 3.394.6 Sympy [F]

$$\int x^2 (a + b \arcsin(c + dx^2)) \, dx = \int x^2 (a + b \operatorname{asin}(c + dx^2)) \, dx$$

input
```
integrate(x**2*(a+b*asin(d*x**2+c)),x)
```

output
```
Integral(x**2*(a + b*asin(c + d*x**2)), x)
```

### 3.394.7 Maxima [F(-2)]

Exception generated.

$$\int x^2 (a + b \arcsin(c + dx^2)) \, dx = \text{Exception raised: ValueError}$$

input
```
integrate(x^2*(a+b*arcsin(d*x^2+c)),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(c-1>0)', see `assume?` for more
details)Is
```

### 3.394.8 Giac [F]

$$\int x^2(a+b\arcsin(c+dx^2))\,dx=\int(b\arcsin(dx^2+c)+a)x^2\,dx$$

input
```
integrate(x^2*(a+b*arcsin(d*x^2+c)),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + c) + a)*x^2, x)
```

### 3.394.9 Mupad [F(-1)]

Timed out.

$$\int x^2(a+b\arcsin(c+dx^2))\,dx=\int x^2\left(a+b\,\mathrm{asin}\left(d\,x^2+c\right)\right)\,dx$$

input
```
int(x^2*(a + b*asin(c + d*x^2)),x)
```

output
```
int(x^2*(a + b*asin(c + d*x^2)), x)
```

# 3.395 $\int (a + b \arcsin (c + dx^2))\, dx$



## 3.395.1 Optimal result

Integrand size = 12, antiderivative size = 237

$$\int (a + b \arcsin (c + dx^2))\, dx = ax + bx \arcsin (c + dx^2) - \frac{2b\sqrt{1-c}(1+c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{\sqrt{d}\sqrt{1-c^2-2cdx^2-d^2x^4}} + \frac{2b\sqrt{1-c}(1+c)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{\sqrt{d}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

output
```
a*x+b*x*arcsin(d*x^2+c)-2*b*(1+c)*EllipticE(x*d^(1/2)/(1-c)^(1/2),((-1+c)/
(1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/d^(1
/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2*b*(1+c)*EllipticF(x*d^(1/2)/(1-c)^(
1/2),((-1+c)/(1+c))^(1/2))*(1-c)^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c
))^(1/2)/d^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)
```

## 3.395.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 10.10 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.65

$$\int (a + b \arcsin (c + dx^2))\, dx = ax + bx \arcsin (c + dx^2) + \frac{2ib(-1+c)\sqrt{\frac{-1+c+dx^2}{-1+c}}\sqrt{\frac{1+c+dx^2}{1+c}}\left(E\left(i\operatorname{arcsinh}\left(\sqrt{\frac{d}{1+c}}x\right)|\frac{1+c}{-1+c}\right)-\text{EllipticF}\left(i\operatorname{arcsinh}\left(\sqrt{\frac{d}{1+c}}x\right),\frac{1+c}{-1+c}\right)\right)}{\sqrt{\frac{d}{1+c}}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

input
```
Integrate[a + b*ArcSin[c + d*x^2],x]
```

output
```
a*x + b*x*ArcSin[c + d*x^2] + ((2*I)*b*(-1 + c)*Sqrt[(-1 + c + d*x^2)/(-1
+ c)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*(EllipticE[I*ArcSinh[Sqrt[d/(1 + c)]*x
], (1 + c)/(-1 + c)] - EllipticF[I*ArcSinh[Sqrt[d/(1 + c)]*x], (1 + c)/(-1
 + c)]))/(Sqrt[d/(1 + c)]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])
```

## 3.395.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a+b \arcsin \left(c+dx^2\right)\right) \, dx$$

$$\Big\downarrow \; 2009$$

$$ax+\frac{2b\sqrt{1-c}(c+1)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{d}\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{2b\sqrt{1-c}(c+1)\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{c+1}\right)}{\sqrt{d}\sqrt{-c^2-2cdx^2-d^2x^4+1}}+bx \arcsin\left(c+dx^2\right)$$

input
```
Int[a + b*ArcSin[c + d*x^2],x]
```

output
```
a*x + b*x*ArcSin[c + d*x^2] - (2*b*Sqrt[1 - c]*(1 + c)*Sqrt[1 - (d*x^2)/(1
 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]]
, -((1 - c)/(1 + c))])/(Sqrt[d]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]) + (2*
b*Sqrt[1 - c]*(1 + c)*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*
EllipticF[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))])/(Sqrt[d]*S
qrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])
```

### 3.395.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

## 3.395.4 Maple [A] (verified)

Time = 0.62 (sec) , antiderivative size = 153, normalized size of antiderivative = 0.65

| method | result |
|---|---|
| default | $ax+b\left(x\arcsin\left(d\,x^2+c\right)+\frac{4d\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\left(\mathrm{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)-\mathrm{EllipticE}\left(x\sqrt{-\frac{d}{-1+c}}\right.\right.}{\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}\,(-2cd+2d)}\right.$ |
| parts | $ax+b\left(x\arcsin\left(d\,x^2+c\right)+\frac{4d\left(-c^2+1\right)\sqrt{1+\frac{d\,x^2}{-1+c}}\,\sqrt{1+\frac{d\,x^2}{1+c}}\,\left(\mathrm{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)-\mathrm{EllipticE}\left(x\sqrt{-\frac{d}{-1+c}}\right.\right.}{\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^2x^4-2cd\,x^2-c^2+1}\,(-2cd+2d)}\right.$ |

input
```
int(a+b*arcsin(d*x^2+c),x,method=_RETURNVERBOSE)
```

output
```
a*x+b*(x*arcsin(d*x^2+c)+4*d*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(
1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-2*c*d+2*d)*(
EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-EllipticE(x*(-d/(-1+c)
)^(1/2),(-1+2*c/(1+c))^(1/2))))
```

## 3.395.5 Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.23

$$\int \left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\frac{bdx^2\arcsin\left(dx^2+c\right)+adx^2+2\sqrt{-d^2x^4-2\,cdx^2-c^2+1}b}{dx}$$

input
```
integrate(a+b*arcsin(d*x^2+c),x, algorithm="fricas")
```

output
```
(b*d*x^2*arcsin(d*x^2 + c) + a*d*x^2 + 2*sqrt(-d^2*x^4 - 2*c*d*x^2 - c^2 +
 1)*b)/(d*x)
```

### 3.395.6 Sympy [F]

$$\int \left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\int \left(a+b\,\mathrm{asin}\left(c+dx^2\right)\right)\,dx$$

input
```
integrate(a+b*asin(d*x**2+c),x)
```

output
```
Integral(a + b*asin(c + d*x**2), x)
```

### 3.395.7 Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\text{Exception raised: ValueError}$$

input
```
integrate(a+b*arcsin(d*x^2+c),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(c-1>0)', see `assume?` for more
details)Is
```

### 3.395.8 Giac [F]

$$\int \left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\int b\arcsin\left(dx^2+c\right)+a\,dx$$

input
```
integrate(a+b*arcsin(d*x^2+c),x, algorithm="giac")
```

output
```
integrate(b*arcsin(d*x^2 + c) + a, x)
```

### 3.395.9 Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(c+dx^2\right)\right)\,dx=\int a+b\,\mathrm{asin}\left(d\,x^2+c\right)\,dx$$

input
```
int(a + b*asin(c + d*x^2),x)
```

output
```
int(a + b*asin(c + d*x^2), x)
```

# 3.396 $\int \frac{a+b\arcsin(c+dx^2)}{x^2}\,dx$



## 3.396.1 Optimal result

Integrand size = 16, antiderivative size = 126

$$\int \frac{a+b\arcsin(c+dx^2)}{x^2}\,dx = -\frac{a+b\arcsin(c+dx^2)}{x} + \frac{2b\sqrt{1-c}\sqrt{d}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

output
```
(-a-b*arcsin(d*x^2+c))/x+2*b*EllipticF(x*d^(1/2)/(1-c)^(1/2),((-1+c)/(1+c)
)^(1/2))*(1-c)^(1/2)*d^(1/2)*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/(
-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)
```

## 3.396.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.18 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.11

$$\int \frac{a+b\arcsin(c+dx^2)}{x^2}\,dx = -\frac{a}{x} - \frac{b\arcsin(c+dx^2)}{x} - \frac{2ibd\sqrt{1-\frac{dx^2}{-1-c}}\sqrt{1-\frac{dx^2}{1-c}}\,\text{EllipticF}\left(i\,\text{arcsinh}\left(\sqrt{-\frac{d}{-1-c}}x\right),\frac{-1-c}{1-c}\right)}{\sqrt{-\frac{d}{-1-c}}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x^2])/x^2,x]
```

output
```
-(a/x) - (b*ArcSin[c + d*x^2])/x - ((2*I)*b*d*Sqrt[1 - (d*x^2)/(-1 - c)]*S
qrt[1 - (d*x^2)/(1 - c)]*EllipticF[I*ArcSinh[Sqrt[-(d/(-1 - c))]*x], (-1 -
 c)/(1 - c)])/(Sqrt[-(d/(-1 - c))]*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])
```

## 3.396.3 Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {5341, 27, 1417, 321}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^2}dx$$

$$\Big\downarrow \text{5341}$$

$$b\int \frac{2d}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin\left(c+dx^2\right)}{x}$$

$$\Big\downarrow \text{27}$$

$$2bd\int \frac{1}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin\left(c+dx^2\right)}{x}$$

$$\Big\downarrow \text{1417}$$

$$\frac{2bd\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\int \frac{1}{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}}dx}{\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{a+b\arcsin\left(c+dx^2\right)}{x}$$

$$\Big\downarrow \text{321}$$

$$\frac{2b\sqrt{1-c}\sqrt{d}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{a+b\arcsin\left(c+dx^2\right)}{x}$$

input
```
Int[(a + b*ArcSin[c + d*x^2])/x^2,x]
```

output
```
-((a + b*ArcSin[c + d*x^2])/x) + (2*b*Sqrt[1 - c]*Sqrt[d]*Sqrt[1 - (d*x^2)
/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*EllipticF[ArcSin[(Sqrt[d]*x)/Sqrt[1 -
c]], -((1 - c)/(1 + c))])/Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]
```

### 3.396.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 321
```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

rule 1417
```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbol] :> With[{q = Rt[b
^2 - 4*a*c, 2]}, Simp[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt[1 + 2*c*(x^2/(b + q
))]/Sqrt[a + b*x^2 + c*x^4])   Int[1/(Sqrt[1 + 2*c*(x^2/(b - q))]*Sqrt[1 +
2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
&& NegQ[c/a]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

---

3.396. $\int \frac{a+b\arcsin(c+dx^2)}{x^2}\,dx$

### 3.396.4 Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.90

| method | result | size |
|---|---|---|
| default | $-\frac{a}{x}+b\left(-\frac{\arcsin\left(d\,x^{2}+c\right)}{x}+\frac{2d\sqrt{1+\frac{d\,x^{2}}{-1+c}}\,\sqrt{1+\frac{d\,x^{2}}{1+c}}\,\operatorname{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)}{\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}}\right)$ | 114 |
| parts | $-\frac{a}{x}+b\left(-\frac{\arcsin\left(d\,x^{2}+c\right)}{x}+\frac{2d\sqrt{1+\frac{d\,x^{2}}{-1+c}}\,\sqrt{1+\frac{d\,x^{2}}{1+c}}\,\operatorname{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)}{\sqrt{-\frac{d}{-1+c}}\,\sqrt{-d^{2}x^{4}-2cd\,x^{2}-c^{2}+1}}\right)$ | 114 |

input
```
int((a+b*arcsin(d*x^2+c))/x^2,x,method=_RETURNVERBOSE)
```

output
```
-a/x+b*(-1/x*arcsin(d*x^2+c)+2*d/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(1/2)*
(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)*EllipticF(x*(-d/(-1
+c))^(1/2),(-1+2*c/(1+c))^(1/2)))
```

### 3.396.5 Fricas [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.13

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^2}\,dx=-\frac{b\arcsin\left(dx^2+c\right)+a}{x}$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^2,x, algorithm="fricas")
```

output
```
-(b*arcsin(d*x^2 + c) + a)/x
```

### 3.396.6 Sympy [F]

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^2}\,dx=\int \frac{a+b\,\mathrm{asin}\left(c+dx^2\right)}{x^2}\,dx$$

input
```
integrate((a+b*asin(d*x**2+c))/x**2,x)
```

output
```
Integral((a + b*asin(c + d*x**2))/x**2, x)
```

### 3.396.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b\arcsin(c + dx^2)}{x^2} \, dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^2,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(c-1>0)', see `assume?` for more
details)Is
```

### 3.396.8 Giac [F]

$$\int \frac{a + b\arcsin(c + dx^2)}{x^2} \, dx = \int \frac{b\arcsin(dx^2 + c) + a}{x^2} \, dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + c) + a)/x^2, x)
```

### 3.396.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a + b\arcsin(c + dx^2)}{x^2} \, dx = \int \frac{a + b\,\mathrm{asin}(d\,x^2 + c)}{x^2} \, dx$$

input
```
int((a + b*asin(c + d*x^2))/x^2,x)
```

output
```
int((a + b*asin(c + d*x^2))/x^2, x)
```

# 3.397 $\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx$



## 3.397.1 Optimal result

Integrand size = 16, antiderivative size = 284

$$\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx = -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{3(1-c^2)x} - \frac{a+b\arcsin(c+dx^2)}{3x^3} - \frac{2bd^{3/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{3\sqrt{1-c}\sqrt{1-c^2-2cdx^2-d^2x^4}} + \frac{2bd^{3/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{3\sqrt{1-c}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

output
```
1/3*(-a-b*arcsin(d*x^2+c))/x^3-2/3*b*d^(3/2)*EllipticE(x*d^(1/2)/(1-c)^(1/
2),((-1+c)/(1+c))^(1/2))*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/(1-c)
^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2/3*b*d^(3/2)*EllipticF(x*d^(1/2)/
(1-c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1
/2)/(1-c)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)-2/3*b*d*(-d^2*x^4-2*c*d*x
^2-c^2+1)^(1/2)/(-c^2+1)/x
```

### 3.397.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.27 (sec) , antiderivative size = 243, normalized size of antiderivative = 0.86

$$\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx = -\frac{a}{3x^3} + \frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{3(-1+c^2)\,x} - \frac{b\arcsin(c+dx^2)}{3x^3} + \frac{2ib(1-c)d^2\sqrt{1-\frac{dx^2}{-1-c}}\sqrt{1-\frac{dx^2}{1-c}}\left(E\left(i\operatorname{arcsinh}\left(\sqrt{-\frac{d}{-1-c}}x\right)|\frac{-1-c}{1-c}\right)-\operatorname{EllipticF}\left(i\operatorname{arcsinh}\left(\sqrt{-\frac{d}{-1-c}}x\right)\right.\right.}{3(-1+c)(1+c)\sqrt{-\frac{d}{-1-c}}\sqrt{1-c^2-2cdx^2-d^2x^4}}$$

input
```
Integrate[(a + b*ArcSin[c + d*x^2])/x^4,x]
```

output
```
-1/3*a/x^3 + (2*b*d*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4])/(3*(-1 + c^2)*x)
- (b*ArcSin[c + d*x^2])/(3*x^3) + (((2*I)/3)*b*(1 - c)*d^2*Sqrt[1 - (d*x^2
)/(-1 - c)]*Sqrt[1 - (d*x^2)/(1 - c)]*(EllipticE[I*ArcSinh[Sqrt[-(d/(-1 -
c))]*x], (-1 - c)/(1 - c)] - EllipticF[I*ArcSinh[Sqrt[-(d/(-1 - c))]*x], (
-1 - c)/(1 - c)]))/((-1 + c)*(1 + c)*Sqrt[-(d/(-1 - c))]*Sqrt[1 - c^2 - 2*
c*d*x^2 - d^2*x^4])
```

### 3.397.3 Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 240, normalized size of antiderivative = 0.85, number of steps used = 9, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.562$, Rules used = {5341, 27, 1443, 25, 27, 1460, 389, 321, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx$$

$$\Big\downarrow \text{ 5341}$$

$$\frac{1}{3}b\int \frac{2d}{x^2\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx - \frac{a+b\arcsin(c+dx^2)}{3x^3}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{2}{3}bd\int \frac{1}{x^2\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx - \frac{a+b\arcsin(c+dx^2)}{3x^3}$$

$$\Big\downarrow \text{1443}$$

$$\frac{2}{3}bd\left(\frac{\int -\frac{d^2x^2}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{1-c^2}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)\,x}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}$$

$$\Big\downarrow \text{25}$$

$$\frac{2}{3}bd\left(-\frac{\int \frac{d^2x^2}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{1-c^2}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)\,x}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}$$

$$\Big\downarrow \text{27}$$

$$\frac{2}{3}bd\left(-\frac{d^2\int \frac{x^2}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{1-c^2}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)\,x}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}$$

$$\Big\downarrow \text{1460}$$

$$\frac{2}{3}bd\left(-\frac{d^2\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\int \frac{x^2}{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}}dx}{(1-c^2)\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)\,x}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}$$

$$\Big\downarrow \text{389}$$

$$\frac{2}{3}bd\left(-\frac{d^2\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left(\frac{(c+1)\int \frac{\sqrt{\frac{dx^2}{c+1}+1}}{\sqrt{1-\frac{dx^2}{1-c}}}dx}{d}-\frac{(c+1)\int \frac{1}{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}}dx}{d}\right)}{(1-c^2)\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)\,x}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}$$

$$\Big\downarrow \text{321}$$

3.397. $\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^4}\,dx$

$$\frac{2}{3}bd\left(-\frac{d^2\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left(\frac{(c+1)\int\frac{\sqrt{\frac{dx^2}{c+1}+1}}{\sqrt{1-\frac{dx^2}{1-c}}}dx}{d}-\frac{\sqrt{1-c}(c+1)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{d^{3/2}}\right)}{(1-c^2)\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{\sqrt{-c^2-2cdx^2-d^2x}}{(1-c^2)\,x}\right.$$

$$\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}$$

$\downarrow$ 327

$$\frac{2}{3}bd\left(-\frac{d^2\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left(\frac{\sqrt{1-c}(c+1)E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{c+1}\right)}{d^{3/2}}-\frac{\sqrt{1-c}(c+1)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{d^{3/2}}\right)}{(1-c^2)\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{\sqrt{-c^2-}}{}\right.$$

$$\frac{a+b\arcsin\left(c+dx^2\right)}{3x^3}$$

input
```
Int[(a + b*ArcSin[c + d*x^2])/x^4,x]
```

output
```
-1/3*(a + b*ArcSin[c + d*x^2])/x^3 + (2*b*d*(-(Sqrt[1 - c^2 - 2*c*d*x^2 -
d^2*x^4]/((1 - c^2)*x)) - (d^2*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/
(1 + c)]*((Sqrt[1 - c]*(1 + c)*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]],
-((1 - c)/(1 + c))])/d^(3/2) - (Sqrt[1 - c]*(1 + c)*EllipticF[ArcSin[(Sqrt
[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))])/d^(3/2)))/((1 - c^2)*Sqrt[1 - c^
2 - 2*c*d*x^2 - d^2*x^4])))/3
```

### 3.397.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 321
```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 389
```
Int[(x_)^2/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol]
 :> Simp[1/b   Int[Sqrt[a + b*x^2]/Sqrt[c + d*x^2], x], x] - Simp[a/b   Int
[1/(Sqrt[a + b*x^2]*Sqrt[c + d*x^2]), x], x] /; FreeQ[{a, b, c, d}, x] && N
eQ[b*c - a*d, 0] &&  !SimplerSqrtQ[-b/a, -d/c]
```

rule 1443
```
Int[((d_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*x^2 + c*x^4)^(p + 1)/(a*d*(m + 1))), x] - Sim
p[1/(a*d^2*(m + 1))   Int[(d*x)^(m + 2)*(b*(m + 2*p + 3) + c*(m + 4*p + 5)*
x^2)*(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, p}, x] && NeQ[b^2
- 4*a*c, 0] && LtQ[m, -1] && IntegerQ[2*p] && (IntegerQ[p] || IntegerQ[m])
```

rule 1460
```
Int[(x_)^2/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbol] :> With[{q =
 Rt[b^2 - 4*a*c, 2]}, Simp[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt[1 + 2*c*(x^2/(
b + q))]/Sqrt[a + b*x^2 + c*x^4])   Int[x^2/(Sqrt[1 + 2*c*(x^2/(b - q))]*Sq
rt[1 + 2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a
*c, 0] && NegQ[c/a]
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

## 3.397. $\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx$

## 3.397.4 Maple [A] (verified)

Time = 0.55 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.73

| method | result |
|---|---|
| default | $-\frac{a}{3x^3}+b\left(-\frac{\arcsin(dx^2+c)}{3x^3}+\frac{2d\left(\frac{\sqrt{-d^2x^4-2cdx^2-c^2+1}}{(c^2-1)x}-\frac{2d^2(-c^2+1)\sqrt{1+\frac{dx^2}{-1+c}}\sqrt{1+\frac{dx^2}{1+c}}\left(\operatorname{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)-\cdots\right.}{(c^2-1)\sqrt{-\frac{d}{-1+c}}\sqrt{-d^2x^4-2cdx^2-c^2+1}\,(\cdots}\right.}{3}\right.$ |
| parts | $-\frac{a}{3x^3}+b\left(-\frac{\arcsin(dx^2+c)}{3x^3}+\frac{2d\left(\frac{\sqrt{-d^2x^4-2cdx^2-c^2+1}}{(c^2-1)x}-\frac{2d^2(-c^2+1)\sqrt{1+\frac{dx^2}{-1+c}}\sqrt{1+\frac{dx^2}{1+c}}\left(\operatorname{EllipticF}\left(x\sqrt{-\frac{d}{-1+c}},\sqrt{-1+\frac{2c}{1+c}}\right)-\cdots\right.}{(c^2-1)\sqrt{-\frac{d}{-1+c}}\sqrt{-d^2x^4-2cdx^2-c^2+1}\,(\cdots}\right.}{3}\right.$ |

input
```
int((a+b*arcsin(d*x^2+c))/x^4,x,method=_RETURNVERBOSE)
```

output
```
-1/3*a/x^3+b*(-1/3/x^3*arcsin(d*x^2+c)+2/3*d*(1/(c^2-1)*(-d^2*x^4-2*c*d*x^
2-c^2+1)^(1/2)/x-2*d^2/(c^2-1)*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)
^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-2*c*d+2*d)
*(EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-EllipticE(x*(-d/(-1+
c))^(1/2),(-1+2*c/(1+c))^(1/2)))))
```

## 3.397.5 Fricas [F]

$$\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx=\int \frac{b\arcsin(dx^2+c)+a}{x^4}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^4,x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x^2 + c) + a)/x^4, x)
```

### 3.397.6 Sympy [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x^4} \, dx = \int \frac{a + b \operatorname{asin}(c + dx^2)}{x^4} \, dx$$

input
```
integrate((a+b*asin(d*x**2+c))/x**4,x)
```

output
```
Integral((a + b*asin(c + d*x**2))/x**4, x)
```

### 3.397.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a + b \arcsin(c + dx^2)}{x^4} \, dx = \text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^4,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(c-1>0)', see `assume?` for more
details)Is
```

### 3.397.8 Giac [F]

$$\int \frac{a + b \arcsin(c + dx^2)}{x^4} \, dx = \int \frac{b \arcsin(dx^2 + c) + a}{x^4} \, dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^4,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + c) + a)/x^4, x)
```

### 3.397.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin(c+dx^2)}{x^4}\,dx = \int \frac{a+b\,\mathrm{asin}(d\,x^2+c)}{x^4}\,dx$$

input
```
int((a + b*asin(c + d*x^2))/x^4,x)
```

output
```
int((a + b*asin(c + d*x^2))/x^4, x)
```

# 3.398 $\int \frac{a+b\arcsin(c+dx^2)}{x^6}\,dx$



## 3.398.1 Optimal result

Integrand size = 16, antiderivative size = 355

$$\begin{aligned}\int \frac{a+b\arcsin(c+dx^2)}{x^6}\,dx &= -\frac{2bd\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)x^3} - \frac{8bcd^2\sqrt{1-c^2-2cdx^2-d^2x^4}}{15(1-c^2)^2x} \\ &\quad - \frac{a+b\arcsin(c+dx^2)}{5x^5} - \frac{8bcd^{5/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{1+c}\right)}{15\sqrt{1-c}(1-c^2)\sqrt{1-c^2-2cdx^2-d^2x^4}} \\ &\quad + \frac{2b(1+3c)d^{5/2}\sqrt{1-\frac{dx^2}{1-c}}\sqrt{1+\frac{dx^2}{1+c}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{1+c}\right)}{15\sqrt{1-c}(1-c^2)\sqrt{1-c^2-2cdx^2-d^2x^4}}\end{aligned}$$

output

```
1/5*(-a-b*arcsin(d*x^2+c))/x^5-8/15*b*c*d^(5/2)*EllipticE(x*d^(1/2)/(1-c)^
(1/2),((-1+c)/(1+c))^(1/2))*(1-d*x^2/(1-c))^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-
c^2+1)/(1-c)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)+2/15*b*(1+3*c)*d^(5/2)
*EllipticF(x*d^(1/2)/(1-c)^(1/2),((-1+c)/(1+c))^(1/2))*(1-d*x^2/(1-c))^(1/
2)*(1+d*x^2/(1+c))^(1/2)/(-c^2+1)/(1-c)^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(
1/2)-2/15*b*d*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-c^2+1)/x^3-8/15*b*c*d^2*(
-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-c^2+1)^2/x
```

### 3.398.2 Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 0.52 (sec) , antiderivative size = 370, normalized size of antiderivative = 1.04

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^6}\,dx$$
$$= \frac{\sqrt{\frac{d}{1+c}}\left(-3a(-1+c^2)^2\sqrt{1-c^2-2cdx^2-d^2x^4}+2bdx^2(-1-c^4+2c^3dx^2+d^2x^4+c^2(2+7d^2x^4)+c(-2\right.}{}$$

input
```
Integrate[(a + b*ArcSin[c + d*x^2])/x^6,x]
```

output
```
(Sqrt[d/(1 + c)]*(-3*a*(-1 + c^2)^2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4] +
2*b*d*x^2*(-1 - c^4 + 2*c^3*d*x^2 + d^2*x^4 + c^2*(2 + 7*d^2*x^4) + c*(-2*
d*x^2 + 4*d^3*x^6)) - 3*b*(-1 + c^2)^2*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4]
*ArcSin[c + d*x^2]) + (8*I)*b*(-1 + c)*c*d^3*x^5*Sqrt[(-1 + c + d*x^2)/(-1
 + c)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*EllipticE[I*ArcSinh[Sqrt[d/(1 + c)]*x
], (1 + c)/(-1 + c)] - (2*I)*b*(1 - 4*c + 3*c^2)*d^3*x^5*Sqrt[(-1 + c + d*
x^2)/(-1 + c)]*Sqrt[(1 + c + d*x^2)/(1 + c)]*EllipticF[I*ArcSinh[Sqrt[d/(1
 + c)]*x], (1 + c)/(-1 + c)])/(15*(-1 + c^2)^2*Sqrt[d/(1 + c)]*x^5*Sqrt[1
- c^2 - 2*c*d*x^2 - d^2*x^4])
```

### 3.398.3 Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 301, normalized size of antiderivative = 0.85, number of steps used = 11, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.688$, Rules used = {5341, 27, 1443, 27, 1604, 25, 27, 1514, 399, 321, 327}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^6}\,dx$$
$$\Big\downarrow \text{ 5341}$$
$$\frac{1}{5}b\int \frac{2d}{x^4\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin\left(c+dx^2\right)}{5x^5}$$
$$\Big\downarrow \text{ 27}$$

$$\frac{2}{5}bd\int \frac{1}{x^4\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx-\frac{a+b\arcsin\left(c+dx^2\right)}{5x^5}$$

$$\Big\downarrow \text{1443}$$

$$\frac{2}{5}bd\left(\frac{\int \frac{d\left(dx^2+4c\right)}{x^2\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{3\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3\left(1-c^2\right)x^3}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{5x^5}$$

$$\Big\downarrow \text{27}$$

$$\frac{2}{5}bd\left(\frac{d\int \frac{dx^2+4c}{x^2\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{3\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3\left(1-c^2\right)x^3}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{5x^5}$$

$$\Big\downarrow \text{1604}$$

$$\frac{2}{5}bd\left(\frac{d\left(-\frac{\int -\frac{d\left(-c^2-4dx^2c+1\right)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{1-c^2}-\frac{4c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)x}\right)}{3\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3\left(1-c^2\right)x^3}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{5x^5}$$

$$\Big\downarrow \text{25}$$

$$\frac{2}{5}bd\left(\frac{d\left(\frac{\int \frac{d\left(-c^2-4dx^2c+1\right)}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{1-c^2}-\frac{4c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)x}\right)}{3\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3\left(1-c^2\right)x^3}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{5x^5}$$

$$\Big\downarrow \text{27}$$

$$\frac{2}{5}bd\left(\frac{d\left(\frac{d\int \frac{-c^2-4dx^2c+1}{\sqrt{-d^2x^4-2cdx^2-c^2+1}}dx}{1-c^2}-\frac{4c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)x}\right)}{3\left(1-c^2\right)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3\left(1-c^2\right)x^3}\right)-\frac{a+b\arcsin\left(c+dx^2\right)}{5x^5}$$

$$\Big\downarrow \text{1514}$$

3.398. $\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^6}\,dx$

$$\frac{2}{5}bd\left(\frac{d\left(\frac{d\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\int\frac{-c^2-4dx^2c+1}{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}}dx}{(1-c^2)\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{4c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)x}\right)}{3(1-c^2)}-\frac{\sqrt{-c^2-2cdx^2-d^2x^4+1}}{3(1-c^2)x^3}\right)-$$

$$\frac{a+b\arcsin(c+dx^2)}{5x^5}$$

$$\Big\downarrow \text{399}$$

$$\frac{2}{5}bd\left(\frac{d\left(\frac{d\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left((c+1)(3c+1)\int\frac{1}{\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}}dx-4c(c+1)\int\frac{\sqrt{\frac{dx^2}{c+1}+1}}{\sqrt{1-\frac{dx^2}{1-c}}}dx\right)}{(1-c^2)\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{4c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)x}\right)}{3(1-c^2)}-\frac{\sqrt{-c^2-2}}{3(}\right.$$

$$\frac{a+b\arcsin(c+dx^2)}{5x^5}$$

$$\Big\downarrow \text{321}$$

$$\frac{2}{5}bd\left(\frac{d\left(\frac{d\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left(\frac{\sqrt{1-c}(c+1)(3c+1)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{d}}-4c(c+1)\int\frac{\sqrt{\frac{dx^2}{c+1}+1}}{\sqrt{1-\frac{dx^2}{1-c}}}dx\right)}{(1-c^2)\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{4c\sqrt{-c^2-2cdx^2-d^2x^4+1}}{(1-c^2)x}\right)}{3(1-c^2)}-\right.$$

$$\frac{a+b\arcsin(c+dx^2)}{5x^5}$$

$$\Big\downarrow \text{327}$$

---

3.398. $\int\frac{a+b\arcsin(c+dx^2)}{x^6}\,dx$

$$\frac{2}{5}bd\left(\frac{d\left(\frac{d\sqrt{1-\frac{dx^2}{1-c}}\sqrt{\frac{dx^2}{c+1}+1}\left(\frac{\sqrt{1-c}(c+1)(3c+1)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right),-\frac{1-c}{c+1}\right)}{\sqrt{d}}-\frac{4\sqrt{1-c}c(c+1)E\left(\arcsin\left(\frac{\sqrt{d}x}{\sqrt{1-c}}\right)|-\frac{1-c}{c+1}\right)}{\sqrt{d}}\right)}{(1-c^2)\sqrt{-c^2-2cdx^2-d^2x^4+1}}-\frac{4c\sqrt{-c^2-2cdx^2-}}{(1-c^2)x}\right.}{3(1-c^2)}\right.$$

$$\frac{a+b\arcsin(c+dx^2)}{5x^5}$$

input
```
Int[(a + b*ArcSin[c + d*x^2])/x^6,x]
```

output
```
-1/5*(a + b*ArcSin[c + d*x^2])/x^5 + (2*b*d*(-1/3*Sqrt[1 - c^2 - 2*c*d*x^2
 - d^2*x^4]/((1 - c^2)*x^3) + (d*((-4*c*Sqrt[1 - c^2 - 2*c*d*x^2 - d^2*x^4
])/((1 - c^2)*x) + (d*Sqrt[1 - (d*x^2)/(1 - c)]*Sqrt[1 + (d*x^2)/(1 + c)]*
((-4*Sqrt[1 - c]*c*(1 + c)*EllipticE[ArcSin[(Sqrt[d]*x)/Sqrt[1 - c]], -((1
 - c)/(1 + c))])/Sqrt[d] + (Sqrt[1 - c]*(1 + c)*(1 + 3*c)*EllipticF[ArcSin
[(Sqrt[d]*x)/Sqrt[1 - c]], -((1 - c)/(1 + c))])/Sqrt[d]))/((1 - c^2)*Sqrt[
1 - c^2 - 2*c*d*x^2 - d^2*x^4])))/(3*(1 - c^2))))/5
```

### 3.398.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 321
```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)^2]), x_Symbol] :> S
imp[(1/(Sqrt[a]*Sqrt[c]*Rt[-d/c, 2]))*EllipticF[ArcSin[Rt[-d/c, 2]*x], b*(c
/(a*d))], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a,
0] &&  !(NegQ[b/a] && SimplerSqrtQ[-b/a, -d/c])
```

rule 327
```
Int[Sqrt[(a_) + (b_.)*(x_)^2]/Sqrt[(c_) + (d_.)*(x_)^2], x_Symbol] :> Simp[
(Sqrt[a]/(Sqrt[c]*Rt[-d/c, 2]))*EllipticE[ArcSin[Rt[-d/c, 2]*x], b*(c/(a*d)
)], x] /; FreeQ[{a, b, c, d}, x] && NegQ[d/c] && GtQ[c, 0] && GtQ[a, 0]
```

rule 399
```
Int[((e_) + (f_.)*(x_)^2)/(Sqrt[(a_) + (b_.)*(x_)^2]*Sqrt[(c_) + (d_.)*(x_)
^2]), x_Symbol] :> Simp[f/b   Int[Sqrt[a + b*x^2]/Sqrt[c + d*x^2], x], x] +
 Simp[(b*e - a*f)/b   Int[1/(Sqrt[a + b*x^2]*Sqrt[c + d*x^2]), x], x] /; Fr
eeQ[{a, b, c, d, e, f}, x] &&  !((PosQ[b/a] && PosQ[d/c]) || (NegQ[b/a] &&
(PosQ[d/c] || (GtQ[a, 0] && ( !GtQ[c, 0] || SimplerSqrtQ[-b/a, -d/c])))))
```

rule 1443
```
Int[((d_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_), x_Symbol]
:> Simp[(d*x)^(m + 1)*((a + b*x^2 + c*x^4)^(p + 1)/(a*d*(m + 1))), x] - Sim
p[1/(a*d^2*(m + 1))   Int[(d*x)^(m + 2)*(b*(m + 2*p + 3) + c*(m + 4*p + 5)*
x^2)*(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, p}, x] && NeQ[b^2
- 4*a*c, 0] && LtQ[m, -1] && IntegerQ[2*p] && (IntegerQ[p] || IntegerQ[m])
```

rule 1514
```
Int[((d_) + (e_.)*(x_)^2)/Sqrt[(a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4], x_Symbo
l] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[Sqrt[1 + 2*c*(x^2/(b - q))]*(Sqrt
[1 + 2*c*(x^2/(b + q))]/Sqrt[a + b*x^2 + c*x^4])   Int[(d + e*x^2)/(Sqrt[1
+ 2*c*(x^2/(b - q))]*Sqrt[1 + 2*c*(x^2/(b + q))]), x], x]] /; FreeQ[{a, b,
c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[c/a]
```

rule 1604
```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)*((a_) + (b_.)*(x_)^2 + (c_.)*(
x_)^4)^(p_), x_Symbol] :> Simp[d*(f*x)^(m + 1)*((a + b*x^2 + c*x^4)^(p + 1)
/(a*f*(m + 1))), x] + Simp[1/(a*f^2*(m + 1))   Int[(f*x)^(m + 2)*(a + b*x^2
 + c*x^4)^p*Simp[a*e*(m + 1) - b*d*(m + 2*p + 3) - c*d*(m + 4*p + 5)*x^2, x
], x], x] /; FreeQ[{a, b, c, d, e, f, p}, x] && NeQ[b^2 - 4*a*c, 0] && LtQ[
m, -1] && IntegerQ[2*p] && (IntegerQ[p] || IntegerQ[m])
```

rule 5341
```
Int[((a_.) + ArcSin[u_]*(b_.))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Sim
p[(c + d*x)^(m + 1)*((a + b*ArcSin[u])/(d*(m + 1))), x] - Simp[b/(d*(m + 1)
)   Int[SimplifyIntegrand[(c + d*x)^(m + 1)*(D[u, x]/Sqrt[1 - u^2]), x], x]
, x] /; FreeQ[{a, b, c, d, m}, x] && NeQ[m, -1] && InverseFunctionFreeQ[u,
x] &&  !FunctionOfQ[(c + d*x)^(m + 1), u, x] &&  !FunctionOfExponentialQ[u,
 x]
```

---

## 3.398. $\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^6}\,dx$

## 3.398.4 Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 346, normalized size of antiderivative = 0.97

| method | result |
|---|---|
| default | $-\frac{a}{5x^5}+b\left(-\frac{\arcsin(d\,x^2+c)}{5x^5}+\frac{2d\left(\frac{\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3(c^2-1)x^3}-\frac{4cd\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3(c^2-1)^2x}-\frac{d^2\sqrt{1+\frac{d\,x^2}{-1+c}}\sqrt{1+\frac{d\,x^2}{1+c}}\ \mathrm{EllipticF}\left(x\sqrt{-\dots}\right.}{3(c^2-1)\sqrt{-\frac{d}{-1+c}}\sqrt{-d^2x^4-2cd\dots}}\dots\right.}{\dots}\right.$ |
| parts | $-\frac{a}{5x^5}+b\left(-\frac{\arcsin(d\,x^2+c)}{5x^5}+\frac{2d\left(\frac{\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3(c^2-1)x^3}-\frac{4cd\sqrt{-d^2x^4-2cd\,x^2-c^2+1}}{3(c^2-1)^2x}-\frac{d^2\sqrt{1+\frac{d\,x^2}{-1+c}}\sqrt{1+\frac{d\,x^2}{1+c}}\ \mathrm{EllipticF}\left(x\sqrt{-\dots}\right.}{3(c^2-1)\sqrt{-\frac{d}{-1+c}}\sqrt{-d^2x^4-2cd\dots}}\dots\right.}{\dots}\right.$ |

input
```
int((a+b*arcsin(d*x^2+c))/x^6,x,method=_RETURNVERBOSE)
```

output
```
-1/5*a/x^5+b*(-1/5/x^5*arcsin(d*x^2+c)+2/5*d*(1/3/(c^2-1)*(-d^2*x^4-2*c*d*
x^2-c^2+1)^(1/2)/x^3-4/3*c*d/(c^2-1)^2*(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/x-
1/3*d^2/(c^2-1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)*x^2)^(1/2)*(1+d*x^2/(1+c))^(
1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)*EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*
c/(1+c))^(1/2))+8/3*c*d^3/(c^2-1)^2*(-c^2+1)/(-d/(-1+c))^(1/2)*(1+d/(-1+c)
*x^2)^(1/2)*(1+d*x^2/(1+c))^(1/2)/(-d^2*x^4-2*c*d*x^2-c^2+1)^(1/2)/(-2*c*d
+2*d)*(EllipticF(x*(-d/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2))-EllipticE(x*(-d
/(-1+c))^(1/2),(-1+2*c/(1+c))^(1/2)))))
```

## 3.398.5 Fricas [F]

$$\int \frac{a+b\arcsin(c+dx^2)}{x^6}\,dx=\int \frac{b\arcsin(dx^2+c)+a}{x^6}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^6,x, algorithm="fricas")
```

output
```
integral((b*arcsin(d*x^2 + c) + a)/x^6, x)
```

### 3.398.6 Sympy [F]

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^6}\,dx=\int \frac{a+b\,\mathrm{asin}\left(c+dx^2\right)}{x^6}\,dx$$

input
```
integrate((a+b*asin(d*x**2+c))/x**6,x)
```

output
```
Integral((a + b*asin(c + d*x**2))/x**6, x)
```

### 3.398.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^6}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^6,x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume(c-1>0)', see `assume?` for more
details)Is
```

### 3.398.8 Giac [F]

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^6}\,dx=\int \frac{b\arcsin\left(dx^2+c\right)+a}{x^6}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+c))/x^6,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + c) + a)/x^6, x)
```

### 3.398.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(c+dx^2\right)}{x^6}\,dx=\int \frac{a+b\,\mathrm{asin}(d\,x^2+c)}{x^6}\,dx$$

input
```
int((a + b*asin(c + d*x^2))/x^6,x)
```

output
```
int((a + b*asin(c + d*x^2))/x^6, x)
```

# 3.399 $\int x^3 \arcsin(a+bx^4)\,dx$



## 3.399.1 Optimal result

Integrand size = 12, antiderivative size = 47

$$\int x^3 \arcsin(a+bx^4)\,dx = \frac{\sqrt{1-(a+bx^4)^2}}{4b} + \frac{(a+bx^4)\arcsin(a+bx^4)}{4b}$$

output
```
1/4*(b*x^4+a)*arcsin(b*x^4+a)/b+1/4*(1-(b*x^4+a)^2)^(1/2)/b
```

## 3.399.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.87

$$\int x^3 \arcsin(a+bx^4)\,dx = \frac{\sqrt{1-(a+bx^4)^2} + (a+bx^4)\arcsin(a+bx^4)}{4b}$$

input
```
Integrate[x^3*ArcSin[a + b*x^4],x]
```

output
```
(Sqrt[1 - (a + b*x^4)^2] + (a + b*x^4)*ArcSin[a + b*x^4])/(4*b)
```

### 3.399.3 Rubi [A] (warning: unable to verify)

Time = 0.25 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.74, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {7266, 5302, 5130, 241}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3 \arcsin\left(a+bx^4\right)\,dx$$

$$\Big\downarrow \text{ 7266}$$

$$\frac{1}{4}\int \arcsin\left(bx^4+a\right)dx^4$$

$$\Big\downarrow \text{ 5302}$$

$$\frac{\int \arcsin\left(bx^4+a\right)d\left(bx^4+a\right)}{4b}$$

$$\Big\downarrow \text{ 5130}$$

$$\frac{\left(a+bx^4\right)\arcsin\left(a+bx^4\right)-\int \frac{bx^4+a}{\sqrt{1-x^8}}d\left(bx^4+a\right)}{4b}$$

$$\Big\downarrow \text{ 241}$$

$$\frac{\left(a+bx^4\right)\arcsin\left(a+bx^4\right)+\sqrt{1-x^8}}{4b}$$

input
```
Int[x^3*ArcSin[a + b*x^4],x]
```

output
```
(Sqrt[1 - x^8] + (a + b*x^4)*ArcSin[a + b*x^4])/(4*b)
```

#### 3.399.3.1 Defintions of rubi rules used

rule 241
```
Int[(x_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(a + b*x^2)^(p + 1)/
(2*b*(p + 1)), x] /; FreeQ[{a, b, p}, x] && NeQ[p, -1]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

rule 7266
```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Simp[1/(m + 1)   Subst[Int[SubstFor[x^(m
+ 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && Function
OfQ[x^(m + 1), u, x]
```

### 3.399.4 Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.81

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{(b\,x^{4}+a)\arcsin(b\,x^{4}+a)+\sqrt{1-(b\,x^{4}+a)^{2}}}{4b}$ | 38 |
| default | $\frac{(b\,x^{4}+a)\arcsin(b\,x^{4}+a)+\sqrt{1-(b\,x^{4}+a)^{2}}}{4b}$ | 38 |

input
```
int(x^3*arcsin(b*x^4+a),x,method=_RETURNVERBOSE)
```

output
```
1/4/b*((b*x^4+a)*arcsin(b*x^4+a)+(1-(b*x^4+a)^2)^(1/2))
```

### 3.399.5 Fricas [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 46, normalized size of antiderivative = 0.98

$$\int x^3 \arcsin\left(a+bx^4\right)\,dx = \frac{(bx^4+a)\arcsin\left(bx^4+a\right)+\sqrt{-b^2x^8-2\,abx^4-a^2+1}}{4\,b}$$

input
```
integrate(x^3*arcsin(b*x^4+a),x, algorithm="fricas")
```

output
```
1/4*((b*x^4 + a)*arcsin(b*x^4 + a) + sqrt(-b^2*x^8 - 2*a*b*x^4 - a^2 + 1))
/b
```

### 3.399.6 Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.30

$$\int x^3 \arcsin(a+bx^4)\,dx = \begin{cases} \frac{a\,\mathrm{asin}\,(a+bx^4)}{4b} + \frac{x^4\,\mathrm{asin}\,(a+bx^4)}{4} + \frac{\sqrt{-a^2-2abx^4-b^2x^8+1}}{4b} & \text{for } b \neq 0 \\ \frac{x^4\,\mathrm{asin}\,(a)}{4} & \text{otherwise} \end{cases}$$

input
```
integrate(x**3*asin(b*x**4+a),x)
```

output
```
Piecewise((a*asin(a + b*x**4)/(4*b) + x**4*asin(a + b*x**4)/4 + sqrt(-a**2
 - 2*a*b*x**4 - b**2*x**8 + 1)/(4*b), Ne(b, 0)), (x**4*asin(a)/4, True))
```

### 3.399.7 Maxima [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.79

$$\int x^3 \arcsin(a+bx^4)\,dx = \frac{(bx^4+a)\arcsin(bx^4+a) + \sqrt{-(bx^4+a)^2+1}}{4\,b}$$

input
```
integrate(x^3*arcsin(b*x^4+a),x, algorithm="maxima")
```

output
```
1/4*((b*x^4 + a)*arcsin(b*x^4 + a) + sqrt(-(b*x^4 + a)^2 + 1))/b
```

### 3.399.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.79

$$\int x^3 \arcsin(a+bx^4)\,dx = \frac{(bx^4+a)\arcsin(bx^4+a) + \sqrt{-(bx^4+a)^2+1}}{4\,b}$$

input
```
integrate(x^3*arcsin(b*x^4+a),x, algorithm="giac")
```

output
```
1/4*((b*x^4 + a)*arcsin(b*x^4 + a) + sqrt(-(b*x^4 + a)^2 + 1))/b
```

### 3.399.9 Mupad [B] (verification not implemented)

Time = 0.77 (sec) , antiderivative size = 99, normalized size of antiderivative = 2.11

$$\int x^3 \arcsin\left(a+bx^4\right)\,dx = \frac{x^4\,\mathrm{asin}(b\,x^4+a)}{4}+\frac{\sqrt{-a^2-2\,a\,b\,x^4-b^2\,x^8+1}}{4\,b}+\frac{a\,\ln\left(\sqrt{-a^2-2\,a\,b\,x^4-b^2\,x^8+1}-\frac{b^2\,x^4+a\,b}{\sqrt{-b^2}}\right)}{4\,\sqrt{-b^2}}$$

input
```
int(x^3*asin(a + b*x^4),x)
```

output
```
(x^4*asin(a + b*x^4))/4 + (1 - b^2*x^8 - 2*a*b*x^4 - a^2)^(1/2)/(4*b) + (a
*log((1 - b^2*x^8 - 2*a*b*x^4 - a^2)^(1/2) - (a*b + b^2*x^4)/(-b^2)^(1/2))
)/(4*(-b^2)^(1/2))
```

# 3.400 $\int x^{-1+n} \arcsin(a+bx^n)\, dx$



## 3.400.1 Optimal result

Integrand size = 14, antiderivative size = 47

$$\int x^{-1+n} \arcsin(a+bx^n)\, dx = \frac{\sqrt{1-(a+bx^n)^2}}{bn} + \frac{(a+bx^n)\arcsin(a+bx^n)}{bn}$$

output
```
(a+b*x^n)*arcsin(a+b*x^n)/b/n+(1-(a+b*x^n)^2)^(1/2)/b/n
```

## 3.400.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

$$\int x^{-1+n} \arcsin(a+bx^n)\, dx = \frac{\sqrt{1-(a+bx^n)^2}}{bn} + \frac{(a+bx^n)\arcsin(a+bx^n)}{bn}$$

input
```
Integrate[x^(-1 + n)*ArcSin[a + b*x^n],x]
```

output
```
Sqrt[1 - (a + b*x^n)^2]/(b*n) + ((a + b*x^n)*ArcSin[a + b*x^n])/(b*n)
```

### 3.400.3 Rubi [A] (warning: unable to verify)

Time = 0.29 (sec) , antiderivative size = 37, normalized size of antiderivative = 0.79, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {7266, 5302, 5130, 241}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^{n-1} \arcsin(a+bx^n)\, dx$$

$$\Big\downarrow \text{7266}$$

$$\frac{\int \arcsin(bx^n+a)\, dx^n}{n}$$

$$\Big\downarrow \text{5302}$$

$$\frac{\int \arcsin(bx^n+a)\, d(bx^n+a)}{bn}$$

$$\Big\downarrow \text{5130}$$

$$\frac{(a+bx^n)\arcsin(a+bx^n) - \int \frac{bx^n+a}{\sqrt{1-x^{2n}}} d(bx^n+a)}{bn}$$

$$\Big\downarrow \text{241}$$

$$\frac{(a+bx^n)\arcsin(a+bx^n) + \sqrt{1-x^{2n}}}{bn}$$

input
```
Int[x^(-1 + n)*ArcSin[a + b*x^n],x]
```

output
```
(Sqrt[1 - x^(2*n)] + (a + b*x^n)*ArcSin[a + b*x^n])/(b*n)
```

#### 3.400.3.1 Defintions of rubi rules used

rule 241
```
Int[(x_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(a + b*x^2)^(p + 1)/
(2*b*(p + 1)), x] /; FreeQ[{a, b, p}, x] && NeQ[p, -1]
```

rule 5130
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a + b*Ar
cSin[c*x])^n, x] - Simp[b*c*n   Int[x*((a + b*ArcSin[c*x])^(n - 1)/Sqrt[1 -
 c^2*x^2]), x], x] /; FreeQ[{a, b, c}, x] && GtQ[n, 0]
```

rule 5302
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)]*(b_.))^(n_.), x_Symbol] :> Simp[1/d
  Subst[Int[(a + b*ArcSin[x])^n, x], x, c + d*x], x] /; FreeQ[{a, b, c, d,
n}, x]
```

rule 7266
```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Simp[1/(m + 1)   Subst[Int[SubstFor[x^(m
+ 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && Function
OfQ[x^(m + 1), u, x]
```

### 3.400.4 Maple [F]

$$\int x^{n-1} \arcsin\left(a + b\, x^{n}\right) dx$$

input
```
int(x^(n-1)*arcsin(a+b*x^n),x)
```

output
```
int(x^(n-1)*arcsin(a+b*x^n),x)
```

### 3.400.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.21

$$\int x^{-1+n} \arcsin\left(a + bx^{n}\right)\, dx = \frac{bx^{n} \arcsin\left(bx^{n} + a\right) + a \arcsin\left(bx^{n} + a\right) + \sqrt{-b^{2}x^{2\,n} - 2\,abx^{n} - a^{2} + 1}}{bn}$$

input
```
integrate(x^(-1+n)*arcsin(a+b*x^n),x, algorithm="fricas")
```

output
```
(b*x^n*arcsin(b*x^n + a) + a*arcsin(b*x^n + a) + sqrt(-b^2*x^(2*n) - 2*a*b
*x^n - a^2 + 1))/(b*n)
```

### 3.400.6 Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 80 vs. $2(34) = 68$.

Time = 12.94 (sec) , antiderivative size = 80, normalized size of antiderivative = 1.70

$$\int x^{-1+n}\arcsin\left(a+bx^n\right)\,dx = \begin{cases} \log\left(x\right)\operatorname{asin}\left(a\right) & \text{for } b=0\wedge n=0\\ \frac{xx^{n-1}\operatorname{asin}\left(a\right)}{n} & \text{for } b=0\\ \log\left(x\right)\operatorname{asin}\left(a+b\right) & \text{for } n=0\\ \frac{a\operatorname{asin}\left(a+bx^n\right)}{bn}+\frac{x^n\operatorname{asin}\left(a+bx^n\right)}{n}+\frac{\sqrt{-a^2-2abx^n-b^2x^{2n}+1}}{bn} & \text{otherwise} \end{cases}$$

input
```
integrate(x**(-1+n)*asin(a+b*x**n),x)
```

output
```
Piecewise((log(x)*asin(a), Eq(b, 0) & Eq(n, 0)), (x*x**(n - 1)*asin(a)/n,
Eq(b, 0)), (log(x)*asin(a + b), Eq(n, 0)), (a*asin(a + b*x**n)/(b*n) + x**
n*asin(a + b*x**n)/n + sqrt(-a**2 - 2*a*b*x**n - b**2*x**(2*n) + 1)/(b*n),
 True))
```

### 3.400.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.83

$$\int x^{-1+n}\arcsin\left(a+bx^n\right)\,dx = \frac{\left(bx^n+a\right)\arcsin\left(bx^n+a\right)+\sqrt{-\left(bx^n+a\right)^2+1}}{bn}$$

input
```
integrate(x^(-1+n)*arcsin(a+b*x^n),x, algorithm="maxima")
```

output
```
((b*x^n + a)*arcsin(b*x^n + a) + sqrt(-(b*x^n + a)^2 + 1))/(b*n)
```

### 3.400.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.83

$$\int x^{-1+n}\arcsin\left(a+bx^n\right)\,dx=\frac{(bx^n+a)\arcsin\left(bx^n+a\right)+\sqrt{-(bx^n+a)^2+1}}{bn}$$

input
```
integrate(x^(-1+n)*arcsin(a+b*x^n),x, algorithm="giac")
```

output
```
((b*x^n + a)*arcsin(b*x^n + a) + sqrt(-(b*x^n + a)^2 + 1))/(b*n)
```

### 3.400.9 Mupad [B] (verification not implemented)

Time = 0.38 (sec) , antiderivative size = 109, normalized size of antiderivative = 2.32

$$\int x^{-1+n}\arcsin\left(a+bx^n\right)\,dx=\frac{x^n\,\mathrm{asin}(a+b\,x^n)}{n}+\frac{\sqrt{1-b^2\,x^{2\,n}-2\,a\,b\,x^n-a^2}}{b\,n}+\frac{a\,\ln\left(\sqrt{1-b^2\,x^{2\,n}-2\,a\,b\,x^n-a^2}-\frac{a\,b+b^2\,x^n}{\sqrt{-b^2}}\right)}{n\,\sqrt{-b^2}}$$

input
```
int(x^(n - 1)*asin(a + b*x^n),x)
```

output
```
(x^n*asin(a + b*x^n))/n + (1 - b^2*x^(2*n) - 2*a*b*x^n - a^2)^(1/2)/(b*n)
+ (a*log((1 - b^2*x^(2*n) - 2*a*b*x^n - a^2)^(1/2) - (a*b + b^2*x^n)/(-b^2
)^(1/2)))/(n*(-b^2)^(1/2))
```

# 3.401 $\int (a+b\arcsin(1+dx^2))^4\,dx$



## 3.401.1 Optimal result

Integrand size = 14, antiderivative size = 127

$$\int (a+b\arcsin(1+dx^2))^4\,dx=384b^4x-\frac{192b^3\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx}-48b^2x(a+b\arcsin(1+dx^2))^2+\frac{8b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^3}{dx}+x(a+b\arcsin(1+dx^2))^4$$

output
```
384*b^4*x-48*b^2*x*(a+b*arcsin(d*x^2+1))^2+x*(a+b*arcsin(d*x^2+1))^4-192*b
^3*(a+b*arcsin(d*x^2+1))*(-d^2*x^4-2*d*x^2)^(1/2)/d/x+8*b*(a+b*arcsin(d*x^
2+1))^3*(-d^2*x^4-2*d*x^2)^(1/2)/d/x
```

## 3.401.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.97

$$\int (a+b\arcsin(1+dx^2))^4\,dx=\frac{8b\sqrt{-dx^2(2+dx^2)}(a+b\arcsin(1+dx^2))^3}{dx}+x(a+b\arcsin(1+dx^2))^4-48b^2\left(-8b^2x+\frac{4b\sqrt{-dx^2(2+dx^2)}(a+b\arcsin(1+dx^2))}{dx}+x(a+b\arcsin(1+dx^2))^2\right)$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^4,x]
```

output
```
(8*b*Sqrt[-(d*x^2*(2 + d*x^2))]*(a + b*ArcSin[1 + d*x^2])^3)/(d*x) + x*(a
+ b*ArcSin[1 + d*x^2])^4 - 48*b^2*(-8*b^2*x + (4*b*Sqrt[-(d*x^2*(2 + d*x^2
))]*(a + b*ArcSin[1 + d*x^2]))/(d*x) + x*(a + b*ArcSin[1 + d*x^2])^2)
```

## 3.401.3 Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {5313, 5313, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a+b \arcsin \left(dx^2+1\right)\right)^4 dx$$

$$\Big\downarrow \text{5313}$$

$$-48b^2 \int \left(a+b \arcsin \left(dx^2+1\right)\right)^2 dx+\frac{8b\sqrt{-d^2x^4-2dx^2}\left(a+b \arcsin \left(dx^2+1\right)\right)^3}{dx}+x\left(a+b \arcsin \left(dx^2+1\right)\right)^4$$

$$\Big\downarrow \text{5313}$$

$$-48b^2 \left(-8b^2 \int 1dx+\frac{4b\sqrt{-d^2x^4-2dx^2}\left(a+b \arcsin \left(dx^2+1\right)\right)}{dx}+x\left(a+b \arcsin \left(dx^2+1\right)\right)^2\right)+\frac{8b\sqrt{-d^2x^4-2dx^2}\left(a+b \arcsin \left(dx^2+1\right)\right)^3}{dx}+x\left(a+b \arcsin \left(dx^2+1\right)\right)^4$$

$$\Big\downarrow \text{24}$$

$$-48b^2 \left(\frac{4b\sqrt{-d^2x^4-2dx^2}\left(a+b \arcsin \left(dx^2+1\right)\right)}{dx}+x\left(a+b \arcsin \left(dx^2+1\right)\right)^2-8b^2x\right)+\frac{8b\sqrt{-d^2x^4-2dx^2}\left(a+b \arcsin \left(dx^2+1\right)\right)^3}{dx}+x\left(a+b \arcsin \left(dx^2+1\right)\right)^4$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^4,x]
```

output
```
(8*b*Sqrt[-2*d*x^2 - d^2*x^4]*(a + b*ArcSin[1 + d*x^2])^3)/(d*x) + x*(a +
b*ArcSin[1 + d*x^2])^4 - 48*b^2*(-8*b^2*x + (4*b*Sqrt[-2*d*x^2 - d^2*x^4]*
(a + b*ArcSin[1 + d*x^2]))/(d*x) + x*(a + b*ArcSin[1 + d*x^2])^2)
```

### 3.401.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

## 3.401.4 Maple [F]

$$\int \left(a+b \arcsin \left(d \,x^{2}+1\right)\right)^{4}d x$$

input
```
int((a+b*arcsin(d*x^2+1))^4,x)
```

output
```
int((a+b*arcsin(d*x^2+1))^4,x)
```

## 3.401.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.63

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^4\,dx$$
$$=\frac{b^4dx^2\arcsin\left(dx^2+1\right)^4+4\,ab^3dx^2\arcsin\left(dx^2+1\right)^3+6\,(a^2b^2-8\,b^4)dx^2\arcsin\left(dx^2+1\right)^2+4\,(a^3b-24\,ab$$

input
```
integrate((a+b*arcsin(d*x^2+1))^4,x, algorithm="fricas")
```

output
```
(b^4*d*x^2*arcsin(d*x^2 + 1)^4 + 4*a*b^3*d*x^2*arcsin(d*x^2 + 1)^3 + 6*(a^
2*b^2 - 8*b^4)*d*x^2*arcsin(d*x^2 + 1)^2 + 4*(a^3*b - 24*a*b^3)*d*x^2*arcs
in(d*x^2 + 1) + (a^4 - 48*a^2*b^2 + 384*b^4)*d*x^2 + 8*(b^4*arcsin(d*x^2 +
 1)^3 + 3*a*b^3*arcsin(d*x^2 + 1)^2 + a^3*b - 24*a*b^3 + 3*(a^2*b^2 - 8*b^
4)*arcsin(d*x^2 + 1))*sqrt(-d^2*x^4 - 2*d*x^2))/(d*x)
```

### 3.401.6 Sympy [F]

$$\int (a+b\arcsin(1+dx^2))^4\,dx = \int (a+b\operatorname{asin}(dx^2+1))^4\,dx$$

input
```
integrate((a+b*asin(d*x**2+1))**4,x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**4, x)
```

### 3.401.7 Maxima [F(-2)]

Exception generated.

$$\int (a+b\arcsin(1+dx^2))^4\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^4,x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.401.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 664 vs. $2(123) = 246$.

Time = 1.03 (sec) , antiderivative size = 664, normalized size of antiderivative = 5.23

$$\int \left(a + b \arcsin\left(1 + dx^2\right)\right)^4 \, dx$$

$$= 4 \left( x \arcsin\left(dx^2 + 1\right) - \frac{2\sqrt{2}\sqrt{-d}\,\mathrm{sgn}(x)}{d} + \frac{2\sqrt{-d^2x^2 - 2d}}{d\,\mathrm{sgn}(x)} \right) a^3 b$$

$$+6 \left( x \arcsin\left(dx^2 + 1\right)^2 - \frac{2\left(\sqrt{2}\pi\sqrt{-d}|d| + 4\sqrt{2}\sqrt{-d}d\right)\mathrm{sgn}(x)}{d|d|} + \frac{4\left(\sqrt{-d^2x^2 - 2d}\arcsin\left(dx^2 + 1\right) + \right.}{d\,\mathrm{sgn}(x)} \right.$$

$$+2 \left( 2x \arcsin\left(dx^2 + 1\right)^3 - \frac{3\left(\sqrt{2}\pi^2\sqrt{-d}d - 8\sqrt{2}\pi\sqrt{-d}|d| - 32\sqrt{2}\sqrt{-d}d\right)\mathrm{sgn}(x)}{d^2} + \frac{12\left(\sqrt{-d^2x^2 - 2\right.}{} \right.$$

$$+ \left( x \arcsin\left(dx^2 + 1\right)^4 - \frac{\left(\sqrt{2}\pi^3\sqrt{-d}|d| + 12\sqrt{2}\pi^2\sqrt{-d}d - 96\sqrt{2}\pi\sqrt{-d}|d| - 384\sqrt{2}\sqrt{-d}d\right)\mathrm{sgn}(x)}{d|d|} + \frac{4}{} \right.$$

$$+ a^4 x$$

input
```
integrate((a+b*arcsin(d*x^2+1))^4,x, algorithm="giac")
```

3.401. $\int \left(a + b \arcsin\left(1 + dx^2\right)\right)^4 \, dx$

output
```
4*(x*arcsin(d*x^2 + 1) - 2*sqrt(2)*sqrt(-d)*sgn(x)/d + 2*sqrt(-d^2*x^2 - 2
*d)/(d*sgn(x)))*a^3*b + 6*(x*arcsin(d*x^2 + 1)^2 - 2*(sqrt(2)*pi*sqrt(-d)*
abs(d) + 4*sqrt(2)*sqrt(-d)*d)*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 - 2*d)
*arcsin(d*x^2 + 1) + 2*(sqrt(2)*sqrt(-d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn
(x)))*a^2*b^2 + 2*(2*x*arcsin(d*x^2 + 1)^3 - 3*(sqrt(2)*pi^2*sqrt(-d)*d -
8*sqrt(2)*pi*sqrt(-d)*abs(d) - 32*sqrt(2)*sqrt(-d)*d)*sgn(x)/d^2 + 12*(sqr
t(-d^2*x^2 - 2*d)*arcsin(d*x^2 + 1)^2 - 2*(2*sqrt(d^2*x^2)*arcsin((d^2*x^2
 + d)/d) - 4*(sqrt(2)*sqrt(-d) - sqrt(-d^2*x^2 - 2*d))*d/abs(d) + (sqrt(2)
*pi*sqrt(-d)*abs(d) + 4*sqrt(2)*sqrt(-d)*d)/abs(d))*d/abs(d))/(d*sgn(x)))*
a*b^3 + (x*arcsin(d*x^2 + 1)^4 - (sqrt(2)*pi^3*sqrt(-d)*abs(d) + 12*sqrt(2
)*pi^2*sqrt(-d)*d - 96*sqrt(2)*pi*sqrt(-d)*abs(d) - 384*sqrt(2)*sqrt(-d)*d
)*sgn(x)/(d*abs(d)) + 4*(2*sqrt(-d^2*x^2 - 2*d)*arcsin(d*x^2 + 1)^3 - 3*(4
*sqrt(d^2*x^2)*arcsin((d^2*x^2 + d)/d)^2 + 8*(2*sqrt(-d^2*x^2 - 2*d)*arcsi
n((d^2*x^2 + d)/d) + 4*(sqrt(2)*sqrt(-d) - sqrt(d^2*x^2))*d/abs(d) - (sqrt
(2)*pi*sqrt(-d)*abs(d) + 4*sqrt(2)*sqrt(-d)*d)/abs(d))*d/abs(d) - (sqrt(2)
*pi^2*sqrt(-d)*d - 8*sqrt(2)*pi*sqrt(-d)*abs(d) - 32*sqrt(2)*sqrt(-d)*d)/d
)*d/abs(d))/(d*sgn(x)))*b^4 + a^4*x
```

## 3.401.9 Mupad [F(-1)]

Timed out.

$$\int \left(a + b \arcsin\left(1 + dx^2\right)\right)^4 \, dx = \int \left(a + b\,\mathrm{asin}\left(d\,x^2 + 1\right)\right)^4 \, dx$$

input
```
int((a + b*asin(d*x^2 + 1))^4,x)
```

output
```
int((a + b*asin(d*x^2 + 1))^4, x)
```

# 3.402 $\int (a+b\arcsin(1+dx^2))^3\,dx$



## 3.402.1 Optimal result

Integrand size = 14, antiderivative size = 110

$$\int (a+b\arcsin(1+dx^2))^3\,dx = -24ab^2x - \frac{48b^3\sqrt{-2dx^2-d^2x^4}}{dx} - 24b^3x\arcsin(1+dx^2) + \frac{6b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^2}{dx} + x(a+b\arcsin(1+dx^2))^3$$

output
```
-24*a*b^2*x-24*b^3*x*arcsin(d*x^2+1)+x*(a+b*arcsin(d*x^2+1))^3-48*b^3*(-d^
2*x^4-2*d*x^2)^(1/2)/d/x+6*b*(a+b*arcsin(d*x^2+1))^2*(-d^2*x^4-2*d*x^2)^(1
/2)/d/x
```

## 3.402.2 Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.47

$$\int (a+b\arcsin(1+dx^2))^3\,dx = \frac{a(a^2-24b^2)\,dx^2+6b(a^2-8b^2)\sqrt{-dx^2(2+dx^2)}+3b\left(a^2dx^2-8b^2dx^2+4ab\sqrt{-dx^2(2+dx^2)}\right)\arcsin(}{dx}$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^3,x]
```

output
```
(a*(a^2 - 24*b^2)*d*x^2 + 6*b*(a^2 - 8*b^2)*Sqrt[-(d*x^2*(2 + d*x^2))] + 3
*b*(a^2*d*x^2 - 8*b^2*d*x^2 + 4*a*b*Sqrt[-(d*x^2*(2 + d*x^2))])*ArcSin[1 +
 d*x^2] + 3*b^2*(a*d*x^2 + 2*b*Sqrt[-(d*x^2*(2 + d*x^2))])*ArcSin[1 + d*x^
2]^2 + b^3*d*x^2*ArcSin[1 + d*x^2]^3)/(d*x)
```

### 3.402.3 Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.97, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {5313, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a+b\arcsin\left(dx^2+1\right)\right)^3\,dx$$

$$\Big\downarrow \text{ 5313}$$

$$-24b^2\int \left(a+b\arcsin\left(dx^2+1\right)\right)dx+\frac{6b\sqrt{-d^2x^4-2dx^2}\left(a+b\arcsin\left(dx^2+1\right)\right)^2}{dx}+x\left(a+b\arcsin\left(dx^2+1\right)\right)^3$$

$$\Big\downarrow \text{ 2009}$$

$$-24b^2\left(ax+bx\arcsin\left(dx^2+1\right)+\frac{2b\sqrt{-d^2x^4-2dx^2}}{dx}\right)+\frac{6b\sqrt{-d^2x^4-2dx^2}\left(a+b\arcsin\left(dx^2+1\right)\right)^2}{dx}+x\left(a+b\arcsin\left(dx^2+1\right)\right)^3$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^3,x]
```

output
```
(6*b*Sqrt[-2*d*x^2 - d^2*x^4]*(a + b*ArcSin[1 + d*x^2])^2)/(d*x) + x*(a +
b*ArcSin[1 + d*x^2])^3 - 24*b^2*(a*x + (2*b*Sqrt[-2*d*x^2 - d^2*x^4])/(d*x
) + b*x*ArcSin[1 + d*x^2])
```

### 3.402.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

## 3.402.4 Maple [F]

$$\int \left(a+b\arcsin\left(d\,x^2+1\right)\right)^3 dx$$

input
```
int((a+b*arcsin(d*x^2+1))^3,x)
```

output
```
int((a+b*arcsin(d*x^2+1))^3,x)
```

## 3.402.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.31

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^3\,dx = \frac{b^3dx^2\arcsin\left(dx^2+1\right)^3+3\,ab^2dx^2\arcsin\left(dx^2+1\right)^2+3\left(a^2b-8\,b^3\right)dx^2\arcsin\left(dx^2+1\right)+\left(a^3-24\,ab^2\right)dx}{dx}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^3,x, algorithm="fricas")
```

output
```
(b^3*d*x^2*arcsin(d*x^2 + 1)^3 + 3*a*b^2*d*x^2*arcsin(d*x^2 + 1)^2 + 3*(a^
2*b - 8*b^3)*d*x^2*arcsin(d*x^2 + 1) + (a^3 - 24*a*b^2)*d*x^2 + 6*sqrt(-d^
2*x^4 - 2*d*x^2)*(b^3*arcsin(d*x^2 + 1)^2 + 2*a*b^2*arcsin(d*x^2 + 1) + a^
2*b - 8*b^3))/(d*x)
```

### 3.402.6 Sympy [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^3\,dx=\int \left(a+b\operatorname{asin}\left(dx^2+1\right)\right)^3\,dx$$

input
```
integrate((a+b*asin(d*x**2+1))**3,x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**3, x)
```

### 3.402.7 Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^3\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^3,x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.402.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 370 vs. $2(106) = 212$.

Time = 0.68 (sec) , antiderivative size = 370, normalized size of antiderivative = 3.36

$$\int \left(a+b \arcsin \left(1+d x^2\right)\right)^3 \, dx$$
$$= 3 \left(x \arcsin \left(dx^2+1\right) - \frac{2\sqrt{2}\sqrt{-d}\mathrm{sgn}(x)}{d} + \frac{2\sqrt{-d^2x^2-2d}}{d\mathrm{sgn}\left(x\right)}\right)a^2b$$
$$+3 \left(x \arcsin \left(dx^2+1\right)^2 - \frac{2\left(\sqrt{2}\pi\sqrt{-d}|d| + 4\sqrt{2}\sqrt{-d}d\right)\mathrm{sgn}(x)}{d|d|} + \frac{4\left(\sqrt{-d^2x^2-2d}\arcsin\left(dx^2+1\right)+\right.}{d\mathrm{sgn}\left(x\right)}\right.$$
$$+\frac{1}{2}\left(2x\arcsin\left(dx^2+1\right)^3 - \frac{3\left(\sqrt{2}\pi^2\sqrt{-d}d - 8\sqrt{2}\pi\sqrt{-d}|d| - 32\sqrt{2}\sqrt{-d}d\right)\mathrm{sgn}(x)}{d^2} + \frac{12\left(\sqrt{-d^2x^2-2\right.}{}\right.$$
$$+ a^3x$$

input
```
integrate((a+b*arcsin(d*x^2+1))^3,x, algorithm="giac")
```

output
```
3*(x*arcsin(d*x^2 + 1) - 2*sqrt(2)*sqrt(-d)*sgn(x)/d + 2*sqrt(-d^2*x^2 - 2
*d)/(d*sgn(x)))*a^2*b + 3*(x*arcsin(d*x^2 + 1)^2 - 2*(sqrt(2)*pi*sqrt(-d)*
abs(d) + 4*sqrt(2)*sqrt(-d)*d)*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 - 2*d)
*arcsin(d*x^2 + 1) + 2*(sqrt(2)*sqrt(-d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn
(x)))*a*b^2 + 1/2*(2*x*arcsin(d*x^2 + 1)^3 - 3*(sqrt(2)*pi^2*sqrt(-d)*d -
8*sqrt(2)*pi*sqrt(-d)*abs(d) - 32*sqrt(2)*sqrt(-d)*d)*sgn(x)/d^2 + 12*(sqr
t(-d^2*x^2 - 2*d)*arcsin(d*x^2 + 1)^2 - 2*(2*sqrt(d^2*x^2)*arcsin((d^2*x^2
 + d)/d) - 4*(sqrt(2)*sqrt(-d) - sqrt(-d^2*x^2 - 2*d))*d/abs(d) + (sqrt(2)
*pi*sqrt(-d)*abs(d) + 4*sqrt(2)*sqrt(-d)*d)/abs(d))*d/abs(d))/(d*sgn(x)))*
b^3 + a^3*x
```

### 3.402.9 Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^3\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)^3\,dx$$

input
```
int((a + b*asin(d*x^2 + 1))^3,x)
```

output
```
int((a + b*asin(d*x^2 + 1))^3, x)
```

# 3.403 $\int (a+b\arcsin(1+dx^2))^2\,dx$



## 3.403.1 Optimal result

Integrand size = 14, antiderivative size = 63

$$\int (a+b\arcsin(1+dx^2))^2\,dx = -8b^2x+\frac{4b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx} + x(a+b\arcsin(1+dx^2))^2$$

output
```
-8*b^2*x+x*(a+b*arcsin(d*x^2+1))^2+4*b*(a+b*arcsin(d*x^2+1))*(-d^2*x^4-2*d
*x^2)^(1/2)/d/x
```

## 3.403.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00

$$\int (a+b\arcsin(1+dx^2))^2\,dx = -8b^2x+\frac{4b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))}{dx} + x(a+b\arcsin(1+dx^2))^2$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^2,x]
```

output
```
-8*b^2*x + (4*b*Sqrt[-2*d*x^2 - d^2*x^4]*(a + b*ArcSin[1 + d*x^2]))/(d*x)
+ x*(a + b*ArcSin[1 + d*x^2])^2
```

### 3.403.3 Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {5313, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(dx^2+1))^2 dx$$

$$\Big\downarrow \text{5313}$$

$$-8b^2\int 1dx+\frac{4b\sqrt{-d^2x^4-2dx^2}(a+b\arcsin(dx^2+1))}{dx}+x(a+b\arcsin(dx^2+1))^2$$

$$\Big\downarrow \text{24}$$

$$\frac{4b\sqrt{-d^2x^4-2dx^2}(a+b\arcsin(dx^2+1))}{dx}+x(a+b\arcsin(dx^2+1))^2-8b^2x$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^2,x]
```

output
```
-8*b^2*x + (4*b*Sqrt[-2*d*x^2 - d^2*x^4]*(a + b*ArcSin[1 + d*x^2]))/(d*x)
+ x*(a + b*ArcSin[1 + d*x^2])^2
```

#### 3.403.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

### 3.403.4 Maple [F]

$$\int (a+b\arcsin (d\,x^2+1))^2dx$$

input
```
int((a+b*arcsin(d*x^2+1))^2,x)
```

output
```
int((a+b*arcsin(d*x^2+1))^2,x)
```

### 3.403.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.44

$$\int (a+b\arcsin (1+dx^2))^2\,dx$$
$$=\frac{b^2dx^2\arcsin (dx^2+1)^2+2\,abdx^2\arcsin (dx^2+1)+(a^2-8\,b^2)dx^2+4\,\sqrt{-d^2x^4-2\,dx^2}(b^2\arcsin (dx^2+1}{dx}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^2,x, algorithm="fricas")
```

output
```
(b^2*d*x^2*arcsin(d*x^2 + 1)^2 + 2*a*b*d*x^2*arcsin(d*x^2 + 1) + (a^2 - 8*
b^2)*d*x^2 + 4*sqrt(-d^2*x^4 - 2*d*x^2)*(b^2*arcsin(d*x^2 + 1) + a*b))/(d*
x)
```

### 3.403.6 Sympy [F]

$$\int (a+b\arcsin (1+dx^2))^2\,dx=\int (a+b\operatorname{asin}(dx^2+1))^2\,dx$$

input
```
integrate((a+b*asin(d*x**2+1))**2,x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**2, x)
```

### 3.403.7 Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^2,x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.403.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 172 vs. 2(61) = 122.

Time = 0.42 (sec) , antiderivative size = 172, normalized size of antiderivative = 2.73

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx$$
$$=2\left(x\arcsin\left(dx^2+1\right)-\frac{2\sqrt{2}\sqrt{-d}\mathrm{sgn}(x)}{d}+\frac{2\sqrt{-d^2x^2-2d}}{d\mathrm{sgn}\left(x\right)}\right)ab$$
$$+\left(x\arcsin\left(dx^2+1\right)^2-\frac{2\left(\sqrt{2}\pi\sqrt{-d}|d|+4\sqrt{2}\sqrt{-d}d\right)\mathrm{sgn}(x)}{d|d|}+\frac{4\left(\sqrt{-d^2x^2-2d}\arcsin\left(dx^2+1\right)+\frac{2(\cdots}{\cdots}\right.}{d\mathrm{sgn}\left(x\right)}\right.$$
$$+a^2x$$

input
```
integrate((a+b*arcsin(d*x^2+1))^2,x, algorithm="giac")
```

output
```
2*(x*arcsin(d*x^2 + 1) - 2*sqrt(2)*sqrt(-d)*sgn(x)/d + 2*sqrt(-d^2*x^2 - 2
*d)/(d*sgn(x)))*a*b + (x*arcsin(d*x^2 + 1)^2 - 2*(sqrt(2)*pi*sqrt(-d)*abs(
d) + 4*sqrt(2)*sqrt(-d)*d)*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 - 2*d)*arc
sin(d*x^2 + 1) + 2*(sqrt(2)*sqrt(-d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x))
)*b^2 + a^2*x
```

### 3.403.9 Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^2\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)^2\,dx$$

input
```
int((a + b*asin(d*x^2 + 1))^2,x)
```

output
```
int((a + b*asin(d*x^2 + 1))^2, x)
```

# 3.404 $\int (a+b\arcsin(1+dx^2))\,dx$



## 3.404.1 Optimal result

Integrand size = 12, antiderivative size = 43

$$\int (a+b\arcsin(1+dx^2))\,dx = ax+\frac{2b\sqrt{-2dx^2-d^2x^4}}{dx}+bx\arcsin(1+dx^2)$$

output
```
a*x+b*x*arcsin(d*x^2+1)+2*b*(-d^2*x^4-2*d*x^2)^(1/2)/d/x
```

## 3.404.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 41, normalized size of antiderivative = 0.95

$$\int (a+b\arcsin(1+dx^2))\,dx = ax+\frac{2b\sqrt{-dx^2(2+dx^2)}}{dx}+bx\arcsin(1+dx^2)$$

input
```
Integrate[a + b*ArcSin[1 + d*x^2],x]
```

output
```
a*x + (2*b*Sqrt[-(d*x^2*(2 + d*x^2))])/(d*x) + b*x*ArcSin[1 + d*x^2]
```

## 3.404.3 Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a+b\arcsin\left(dx^2+1\right)\right)\,dx$$

$$\Big\downarrow \ 2009$$

$$ax+bx\arcsin\left(dx^2+1\right)+\frac{2b\sqrt{-d^2x^4-2dx^2}}{dx}$$

input
```
Int[a + b*ArcSin[1 + d*x^2],x]
```

output
```
a*x + (2*b*Sqrt[-2*d*x^2 - d^2*x^4])/(d*x) + b*x*ArcSin[1 + d*x^2]
```

### 3.404.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

## 3.404.4 Maple [A] (verified)

Time = 0.07 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.05

| method | result | size |
|---|---|---|
| default | $ax+b\left(x\arcsin\left(d\,x^2+1\right)-\frac{2x\left(d\,x^2+2\right)}{\sqrt{-d^2x^4-2d\,x^2}}\right)$ | 45 |
| parts | $ax+b\left(x\arcsin\left(d\,x^2+1\right)-\frac{2x\left(d\,x^2+2\right)}{\sqrt{-d^2x^4-2d\,x^2}}\right)$ | 45 |

input
```
int(a+b*arcsin(d*x^2+1),x,method=_RETURNVERBOSE)
```

output
```
a*x+b*(x*arcsin(d*x^2+1)-2/(-d^2*x^4-2*d*x^2)^(1/2)*x*(d*x^2+2))
```

### 3.404.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.12

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx=\frac{bdx^2\arcsin\left(dx^2+1\right)+adx^2+2\sqrt{-d^2x^4-2\,dx^2}b}{dx}$$

input
```
integrate(a+b*arcsin(d*x^2+1),x, algorithm="fricas")
```

output
```
(b*d*x^2*arcsin(d*x^2 + 1) + a*d*x^2 + 2*sqrt(-d^2*x^4 - 2*d*x^2)*b)/(d*x)
```

### 3.404.6 Sympy [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx=\int \left(a+b\,\mathrm{asin}\left(dx^2+1\right)\right)\,dx$$

input
```
integrate(a+b*asin(d*x**2+1),x)
```

output
```
Integral(a + b*asin(d*x**2 + 1), x)
```

### 3.404.7 Maxima [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.05

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx=\left(x\arcsin\left(dx^2+1\right)-\frac{2\left(d^{\frac{3}{2}}x^2+2\sqrt{d}\right)}{\sqrt{-dx^2-2}d}\right)b+ax$$

input
```
integrate(a+b*arcsin(d*x^2+1),x, algorithm="maxima")
```

output
```
(x*arcsin(d*x^2 + 1) - 2*(d^(3/2)*x^2 + 2*sqrt(d))/(sqrt(-d*x^2 - 2)*d))*b
 + a*x
```

### 3.404.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.28

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx$$
$$=\left(x\arcsin\left(dx^2+1\right)-\frac{2\sqrt{2}\sqrt{-d}\operatorname{sgn}(x)}{d}+\frac{2\sqrt{-d^2x^2-2d}}{d\operatorname{sgn}(x)}\right)b$$
$$+ax$$

input
```
integrate(a+b*arcsin(d*x^2+1),x, algorithm="giac")
```

output
```
(x*arcsin(d*x^2 + 1) - 2*sqrt(2)*sqrt(-d)*sgn(x)/d + 2*sqrt(-d^2*x^2 - 2*d
)/(d*sgn(x)))*b + a*x
```

### 3.404.9 Mupad [B] (verification not implemented)

Time = 0.56 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.91

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)\,dx=a\,x+b\,x\,\mathrm{asin}\left(d\,x^2+1\right)+\frac{2\,b\,\sqrt{1-{\left(d\,x^2+1\right)}^2}}{d\,x}$$

input
```
int(a + b*asin(d*x^2 + 1),x)
```

output
```
a*x + b*x*asin(d*x^2 + 1) + (2*b*(1 - (d*x^2 + 1)^2)^(1/2))/(d*x)
```

# 3.405 $\int \frac{1}{a+b \arcsin(1+dx^2)}\,dx$



## 3.405.1 Optimal result

Integrand size = 14, antiderivative size = 159

$$\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx = -\frac{x\,\text{CosIntegral}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)} - \frac{x\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

output
```
-1/2*x*Ci(1/2*(a+b*arcsin(d*x^2+1))/b)*(cos(1/2*a/b)-sin(1/2*a/b))/b/(cos(
1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))-1/2*x*Si(1/2*(a+b*arcsin(d*
x^2+1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))/b/(cos(1/2*arcsin(d*x^2+1))-sin(1/2
*arcsin(d*x^2+1)))
```

## 3.405.2 Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.75

$$\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx = -\frac{x\left(\text{CosIntegral}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin(1+dx^2)\right)\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin\left(\right.\right.\right.\right.}{2b\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^(-1),x]
```

output
```
-1/2*(x*(CosIntegral[(a/b + ArcSin[1 + d*x^2])/2]*(Cos[a/(2*b)] - Sin[a/(2
*b)]) + (Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[(a/b + ArcSin[1 + d*x^2]
)/2]))/(b*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

## 3.405.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {5315}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{a+b\arcsin\left(dx^2+1\right)}dx$$

$$\Big\downarrow \ 5315$$

$$-\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(\frac{a+b\arcsin\left(dx^2+1\right)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)}-\frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin\left(dx^2+1\right)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)}$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^(-1),x]
```

output
```
-1/2*(x*CosIntegral[(a + b*ArcSin[1 + d*x^2])/(2*b)]*(Cos[a/(2*b)] - Sin[a
/(2*b)]))/(b*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) - (x*(
Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[(a + b*ArcSin[1 + d*x^2])/(2*b)])
/(2*b*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

### 3.405.3.1 Defintions of rubi rules used

rule 5315
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-1), x_Symbol] :> Simp[(-x
)*(c*Cos[a/(2*b)] - Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c +
d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x]
 - Simp[x*(c*Cos[a/(2*b)] + Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Arc
Sin[c + d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2
]))), x] /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

### 3.405.4 Maple [F]

$$\int \frac{1}{a+b\arcsin\left(d\,x^{2}+1\right)}dx$$

input
```
int(1/(a+b*arcsin(d*x^2+1)),x)
```

output
```
int(1/(a+b*arcsin(d*x^2+1)),x)
```

### 3.405.5 Fricas [F]

$$\int \frac{1}{a+b\arcsin\left(1+dx^{2}\right)}\,dx = \int \frac{1}{b\arcsin\left(dx^{2}+1\right)+a}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1)),x, algorithm="fricas")
```

output
```
integral(1/(b*arcsin(d*x^2 + 1) + a), x)
```

### 3.405.6 Sympy [F]

$$\int \frac{1}{a+b\arcsin\left(1+dx^{2}\right)}\,dx = \int \frac{1}{a+b\,\mathrm{asin}\left(dx^{2}+1\right)}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2+1)),x)
```

output
```
Integral(1/(a + b*asin(d*x**2 + 1)), x)
```

### 3.405.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1)),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.405.8 Giac [F]

$$\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx = \int \frac{1}{b\arcsin(dx^2+1)+a}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1)),x, algorithm="giac")
```

output
```
integrate(1/(b*arcsin(d*x^2 + 1) + a), x)
```

### 3.405.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a+b\arcsin(1+dx^2)}\,dx = \int \frac{1}{a+b\,\mathrm{asin}(d\,x^2+1)}\,dx$$

input
```
int(1/(a + b*asin(d*x^2 + 1)),x)
```

output
```
int(1/(a + b*asin(d*x^2 + 1)), x)
```

# 3.406 $\int \frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx$



## 3.406.1 Optimal result

Integrand size = 14, antiderivative size = 205

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx = -\frac{\sqrt{-2dx^2-d^2x^4}}{2bdx(a+b\arcsin(1+dx^2))} - \frac{x\,\text{CosIntegral}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)} + \frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin(1+dx^2)}{2b}\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

output
```
1/4*x*Si(1/2*(a+b*arcsin(d*x^2+1))/b)*(cos(1/2*a/b)-sin(1/2*a/b))/b^2/(cos
(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))-1/4*x*Ci(1/2*(a+b*arcsin(d
*x^2+1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))/b^2/(cos(1/2*arcsin(d*x^2+1))-sin(
1/2*arcsin(d*x^2+1)))-1/2*(-d^2*x^4-2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2
+1))
```

### 3.406.2 Mathematica [A] (verified)

Time = 1.16 (sec) , antiderivative size = 164, normalized size of antiderivative = 0.80

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx = -\frac{\frac{2b\sqrt{-dx^2(2+dx^2)}}{d(a+b\arcsin(1+dx^2))} + \frac{x^2\left(\text{CosIntegral}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin(1+dx^2)\right)\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)+\left(-\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin(1+dx^2)\right)\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}}{4b^2x}$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^(-2),x]
```

output
```
-1/4*((2*b*Sqrt[-(d*x^2*(2 + d*x^2))])/(d*(a + b*ArcSin[1 + d*x^2])) + (x^
2*(CosIntegral[(a/b + ArcSin[1 + d*x^2])/2]*(Cos[a/(2*b)] + Sin[a/(2*b)])
+ (-Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[(a/b + ArcSin[1 + d*x^2])/2])
)/(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))/(b^2*x)
```

### 3.406.3 Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {5324}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(dx^2+1))^2}\,dx$$

$$\Big\downarrow \; 5324$$

$$-\frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(\frac{a+b\arcsin(dx^2+1)}{2b}\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}+\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin(dx^2+1)}{2b}\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}-\frac{\sqrt{-d^2x^4-2dx^2}}{2bdx\,(a+b\arcsin(dx^2+1))}$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^(-2),x]
```

output
```
-1/2*Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*(a + b*ArcSin[1 + d*x^2])) - (x*CosIn
tegral[(a + b*ArcSin[1 + d*x^2])/(2*b)]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(4*
b^2*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) + (x*(Cos[a/(2*
b)] - Sin[a/(2*b)])*SinIntegral[(a + b*ArcSin[1 + d*x^2])/(2*b)])/(4*b^2*(
Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

### 3.406.3.1 Defintions of rubi rules used

rule 5324
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-2), x_Symbol] :> Simp[-Sq
rt[-2*c*d*x^2 - d^2*x^4]/(2*b*d*x*(a + b*ArcSin[c + d*x^2])), x] + (-Simp[x
*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c + d
*x^2])]/(4*b^2*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x
] + Simp[x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Ar
cSin[c + d*x^2])]/(4*b^2*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2
]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

## 3.406.4 Maple [F]

$$\int \frac{1}{\left(a+b\arcsin\left(d\,x^{2}+1\right)\right)^{2}}dx$$

input
```
int(1/(a+b*arcsin(d*x^2+1))^2,x)
```

output
```
int(1/(a+b*arcsin(d*x^2+1))^2,x)
```

## 3.406.5 Fricas [F]

$$\int \frac{1}{\left(a+b\arcsin\left(1+dx^{2}\right)\right)^{2}}\,dx=\int \frac{1}{\left(b\arcsin\left(dx^{2}+1\right)+a\right)^{2}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^2,x, algorithm="fricas")
```

output
```
integral(1/(b^2*arcsin(d*x^2 + 1)^2 + 2*a*b*arcsin(d*x^2 + 1) + a^2), x)
```

### 3.406.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}\,(dx^2+1))^2}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2+1))**2,x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**(-2), x)
```

### 3.406.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^2,x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.406.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx = \int \frac{1}{(b\arcsin(dx^2+1)+a)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + 1) + a)^(-2), x)
```

### 3.406.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^2}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}\,(d\,x^2+1))^2}\,dx$$

input
```
int(1/(a + b*asin(d*x^2 + 1))^2,x)
```

output
```
int(1/(a + b*asin(d*x^2 + 1))^2, x)
```

# 3.407 $\int \frac{1}{\left(a+b \arcsin \left(1+d x^2\right)\right)^3} dx$



## 3.407.1 Optimal result

Integrand size = 14, antiderivative size = 227

$$\int \frac{1}{\left(a+b \arcsin \left(1+d x^2\right)\right)^3} dx = -\frac{\sqrt{-2 d x^2-d^2 x^4}}{4 b d x \left(a+b \arcsin \left(1+d x^2\right)\right)^2} + \frac{x}{8 b^2 \left(a+b \arcsin \left(1+d x^2\right)\right)} + \frac{x \operatorname{CosIntegral}\left(\frac{a+b \arcsin(1+d x^2)}{2 b}\right) \left(\cos \left(\frac{a}{2 b}\right)-\sin \left(\frac{a}{2 b}\right)\right)}{16 b^3 \left(\cos \left(\frac{1}{2} \arcsin \left(1+d x^2\right)\right)-\sin \left(\frac{1}{2} \arcsin \left(1+d x^2\right)\right)\right)} + \frac{x \left(\cos \left(\frac{a}{2 b}\right)+\sin \left(\frac{a}{2 b}\right)\right) \operatorname{Si}\left(\frac{a+b \arcsin(1+d x^2)}{2 b}\right)}{16 b^3 \left(\cos \left(\frac{1}{2} \arcsin \left(1+d x^2\right)\right)-\sin \left(\frac{1}{2} \arcsin \left(1+d x^2\right)\right)\right)}$$

output
```
1/8*x/b^2/(a+b*arcsin(d*x^2+1))+1/16*x*Ci(1/2*(a+b*arcsin(d*x^2+1))/b)*(co
s(1/2*a/b)-sin(1/2*a/b))/b^3/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^
2+1)))+1/16*x*Si(1/2*(a+b*arcsin(d*x^2+1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))/
b^3/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))-1/4*(-d^2*x^4-2*d*
x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2+1))^2
```

### 3.407.2 Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.82

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^3}\,dx$$
$$= -\frac{\sqrt{-dx^2(2+dx^2)}}{4bdx(a+b\arcsin(1+dx^2))^2} + \frac{x}{8b^2(a+b\arcsin(1+dx^2))}$$
$$+ \frac{x\left(\text{CosIntegral}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin(1+dx^2)\right)\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{1}{2}\left(\frac{a}{b}+\arcsin(\right.\right.\right.}{16b^3\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^(-3),x]
```

output
```
-1/4*Sqrt[-(d*x^2*(2 + d*x^2))]/(b*d*x*(a + b*ArcSin[1 + d*x^2])^2) + x/(8
*b^2*(a + b*ArcSin[1 + d*x^2])) + (x*(CosIntegral[(a/b + ArcSin[1 + d*x^2]
)/2]*(Cos[a/(2*b)] - Sin[a/(2*b)]) + (Cos[a/(2*b)] + Sin[a/(2*b)])*SinInte
gral[(a/b + ArcSin[1 + d*x^2])/2]))/(16*b^3*(Cos[ArcSin[1 + d*x^2]/2] - Si
n[ArcSin[1 + d*x^2]/2]))
```

### 3.407.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.04, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {5327, 5315}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(dx^2+1))^3}\,dx$$
$$\Big\downarrow \text{ 5327}$$
$$-\frac{\int \frac{1}{a+b\arcsin(dx^2+1)}dx}{8b^2} + \frac{x}{8b^2(a+b\arcsin(dx^2+1))} - \frac{\sqrt{-d^2x^4-2dx^2}}{4bdx(a+b\arcsin(dx^2+1))^2}$$
$$\Big\downarrow \text{ 5315}$$

$$-\frac{-\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(\frac{a+b\arcsin\left(dx^2+1\right)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}-\frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a+b\arcsin\left(dx^2+1\right)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}}{8b^2}+\frac{x}{8b^2\left(a+b\arcsin\left(dx^2+1\right)\right)}-\frac{\sqrt{-d^2x^4-2dx^2}}{4bdx\left(a+b\arcsin\left(dx^2+1\right)\right)^2}$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^(-3),x]
```

output
```
-1/4*Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*(a + b*ArcSin[1 + d*x^2])^2) + x/(8*b
^2*(a + b*ArcSin[1 + d*x^2])) - (-1/2*(x*CosIntegral[(a + b*ArcSin[1 + d*x
^2])/(2*b)]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(b*(Cos[ArcSin[1 + d*x^2]/2] -
Sin[ArcSin[1 + d*x^2]/2])) - (x*(Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[
(a + b*ArcSin[1 + d*x^2])/(2*b)])/(2*b*(Cos[ArcSin[1 + d*x^2]/2] - Sin[Arc
Sin[1 + d*x^2]/2])))/(8*b^2)
```

### 3.407.3.1 Defintions of rubi rules used

rule 5315
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-1), x_Symbol] :> Simp[(-x
)*(c*Cos[a/(2*b)] - Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c +
d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x]
 - Simp[x*(c*Cos[a/(2*b)] + Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Arc
Sin[c + d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2
]))), x] /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

rule 5327
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (Simp[Sqrt
[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n + 1)*x)
), x] - Simp[1/(4*b^2*(n + 1)*(n + 2))   Int[(a + b*ArcSin[c + d*x^2])^(n +
 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

### 3.407.4 Maple [F]

$$\int \frac{1}{\left(a+b\arcsin\left(d\,x^{2}+1\right)\right)^{3}}dx$$

input
```
int(1/(a+b*arcsin(d*x^2+1))^3,x)
```

output
```
int(1/(a+b*arcsin(d*x^2+1))^3,x)
```

### 3.407.5 Fricas [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^3}\,dx = \int \frac{1}{\left(b\arcsin\left(dx^2+1\right)+a\right)^3}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^3,x, algorithm="fricas")
```

output
```
integral(1/(b^3*arcsin(d*x^2 + 1)^3 + 3*a*b^2*arcsin(d*x^2 + 1)^2 + 3*a^2*
b*arcsin(d*x^2 + 1) + a^3), x)
```

### 3.407.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^3}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(dx^2+1\right)\right)^3}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2+1))**3,x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**(-3), x)
```

### 3.407.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a + b \arcsin (1 + dx^2))^3} \, dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^3,x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.407.8 Giac [F]

$$\int \frac{1}{(a + b \arcsin (1 + dx^2))^3} \, dx = \int \frac{1}{(b \arcsin (dx^2 + 1) + a)^3} \, dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^3,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + 1) + a)^(-3), x)
```

### 3.407.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a + b \arcsin (1 + dx^2))^3} \, dx = \int \frac{1}{(a + b \operatorname{asin} (d\, x^2 + 1))^3} \, dx$$

input
```
int(1/(a + b*asin(d*x^2 + 1))^3,x)
```

output
```
int(1/(a + b*asin(d*x^2 + 1))^3, x)
```

# 3.408 $\int (a-b\arcsin(1-dx^2))^4\,dx$



## 3.408.1 Optimal result

Integrand size = 16, antiderivative size = 135

$$\int (a-b\arcsin(1-dx^2))^4\,dx = 384b^4x-\frac{192b^3\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx} - 48b^2x(a-b\arcsin(1-dx^2))^2 + \frac{8b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))^3}{dx} + x(a-b\arcsin(1-dx^2))^4$$

output
```
384*b^4*x-48*b^2*x*(a+b*arcsin(d*x^2-1))^2+x*(a+b*arcsin(d*x^2-1))^4-192*b
^3*(a+b*arcsin(d*x^2-1))*(-d^2*x^4+2*d*x^2)^(1/2)/d/x+8*b*(a+b*arcsin(d*x^
2-1))^3*(-d^2*x^4+2*d*x^2)^(1/2)/d/x
```

## 3.408.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 131, normalized size of antiderivative = 0.97

$$\int (a-b\arcsin(1-dx^2))^4\,dx = \frac{8b\sqrt{-dx^2(-2+dx^2)}(a-b\arcsin(1-dx^2))^3}{dx} + x(a-b\arcsin(1-dx^2))^4 - 48b^2\left(-8b^2x + \frac{4b\sqrt{-dx^2(-2+dx^2)}(a-b\arcsin(1-dx^2))}{dx} + x(a-b\arcsin(1-dx^2))^2\right)$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^4,x]
```

output
```
(8*b*Sqrt[-(d*x^2*(-2 + d*x^2))]*(a - b*ArcSin[1 - d*x^2])^3)/(d*x) + x*(a
 - b*ArcSin[1 - d*x^2])^4 - 48*b^2*(-8*b^2*x + (4*b*Sqrt[-(d*x^2*(-2 + d*x
^2))]*(a - b*ArcSin[1 - d*x^2]))/(d*x) + x*(a - b*ArcSin[1 - d*x^2])^2)
```

## 3.408.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {5313, 5313, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a-b \arcsin \left(1-d x^2\right)\right)^4 \, dx$$

$$\Big\downarrow \text{5313}$$

$$-48 b^2 \int \left(a-b \arcsin \left(1-d x^2\right)\right)^2dx+\frac{8 b \sqrt{2 d x^2-d^2 x^4} \left(a-b \arcsin \left(1-d x^2\right)\right)^3}{d x}+x \left(a-b \arcsin \left(1-d x^2\right)\right)^4$$

$$\Big\downarrow \text{5313}$$

$$-48 b^2 \left(-8 b^2 \int 1dx+\frac{4 b \sqrt{2 d x^2-d^2 x^4} \left(a-b \arcsin \left(1-d x^2\right)\right)}{d x}+x \left(a-b \arcsin \left(1-d x^2\right)\right)^2\right)+\frac{8 b \sqrt{2 d x^2-d^2 x^4} \left(a-b \arcsin \left(1-d x^2\right)\right)^3}{d x}+x \left(a-b \arcsin \left(1-d x^2\right)\right)^4$$

$$\Big\downarrow \text{24}$$

$$-48 b^2 \left(\frac{4 b \sqrt{2 d x^2-d^2 x^4} \left(a-b \arcsin \left(1-d x^2\right)\right)}{d x}+x \left(a-b \arcsin \left(1-d x^2\right)\right)^2-8 b^2 x\right)+\frac{8 b \sqrt{2 d x^2-d^2 x^4} \left(a-b \arcsin \left(1-d x^2\right)\right)^3}{d x}+x \left(a-b \arcsin \left(1-d x^2\right)\right)^4$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^4,x]
```

output
```
(8*b*Sqrt[2*d*x^2 - d^2*x^4]*(a - b*ArcSin[1 - d*x^2])^3)/(d*x) + x*(a - b
*ArcSin[1 - d*x^2])^4 - 48*b^2*(-8*b^2*x + (4*b*Sqrt[2*d*x^2 - d^2*x^4]*(a
 - b*ArcSin[1 - d*x^2]))/(d*x) + x*(a - b*ArcSin[1 - d*x^2])^2)
```

### 3.408.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

## 3.408.4 Maple [F]

$$\int \left(a+b\arcsin\left(d\,x^{2}-1\right)\right)^{4}dx$$

input
```
int((a+b*arcsin(d*x^2-1))^4,x)
```

output
```
int((a+b*arcsin(d*x^2-1))^4,x)
```

## 3.408.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.53

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^4\,dx$$
$$=\frac{b^4dx^2\arcsin\left(dx^2-1\right)^4+4\,ab^3dx^2\arcsin\left(dx^2-1\right)^3+6\,(a^2b^2-8\,b^4)dx^2\arcsin\left(dx^2-1\right)^2+4\,(a^3b-24\,a\ldots}{\ldots}$$

input
```
integrate((a+b*arcsin(d*x^2-1))^4,x, algorithm="fricas")
```

output
```
(b^4*d*x^2*arcsin(d*x^2 - 1)^4 + 4*a*b^3*d*x^2*arcsin(d*x^2 - 1)^3 + 6*(a^
2*b^2 - 8*b^4)*d*x^2*arcsin(d*x^2 - 1)^2 + 4*(a^3*b - 24*a*b^3)*d*x^2*arcs
in(d*x^2 - 1) + (a^4 - 48*a^2*b^2 + 384*b^4)*d*x^2 + 8*(b^4*arcsin(d*x^2 -
 1)^3 + 3*a*b^3*arcsin(d*x^2 - 1)^2 + a^3*b - 24*a*b^3 + 3*(a^2*b^2 - 8*b^
4)*arcsin(d*x^2 - 1))*sqrt(-d^2*x^4 + 2*d*x^2))/(d*x)
```

## 3.408.6 Sympy [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^4\,dx=\int \left(a+b\,\mathrm{asin}\left(dx^2-1\right)\right)^4\,dx$$

input
```
integrate((a+b*asin(d*x**2-1))**4,x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**4, x)
```

## 3.408.7 Maxima [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^4\,dx=\int \left(b\arcsin\left(dx^2-1\right)+a\right)^4\,dx$$

input
```
integrate((a+b*arcsin(d*x^2-1))^4,x, algorithm="maxima")
```

output
```
b^4*x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)^4 + 4*(x*arcsin(d*x^2
 - 1) - 2*(d^(3/2)*x^2 - 2*sqrt(d))/(sqrt(-d*x^2 + 2)*d))*a^3*b + a^4*x +
integrate(2*(4*sqrt(-d*x^2 + 2)*b^4*sqrt(d)*x*arctan2(d*x^2 - 1, sqrt(-d*x
^2 + 2)*sqrt(d)*x)^3 + 2*(a*b^3*d*x^2 - 2*a*b^3)*arctan2(d*x^2 - 1, sqrt(-
d*x^2 + 2)*sqrt(d)*x)^3 + 3*(a^2*b^2*d*x^2 - 2*a^2*b^2)*arctan2(d*x^2 - 1,
 sqrt(-d*x^2 + 2)*sqrt(d)*x)^2)/(d*x^2 - 2), x)
```

### 3.408.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 617 vs. $2(123) = 246$.

Time = 1.01 (sec) , antiderivative size = 617, normalized size of antiderivative = 4.57

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^4\,dx=4\left(x\arcsin\left(dx^2-1\right)-\frac{2\sqrt{2}\operatorname{sgn}(x)}{\sqrt{d}}+\frac{2\sqrt{-d^2x^2+2\,d}}{d\operatorname{sgn}(x)}\right)a^3b$$

$$+6\left(x\arcsin\left(dx^2-1\right)^2+\frac{2\left(\sqrt{2}\pi\sqrt{d}|d|-4\sqrt{2}d^{\frac{3}{2}}\right)\operatorname{sgn}(x)}{d|d|}+\frac{4\left(\sqrt{-d^2x^2+2\,d}\arcsin\left(dx^2-1\right)+\frac{2\left(\sqrt{2}\cdots\right.}{\cdots}\right.}{d\operatorname{sgn}(x)}\cdots\right.$$

$$+2\left(2\,x\arcsin\left(dx^2-1\right)^3-\frac{3\left(\sqrt{2}\pi^2d^{\frac{3}{2}}+8\sqrt{2}\pi\sqrt{d}|d|-32\sqrt{2}d^{\frac{3}{2}}\right)\operatorname{sgn}(x)}{d^2}+\frac{12\left(\sqrt{-d^2x^2+2\,d}\arcsin\left(\cdots\right.\right.}{\cdots}\cdots\right.$$

$$+\left(x\arcsin\left(dx^2-1\right)^4+\frac{\left(\sqrt{2}\pi^3\sqrt{d}|d|-12\sqrt{2}\pi^2d^{\frac{3}{2}}-96\sqrt{2}\pi\sqrt{d}|d|+384\sqrt{2}d^{\frac{3}{2}}\right)\operatorname{sgn}(x)}{d|d|}+\frac{4\left(2\sqrt{-d^2x^2\cdots}\right.}{\cdots}\cdots\right.$$

$$+a^4x$$

input
```
integrate((a+b*arcsin(d*x^2-1))^4,x, algorithm="giac")
```

output
```
4*(x*arcsin(d*x^2 - 1) - 2*sqrt(2)*sgn(x)/sqrt(d) + 2*sqrt(-d^2*x^2 + 2*d)
/(d*sgn(x)))*a^3*b + 6*(x*arcsin(d*x^2 - 1)^2 + 2*(sqrt(2)*pi*sqrt(d)*abs(
d) - 4*sqrt(2)*d^(3/2))*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 + 2*d)*arcsin
(d*x^2 - 1) + 2*(sqrt(2)*sqrt(d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x)))*a^
2*b^2 + 2*(2*x*arcsin(d*x^2 - 1)^3 - 3*(sqrt(2)*pi^2*d^(3/2) + 8*sqrt(2)*p
i*sqrt(d)*abs(d) - 32*sqrt(2)*d^(3/2))*sgn(x)/d^2 + 12*(sqrt(-d^2*x^2 + 2*
d)*arcsin(d*x^2 - 1)^2 - 2*(2*sqrt(d^2*x^2)*arcsin((d^2*x^2 - d)/d) - 4*(s
qrt(2)*sqrt(d) - sqrt(-d^2*x^2 + 2*d))*d/abs(d) - (sqrt(2)*pi*sqrt(d)*abs(
d) - 4*sqrt(2)*d^(3/2))/abs(d))*d/abs(d))/(d*sgn(x)))*a*b^3 + (x*arcsin(d*
x^2 - 1)^4 + (sqrt(2)*pi^3*sqrt(d)*abs(d) - 12*sqrt(2)*pi^2*d^(3/2) - 96*s
qrt(2)*pi*sqrt(d)*abs(d) + 384*sqrt(2)*d^(3/2))*sgn(x)/(d*abs(d)) + 4*(2*s
qrt(-d^2*x^2 + 2*d)*arcsin(d*x^2 - 1)^3 - 3*(4*sqrt(d^2*x^2)*arcsin((d^2*x
^2 - d)/d)^2 + 8*(2*sqrt(-d^2*x^2 + 2*d)*arcsin((d^2*x^2 - d)/d) + 4*(sqrt
(2)*sqrt(d) - sqrt(d^2*x^2))*d/abs(d) + (sqrt(2)*pi*sqrt(d)*abs(d) - 4*sqr
t(2)*d^(3/2))/abs(d))*d/abs(d) - (sqrt(2)*pi^2*d^(3/2) + 8*sqrt(2)*pi*sqrt
(d)*abs(d) - 32*sqrt(2)*d^(3/2))/d)*d/abs(d))/(d*sgn(x)))*b^4 + a^4*x
```

## 3.408.9 Mupad [F(-1)]

Timed out.

$$\int \left(a - b\arcsin\left(1 - dx^2\right)\right)^4 dx = \int \left(a + b\,\mathrm{asin}\left(d\,x^2 - 1\right)\right)^4 dx$$

input
```
int((a + b*asin(d*x^2 - 1))^4,x)
```

output
```
int((a + b*asin(d*x^2 - 1))^4, x)
```

# 3.409 $\int (a-b\arcsin(1-dx^2))^3\,dx$



## 3.409.1 Optimal result

Integrand size = 16, antiderivative size = 115

$$\int (a-b\arcsin(1-dx^2))^3\,dx = -24ab^2x-\frac{48b^3\sqrt{2dx^2-d^2x^4}}{dx}+24b^3x\arcsin(1-dx^2)+\frac{6b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))^2}{dx}+x(a-b\arcsin(1-dx^2))^3$$

output
```
-24*a*b^2*x-24*b^3*x*arcsin(d*x^2-1)+x*(a+b*arcsin(d*x^2-1))^3-48*b^3*(-d^
2*x^4+2*d*x^2)^(1/2)/d/x+6*b*(a+b*arcsin(d*x^2-1))^2*(-d^2*x^4+2*d*x^2)^(1
/2)/d/x
```

## 3.409.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.44

$$\int (a-b\arcsin(1-dx^2))^3\,dx = \frac{a(a^2-24b^2)\,dx^2+6b(a^2-8b^2)\sqrt{dx^2(2-dx^2)}-3b\left(a^2dx^2-8b^2dx^2+4ab\sqrt{-dx^2(-2+dx^2)}\right)\arcsin(\ldots}{dx}$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^3,x]
```

output
```
(a*(a^2 - 24*b^2)*d*x^2 + 6*b*(a^2 - 8*b^2)*Sqrt[d*x^2*(2 - d*x^2)] - 3*b*
(a^2*d*x^2 - 8*b^2*d*x^2 + 4*a*b*Sqrt[-(d*x^2*(-2 + d*x^2))])*ArcSin[1 - d
*x^2] + 3*b^2*(a*d*x^2 + 2*b*Sqrt[-(d*x^2*(-2 + d*x^2))])*ArcSin[1 - d*x^2
]^2 - b^3*d*x^2*ArcSin[1 - d*x^2]^3)/(d*x)
```

## 3.409.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.98, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5313, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3 dx$$

$$\Big\downarrow \text{5313}$$

$$-24b^2\int \left(a-b\arcsin\left(1-dx^2\right)\right)dx+\frac{6b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)^2}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^3$$

$$\Big\downarrow \text{2009}$$

$$-24b^2\left(ax+b(-x)\arcsin\left(1-dx^2\right)+\frac{2b\sqrt{2dx^2-d^2x^4}}{dx}\right)+\frac{6b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)^2}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^3$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^3,x]
```

output
```
(6*b*Sqrt[2*d*x^2 - d^2*x^4]*(a - b*ArcSin[1 - d*x^2])^2)/(d*x) + x*(a - b
*ArcSin[1 - d*x^2])^3 - 24*b^2*(a*x + (2*b*Sqrt[2*d*x^2 - d^2*x^4])/(d*x)
- b*x*ArcSin[1 - d*x^2])
```

#### 3.409.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

### 3.409.4 Maple [F]

$$\int \left(a + b \arcsin \left(d\,x^{2}-1\right)\right)^{3}dx$$

input
```
int((a+b*arcsin(d*x^2-1))^3,x)
```

output
```
int((a+b*arcsin(d*x^2-1))^3,x)
```

### 3.409.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.25

$$\int \left(a - b \arcsin \left(1 - dx^2\right)\right)^3 \, dx = \frac{b^3dx^2 \arcsin \left(dx^2-1\right)^3 + 3\,ab^2dx^2 \arcsin \left(dx^2-1\right)^2 + 3\,(a^2b - 8\,b^3)dx^2 \arcsin \left(dx^2-1\right) + (a^3 - 24\,ab^2)dx}{dx}$$

input
```
integrate((a+b*arcsin(d*x^2-1))^3,x, algorithm="fricas")
```

output
```
(b^3*d*x^2*arcsin(d*x^2 - 1)^3 + 3*a*b^2*d*x^2*arcsin(d*x^2 - 1)^2 + 3*(a^
2*b - 8*b^3)*d*x^2*arcsin(d*x^2 - 1) + (a^3 - 24*a*b^2)*d*x^2 + 6*sqrt(-d^
2*x^4 + 2*d*x^2)*(b^3*arcsin(d*x^2 - 1)^2 + 2*a*b^2*arcsin(d*x^2 - 1) + a^
2*b - 8*b^3))/(d*x)
```

### 3.409.6 Sympy [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3\,dx=\int \left(a+b\,\mathrm{asin}\left(dx^2-1\right)\right)^3\,dx$$

input
```
integrate((a+b*asin(d*x**2-1))**3,x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**3, x)
```

### 3.409.7 Maxima [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3\,dx=\int \left(b\arcsin\left(dx^2-1\right)+a\right)^3\,dx$$

input
```
integrate((a+b*arcsin(d*x^2-1))^3,x, algorithm="maxima")
```

output
```
b^3*x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)^3 + 3*(x*arcsin(d*x^2
 - 1) - 2*(d^(3/2)*x^2 - 2*sqrt(d))/(sqrt(-d*x^2 + 2)*d))*a^2*b + a^3*x +
integrate(3*(2*sqrt(-d*x^2 + 2)*b^3*sqrt(d)*x*arctan2(d*x^2 - 1, sqrt(-d*x
^2 + 2)*sqrt(d)*x)^2 + (a*b^2*d*x^2 - 2*a*b^2)*arctan2(d*x^2 - 1, sqrt(-d*
x^2 + 2)*sqrt(d)*x)^2)/(d*x^2 - 2), x)
```

### 3.409.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 346 vs. $2(106) = 212$.

Time = 0.65 (sec) , antiderivative size = 346, normalized size of antiderivative = 3.01

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3\,dx = 3\left(x\arcsin\left(dx^2-1\right)-\frac{2\sqrt{2}\mathrm{sgn}(x)}{\sqrt{d}}+\frac{2\sqrt{-d^2x^2+2\,d}}{d\mathrm{sgn}\left(x\right)}\right)a^2b$$
$$+3\left(x\arcsin\left(dx^2-1\right)^2+\frac{2\left(\sqrt{2}\pi\sqrt{d}|d|-4\sqrt{2}d^{\frac{3}{2}}\right)\mathrm{sgn}(x)}{d|d|}+\frac{4\left(\sqrt{-d^2x^2+2\,d}\arcsin\left(dx^2-1\right)+\frac{2\left(\sqrt{2}\right.}{}\right.}{d\mathrm{sgn}\left(x\right)}\right.$$
$$+\frac{1}{2}\left(2\,x\arcsin\left(dx^2-1\right)^3-\frac{3\left(\sqrt{2}\pi^2d^{\frac{3}{2}}+8\sqrt{2}\pi\sqrt{d}|d|-32\sqrt{2}d^{\frac{3}{2}}\right)\mathrm{sgn}(x)}{d^2}+\frac{12\left(\sqrt{-d^2x^2+2\,d}\arcsin\right.}{}\right.$$
$$+a^3x$$

input
```
integrate((a+b*arcsin(d*x^2-1))^3,x, algorithm="giac")
```

output
```
3*(x*arcsin(d*x^2 - 1) - 2*sqrt(2)*sgn(x)/sqrt(d) + 2*sqrt(-d^2*x^2 + 2*d)
/(d*sgn(x)))*a^2*b + 3*(x*arcsin(d*x^2 - 1)^2 + 2*(sqrt(2)*pi*sqrt(d)*abs(
d) - 4*sqrt(2)*d^(3/2))*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 + 2*d)*arcsin
(d*x^2 - 1) + 2*(sqrt(2)*sqrt(d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x)))*a*
b^2 + 1/2*(2*x*arcsin(d*x^2 - 1)^3 - 3*(sqrt(2)*pi^2*d^(3/2) + 8*sqrt(2)*p
i*sqrt(d)*abs(d) - 32*sqrt(2)*d^(3/2))*sgn(x)/d^2 + 12*(sqrt(-d^2*x^2 + 2*
d)*arcsin(d*x^2 - 1)^2 - 2*(2*sqrt(d^2*x^2)*arcsin((d^2*x^2 - d)/d) - 4*(s
qrt(2)*sqrt(d) - sqrt(-d^2*x^2 + 2*d))*d/abs(d) - (sqrt(2)*pi*sqrt(d)*abs(
d) - 4*sqrt(2)*d^(3/2))/abs(d))*d/abs(d))/(d*sgn(x)))*b^3 + a^3*x
```

### 3.409.9 Mupad [F(-1)]

Timed out.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^3\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2-1\right)\right)^3\,dx$$

input
```
int((a + b*asin(d*x^2 - 1))^3,x)
```

output
```
int((a + b*asin(d*x^2 - 1))^3, x)
```

# 3.410 $\int (a-b\arcsin(1-dx^2))^2\,dx$



## 3.410.1 Optimal result

Integrand size = 16, antiderivative size = 67

$$\int (a-b\arcsin(1-dx^2))^2\,dx = -8b^2x+\frac{4b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx} + x(a-b\arcsin(1-dx^2))^2$$

output
```
-8*b^2*x+x*(a+b*arcsin(d*x^2-1))^2+4*b*(a+b*arcsin(d*x^2-1))*(-d^2*x^4+2*d
*x^2)^(1/2)/d/x
```

## 3.410.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00

$$\int (a-b\arcsin(1-dx^2))^2\,dx = -8b^2x+\frac{4b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))}{dx} + x(a-b\arcsin(1-dx^2))^2$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^2,x]
```

output
```
-8*b^2*x + (4*b*Sqrt[2*d*x^2 - d^2*x^4]*(a - b*ArcSin[1 - d*x^2]))/(d*x) +
 x*(a - b*ArcSin[1 - d*x^2])^2
```

### 3.410.3 Rubi [A] (verified)

Time = 0.18 (sec) , antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5313, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^2 dx$$

$$\Big\downarrow \text{5313}$$

$$-8b^2\int 1dx+\frac{4b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^2$$

$$\Big\downarrow \text{24}$$

$$\frac{4b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^2-8b^2x$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^2,x]
```

output
```
-8*b^2*x + (4*b*Sqrt[2*d*x^2 - d^2*x^4]*(a - b*ArcSin[1 - d*x^2]))/(d*x) +
 x*(a - b*ArcSin[1 - d*x^2])^2
```

#### 3.410.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

### 3.410.4 Maple [F]

$$\int \left(a+b\arcsin \left(d\,x^{2}-1\right)\right)^{2}dx$$

input
```
int((a+b*arcsin(d*x^2-1))^2,x)
```

output
```
int((a+b*arcsin(d*x^2-1))^2,x)
```

### 3.410.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 1.36

$$\int \left(a-b\arcsin \left(1-dx^2\right)\right)^2\,dx$$
$$=\frac{b^2dx^2\arcsin \left(dx^2-1\right)^2+2\,abdx^2\arcsin \left(dx^2-1\right)+(a^2-8\,b^2)dx^2+4\,\sqrt{-d^2x^4+2\,dx^2}(b^2\arcsin \left(dx^2-1\right.}{dx}$$

input
```
integrate((a+b*arcsin(d*x^2-1))^2,x, algorithm="fricas")
```

output
```
(b^2*d*x^2*arcsin(d*x^2 - 1)^2 + 2*a*b*d*x^2*arcsin(d*x^2 - 1) + (a^2 - 8*
b^2)*d*x^2 + 4*sqrt(-d^2*x^4 + 2*d*x^2)*(b^2*arcsin(d*x^2 - 1) + a*b))/(d*
x)
```

### 3.410.6 Sympy [F]

$$\int \left(a-b\arcsin \left(1-dx^2\right)\right)^2\,dx=\int \left(a+b\,\mathrm{asin}\,\left(dx^2-1\right)\right)^2\,dx$$

input
```
integrate((a+b*asin(d*x**2-1))**2,x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**2, x)
```

### 3.410.7 Maxima [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^2\,dx=\int \left(b\arcsin\left(dx^2-1\right)+a\right)^2\,dx$$

input
```
integrate((a+b*arcsin(d*x^2-1))^2,x, algorithm="maxima")
```

output
```
2*(x*arcsin(d*x^2 - 1) - 2*(d^(3/2)*x^2 - 2*sqrt(d))/(sqrt(-d*x^2 + 2)*d))
*a*b + (x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)^2 + 4*sqrt(d)*int
egrate(sqrt(-d*x^2 + 2)*x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)/(
d*x^2 - 2), x))*b^2 + a^2*x
```

### 3.410.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 160 vs. $2(61)=122$.

Time = 0.44 (sec) , antiderivative size = 160, normalized size of antiderivative = 2.39

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^2\,dx=2\left(x\arcsin\left(dx^2-1\right)-\frac{2\sqrt{2}\text{sgn}(x)}{\sqrt{d}}+\frac{2\sqrt{-d^2x^2+2d}}{d\text{sgn}\left(x\right)}\right)ab+\left(x\arcsin\left(dx^2-1\right)^2+\frac{2\left(\sqrt{2}\pi\sqrt{d}|d|-4\sqrt{2}d^{\frac{3}{2}}\right)\text{sgn}(x)}{d|d|}+\frac{4\left(\sqrt{-d^2x^2+2d}\arcsin\left(dx^2-1\right)+\frac{2\left(\sqrt{2}\sqrt{d}\right.}{}\right.}{d\text{sgn}\left(x\right)}\right.+a^2x$$

input
```
integrate((a+b*arcsin(d*x^2-1))^2,x, algorithm="giac")
```

output
```
2*(x*arcsin(d*x^2 - 1) - 2*sqrt(2)*sgn(x)/sqrt(d) + 2*sqrt(-d^2*x^2 + 2*d)
/(d*sgn(x)))*a*b + (x*arcsin(d*x^2 - 1)^2 + 2*(sqrt(2)*pi*sqrt(d)*abs(d) -
 4*sqrt(2)*d^(3/2))*sgn(x)/(d*abs(d)) + 4*(sqrt(-d^2*x^2 + 2*d)*arcsin(d*x
^2 - 1) + 2*(sqrt(2)*sqrt(d) - sqrt(d^2*x^2))*d/abs(d))/(d*sgn(x)))*b^2 +
a^2*x
```

### 3.410.9 Mupad [F(-1)]

Timed out.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^2\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2-1\right)\right)^2\,dx$$

input
```
int((a + b*asin(d*x^2 - 1))^2,x)
```

output
```
int((a + b*asin(d*x^2 - 1))^2, x)
```

# 3.411 $\int (a - b \arcsin(1 - dx^2))\,dx$



## 3.411.1 Optimal result

Integrand size = 14, antiderivative size = 45

$$\int (a - b \arcsin(1 - dx^2))\,dx = ax + \frac{2b\sqrt{2dx^2 - d^2x^4}}{dx} - bx \arcsin(1 - dx^2)$$

output
```
a*x+b*x*arcsin(d*x^2-1)+2*b*(-d^2*x^4+2*d*x^2)^(1/2)/d/x
```

## 3.411.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.96

$$\int (a - b \arcsin(1 - dx^2))\,dx = ax + \frac{2b\sqrt{-dx^2(-2 + dx^2)}}{dx} - bx \arcsin(1 - dx^2)$$

input
```
Integrate[a - b*ArcSin[1 - d*x^2],x]
```

output
```
a*x + (2*b*Sqrt[-(d*x^2*(-2 + d*x^2))])/(d*x) - b*x*ArcSin[1 - d*x^2]
```

## 3.411.3 Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$, Rules used = {2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)\,dx$$

$$\Big\downarrow \; 2009$$

$$ax+b(-x)\arcsin\left(1-dx^2\right)+\frac{2b\sqrt{2dx^2-d^2x^4}}{dx}$$

input
```
Int[a - b*ArcSin[1 - d*x^2],x]
```

output
```
a*x + (2*b*Sqrt[2*d*x^2 - d^2*x^4])/(d*x) - b*x*ArcSin[1 - d*x^2]
```

### 3.411.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

## 3.411.4 Maple [A] (verified)

Time = 0.06 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00

| method | result | size |
|---|---|---|
| default | $ax+b\left(x\arcsin\left(d\,x^2-1\right)-\frac{2x\left(d\,x^2-2\right)}{\sqrt{-d^2x^4+2d\,x^2}}\right)$ | 45 |
| parts | $ax+b\left(x\arcsin\left(d\,x^2-1\right)-\frac{2x\left(d\,x^2-2\right)}{\sqrt{-d^2x^4+2d\,x^2}}\right)$ | 45 |

input
```
int(a+b*arcsin(d*x^2-1),x,method=_RETURNVERBOSE)
```

output
```
a*x+b*(x*arcsin(d*x^2-1)-2/(-d^2*x^4+2*d*x^2)^(1/2)*x*(d*x^2-2))
```

### 3.411.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.07

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)\,dx=\frac{bdx^2\arcsin\left(dx^2-1\right)+adx^2+2\sqrt{-d^2x^4+2\,dx^2}b}{dx}$$

input
```
integrate(a+b*arcsin(d*x^2-1),x, algorithm="fricas")
```

output
```
(b*d*x^2*arcsin(d*x^2 - 1) + a*d*x^2 + 2*sqrt(-d^2*x^4 + 2*d*x^2)*b)/(d*x)
```

### 3.411.6 Sympy [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)\,dx=\int \left(a+b\,\mathrm{asin}\left(dx^2-1\right)\right)\,dx$$

input
```
integrate(a+b*asin(d*x**2-1),x)
```

output
```
Integral(a + b*asin(d*x**2 - 1), x)
```

### 3.411.7 Maxima [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)\,dx=\left(x\arcsin\left(dx^2-1\right)-\frac{2\left(d^{\frac{3}{2}}x^2-2\sqrt{d}\right)}{\sqrt{-dx^2+2}d}\right)b+ax$$

input
```
integrate(a+b*arcsin(d*x^2-1),x, algorithm="maxima")
```

output
```
(x*arcsin(d*x^2 - 1) - 2*(d^(3/2)*x^2 - 2*sqrt(d))/(sqrt(-d*x^2 + 2)*d))*b
 + a*x
```

### 3.411.8 Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 50, normalized size of antiderivative = 1.11

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)\,dx=\left(x\arcsin\left(dx^2-1\right)-\frac{2\sqrt{2}\mathrm{sgn}(x)}{\sqrt{d}}+\frac{2\sqrt{-d^2x^2+2\,d}}{d\mathrm{sgn}\left(x\right)}\right)b+ax$$

input
```
integrate(a+b*arcsin(d*x^2-1),x, algorithm="giac")
```

output
```
(x*arcsin(d*x^2 - 1) - 2*sqrt(2)*sgn(x)/sqrt(d) + 2*sqrt(-d^2*x^2 + 2*d)/(
d*sgn(x)))*b + a*x
```

### 3.411.9 Mupad [B] (verification not implemented)

Time = 0.50 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.87

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)\,dx=a\,x+b\,x\,\mathrm{asin}\left(d\,x^2-1\right)+\frac{2\,b\,\sqrt{1-{\left(d\,x^2-1\right)}^2}}{d\,x}$$

input
```
int(a + b*asin(d*x^2 - 1),x)
```

output
```
a*x + b*x*asin(d*x^2 - 1) + (2*b*(1 - (d*x^2 - 1)^2)^(1/2))/(d*x)
```

# 3.412 $\int \frac{1}{a-b\arcsin(1-dx^2)}\,dx$



## 3.412.1 Optimal result

Integrand size = 16, antiderivative size = 168

$$\int \frac{1}{a-b\arcsin(1-dx^2)}\,dx = \frac{x\,\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

output
```
-1/2*x*Si(1/2*a/b+1/2*arcsin(d*x^2-1))*(cos(1/2*a/b)-sin(1/2*a/b))/b/(cos(
1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))+1/2*x*Ci(1/2*(-a-b*arcsin(d
*x^2-1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))/b/(cos(1/2*arcsin(d*x^2-1))+sin(1/
2*arcsin(d*x^2-1)))
```

## 3.412.2 Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 130, normalized size of antiderivative = 0.77

$$\int \frac{1}{a-b\arcsin(1-dx^2)}\,dx = \frac{\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)\left(\text{CosIntegral}\left(\frac{1}{2}\left(-\frac{a}{b}+\arcsin(1-dx^2)\right)\right)\left(\cos\left(\frac{a}{2b}\right)+\right.\right.}{2bdx}$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^(-1),x]
```

output
```
((Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])*(CosIntegral[(-(a/b
) + ArcSin[1 - d*x^2])/2]*(Cos[a/(2*b)] + Sin[a/(2*b)]) + (-Cos[a/(2*b)] +
 Sin[a/(2*b)])*SinIntegral[(a - b*ArcSin[1 - d*x^2])/(2*b)]))/(2*b*d*x)
```

## 3.412.3 Rubi [A] (verified)

Time = 0.22 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {5315}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{a-b\arcsin(1-dx^2)}dx$$

$$\Big\downarrow \text{5315}$$

$$\frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}-\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^(-1),x]
```

output
```
(x*CosIntegral[-1/2*(a - b*ArcSin[1 - d*x^2])/b]*(Cos[a/(2*b)] + Sin[a/(2*
b)]))/(2*b*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) - (x*(Co
s[a/(2*b)] - Sin[a/(2*b)])*SinIntegral[a/(2*b) - ArcSin[1 - d*x^2]/2])/(2*
b*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

### 3.412.3.1 Defintions of rubi rules used

rule 5315
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-1), x_Symbol] :> Simp[(-x
)*(c*Cos[a/(2*b)] - Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c +
d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x]
 - Simp[x*(c*Cos[a/(2*b)] + Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Arc
Sin[c + d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2
]))), x] /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

### 3.412.4 Maple [F]

$$\int \frac{1}{a + b \arcsin\left(d\,x^2 - 1\right)}dx$$

input
```
int(1/(a+b*arcsin(d*x^2-1)),x)
```

output
```
int(1/(a+b*arcsin(d*x^2-1)),x)
```

### 3.412.5 Fricas [F]

$$\int \frac{1}{a - b \arcsin\left(1 - dx^2\right)}\,dx = \int \frac{1}{b \arcsin\left(dx^2 - 1\right) + a}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1)),x, algorithm="fricas")
```

output
```
integral(1/(b*arcsin(d*x^2 - 1) + a), x)
```

### 3.412.6 Sympy [F]

$$\int \frac{1}{a - b \arcsin\left(1 - dx^2\right)}\,dx = \int \frac{1}{a + b\,\mathrm{asin}\left(dx^2 - 1\right)}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2-1)),x)
```

output
```
Integral(1/(a + b*asin(d*x**2 - 1)), x)
```

### 3.412.7 Maxima [F]

$$\int \frac{1}{a - b \arcsin(1 - dx^2)} \, dx = \int \frac{1}{b \arcsin(dx^2 - 1) + a} \, dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1)),x, algorithm="maxima")
```

output
```
integrate(1/(b*arcsin(d*x^2 - 1) + a), x)
```

### 3.412.8 Giac [F]

$$\int \frac{1}{a - b \arcsin(1 - dx^2)} \, dx = \int \frac{1}{b \arcsin(dx^2 - 1) + a} \, dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1)),x, algorithm="giac")
```

output
```
integrate(1/(b*arcsin(d*x^2 - 1) + a), x)
```

### 3.412.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{a - b \arcsin(1 - dx^2)} \, dx = \int \frac{1}{a + b \operatorname{asin}(d x^2 - 1)} \, dx$$

input
```
int(1/(a + b*asin(d*x^2 - 1)),x)
```

output
```
int(1/(a + b*asin(d*x^2 - 1)), x)
```

# 3.413 $\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^2}\,dx$



## 3.413.1 Optimal result

Integrand size = 16, antiderivative size = 216

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^2}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{2bdx\,(a-b\arcsin(1-dx^2))} - \frac{x\,\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{x\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

output
```
-1/4*x*Ci(1/2*(-a-b*arcsin(d*x^2-1))/b)*(cos(1/2*a/b)-sin(1/2*a/b))/b^2/(c
os(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))-1/4*x*Si(1/2*a/b+1/2*arc
sin(d*x^2-1))*(cos(1/2*a/b)+sin(1/2*a/b))/b^2/(cos(1/2*arcsin(d*x^2-1))+si
n(1/2*arcsin(d*x^2-1)))-1/2*(-d^2*x^4+2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x
^2-1))
```

### 3.413.2 Mathematica [A] (verified)

Time = 0.53 (sec) , antiderivative size = 183, normalized size of antiderivative = 0.85

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^2}\,dx$$
$$=\frac{2b\sqrt{dx^2(2-dx^2)}+(a-b\arcsin(1-dx^2))\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)\left(\text{CosInt}\right.}{4b^2dx\,(-a+b\,\text{arcs}}$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^(-2),x]
```

output
```
(2*b*Sqrt[d*x^2*(2 - d*x^2)] + (a - b*ArcSin[1 - d*x^2])*(Cos[ArcSin[1 - d
*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])*(CosIntegral[(-(a/b) + ArcSin[1 - d*x
^2])/2]*(Cos[a/(2*b)] - Sin[a/(2*b)]) + (Cos[a/(2*b)] + Sin[a/(2*b)])*SinI
ntegral[(a - b*ArcSin[1 - d*x^2])/(2*b)]))/(4*b^2*d*x*(-a + b*ArcSin[1 - d
*x^2]))
```

### 3.413.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {5324}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^2}\,dx$$
$$\Big\downarrow \; 5324$$
$$-\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}-\frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{4b^2\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}-\frac{\sqrt{2dx^2-d^2x^4}}{2bdx\,(a-b\arcsin(1-dx^2))}$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^(-2),x]
```

output
```
-1/2*Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*(a - b*ArcSin[1 - d*x^2])) - (x*CosInt
egral[-1/2*(a - b*ArcSin[1 - d*x^2])/b]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(4*
b^2*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) - (x*(Cos[a/(2*
b)] + Sin[a/(2*b)])*SinIntegral[a/(2*b) - ArcSin[1 - d*x^2]/2])/(4*b^2*(Co
s[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

#### 3.413.3.1 Defintions of rubi rules used

rule 5324
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-2), x_Symbol] :> Simp[-Sq
rt[-2*c*d*x^2 - d^2*x^4]/(2*b*d*x*(a + b*ArcSin[c + d*x^2])), x] + (-Simp[x
*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c + d
*x^2])]/(4*b^2*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x
] + Simp[x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Ar
cSin[c + d*x^2])]/(4*b^2*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2
]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

### 3.413.4 Maple [F]

$$\int \frac{1}{\left(a+b\arcsin\left(d\,x^{2}-1\right)\right)^{2}}dx$$

input
```
int(1/(a+b*arcsin(d*x^2-1))^2,x)
```

output
```
int(1/(a+b*arcsin(d*x^2-1))^2,x)
```

### 3.413.5 Fricas [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^2}\,dx=\int \frac{1}{(b\arcsin(dx^2-1)+a)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^2,x, algorithm="fricas")
```

output
```
integral(1/(b^2*arcsin(d*x^2 - 1)^2 + 2*a*b*arcsin(d*x^2 - 1) + a^2), x)
```

### 3.413.6 Sympy [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^2}\,dx=\int \frac{1}{\left(a+b\,\mathrm{asin}\left(dx^2-1\right)\right)^2}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2-1))**2,x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**(-2), x)
```

### 3.413.7 Maxima [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^2}\,dx=\int \frac{1}{\left(b\arcsin\left(dx^2-1\right)+a\right)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^2,x, algorithm="maxima")
```

output
```
1/2*(2*(b^2*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a*b*d)*sqrt
(d)*integrate(1/2*sqrt(-d*x^2 + 2)*x/(a*b*d*x^2 - 2*a*b + (b^2*d*x^2 - 2*b
^2)*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)), x) - sqrt(-d*x^2 + 2)
*sqrt(d))/(b^2*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a*b*d)
```

### 3.413.8 Giac [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^2}\,dx=\int \frac{1}{\left(b\arcsin\left(dx^2-1\right)+a\right)^2}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^2,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(-2), x)
```

### 3.413.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^2}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}\,(d\,x^2-1))^2}\,dx$$

input
```
int(1/(a + b*asin(d*x^2 - 1))^2,x)
```

output
```
int(1/(a + b*asin(d*x^2 - 1))^2, x)
```

# 3.414 $\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^3}\,dx$



## 3.414.1 Optimal result

Integrand size = 16, antiderivative size = 240

$$\begin{aligned}\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^3}\,dx = &-\frac{\sqrt{2dx^2-d^2x^4}}{4bdx\left(a-b\arcsin\left(1-dx^2\right)\right)^2} \\ &+\frac{x}{8b^2\left(a-b\arcsin\left(1-dx^2\right)\right)} \\ &-\frac{x\,\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)} \\ &+\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}{16b^3\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}\end{aligned}$$

output
```
1/8*x/b^2/(a+b*arcsin(d*x^2-1))+1/16*x*Si(1/2*a/b+1/2*arcsin(d*x^2-1))*(co
s(1/2*a/b)-sin(1/2*a/b))/b^3/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^
2-1)))-1/16*x*Ci(1/2*(-a-b*arcsin(d*x^2-1))/b)*(cos(1/2*a/b)+sin(1/2*a/b))
/b^3/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))-1/4*(-d^2*x^4+2*d
*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2-1))^2
```

### 3.414.2 Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 195, normalized size of antiderivative = 0.81

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^3}\,dx =$$

$$-\frac{\frac{4b^2\sqrt{-dx^2(-2+dx^2)}}{d(a-b\arcsin(1-dx^2))^2}-\frac{2bx^2}{a-b\arcsin(1-dx^2)}+\frac{\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)\left(\text{CosIntegral}\left(\frac{1}{2}\left(-\frac{a}{b}+\arcsin(1-dx^2)\right)\right)(}{d}}{16b^3x}$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^(-3),x]
```

output
```
-1/16*((4*b^2*Sqrt[-(d*x^2*(-2 + d*x^2))])/(d*(a - b*ArcSin[1 - d*x^2])^2)
 - (2*b*x^2)/(a - b*ArcSin[1 - d*x^2]) + ((Cos[ArcSin[1 - d*x^2]/2] - Sin[
ArcSin[1 - d*x^2]/2])*(CosIntegral[(-(a/b) + ArcSin[1 - d*x^2])/2]*(Cos[a/
(2*b)] + Sin[a/(2*b)]) + (-Cos[a/(2*b)] + Sin[a/(2*b)])*SinIntegral[(a - b
*ArcSin[1 - d*x^2])/(2*b)]))/d)/(b^3*x)
```

### 3.414.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.03, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5327, 5315}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^3}\,dx$$

$$\Big\downarrow \; 5327$$

$$-\frac{\int \frac{1}{a-b\arcsin(1-dx^2)}dx}{8b^2}+\frac{x}{8b^2(a-b\arcsin(1-dx^2))}-\frac{\sqrt{2dx^2-d^2x^4}}{4bdx(a-b\arcsin(1-dx^2))^2}$$

$$\Big\downarrow \; 5315$$

$$-\frac{\frac{x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{CosIntegral}\left(-\frac{a-b\arcsin(1-dx^2)}{2b}\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}-\frac{x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Si}\left(\frac{a}{2b}-\frac{1}{2}\arcsin(1-dx^2)\right)}{2b\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}}{8b^2}+\frac{x}{8b^2(a-b\arcsin(1-dx^2))}-\frac{\sqrt{2dx^2-d^2x^4}}{4bdx(a-b\arcsin(1-dx^2))^2}$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^(-3),x]
```

output
```
-1/4*Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*(a - b*ArcSin[1 - d*x^2])^2) + x/(8*b^
2*(a - b*ArcSin[1 - d*x^2])) - ((x*CosIntegral[-1/2*(a - b*ArcSin[1 - d*x^
2])/b]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(2*b*(Cos[ArcSin[1 - d*x^2]/2] - Sin
[ArcSin[1 - d*x^2]/2])) - (x*(Cos[a/(2*b)] - Sin[a/(2*b)])*SinIntegral[a/(
2*b) - ArcSin[1 - d*x^2]/2])/(2*b*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1
 - d*x^2]/2])))/(8*b^2)
```

### 3.414.3.1 Defintions of rubi rules used

rule 5315
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-1), x_Symbol] :> Simp[(-x
)*(c*Cos[a/(2*b)] - Sin[a/(2*b)])*(CosIntegral[(c/(2*b))*(a + b*ArcSin[c +
d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x]
 - Simp[x*(c*Cos[a/(2*b)] + Sin[a/(2*b)])*(SinIntegral[(c/(2*b))*(a + b*Arc
Sin[c + d*x^2])]/(2*b*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2
]))), x] /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

rule 5327
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (Simp[Sqrt
[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n + 1)*x)
), x] - Simp[1/(4*b^2*(n + 1)*(n + 2))   Int[(a + b*ArcSin[c + d*x^2])^(n +
 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

## 3.414.4 Maple [F]

$$\int \frac{1}{\left(a+b\arcsin\left(d\,x^{2}-1\right)\right)^{3}}dx$$

input
```
int(1/(a+b*arcsin(d*x^2-1))^3,x)
```

output
```
int(1/(a+b*arcsin(d*x^2-1))^3,x)
```

### 3.414.5 Fricas [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^3}\,dx=\int \frac{1}{\left(b\arcsin\left(dx^2-1\right)+a\right)^3}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^3,x, algorithm="fricas")
```

output
```
integral(1/(b^3*arcsin(d*x^2 - 1)^3 + 3*a*b^2*arcsin(d*x^2 - 1)^2 + 3*a^2*
b*arcsin(d*x^2 - 1) + a^3), x)
```

### 3.414.6 Sympy [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^3}\,dx=\int \frac{1}{\left(a+b\operatorname{asin}\left(dx^2-1\right)\right)^3}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2-1))**3,x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**(-3), x)
```

### 3.414.7 Maxima [F]

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^3}\,dx=\int \frac{1}{\left(b\arcsin\left(dx^2-1\right)+a\right)^3}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^3,x, algorithm="maxima")
```

output
```
1/8*(b*d*x*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a*d*x - 2*sqrt
(-d*x^2 + 2)*b*sqrt(d) - 8*(b^4*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt
(d)*x)^2 + 2*a*b^3*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a^2*
b^2*d)*integrate(1/8/(b^3*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) +
 a*b^2), x))/(b^4*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x)^2 + 2*a
*b^3*d*arctan2(d*x^2 - 1, sqrt(-d*x^2 + 2)*sqrt(d)*x) + a^2*b^2*d)
```

### 3.414.8 Giac [F]

$$\int \frac{1}{(a - b \arcsin (1 - dx^2))^3} \, dx = \int \frac{1}{(b \arcsin (dx^2 - 1) + a)^3} \, dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^3,x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(-3), x)
```

### 3.414.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a - b \arcsin (1 - dx^2))^3} \, dx = \int \frac{1}{(a + b \operatorname{asin} (d\, x^2 - 1))^3} \, dx$$

input
```
int(1/(a + b*asin(d*x^2 - 1))^3,x)
```

output
```
int(1/(a + b*asin(d*x^2 - 1))^3, x)
```

# 3.415 $\int \arcsin\left(1+x^2\right)^2 \, dx$



## 3.415.1 Optimal result

Integrand size = 8, antiderivative size = 40

$$\int \arcsin\left(1+x^2\right)^2 \, dx = -8x + \frac{4\sqrt{-2x^2-x^4}\arcsin\left(1+x^2\right)}{x} + x\arcsin\left(1+x^2\right)^2$$

output
```
-8*x+x*arcsin(x^2+1)^2+4*arcsin(x^2+1)*(-x^4-2*x^2)^(1/2)/x
```

## 3.415.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00

$$\int \arcsin\left(1+x^2\right)^2 \, dx = -8x + \frac{4\sqrt{-2x^2-x^4}\arcsin\left(1+x^2\right)}{x} + x\arcsin\left(1+x^2\right)^2$$

input
```
Integrate[ArcSin[1 + x^2]^2,x]
```

output
```
-8*x + (4*Sqrt[-2*x^2 - x^4]*ArcSin[1 + x^2])/x + x*ArcSin[1 + x^2]^2
```

### 3.415.3 Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {5313, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \arcsin \left(x^2+1\right)^2 \, dx$$

$$\Big\downarrow \text{5313}$$

$$-8 \int 1dx+x \arcsin \left(x^2+1\right)^2+\frac{4 \sqrt{-x^4-2 x^2} \arcsin \left(x^2+1\right)}{x}$$

$$\Big\downarrow \text{24}$$

$$x \arcsin \left(x^2+1\right)^2+\frac{4 \sqrt{-x^4-2 x^2} \arcsin \left(x^2+1\right)}{x}-8 x$$

input
```
Int[ArcSin[1 + x^2]^2,x]
```

output
```
-8*x + (4*Sqrt[-2*x^2 - x^4]*ArcSin[1 + x^2])/x + x*ArcSin[1 + x^2]^2
```

#### 3.415.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

### 3.415.4 Maple [F]

$$\int \arcsin\left(x^2+1\right)^2 dx$$

input
```
int(arcsin(x^2+1)^2,x)
```

output
```
int(arcsin(x^2+1)^2,x)
```

### 3.415.5 Fricas [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.08

$$\int \arcsin\left(1+x^2\right)^2 dx = \frac{x^2 \arcsin\left(x^2+1\right)^2 - 8\,x^2 + 4\,\sqrt{-x^4-2\,x^2}\arcsin\left(x^2+1\right)}{x}$$

input
```
integrate(arcsin(x^2+1)^2,x, algorithm="fricas")
```

output
```
(x^2*arcsin(x^2 + 1)^2 - 8*x^2 + 4*sqrt(-x^4 - 2*x^2)*arcsin(x^2 + 1))/x
```

### 3.415.6 Sympy [F]

$$\int \arcsin\left(1+x^2\right)^2 dx = \int \operatorname{asin}^2\left(x^2+1\right) dx$$

input
```
integrate(asin(x**2+1)**2,x)
```

output
```
Integral(asin(x**2 + 1)**2, x)
```

### 3.415.7 Maxima [F(-2)]

Exception generated.

$$\int \arcsin\left(1+x^2\right)^2 \, dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(arcsin(x^2+1)^2,x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_x^2)-2)
```

### 3.415.8 Giac [F]

$$\int \arcsin\left(1+x^2\right)^2 \, dx = \int \arcsin\left(x^2+1\right)^2 \, dx$$

input
```
integrate(arcsin(x^2+1)^2,x, algorithm="giac")
```

output
```
integrate(arcsin(x^2 + 1)^2, x)
```

### 3.415.9 Mupad [F(-1)]

Timed out.

$$\int \arcsin\left(1+x^2\right)^2 \, dx = \int \operatorname{asin}\left(x^2+1\right)^2 \, dx$$

input
```
int(asin(x^2 + 1)^2,x)
```

output
```
int(asin(x^2 + 1)^2, x)
```

# 3.416 $\int \arcsin \left(1-x^2\right)^2 \, dx$



## 3.416.1 Optimal result

Integrand size = 10, antiderivative size = 44

$$\int \arcsin \left(1-x^2\right)^2 \, dx = -8x-\frac{4\sqrt{2x^2-x^4}\arcsin \left(1-x^2\right)}{x}+x\arcsin \left(1-x^2\right)^2$$

output
```
-8*x+x*arcsin(x^2-1)^2+4*arcsin(x^2-1)*(-x^4+2*x^2)^(1/2)/x
```

## 3.416.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00

$$\int \arcsin \left(1-x^2\right)^2 \, dx = -8x-\frac{4\sqrt{2x^2-x^4}\arcsin \left(1-x^2\right)}{x}+x\arcsin \left(1-x^2\right)^2$$

input
```
Integrate[ArcSin[1 - x^2]^2,x]
```

output
```
-8*x - (4*Sqrt[2*x^2 - x^4]*ArcSin[1 - x^2])/x + x*ArcSin[1 - x^2]^2
```

### 3.416.3 Rubi [A] (verified)

Time = 0.17 (sec) , antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {5313, 24}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \arcsin\left(1-x^2\right)^2 dx$$

$$\Big\downarrow \text{5313}$$

$$-8\int 1dx + x\arcsin\left(1-x^2\right)^2 - \frac{4\sqrt{2x^2-x^4}\arcsin\left(1-x^2\right)}{x}$$

$$\Big\downarrow \text{24}$$

$$x\arcsin\left(1-x^2\right)^2 - \frac{4\sqrt{2x^2-x^4}\arcsin\left(1-x^2\right)}{x} - 8x$$

input
```
Int[ArcSin[1 - x^2]^2,x]
```

output
```
-8*x - (4*Sqrt[2*x^2 - x^4]*ArcSin[1 - x^2])/x + x*ArcSin[1 - x^2]^2
```

#### 3.416.3.1 Defintions of rubi rules used

rule 24
```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

### 3.416.4 Maple [F]

$$\int \arcsin\left(x^2-1\right)^2 dx$$

input
```
int(arcsin(x^2-1)^2,x)
```

output
```
int(arcsin(x^2-1)^2,x)
```

### 3.416.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.98

$$\int \arcsin\left(1-x^2\right)^2 \, dx = \frac{x^2 \arcsin\left(x^2-1\right)^2 - 8\,x^2 + 4\,\sqrt{-x^4+2\,x^2}\arcsin\left(x^2-1\right)}{x}$$

input
```
integrate(arcsin(x^2-1)^2,x, algorithm="fricas")
```

output
```
(x^2*arcsin(x^2 - 1)^2 - 8*x^2 + 4*sqrt(-x^4 + 2*x^2)*arcsin(x^2 - 1))/x
```

### 3.416.6 Sympy [F]

$$\int \arcsin\left(1-x^2\right)^2 \, dx = \int \operatorname{asin}^2\left(x^2-1\right) dx$$

input
```
integrate(asin(x**2-1)**2,x)
```

output
```
Integral(asin(x**2 - 1)**2, x)
```

### 3.416.7 Maxima [F]

$$\int \arcsin\left(1-x^2\right)^2 dx = \int \arcsin\left(x^2-1\right)^2 dx$$

input
```
integrate(arcsin(x^2-1)^2,x, algorithm="maxima")
```

output
```
x*arctan2(x^2 - 1, sqrt(-x^2 + 2)*x)^2 + 4*integrate(sqrt(-x^2 + 2)*x*arct
an2(x^2 - 1, sqrt(-x^2 + 2)*x)/(x^2 - 2), x)
```

### 3.416.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.32

$$\int \arcsin\left(1-x^2\right)^2 dx = x\arcsin\left(x^2-1\right)^2 + 2\left(\sqrt{2}\pi - 4\sqrt{2}\right)\operatorname{sgn}(x) + \frac{4\left(\sqrt{-x^2+2}\arcsin\left(x^2-1\right) + 2\sqrt{2} - 2|x|\right)}{\operatorname{sgn}(x)}$$

input
```
integrate(arcsin(x^2-1)^2,x, algorithm="giac")
```

output
```
x*arcsin(x^2 - 1)^2 + 2*(sqrt(2)*pi - 4*sqrt(2))*sgn(x) + 4*(sqrt(-x^2 + 2
)*arcsin(x^2 - 1) + 2*sqrt(2) - 2*abs(x))/sgn(x)
```

### 3.416.9 Mupad [F(-1)]

Timed out.

$$\int \arcsin\left(1-x^2\right)^2 dx = \int \operatorname{asin}\left(x^2-1\right)^2 dx$$

input
```
int(asin(x^2 - 1)^2,x)
```

output
```
int(asin(x^2 - 1)^2, x)
```

# 3.417 $\int (a+b\arcsin(1+dx^2))^{5/2}\,dx$



## 3.417.1 Optimal result

Integrand size = 16, antiderivative size = 277

$$\begin{aligned}\int (a+b\arcsin(1+dx^2))^{5/2}\,dx &= -15b^2x\sqrt{a+b\arcsin(1+dx^2)}\\ &+\frac{5b\sqrt{-2dx^2-d^2x^4}(a+b\arcsin(1+dx^2))^{3/2}}{dx}+x(a+b\arcsin(1+dx^2))^{5/2}\\ &-\frac{15\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}\\ &+\frac{15\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}\end{aligned}$$

output
```
x*(a+b*arcsin(d*x^2+1))^(5/2)-15*x*FresnelS((1/b)^(1/2)*(a+b*arcsin(d*x^2+
1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(1/b)^(5/2)/(cos(
1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+15*x*FresnelC((1/b)^(1/2)*(
a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/
(1/b)^(5/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+5*b*(a+b*a
rcsin(d*x^2+1))^(3/2)*(-d^2*x^4-2*d*x^2)^(1/2)/d/x-15*b^2*x*(a+b*arcsin(d*
x^2+1))^(1/2)
```

### 3.417.2 Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 269, normalized size of antiderivative = 0.97

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}\,dx = \frac{5b\sqrt{-dx^2\left(2+dx^2\right)}\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}{dx}$$
$$+x\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}$$
$$-\frac{15x\left(\sqrt{\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)-\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\right.\right.}{\left(\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right.}$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^(5/2),x]
```

output
```
(5*b*Sqrt[-(d*x^2*(2 + d*x^2))]*(a + b*ArcSin[1 + d*x^2])^(3/2))/(d*x) + x
*(a + b*ArcSin[1 + d*x^2])^(5/2) - (15*x*(Sqrt[Pi]*FresnelS[(Sqrt[b^(-1)]*
Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]) - S
qrt[Pi]*FresnelC[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(C
os[a/(2*b)] + Sin[a/(2*b)]) + Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]]*(
Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])))/((b^(-1))^(5/2)*(Co
s[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

### 3.417.3 Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {5313, 5310}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a+b\arcsin\left(dx^2+1\right)\right)^{5/2}dx$$
$$\Big\downarrow \; 5313$$
$$-15b^2\int \sqrt{a+b\arcsin\left(dx^2+1\right)}dx+\frac{5b\sqrt{-d^2x^4-2dx^2}\left(a+b\arcsin\left(dx^2+1\right)\right)^{3/2}}{dx}+$$
$$x\left(a+b\arcsin\left(dx^2+1\right)\right)^{5/2}$$
$$\Big\downarrow \; 5310$$

$$-15b^2\left(-\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)}+\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{\ldots}}{}\right.}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\text{ar}\ldots\right.\right.}\right.$$

$$\frac{5b\sqrt{-d^2x^4-2dx^2}\left(a+b\arcsin\left(dx^2+1\right)\right)^{3/2}}{dx}+x\left(a+b\arcsin\left(dx^2+1\right)\right)^{5/2}$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^(5/2),x]
```

output
```
(5*b*Sqrt[-2*d*x^2 - d^2*x^4]*(a + b*ArcSin[1 + d*x^2])^(3/2))/(d*x) + x*(
a + b*ArcSin[1 + d*x^2])^(5/2) - 15*b^2*(x*Sqrt[a + b*ArcSin[1 + d*x^2]] +
 (Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi
]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[b^(-1)]*(Cos[ArcSin[1 + d*x^2]/2]
- Sin[ArcSin[1 + d*x^2]/2])) - (Sqrt[Pi]*x*FresnelC[(Sqrt[b^(-1)]*Sqrt[a +
 b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Sqrt[b^(-
1)]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])))
```

### 3.417.3.1 Defintions of rubi rules used

rule 5310
```
Int[Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[x*Sq
rt[a + b*ArcSin[c + d*x^2]], x] + (-Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a
/(2*b)])*(FresnelC[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[c/b]
*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] + Simp[Sqrt[
Pi]*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*A
rcSin[c + d*x^2]]]/(Sqrt[c/b]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c +
d*x^2]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

### 3.417.4 Maple [F]

$$\int \left(a+b \arcsin \left(d \,x^{2}+1\right)\right)^{\frac{5}{2}}d x$$

input
```
int((a+b*arcsin(d*x^2+1))^(5/2),x)
```

output
```
int((a+b*arcsin(d*x^2+1))^(5/2),x)
```

### 3.417.5 Fricas [F(-2)]

Exception generated.

$$\int \left(a+b \arcsin \left(1+dx^2\right)\right)^{5/2} \, dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.417.6 Sympy [F]

$$\int \left(a+b \arcsin \left(1+dx^2\right)\right)^{5/2} \, dx = \int \left(a + b \operatorname{asin}{\left(d x^{2} + 1 \right)}\right)^{\frac{5}{2}}\, dx$$

input
```
integrate((a+b*asin(d*x**2+1))**(5/2),x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**(5/2), x)
```

### 3.417.7 Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin \left(1+dx^2\right)\right)^{5/2}\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.417.8 Giac [F]

$$\int \left(a+b\arcsin \left(1+dx^2\right)\right)^{5/2}\,dx=\int \left(b\arcsin \left(dx^2+1\right)+a\right)^{\frac{5}{2}}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + 1) + a)^(5/2), x)
```

### 3.417.9 Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin \left(1+dx^2\right)\right)^{5/2}\,dx=\int {\left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)}^{5/2}\,dx$$

input
```
int((a + b*asin(d*x^2 + 1))^(5/2),x)
```

output
```
int((a + b*asin(d*x^2 + 1))^(5/2), x)
```

# 3.418 $\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx$



## 3.418.1 Optimal result

Integrand size = 16, antiderivative size = 247

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx = \frac{3b\sqrt{-2dx^2-d^2x^4}\sqrt{a+b\arcsin\left(1+dx^2\right)}}{dx} + x\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2} + \frac{3b^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)} + \frac{3b^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)}$$

output
```
x*(a+b*arcsin(d*x^2+1))^(3/2)+3*b^(3/2)*x*FresnelC((a+b*arcsin(d*x^2+1))^(
1/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsi
n(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+3*b^(3/2)*x*FresnelS((a+b*arcsin(d*x
^2+1))^(1/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1
/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+3*b*(-d^2*x^4-2*d*x^2)^(1/2)
*(a+b*arcsin(d*x^2+1))^(1/2)/d/x
```

### 3.418.2 Mathematica [A] (verified)

Time = 0.24 (sec) , antiderivative size = 249, normalized size of antiderivative = 1.01

$$\int (a+b\arcsin(1+dx^2))^{3/2}\,dx = \frac{\sqrt{a+b\arcsin(1+dx^2)}\left(adx^2+3b\sqrt{-dx^2(2+dx^2)}+bdx^2\arcsin(1+dx^2)\right)}{dx} + \frac{3b^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)} + \frac{3b^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^(3/2),x]
```

output
```
(Sqrt[a + b*ArcSin[1 + d*x^2]]*(a*d*x^2 + 3*b*Sqrt[-(d*x^2*(2 + d*x^2))] +
 b*d*x^2*ArcSin[1 + d*x^2]))/(d*x) + (3*b^(3/2)*Sqrt[Pi]*x*FresnelC[Sqrt[a
 + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))
/(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]) + (3*b^(3/2)*Sqrt[P
i]*x*FresnelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*
b)] + Sin[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])
```

### 3.418.3 Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 253, normalized size of antiderivative = 1.02, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5313, 5318}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (a+b\arcsin(dx^2+1))^{3/2}\,dx$$

$$\Big\downarrow \text{5313}$$

$$-3b^2\int \frac{1}{\sqrt{a+b\arcsin(dx^2+1)}}dx + \frac{3b\sqrt{-d^2x^4-2dx^2}\sqrt{a+b\arcsin(dx^2+1)}}{dx} + x(a+b\arcsin(dx^2+1))^{3/2}$$

$\big\downarrow$ 5318

$$-3b^2\left(-\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)}-\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a+b\arcsi}}{\sqrt{b}\sqrt{}}\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx\right.\right.\right.}\right.$$
$$\frac{3b\sqrt{-d^2x^4-2dx^2}\sqrt{a+b\arcsin\left(dx^2+1\right)}}{dx}+x\left(a+b\arcsin\left(dx^2+1\right)\right)^{3/2}$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^(3/2),x]
```

output
```
(3*b*Sqrt[-2*d*x^2 - d^2*x^4]*Sqrt[a + b*ArcSin[1 + d*x^2]])/(d*x) + x*(a
+ b*ArcSin[1 + d*x^2])^(3/2) - 3*b^2*(-((Sqrt[Pi]*x*FresnelC[Sqrt[a + b*Ar
cSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[
b]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))) - (Sqrt[Pi]*x*F
resnelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] +
Sin[a/(2*b)]))/(Sqrt[b]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/
2])))
```

### 3.418.3.1 Defintions of rubi rules used

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

rule 5318
```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

3.418. $\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx$

### 3.418.4 Maple [F]

$$\int \left(a+b \arcsin \left(d \,x^{2}+1\right)\right)^{\frac{3}{2}}d x$$

input
```
int((a+b*arcsin(d*x^2+1))^(3/2),x)
```

output
```
int((a+b*arcsin(d*x^2+1))^(3/2),x)
```

### 3.418.5 Fricas [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin \left(1+dx^2\right)\right)^{3/2}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.418.6 Sympy [F]

$$\int \left(a+b\arcsin \left(1+dx^2\right)\right)^{3/2}\,dx=\int \left(a+b\operatorname{asin}\left(dx^{2}+1\right)\right)^{\frac{3}{2}}\,dx$$

input
```
integrate((a+b*asin(d*x**2+1))**(3/2),x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**(3/2), x)
```

### 3.418.7 Maxima [F(-2)]

Exception generated.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.418.8 Giac [F]

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx = \int \left(b\arcsin\left(dx^2+1\right)+a\right)^{\frac{3}{2}}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + 1) + a)^(3/2), x)
```

### 3.418.9 Mupad [F(-1)]

Timed out.

$$\int \left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}\,dx = \int \left(a+b\,\mathrm{asin}\left(d\,x^2+1\right)\right)^{3/2}\,dx$$

input
```
int((a + b*asin(d*x^2 + 1))^(3/2),x)
```

output
```
int((a + b*asin(d*x^2 + 1))^(3/2), x)
```

# 3.419 $\int \sqrt{a+b\arcsin\left(1+dx^2\right)}\,dx$



## 3.419.1 Optimal result

Integrand size = 16, antiderivative size = 210

$$\int \sqrt{a+b\arcsin\left(1+dx^2\right)}\,dx = x\sqrt{a+b\arcsin\left(1+dx^2\right)} + \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)} - \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}$$

output
```
x*FresnelS((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)
-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1))
)/(1/b)^(1/2)-x*FresnelC((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))
*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*ar
csin(d*x^2+1)))/(1/b)^(1/2)+x*(a+b*arcsin(d*x^2+1))^(1/2)
```

### 3.419.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.99

$$\int \sqrt{a+b\arcsin(1+dx^2)}\,dx$$
$$=\frac{x\left(\sqrt{\pi}\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)-\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right.\right.\right.}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\right.}$$

input
```
Integrate[Sqrt[a + b*ArcSin[1 + d*x^2]],x]
```

output
```
(x*(Sqrt[Pi]*FresnelS[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi
]]*(Cos[a/(2*b)] - Sin[a/(2*b)]) - Sqrt[Pi]*FresnelC[(Sqrt[b^(-1)]*Sqrt[a
+ b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]) + Sqrt[b^(
-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[
1 + d*x^2]/2])))/(Sqrt[b^(-1)]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 +
d*x^2]/2]))
```

### 3.419.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {5310}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{a+b\arcsin(dx^2+1)}\,dx$$
$$\Big\downarrow \text{5310}$$
$$-\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}+\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\sqrt{\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}+x\sqrt{a+b\arcsin(dx^2+1)}$$

input
```
Int[Sqrt[a + b*ArcSin[1 + d*x^2]],x]
```

output
```
x*Sqrt[a + b*ArcSin[1 + d*x^2]] + (Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)]*Sqrt[
a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[b
^(-1)]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) - (Sqrt[Pi]*
x*FresnelC[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(
2*b)] + Sin[a/(2*b)]))/(Sqrt[b^(-1)]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSi
n[1 + d*x^2]/2]))
```

### 3.419.3.1 Defintions of rubi rules used

rule 5310
```
Int[Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[x*Sq
rt[a + b*ArcSin[c + d*x^2]], x] + (-Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a
/(2*b)])*(FresnelC[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[c/b]
*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] + Simp[Sqrt[
Pi]*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*A
rcSin[c + d*x^2]]]/(Sqrt[c/b]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c +
d*x^2]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

## 3.419.4 Maple [F]

$$\int \sqrt{a+b \arcsin \left(d\,x^{2}+1\right)}dx$$

input
```
int((a+b*arcsin(d*x^2+1))^(1/2),x)
```

output
```
int((a+b*arcsin(d*x^2+1))^(1/2),x)
```

## 3.419.5 Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a+b \arcsin \left(1+dx^2\right)}\, dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >> Error detected within library code: inte
grate: implementation incomplete (constant residues)
```

### 3.419.6 Sympy [F]

$$\int \sqrt{a+b\arcsin(1+dx^2)}\,dx=\int \sqrt{a+b\,\mathrm{asin}(dx^2+1)}\,dx$$

input
```
integrate((a+b*asin(d*x**2+1))**(1/2),x)
```

output
```
Integral(sqrt(a + b*asin(d*x**2 + 1)), x)
```

### 3.419.7 Maxima [F(-2)]

Exception generated.

$$\int \sqrt{a+b\arcsin(1+dx^2)}\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate((a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.419.8 Giac [F]

$$\int \sqrt{a+b\arcsin(1+dx^2)}\,dx=\int \sqrt{b\arcsin(dx^2+1)+a}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="giac")
```

output
```
integrate(sqrt(b*arcsin(d*x^2 + 1) + a), x)
```

### 3.419.9 Mupad [F(-1)]

Timed out.

$$\int \sqrt{a+b\arcsin\left(1+dx^2\right)}\,dx=\int \sqrt{a+b\,\mathrm{asin}\left(d\,x^2+1\right)}\,dx$$

input
```
int((a + b*asin(d*x^2 + 1))^(1/2),x)
```

output
```
int((a + b*asin(d*x^2 + 1))^(1/2), x)
```

# 3.420 $\int \frac{1}{\sqrt{a+b \arcsin(1+dx^2)}}\,dx$



## 3.420.1 Optimal result

Integrand size = 16, antiderivative size = 185

$$\int \frac{1}{\sqrt{a+b\arcsin(1+dx^2)}}\,dx = -\frac{\sqrt{\pi}x \operatorname{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)} - \frac{\sqrt{\pi}x \operatorname{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

output
```
-x*FresnelC((a+b*arcsin(d*x^2+1))^(1/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-si
n(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))/b
^(1/2)-x*FresnelS((a+b*arcsin(d*x^2+1))^(1/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a
/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+
1)))/b^(1/2)
```

## 3.420.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 143, normalized size of antiderivative = 0.77

$$\int \frac{1}{\sqrt{a+b\arcsin(1+dx^2)}}\,dx = -\frac{\sqrt{\pi}x\left(\operatorname{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\operatorname{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\right.\right.\right.}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

input
```
Integrate[1/Sqrt[a + b*ArcSin[1 + d*x^2]],x]
```

output
```
-((Sqrt[Pi]*x*(FresnelC[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*
(Cos[a/(2*b)] - Sin[a/(2*b)]) + FresnelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sq
rt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(2*b)])))/(Sqrt[b]*(Cos[ArcSin[1 +
d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])))
```

## 3.420.3 Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {5318}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\sqrt{a+b\arcsin\left(dx^2+1\right)}}dx$$

$$\Big\downarrow \text{5318}$$

$$-\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)}-\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(dx^2+1\right)\right)\right)}$$

input
```
Int[1/Sqrt[a + b*ArcSin[1 + d*x^2]],x]
```

output
```
-((Sqrt[Pi]*x*FresnelC[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(
Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[b]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[Arc
Sin[1 + d*x^2]/2]))) - (Sqrt[Pi]*x*FresnelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/
(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Sqrt[b]*(Cos[ArcSin[1
+ d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))
```

### 3.420.3.1 Defintions of rubi rules used

rule 5318
```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

## 3.420.4 Maple [F]

$$\int \frac{1}{\sqrt{a+b\arcsin\left(d\,x^{2}+1\right)}}dx$$

input
```
int(1/(a+b*arcsin(d*x^2+1))^(1/2),x)
```

output
```
int(1/(a+b*arcsin(d*x^2+1))^(1/2),x)
```

## 3.420.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^{2}\right)}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.420.6 Sympy [F]

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^2\right)}}\,dx=\int \frac{1}{\sqrt{a+b\,\mathrm{asin}\left(dx^2+1\right)}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2+1))**(1/2),x)
```

output
```
Integral(1/sqrt(a + b*asin(d*x**2 + 1)), x)
```

### 3.420.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^2\right)}}\,dx=\text{Exception raised: RuntimeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.420.8 Giac [F]

$$\int \frac{1}{\sqrt{a+b\arcsin\left(1+dx^2\right)}}\,dx=\int \frac{1}{\sqrt{b\arcsin\left(dx^2+1\right)+a}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(1/2),x, algorithm="giac")
```

output
```
integrate(1/sqrt(b*arcsin(d*x^2 + 1) + a), x)
```

### 3.420.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a + b \arcsin (1 + dx^2)}} \, dx = \int \frac{1}{\sqrt{a + b \operatorname{asin} (d\, x^2 + 1)}} \, dx$$

input
```
int(1/(a + b*asin(d*x^2 + 1))^(1/2),x)
```

output
```
int(1/(a + b*asin(d*x^2 + 1))^(1/2), x)
```

# 3.421 $\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}\,dx$



## 3.421.1 Optimal result

Integrand size = 16, antiderivative size = 238

$$\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}\,dx = -\frac{\sqrt{-2dx^2-d^2x^4}}{bdx\sqrt{a+b\arcsin\left(1+dx^2\right)}} + \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)} - \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)}$$

output
```
(1/b)^(3/2)*x*FresnelS((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(
cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcs
in(d*x^2+1)))-(1/b)^(3/2)*x*FresnelC((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/
2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1)
)-sin(1/2*arcsin(d*x^2+1)))-(-d^2*x^4-2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x
^2+1))^(1/2)
```

### 3.421.2 Mathematica [A] (verified)

Time = 0.44 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = -\frac{\sqrt{-2dx^2-d^2x^4}}{bdx\sqrt{a+b\arcsin(1+dx^2)}} + \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)} - \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)}$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^(-3/2),x]
```

output
```
-(Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[1 + d*x^2]])) + ((b^(-
1))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])
/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[
ArcSin[1 + d*x^2]/2]) - ((b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[b^(-1)]*
Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(C
os[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])
```

### 3.421.3 Rubi [A] (verified)

Time = 0.28 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.062$, Rules used = {5321}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(dx^2+1))^{3/2}}\,dx$$

$$\Big\downarrow \text{ 5321}$$

$$-\frac{\sqrt{-d^2x^4-2dx^2}}{bdx\sqrt{a+b\arcsin(dx^2+1)}}-\frac{\sqrt{\pi}\left(\frac{1}{b}\right)^{3/2}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)}+\frac{\sqrt{\pi}\left(\frac{1}{b}\right)^{3/2}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)}$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^(-3/2),x]
```

output
```
-(Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[1 + d*x^2]])) + ((b^(-
1))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])
/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[
ArcSin[1 + d*x^2]/2]) - ((b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[b^(-1)]*
Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(C
os[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])
```

### 3.421.3.1 Defintions of rubi rules used

rule 5321
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-3/2), x_Symbol] :> Simp[-
Sqrt[-2*c*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[c + d*x^2]]), x] + (-Si
mp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(FresnelC[Sqrt[c/
(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Cos[(1/2)*ArcSin[c + d*x^2]] - c*Si
n[ArcSin[c + d*x^2]/2])), x] + Simp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] -
c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Co
s[(1/2)*ArcSin[c + d*x^2]] - c*Sin[ArcSin[c + d*x^2]/2])), x]) /; FreeQ[{a,
 b, c, d}, x] && EqQ[c^2, 1]
```

## 3.421.4 Maple [F]

$$\int \frac{1}{(a+b\arcsin(d\,x^2+1))^{\frac{3}{2}}}dx$$

input
```
int(1/(a+b*arcsin(d*x^2+1))^(3/2),x)
```

output
```
int(1/(a+b*arcsin(d*x^2+1))^(3/2),x)
```

### 3.421.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.421.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \int \frac{1}{(a+b\,\text{asin}(dx^2+1))^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2+1))**(3/2),x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**(-3/2), x)
```

### 3.421.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.421.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2+1)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + 1) + a)^(-3/2), x)
```

### 3.421.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{3/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(d\,x^2+1))^{3/2}}\,dx$$

input
```
int(1/(a + b*asin(d*x^2 + 1))^(3/2),x)
```

output
```
int(1/(a + b*asin(d*x^2 + 1))^(3/2), x)
```

# 3.422 $\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}}\,dx$



## 3.422.1 Optimal result

Integrand size = 16, antiderivative size = 261

$$\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{5/2}}\,dx = -\frac{\sqrt{-2dx^2-d^2x^4}}{3bdx\left(a+b\arcsin\left(1+dx^2\right)\right)^{3/2}}+\frac{x}{3b^2\sqrt{a+b\arcsin\left(1+dx^2\right)}} + \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{3b^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)} + \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{3b^{5/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1+dx^2\right)\right)\right)}$$

output
```
1/3*x*FresnelC((a+b*arcsin(d*x^2+1))^(1/2)/b^(1/2)/Pi^(1/2))*(cos(1/2*a/b)
-sin(1/2*a/b))*Pi^(1/2)/b^(5/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d
*x^2+1)))+1/3*x*FresnelS((a+b*arcsin(d*x^2+1))^(1/2)/b^(1/2)/Pi^(1/2))*(co
s(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/b^(5/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/
2*arcsin(d*x^2+1)))-1/3*(-d^2*x^4-2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2+1
))^(3/2)+1/3*x/b^2/(a+b*arcsin(d*x^2+1))^(1/2)
```

### 3.422.2 Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 247, normalized size of antiderivative = 0.95

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \frac{x\left(\frac{b(2+dx^2)}{\sqrt{-dx^2(2+dx^2)}(a+b\arcsin(1+dx^2))^{3/2}}+\frac{1}{\sqrt{a+b\arcsin(1+dx^2)}}+\frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{a+b\arc\cdots}}{\sqrt{\cdots}}\right.}{\sqrt{b}(\cos(\frac{1}{2}\arcsin(1+\cdots}\right.}{3b^2\cdots}$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^(-5/2),x]
```

output
```
(x*((b*(2 + d*x^2))/(Sqrt[-(d*x^2*(2 + d*x^2))]*(a + b*ArcSin[1 + d*x^2])^
(3/2)) + 1/Sqrt[a + b*ArcSin[1 + d*x^2]] + (Sqrt[Pi]*FresnelC[Sqrt[a + b*A
rcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt
[b]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2])) + (Sqrt[Pi]*Fre
snelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Si
n[a/(2*b)]))/(Sqrt[b]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]
))))/(3*b^2)
```

### 3.422.3 Rubi [A] (verified)

Time = 0.34 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.02, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5327, 5318}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(dx^2+1))^{5/2}}dx$$

$$\Big\downarrow \; 5327$$

$$-\frac{\int \frac{1}{\sqrt{a+b\arcsin(dx^2+1)}}dx}{3b^2}+\frac{x}{3b^2\sqrt{a+b\arcsin(dx^2+1)}}-\frac{\sqrt{-d^2x^4-2dx^2}}{3bdx(a+b\arcsin(dx^2+1))^{3/2}}$$

$$\Big\downarrow \; 5318$$

$$-\frac{-\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a+b\arcsin\left(dx^2+1\right)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}-\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a+b\arcsin\left(dx^2+1\right)}}{\sqrt{b}\sqrt{\pi}}\right)}{\sqrt{b}\left(\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)\right)}}{3b^2}+\frac{x}{3b^2\sqrt{a+b\arcsin\left(dx^2+1\right)}}-\frac{\sqrt{-d^2x^4-2dx^2}}{3bdx\left(a+b\arcsin\left(dx^2+1\right)\right)^{3/2}}$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^(-5/2),x]
```

output
```
-1/3*Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*(a + b*ArcSin[1 + d*x^2])^(3/2)) + x/
(3*b^2*Sqrt[a + b*ArcSin[1 + d*x^2]]) - (-((Sqrt[Pi]*x*FresnelC[Sqrt[a + b
*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sq
rt[b]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]))) - (Sqrt[Pi]*
x*FresnelS[Sqrt[a + b*ArcSin[1 + d*x^2]]/(Sqrt[b]*Sqrt[Pi])]*(Cos[a/(2*b)]
 + Sin[a/(2*b)]))/(Sqrt[b]*(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^
2]/2])))/(3*b^2)
```

### 3.422.3.1 Defintions of rubi rules used

rule 5318
```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

rule 5327
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (Simp[Sqrt
[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n + 1)*x)
), x] - Simp[1/(4*b^2*(n + 1)*(n + 2))   Int[(a + b*ArcSin[c + d*x^2])^(n +
 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

### 3.422.4 Maple [F]

$$\int \frac{1}{(a+b\arcsin(d\,x^2+1))^{\frac{5}{2}}}dx$$

input
```
int(1/(a+b*arcsin(d*x^2+1))^(5/2),x)
```

output
```
int(1/(a+b*arcsin(d*x^2+1))^(5/2),x)
```

### 3.422.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.422.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(dx^2+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2+1))**(5/2),x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**(-5/2), x)
```

### 3.422.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.422.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2+1)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + 1) + a)^(-5/2), x)
```

### 3.422.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{5/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(d\,x^2+1))^{5/2}}\,dx$$

input
```
int(1/(a + b*asin(d*x^2 + 1))^(5/2),x)
```

output
```
int(1/(a + b*asin(d*x^2 + 1))^(5/2), x)
```

# 3.423 $\int \frac{1}{\left(a+b\arcsin\left(1+dx^2\right)\right)^{7/2}}\,dx$



## 3.423.1 Optimal result

Integrand size = 16, antiderivative size = 317

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx=-\frac{\sqrt{-2dx^2-d^2x^4}}{5bdx\,(a+b\arcsin(1+dx^2))^{5/2}}+\frac{x}{15b^2\,(a+b\arcsin(1+dx^2))^{3/2}}+\frac{\sqrt{-2dx^2-d^2x^4}}{15b^3dx\sqrt{a+b\arcsin(1+dx^2)}}-\frac{\left(\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}+\frac{\left(\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(1+dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(1+dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1+dx^2)\right)\right)}$$

output
```
1/15*x/b^2/(a+b*arcsin(d*x^2+1))^(3/2)-1/15*(1/b)^(7/2)*x*FresnelS((1/b)^(
1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^
(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)))+1/15*(1/b)^(7/2)
*x*FresnelC((1/b)^(1/2)*(a+b*arcsin(d*x^2+1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b
)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2+1))-sin(1/2*arcsin(d*x^2+1)
))-1/5*(-d^2*x^4-2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2+1))^(5/2)+1/15*(-d
^2*x^4-2*d*x^2)^(1/2)/b^3/d/x/(a+b*arcsin(d*x^2+1))^(1/2)
```

### 3.423.2 Mathematica [A] (verified)

Time = 0.57 (sec) , antiderivative size = 297, normalized size of antiderivative = 0.94

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx = \frac{\frac{-\frac{3b\sqrt{-dx^2(2+dx^2)}}{d}+x^2(a+b\arcsin(1+dx^2))+\frac{\sqrt{-dx^2(2+dx^2)}(a+b\arcsin(1+dx^2))^2}{bd}}{x(a+b\arcsin(1+dx^2))^{5/2}} - \frac{\left(\frac{1}{b}\right)^{3/2}\sqrt{\pi}\ldots}{}}{}$$

input
```
Integrate[(a + b*ArcSin[1 + d*x^2])^(-7/2),x]
```

output
```
(((-3*b*Sqrt[-(d*x^2*(2 + d*x^2))])/d + x^2*(a + b*ArcSin[1 + d*x^2]) + (S
qrt[-(d*x^2*(2 + d*x^2))]*(a + b*ArcSin[1 + d*x^2])^2)/(b*d))/(x*(a + b*Ar
cSin[1 + d*x^2])^(5/2)) - ((b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[b^(-1)
]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/
(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]) + ((b^(-1))^(3/2)*Sq
rt[Pi]*x*FresnelC[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(
Cos[a/(2*b)] + Sin[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d
*x^2]/2]))/(15*b^2)
```

### 3.423.3 Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 318, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5327, 5321}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a+b\arcsin(dx^2+1))^{7/2}}dx$$

$$\Big\downarrow \text{5327}$$

$$-\frac{\int \frac{1}{(a+b\arcsin(dx^2+1))^{3/2}}dx}{15b^2}+\frac{x}{15b^2(a+b\arcsin(dx^2+1))^{3/2}}-\frac{\sqrt{-d^2x^4-2dx^2}}{5bdx(a+b\arcsin(dx^2+1))^{5/2}}$$

$$\Big\downarrow \text{5321}$$

$$-\frac{-\frac{\sqrt{-d^2x^4-2dx^2}}{bdx\sqrt{a+b\arcsin(dx^2+1)}}-\frac{\sqrt{\pi}\left(\frac{1}{b}\right)^{3/2}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{\frac{1}{b}}\sqrt{a+b\arcsin(dx^2+1)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin\left(\frac{1}{2}\arcsin(dx^2+1)\right)}+\frac{\sqrt{\pi}\left(\frac{1}{b}\right)^{3/2}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{Fresnel}}{\cos\left(\frac{1}{2}\arcsin(dx^2+1)\right)-\sin(}}{15b^2}$$

$$\frac{x}{15b^2\left(a+b\arcsin\left(dx^2+1\right)\right)^{3/2}}-\frac{\sqrt{-d^2x^4-2dx^2}}{5bdx\left(a+b\arcsin\left(dx^2+1\right)\right)^{5/2}}$$

input
```
Int[(a + b*ArcSin[1 + d*x^2])^(-7/2),x]
```

output
```
-1/5*Sqrt[-2*d*x^2 - d^2*x^4]/(b*d*x*(a + b*ArcSin[1 + d*x^2])^(5/2)) + x/
(15*b^2*(a + b*ArcSin[1 + d*x^2])^(3/2)) - (-(Sqrt[-2*d*x^2 - d^2*x^4]/(b*
d*x*Sqrt[a + b*ArcSin[1 + d*x^2]])) + ((b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelS[
(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin
[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[ArcSin[1 + d*x^2]/2]) - ((b^(-
1))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[b^(-1)]*Sqrt[a + b*ArcSin[1 + d*x^2]])
/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Cos[ArcSin[1 + d*x^2]/2] - Sin[
ArcSin[1 + d*x^2]/2]))/(15*b^2)
```

### 3.423.3.1 Defintions of rubi rules used

rule 5321
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-3/2), x_Symbol] :> Simp[-
Sqrt[-2*c*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[c + d*x^2]]), x] + (-Si
mp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(FresnelC[Sqrt[c/
(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Cos[(1/2)*ArcSin[c + d*x^2]] - c*Si
n[ArcSin[c + d*x^2]/2])), x] + Simp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] -
c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Co
s[(1/2)*ArcSin[c + d*x^2]] - c*Sin[ArcSin[c + d*x^2]/2])), x]) /; FreeQ[{a,
 b, c, d}, x] && EqQ[c^2, 1]
```

rule 5327
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (Simp[Sqrt
[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n + 1)*x)
), x] - Simp[1/(4*b^2*(n + 1)*(n + 2))   Int[(a + b*ArcSin[c + d*x^2])^(n +
 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

## 3.423. $\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx$

### 3.423.4 Maple [F]

$$\int \frac{1}{\left(a+b \arcsin \left(d \,x^{2}+1\right)\right)^{\frac{7}{2}}}d x$$

input
```
int(1/(a+b*arcsin(d*x^2+1))^(7/2),x)
```

output
```
int(1/(a+b*arcsin(d*x^2+1))^(7/2),x)
```

### 3.423.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.423.6 Sympy [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx = \int \frac{1}{\left(a + b \operatorname{asin}{\left(d x^{2} + 1 \right)}\right)^{\frac{7}{2}}}\, dx$$

input
```
integrate(1/(a+b*asin(d*x**2+1))**(7/2),x)
```

output
```
Integral((a + b*asin(d*x**2 + 1))**(-7/2), x)
```

### 3.423.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(7/2),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt((-_SAGE_VAR_d*_SAGE_VAR_x^2)-2)
```

### 3.423.8 Giac [F]

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2+1)+a)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2+1))^(7/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 + 1) + a)^(-7/2), x)
```

### 3.423.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a+b\arcsin(1+dx^2))^{7/2}}\,dx = \int \frac{1}{(a+b\,\mathrm{asin}(d\,x^2+1))^{7/2}}\,dx$$

input
```
int(1/(a + b*asin(d*x^2 + 1))^(7/2),x)
```

output
```
int(1/(a + b*asin(d*x^2 + 1))^(7/2), x)
```

# 3.424 $\int (a-b\arcsin(1-dx^2))^{5/2}\,dx$



## 3.424.1 Optimal result

Integrand size = 18, antiderivative size = 299

$$\begin{aligned}\int (a-b\arcsin(1-dx^2))^{5/2}\,dx &= -15b^2x\sqrt{a-b\arcsin(1-dx^2)} \\ &+ \frac{5b\sqrt{2dx^2-d^2x^4}(a-b\arcsin(1-dx^2))^{3/2}}{dx} + x(a-b\arcsin(1-dx^2))^{5/2} \\ &+ \frac{15\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\left(-\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} \\ &- \frac{15\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\left(-\frac{1}{b}\right)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}\end{aligned}$$

output
```
x*(a+b*arcsin(d*x^2-1))^(5/2)+15*x*FresnelC((-1/b)^(1/2)*(a+b*arcsin(d*x^2
-1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(-1/b)^(5/2)/(co
s(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))-15*x*FresnelS((-1/b)^(1/2
)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/
2)/(-1/b)^(5/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))+5*b*(a
+b*arcsin(d*x^2-1))^(3/2)*(-d^2*x^4+2*d*x^2)^(1/2)/d/x-15*b^2*x*(a+b*arcsi
n(d*x^2-1))^(1/2)
```

### 3.424.2 Mathematica [A] (verified)

Time = 0.21 (sec) , antiderivative size = 292, normalized size of antiderivative = 0.98

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}\,dx=\frac{5b\sqrt{-dx^2\left(-2+dx^2\right)}\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}{dx}$$
$$+x\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}$$
$$+\frac{15bx\left(-\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\sqrt{\pi}\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\right.}{\left(-\frac{1}{b}\right)^{3/2}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx\right.\right.\right.}$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^(5/2),x]
```

output
```
(5*b*Sqrt[-(d*x^2*(-2 + d*x^2))]*(a - b*ArcSin[1 - d*x^2])^(3/2))/(d*x) +
x*(a - b*ArcSin[1 - d*x^2])^(5/2) + (15*b*x*(-(Sqrt[Pi]*FresnelC[(Sqrt[-b^
(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)
])) + Sqrt[Pi]*FresnelS[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt
[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]) + Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 -
d*x^2]]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])))/((-b^(-1))
^(3/2)*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

### 3.424.3 Rubi [A] (verified)

Time = 0.40 (sec) , antiderivative size = 300, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {5313, 5310}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}dx$$

$$\Big\downarrow \; 5313$$

$$-15b^2\int \sqrt{a-b\arcsin\left(1-dx^2\right)}dx+\frac{5b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}$$

$$\Big\downarrow \; 5310$$

$$-15b^2\left(-\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}+\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\sqrt{-\right.}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\right.\right.}\right.$$

$$\frac{5b\sqrt{2dx^2-d^2x^4}\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^(5/2),x]
```

output
```
(5*b*Sqrt[2*d*x^2 - d^2*x^4]*(a - b*ArcSin[1 - d*x^2])^(3/2))/(d*x) + x*(a
 - b*ArcSin[1 - d*x^2])^(5/2) - 15*b^2*(x*Sqrt[a - b*ArcSin[1 - d*x^2]] -
(Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi
]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[-b^(-1)]*(Cos[ArcSin[1 - d*x^2]/2]
 - Sin[ArcSin[1 - d*x^2]/2])) + (Sqrt[Pi]*x*FresnelS[(Sqrt[-b^(-1)]*Sqrt[a
 - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Sqrt[-b
^(-1)]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])))
```

### 3.424.3.1 Defintions of rubi rules used

rule 5310
```
Int[Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[x*Sq
rt[a + b*ArcSin[c + d*x^2]], x] + (-Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a
/(2*b)])*(FresnelC[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[c/b]
*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] + Simp[Sqrt[
Pi]*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*A
rcSin[c + d*x^2]]]/(Sqrt[c/b]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c +
d*x^2]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

### 3.424.4 Maple [F]

$$\int \left(a+b \arcsin \left(d \,x^{2}-1\right)\right)^{\frac{5}{2}}d x$$

input
```
int((a+b*arcsin(d*x^2-1))^(5/2),x)
```

output
```
int((a+b*arcsin(d*x^2-1))^(5/2),x)
```

### 3.424.5 Fricas [F(-2)]

Exception generated.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.424.6 Sympy [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}\,dx = \int \left(a+b\operatorname{asin}\left(dx^2-1\right)\right)^{\frac{5}{2}}\,dx$$

input
```
integrate((a+b*asin(d*x**2-1))**(5/2),x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**(5/2), x)
```

### 3.424.7 Maxima [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2} dx = \int \left(b\arcsin\left(dx^2-1\right)+a\right)^{\frac{5}{2}} dx$$

input
```
integrate((a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(5/2), x)
```

### 3.424.8 Giac [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2} dx = \int \left(b\arcsin\left(dx^2-1\right)+a\right)^{\frac{5}{2}} dx$$

input
```
integrate((a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(5/2), x)
```

### 3.424.9 Mupad [F(-1)]

Timed out.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2} dx = \int \left(a+b\,\mathrm{asin}\left(d\,x^2-1\right)\right)^{5/2} dx$$

input
```
int((a + b*asin(d*x^2 - 1))^(5/2),x)
```

output
```
int((a + b*asin(d*x^2 - 1))^(5/2), x)
```

# 3.425 $\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2} dx$



## 3.425.1 Optimal result

Integrand size = 18, antiderivative size = 267

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2} dx=\frac{3b\sqrt{2dx^2-d^2x^4}\sqrt{a-b\arcsin\left(1-dx^2\right)}}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}+\frac{3(-b)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}+\frac{3(-b)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}$$

output
```
x*(a+b*arcsin(d*x^2-1))^(3/2)+3*(-b)^(3/2)*x*FresnelS((a+b*arcsin(d*x^2-1)
)^(1/2)/(-b)^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2
*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))+3*(-b)^(3/2)*x*FresnelC((a+b*a
rcsin(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^
(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))+3*b*(-d^2*x^4+2*
d*x^2)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/d/x
```

### 3.425.2 Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 265, normalized size of antiderivative = 0.99

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx=\frac{3b\sqrt{-dx^2\left(-2+dx^2\right)}\sqrt{a-b\arcsin\left(1-dx^2\right)}}{dx}$$
$$+x\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}$$
$$+\frac{3(-b)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}$$
$$+\frac{3(-b)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^(3/2),x]
```

output
```
(3*b*Sqrt[-(d*x^2*(-2 + d*x^2))]*Sqrt[a - b*ArcSin[1 - d*x^2]])/(d*x) + x*
(a - b*ArcSin[1 - d*x^2])^(3/2) + (3*(-b)^(3/2)*Sqrt[Pi]*x*FresnelS[Sqrt[a
 - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)])
)/(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]) + (3*(-b)^(3/2)*Sq
rt[Pi]*x*FresnelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[
a/(2*b)] + Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2
]/2])
```

### 3.425.3 Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.02, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {5313, 5318}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx$$

$$\Big\downarrow \text{5313}$$

$$-3b^2\int \frac{1}{\sqrt{a-b\arcsin\left(1-dx^2\right)}}dx+\frac{3b\sqrt{2dx^2-d^2x^4}\sqrt{a-b\arcsin\left(1-dx^2\right)}}{dx}+$$
$$x\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}$$

$$\Big\downarrow \text{5318}$$

$$-3b^2\left(-\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}-\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a-b\,\text{ar}}}{\sqrt{}}\right.}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\text{arcsi}\right.\right.}\right.$$

$$\frac{3b\sqrt{2dx^2-d^2x^4}\sqrt{a-b\arcsin\left(1-dx^2\right)}}{dx}+x\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^(3/2),x]
```

output
```
(3*b*Sqrt[2*d*x^2 - d^2*x^4]*Sqrt[a - b*ArcSin[1 - d*x^2]])/(d*x) + x*(a -
 b*ArcSin[1 - d*x^2])^(3/2) - 3*b^2*(-((Sqrt[Pi]*x*FresnelS[Sqrt[a - b*Arc
Sin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[
-b]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))) - (Sqrt[Pi]*x*
FresnelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)]
+ Sin[a/(2*b)]))/(Sqrt[-b]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^
2]/2])))
```

### 3.425.3.1 Defintions of rubi rules used

rule 5313
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
a + b*ArcSin[c + d*x^2])^n, x] + (Simp[2*b*n*Sqrt[-2*c*d*x^2 - d^2*x^4]*((a
 + b*ArcSin[c + d*x^2])^(n - 1)/(d*x)), x] - Simp[4*b^2*n*(n - 1)   Int[(a
+ b*ArcSin[c + d*x^2])^(n - 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^
2, 1] && GtQ[n, 1]
```

rule 5318
```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

### 3.425.4 Maple [F]

$$\int \left(a+b \arcsin \left(d \,x^{2}-1\right)\right)^{\frac{3}{2}}d x$$

input
```
int((a+b*arcsin(d*x^2-1))^(3/2),x)
```

output
```
int((a+b*arcsin(d*x^2-1))^(3/2),x)
```

### 3.425.5 Fricas [F(-2)]

Exception generated.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.425.6 Sympy [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx=\int \left(a+b\operatorname{asin}\left(dx^{2}-1\right)\right)^{\frac{3}{2}}\,dx$$

input
```
integrate((a+b*asin(d*x**2-1))**(3/2),x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**(3/2), x)
```

### 3.425.7 Maxima [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx=\int \left(b\arcsin\left(dx^2-1\right)+a\right)^{\frac{3}{2}}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(3/2), x)
```

### 3.425.8 Giac [F]

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx=\int \left(b\arcsin\left(dx^2-1\right)+a\right)^{\frac{3}{2}}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(3/2), x)
```

### 3.425.9 Mupad [F(-1)]

Timed out.

$$\int \left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}\,dx=\int \left(a+b\,\mathrm{asin}\left(d\,x^2-1\right)\right)^{3/2}\,dx$$

input
```
int((a + b*asin(d*x^2 - 1))^(3/2),x)
```

output
```
int((a + b*asin(d*x^2 - 1))^(3/2), x)
```

# 3.426 $\int \sqrt{a-b\arcsin(1-dx^2)}\,dx$



## 3.426.1 Optimal result

Integrand size = 18, antiderivative size = 228

$$\int \sqrt{a-b\arcsin(1-dx^2)}\,dx$$
$$= x\sqrt{a-b\arcsin(1-dx^2)} - \frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$
$$+ \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

output
```
-x*FresnelC((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2))*(cos(1/2*a/
b)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1
)))/(-1/b)^(1/2)+x*FresnelS((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1
/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/
2*arcsin(d*x^2-1)))/(-1/b)^(1/2)+x*(a+b*arcsin(d*x^2-1))^(1/2)
```

### 3.426.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 225, normalized size of antiderivative = 0.99

$$\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx = \frac{x\left(-\sqrt{\pi}\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)+\sqrt{\pi}\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)(\text{c}}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right.\right.}$$

input
```
Integrate[Sqrt[a - b*ArcSin[1 - d*x^2]],x]
```

output
```
(x*(-(Sqrt[Pi]*FresnelC[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt
[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)])) + Sqrt[Pi]*FresnelS[(Sqrt[-b^(-1)]*Sq
rt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]) + Sqr
t[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[A
rcSin[1 - d*x^2]/2])))/(Sqrt[-b^(-1)]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcS
in[1 - d*x^2]/2]))
```

### 3.426.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 228, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {5310}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx$$

$$\Big\downarrow \; 5310$$

$$-\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}+\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\sqrt{-\frac{1}{b}}\left(\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)\right)}+x\sqrt{a-b\arcsin\left(1-dx^2\right)}$$

input
```
Int[Sqrt[a - b*ArcSin[1 - d*x^2]],x]
```

output
```
x*Sqrt[a - b*ArcSin[1 - d*x^2]] - (Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sqrt
[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[
-b^(-1)]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) + (Sqrt[Pi
]*x*FresnelS[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[
a/(2*b)] + Sin[a/(2*b)]))/(Sqrt[-b^(-1)]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[A
rcSin[1 - d*x^2]/2]))
```

### 3.426.3.1 Defintions of rubi rules used

rule 5310
```
Int[Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[x*Sq
rt[a + b*ArcSin[c + d*x^2]], x] + (-Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a
/(2*b)])*(FresnelC[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[c/b]
*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] + Simp[Sqrt[
Pi]*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*A
rcSin[c + d*x^2]]]/(Sqrt[c/b]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c +
d*x^2]/2]))), x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

## 3.426.4 Maple [F]

$$\int \sqrt{a+b\arcsin\left(d\,x^{2}-1\right)}dx$$

input
```
int((a+b*arcsin(d*x^2-1))^(1/2),x)
```

output
```
int((a+b*arcsin(d*x^2-1))^(1/2),x)
```

## 3.426.5 Fricas [F(-2)]

Exception generated.

$$\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >> Error detected within library code: inte
grate: implementation incomplete (constant residues)
```

### 3.426.6 Sympy [F]

$$\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx=\int \sqrt{a+b\,\mathrm{asin}\left(dx^2-1\right)}\,dx$$

input
```
integrate((a+b*asin(d*x**2-1))**(1/2),x)
```

output
```
Integral(sqrt(a + b*asin(d*x**2 - 1)), x)
```

### 3.426.7 Maxima [F]

$$\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx=\int \sqrt{b\arcsin\left(dx^2-1\right)+a}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(b*arcsin(d*x^2 - 1) + a), x)
```

### 3.426.8 Giac [F]

$$\int \sqrt{a-b\arcsin\left(1-dx^2\right)}\,dx=\int \sqrt{b\arcsin\left(dx^2-1\right)+a}\,dx$$

input
```
integrate((a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="giac")
```

output
```
integrate(sqrt(b*arcsin(d*x^2 - 1) + a), x)
```

### 3.426.9 Mupad [F(-1)]

Timed out.

$$\int \sqrt{a-b\arcsin(1-dx^2)}\,dx=\int \sqrt{a+b\,\mathrm{asin}\left(d\,x^2-1\right)}\,dx$$

input
```
int((a + b*asin(d*x^2 - 1))^(1/2),x)
```

output
```
int((a + b*asin(d*x^2 - 1))^(1/2), x)
```

# 3.427 $\int \frac{1}{\sqrt{a-b \arcsin (1-d x^2)}} \, dx$



## 3.427.1 Optimal result

Integrand size = 18, antiderivative size = 201

$$\int \frac{1}{\sqrt{a-b \arcsin (1-d x^2)}} \, dx = -\frac{\sqrt{\pi} x \operatorname{FresnelS}\left(\frac{\sqrt{a-b \arcsin (1-d x^2)}}{\sqrt{-b}\sqrt{\pi}}\right) \left(\cos \left(\frac{a}{2 b}\right)-\sin \left(\frac{a}{2 b}\right)\right)}{\sqrt{-b} \left(\cos \left(\frac{1}{2} \arcsin (1-d x^2)\right)-\sin \left(\frac{1}{2} \arcsin (1-d x^2)\right)\right)} - \frac{\sqrt{\pi} x \operatorname{FresnelC}\left(\frac{\sqrt{a-b \arcsin (1-d x^2)}}{\sqrt{-b}\sqrt{\pi}}\right) \left(\cos \left(\frac{a}{2 b}\right)+\sin \left(\frac{a}{2 b}\right)\right)}{\sqrt{-b} \left(\cos \left(\frac{1}{2} \arcsin (1-d x^2)\right)-\sin \left(\frac{1}{2} \arcsin (1-d x^2)\right)\right)}$$

output
```
-x*FresnelS((a+b*arcsin(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(1/2))*(cos(1/2*a/b)
-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1))
)/(-b)^(1/2)-x*FresnelC((a+b*arcsin(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(1/2))*(
cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcs
in(d*x^2-1)))/(-b)^(1/2)
```

## 3.427.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.77

$$\int \frac{1}{\sqrt{a-b \arcsin (1-d x^2)}} \, dx = \frac{b\sqrt{\pi} x \left(\operatorname{FresnelS}\left(\frac{\sqrt{a-b \arcsin (1-d x^2)}}{\sqrt{-b}\sqrt{\pi}}\right) \left(\cos \left(\frac{a}{2 b}\right)-\sin \left(\frac{a}{2 b}\right)\right)+\operatorname{FresnelC}\left(\frac{\sqrt{a-b \arcsin (1-d x^2)}}{\sqrt{-b}\sqrt{\pi}}\right) \left(\cos \left(\frac{a}{2 b}\right)+\sin \left(\frac{a}{2 b}\right)\right)\right)}{(-b)^{3/2} \left(\cos \left(\frac{1}{2} \arcsin (1-d x^2)\right)-\sin \left(\frac{1}{2} \arcsin (1-d x^2)\right)\right)}$$

input
```
Integrate[1/Sqrt[a - b*ArcSin[1 - d*x^2]],x]
```

output
```
(b*Sqrt[Pi]*x*(FresnelS[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]
*(Cos[a/(2*b)] - Sin[a/(2*b)]) + FresnelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(S
qrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(2*b)])))/((-b)^(3/2)*(Cos[ArcSin
[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

### 3.427.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {5318}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\sqrt{a-b\arcsin(1-dx^2)}}dx$$

$$\Big\downarrow \text{ 5318}$$

$$-\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}-\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

input
```
Int[1/Sqrt[a - b*ArcSin[1 - d*x^2]],x]
```

output
```
-((Sqrt[Pi]*x*FresnelS[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*
(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[-b]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[A
rcSin[1 - d*x^2]/2]))) - (Sqrt[Pi]*x*FresnelC[Sqrt[a - b*ArcSin[1 - d*x^2]
]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Sqrt[-b]*(Cos[ArcSi
n[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))
```

### 3.427.3.1 Defintions of rubi rules used

rule 5318
```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

## 3.427.4 Maple [F]

$$\int \frac{1}{\sqrt{a+b\arcsin\left(d\,x^{2}-1\right)}}dx$$

input
```
int(1/(a+b*arcsin(d*x^2-1))^(1/2),x)
```

output
```
int(1/(a+b*arcsin(d*x^2-1))^(1/2),x)
```

## 3.427.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{a-b\arcsin\left(1-dx^{2}\right)}}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.427.6 Sympy [F]

$$\int \frac{1}{\sqrt{a - b \arcsin (1 - dx^2)}}\, dx = \int \frac{1}{\sqrt{a + b \operatorname{asin}(dx^2 - 1)}}\, dx$$

input
```
integrate(1/(a+b*asin(d*x**2-1))**(1/2),x)
```

output
```
Integral(1/sqrt(a + b*asin(d*x**2 - 1)), x)
```

### 3.427.7 Maxima [F]

$$\int \frac{1}{\sqrt{a - b \arcsin (1 - dx^2)}}\, dx = \int \frac{1}{\sqrt{b \arcsin (dx^2 - 1) + a}}\, dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="maxima")
```

output
```
integrate(1/sqrt(b*arcsin(d*x^2 - 1) + a), x)
```

### 3.427.8 Giac [F]

$$\int \frac{1}{\sqrt{a - b \arcsin (1 - dx^2)}}\, dx = \int \frac{1}{\sqrt{b \arcsin (dx^2 - 1) + a}}\, dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(1/2),x, algorithm="giac")
```

output
```
integrate(1/sqrt(b*arcsin(d*x^2 - 1) + a), x)
```

### 3.427.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\sqrt{a - b \arcsin(1 - dx^2)}}\, dx = \int \frac{1}{\sqrt{a + b \operatorname{asin}(d\, x^2 - 1)}}\, dx$$

input
```
int(1/(a + b*asin(d*x^2 - 1))^(1/2),x)
```

output
```
int(1/(a + b*asin(d*x^2 - 1))^(1/2), x)
```

# 3.428 $\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}\,dx$



## 3.428.1 Optimal result

Integrand size = 18, antiderivative size = 256

$$\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{bdx\sqrt{a-b\arcsin\left(1-dx^2\right)}} - \frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)} + \frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)-\sin\left(\frac{1}{2}\arcsin\left(1-dx^2\right)\right)}$$

output
```
-(-1/b)^(3/2)*x*FresnelC((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2)
)*(cos(1/2*a/b)-sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*a
rcsin(d*x^2-1)))+(-1/b)^(3/2)*x*FresnelS((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1)
)^(1/2)/Pi^(1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x
^2-1))+sin(1/2*arcsin(d*x^2-1)))-(-d^2*x^4+2*d*x^2)^(1/2)/b/d/x/(a+b*arcsi
n(d*x^2-1))^(1/2)
```

### 3.428.2 Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.00

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{bdx\sqrt{a-b\arcsin(1-dx^2)}} - \frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)} + \frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)}$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^(-3/2),x]
```

output
```
-(Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a - b*ArcSin[1 - d*x^2]])) - ((-b^(-
1))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]]
)/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin
[ArcSin[1 - d*x^2]/2]) + ((-b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[-b^(-1
)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))
/(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])
```

### 3.428.3 Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}} = 0.056$, Rules used = {5321}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx$$

$$\Big\downarrow \; 5321$$

$$
-\frac{\sqrt{2dx^2-d^2x^4}}{bdx\sqrt{a-b\arcsin(1-dx^2)}}-\frac{\sqrt{\pi}\left(-\frac{1}{b}\right)^{3/2}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)}+\frac{\sqrt{\pi}\left(-\frac{1}{b}\right)^{3/2}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)}
$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^(-3/2),x]
```

output
```
-(Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a - b*ArcSin[1 - d*x^2]])) - ((-b^(-
1))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]]
)/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin
[ArcSin[1 - d*x^2]/2]) + ((-b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[-b^(-1
)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))
/(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])
```

### 3.428.3.1 Defintions of rubi rules used

rule 5321
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-3/2), x_Symbol] :> Simp[-
Sqrt[-2*c*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[c + d*x^2]]), x] + (-Si
mp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(FresnelC[Sqrt[c/
(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Cos[(1/2)*ArcSin[c + d*x^2]] - c*Si
n[ArcSin[c + d*x^2]/2])), x] + Simp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] -
c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Co
s[(1/2)*ArcSin[c + d*x^2]] - c*Sin[ArcSin[c + d*x^2]/2])), x]) /; FreeQ[{a,
 b, c, d}, x] && EqQ[c^2, 1]
```

## 3.428.4 Maple [F]

$$
\int \frac{1}{(a+b\arcsin(d\,x^2-1))^{\frac{3}{2}}}dx
$$

input
```
int(1/(a+b*arcsin(d*x^2-1))^(3/2),x)
```

output
```
int(1/(a+b*arcsin(d*x^2-1))^(3/2),x)
```

### 3.428.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.428.6 Sympy [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = \int \frac{1}{(a+b\,\text{asin}\,(dx^2-1))^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2-1))**(3/2),x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**(-3/2), x)
```

### 3.428.7 Maxima [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2-1)+a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(-3/2), x)
```

### 3.428.8 Giac [F]

$$\int \frac{1}{(a - b\arcsin(1 - dx^2))^{3/2}}\,dx = \int \frac{1}{(b\arcsin(dx^2 - 1) + a)^{\frac{3}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(3/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(-3/2), x)
```

### 3.428.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a - b\arcsin(1 - dx^2))^{3/2}}\,dx = \int \frac{1}{(a + b\,\mathrm{asin}(d\,x^2 - 1))^{3/2}}\,dx$$

input
```
int(1/(a + b*asin(d*x^2 - 1))^(3/2),x)
```

output
```
int(1/(a + b*asin(d*x^2 - 1))^(3/2), x)
```

# 3.429 $\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}}\,dx$



## 3.429.1 Optimal result

Integrand size = 18, antiderivative size = 281

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{3bdx\,(a-b\arcsin(1-dx^2))^{3/2}}+\frac{x}{3b^2\sqrt{a-b\arcsin(1-dx^2)}}+\frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{3(-b)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}+\frac{\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{3(-b)^{5/2}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

output
```
1/3*x*FresnelS((a+b*arcsin(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(1/2))*(cos(1/2*a
/b)-sin(1/2*a/b))*Pi^(1/2)/(-b)^(5/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*ar
csin(d*x^2-1)))+1/3*x*FresnelC((a+b*arcsin(d*x^2-1))^(1/2)/(-b)^(1/2)/Pi^(
1/2))*(cos(1/2*a/b)+sin(1/2*a/b))*Pi^(1/2)/(-b)^(5/2)/(cos(1/2*arcsin(d*x^
2-1))+sin(1/2*arcsin(d*x^2-1)))-1/3*(-d^2*x^4+2*d*x^2)^(1/2)/b/d/x/(a+b*ar
csin(d*x^2-1))^(3/2)+1/3*x/b^2/(a+b*arcsin(d*x^2-1))^(1/2)
```

## 3.429.2 Mathematica [A] (verified)

Time = 0.58 (sec) , antiderivative size = 270, normalized size of antiderivative = 0.96

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx = \frac{\frac{-\frac{b\sqrt{-dx^2(-2+dx^2)}}{d}+x^2(a-b\arcsin(1-dx^2))}{x(a-b\arcsin(1-dx^2))^{3/2}} + \frac{\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{-b}\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\right.}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-\right.\right.}}{3b^2}$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^(-5/2),x]
```

output
```
((-((b*Sqrt[-(d*x^2*(-2 + d*x^2))])/d) + x^2*(a - b*ArcSin[1 - d*x^2]))/(x
*(a - b*ArcSin[1 - d*x^2])^(3/2)) + (Sqrt[Pi]*x*FresnelS[Sqrt[a - b*ArcSin
[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sqrt[-b]
*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2])) + (Sqrt[Pi]*x*Fres
nelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] + Si
n[a/(2*b)]))/(Sqrt[-b]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2
])))/(3*b^2)
```

## 3.429.3 Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.01, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {5327, 5318}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx$$

$$\Big\downarrow \text{ 5327}$$

$$-\frac{\int \frac{1}{\sqrt{a-b\arcsin(1-dx^2)}}dx}{3b^2} + \frac{x}{3b^2\sqrt{a-b\arcsin(1-dx^2)}} - \frac{\sqrt{2dx^2-d^2x^4}}{3bdx(a-b\arcsin(1-dx^2))^{3/2}}$$

$$\Big\downarrow \text{ 5318}$$

$$-\frac{-\frac{\sqrt{\pi}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\text{FresnelC}\left(\frac{\sqrt{a-b\arcsin\left(1-dx^2\right)}}{\sqrt{-b}\sqrt{\pi}}\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}-\frac{\sqrt{\pi}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\text{FresnelS}\left(\frac{\sqrt{a-b\arcsin\left(1-dx^2\right)}}{\sqrt{-b}\sqrt{\pi}}\right)}{\sqrt{-b}\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}}{3b^2}+\frac{x}{3b^2\sqrt{a-b\arcsin\left(1-dx^2\right)}}-\frac{\sqrt{2dx^2-d^2x^4}}{3bdx\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^(-5/2),x]
```

output
```
-1/3*Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*(a - b*ArcSin[1 - d*x^2])^(3/2)) + x/(
3*b^2*Sqrt[a - b*ArcSin[1 - d*x^2]]) - (-((Sqrt[Pi]*x*FresnelS[Sqrt[a - b*
ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Sq
rt[-b]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]))) - (Sqrt[Pi]
*x*FresnelC[Sqrt[a - b*ArcSin[1 - d*x^2]]/(Sqrt[-b]*Sqrt[Pi])]*(Cos[a/(2*b
)] + Sin[a/(2*b)]))/(Sqrt[-b]*(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d
*x^2]/2])))/(3*b^2)
```

### 3.429.3.1 Defintions of rubi rules used

rule 5318
```
Int[1/Sqrt[(a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.)], x_Symbol] :> Simp[(-
Sqrt[Pi])*x*(Cos[a/(2*b)] - c*Sin[a/(2*b)])*(FresnelC[(1/(Sqrt[b*c]*Sqrt[Pi
]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c
*Sin[ArcSin[c + d*x^2]/2]))), x] - Simp[Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/
(2*b)])*(FresnelS[(1/(Sqrt[b*c]*Sqrt[Pi]))*Sqrt[a + b*ArcSin[c + d*x^2]]]/(
Sqrt[b*c]*(Cos[ArcSin[c + d*x^2]/2] - c*Sin[ArcSin[c + d*x^2]/2]))), x] /;
FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1]
```

rule 5327
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (Simp[Sqrt
[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n + 1)*x)
), x] - Simp[1/(4*b^2*(n + 1)*(n + 2))   Int[(a + b*ArcSin[c + d*x^2])^(n +
 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

### 3.429.4 Maple [F]

$$\int \frac{1}{\left(a+b \arcsin \left(d \,x^{2}-1\right)\right)^{\frac{5}{2}}}d x$$

input
```
int(1/(a+b*arcsin(d*x^2-1))^(5/2),x)
```

output
```
int(1/(a+b*arcsin(d*x^2-1))^(5/2),x)
```

### 3.429.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.429.6 Sympy [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx = \int \frac{1}{\left(a+b\,\mathrm{asin}\left(dx^{2}-1\right)\right)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2-1))**(5/2),x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**(-5/2), x)
```

### 3.429.7 Maxima [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx=\int \frac{1}{(b\arcsin(dx^2-1)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(-5/2), x)
```

### 3.429.8 Giac [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx=\int \frac{1}{(b\arcsin(dx^2-1)+a)^{\frac{5}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(5/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(-5/2), x)
```

### 3.429.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{5/2}}\,dx=\int \frac{1}{(a+b\,\mathrm{asin}(d\,x^2-1))^{5/2}}\,dx$$

input
```
int(1/(a + b*asin(d*x^2 - 1))^(5/2),x)
```

output
```
int(1/(a + b*asin(d*x^2 - 1))^(5/2), x)
```

# 3.430 $\int \frac{1}{\left(a-b\arcsin\left(1-dx^2\right)\right)^{7/2}}\,dx$



## 3.430.1 Optimal result

Integrand size = 18, antiderivative size = 339

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{7/2}}\,dx = -\frac{\sqrt{2dx^2-d^2x^4}}{5bdx\,(a-b\arcsin(1-dx^2))^{5/2}} + \frac{x}{15b^2(a-b\arcsin(1-dx^2))^{3/2}} + \frac{\sqrt{2dx^2-d^2x^4}}{15b^3dx\sqrt{a-b\arcsin(1-dx^2)}} + \frac{\left(-\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)} - \frac{\left(-\frac{1}{b}\right)^{7/2}\sqrt{\pi}x\,\text{FresnelS}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin(1-dx^2)}}{\sqrt{\pi}}\right)\left(\cos\left(\frac{a}{2b}\right)+\sin\left(\frac{a}{2b}\right)\right)}{15\left(\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)\right)}$$

output
```
1/15*x/b^2/(a+b*arcsin(d*x^2-1))^(3/2)+1/15*(-1/b)^(7/2)*x*FresnelC((-1/b)
^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2))*(cos(1/2*a/b)-sin(1/2*a/b))*P
i^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^2-1)))-1/15*(-1/b)^(7
/2)*x*FresnelS((-1/b)^(1/2)*(a+b*arcsin(d*x^2-1))^(1/2)/Pi^(1/2))*(cos(1/2
*a/b)+sin(1/2*a/b))*Pi^(1/2)/(cos(1/2*arcsin(d*x^2-1))+sin(1/2*arcsin(d*x^
2-1)))-1/5*(-d^2*x^4+2*d*x^2)^(1/2)/b/d/x/(a+b*arcsin(d*x^2-1))^(5/2)+1/15
*(-d^2*x^4+2*d*x^2)^(1/2)/b^3/d/x/(a+b*arcsin(d*x^2-1))^(1/2)
```

## 3.430.2 Mathematica [A] (verified)

Time = 0.64 (sec) , antiderivative size = 319, normalized size of antiderivative = 0.94

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{7/2}}\,dx = \frac{\frac{-\frac{3b\sqrt{dx^2(2-dx^2)}}{d}+x^2(a-b\arcsin(1-dx^2))+\frac{\sqrt{dx^2(2-dx^2)}\left(a-b\arcsin\left(1-dx^2\right)\right)^2}{bd}}{x(a-b\arcsin(1-dx^2))^{5/2}} + \frac{\left(-\frac{1}{b}\right)^{3/2}\sqrt{\pi}x \cdots}{\cdots}}{\cdots}$$

input
```
Integrate[(a - b*ArcSin[1 - d*x^2])^(-7/2),x]
```

output
```
(((-3*b*Sqrt[d*x^2*(2 - d*x^2)])/d + x^2*(a - b*ArcSin[1 - d*x^2]) + (Sqrt
[d*x^2*(2 - d*x^2)]*(a - b*ArcSin[1 - d*x^2])^2)/(b*d))/(x*(a - b*ArcSin[1
 - d*x^2])^(5/2)) + ((-b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelC[(Sqrt[-b^(-1)]*Sq
rt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin[a/(2*b)]))/(Cos
[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]) + ((-b^(-1))^(5/2)*b*Sqr
t[Pi]*x*FresnelS[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(
Cos[a/(2*b)] + Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d
*x^2]/2]))/(15*b^2)
```

## 3.430.3 Rubi [A] (verified)

Time = 0.38 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {5327, 5321}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{7/2}}\,dx$$

$$\Big\downarrow \; 5327$$

$$-\frac{\int \frac{1}{(a-b\arcsin(1-dx^2))^{3/2}}dx}{15b^2}+\frac{x}{15b^2(a-b\arcsin(1-dx^2))^{3/2}}-\frac{\sqrt{2dx^2-d^2x^4}}{5bdx(a-b\arcsin(1-dx^2))^{5/2}}$$

$$\Big\downarrow \; 5321$$

$$-\frac{-\frac{\sqrt{2dx^2-d^2x^4}}{bdx\sqrt{a-b\arcsin(1-dx^2)}}-\frac{\sqrt{\pi}\left(-\frac{1}{b}\right)^{3/2}x\left(\cos\left(\frac{a}{2b}\right)-\sin\left(\frac{a}{2b}\right)\right)\operatorname{FresnelC}\left(\frac{\sqrt{-\frac{1}{b}}\sqrt{a-b\arcsin\left(1-dx^2\right)}}{\sqrt{\pi}}\right)}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\sin\left(\frac{1}{2}\arcsin(1-dx^2)\right)}+\frac{\sqrt{\pi}\left(-\frac{1}{b}\right)^{3/2}x\left(\sin\left(\frac{a}{2b}\right)+\cos\left(\frac{a}{2b}\right)\right)\operatorname{Fr}\cdots}{\cos\left(\frac{1}{2}\arcsin(1-dx^2)\right)-\cdots}}{15b^2}$$

$$\frac{x}{15b^2\left(a-b\arcsin\left(1-dx^2\right)\right)^{3/2}}-\frac{\sqrt{2dx^2-d^2x^4}}{5bdx\left(a-b\arcsin\left(1-dx^2\right)\right)^{5/2}}$$

input
```
Int[(a - b*ArcSin[1 - d*x^2])^(-7/2),x]
```

output
```
-1/5*Sqrt[2*d*x^2 - d^2*x^4]/(b*d*x*(a - b*ArcSin[1 - d*x^2])^(5/2)) + x/(
15*b^2*(a - b*ArcSin[1 - d*x^2])^(3/2)) - (-(Sqrt[2*d*x^2 - d^2*x^4]/(b*d*
x*Sqrt[a - b*ArcSin[1 - d*x^2]])) - ((-b^(-1))^(3/2)*Sqrt[Pi]*x*FresnelC[(
Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]])/Sqrt[Pi]]*(Cos[a/(2*b)] - Sin
[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Sin[ArcSin[1 - d*x^2]/2]) + ((-b^(
-1))^(3/2)*Sqrt[Pi]*x*FresnelS[(Sqrt[-b^(-1)]*Sqrt[a - b*ArcSin[1 - d*x^2]
])/Sqrt[Pi]]*(Cos[a/(2*b)] + Sin[a/(2*b)]))/(Cos[ArcSin[1 - d*x^2]/2] - Si
n[ArcSin[1 - d*x^2]/2]))/(15*b^2)
```

### 3.430.3.1 Defintions of rubi rules used

rule 5321
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(-3/2), x_Symbol] :> Simp[-
Sqrt[-2*c*d*x^2 - d^2*x^4]/(b*d*x*Sqrt[a + b*ArcSin[c + d*x^2]]), x] + (-Si
mp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] + c*Sin[a/(2*b)])*(FresnelC[Sqrt[c/
(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Cos[(1/2)*ArcSin[c + d*x^2]] - c*Si
n[ArcSin[c + d*x^2]/2])), x] + Simp[(c/b)^(3/2)*Sqrt[Pi]*x*(Cos[a/(2*b)] -
c*Sin[a/(2*b)])*(FresnelS[Sqrt[c/(Pi*b)]*Sqrt[a + b*ArcSin[c + d*x^2]]]/(Co
s[(1/2)*ArcSin[c + d*x^2]] - c*Sin[ArcSin[c + d*x^2]/2])), x]) /; FreeQ[{a,
 b, c, d}, x] && EqQ[c^2, 1]
```

rule 5327
```
Int[((a_.) + ArcSin[(c_) + (d_.)*(x_)^2]*(b_.))^(n_), x_Symbol] :> Simp[x*(
(a + b*ArcSin[c + d*x^2])^(n + 2)/(4*b^2*(n + 1)*(n + 2))), x] + (Simp[Sqrt
[-2*c*d*x^2 - d^2*x^4]*((a + b*ArcSin[c + d*x^2])^(n + 1)/(2*b*d*(n + 1)*x)
), x] - Simp[1/(4*b^2*(n + 1)*(n + 2))   Int[(a + b*ArcSin[c + d*x^2])^(n +
 2), x], x]) /; FreeQ[{a, b, c, d}, x] && EqQ[c^2, 1] && LtQ[n, -1] && NeQ[
n, -2]
```

### 3.430.4 Maple [F]

$$\int \frac{1}{\left(a+b \arcsin \left(d \,x^{2}-1\right)\right)^{\frac{7}{2}}}d x$$

input
```
int(1/(a+b*arcsin(d*x^2-1))^(7/2),x)
```

output
```
int(1/(a+b*arcsin(d*x^2-1))^(7/2),x)
```

### 3.430.5 Fricas [F(-2)]

Exception generated.

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{7/2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(7/2),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.430.6 Sympy [F]

$$\int \frac{1}{(a-b\arcsin(1-dx^2))^{7/2}}\,dx = \int \frac{1}{\left(a+b\operatorname{asin}\left(dx^{2}-1\right)\right)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*asin(d*x**2-1))**(7/2),x)
```

output
```
Integral((a + b*asin(d*x**2 - 1))**(-7/2), x)
```

### 3.430.7 Maxima [F]

$$\int \frac{1}{\left(a - b\arcsin\left(1 - dx^2\right)\right)^{7/2}}\,dx = \int \frac{1}{\left(b\arcsin\left(dx^2 - 1\right) + a\right)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(7/2),x, algorithm="maxima")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(-7/2), x)
```

### 3.430.8 Giac [F]

$$\int \frac{1}{\left(a - b\arcsin\left(1 - dx^2\right)\right)^{7/2}}\,dx = \int \frac{1}{\left(b\arcsin\left(dx^2 - 1\right) + a\right)^{\frac{7}{2}}}\,dx$$

input
```
integrate(1/(a+b*arcsin(d*x^2-1))^(7/2),x, algorithm="giac")
```

output
```
integrate((b*arcsin(d*x^2 - 1) + a)^(-7/2), x)
```

### 3.430.9 Mupad [F(-1)]

Timed out.

$$\int \frac{1}{\left(a - b\arcsin\left(1 - dx^2\right)\right)^{7/2}}\,dx = \int \frac{1}{\left(a + b\,\mathrm{asin}\left(d\,x^2 - 1\right)\right)^{7/2}}\,dx$$

input
```
int(1/(a + b*asin(d*x^2 - 1))^(7/2),x)
```

output
```
int(1/(a + b*asin(d*x^2 - 1))^(7/2), x)
```

# 3.431 $\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx$



## 3.431.1 Optimal result

Integrand size = 40, antiderivative size = 40

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=\text{Int}\left(\frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2},x\right)$$

output
```
Unintegrable((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x)
```

## 3.431.2 Mathematica [N/A]

Not integrable

Time = 0.19 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.05

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx$$

input
```
Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2),x]
```

output
```
Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2), x]
```

## 3.431.3 Rubi [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {7234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^n}{1-c^2x^2}dx$$
$$\Big\downarrow \text{7234}$$
$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^n}{1-c^2x^2}dx$$

input
```
Int[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2),x]
```

output
```
$Aborted
```

### 3.431.3.1 Defintions of rubi rules used

rule 7234
```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Unintegrable[(a + b*F[(c*
Sqrt[d + e*x])/Sqrt[f + g*x]])^n/(A + C*x^2), x] /; FreeQ[{a, b, c, d, e, f
, g, A, C, F, n}, x] && EqQ[C*d*f - A*e*g, 0] && EqQ[e*f + d*g, 0] &&  !IGt
Q[n, 0]
```

## 3.431.4 Maple [N/A] (verified)

Not integrable

Time = 2.12 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.90

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\right)^n}{-c^2x^2+1}dx$$

input
```
int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x)
```

output
```
int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x)
```

### 3.431.5 Fricas [N/A]

Not integrable

Time = 0.29 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.95

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^n}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x, alg
orithm="fricas")
```

output
```
integral(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^n/(c^2*x^2 - 1), x)
```

### 3.431.6 Sympy [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=\text{Timed out}$$

input
```
integrate((a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**n/(-c**2*x**2+1),x)
```

output
```
Timed out
```

### 3.431.7 Maxima [N/A]

Not integrable

Time = 1.08 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^n}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x, alg
orithm="maxima")
```

output
```
-integrate((b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^n/(c^2*x^2 - 1), x
)
```

### 3.431.8 Giac [N/A]

Not integrable

Time = 0.92 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.95

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^n}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x, alg
orithm="giac")
```

output
```
integrate(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^n/(c^2*x^2 - 1), x
)
```

### 3.431.9 Mupad [N/A]

Not integrable

Time = 0.71 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=-\int \frac{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)^n}{c^2\,x^2-1}\,dx$$

input
```
int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^n/(c^2*x^2 - 1),x)
```

output
```
-int((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^n/(c^2*x^2 - 1), x)
```

# 3.432 $\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx$



## 3.432.1 Optimal result

Integrand size = 40, antiderivative size = 275

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx = \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^4}{4bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{3ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\operatorname{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c} - \frac{3b^2\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\operatorname{PolyLog}\left(3,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c} - \frac{3ib^3\operatorname{PolyLog}\left(4,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{4c}$$

output
```
1/4*I*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^4/b/c-(a+b*arcsin((-c*x+1
)^(1/2)/(c*x+1)^(1/2)))^3*ln(1-(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)
/(c*x+1))^(1/2))^2)/c+3/2*I*b*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2
*polylog(2,(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^2)/
c-3/2*b^2*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))*polylog(3,(I*(-c*x+1)
^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^2)/c-3/4*I*b^3*polylog(4,
(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^2)/c
```

### 3.432.2 Mathematica [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx=\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx$$

input
```
Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3/(1 - c^2*x^2),x]
```

output
```
Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3/(1 - c^2*x^2), x]
```

### 3.432.3 Rubi [A] (verified)

Time = 0.76 (sec) , antiderivative size = 282, normalized size of antiderivative = 1.03, number of steps used = 12, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.275, Rules used = {7232, 5136, 3042, 25, 4200, 25, 2620, 3011, 7163, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3}{1-c^2x^2}dx$$

$$\Big\downarrow \text{ 7232}$$

$$-\frac{\int \frac{\sqrt{cx+1}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3}{\sqrt{1-cx}}d\frac{\sqrt{1-cx}}{\sqrt{cx+1}}}{c}$$

$$\Big\downarrow \text{ 5136}$$

$$-\frac{\int \frac{\sqrt{cx+1}\sqrt{1-\frac{1-cx}{cx+1}}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3}{\sqrt{1-cx}}d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

$$\Big\downarrow \text{ 3042}$$

$$-\frac{\int -\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3\tan\left(\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)+\frac{\pi}{2}\right)d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

$$\Big\downarrow \text{ 25}$$

$$\frac{\int \left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3\tan\left(\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)+\frac{\pi}{2}\right)d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

$$\Big\downarrow \text{4200}$$

$$-\frac{2i\int -\frac{e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3}{1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}}d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)-\frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^4}{4b}}{c}$$

$$\Big\downarrow \text{25}$$

$$-\frac{-2i\int \frac{e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3}{1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}}d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)-\frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^4}{4b}}{c}$$

$$\Big\downarrow \text{2620}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3-\frac{3}{2}ib\int\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2\log\left(1-e^{2i\arcsin\left(\right.}\right.\right.}{c}$$

$$\Big\downarrow \text{3011}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3-\frac{3}{2}ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcs\right.\right.\right.}{}$$

$$\Big\downarrow \text{7163}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3-\frac{3}{2}ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcs\right.\right.\right.}{}$$

$$\Big\downarrow \text{2720}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3-\frac{3}{2}ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcs\right.\right.\right.}{}$$

$$\Big\downarrow \text{7143}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3-\frac{3}{2}ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcs\right.\right.\right.}{}$$

---

3.432. $\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx$

input
```
Int[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3/(1 - c^2*x^2),x]
```

output
```
-((((-1/4*I)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^4)/b - (2*I)*((I/
2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3*Log[1 - E^((2*I)*ArcSin[S
qrt[1 - c*x]/Sqrt[1 + c*x]])] - ((3*I)/2)*b*((I/2)*(a + b*ArcSin[Sqrt[1 -
c*x]/Sqrt[1 + c*x]])^2*PolyLog[2, E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c
*x]])] - I*b*((-1/2*I)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])*PolyLog
[3, E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])] + (b*PolyLog[4, E^((2*I
)*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])])/4))))/c)
```

### 3.432.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

## 3.432. $\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx$

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

rule 7163
```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[(e + f*x)^m*(PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p]/(b*c*p*Log[F])), x] - Simp[f*(m/(b*c*p*Log[F]))   Int[(e + f*x)
^(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c
, d, e, f, n, p}, x] && GtQ[m, 0]
```

rule 7232
```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_.)/((A_.) + (C_.)*(x_)^2), x_Symbol] :> Simp[2*e*(g/(C*(e*f - d
*g)))   Subst[Int[(a + b*F[c*x])^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

## 3.432.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 1170 vs. 2(300) = 600.

Time = 3.27 (sec) , antiderivative size = 1171, normalized size of antiderivative = 4.26

| method | result | size |
|---|---|---|
| default | Expression too large to display | 1171 |
| parts | Expression too large to display | 1171 |

input
```
int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x,method=_RE
TURNVERBOSE)
```

output
```
-1/2*a^3/c*ln(c*x-1)+1/2*a^3/c*ln(c*x+1)-b^3*(-1/4*I/c*arcsin((-c*x+1)^(1/
2)/(c*x+1)^(1/2))^4+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^3*ln(I*(-c*x+
1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)+1)-3*I/c*arcsin((-c*x+1)
^(1/2)/(c*x+1)^(1/2))^2*polylog(2,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x
+1)/(c*x+1))^(1/2))+6/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(3,-I*
(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))+6*I/c*polylog(4,-
I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))+1/c*arcsin((-c*
x+1)^(1/2)/(c*x+1)^(1/2))^3*ln(1-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1
)/(c*x+1))^(1/2))-3*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*polylog(2,I
*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))+6/c*arcsin((-c*x
+1)^(1/2)/(c*x+1)^(1/2))*polylog(3,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x
+1)/(c*x+1))^(1/2))+6*I/c*polylog(4,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*
x+1)/(c*x+1))^(1/2)))-3*a*b^2*(-1/3*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2
))^3+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln(I*(-c*x+1)^(1/2)/(c*x+1
)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)+1)-2*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^
(1/2))*polylog(2,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2
))+2/c*polylog(3,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2
))+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln(1-I*(-c*x+1)^(1/2)/(c*x+1
)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))-2*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1
/2))*polylog(2,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2...
```

### 3.432.5 Fricas [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^3}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x, alg
orithm="fricas")
```

output
```
integral(-(b^3*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1))^3 + 3*a*b^2*arcsin(sqr
t(-c*x + 1)/sqrt(c*x + 1))^2 + 3*a^2*b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)
) + a^3)/(c^2*x^2 - 1), x)
```

### 3.432.6 Sympy [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**3/(-c**2*x**2+1),x)
```

output
```
Timed out
```

### 3.432.7 Maxima [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx = \int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^3}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x, alg
orithm="maxima")
```

output
```
1/2*a^3*(log(c*x + 1)/c - log(c*x - 1)/c) - integrate((b^3*arctan2(sqrt(-c
*x + 1), sqrt(2)*sqrt(c)*sqrt(x))^3 + 3*a*b^2*arctan2(sqrt(-c*x + 1), sqrt
(2)*sqrt(c)*sqrt(x))^2 + 3*a^2*b*arctan2(sqrt(-c*x + 1), sqrt(2)*sqrt(c)*s
qrt(x)))/(c^2*x^2 - 1), x)
```

### 3.432.8 Giac [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx = \int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^3}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x, alg
orithm="giac")
```

output
```
integrate(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^3/(c^2*x^2 - 1), x
)
```

### 3.432.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx=\int -\frac{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)^3}{c^2\,x^2-1}\,dx$$

input
```
int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^3/(c^2*x^2 - 1),x)
```

output
```
int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^3/(c^2*x^2 - 1), x)
```

# 3.433 $\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx$



## 3.433.1 Optimal result

Integrand size = 40, antiderivative size = 205

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx = \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{3bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{ib\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\operatorname{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} - \frac{b^2\operatorname{PolyLog}\left(3,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}$$

output
```
1/3*I*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/b/c-(a+b*arcsin((-c*x+1
)^(1/2)/(c*x+1)^(1/2)))^2*ln(1-(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)
/(c*x+1))^(1/2))^2)/c+I*b*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))*polyl
og(2,(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^2)/c-1/2*
b^2*polylog(3,(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))^
2)/c
```

### 3.433.2 Mathematica [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx=\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx$$

input
```
Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2/(1 - c^2*x^2),x]
```

output
```
Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2/(1 - c^2*x^2), x]
```

### 3.433.3 Rubi [A] (verified)

Time = 0.62 (sec) , antiderivative size = 212, normalized size of antiderivative = 1.03, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {7232, 5136, 3042, 25, 4200, 25, 2620, 3011, 2720, 7143}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{1-c^2x^2}dx$$

$$\Big\downarrow \text{ 7232}$$

$$-\frac{\int \frac{\sqrt{cx+1}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{\sqrt{1-cx}}d\frac{\sqrt{1-cx}}{\sqrt{cx+1}}}{c}$$

$$\Big\downarrow \text{ 5136}$$

$$-\frac{\int \frac{\sqrt{cx+1}\sqrt{1-\frac{1-cx}{cx+1}}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{\sqrt{1-cx}}d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

$$\Big\downarrow \text{ 3042}$$

$$-\frac{\int -\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2\tan\left(\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)+\frac{\pi}{2}\right)d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

$$\Big\downarrow \text{ 25}$$

$$\frac{\int \left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2\tan\left(\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)+\frac{\pi}{2}\right)d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

$$\Big\downarrow \text{4200}$$

$$-\frac{2i\int -\frac{e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}}d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)-\frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3}{3b}}{c}$$

$$\Big\downarrow \text{25}$$

$$-\frac{-2i\int \frac{e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}}d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)-\frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^3}{3b}}{c}$$

$$\Big\downarrow \text{2620}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2-ib\int\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-}}{\sqrt{cx}}\right.}\right.\right.}{c}$$

$$\Big\downarrow \text{3011}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2-ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\right.\right.\right.}{c}$$

$$\Big\downarrow \text{2720}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2-ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsi\right.\right.\right.}{c}$$

$$\Big\downarrow \text{7143}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2-ib\left(\frac{1}{2}i\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\right.\right.\right.}{c}$$

input
```
Int[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2/(1 - c^2*x^2),x]
```

---

3.433. $\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx$

output
```
-((((-1/3*I)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3)/b - (2*I)*((I/
2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2*Log[1 - E^((2*I)*ArcSin[S
qrt[1 - c*x]/Sqrt[1 + c*x]])] - I*b*((I/2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqr
t[1 + c*x]])*PolyLog[2, E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])] - (
b*PolyLog[3, E^((2*I)*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])])/4)))/c)
```

### 3.433.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 3011
```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> Simp[(-(f + g*x)^m)*(PolyLog[2, (-e)*(F^(c*(a +
b*x)))^n]/(b*c*n*Log[F])), x] + Simp[g*(m/(b*c*n*Log[F]))   Int[(f + g*x)^(
m - 1)*PolyLog[2, (-e)*(F^(c*(a + b*x)))^n], x], x] /; FreeQ[{F, a, b, c, e
, f, g, n}, x] && GtQ[m, 0]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

---

## 3.433. $\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx$

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

rule 7143
```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

rule 7232
```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_.)/((A_.) + (C_.)*(x_)^2), x_Symbol] :> Simp[2*e*(g/(C*(e*f - d
*g)))   Subst[Int[(a + b*F[c*x])^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

## 3.433.4 Maple [B] (verified)

Both result and optimal contain complex but leaf count of result is larger than twice the leaf count of optimal. 656 vs. $2(226) = 452$.

Time = 1.30 (sec) , antiderivative size = 657, normalized size of antiderivative = 3.20

| method | result |
|---|---|
| default | $-\frac{a^2 \ln(cx-1)}{2c} + \frac{a^2 \ln(cx+1)}{2c} - b^2 \left( -\frac{i \arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^3}{3c} + \frac{\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^2 \ln\left(\frac{i\sqrt{-cx+1}}{\sqrt{cx+1}} + \sqrt{1-\frac{-cx+1}{cx+1}} + 1\right)}{c} - \frac{2i \arcsin}{} \right.$ |
| parts | $-\frac{a^2 \ln(cx-1)}{2c} + \frac{a^2 \ln(cx+1)}{2c} - b^2 \left( -\frac{i \arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^3}{3c} + \frac{\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^2 \ln\left(\frac{i\sqrt{-cx+1}}{\sqrt{cx+1}} + \sqrt{1-\frac{-cx+1}{cx+1}} + 1\right)}{c} - \frac{2i \arcsin}{} \right.$ |

input
```
int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x,method=_RE
TURNVERBOSE)
```

output
```
-1/2*a^2/c*ln(c*x-1)+1/2*a^2/c*ln(c*x+1)-b^2*(-1/3*I/c*arcsin((-c*x+1)^(1/
2)/(c*x+1)^(1/2))^3+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln(I*(-c*x+
1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)+1)-2*I/c*arcsin((-c*x+1)
^(1/2)/(c*x+1)^(1/2))*polylog(2,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1
)/(c*x+1))^(1/2))+2/c*polylog(3,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1
)/(c*x+1))^(1/2))+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln(1-I*(-c*x+
1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))-2*I/c*arcsin((-c*x+1)^(
1/2)/(c*x+1)^(1/2))*polylog(2,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(
c*x+1))^(1/2))+2/c*polylog(3,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c
*x+1))^(1/2)))-2*a*b*(-1/2*I/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2+1/c*
arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-
(-c*x+1)/(c*x+1))^(1/2)+1)-I/c*polylog(2,-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(
1-(-c*x+1)/(c*x+1))^(1/2))+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln(1-I
*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))-I/c*polylog(2,I*
(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)))
```

### 3.433.5 Fricas [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx = \int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x, alg
orithm="fricas")
```

output
```
integral(-(b^2*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1))^2 + 2*a*b*arcsin(sqrt(
-c*x + 1)/sqrt(c*x + 1)) + a^2)/(c^2*x^2 - 1), x)
```

### 3.433.6 Sympy [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**2/(-c**2*x**2+1),x)
```

output
```
Timed out
```

## 3.433.7 Maxima [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x, alg
orithm="maxima")
```

output
```
1/2*a^2*(log(c*x + 1)/c - log(c*x - 1)/c) - integrate((b^2*arctan2(sqrt(-c
*x + 1), sqrt(2)*sqrt(c)*sqrt(x))^2 + 2*a*b*arctan2(sqrt(-c*x + 1), sqrt(2
)*sqrt(c)*sqrt(x)))/(c^2*x^2 - 1), x)
```

## 3.433.8 Giac [F]

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx=\int -\frac{\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x, alg
orithm="giac")
```

output
```
integrate(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^2/(c^2*x^2 - 1), x
)
```

## 3.433.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx=\int -\frac{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)^2}{c^2\,x^2-1}\,dx$$

input
```
int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^2/(c^2*x^2 - 1),x)
```

output
```
int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^2/(c^2*x^2 - 1), x)
```

# 3.434 $\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx$



## 3.434.1 Optimal result

Integrand size = 38, antiderivative size = 141

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{2bc} - \frac{\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{c} + \frac{ib\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}\right)}{2c}$$

output
```
1/2*I*(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/b/c-(a+b*arcsin((-c*x+1
)^(1/2)/(c*x+1)^(1/2)))*ln(1-(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(
c*x+1))^(1/2))^2)/c+1/2*I*b*polylog(2,(I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(
-c*x+1)/(c*x+1))^(1/2))^2)/c
```

### 3.434.2 Mathematica [F]

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx=\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx$$

input
```
Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/(1 - c^2*x^2),x]
```

output
```
Integrate[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/(1 - c^2*x^2), x]
```

### 3.434.3 Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 144, normalized size of antiderivative = 1.02, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.237, Rules used = {7232, 5136, 3042, 25, 4200, 25, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{1-c^2x^2}\,dx$$

$$\Big\downarrow \text{7232}$$

$$-\frac{\int \frac{\sqrt{cx+1}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{\sqrt{1-cx}}d\frac{\sqrt{1-cx}}{\sqrt{cx+1}}}{c}$$

$$\Big\downarrow \text{5136}$$

$$-\frac{\int \frac{\sqrt{cx+1}\sqrt{1-\frac{1-cx}{cx+1}}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{\sqrt{1-cx}}d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

$$\Big\downarrow \text{3042}$$

$$-\frac{\int -\left(\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)\tan\left(\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)+\frac{\pi}{2}\right)\right)d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

$$\Big\downarrow \text{25}$$

$$\frac{\int \left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)\tan\left(\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)+\frac{\pi}{2}\right)d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

$$\Big\downarrow \text{4200}$$

$$-\frac{2i\int -\frac{e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}}d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)-\frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{2b}}{c}$$

$$\Big\downarrow \text{25}$$

$$-\frac{-2i\int \frac{e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}}d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)-\frac{i\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}{2b}}{c}$$

$$\Big\downarrow \text{2620}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)-\frac{1}{2}ib\int\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)d\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right.}{c}$$

$$\Big\downarrow \text{2715}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)-\frac{1}{4}b\int\frac{\sqrt{cx+1}\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)}{\sqrt{1-cx}}de^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right.}{c}$$

$$\Big\downarrow \text{2838}$$

$$-\frac{-2i\left(\frac{1}{2}i\log\left(1-e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)+\frac{1}{4}b\,\text{PolyLog}\left(2,e^{2i\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}\right)\right)-\frac{i\left(a+b\arcsin\left(\frac{\sqrt{\ldots}}{\sqrt{\ldots}}\right.\right.}{2b}}{c}$$

input
```
Int[(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/(1 - c^2*x^2),x]
```

output
```
-((((-1/2*I)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2)/b - (2*I)*((I/
2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])*Log[1 - E^((2*I)*ArcSin[Sqr
t[1 - c*x]/Sqrt[1 + c*x]])] + (b*PolyLog[2, E^((2*I)*ArcSin[Sqrt[1 - c*x]/
Sqrt[1 + c*x]])])/4))/c)
```

## 3.434. $\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx$

### 3.434.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

rule 7232
```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_.)/((A_.) + (C_.)*(x_)^2), x_Symbol] :> Simp[2*e*(g/(C*(e*f - d
*g)))   Subst[Int[(a + b*F[c*x])^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

---

3.434. $\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx$

### 3.434.4 Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.94

| method | result |
|---|---|
| default | $-\frac{a\ln(cx-1)}{2c}+\frac{a\ln(cx+1)}{2c}-b\left(-\frac{i\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^{2}}{2c}+\frac{\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\ln\left(\frac{i\sqrt{-cx+1}}{\sqrt{cx+1}}+\sqrt{1-\frac{-cx+1}{cx+1}}+1\right)}{c}-\frac{i\,\mathrm{polylog}\left(2,-\right.}{}\right.$ |
| parts | $-\frac{a\ln(cx-1)}{2c}+\frac{a\ln(cx+1)}{2c}-b\left(-\frac{i\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^{2}}{2c}+\frac{\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\ln\left(\frac{i\sqrt{-cx+1}}{\sqrt{cx+1}}+\sqrt{1-\frac{-cx+1}{cx+1}}+1\right)}{c}-\frac{i\,\mathrm{polylog}\left(2,-\right.}{}\right.$ |

input
```
int((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x,method=_RETU
RNVERBOSE)
```

output
```
-1/2*a/c*ln(c*x-1)+1/2*a/c*ln(c*x+1)-b*(-1/2*I/c*arcsin((-c*x+1)^(1/2)/(c*
x+1)^(1/2))^2+1/c*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln(I*(-c*x+1)^(1/2)
/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2)+1)-I/c*polylog(2,-I*(-c*x+1)^(1/
2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2))+1/c*arcsin((-c*x+1)^(1/2)/(c*
x+1)^(1/2))*ln(1-I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)-(1-(-c*x+1)/(c*x+1))^(1/2)
)-I/c*polylog(2,I*(-c*x+1)^(1/2)/(c*x+1)^(1/2)+(1-(-c*x+1)/(c*x+1))^(1/2))
)
```

### 3.434.5 Fricas [F]

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx=\int -\frac{b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x, algor
ithm="fricas")
```

output
```
integral(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)/(c^2*x^2 - 1), x)
```

### 3.434.6 Sympy [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \text{Timed out}$$

input
```
integrate((a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))/(-c**2*x**2+1),x)
```

output
```
Timed out
```

### 3.434.7 Maxima [F]

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \int -\frac{b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x, algor
ithm="maxima")
```

output
```
1/2*a*(log(c*x + 1)/c - log(c*x - 1)/c) - b*integrate(arctan2(sqrt(-c*x +
1), sqrt(2)*sqrt(c)*sqrt(x))/(c^2*x^2 - 1), x)
```

### 3.434.8 Giac [F]

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx = \int -\frac{b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a}{c^2x^2-1}\,dx$$

input
```
integrate((a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x, algor
ithm="giac")
```

output
```
integrate(-(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)/(c^2*x^2 - 1), x)
```

### 3.434.9 Mupad [F(-1)]

Timed out.

$$\int \frac{a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx=\int -\frac{a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)}{c^2\,x^2-1}\,dx$$

input
```
int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))/(c^2*x^2 - 1),x)
```

output
```
int(-(a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))/(c^2*x^2 - 1), x)
```

# 3.435 $\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$



## 3.435.1 Optimal result

Integrand size = 40, antiderivative size = 40

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx=\text{Int}\left(\frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)},x\right)$$

output
```
Unintegrable(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x)
```

## 3.435.2 Mathematica [N/A]

Not integrable

Time = 0.32 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.05

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx=\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$$

input
```
Integrate[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])),x]
```

output
```
Integrate[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])), x
]
```

### 3.435.3 Rubi [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {7234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}dx$$

$$\Big\downarrow \text{7234}$$

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}dx$$

input
```
Int[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])),x]
```

output
```
$Aborted
```

#### 3.435.3.1 Defintions of rubi rules used

rule 7234
```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Unintegrable[(a + b*F[(c*
Sqrt[d + e*x])/Sqrt[f + g*x]])^n/(A + C*x^2), x] /; FreeQ[{a, b, c, d, e, f
, g, A, C, F, n}, x] && EqQ[C*d*f - A*e*g, 0] && EqQ[e*f + d*g, 0] &&  !IGt
Q[n, 0]
```

### 3.435.4 Maple [N/A] (verified)

Not integrable

Time = 0.90 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.90

$$\int \frac{1}{(-c^2x^2+1)\left(a+b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\right)}dx$$

input
```
int(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x)
```

output
```
int(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x)
```

### 3.435.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.20

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx = \int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)}\,dx$$

input
```
integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x, alg
orithm="fricas")
```

output
```
integral(-1/(a*c^2*x^2 + (b*c^2*x^2 - b)*arcsin(sqrt(-c*x + 1)/sqrt(c*x +
1)) - a), x)
```

### 3.435.6 Sympy [N/A]

Not integrable

Time = 133.39 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.52

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$$
$$= -\int \frac{1}{ac^2x^2-a+bc^2x^2\operatorname{asin}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)-b\operatorname{asin}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}\,dx$$

input
```
integrate(1/(-c**2*x**2+1)/(a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2))),x)
```

output
```
-Integral(1/(a*c**2*x**2 - a + b*c**2*x**2*asin(sqrt(-c*x + 1)/sqrt(c*x +
1)) - b*asin(sqrt(-c*x + 1)/sqrt(c*x + 1))), x)
```

### 3.435.7 Maxima [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx=\int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)}\,dx$$

input
```
integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x, alg
orithm="maxima")
```

output
```
-integrate(1/((c^2*x^2 - 1)*(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)),
 x)
```

### 3.435.8 Giac [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.95

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx=\int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)}\,dx$$

input
```
integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x, alg
orithm="giac")
```

output
```
integrate(-1/((c^2*x^2 - 1)*(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)),
 x)
```

### 3.435.9 Mupad [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx=-\int \frac{1}{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)\,(c^2\,x^2-1)}\,dx$$

input
```
int(-1/((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))*(c^2*x^2 - 1)),x)
```

output
```
-int(1/((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))*(c^2*x^2 - 1)), x)
```

3.435. $\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$

# 3.436 $\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}dx$



## 3.436.1 Optimal result

Integrand size = 40, antiderivative size = 40

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}dx=\text{Int}\left(\frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2},x\right)$$

output
```
Unintegrable(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x
)
```

## 3.436.2 Mathematica [N/A]

Not integrable

Time = 3.16 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.05

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}dx=\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}dx$$

input
```
Integrate[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),
x]
```

output
```
Integrate[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),
 x]
```

## 3.436.3 Rubi [N/A]

Not integrable

Time = 0.22 (sec) , antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {7234}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}dx$$
$$\Big\downarrow \text{ 7234}$$
$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2}dx$$

input
```
Int[1/((1 - c^2*x^2)*(a + b*ArcSin[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),x]
```

output
```
$Aborted
```

### 3.436.3.1 Defintions of rubi rules used

rule 7234
```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Unintegrable[(a + b*F[(c*
Sqrt[d + e*x])/Sqrt[f + g*x]])^n/(A + C*x^2), x] /; FreeQ[{a, b, c, d, e, f
, g, A, C, F, n}, x] && EqQ[C*d*f - A*e*g, 0] && EqQ[e*f + d*g, 0] &&  !IGt
Q[n, 0]
```

## 3.436.4 Maple [N/A] (verified)

Not integrable

Time = 0.81 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.90

$$\int \frac{1}{(-c^2x^2+1)\left(a+b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\right)^2}dx$$

input
```
int(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x)
```

output
```
int(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x)
```

### 3.436.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 91, normalized size of antiderivative = 2.28

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx=\int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}\,dx$$

input
```
integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x, a
lgorithm="fricas")
```

output
```
integral(-1/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arcsin(sqrt(-c*x + 1)/sqrt(
c*x + 1))^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arcsin(sqrt(-c*x + 1)/sqrt(c*x +
 1))), x)
```

### 3.436.6 Sympy [F(-1)]

Timed out.

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx=\text{Timed out}$$

input
```
integrate(1/(-c**2*x**2+1)/(a+b*asin((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**2,x
)
```

output
```
Timed out
```

### 3.436.7 Maxima [N/A]

Not integrable

Time = 1.89 (sec) , antiderivative size = 225, normalized size of antiderivative = 5.62

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx = \int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}\,dx$$

input
```
integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x, a
lgorithm="maxima")
```

output
```
-((sqrt(2)*a*b*c^2*x - sqrt(2)*a*b*c + (sqrt(2)*b^2*c^2*x - sqrt(2)*b^2*c)
*arctan2(sqrt(-c*x + 1), sqrt(2)*sqrt(c)*sqrt(x)))*sqrt(c)*integrate(1/2*s
qrt(-c*x + 1)*sqrt(x)/(a*b*c^3*x^3 - 2*a*b*c^2*x^2 + a*b*c*x + (b^2*c^3*x^
3 - 2*b^2*c^2*x^2 + b^2*c*x)*arctan2(sqrt(-c*x + 1), sqrt(2)*sqrt(c)*sqrt(
x))), x) + sqrt(2)*sqrt(-c*x + 1)*sqrt(c)*sqrt(x))/(a*b*c^2*x - a*b*c + (b
^2*c^2*x - b^2*c)*arctan2(sqrt(-c*x + 1), sqrt(2)*sqrt(c)*sqrt(x)))
```

### 3.436.8 Giac [N/A]

Not integrable

Time = 0.54 (sec) , antiderivative size = 38, normalized size of antiderivative = 0.95

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx = \int -\frac{1}{(c^2x^2-1)\left(b\arcsin\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^2}\,dx$$

input
```
integrate(1/(-c^2*x^2+1)/(a+b*arcsin((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x, a
lgorithm="giac")
```

output
```
integrate(-1/((c^2*x^2 - 1)*(b*arcsin(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^2
), x)
```

### 3.436.9 Mupad [N/A]

Not integrable

Time = 1.29 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.98

$$\int \frac{1}{(1-c^2x^2)\left(a+b\arcsin\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx=-\int \frac{1}{\left(a+b\,\mathrm{asin}\left(\frac{\sqrt{1-c\,x}}{\sqrt{c\,x+1}}\right)\right)^2\,(c^2\,x^2-1)}\,dx$$

input
```
int(-1/((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^2*(c^2*x^2 - 1)),x)
```

output
```
-int(1/((a + b*asin((1 - c*x)^(1/2)/(c*x + 1)^(1/2)))^2*(c^2*x^2 - 1)), x)
```

# 3.437 $\int e^x \arcsin (e^x) \, dx$



## 3.437.1 Optimal result

Integrand size = 8, antiderivative size = 22

$$\int e^x \arcsin (e^x) \, dx = \sqrt{1-e^{2x}} + e^x \arcsin (e^x)$$

output
```
exp(x)*arcsin(exp(x))+(1-exp(2*x))^(1/2)
```

## 3.437.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00

$$\int e^x \arcsin (e^x) \, dx = \sqrt{1-e^{2x}} + e^x \arcsin (e^x)$$

input
```
Integrate[E^x*ArcSin[E^x],x]
```

output
```
Sqrt[1 - E^(2*x)] + E^x*ArcSin[E^x]
```

## 3.437.3 Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {5343, 2676, 17}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int e^x \arcsin\left(e^x\right) \, dx$$

$$\Big\downarrow \; 5343$$

$$e^x \arcsin\left(e^x\right) - \int \frac{e^{2x}}{\sqrt{1-e^{2x}}}dx$$

$$\Big\downarrow \; 2676$$

$$e^x \arcsin\left(e^x\right) - \frac{1}{2}\int \frac{1}{\sqrt{1-e^{2x}}}de^{2x}$$

$$\Big\downarrow \; 17$$

$$e^x \arcsin\left(e^x\right) + \sqrt{1-e^{2x}}$$

input
```
Int[E^x*ArcSin[E^x],x]
```

output
```
Sqrt[1 - E^(2*x)] + E^x*ArcSin[E^x]
```

### 3.437.3.1 Defintions of rubi rules used

rule 17
```
Int[(c_.)*((a_.) + (b_.)*(x_))^(m_.), x_Symbol] :> Simp[c*((a + b*x)^(m + 1
)/(b*(m + 1))), x] /; FreeQ[{a, b, c, m}, x] && NeQ[m, -1]
```

rule 2676
```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Simp[1/(d*e*n*Log[F])   Sub
st[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d
, e, n, p}, x]
```

rule 5343
```
Int[((a_.) + ArcSin[u_]*(b_.))*(v_), x_Symbol] :> With[{w = IntHide[v, x]},
 Simp[(a + b*ArcSin[u])   w, x] - Simp[b   Int[SimplifyIntegrand[w*(D[u, x]
/Sqrt[1 - u^2]), x], x], x] /; InverseFunctionFreeQ[w, x]] /; FreeQ[{a, b},
 x] && InverseFunctionFreeQ[u, x] &&  !MatchQ[v, ((c_.) + (d_.)*x)^(m_.) /;
 FreeQ[{c, d, m}, x]]
```

### 3.437.4 Maple [A] (verified)

Time = 0.08 (sec) , antiderivative size = 18, normalized size of antiderivative = 0.82

| method | result | size |
|---|---|---|
| derivativedivides | $e^x \arcsin(e^x) + \sqrt{1 - e^{2x}}$ | 18 |
| default | $e^x \arcsin(e^x) + \sqrt{1 - e^{2x}}$ | 18 |

input
```
int(exp(x)*arcsin(exp(x)),x,method=_RETURNVERBOSE)
```

output
```
exp(x)*arcsin(exp(x))+(-exp(x)^2+1)^(1/2)
```

### 3.437.5 Fricas [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin(e^x)\, dx = \arcsin(e^x)\, e^x + \sqrt{-e^{(2x)} + 1}$$

input
```
integrate(exp(x)*arcsin(exp(x)),x, algorithm="fricas")
```

output
```
arcsin(e^x)*e^x + sqrt(-e^(2*x) + 1)
```

### 3.437.6 Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin(e^x)\,dx = \sqrt{1-e^{2x}} + e^x \operatorname{asin}(e^x)$$

input
```
integrate(exp(x)*asin(exp(x)),x)
```

output
```
sqrt(1 - exp(2*x)) + exp(x)*asin(exp(x))
```

### 3.437.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin(e^x)\,dx = \arcsin(e^x)\,e^x + \sqrt{-e^{(2\,x)}+1}$$

input
```
integrate(exp(x)*arcsin(exp(x)),x, algorithm="maxima")
```

output
```
arcsin(e^x)*e^x + sqrt(-e^(2*x) + 1)
```

### 3.437.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin(e^x)\,dx = \arcsin(e^x)\,e^x + \sqrt{-e^{(2\,x)}+1}$$

input
```
integrate(exp(x)*arcsin(exp(x)),x, algorithm="giac")
```

output
```
arcsin(e^x)*e^x + sqrt(-e^(2*x) + 1)
```

### 3.437.9 Mupad [B] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 17, normalized size of antiderivative = 0.77

$$\int e^x \arcsin(e^x)\, dx = \sqrt{1 - e^{2x}} + \mathrm{asin}(e^x)\, e^x$$

input
```
int(asin(exp(x))*exp(x),x)
```

output
```
(1 - exp(2*x))^(1/2) + asin(exp(x))*exp(x)
```

# 3.438 $\int \arcsin\left(ce^{a+bx}\right) dx$



## 3.438.1 Optimal result

Integrand size = 10, antiderivative size = 84

$$\int \arcsin\left(ce^{a+bx}\right) dx = -\frac{i\arcsin\left(ce^{a+bx}\right)^2}{2b} + \frac{\arcsin\left(ce^{a+bx}\right)\log\left(1-e^{2i\arcsin\left(ce^{a+bx}\right)}\right)}{b} - \frac{i\,\text{PolyLog}\left(2,e^{2i\arcsin\left(ce^{a+bx}\right)}\right)}{2b}$$

output
```
-1/2*I*arcsin(c*exp(b*x+a))^2/b+arcsin(c*exp(b*x+a))*ln(1-(I*c*exp(b*x+a)+
(1-c^2*exp(b*x+a)^2)^(1/2))^2)/b-1/2*I*polylog(2,(I*c*exp(b*x+a)+(1-c^2*ex
p(b*x+a)^2)^(1/2))^2)/b
```

## 3.438.2 Mathematica [F]

$$\int \arcsin\left(ce^{a+bx}\right) dx = \int \arcsin\left(ce^{a+bx}\right) dx$$

input
```
Integrate[ArcSin[c*E^(a + b*x)],x]
```

output
```
Integrate[ArcSin[c*E^(a + b*x)], x]
```

### 3.438.3 Rubi [A] (warning: unable to verify)

Time = 0.37 (sec) , antiderivative size = 85, normalized size of antiderivative = 1.01, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.900, Rules used = {2720, 5136, 3042, 25, 4200, 25, 2620, 2715, 2838}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \arcsin\left(ce^{a+bx}\right) dx$$

$$\Big\downarrow \text{2720}$$

$$\frac{\int e^{-a-bx} \arcsin\left(ce^{a+bx}\right) de^{a+bx}}{b}$$

$$\Big\downarrow \text{5136}$$

$$\frac{\int \frac{e^{-a-bx}\sqrt{1-c^2e^{2a+2bx}}\arcsin\left(ce^{a+bx}\right)}{c} d\arcsin\left(ce^{a+bx}\right)}{b}$$

$$\Big\downarrow \text{3042}$$

$$\frac{\int -\arcsin\left(ce^{a+bx}\right)\tan\left(\arcsin\left(ce^{a+bx}\right)+\frac{\pi}{2}\right) d\arcsin\left(ce^{a+bx}\right)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int \arcsin\left(ce^{a+bx}\right)\tan\left(\arcsin\left(ce^{a+bx}\right)+\frac{\pi}{2}\right) d\arcsin\left(ce^{a+bx}\right)}{b}$$

$$\Big\downarrow \text{4200}$$

$$\frac{2i\int -\frac{e^{a+bx+2i\arcsin\left(ce^{a+bx}\right)}}{1-e^{2i\arcsin\left(ce^{a+bx}\right)}} d\arcsin\left(ce^{a+bx}\right)-\frac{1}{2}ie^{2a+2bx}}{b}$$

$$\Big\downarrow \text{25}$$

$$\frac{-2i\int \frac{e^{a+bx+2i\arcsin\left(ce^{a+bx}\right)}}{1-e^{2i\arcsin\left(ce^{a+bx}\right)}} d\arcsin\left(ce^{a+bx}\right)-\frac{1}{2}ie^{2a+2bx}}{b}$$

$$\Big\downarrow \text{2620}$$

$$\frac{-2i\left(\frac{1}{2}i\arcsin\left(ce^{a+bx}\right)\log\left(1-e^{2i\arcsin\left(ce^{a+bx}\right)}\right)-\frac{1}{2}i\int \log\left(1-e^{2i\arcsin\left(ce^{a+bx}\right)}\right) d\arcsin\left(ce^{a+bx}\right)\right)-\frac{1}{2}ie^{2a+2bx}}{b}$$

$$\Big\downarrow \text{2715}$$

$$\frac{-2i\left(\frac{1}{2}i\arcsin\left(ce^{a+bx}\right)\log\left(1-e^{2i\arcsin\left(ce^{a+bx}\right)}\right)-\frac{1}{4}\int e^{-a-bx}\log\left(1-e^{2i\arcsin\left(ce^{a+bx}\right)}\right)de^{2i\arcsin\left(ce^{a+bx}\right)}\right)-\frac{1}{2}ie^{2a}}{b}$$

$\downarrow$ 2838

$$\frac{-2i\left(\frac{1}{4}\operatorname{PolyLog}\left(2,e^{2i\arcsin\left(ce^{a+bx}\right)}\right)+\frac{1}{2}i\arcsin\left(ce^{a+bx}\right)\log\left(1-e^{2i\arcsin\left(ce^{a+bx}\right)}\right)\right)-\frac{1}{2}ie^{2a+2bx}}{b}$$

input
```
Int[ArcSin[c*E^(a + b*x)],x]
```

output
```
((-1/2*I)*E^(2*a + 2*b*x) - (2*I)*((I/2)*ArcSin[c*E^(a + b*x)]*Log[1 - E^(
(2*I)*ArcSin[c*E^(a + b*x)])] + PolyLog[2, E^((2*I)*ArcSin[c*E^(a + b*x)])
]/4))/b
```

### 3.438.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 2620
```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m/(b*f*g*n*Log[F]))*Log[1 + b*((F^(g*(e + f*x)))^n/a)], x] - Si
mp[d*(m/(b*f*g*n*Log[F]))   Int[(c + d*x)^(m - 1)*Log[1 + b*((F^(g*(e + f*x
)))^n/a)], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

rule 2715
```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Simp[1/(d*e*n*Log[F])   Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x)
))^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

rule 2720
```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Simp[v/D[v, x]
   Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Funct
ionOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ
[{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))
*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

rule 2838
```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> Simp[-PolyLog[2
, (-c)*e*x^n]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

rule 3042
```
Int[u_, x_Symbol] :> Int[DeactivateTrig[u, x], x] /; FunctionOfTrigOfLinear
Q[u, x]
```

rule 4200
```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[I*((c + d*x)^(m + 1)/(d*(m + 1))), x] - Simp[2*I   Int[(c + d*x)^
m*E^(2*I*k*Pi)*(E^(2*I*(e + f*x))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x)))), x]
, x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

rule 5136
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n*Cot[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

## 3.438.4 Maple [A] (verified)

Time = 0.92 (sec) , antiderivative size = 170, normalized size of antiderivative = 2.02

| method | result |
|---|---|
| derivativedivides | $\frac{-\frac{i \arcsin\left(c\,\mathrm{e}^{bx+a}\right)^{2}}{2}+\arcsin\left(c\,\mathrm{e}^{bx+a}\right)\ln\left(1+ic\,\mathrm{e}^{bx+a}+\sqrt{1-c^{2}\mathrm{e}^{2bx+2a}}\right)-i\,\mathrm{polylog}\left(2,-ic\,\mathrm{e}^{bx+a}-\sqrt{1-c^{2}\mathrm{e}^{2bx+2a}}\right)+\mathrm{arcs}}{b}$ |
| default | $\frac{-\frac{i \arcsin\left(c\,\mathrm{e}^{bx+a}\right)^{2}}{2}+\arcsin\left(c\,\mathrm{e}^{bx+a}\right)\ln\left(1+ic\,\mathrm{e}^{bx+a}+\sqrt{1-c^{2}\mathrm{e}^{2bx+2a}}\right)-i\,\mathrm{polylog}\left(2,-ic\,\mathrm{e}^{bx+a}-\sqrt{1-c^{2}\mathrm{e}^{2bx+2a}}\right)+\mathrm{arcs}}{b}$ |

input
```
int(arcsin(c*exp(b*x+a)),x,method=_RETURNVERBOSE)
```

output
```
1/b*(-1/2*I*arcsin(c*exp(b*x+a))^2+arcsin(c*exp(b*x+a))*ln(1+I*c*exp(b*x+a
)+(1-c^2*exp(b*x+a)^2)^(1/2))-I*polylog(2,-I*c*exp(b*x+a)-(1-c^2*exp(b*x+a
)^2)^(1/2))+arcsin(c*exp(b*x+a))*ln(1-I*c*exp(b*x+a)-(1-c^2*exp(b*x+a)^2)^
(1/2))-I*polylog(2,I*c*exp(b*x+a)+(1-c^2*exp(b*x+a)^2)^(1/2)))
```

### 3.438.5 Fricas [F(-2)]

Exception generated.

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = \text{Exception raised: TypeError}$$

input
```
integrate(arcsin(c*exp(b*x+a)),x, algorithm="fricas")
```

output
```
Exception raised: TypeError >>  Error detected within library code:   inte
grate: implementation incomplete (constant residues)
```

### 3.438.6 Sympy [F]

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = \int \operatorname{asin}\left(ce^{a+bx}\right) \, dx$$

input
```
integrate(asin(c*exp(b*x+a)),x)
```

output
```
Integral(asin(c*exp(a + b*x)), x)
```

### 3.438.7 Maxima [F]

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = \int \arcsin \left(ce^{(bx+a)}\right) \, dx$$

input
```
integrate(arcsin(c*exp(b*x+a)),x, algorithm="maxima")
```

output
```
1/2*(-2*I*b^2*c^2*integrate(x*e^(2*b*x + 2*a)/(c^4*e^(4*b*x + 4*a) - c^2*e
^(2*b*x + 2*a) + (c^2*e^(2*b*x + 2*a) - 1)*e^(log(c*e^(b*x + a) + 1) + log
(-c*e^(b*x + a) + 1))), x) + 2*b^2*c*integrate(x*e^(b*x + a + 1/2*log(c*e^
(b*x + a) + 1) + 1/2*log(-c*e^(b*x + a) + 1))/(c^4*e^(4*b*x + 4*a) - c^2*e
^(2*b*x + 2*a) + (c^2*e^(2*b*x + 2*a) - 1)*e^(log(c*e^(b*x + a) + 1) + log
(-c*e^(b*x + a) + 1))), x) + 2*b*x*arctan2(c*e^(b*x + a), sqrt(c*e^(b*x +
a) + 1)*sqrt(-c*e^(b*x + a) + 1)) + I*b*x*log(c*e^(b*x + a) + 1) + I*b*x*l
og(-c*e^(b*x + a) + 1) + I*dilog(c*e^(b*x + a)) + I*dilog(-c*e^(b*x + a)))
/b
```

### 3.438.8 Giac [F]

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = \int \arcsin \left(ce^{(bx+a)}\right) \, dx$$

input
```
integrate(arcsin(c*exp(b*x+a)),x, algorithm="giac")
```

output
```
integrate(arcsin(c*e^(b*x + a)), x)
```

### 3.438.9 Mupad [B] (verification not implemented)

Time = 0.79 (sec) , antiderivative size = 70, normalized size of antiderivative = 0.83

$$\int \arcsin \left(ce^{a+bx}\right) \, dx = -\frac{\operatorname{asin}\left(c\,e^{a+b\,x}\right)^2\,1{}\mathrm{i}}{2\,b} - \frac{\operatorname{polylog}\left(2,{\mathrm{e}}^{\operatorname{asin}\left(c\,e^{a+b\,x}\right)\,2{}\mathrm{i}}\right)\,1{}\mathrm{i}}{2\,b} + \frac{\ln\left(1-{\mathrm{e}}^{\operatorname{asin}\left(c\,e^{a+b\,x}\right)\,2{}\mathrm{i}}\right)\,\operatorname{asin}\left(c\,e^{a+b\,x}\right)}{b}$$

input
```
int(asin(c*exp(a + b*x)),x)
```

output
```
(log(1 - exp(asin(c*exp(a + b*x))*2i))*asin(c*exp(a + b*x)))/b - (polylog(
2, exp(asin(c*exp(a + b*x))*2i))*1i)/(2*b) - (asin(c*exp(a + b*x))^2*1i)/(
2*b)
```

# 3.439 $\int e^{\arcsin(ax)}x^3\,dx$



## 3.439.1 Optimal result

Integrand size = 10, antiderivative size = 81

$$\int e^{\arcsin(ax)}x^3\,dx=-\frac{e^{\arcsin(ax)}\cos(2\arcsin(ax))}{10a^4}+\frac{e^{\arcsin(ax)}\cos(4\arcsin(ax))}{34a^4}+\frac{e^{\arcsin(ax)}\sin(2\arcsin(ax))}{20a^4}-\frac{e^{\arcsin(ax)}\sin(4\arcsin(ax))}{136a^4}$$

output
```
-1/10*exp(arcsin(a*x))*cos(2*arcsin(a*x))/a^4+1/34*exp(arcsin(a*x))*cos(4*
arcsin(a*x))/a^4+1/20*exp(arcsin(a*x))*sin(2*arcsin(a*x))/a^4-1/136*exp(ar
csin(a*x))*sin(4*arcsin(a*x))/a^4
```

## 3.439.2 Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.62

$$\int e^{\arcsin(ax)}x^3\,dx=\frac{e^{\arcsin(ax)}(-68\cos(2\arcsin(ax))+20\cos(4\arcsin(ax))+34\sin(2\arcsin(ax))-5\sin(4\arcsin(ax)))}{680a^4}$$

input
```
Integrate[E^ArcSin[a*x]*x^3,x]
```

output
```
(E^ArcSin[a*x]*(-68*Cos[2*ArcSin[a*x]] + 20*Cos[4*ArcSin[a*x]] + 34*Sin[2*
ArcSin[a*x]] - 5*Sin[4*ArcSin[a*x]]))/(680*a^4)
```

### 3.439.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 73, normalized size of antiderivative = 0.90, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {5335, 27, 4972, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3 e^{\arcsin(ax)}\,dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int e^{\arcsin(ax)}x^3\sqrt{1-a^2x^2}d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int a^3 e^{\arcsin(ax)}x^3\sqrt{1-a^2x^2}d\arcsin(ax)}{a^4}$$

$$\Big\downarrow \text{4972}$$

$$\frac{\int \left(\frac{1}{4}e^{\arcsin(ax)}\sin(2\arcsin(ax))-\frac{1}{8}e^{\arcsin(ax)}\sin(4\arcsin(ax))\right)d\arcsin(ax)}{a^4}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\frac{1}{20}e^{\arcsin(ax)}\sin(2\arcsin(ax))-\frac{1}{136}e^{\arcsin(ax)}\sin(4\arcsin(ax))-\frac{1}{10}e^{\arcsin(ax)}\cos(2\arcsin(ax))+\frac{1}{34}e^{\arcsin(ax)}\cos(4}{a^4}$$

input
```
Int[E^ArcSin[a*x]*x^3,x]
```

output
```
(-1/10*(E^ArcSin[a*x]*Cos[2*ArcSin[a*x]]) + (E^ArcSin[a*x]*Cos[4*ArcSin[a*
x]])/34 + (E^ArcSin[a*x]*Sin[2*ArcSin[a*x]])/20 - (E^ArcSin[a*x]*Sin[4*Arc
Sin[a*x]])/136)/a^4
```

### 3.439.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4972
```
Int[Cos[(f_.) + (g_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_
.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandTrigReduce[F^(c*(a + b*x)),
Sin[d + e*x]^m*Cos[f + g*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e, f, g}, x]
 && IGtQ[m, 0] && IGtQ[n, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

## 3.439.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)} x^3 dx$$

input
```
int(exp(arcsin(a*x))*x^3,x)
```

output
```
int(exp(arcsin(a*x))*x^3,x)
```

## 3.439.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.67

$$\int e^{\arcsin(ax)} x^3 \, dx = \frac{\left(20 \, a^4 x^4 - 3 \, a^2 x^2 + (5 \, a^3 x^3 + 6 \, a x)\sqrt{-a^2 x^2 + 1} - 6\right) e^{(\arcsin(ax))}}{85 \, a^4}$$

input
```
integrate(exp(arcsin(a*x))*x^3,x, algorithm="fricas")
```

output
```
1/85*(20*a^4*x^4 - 3*a^2*x^2 + (5*a^3*x^3 + 6*a*x)*sqrt(-a^2*x^2 + 1) - 6)
*e^(arcsin(a*x))/a^4
```

### 3.439.6 Sympy [A] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.23

$$\int e^{\arcsin(ax)}x^3\,dx = \begin{cases} \frac{4x^4e^{\operatorname{asin}(ax)}}{17} + \frac{x^3\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{17a} - \frac{3x^2e^{\operatorname{asin}(ax)}}{85a^2} + \frac{6x\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{85a^3} - \frac{6e^{\operatorname{asin}(ax)}}{85a^4} & \text{for } a \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}$$

input
```
integrate(exp(asin(a*x))*x**3,x)
```

output
```
Piecewise((4*x**4*exp(asin(a*x))/17 + x**3*sqrt(-a**2*x**2 + 1)*exp(asin(a
*x))/(17*a) - 3*x**2*exp(asin(a*x))/(85*a**2) + 6*x*sqrt(-a**2*x**2 + 1)*e
xp(asin(a*x))/(85*a**3) - 6*exp(asin(a*x))/(85*a**4), Ne(a, 0)), (x**4/4,
True))
```

### 3.439.7 Maxima [F]

$$\int e^{\arcsin(ax)}x^3\,dx = \int x^3e^{(\arcsin(ax))}\,dx$$

input
```
integrate(exp(arcsin(a*x))*x^3,x, algorithm="maxima")
```

output
```
integrate(x^3*e^(arcsin(a*x)), x)
```

### 3.439.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.20

$$\int e^{\arcsin(ax)}x^3\,dx = -\frac{(-a^2x^2+1)^{\frac{3}{2}}xe^{(\arcsin(ax))}}{17\,a^3} + \frac{11\,\sqrt{-a^2x^2+1}xe^{(\arcsin(ax))}}{85\,a^3} + \frac{4\,(a^2x^2-1)^2e^{(\arcsin(ax))}}{17\,a^4} + \frac{37\,(a^2x^2-1)e^{(\arcsin(ax))}}{85\,a^4} + \frac{11\,e^{(\arcsin(ax))}}{85\,a^4}$$

input
```
integrate(exp(arcsin(a*x))*x^3,x, algorithm="giac")
```

output
```
-1/17*(-a^2*x^2 + 1)^(3/2)*x*e^(arcsin(a*x))/a^3 + 11/85*sqrt(-a^2*x^2 + 1
)*x*e^(arcsin(a*x))/a^3 + 4/17*(a^2*x^2 - 1)^2*e^(arcsin(a*x))/a^4 + 37/85
*(a^2*x^2 - 1)*e^(arcsin(a*x))/a^4 + 11/85*e^(arcsin(a*x))/a^4
```

### 3.439.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}x^3\,dx=\int x^3\,\mathrm{e}^{\mathrm{asin}(a\,x)}\,dx$$

input
```
int(x^3*exp(asin(a*x)),x)
```

output
```
int(x^3*exp(asin(a*x)), x)
```

# 3.440 $\int e^{\arcsin(ax)}x^2\,dx$



## 3.440.1 Optimal result

Integrand size = 10, antiderivative size = 82

$$\int e^{\arcsin(ax)}x^2\,dx=\frac{e^{\arcsin(ax)}x}{8a^2}+\frac{e^{\arcsin(ax)}\sqrt{1-a^2x^2}}{8a^3}-\frac{e^{\arcsin(ax)}\cos(3\arcsin(ax))}{40a^3}-\frac{3e^{\arcsin(ax)}\sin(3\arcsin(ax))}{40a^3}$$

output
```
1/8*exp(arcsin(a*x))*x/a^2-1/40*exp(arcsin(a*x))*cos(3*arcsin(a*x))/a^3-3/
40*exp(arcsin(a*x))*sin(3*arcsin(a*x))/a^3+1/8*exp(arcsin(a*x))*(-a^2*x^2+
1)^(1/2)/a^3
```

## 3.440.2 Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 50, normalized size of antiderivative = 0.61

$$\int e^{\arcsin(ax)}x^2\,dx=-\frac{e^{\arcsin(ax)}\left(-5ax-5\sqrt{1-a^2x^2}+\cos(3\arcsin(ax))+3\sin(3\arcsin(ax))\right)}{40a^3}$$

input
```
Integrate[E^ArcSin[a*x]*x^2,x]
```

output
```
-1/40*(E^ArcSin[a*x]*(-5*a*x - 5*Sqrt[1 - a^2*x^2] + Cos[3*ArcSin[a*x]] +
3*Sin[3*ArcSin[a*x]]))/a^3
```

### 3.440.3 Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.91, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {5335, 27, 4972, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2 e^{\arcsin(ax)} \, dx$$

$$\Big\downarrow \text{ 5335}$$

$$\frac{\int e^{\arcsin(ax)} x^2 \sqrt{1-a^2x^2} d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{\int a^2 e^{\arcsin(ax)} x^2 \sqrt{1-a^2x^2} d\arcsin(ax)}{a^3}$$

$$\Big\downarrow \text{ 4972}$$

$$\frac{\int \left(\frac{1}{4} e^{\arcsin(ax)} \sqrt{1-a^2x^2} - \frac{1}{4} e^{\arcsin(ax)} \cos(3\arcsin(ax))\right) d\arcsin(ax)}{a^3}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{\frac{1}{8}\sqrt{1-a^2x^2} e^{\arcsin(ax)} + \frac{1}{8} a x e^{\arcsin(ax)} - \frac{3}{40} e^{\arcsin(ax)} \sin(3\arcsin(ax)) - \frac{1}{40} e^{\arcsin(ax)} \cos(3\arcsin(ax))}{a^3}$$

input
```
Int[E^ArcSin[a*x]*x^2,x]
```

output
```
((a*E^ArcSin[a*x]*x)/8 + (E^ArcSin[a*x]*Sqrt[1 - a^2*x^2])/8 - (E^ArcSin[a
*x]*Cos[3*ArcSin[a*x]])/40 - (3*E^ArcSin[a*x]*Sin[3*ArcSin[a*x]])/40)/a^3
```

### 3.440.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4972
```
Int[Cos[(f_.) + (g_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_
.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandTrigReduce[F^(c*(a + b*x)),
Sin[d + e*x]^m*Cos[f + g*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e, f, g}, x]
 && IGtQ[m, 0] && IGtQ[n, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

## 3.440.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)} x^2 dx$$

input
```
int(exp(arcsin(a*x))*x^2,x)
```

output
```
int(exp(arcsin(a*x))*x^2,x)
```

## 3.440.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 45, normalized size of antiderivative = 0.55

$$\int e^{\arcsin(ax)} x^2 \, dx = \frac{\left(3 \, a^3 x^3 - ax + (a^2 x^2 + 1)\sqrt{-a^2 x^2 + 1}\right) e^{(\arcsin(ax))}}{10 \, a^3}$$

input
```
integrate(exp(arcsin(a*x))*x^2,x, algorithm="fricas")
```

output
```
1/10*(3*a^3*x^3 - a*x + (a^2*x^2 + 1)*sqrt(-a^2*x^2 + 1))*e^(arcsin(a*x))/
a^3
```

### 3.440.6 Sympy [A] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.98

$$\int e^{\arcsin(ax)}x^2\,dx = \begin{cases} \frac{3x^3e^{\operatorname{asin}(ax)}}{10} + \frac{x^2\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{10a} - \frac{xe^{\operatorname{asin}(ax)}}{10a^2} + \frac{\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{10a^3} & \text{for } a \neq 0 \\ \frac{x^3}{3} & \text{otherwise} \end{cases}$$

input
```
integrate(exp(asin(a*x))*x**2,x)
```

output
```
Piecewise((3*x**3*exp(asin(a*x))/10 + x**2*sqrt(-a**2*x**2 + 1)*exp(asin(a
*x))/(10*a) - x*exp(asin(a*x))/(10*a**2) + sqrt(-a**2*x**2 + 1)*exp(asin(a
*x))/(10*a**3), Ne(a, 0)), (x**3/3, True))
```

### 3.440.7 Maxima [F]

$$\int e^{\arcsin(ax)}x^2\,dx = \int x^2e^{(\arcsin(ax))}\,dx$$

input
```
integrate(exp(arcsin(a*x))*x^2,x, algorithm="maxima")
```

output
```
integrate(x^2*e^(arcsin(a*x)), x)
```

### 3.440.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 76, normalized size of antiderivative = 0.93

$$\int e^{\arcsin(ax)}x^2\,dx = \frac{3\,(a^2x^2-1)xe^{(\arcsin(ax))}}{10\,a^2} + \frac{xe^{(\arcsin(ax))}}{5\,a^2} - \frac{(-a^2x^2+1)^{\frac{3}{2}}e^{(\arcsin(ax))}}{10\,a^3} + \frac{\sqrt{-a^2x^2+1}e^{(\arcsin(ax))}}{5\,a^3}$$

input
```
integrate(exp(arcsin(a*x))*x^2,x, algorithm="giac")
```

output
```
3/10*(a^2*x^2 - 1)*x*e^(arcsin(a*x))/a^2 + 1/5*x*e^(arcsin(a*x))/a^2 - 1/1
0*(-a^2*x^2 + 1)^(3/2)*e^(arcsin(a*x))/a^3 + 1/5*sqrt(-a^2*x^2 + 1)*e^(arc
sin(a*x))/a^3
```

### 3.440.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}x^2\,dx = \int x^2\,\mathrm{e}^{\mathrm{asin}(a\,x)}\,dx$$

input
```
int(x^2*exp(asin(a*x)),x)
```

output
```
int(x^2*exp(asin(a*x)), x)
```

# 3.441 $\int e^{\arcsin(ax)}x\,dx$



## 3.441.1 Optimal result

Integrand size = 8, antiderivative size = 41

$$\int e^{\arcsin(ax)}x\,dx=-\frac{e^{\arcsin(ax)}\cos(2\arcsin(ax))}{5a^2}+\frac{e^{\arcsin(ax)}\sin(2\arcsin(ax))}{10a^2}$$

output
```
-1/5*exp(arcsin(a*x))*cos(2*arcsin(a*x))/a^2+1/10*exp(arcsin(a*x))*sin(2*a
rcsin(a*x))/a^2
```

## 3.441.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 30, normalized size of antiderivative = 0.73

$$\int e^{\arcsin(ax)}x\,dx=\frac{e^{\arcsin(ax)}(-2\cos(2\arcsin(ax))+\sin(2\arcsin(ax)))}{10a^2}$$

input
```
Integrate[E^ArcSin[a*x]*x,x]
```

output
```
(E^ArcSin[a*x]*(-2*Cos[2*ArcSin[a*x]] + Sin[2*ArcSin[a*x]]))/(10*a^2)
```

### 3.441.3 Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 42, normalized size of antiderivative = 1.02, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {5335, 27, 4972, 27, 4932}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int xe^{\arcsin(ax)}\,dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int e^{\arcsin(ax)}x\sqrt{1-a^2x^2}d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int ae^{\arcsin(ax)}x\sqrt{1-a^2x^2}d\arcsin(ax)}{a^2}$$

$$\Big\downarrow \text{4972}$$

$$\frac{\int \frac{1}{2}e^{\arcsin(ax)}\sin(2\arcsin(ax))d\arcsin(ax)}{a^2}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int e^{\arcsin(ax)}\sin(2\arcsin(ax))d\arcsin(ax)}{2a^2}$$

$$\Big\downarrow \text{4932}$$

$$\frac{\frac{1}{5}e^{\arcsin(ax)}\sin(2\arcsin(ax))-\frac{2}{5}e^{\arcsin(ax)}\cos(2\arcsin(ax))}{2a^2}$$

input
```
Int[E^ArcSin[a*x]*x,x]
```

output
```
((-2*E^ArcSin[a*x]*Cos[2*ArcSin[a*x]])/5 + (E^ArcSin[a*x]*Sin[2*ArcSin[a*x
]])/5)/(2*a^2)
```

### 3.441.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 4932
```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_.) + (e_.)*(x_)], x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] - Simp[e*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

rule 4972
```
Int[Cos[(f_.) + (g_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_
.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandTrigReduce[F^(c*(a + b*x)),
Sin[d + e*x]^m*Cos[f + g*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e, f, g}, x]
 && IGtQ[m, 0] && IGtQ[n, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

## 3.441.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)} x dx$$

input
```
int(exp(arcsin(a*x))*x,x)
```

output
```
int(exp(arcsin(a*x))*x,x)
```

## 3.441.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.85

$$\int e^{\arcsin(ax)} x \, dx = \frac{\left(2\, a^2 x^2 + \sqrt{-a^2 x^2 + 1} a x - 1\right) e^{(\arcsin(ax))}}{5\, a^2}$$

input
```
integrate(exp(arcsin(a*x))*x,x, algorithm="fricas")
```

output
```
1/5*(2*a^2*x^2 + sqrt(-a^2*x^2 + 1)*a*x - 1)*e^(arcsin(a*x))/a^2
```

### 3.441.6 Sympy [A] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.29

$$\int e^{\arcsin(ax)}x\,dx = \begin{cases} \frac{2x^2e^{\operatorname{asin}(ax)}}{5} + \frac{x\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{5a} - \frac{e^{\operatorname{asin}(ax)}}{5a^2} & \text{for } a \neq 0 \\ \frac{x^2}{2} & \text{otherwise} \end{cases}$$

input
```
integrate(exp(asin(a*x))*x,x)
```

output
```
Piecewise((2*x**2*exp(asin(a*x))/5 + x*sqrt(-a**2*x**2 + 1)*exp(asin(a*x))
/(5*a) - exp(asin(a*x))/(5*a**2), Ne(a, 0)), (x**2/2, True))
```

### 3.441.7 Maxima [F]

$$\int e^{\arcsin(ax)}x\,dx = \int xe^{(\arcsin(ax))}\,dx$$

input
```
integrate(exp(arcsin(a*x))*x,x, algorithm="maxima")
```

output
```
integrate(x*e^(arcsin(a*x)), x)
```

### 3.441.8 Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 53, normalized size of antiderivative = 1.29

$$\int e^{\arcsin(ax)}x\,dx = \frac{\sqrt{-a^2x^2+1}xe^{(\arcsin(ax))}}{5\,a} + \frac{2\,(a^2x^2-1)e^{(\arcsin(ax))}}{5\,a^2} + \frac{e^{(\arcsin(ax))}}{5\,a^2}$$

input
```
integrate(exp(arcsin(a*x))*x,x, algorithm="giac")
```

output
```
1/5*sqrt(-a^2*x^2 + 1)*x*e^(arcsin(a*x))/a + 2/5*(a^2*x^2 - 1)*e^(arcsin(a
*x))/a^2 + 1/5*e^(arcsin(a*x))/a^2
```

### 3.441.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}x\,dx=\int x\,\mathrm{e}^{\mathrm{asin}(a\,x)}\,dx$$

input
```
int(x*exp(asin(a*x)),x)
```

output
```
int(x*exp(asin(a*x)), x)
```

# 3.442 $\int e^{\arcsin(ax)}\,dx$



## 3.442.1 Optimal result

Integrand size = 6, antiderivative size = 39

$$\int e^{\arcsin(ax)}\,dx = \frac{1}{2}e^{\arcsin(ax)}x + \frac{e^{\arcsin(ax)}\sqrt{1-a^2x^2}}{2a}$$

output
```
1/2*exp(arcsin(a*x))*x+1/2*exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2)/a
```

## 3.442.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.79

$$\int e^{\arcsin(ax)}\,dx = \frac{e^{\arcsin(ax)}\left(ax+\sqrt{1-a^2x^2}\right)}{2a}$$

input
```
Integrate[E^ArcSin[a*x],x]
```

output
```
(E^ArcSin[a*x]*(a*x + Sqrt[1 - a^2*x^2]))/(2*a)
```

### 3.442.3 Rubi [A] (verified)

Time = 0.19 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.05, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5335, 4933}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int e^{\arcsin(ax)}\,dx$$

$$\Big\downarrow \text{ 5335}$$

$$\frac{\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{ 4933}$$

$$\frac{\frac{1}{2}\sqrt{1-a^2x^2}e^{\arcsin(ax)}+\frac{1}{2}axe^{\arcsin(ax)}}{a}$$

input
```
Int[E^ArcSin[a*x],x]
```

output
```
((a*E^ArcSin[a*x]*x)/2 + (E^ArcSin[a*x]*Sqrt[1 - a^2*x^2])/2)/a
```

#### 3.442.3.1 Defintions of rubi rules used

rule 4933
```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

### 3.442.4 Maple [F]

$$\int e^{\arcsin(ax)}dx$$

input
```
int(exp(arcsin(a*x)),x)
```

output
```
int(exp(arcsin(a*x)),x)
```

### 3.442.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.67

$$\int e^{\arcsin(ax)}\,dx = \frac{\left(ax+\sqrt{-a^2x^2+1}\right)e^{(\arcsin(ax))}}{2\,a}$$

input
```
integrate(exp(arcsin(a*x)),x, algorithm="fricas")
```

output
```
1/2*(a*x + sqrt(-a^2*x^2 + 1))*e^(arcsin(a*x))/a
```

### 3.442.6 Sympy [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 32, normalized size of antiderivative = 0.82

$$\int e^{\arcsin(ax)}\,dx = \begin{cases} \frac{xe^{\operatorname{asin}(ax)}}{2}+\frac{\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{2a} & \text{for } a\neq 0 \\ x & \text{otherwise} \end{cases}$$

input
```
integrate(exp(asin(a*x)),x)
```

output
```
Piecewise((x*exp(asin(a*x))/2 + sqrt(-a**2*x**2 + 1)*exp(asin(a*x))/(2*a),
 Ne(a, 0)), (x, True))
```

### 3.442.7 Maxima [F]

$$\int e^{\arcsin(ax)} \, dx = \int e^{(\arcsin(ax))} \, dx$$

input
```
integrate(exp(arcsin(a*x)),x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(a*x)), x)
```

### 3.442.8 Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.79

$$\int e^{\arcsin(ax)} \, dx = \frac{1}{2} \, x e^{(\arcsin(ax))} + \frac{\sqrt{-a^2x^2 + 1}e^{(\arcsin(ax))}}{2 \, a}$$

input
```
integrate(exp(arcsin(a*x)),x, algorithm="giac")
```

output
```
1/2*x*e^(arcsin(a*x)) + 1/2*sqrt(-a^2*x^2 + 1)*e^(arcsin(a*x))/a
```

### 3.442.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)} \, dx = \int e^{\mathrm{asin}(a\,x)} \, dx$$

input
```
int(exp(asin(a*x)),x)
```

output
```
int(exp(asin(a*x)), x)
```

# 3.443 $\int \frac{e^{\arcsin(ax)}}{x}\,dx$



## 3.443.1 Optimal result

Integrand size = 10, antiderivative size = 43

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = ie^{\arcsin(ax)} - 2ie^{\arcsin(ax)}\,\text{Hypergeometric2F1}\left(-\frac{i}{2},1,1-\frac{i}{2},e^{2i\arcsin(ax)}\right)$$

output
```
I*exp(arcsin(a*x))-2*I*exp(arcsin(a*x))*hypergeom([1, -1/2*I],[1-1/2*I],(I
*a*x+(-a^2*x^2+1)^(1/2))^2)
```

## 3.443.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.74

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = i\left(-e^{\arcsin(ax)}\,\text{Hypergeometric2F1}\left(-\frac{i}{2},1,1-\frac{i}{2},e^{2i\arcsin(ax)}\right) - \left(\frac{1}{5} - \frac{2i}{5}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1,1-\frac{i}{2},2-\frac{i}{2},e^{2i\arcsin(ax)}\right)\right)$$

input
```
Integrate[E^ArcSin[a*x]/x,x]
```

output
```
I*(-(E^ArcSin[a*x]*Hypergeometric2F1[-1/2*I, 1, 1 - I/2, E^((2*I)*ArcSin[a
*x])]) - (1/5 - (2*I)/5)*E^((1 + 2*I)*ArcSin[a*x])*Hypergeometric2F1[1, 1
- I/2, 2 - I/2, E^((2*I)*ArcSin[a*x])])
```

### 3.443.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {5335, 27, 4943, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(ax)}}{x} \, dx$$

$$\Big\downarrow \text{ 5335}$$

$$\frac{\int \frac{e^{\arcsin(ax)}\sqrt{1-a^2x^2}}{x} d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{ 27}$$

$$\int \frac{\sqrt{1-a^2x^2}e^{\arcsin(ax)}}{ax} d\arcsin(ax)$$

$$\Big\downarrow \text{ 4943}$$

$$-i\int \left(\frac{2e^{\arcsin(ax)}}{1-e^{2i\arcsin(ax)}} - e^{\arcsin(ax)}\right) d\arcsin(ax)$$

$$\Big\downarrow \text{ 2009}$$

$$-i\left(-e^{\arcsin(ax)} + 2e^{\arcsin(ax)}\,\text{Hypergeometric2F1}\left(-\frac{i}{2},1,1-\frac{i}{2},e^{2i\arcsin(ax)}\right)\right)$$

input
```
Int[E^ArcSin[a*x]/x,x]
```

output
```
(-I)*(-E^ArcSin[a*x] + 2*E^ArcSin[a*x]*Hypergeometric2F1[-1/2*I, 1, 1 - I/
2, E^((2*I)*ArcSin[a*x])])
```

#### 3.443.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4943
```
Int[Cot[(d_.) + (e_.)*(x_)]^(n_.)*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symb
ol] :> Simp[(-I)^n   Int[ExpandIntegrand[F^(c*(a + b*x))*((1 + E^(2*I*(d +
e*x)))^n/(1 - E^(2*I*(d + e*x)))^n), x], x], x] /; FreeQ[{F, a, b, c, d, e}
, x] && IntegerQ[n]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

### 3.443.4 Maple [F]

$$\int \frac{e^{\arcsin(ax)}}{x}dx$$

input
```
int(exp(arcsin(a*x))/x,x)
```

output
```
int(exp(arcsin(a*x))/x,x)
```

### 3.443.5 Fricas [F]

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{e^{(\arcsin(ax))}}{x}\,dx$$

input
```
integrate(exp(arcsin(a*x))/x,x, algorithm="fricas")
```

output
```
integral(e^(arcsin(a*x))/x, x)
```

### 3.443.6 Sympy [F]

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{e^{\operatorname{asin}(ax)}}{x}\,dx$$

input
```
integrate(exp(asin(a*x))/x,x)
```

output
```
Integral(exp(asin(a*x))/x, x)
```

### 3.443.7 Maxima [F]

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{e^{(\arcsin(ax))}}{x}\,dx$$

input
```
integrate(exp(arcsin(a*x))/x,x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(a*x))/x, x)
```

### 3.443.8 Giac [F]

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{e^{(\arcsin(ax))}}{x}\,dx$$

input
```
integrate(exp(arcsin(a*x))/x,x, algorithm="giac")
```

output
```
integrate(e^(arcsin(a*x))/x, x)
```

### 3.443.9 Mupad [F(-1)]

Timed out.

$$\int \frac{e^{\arcsin(ax)}}{x}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a\,x)}}{x}\,dx$$

input
```
int(exp(asin(a*x))/x,x)
```

output
```
int(exp(asin(a*x))/x, x)
```

# 3.444 $\int \frac{e^{\arcsin(ax)}}{x^2}\,dx$



## 3.444.1 Optimal result

Integrand size = 10, antiderivative size = 83

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = (1-i)ae^{(1+i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2},1,\frac{3}{2}-\frac{i}{2},e^{2i\arcsin(ax)}\right) - (2-2i)ae^{(1+i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2},2,\frac{3}{2}-\frac{i}{2},e^{2i\arcsin(ax)}\right)$$

output
```
(1-I)*a*exp((1+I)*arcsin(a*x))*hypergeom([1, 1/2-1/2*I],[3/2-1/2*I],(I*a*x
+(-a^2*x^2+1)^(1/2))^2)+(-2+2*I)*a*exp((1+I)*arcsin(a*x))*hypergeom([2, 1/
2-1/2*I],[3/2-1/2*I],(I*a*x+(-a^2*x^2+1)^(1/2))^2)
```

## 3.444.2 Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 54, normalized size of antiderivative = 0.65

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = -\frac{e^{\arcsin(ax)} + (1+i)ae^{(1+i)\arcsin(ax)}x\,\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2},1,\frac{3}{2}-\frac{i}{2},e^{2i\arcsin(ax)}\right)}{x}$$

input
```
Integrate[E^ArcSin[a*x]/x^2,x]
```

output
```
-((E^ArcSin[a*x] + (1 + I)*a*E^((1 + I)*ArcSin[a*x])*x*Hypergeometric2F1[1
/2 - I/2, 1, 3/2 - I/2, E^((2*I)*ArcSin[a*x])])/x)
```

### 3.444.3 Rubi [A] (verified)

Time = 0.29 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {5335, 27, 4974, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(ax)}}{x^2}dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int \frac{e^{\arcsin(ax)}\sqrt{1-a^2x^2}}{x^2}d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{27}$$

$$a\int \frac{e^{\arcsin(ax)}\sqrt{1-a^2x^2}}{a^2x^2}d\arcsin(ax)$$

$$\Big\downarrow \text{4974}$$

$$a\int \left(\frac{2e^{(1+i)\arcsin(ax)}}{1-e^{2i\arcsin(ax)}}-\frac{4e^{(1+i)\arcsin(ax)}}{\left(-1+e^{2i\arcsin(ax)}\right)^2}\right)d\arcsin(ax)$$

$$\Big\downarrow \text{2009}$$

$$a\left((1-i)e^{(1+i)\arcsin(ax)}\text{Hypergeometric2F1}\left(\frac{1}{2}-\frac{i}{2},1,\frac{3}{2}-\frac{i}{2},e^{2i\arcsin(ax)}\right)-(2-2i)e^{(1+i)\arcsin(ax)}\text{Hypergeome}\right.$$

input
```
Int[E^ArcSin[a*x]/x^2,x]
```

output
```
a*((1 - I)*E^((1 + I)*ArcSin[a*x])*Hypergeometric2F1[1/2 - I/2, 1, 3/2 - I
/2, E^((2*I)*ArcSin[a*x])] - (2 - 2*I)*E^((1 + I)*ArcSin[a*x])*Hypergeomet
ric2F1[1/2 - I/2, 2, 3/2 - I/2, E^((2*I)*ArcSin[a*x])])
```

### 3.444.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4974
```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*(G_)[(d_.) + (e_.)*(x_)]^(m_.)*(H_)[(
d_.) + (e_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigToExp[F^(c*(a + b*x)),
 G[d + e*x]^m*H[d + e*x]^n, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && IGtQ[
m, 0] && IGtQ[n, 0] && TrigQ[G] && TrigQ[H]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

## 3.444.4 Maple [F]

$$\int \frac{\mathrm{e}^{\arcsin(ax)}}{x^2} dx$$

input
```
int(exp(arcsin(a*x))/x^2,x)
```

output
```
int(exp(arcsin(a*x))/x^2,x)
```

## 3.444.5 Fricas [F]

$$\int \frac{e^{\arcsin(ax)}}{x^2} dx = \int \frac{e^{(\arcsin(ax))}}{x^2} dx$$

input
```
integrate(exp(arcsin(a*x))/x^2,x, algorithm="fricas")
```

output
```
integral(e^(arcsin(a*x))/x^2, x)
```

### 3.444.6 Sympy [F]

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = \int \frac{e^{\operatorname{asin}(ax)}}{x^2}\,dx$$

input
```
integrate(exp(asin(a*x))/x**2,x)
```

output
```
Integral(exp(asin(a*x))/x**2, x)
```

### 3.444.7 Maxima [F]

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = \int \frac{e^{(\arcsin(ax))}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(a*x))/x^2,x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(a*x))/x^2, x)
```

### 3.444.8 Giac [F]

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = \int \frac{e^{(\arcsin(ax))}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(a*x))/x^2,x, algorithm="giac")
```

output
```
integrate(e^(arcsin(a*x))/x^2, x)
```

### 3.444.9 Mupad [F(-1)]

Timed out.

$$\int \frac{e^{\arcsin(ax)}}{x^2}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a\,x)}}{x^2}\,dx$$

input
```
int(exp(asin(a*x))/x^2,x)
```

output
```
int(exp(asin(a*x))/x^2, x)
```

# 3.445 $\int e^{\arcsin(ax)^2}x^3\,dx$



## 3.445.1 Optimal result

Integrand size = 12, antiderivative size = 101

$$\int e^{\arcsin(ax)^2}x^3\,dx = \frac{e\sqrt{\pi}\text{erf}(1-i\arcsin(ax))}{16a^4} - \frac{e^4\sqrt{\pi}\text{erf}(2-i\arcsin(ax))}{32a^4} + \frac{e\sqrt{\pi}\text{erf}(1+i\arcsin(ax))}{16a^4} - \frac{e^4\sqrt{\pi}\text{erf}(2+i\arcsin(ax))}{32a^4}$$

output
```
1/16*I*exp(1)*erfi(-I+arcsin(a*x))*Pi^(1/2)/a^4-1/16*I*exp(1)*erfi(I+arcsi
n(a*x))*Pi^(1/2)/a^4-1/32*I*exp(4)*erfi(-2*I+arcsin(a*x))*Pi^(1/2)/a^4+1/3
2*I*exp(4)*erfi(2*I+arcsin(a*x))*Pi^(1/2)/a^4
```

## 3.445.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.66

$$\int e^{\arcsin(ax)^2}x^3\,dx = \frac{e\sqrt{\pi}(2(\text{erf}(1-i\arcsin(ax))+\text{erf}(1+i\arcsin(ax)))-e^3(\text{erf}(2-i\arcsin(ax))+\text{erf}(2+i\arcsin(ax))))}{32a^4}$$

input
```
Integrate[E^ArcSin[a*x]^2*x^3,x]
```

output
```
(E*Sqrt[Pi]*(2*(Erf[1 - I*ArcSin[a*x]] + Erf[1 + I*ArcSin[a*x]]) - E^3*(Er
f[2 - I*ArcSin[a*x]] + Erf[2 + I*ArcSin[a*x]])))/(32*a^4)
```

### 3.445.3 Rubi [A] (verified)

Time = 0.31 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.92, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5335, 27, 4977, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3 e^{\arcsin(ax)^2} \, dx$$

$$\Big\downarrow \text{ 5335}$$

$$\frac{\int e^{\arcsin(ax)^2} x^3 \sqrt{1-a^2x^2} d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{\int a^3 e^{\arcsin(ax)^2} x^3 \sqrt{1-a^2x^2} d\arcsin(ax)}{a^4}$$

$$\Big\downarrow \text{ 4977}$$

$$\frac{\int \left(\frac{1}{8} i e^{\arcsin(ax)^2-2i\arcsin(ax)} - \frac{1}{8} i e^{\arcsin(ax)^2+2i\arcsin(ax)} - \frac{1}{16} i e^{\arcsin(ax)^2-4i\arcsin(ax)} + \frac{1}{16} i e^{\arcsin(ax)^2+4i\arcsin(ax)}\right) d a}{a^4}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{\frac{1}{16} e\sqrt{\pi}\text{erf}(1-i\arcsin(ax)) - \frac{1}{32} e^4 \sqrt{\pi}\text{erf}(2-i\arcsin(ax)) + \frac{1}{16} e\sqrt{\pi}\text{erf}(1+i\arcsin(ax)) - \frac{1}{32} e^4\sqrt{\pi}\text{erf}(2+i\arcsin}{a^4}$$

input
```
Int[E^ArcSin[a*x]^2*x^3,x]
```

output
```
((E*Sqrt[Pi]*Erf[1 - I*ArcSin[a*x]])/16 - (E^4*Sqrt[Pi]*Erf[2 - I*ArcSin[a
*x]])/32 + (E*Sqrt[Pi]*Erf[1 + I*ArcSin[a*x]])/16 - (E^4*Sqrt[Pi]*Erf[2 +
I*ArcSin[a*x]])/32)/a^4
```

### 3.445.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4977
```
Int[Cos[v_]^(n_.)*(F_)^(u_)*Sin[v_]^(m_.), x_Symbol] :> Int[ExpandTrigToExp
[F^u, Sin[v]^m*Cos[v]^n, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u
, x, 2]) && (LinearQ[v, x] || PolyQ[v, x, 2]) && IGtQ[m, 0] && IGtQ[n, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

## 3.445.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)^2} x^3 dx$$

input
```
int(exp(arcsin(a*x)^2)*x^3,x)
```

output
```
int(exp(arcsin(a*x)^2)*x^3,x)
```

## 3.445.5 Fricas [F]

$$\int e^{\arcsin(ax)^2} x^3 \, dx = \int x^3 e^{\left(\arcsin(ax)^2\right)} \, dx$$

input
```
integrate(exp(arcsin(a*x)^2)*x^3,x, algorithm="fricas")
```

output
```
integral(x^3*e^(arcsin(a*x)^2), x)
```

### 3.445.6 Sympy [F]

$$\int e^{\arcsin(ax)^2}x^3\,dx = \int x^3e^{\operatorname{asin}^2(ax)}\,dx$$

input
```
integrate(exp(asin(a*x)**2)*x**3,x)
```

output
```
Integral(x**3*exp(asin(a*x)**2), x)
```

### 3.445.7 Maxima [F]

$$\int e^{\arcsin(ax)^2}x^3\,dx = \int x^3e^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)*x^3,x, algorithm="maxima")
```

output
```
integrate(x^3*e^(arcsin(a*x)^2), x)
```

### 3.445.8 Giac [F]

$$\int e^{\arcsin(ax)^2}x^3\,dx = \int x^3e^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)*x^3,x, algorithm="giac")
```

output
```
integrate(x^3*e^(arcsin(a*x)^2), x)
```

### 3.445.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)^2}x^3\,dx=\int x^3\,\mathrm{e}^{\mathrm{asin}(a\,x)^2}\,dx$$

input
```
int(x^3*exp(asin(a*x)^2),x)
```

output
```
int(x^3*exp(asin(a*x)^2), x)
```

# 3.446 $\int e^{\arcsin(ax)^2}x^2\,dx$



## 3.446.1 Optimal result

Integrand size = 12, antiderivative size = 129

$$\int e^{\arcsin(ax)^2}x^2\,dx=\frac{\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right)}{16a^3}+\frac{\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right)}{16a^3}-\frac{e^{9/4}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(-3i+2\arcsin(ax))\right)}{16a^3}-\frac{e^{9/4}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(3i+2\arcsin(ax))\right)}{16a^3}$$

output
```
1/16*exp(1/4)*erfi(-1/2*I+arcsin(a*x))*Pi^(1/2)/a^3+1/16*exp(1/4)*erfi(1/2
*I+arcsin(a*x))*Pi^(1/2)/a^3-1/16*exp(9/4)*erfi(-3/2*I+arcsin(a*x))*Pi^(1/
2)/a^3-1/16*exp(9/4)*erfi(3/2*I+arcsin(a*x))*Pi^(1/2)/a^3
```

## 3.446.2 Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.65

$$\int e^{\arcsin(ax)^2}x^2\,dx$$
$$=\frac{\sqrt[4]{e}\sqrt{\pi}\left(\operatorname{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right)+\operatorname{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right)-e^2\left(\operatorname{erfi}\left(\frac{1}{2}(-3i+2\arcsin(ax))\right)+\operatorname{erfi}\left(\frac{1}{2}(3\right.\right.\right.}{16a^3}$$

input
```
Integrate[E^ArcSin[a*x]^2*x^2,x]
```

output
```
(E^(1/4)*Sqrt[Pi]*(Erfi[(-I + 2*ArcSin[a*x])/2] + Erfi[(I + 2*ArcSin[a*x])
/2] - E^2*(Erfi[(-3*I + 2*ArcSin[a*x])/2] + Erfi[(3*I + 2*ArcSin[a*x])/2])
))/(16*a^3)
```

### 3.446.3 Rubi [A] (verified)

Time = 0.32 (sec) , antiderivative size = 121, normalized size of antiderivative = 0.94, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5335, 27, 4977, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2 e^{\arcsin(ax)^2} dx$$

$$\Big\downarrow \text{ 5335}$$

$$\frac{\int e^{\arcsin(ax)^2} x^2 \sqrt{1-a^2x^2} d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{\int a^2 e^{\arcsin(ax)^2} x^2 \sqrt{1-a^2x^2} d\arcsin(ax)}{a^3}$$

$$\Big\downarrow \text{ 4977}$$

$$\frac{\int \left(\frac{1}{8} e^{\arcsin(ax)^2 - i\arcsin(ax)} + \frac{1}{8} e^{\arcsin(ax)^2 + i\arcsin(ax)} - \frac{1}{8} e^{\arcsin(ax)^2 - 3i\arcsin(ax)} - \frac{1}{8} e^{\arcsin(ax)^2 + 3i\arcsin(ax)}\right) d\arcsin(a}{a^3}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{\frac{1}{16}\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(ax)-i)\right) + \frac{1}{16}\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(ax)+i)\right) - \frac{1}{16}e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(ax)-3i)\right) - \frac{1}{16}e}{a^3}$$

input
```
Int[E^ArcSin[a*x]^2*x^2,x]
```

output
```
((E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a*x])/2])/16 + (E^(1/4)*Sqrt[Pi]*Er
fi[(I + 2*ArcSin[a*x])/2])/16 - (E^(9/4)*Sqrt[Pi]*Erfi[(-3*I + 2*ArcSin[a*
x])/2])/16 - (E^(9/4)*Sqrt[Pi]*Erfi[(3*I + 2*ArcSin[a*x])/2])/16)/a^3
```

### 3.446.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4977
```
Int[Cos[v_]^(n_.)*(F_)^(u_)*Sin[v_]^(m_.), x_Symbol] :> Int[ExpandTrigToExp
[F^u, Sin[v]^m*Cos[v]^n, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u
, x, 2]) && (LinearQ[v, x] || PolyQ[v, x, 2]) && IGtQ[m, 0] && IGtQ[n, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

## 3.446.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)^2} x^2 dx$$

input
```
int(exp(arcsin(a*x)^2)*x^2,x)
```

output
```
int(exp(arcsin(a*x)^2)*x^2,x)
```

## 3.446.5 Fricas [F]

$$\int e^{\arcsin(ax)^2} x^2 \, dx = \int x^2 e^{\left(\arcsin(ax)^2\right)} \, dx$$

input
```
integrate(exp(arcsin(a*x)^2)*x^2,x, algorithm="fricas")
```

output
```
integral(x^2*e^(arcsin(a*x)^2), x)
```

### 3.446.6 Sympy [F]

$$\int e^{\arcsin(ax)^2}x^2\,dx=\int x^2e^{\operatorname{asin}^2(ax)}\,dx$$

input
```
integrate(exp(asin(a*x)**2)*x**2,x)
```

output
```
Integral(x**2*exp(asin(a*x)**2), x)
```

### 3.446.7 Maxima [F]

$$\int e^{\arcsin(ax)^2}x^2\,dx=\int x^2e^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)*x^2,x, algorithm="maxima")
```

output
```
integrate(x^2*e^(arcsin(a*x)^2), x)
```

### 3.446.8 Giac [F]

$$\int e^{\arcsin(ax)^2}x^2\,dx=\int x^2e^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)*x^2,x, algorithm="giac")
```

output
```
integrate(x^2*e^(arcsin(a*x)^2), x)
```

### 3.446.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)^2}x^2\,dx=\int x^2\,\mathrm{e}^{\mathrm{asin}(a\,x)^2}\,dx$$

input
```
int(x^2*exp(asin(a*x)^2),x)
```

output
```
int(x^2*exp(asin(a*x)^2), x)
```

# 3.447 $\int e^{\arcsin(ax)^2} x\,dx$



## 3.447.1 Optimal result

Integrand size = 10, antiderivative size = 49

$$\int e^{\arcsin(ax)^2} x\,dx = \frac{e\sqrt{\pi}\text{erf}(1-i\arcsin(ax))}{8a^2} + \frac{e\sqrt{\pi}\text{erf}(1+i\arcsin(ax))}{8a^2}$$

output
```
1/8*I*exp(1)*erfi(-I+arcsin(a*x))*Pi^(1/2)/a^2-1/8*I*exp(1)*erfi(I+arcsin(
a*x))*Pi^(1/2)/a^2
```

## 3.447.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 36, normalized size of antiderivative = 0.73

$$\int e^{\arcsin(ax)^2} x\,dx = \frac{e\sqrt{\pi}(\text{erf}(1-i\arcsin(ax)) + \text{erf}(1+i\arcsin(ax)))}{8a^2}$$

input
```
Integrate[E^ArcSin[a*x]^2*x,x]
```

output
```
(E*Sqrt[Pi]*(Erf[1 - I*ArcSin[a*x]] + Erf[1 + I*ArcSin[a*x]]))/(8*a^2)
```

### 3.447.3 Rubi [A] (verified)

Time = 0.26 (sec) , antiderivative size = 47, normalized size of antiderivative = 0.96, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {5335, 27, 4977, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int xe^{\arcsin(ax)^2}\,dx$$
$$\Big\downarrow \; 5335$$
$$\frac{\int e^{\arcsin(ax)^2}x\sqrt{1-a^2x^2}d\arcsin(ax)}{a}$$
$$\Big\downarrow \; 27$$
$$\frac{\int ae^{\arcsin(ax)^2}x\sqrt{1-a^2x^2}d\arcsin(ax)}{a^2}$$
$$\Big\downarrow \; 4977$$
$$\frac{\int \left(\frac{1}{4}ie^{\arcsin(ax)^2-2i\arcsin(ax)}-\frac{1}{4}ie^{\arcsin(ax)^2+2i\arcsin(ax)}\right)d\arcsin(ax)}{a^2}$$
$$\Big\downarrow \; 2009$$
$$\frac{\frac{1}{8}e\sqrt{\pi}\text{erf}(1-i\arcsin(ax))+\frac{1}{8}e\sqrt{\pi}\text{erf}(1+i\arcsin(ax))}{a^2}$$

input
```
Int[E^ArcSin[a*x]^2*x,x]
```

output
```
((E*Sqrt[Pi]*Erf[1 - I*ArcSin[a*x]])/8 + (E*Sqrt[Pi]*Erf[1 + I*ArcSin[a*x]
])/8)/a^2
```

#### 3.447.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4977
```
Int[Cos[v_]^(n_.)*(F_)^(u_)*Sin[v_]^(m_.), x_Symbol] :> Int[ExpandTrigToExp
[F^u, Sin[v]^m*Cos[v]^n, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u
, x, 2]) && (LinearQ[v, x] || PolyQ[v, x, 2]) && IGtQ[m, 0] && IGtQ[n, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

### 3.447.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)^2} x dx$$

input
```
int(exp(arcsin(a*x)^2)*x,x)
```

output
```
int(exp(arcsin(a*x)^2)*x,x)
```

### 3.447.5 Fricas [F]

$$\int e^{\arcsin(ax)^2} x\,dx = \int xe^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)*x,x, algorithm="fricas")
```

output
```
integral(x*e^(arcsin(a*x)^2), x)
```

### 3.447.6 Sympy [F]

$$\int e^{\arcsin(ax)^2} x\,dx = \int xe^{\operatorname{asin}^2(ax)}\,dx$$

input
```
integrate(exp(asin(a*x)**2)*x,x)
```

output
```
Integral(x*exp(asin(a*x)**2), x)
```

## 3.447.7 Maxima [F]

$$\int e^{\arcsin(ax)^2}x\,dx = \int xe^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)*x,x, algorithm="maxima")
```

output
```
integrate(x*e^(arcsin(a*x)^2), x)
```

## 3.447.8 Giac [F]

$$\int e^{\arcsin(ax)^2}x\,dx = \int xe^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)*x,x, algorithm="giac")
```

output
```
integrate(x*e^(arcsin(a*x)^2), x)
```

## 3.447.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)^2}x\,dx = \int x\,\mathrm{e}^{\mathrm{asin}(a\,x)^2}\,dx$$

input
```
int(x*exp(asin(a*x)^2),x)
```

output
```
int(x*exp(asin(a*x)^2), x)
```

# 3.448 $\int e^{\arcsin(ax)^2}\,dx$



## 3.448.1 Optimal result

Integrand size = 8, antiderivative size = 65

$$\int e^{\arcsin(ax)^2}\,dx=\frac{\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right)}{4a}+\frac{\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right)}{4a}$$

output
```
1/4*exp(1/4)*erfi(-1/2*I+arcsin(a*x))*Pi^(1/2)/a+1/4*exp(1/4)*erfi(1/2*I+a
rcsin(a*x))*Pi^(1/2)/a
```

## 3.448.2 Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 48, normalized size of antiderivative = 0.74

$$\int e^{\arcsin(ax)^2}\,dx=\frac{\sqrt[4]{e}\sqrt{\pi}\left(\operatorname{erfi}\left(\frac{1}{2}(-i+2\arcsin(ax))\right)+\operatorname{erfi}\left(\frac{1}{2}(i+2\arcsin(ax))\right)\right)}{4a}$$

input
```
Integrate[E^ArcSin[a*x]^2,x]
```

output
```
(E^(1/4)*Sqrt[Pi]*(Erfi[(-I + 2*ArcSin[a*x])/2] + Erfi[(I + 2*ArcSin[a*x])
/2]))/(4*a)
```

### 3.448.3 Rubi [A] (verified)

Time = 0.24 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.97, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {5335, 4976, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int e^{\arcsin(ax)^2}dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int e^{\arcsin(ax)^2}\sqrt{1-a^2x^2}d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{4976}$$

$$\frac{\int \left(\frac{1}{2}e^{\arcsin(ax)^2-i\arcsin(ax)}+\frac{1}{2}e^{\arcsin(ax)^2+i\arcsin(ax)}\right)d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\frac{1}{4}\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(ax)-i)\right)+\frac{1}{4}\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(ax)+i)\right)}{a}$$

input
```
Int[E^ArcSin[a*x]^2,x]
```

output
```
((E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a*x])/2])/4 + (E^(1/4)*Sqrt[Pi]*Erf
i[(I + 2*ArcSin[a*x])/2])/4)/a
```

#### 3.448.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4976
```
Int[Cos[v_]^(n_.)*(F_)^(u_), x_Symbol] :> Int[ExpandTrigToExp[F^u, Cos[v]^n
, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u, x, 2]) && (LinearQ[v,
 x] || PolyQ[v, x, 2]) && IGtQ[n, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

## 3.448.4 Maple [F]

$$\int e^{\arcsin(ax)^2}dx$$

input
```
int(exp(arcsin(a*x)^2),x)
```

output
```
int(exp(arcsin(a*x)^2),x)
```

## 3.448.5 Fricas [F]

$$\int e^{\arcsin(ax)^2}\,dx = \int e^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2),x, algorithm="fricas")
```

output
```
integral(e^(arcsin(a*x)^2), x)
```

## 3.448.6 Sympy [F]

$$\int e^{\arcsin(ax)^2}\,dx = \int e^{\operatorname{asin}^2(ax)}\,dx$$

input
```
integrate(exp(asin(a*x)**2),x)
```

output
```
Integral(exp(asin(a*x)**2), x)
```

### 3.448.7 Maxima [F]

$$\int e^{\arcsin(ax)^2}\,dx = \int e^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2),x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(a*x)^2), x)
```

### 3.448.8 Giac [F]

$$\int e^{\arcsin(ax)^2}\,dx = \int e^{\left(\arcsin(ax)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2),x, algorithm="giac")
```

output
```
integrate(e^(arcsin(a*x)^2), x)
```

### 3.448.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)^2}\,dx = \int \mathrm{e}^{\mathrm{asin}(a\,x)^2}\,dx$$

input
```
int(exp(asin(a*x)^2),x)
```

output
```
int(exp(asin(a*x)^2), x)
```

# 3.449 $\int \frac{e^{\arcsin(ax)^2}}{x} dx$



## 3.449.1 Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{e^{\arcsin(ax)^2}}{x} dx = a\text{Int}\left(\frac{e^{\arcsin(ax)^2}}{ax}, x\right)$$

output
```
a*CannotIntegrate(exp(arcsin(a*x)^2)/a/x,x)
```

## 3.449.2 Mathematica [N/A]

Not integrable

Time = 0.17 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{e^{\arcsin(ax)^2}}{x} dx = \int \frac{e^{\arcsin(ax)^2}}{x} dx$$

input
```
Integrate[E^ArcSin[a*x]^2/x,x]
```

output
```
Integrate[E^ArcSin[a*x]^2/x, x]
```

### 3.449.3 Rubi [N/A]

Not integrable

Time = 0.23 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5335, 27, 7299}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(ax)^2}}{x} \, dx$$

$$\Big\downarrow \; 5335$$

$$\frac{\int \frac{e^{\arcsin(ax)^2}\sqrt{1-a^2x^2}}{x}d\arcsin(ax)}{a}$$

$$\Big\downarrow \; 27$$

$$\int \frac{\sqrt{1-a^2x^2}e^{\arcsin(ax)^2}}{ax}d\arcsin(ax)$$

$$\Big\downarrow \; 7299$$

$$\int \frac{\sqrt{1-a^2x^2}e^{\arcsin(ax)^2}}{ax}d\arcsin(ax)$$

input
```
Int[E^ArcSin[a*x]^2/x,x]
```

output
```
$Aborted
```

#### 3.449.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7299
```
Int[u_, x_] :> CannotIntegrate[u, x]
```

### 3.449.4 Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.92

$$\int \frac{\mathrm{e}^{\arcsin(ax)^2}}{x}dx$$

input
```
int(exp(arcsin(a*x)^2)/x,x)
```

output
```
int(exp(arcsin(a*x)^2)/x,x)
```

### 3.449.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)/x,x, algorithm="fricas")
```

output
```
integral(e^(arcsin(a*x)^2)/x, x)
```

### 3.449.6 Sympy [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 10, normalized size of antiderivative = 0.83

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{e^{\operatorname{asin}^2(ax)}}{x}\,dx$$

input
```
integrate(exp(asin(a*x)**2)/x,x)
```

output
```
Integral(exp(asin(a*x)**2)/x, x)
```

### 3.449.7 Maxima [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)/x,x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(a*x)^2)/x, x)
```

### 3.449.8 Giac [N/A]

Not integrable

Time = 0.31 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)/x,x, algorithm="giac")
```

output
```
integrate(e^(arcsin(a*x)^2)/x, x)
```

### 3.449.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a\,x)^2}}{x}\,dx$$

input
```
int(exp(asin(a*x)^2)/x,x)
```

output
```
int(exp(asin(a*x)^2)/x, x)
```

# 3.450 $\int \frac{e^{\arcsin(ax)^2}}{x^2} dx$



## 3.450.1 Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{e^{\arcsin(ax)^2}}{x^2} dx = a^2 \text{Int}\left(\frac{e^{\arcsin(ax)^2}}{a^2x^2}, x\right)$$

output
```
a^2*CannotIntegrate(exp(arcsin(a*x)^2)/a^2/x^2,x)
```

## 3.450.2 Mathematica [N/A]

Not integrable

Time = 1.47 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{e^{\arcsin(ax)^2}}{x^2} dx = \int \frac{e^{\arcsin(ax)^2}}{x^2} dx$$

input
```
Integrate[E^ArcSin[a*x]^2/x^2,x]
```

output
```
Integrate[E^ArcSin[a*x]^2/x^2, x]
```

## 3.450.3 Rubi [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5335, 27, 7299}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin (ax)^2}}{x^2} \, dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int \frac{e^{\arcsin (ax)^2}\sqrt{1-a^2x^2}}{x^2}d\arcsin (ax)}{a}$$

$$\Big\downarrow \text{27}$$

$$a\int \frac{e^{\arcsin (ax)^2}\sqrt{1-a^2x^2}}{a^2x^2}d\arcsin (ax)$$

$$\Big\downarrow \text{7299}$$

$$a\int \frac{e^{\arcsin (ax)^2}\sqrt{1-a^2x^2}}{a^2x^2}d\arcsin (ax)$$

input
```
Int[E^ArcSin[a*x]^2/x^2,x]
```

output
```
$Aborted
```

### 3.450.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7299
```
Int[u_, x_] :> CannotIntegrate[u, x]
```

## 3.450.4 Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.92

$$\int \frac{\mathrm{e}^{\arcsin(ax)^2}}{x^2}dx$$

input
```
int(exp(arcsin(a*x)^2)/x^2,x)
```

output
```
int(exp(arcsin(a*x)^2)/x^2,x)
```

## 3.450.5 Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)/x^2,x, algorithm="fricas")
```

output
```
integral(e^(arcsin(a*x)^2)/x^2, x)
```

## 3.450.6 Sympy [N/A]

Not integrable

Time = 0.38 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = \int \frac{e^{\operatorname{asin}^2(ax)}}{x^2}\,dx$$

input
```
integrate(exp(asin(a*x)**2)/x**2,x)
```

output
```
Integral(exp(asin(a*x)**2)/x**2, x)
```

### 3.450.7 Maxima [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)/x^2,x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(a*x)^2)/x^2, x)
```

### 3.450.8 Giac [N/A]

Not integrable

Time = 0.33 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = \int \frac{e^{\left(\arcsin(ax)^2\right)}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(a*x)^2)/x^2,x, algorithm="giac")
```

output
```
integrate(e^(arcsin(a*x)^2)/x^2, x)
```

### 3.450.9 Mupad [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(ax)^2}}{x^2}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a\,x)^2}}{x^2}\,dx$$

input
```
int(exp(asin(a*x)^2)/x^2,x)
```

output
```
int(exp(asin(a*x)^2)/x^2, x)
```

# 3.451 $\int e^{\arcsin(a+bx)}x^3\,dx$



## 3.451.1 Optimal result

Integrand size = 12, antiderivative size = 309

$$\begin{aligned}\int e^{\arcsin(a+bx)}x^3\,dx = &-\frac{3ae^{\arcsin(a+bx)}(a+bx)}{8b^4}-\frac{a^3e^{\arcsin(a+bx)}(a+bx)}{2b^4}\\&-\frac{3ae^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{8b^4}-\frac{a^3e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^4}\\&-\frac{e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{10b^4}\\&-\frac{3a^2e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^4}\\&+\frac{3ae^{\arcsin(a+bx)}\cos(3\arcsin(a+bx))}{40b^4}\\&+\frac{e^{\arcsin(a+bx)}\cos(4\arcsin(a+bx))}{34b^4}+\frac{e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{20b^4}\\&+\frac{3a^2e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{10b^4}\\&+\frac{9ae^{\arcsin(a+bx)}\sin(3\arcsin(a+bx))}{40b^4}\\&-\frac{e^{\arcsin(a+bx)}\sin(4\arcsin(a+bx))}{136b^4}\end{aligned}$$

output
```
-3/8*a*exp(arcsin(b*x+a))*(b*x+a)/b^4-1/2*a^3*exp(arcsin(b*x+a))*(b*x+a)/b
^4-1/10*exp(arcsin(b*x+a))*cos(2*arcsin(b*x+a))/b^4-3/5*a^2*exp(arcsin(b*x
+a))*cos(2*arcsin(b*x+a))/b^4+3/40*a*exp(arcsin(b*x+a))*cos(3*arcsin(b*x+a
))/b^4+1/34*exp(arcsin(b*x+a))*cos(4*arcsin(b*x+a))/b^4+1/20*exp(arcsin(b*
x+a))*sin(2*arcsin(b*x+a))/b^4+3/10*a^2*exp(arcsin(b*x+a))*sin(2*arcsin(b*
x+a))/b^4+9/40*a*exp(arcsin(b*x+a))*sin(3*arcsin(b*x+a))/b^4-1/136*exp(arc
sin(b*x+a))*sin(4*arcsin(b*x+a))/b^4-3/8*a*exp(arcsin(b*x+a))*(1-(b*x+a)^2
)^(1/2)/b^4-1/2*a^3*exp(arcsin(b*x+a))*(1-(b*x+a)^2)^(1/2)/b^4
```

## 3.451.2 Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.48

$$\int e^{\arcsin(a+bx)}x^3\,dx$$

$$= \frac{e^{\arcsin(a+bx)}\left(-255a(a+bx)-340a^3(a+bx)-85a(3+4a^2)\sqrt{1-(a+bx)^2}-68(1+6a^2)\cos(2\arcsin(a\right.}{}$$

input
```
Integrate[E^ArcSin[a + b*x]*x^3,x]
```

output
```
(E^ArcSin[a + b*x]*(-255*a*(a + b*x) - 340*a^3*(a + b*x) - 85*a*(3 + 4*a^2
)*Sqrt[1 - (a + b*x)^2] - 68*(1 + 6*a^2)*Cos[2*ArcSin[a + b*x]] + 51*a*Cos
[3*ArcSin[a + b*x]] + 20*Cos[4*ArcSin[a + b*x]] + 34*Sin[2*ArcSin[a + b*x]
] + 204*a^2*Sin[2*ArcSin[a + b*x]] + 153*a*Sin[3*ArcSin[a + b*x]] - 5*Sin[
4*ArcSin[a + b*x]]))/(680*b^4)
```

## 3.451.3 Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 278, normalized size of antiderivative = 0.90, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {5335, 25, 7292, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3e^{\arcsin(a+bx)}dx$$

$$\Big\downarrow \text{ 5335}$$

$$\frac{\int -e^{\arcsin(a+bx)}\left(\frac{a}{b}-\frac{a+bx}{b}\right)^3\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int e^{\arcsin(a+bx)}\left(\frac{a}{b}-\frac{a+bx}{b}\right)^3\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \ 7292$$

$$-\frac{\int -e^{\arcsin(a+bx)}x^3\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \ 27$$

$$-\frac{\int -b^3e^{\arcsin(a+bx)}x^3\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b^4}$$

$$\Big\downarrow \ 7293$$

$$-\frac{\int \left(e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}a^3-3e^{\arcsin(a+bx)}(a+bx)\sqrt{1-(a+bx)^2}a^2+3e^{\arcsin(a+bx)}(a+bx)^2\sqrt{1-(a+b}{b^4}$$

$$\Big\downarrow \ 2009$$

$$-\frac{\frac{1}{2}a^3(a+bx)e^{\arcsin(a+bx)}+\frac{1}{2}a^3\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}-\frac{3}{10}a^2e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))+\frac{3}{5}a^2e^{\arcsin(a}{}$$

input
```
Int[E^ArcSin[a + b*x]*x^3,x]
```

output
```
-(((3*a*E^ArcSin[a + b*x]*(a + b*x))/8 + (a^3*E^ArcSin[a + b*x]*(a + b*x))
/2 + (3*a*E^ArcSin[a + b*x]*Sqrt[1 - (a + b*x)^2])/8 + (a^3*E^ArcSin[a + b
*x]*Sqrt[1 - (a + b*x)^2])/2 + (E^ArcSin[a + b*x]*Cos[2*ArcSin[a + b*x]])/
10 + (3*a^2*E^ArcSin[a + b*x]*Cos[2*ArcSin[a + b*x]])/5 - (3*a*E^ArcSin[a
+ b*x]*Cos[3*ArcSin[a + b*x]])/40 - (E^ArcSin[a + b*x]*Cos[4*ArcSin[a + b*
x]])/34 - (E^ArcSin[a + b*x]*Sin[2*ArcSin[a + b*x]])/20 - (3*a^2*E^ArcSin[
a + b*x]*Sin[2*ArcSin[a + b*x]])/10 - (9*a*E^ArcSin[a + b*x]*Sin[3*ArcSin[
a + b*x]])/40 + (E^ArcSin[a + b*x]*Sin[4*ArcSin[a + b*x]])/136)/b^4)
```

3.451. $\int e^{\arcsin(a+bx)}x^3\,dx$

### 3.451.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

## 3.451.4 Maple [F]

$$\int e^{\arcsin(bx+a)}x^3dx$$

input
```
int(exp(arcsin(b*x+a))*x^3,x)
```

output
```
int(exp(arcsin(b*x+a))*x^3,x)
```

### 3.451.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.42

$$\int e^{\arcsin(a+bx)}x^3\,dx$$
$$= \frac{(40\,b^4x^4 + 7\,ab^3x^3 - 3\,(5\,a^2+2)b^2x^2 + 6\,a^4 + 3\,(8\,a^3+13\,a)bx - 57\,a^2 + (10\,b^3x^3 - 21\,ab^2x^2 - 24\,a^3 + 6}{170\,b^4}$$

input
```
integrate(exp(arcsin(b*x+a))*x^3,x, algorithm="fricas")
```

output
```
1/170*(40*b^4*x^4 + 7*a*b^3*x^3 - 3*(5*a^2 + 2)*b^2*x^2 + 6*a^4 + 3*(8*a^3
 + 13*a)*b*x - 57*a^2 + (10*b^3*x^3 - 21*a*b^2*x^2 - 24*a^3 + 6*(5*a^2 + 2
)*b*x - 39*a)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1) - 12)*e^(arcsin(b*x + a))
/b^4
```

### 3.451.6 Sympy [A] (verification not implemented)

Time = 0.61 (sec) , antiderivative size = 416, normalized size of antiderivative = 1.35

$$\int e^{\arcsin(a+bx)}x^3\,dx$$
$$= \begin{cases} \frac{3a^4e^{\operatorname{asin}(a+bx)}}{85b^4} + \frac{12a^3xe^{\operatorname{asin}(a+bx)}}{85b^3} - \frac{12a^3\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{85b^4} - \frac{3a^2x^2e^{\operatorname{asin}(a+bx)}}{34b^2} + \frac{3a^2x\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a}}{17b^3} \\ \frac{x^4e^{\operatorname{asin}(a)}}{4} \end{cases}$$

input
```
integrate(exp(asin(b*x+a))*x**3,x)
```

output
```
Piecewise((3*a**4*exp(asin(a + b*x))/(85*b**4) + 12*a**3*x*exp(asin(a + b*
x))/(85*b**3) - 12*a**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a +
 b*x))/(85*b**4) - 3*a**2*x**2*exp(asin(a + b*x))/(34*b**2) + 3*a**2*x*sqr
t(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(17*b**3) - 57*a**2*
exp(asin(a + b*x))/(170*b**4) + 7*a*x**3*exp(asin(a + b*x))/(170*b) - 21*a
*x**2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(170*b**2)
+ 39*a*x*exp(asin(a + b*x))/(170*b**3) - 39*a*sqrt(-a**2 - 2*a*b*x - b**2*
x**2 + 1)*exp(asin(a + b*x))/(170*b**4) + 4*x**4*exp(asin(a + b*x))/17 + x
**3*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(17*b) - 3*x*
*2*exp(asin(a + b*x))/(85*b**2) + 6*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1
)*exp(asin(a + b*x))/(85*b**3) - 6*exp(asin(a + b*x))/(85*b**4), Ne(b, 0))
, (x**4*exp(asin(a))/4, True))
```

### 3.451.7 Maxima [F]

$$\int e^{\arcsin(a+bx)}x^3\,dx = \int x^3 e^{(\arcsin(bx+a))}\,dx$$

input
```
integrate(exp(arcsin(b*x+a))*x^3,x, algorithm="maxima")
```

output
```
integrate(x^3*e^(arcsin(b*x + a)), x)
```

### 3.451.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 334, normalized size of antiderivative = 1.08

$$\begin{aligned}\int e^{\arcsin(a+bx)}x^3\,dx = & -\frac{(bx+a)a^3e^{(\arcsin(bx+a))}}{2\,b^4} + \frac{3\sqrt{-(bx+a)^2+1}(bx+a)a^2e^{(\arcsin(bx+a))}}{5\,b^4} \\ & - \frac{\sqrt{-(bx+a)^2+1}a^3e^{(\arcsin(bx+a))}}{2\,b^4} \\ & - \frac{9\left((bx+a)^2-1\right)(bx+a)ae^{(\arcsin(bx+a))}}{10\,b^4} \\ & + \frac{6\left((bx+a)^2-1\right)a^2e^{(\arcsin(bx+a))}}{5\,b^4} \\ & - \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}(bx+a)e^{(\arcsin(bx+a))}}{17\,b^4} \\ & + \frac{3\left(-(bx+a)^2+1\right)^{\frac{3}{2}}ae^{(\arcsin(bx+a))}}{10\,b^4} + \frac{4\left((bx+a)^2-1\right)^2e^{(\arcsin(bx+a))}}{17\,b^4} \\ & - \frac{3\,(bx+a)ae^{(\arcsin(bx+a))}}{5\,b^4} + \frac{3\,a^2e^{(\arcsin(bx+a))}}{5\,b^4} \\ & + \frac{11\sqrt{-(bx+a)^2+1}(bx+a)e^{(\arcsin(bx+a))}}{85\,b^4} \\ & - \frac{3\sqrt{-(bx+a)^2+1}ae^{(\arcsin(bx+a))}}{5\,b^4} \\ & + \frac{37\left((bx+a)^2-1\right)e^{(\arcsin(bx+a))}}{85\,b^4} + \frac{11\,e^{(\arcsin(bx+a))}}{85\,b^4}\end{aligned}$$

input
```
integrate(exp(arcsin(b*x+a))*x^3,x, algorithm="giac")
```

output
```
-1/2*(b*x + a)*a^3*e^(arcsin(b*x + a))/b^4 + 3/5*sqrt(-(b*x + a)^2 + 1)*(b
*x + a)*a^2*e^(arcsin(b*x + a))/b^4 - 1/2*sqrt(-(b*x + a)^2 + 1)*a^3*e^(ar
csin(b*x + a))/b^4 - 9/10*((b*x + a)^2 - 1)*(b*x + a)*a*e^(arcsin(b*x + a)
)/b^4 + 6/5*((b*x + a)^2 - 1)*a^2*e^(arcsin(b*x + a))/b^4 - 1/17*(-(b*x +
a)^2 + 1)^(3/2)*(b*x + a)*e^(arcsin(b*x + a))/b^4 + 3/10*(-(b*x + a)^2 + 1
)^(3/2)*a*e^(arcsin(b*x + a))/b^4 + 4/17*((b*x + a)^2 - 1)^2*e^(arcsin(b*x
 + a))/b^4 - 3/5*(b*x + a)*a*e^(arcsin(b*x + a))/b^4 + 3/5*a^2*e^(arcsin(b
*x + a))/b^4 + 11/85*sqrt(-(b*x + a)^2 + 1)*(b*x + a)*e^(arcsin(b*x + a))/
b^4 - 3/5*sqrt(-(b*x + a)^2 + 1)*a*e^(arcsin(b*x + a))/b^4 + 37/85*((b*x +
 a)^2 - 1)*e^(arcsin(b*x + a))/b^4 + 11/85*e^(arcsin(b*x + a))/b^4
```

### 3.451.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)}x^3\,dx = \int x^3\,e^{\mathrm{asin}(a+b\,x)}\,dx$$

input
```
int(x^3*exp(asin(a + b*x)),x)
```

output
```
int(x^3*exp(asin(a + b*x)), x)
```

# 3.452 $\int e^{\arcsin(a+bx)}x^2\,dx$



## 3.452.1 Optimal result

Integrand size = 12, antiderivative size = 205

$$\begin{aligned}\int e^{\arcsin(a+bx)}x^2\,dx =& \frac{e^{\arcsin(a+bx)}(a+bx)}{8b^3}+\frac{a^2e^{\arcsin(a+bx)}(a+bx)}{2b^3}\\&+\frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{8b^3}+\frac{a^2e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^3}\\&+\frac{2ae^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^3}\\&-\frac{e^{\arcsin(a+bx)}\cos(3\arcsin(a+bx))}{40b^3}-\frac{ae^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{5b^3}\\&-\frac{3e^{\arcsin(a+bx)}\sin(3\arcsin(a+bx))}{40b^3}\end{aligned}$$

output
```
1/8*exp(arcsin(b*x+a))*(b*x+a)/b^3+1/2*a^2*exp(arcsin(b*x+a))*(b*x+a)/b^3+
2/5*a*exp(arcsin(b*x+a))*cos(2*arcsin(b*x+a))/b^3-1/40*exp(arcsin(b*x+a))*
cos(3*arcsin(b*x+a))/b^3-1/5*a*exp(arcsin(b*x+a))*sin(2*arcsin(b*x+a))/b^3
-3/40*exp(arcsin(b*x+a))*sin(3*arcsin(b*x+a))/b^3+1/8*exp(arcsin(b*x+a))*(
1-(b*x+a)^2)^(1/2)/b^3+1/2*a^2*exp(arcsin(b*x+a))*(1-(b*x+a)^2)^(1/2)/b^3
```

### 3.452.2 Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.50

$$\int e^{\arcsin(a+bx)}x^2\,dx$$
$$= \frac{e^{\arcsin(a+bx)}\left(5(a+bx)+20a^2(a+bx)+5(1+4a^2)\sqrt{1-(a+bx)^2}+16a\cos(2\arcsin(a+bx))-\cos(3\,a\right.}{40b^3}$$

input
```
Integrate[E^ArcSin[a + b*x]*x^2,x]
```

output
```
(E^ArcSin[a + b*x]*(5*(a + b*x) + 20*a^2*(a + b*x) + 5*(1 + 4*a^2)*Sqrt[1
- (a + b*x)^2] + 16*a*Cos[2*ArcSin[a + b*x]] - Cos[3*ArcSin[a + b*x]] - 8*
a*Sin[2*ArcSin[a + b*x]] - 3*Sin[3*ArcSin[a + b*x]]))/(40*b^3)
```

### 3.452.3 Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 185, normalized size of antiderivative = 0.90, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {5335, 7292, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2 e^{\arcsin(a+bx)}\,dx$$
$$\Big\downarrow \text{5335}$$
$$\frac{\int e^{\arcsin(a+bx)}\left(\frac{a}{b}-\frac{a+bx}{b}\right)^2\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$
$$\Big\downarrow \text{7292}$$
$$\frac{\int e^{\arcsin(a+bx)}x^2\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$
$$\Big\downarrow \text{27}$$
$$\frac{\int b^2e^{\arcsin(a+bx)}x^2\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b^3}$$
$$\Big\downarrow \text{7293}$$

$$\frac{\int \left(e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}a^2 - 2e^{\arcsin(a+bx)}(a+bx)\sqrt{1-(a+bx)^2}a + e^{\arcsin(a+bx)}(a+bx)^2\sqrt{1-(a+bx)^2}\right.}{b^3}$$

$$\Big\downarrow \; 2009$$

$$\frac{\frac{1}{2}a^2(a+bx)e^{\arcsin(a+bx)} + \frac{1}{2}a^2\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)} + \frac{1}{8}(a+bx)e^{\arcsin(a+bx)} + \frac{1}{8}\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}}{}$$

input
```
Int[E^ArcSin[a + b*x]*x^2,x]
```

output
```
((E^ArcSin[a + b*x]*(a + b*x))/8 + (a^2*E^ArcSin[a + b*x]*(a + b*x))/2 + (
E^ArcSin[a + b*x]*Sqrt[1 - (a + b*x)^2])/8 + (a^2*E^ArcSin[a + b*x]*Sqrt[1
 - (a + b*x)^2])/2 + (2*a*E^ArcSin[a + b*x]*Cos[2*ArcSin[a + b*x]])/5 - (E
^ArcSin[a + b*x]*Cos[3*ArcSin[a + b*x]])/40 - (a*E^ArcSin[a + b*x]*Sin[2*A
rcSin[a + b*x]])/5 - (3*E^ArcSin[a + b*x]*Sin[3*ArcSin[a + b*x]])/40)/b^3
```

### 3.452.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

---

3.452. $\int e^{\arcsin(a+bx)}x^2\,dx$

### 3.452.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(bx+a)} x^2 dx$$

input
```
int(exp(arcsin(b*x+a))*x^2,x)
```

output
```
int(exp(arcsin(b*x+a))*x^2,x)
```

### 3.452.5 Fricas [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.41

$$\int e^{\arcsin(a+bx)} x^2 \, dx = \frac{\left(3\,b^3x^3 + ab^2x^2 - (2\,a^2+1)bx + (b^2x^2 - 2\,abx + 2\,a^2 + 1)\sqrt{-b^2x^2 - 2\,abx - a^2 + 1} + 3\,a\right)e^{(\arcsin(bx+a))}}{10\,b^3}$$

input
```
integrate(exp(arcsin(b*x+a))*x^2,x, algorithm="fricas")
```

output
```
1/10*(3*b^3*x^3 + a*b^2*x^2 - (2*a^2 + 1)*b*x + (b^2*x^2 - 2*a*b*x + 2*a^2
 + 1)*sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1) + 3*a)*e^(arcsin(b*x + a))/b^3
```

### 3.452.6 Sympy [A] (verification not implemented)

Time = 0.39 (sec) , antiderivative size = 243, normalized size of antiderivative = 1.19

$$\int e^{\arcsin(a+bx)} x^2 \, dx = \begin{cases} -\frac{a^2xe^{\operatorname{asin}(a+bx)}}{5b^2} + \frac{a^2\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{5b^3} + \frac{ax^2e^{\operatorname{asin}(a+bx)}}{10b} - \frac{ax\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{5b^2} + \frac{3ae^{\operatorname{asin}(a+bx)}}{10b^3} + \\ \frac{x^3e^{\operatorname{asin}(a)}}{3} \end{cases}$$

input
```
integrate(exp(asin(b*x+a))*x**2,x)
```

output
```
Piecewise((-a**2*x*exp(asin(a + b*x))/(5*b**2) + a**2*sqrt(-a**2 - 2*a*b*x
 - b**2*x**2 + 1)*exp(asin(a + b*x))/(5*b**3) + a*x**2*exp(asin(a + b*x))/
(10*b) - a*x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(5*b
**2) + 3*a*exp(asin(a + b*x))/(10*b**3) + 3*x**3*exp(asin(a + b*x))/10 + x
**2*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(10*b) - x*ex
p(asin(a + b*x))/(10*b**2) + sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asi
n(a + b*x))/(10*b**3), Ne(b, 0)), (x**3*exp(asin(a))/3, True))
```

## 3.452.7 Maxima [F]

$$\int e^{\arcsin(a+bx)}x^2\,dx = \int x^2e^{(\arcsin(bx+a))}\,dx$$

input
```
integrate(exp(arcsin(b*x+a))*x^2,x, algorithm="maxima")
```

output
```
integrate(x^2*e^(arcsin(b*x + a)), x)
```

## 3.452.8 Giac [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.01

$$\begin{aligned}\int e^{\arcsin(a+bx)}x^2\,dx =& \frac{(bx+a)a^2e^{(\arcsin(bx+a))}}{2\,b^3} - \frac{2\sqrt{-(bx+a)^2+1}(bx+a)ae^{(\arcsin(bx+a))}}{5\,b^3} \\ &+ \frac{\sqrt{-(bx+a)^2+1}a^2e^{(\arcsin(bx+a))}}{2\,b^3} \\ &+ \frac{3\left((bx+a)^2-1\right)(bx+a)e^{(\arcsin(bx+a))}}{10\,b^3} \\ &- \frac{4\left((bx+a)^2-1\right)ae^{(\arcsin(bx+a))}}{5\,b^3} \\ &- \frac{\left(-(bx+a)^2+1\right)^{\frac{3}{2}}e^{(\arcsin(bx+a))}}{10\,b^3} + \frac{(bx+a)e^{(\arcsin(bx+a))}}{5\,b^3} \\ &- \frac{2\,ae^{(\arcsin(bx+a))}}{5\,b^3} + \frac{\sqrt{-(bx+a)^2+1}e^{(\arcsin(bx+a))}}{5\,b^3}\end{aligned}$$

input
```
integrate(exp(arcsin(b*x+a))*x^2,x, algorithm="giac")
```

output
```
1/2*(b*x + a)*a^2*e^(arcsin(b*x + a))/b^3 - 2/5*sqrt(-(b*x + a)^2 + 1)*(b*
x + a)*a*e^(arcsin(b*x + a))/b^3 + 1/2*sqrt(-(b*x + a)^2 + 1)*a^2*e^(arcsi
n(b*x + a))/b^3 + 3/10*((b*x + a)^2 - 1)*(b*x + a)*e^(arcsin(b*x + a))/b^3
 - 4/5*((b*x + a)^2 - 1)*a*e^(arcsin(b*x + a))/b^3 - 1/10*(-(b*x + a)^2 +
1)^(3/2)*e^(arcsin(b*x + a))/b^3 + 1/5*(b*x + a)*e^(arcsin(b*x + a))/b^3 -
 2/5*a*e^(arcsin(b*x + a))/b^3 + 1/5*sqrt(-(b*x + a)^2 + 1)*e^(arcsin(b*x
+ a))/b^3
```

### 3.452.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)}x^2\,dx = \int x^2\,\mathrm{e}^{\mathrm{asin}(a+b\,x)}\,dx$$

input
```
int(x^2*exp(asin(a + b*x)),x)
```

output
```
int(x^2*exp(asin(a + b*x)), x)
```

# 3.453 $\int e^{\arcsin(a+bx)}x\,dx$



## 3.453.1 Optimal result

Integrand size = 10, antiderivative size = 101

$$\int e^{\arcsin(a+bx)}x\,dx=-\frac{ae^{\arcsin(a+bx)}(a+bx)}{2b^2}-\frac{ae^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b^2}-\frac{e^{\arcsin(a+bx)}\cos(2\arcsin(a+bx))}{5b^2}+\frac{e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))}{10b^2}$$

output
```
-1/2*a*exp(arcsin(b*x+a))*(b*x+a)/b^2-1/5*exp(arcsin(b*x+a))*cos(2*arcsin(
b*x+a))/b^2+1/10*exp(arcsin(b*x+a))*sin(2*arcsin(b*x+a))/b^2-1/2*a*exp(arc
sin(b*x+a))*(1-(b*x+a)^2)^(1/2)/b^2
```

## 3.453.2 Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 59, normalized size of antiderivative = 0.58

$$\int e^{\arcsin(a+bx)}x\,dx=-\frac{e^{\arcsin(a+bx)}\left(5a(a+bx)+(3a-2bx)\sqrt{1-(a+bx)^2}+2\cos(2\arcsin(a+bx))\right)}{10b^2}$$

input
```
Integrate[E^ArcSin[a + b*x]*x,x]
```

output
```
-1/10*(E^ArcSin[a + b*x]*(5*a*(a + b*x) + (3*a - 2*b*x)*Sqrt[1 - (a + b*x)
^2] + 2*Cos[2*ArcSin[a + b*x]]))/b^2
```

### 3.453.3 Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 94, normalized size of antiderivative = 0.93, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {5335, 25, 7292, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int xe^{\arcsin(a+bx)}\,dx$$

$$\Big\downarrow \ 5335$$

$$\frac{\int -e^{\arcsin(a+bx)}\left(\frac{a}{b}-\frac{a+bx}{b}\right)\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int e^{\arcsin(a+bx)}\left(\frac{a}{b}-\frac{a+bx}{b}\right)\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \ 7292$$

$$-\frac{\int -e^{\arcsin(a+bx)}x\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \ 27$$

$$-\frac{\int -be^{\arcsin(a+bx)}x\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \ 7293$$

$$-\frac{\int \left(ae^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}-e^{\arcsin(a+bx)}(a+bx)\sqrt{1-(a+bx)^2}\right)d\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \ 2009$$

$$-\frac{\frac{1}{2}a(a+bx)e^{\arcsin(a+bx)}+\frac{1}{2}a\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}-\frac{1}{10}e^{\arcsin(a+bx)}\sin(2\arcsin(a+bx))+\frac{1}{5}e^{\arcsin(a+bx)}\text{co}}{b^2}$$

input
```
Int[E^ArcSin[a + b*x]*x,x]
```

output
```
-(((a*E^ArcSin[a + b*x]*(a + b*x))/2 + (a*E^ArcSin[a + b*x]*Sqrt[1 - (a +
b*x)^2])/2 + (E^ArcSin[a + b*x]*Cos[2*ArcSin[a + b*x]])/5 - (E^ArcSin[a +
b*x]*Sin[2*ArcSin[a + b*x]])/10)/b^2)
```

### 3.453.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

## 3.453.4 Maple [F]

$$\int e^{\arcsin(bx+a)} x dx$$

input
```
int(exp(arcsin(b*x+a))*x,x)
```

output
```
int(exp(arcsin(b*x+a))*x,x)
```

### 3.453.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.62

$$\int e^{\arcsin(a+bx)}x\,dx$$
$$= \frac{\left(4\,b^2x^2 + 3\,abx - a^2 + \sqrt{-b^2x^2 - 2\,abx - a^2 + 1}(2\,bx - 3\,a) - 2\right)e^{(\arcsin(bx+a))}}{10\,b^2}$$

input
```
integrate(exp(arcsin(b*x+a))*x,x, algorithm="fricas")
```

output
```
1/10*(4*b^2*x^2 + 3*a*b*x - a^2 + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1)*(2*b*
x - 3*a) - 2)*e^(arcsin(b*x + a))/b^2
```

### 3.453.6 Sympy [A] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.45

$$\int e^{\arcsin(a+bx)}x\,dx$$
$$= \begin{cases} -\frac{a^2e^{\operatorname{asin}(a+bx)}}{10b^2} + \frac{3axe^{\operatorname{asin}(a+bx)}}{10b} - \frac{3a\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{10b^2} + \frac{2x^2e^{\operatorname{asin}(a+bx)}}{5} + \frac{x\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{5b} - \\ \frac{x^2e^{\operatorname{asin}(a)}}{2} \end{cases}$$

input
```
integrate(exp(asin(b*x+a))*x,x)
```

output
```
Piecewise((-a**2*exp(asin(a + b*x))/(10*b**2) + 3*a*x*exp(asin(a + b*x))/(
10*b) - 3*a*sqrt(-a**2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(10*b
**2) + 2*x**2*exp(asin(a + b*x))/5 + x*sqrt(-a**2 - 2*a*b*x - b**2*x**2 +
1)*exp(asin(a + b*x))/(5*b) - exp(asin(a + b*x))/(5*b**2), Ne(b, 0)), (x**
2*exp(asin(a))/2, True))
```

### 3.453.7 Maxima [F]

$$\int e^{\arcsin(a+bx)}x\,dx = \int xe^{(\arcsin(bx+a))}\,dx$$

input
```
integrate(exp(arcsin(b*x+a))*x,x, algorithm="maxima")
```

output
```
integrate(x*e^(arcsin(b*x + a)), x)
```

### 3.453.8 Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.07

$$\int e^{\arcsin(a+bx)}x\,dx = -\frac{(bx+a)ae^{(\arcsin(bx+a))}}{2\,b^2} + \frac{\sqrt{-(bx+a)^2+1}(bx+a)e^{(\arcsin(bx+a))}}{5\,b^2} - \frac{\sqrt{-(bx+a)^2+1}ae^{(\arcsin(bx+a))}}{2\,b^2} + \frac{2\left((bx+a)^2-1\right)e^{(\arcsin(bx+a))}}{5\,b^2} + \frac{e^{(\arcsin(bx+a))}}{5\,b^2}$$

input
```
integrate(exp(arcsin(b*x+a))*x,x, algorithm="giac")
```

output
```
-1/2*(b*x + a)*a*e^(arcsin(b*x + a))/b^2 + 1/5*sqrt(-(b*x + a)^2 + 1)*(b*x
 + a)*e^(arcsin(b*x + a))/b^2 - 1/2*sqrt(-(b*x + a)^2 + 1)*a*e^(arcsin(b*x
 + a))/b^2 + 2/5*((b*x + a)^2 - 1)*e^(arcsin(b*x + a))/b^2 + 1/5*e^(arcsin
(b*x + a))/b^2
```

### 3.453.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)}x\,dx = \int x\,\mathrm{e}^{\mathrm{asin}(a+b\,x)}\,dx$$

input
```
int(x*exp(asin(a + b*x)),x)
```

output
```
int(x*exp(asin(a + b*x)), x)
```

# 3.454 $\int e^{\arcsin(a+bx)}\,dx$



## 3.454.1 Optimal result

Integrand size = 8, antiderivative size = 51

$$\int e^{\arcsin(a+bx)}\,dx=\frac{e^{\arcsin(a+bx)}(a+bx)}{2b}+\frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{2b}$$

output
```
1/2*exp(arcsin(b*x+a))*(b*x+a)/b+1/2*exp(arcsin(b*x+a))*(1-(b*x+a)^2)^(1/2
)/b
```

## 3.454.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.69

$$\int e^{\arcsin(a+bx)}\,dx=\frac{e^{\arcsin(a+bx)}\left(a+bx+\sqrt{1-(a+bx)^2}\right)}{2b}$$

input
```
Integrate[E^ArcSin[a + b*x],x]
```

output
```
(E^ArcSin[a + b*x]*(a + b*x + Sqrt[1 - (a + b*x)^2]))/(2*b)
```

### 3.454.3 Rubi [A] (verified)

Time = 0.20 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.96, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {5335, 4933}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int e^{\arcsin(a+bx)}\,dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{4933}$$

$$\frac{\frac{1}{2}(a+bx)e^{\arcsin(a+bx)}+\frac{1}{2}\sqrt{1-(a+bx)^2}e^{\arcsin(a+bx)}}{b}$$

input
```
Int[E^ArcSin[a + b*x],x]
```

output
```
((E^ArcSin[a + b*x]*(a + b*x))/2 + (E^ArcSin[a + b*x]*Sqrt[1 - (a + b*x)^2
])/2)/b
```

#### 3.454.3.1 Defintions of rubi rules used

rule 4933
```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x
] + Simp[e*F^(c*(a + b*x))*(Sin[d + e*x]/(e^2 + b^2*c^2*Log[F]^2)), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

### 3.454.4 Maple [F]

$$\int e^{\arcsin(bx+a)}dx$$

input
```
int(exp(arcsin(b*x+a)),x)
```

output
```
int(exp(arcsin(b*x+a)),x)
```

### 3.454.5 Fricas [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 39, normalized size of antiderivative = 0.76

$$\int e^{\arcsin(a+bx)}\,dx = \frac{\left(bx+a+\sqrt{-b^2x^2-2\,abx-a^2+1}\right)e^{(\arcsin(bx+a))}}{2\,b}$$

input
```
integrate(exp(arcsin(b*x+a)),x, algorithm="fricas")
```

output
```
1/2*(b*x + a + sqrt(-b^2*x^2 - 2*a*b*x - a^2 + 1))*e^(arcsin(b*x + a))/b
```

### 3.454.6 Sympy [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.27

$$\int e^{\arcsin(a+bx)}\,dx = \begin{cases} \frac{ae^{\operatorname{asin}(a+bx)}}{2b} + \frac{xe^{\operatorname{asin}(a+bx)}}{2} + \frac{\sqrt{-a^2-2abx-b^2x^2+1}e^{\operatorname{asin}(a+bx)}}{2b} & \text{for } b \neq 0 \\ xe^{\operatorname{asin}(a)} & \text{otherwise} \end{cases}$$

input
```
integrate(exp(asin(b*x+a)),x)
```

output
```
Piecewise(((a*exp(asin(a + b*x))/(2*b) + x*exp(asin(a + b*x))/2 + sqrt(-a**
2 - 2*a*b*x - b**2*x**2 + 1)*exp(asin(a + b*x))/(2*b), Ne(b, 0)), (x*exp(a
sin(a)), True))
```

### 3.454.7 Maxima [F]

$$\int e^{\arcsin(a+bx)}\,dx = \int e^{(\arcsin(bx+a))}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)),x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(b*x + a)), x)
```

### 3.454.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 43, normalized size of antiderivative = 0.84

$$\int e^{\arcsin(a+bx)}\,dx = \frac{(bx+a)e^{(\arcsin(bx+a))}}{2\,b} + \frac{\sqrt{-(bx+a)^2+1}e^{(\arcsin(bx+a))}}{2\,b}$$

input
```
integrate(exp(arcsin(b*x+a)),x, algorithm="giac")
```

output
```
1/2*(b*x + a)*e^(arcsin(b*x + a))/b + 1/2*sqrt(-(b*x + a)^2 + 1)*e^(arcsin
(b*x + a))/b
```

### 3.454.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)}\,dx = \int \mathrm{e}^{\mathrm{asin}(a+b\,x)}\,dx$$

input
```
int(exp(asin(a + b*x)),x)
```

output
```
int(exp(asin(a + b*x)), x)
```

# 3.455 $\int \frac{e^{\arcsin(a+bx)}}{x}\,dx$



## 3.455.1 Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{e^{\arcsin(a+bx)}}{x}\,dx = b\text{Int}\left(\frac{e^{\arcsin(a+bx)}}{bx},x\right)$$

output
```
b*CannotIntegrate(exp(arcsin(b*x+a))/b/x,x)
```

## 3.455.2 Mathematica [N/A]

Not integrable

Time = 0.13 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{e^{\arcsin(a+bx)}}{x}\,dx = \int \frac{e^{\arcsin(a+bx)}}{x}\,dx$$

input
```
Integrate[E^ArcSin[a + b*x]/x,x]
```

output
```
Integrate[E^ArcSin[a + b*x]/x, x]
```

### 3.455.3 Rubi [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {5335, 25, 7292, 27, 7299}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(a+bx)}}{x} dx$$

$$\Big\downarrow \; 5335$$

$$\frac{\int -\frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{\frac{a}{b}-\frac{a+bx}{b}}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int \frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{\frac{a}{b}-\frac{a+bx}{b}}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \; 7292$$

$$-\frac{\int -\frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{x}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \; 27$$

$$-\int -\frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{bx}d\arcsin(a+bx)$$

$$\Big\downarrow \; 7299$$

$$-\int -\frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{bx}d\arcsin(a+bx)$$

input
```
Int[E^ArcSin[a + b*x]/x,x]
```

output
```
$Aborted
```

### 3.455.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7299
```
Int[u_, x_] :> CannotIntegrate[u, x]
```

## 3.455.4 Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.92

$$\int \frac{\mathrm{e}^{\arcsin(bx+a)}}{x}dx$$

input
```
int(exp(arcsin(b*x+a))/x,x)
```

output
```
int(exp(arcsin(b*x+a))/x,x)
```

### 3.455.5 Fricas [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x} \, dx = \int \frac{e^{(\arcsin(bx+a))}}{x} \, dx$$

input
```
integrate(exp(arcsin(b*x+a))/x,x, algorithm="fricas")
```

output
```
integral(e^(arcsin(b*x + a))/x, x)
```

### 3.455.6 Sympy [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 10, normalized size of antiderivative = 0.83

$$\int \frac{e^{\arcsin(a+bx)}}{x} \, dx = \int \frac{e^{\operatorname{asin}(a+bx)}}{x} \, dx$$

input
```
integrate(exp(asin(b*x+a))/x,x)
```

output
```
Integral(exp(asin(a + b*x))/x, x)
```

### 3.455.7 Maxima [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x} \, dx = \int \frac{e^{(\arcsin(bx+a))}}{x} \, dx$$

input
```
integrate(exp(arcsin(b*x+a))/x,x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(b*x + a))/x, x)
```

### 3.455.8 Giac [N/A]

Not integrable

Time = 0.36 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x}\,dx = \int \frac{e^{(\arcsin(bx+a))}}{x}\,dx$$

input
```
integrate(exp(arcsin(b*x+a))/x,x, algorithm="giac")
```

output
```
integrate(e^(arcsin(b*x + a))/x, x)
```

### 3.455.9 Mupad [N/A]

Not integrable

Time = 0.30 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x}\,dx = \int \frac{e^{\mathrm{asin}(a+b\,x)}}{x}\,dx$$

input
```
int(exp(asin(a + b*x))/x,x)
```

output
```
int(exp(asin(a + b*x))/x, x)
```

# 3.456 $\int \frac{e^{\arcsin(a+bx)}}{x^2} dx$



## 3.456.1 Optimal result

Integrand size = 12, antiderivative size = 12

$$\int \frac{e^{\arcsin(a+bx)}}{x^2} dx = b^2 \text{Int}\left(\frac{e^{\arcsin(a+bx)}}{b^2x^2}, x\right)$$

output
```
b^2*CannotIntegrate(exp(arcsin(b*x+a))/b^2/x^2,x)
```

## 3.456.2 Mathematica [N/A]

Not integrable

Time = 0.20 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.17

$$\int \frac{e^{\arcsin(a+bx)}}{x^2} dx = \int \frac{e^{\arcsin(a+bx)}}{x^2} dx$$

input
```
Integrate[E^ArcSin[a + b*x]/x^2,x]
```

output
```
Integrate[E^ArcSin[a + b*x]/x^2, x]
```

### 3.456.3 Rubi [N/A]

Not integrable

Time = 0.47 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5335, 7292, 27, 7299}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(a+bx)}}{x^2} \, dx$$

$$\Big\downarrow \text{ 5335}$$

$$\frac{\int \frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{\left(\frac{a}{b}-\frac{a+bx}{b}\right)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{ 7292}$$

$$\frac{\int \frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{x^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{ 27}$$

$$b\int \frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{b^2x^2}d\arcsin(a+bx)$$

$$\Big\downarrow \text{ 7299}$$

$$b\int \frac{e^{\arcsin(a+bx)}\sqrt{1-(a+bx)^2}}{b^2x^2}d\arcsin(a+bx)$$

input
```
Int[E^ArcSin[a + b*x]/x^2,x]
```

output
```
$Aborted
```

### 3.456.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7299
```
Int[u_, x_] :> CannotIntegrate[u, x]
```

## 3.456.4 Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 11, normalized size of antiderivative = 0.92

$$\int \frac{\mathrm{e}^{\arcsin(bx+a)}}{x^2}dx$$

input
```
int(exp(arcsin(b*x+a))/x^2,x)
```

output
```
int(exp(arcsin(b*x+a))/x^2,x)
```

## 3.456.5 Fricas [N/A]

Not integrable

Time = 0.26 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = \int \frac{e^{(\arcsin(bx+a))}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(b*x+a))/x^2,x, algorithm="fricas")
```

output
```
integral(e^(arcsin(b*x + a))/x^2, x)
```

### 3.456.6 Sympy [N/A]

Not integrable

Time = 0.41 (sec) , antiderivative size = 12, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = \int \frac{e^{\operatorname{asin}(a+bx)}}{x^2}\,dx$$

input
```
integrate(exp(asin(b*x+a))/x**2,x)
```

output
```
Integral(exp(asin(a + b*x))/x**2, x)
```

### 3.456.7 Maxima [N/A]

Not integrable

Time = 0.45 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = \int \frac{e^{(\arcsin(bx+a))}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(b*x+a))/x^2,x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(b*x + a))/x^2, x)
```

### 3.456.8 Giac [N/A]

Not integrable

Time = 0.39 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = \int \frac{e^{(\arcsin(bx+a))}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(b*x+a))/x^2,x, algorithm="giac")
```

output
```
integrate(e^(arcsin(b*x + a))/x^2, x)
```

### 3.456.9 Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 13, normalized size of antiderivative = 1.08

$$\int \frac{e^{\arcsin(a+bx)}}{x^2}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a+b\,x)}}{x^2}\,dx$$

input
```
int(exp(asin(a + b*x))/x^2,x)
```

output
```
int(exp(asin(a + b*x))/x^2, x)
```

# 3.457 $\int e^{\arcsin(a+bx)^2}x^3\,dx$



## 3.457.1 Optimal result

Integrand size = 14, antiderivative size = 381

$$\begin{aligned}\int e^{\arcsin(a+bx)^2}x^3\,dx =& \frac{e\sqrt{\pi}\,\mathrm{erf}(1-i\arcsin(a+bx))}{16b^4}+\frac{3a^2e\sqrt{\pi}\,\mathrm{erf}(1-i\arcsin(a+bx))}{8b^4}\\&-\frac{e^4\sqrt{\pi}\,\mathrm{erf}(2-i\arcsin(a+bx))}{32b^4}+\frac{e\sqrt{\pi}\,\mathrm{erf}(1+i\arcsin(a+bx))}{16b^4}\\&+\frac{3a^2e\sqrt{\pi}\,\mathrm{erf}(1+i\arcsin(a+bx))}{8b^4}-\frac{e^4\sqrt{\pi}\,\mathrm{erf}(2+i\arcsin(a+bx))}{32b^4}\\&-\frac{3a\sqrt[4]{e}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{16b^4}\\&-\frac{a^3\sqrt[4]{e}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b^4}\\&-\frac{3a\sqrt[4]{e}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{16b^4}\\&-\frac{a^3\sqrt[4]{e}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b^4}\\&+\frac{3ae^{9/4}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{1}{2}(-3i+2\arcsin(a+bx))\right)}{16b^4}\\&+\frac{3ae^{9/4}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{1}{2}(3i+2\arcsin(a+bx))\right)}{16b^4}\end{aligned}$$

output
```
1/16*I*exp(1)*erfi(-I+arcsin(b*x+a))*Pi^(1/2)/b^4+3/8*I*a^2*exp(1)*erfi(-I
+arcsin(b*x+a))*Pi^(1/2)/b^4-1/16*I*exp(1)*erfi(I+arcsin(b*x+a))*Pi^(1/2)/
b^4-3/8*I*a^2*exp(1)*erfi(I+arcsin(b*x+a))*Pi^(1/2)/b^4-1/32*I*exp(4)*erfi
(-2*I+arcsin(b*x+a))*Pi^(1/2)/b^4+1/32*I*exp(4)*erfi(2*I+arcsin(b*x+a))*Pi
^(1/2)/b^4-3/16*a*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^4-1/4*a^3
*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^4-3/16*a*exp(1/4)*erfi(1/2
*I+arcsin(b*x+a))*Pi^(1/2)/b^4-1/4*a^3*exp(1/4)*erfi(1/2*I+arcsin(b*x+a))*
Pi^(1/2)/b^4+3/16*a*exp(9/4)*erfi(-3/2*I+arcsin(b*x+a))*Pi^(1/2)/b^4+3/16*
a*exp(9/4)*erfi(3/2*I+arcsin(b*x+a))*Pi^(1/2)/b^4
```

### 3.457.2 Mathematica [A] (verified)

Time = 0.28 (sec) , antiderivative size = 221, normalized size of antiderivative = 0.58

$$\int e^{\arcsin(a+bx)^2}x^3\,dx = -\frac{\sqrt{\pi}\left(-2(e+6a^2e)\operatorname{erf}(1-i\arcsin(a+bx))+e^4\operatorname{erf}(2-i\arcsin(a+bx))+\sqrt[4]{e}\left(-2ia(3+4a^2)\operatorname{erf}\left(\frac{1}{2}+i\right.\right.\right.}{}$$

input
```
Integrate[E^ArcSin[a + b*x]^2*x^3,x]
```

output
```
-1/32*(Sqrt[Pi]*(-2*(E + 6*a^2*E)*Erf[1 - I*ArcSin[a + b*x]] + E^4*Erf[2 -
 I*ArcSin[a + b*x]] + E^(1/4)*((-2*I)*a*(3 + 4*a^2)*Erf[1/2 + I*ArcSin[a +
 b*x]] - 2*(1 + 6*a^2)*E^(3/4)*Erf[1 + I*ArcSin[a + b*x]] + (6*I)*a*E^2*Er
f[3/2 + I*ArcSin[a + b*x]] + E^(15/4)*Erf[2 + I*ArcSin[a + b*x]] + 6*a*Erf
i[(I + 2*ArcSin[a + b*x])/2] + 8*a^3*Erfi[(I + 2*ArcSin[a + b*x])/2] - 6*a
*E^2*Erfi[(3*I + 2*ArcSin[a + b*x])/2]))/b^4
```

### 3.457.3 Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 350, normalized size of antiderivative = 0.92, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.429$, Rules used = {5335, 25, 7292, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^3 e^{\arcsin(a+bx)^2}\,dx$$

$$\downarrow \text{5335}$$

$$\frac{\int -e^{\arcsin(a+bx)^2}\left(\frac{a}{b}-\frac{a+bx}{b}\right)^3\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\downarrow \text{25}$$

$$-\frac{\int e^{\arcsin(a+bx)^2}\left(\frac{a}{b}-\frac{a+bx}{b}\right)^3\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\downarrow \text{7292}$$

$$-\frac{\int -e^{\arcsin(a+bx)^2}x^3\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\downarrow \text{27}$$

$$-\frac{\int -b^3e^{\arcsin(a+bx)^2}x^3\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b^4}$$

$$\downarrow \text{7293}$$

$$-\frac{\int \left(e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}a^3-3e^{\arcsin(a+bx)^2}(a+bx)\sqrt{1-(a+bx)^2}a^2+3e^{\arcsin(a+bx)^2}(a+bx)^2\sqrt{1-(a}{b^4}$$

$$\downarrow \text{2009}$$

$$-\frac{\frac{1}{4}\sqrt[4]{e}\sqrt{\pi}a^3\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)+\frac{1}{4}\sqrt[4]{e}\sqrt{\pi}a^3\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+i)\right)-\frac{3}{8}e\sqrt{\pi}a^2\text{erf}(1-i\arcsin(a+b}{}$$

input
```
Int[E^ArcSin[a + b*x]^2*x^3,x]
```

output
```
-((-1/16*(E*Sqrt[Pi]*Erf[1 - I*ArcSin[a + b*x]]) - (3*a^2*E*Sqrt[Pi]*Erf[1
 - I*ArcSin[a + b*x]])/8 + (E^4*Sqrt[Pi]*Erf[2 - I*ArcSin[a + b*x]])/32 -
(E*Sqrt[Pi]*Erf[1 + I*ArcSin[a + b*x]])/16 - (3*a^2*E*Sqrt[Pi]*Erf[1 + I*A
rcSin[a + b*x]])/8 + (E^4*Sqrt[Pi]*Erf[2 + I*ArcSin[a + b*x]])/32 + (3*a*E
^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/2])/16 + (a^3*E^(1/4)*Sqrt[P
i]*Erfi[(-I + 2*ArcSin[a + b*x])/2])/4 + (3*a*E^(1/4)*Sqrt[Pi]*Erfi[(I + 2
*ArcSin[a + b*x])/2])/16 + (a^3*E^(1/4)*Sqrt[Pi]*Erfi[(I + 2*ArcSin[a + b*
x])/2])/4 - (3*a*E^(9/4)*Sqrt[Pi]*Erfi[(-3*I + 2*ArcSin[a + b*x])/2])/16 -
 (3*a*E^(9/4)*Sqrt[Pi]*Erfi[(3*I + 2*ArcSin[a + b*x])/2])/16)/b^4)
```

## 3.457. $\int e^{\arcsin(a+bx)^2}x^3\,dx$

#### 3.457.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.457.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(bx+a)^2} x^3 dx$$

input
```
int(exp(arcsin(b*x+a)^2)*x^3,x)
```

output
```
int(exp(arcsin(b*x+a)^2)*x^3,x)
```

### 3.457.5 Fricas [F]

$$\int e^{\arcsin(a+bx)^2}x^3\,dx=\int x^3e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)*x^3,x, algorithm="fricas")
```

output
```
integral(x^3*e^(arcsin(b*x + a)^2), x)
```

### 3.457.6 Sympy [F]

$$\int e^{\arcsin(a+bx)^2}x^3\,dx=\int x^3e^{\operatorname{asin}^2(a+bx)}\,dx$$

input
```
integrate(exp(asin(b*x+a)**2)*x**3,x)
```

output
```
Integral(x**3*exp(asin(a + b*x)**2), x)
```

### 3.457.7 Maxima [F]

$$\int e^{\arcsin(a+bx)^2}x^3\,dx=\int x^3e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)*x^3,x, algorithm="maxima")
```

output
```
integrate(x^3*e^(arcsin(b*x + a)^2), x)
```

### 3.457.8 Giac [F]

$$\int e^{\arcsin(a+bx)^2}x^3\,dx=\int x^3e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)*x^3,x, algorithm="giac")
```

output
```
integrate(x^3*e^(arcsin(b*x + a)^2), x)
```

### 3.457.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)^2}x^3\,dx=\int x^3\,\mathrm{e}^{\mathrm{asin}(a+b\,x)^2}\,dx$$

input
```
int(x^3*exp(asin(a + b*x)^2),x)
```

output
```
int(x^3*exp(asin(a + b*x)^2), x)
```

# 3.458 $\int e^{\arcsin(a+bx)^2} x^2 \, dx$



## 3.458.1 Optimal result

Integrand size = 14, antiderivative size = 265

$$\begin{aligned}\int e^{\arcsin(a+bx)^2} x^2 \, dx = &-\frac{ae\sqrt{\pi}\text{erf}(1-i\arcsin(a+bx))}{4b^3} - \frac{ae\sqrt{\pi}\text{erf}(1+i\arcsin(a+bx))}{4b^3} \\ &+ \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{16b^3} \\ &+ \frac{a^2\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b^3} \\ &+ \frac{\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{16b^3} \\ &+ \frac{a^2\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b^3} \\ &- \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(-3i+2\arcsin(a+bx))\right)}{16b^3} \\ &- \frac{e^{9/4}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(3i+2\arcsin(a+bx))\right)}{16b^3}\end{aligned}$$

output

```
-1/4*I*a*exp(1)*erfi(-I+arcsin(b*x+a))*Pi^(1/2)/b^3+1/4*I*a*exp(1)*erfi(I+
arcsin(b*x+a))*Pi^(1/2)/b^3+1/16*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1
/2)/b^3+1/4*a^2*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^3+1/16*exp(
1/4)*erfi(1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^3+1/4*a^2*exp(1/4)*erfi(1/2*I+ar
csin(b*x+a))*Pi^(1/2)/b^3-1/16*exp(9/4)*erfi(-3/2*I+arcsin(b*x+a))*Pi^(1/2
)/b^3-1/16*exp(9/4)*erfi(3/2*I+arcsin(b*x+a))*Pi^(1/2)/b^3
```

### 3.458.2 Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 161, normalized size of antiderivative = 0.61

$$\int e^{\arcsin(a+bx)^2}x^2\,dx =$$
$$-\frac{\sqrt{\pi}\left(4ae\operatorname{erf}(1-i\arcsin(a+bx))+i\sqrt[4]{e}\left(-\left((1+4a^2)\operatorname{erf}\left(\frac{1}{2}-i\arcsin(a+bx)\right)\right)+e^2\operatorname{erf}\left(\frac{3}{2}-i\arcsin(a-\right.\right.\right.}{}$$

input
```
Integrate[E^ArcSin[a + b*x]^2*x^2,x]
```

output
```
-1/16*(Sqrt[Pi]*(4*a*E*Erf[1 - I*ArcSin[a + b*x]] + I*E^(1/4)*(-((1 + 4*a^
2)*Erf[1/2 - I*ArcSin[a + b*x]]) + E^2*Erf[3/2 - I*ArcSin[a + b*x]] + Erf[
1/2 + I*ArcSin[a + b*x]] + 4*a^2*Erf[1/2 + I*ArcSin[a + b*x]] - (4*I)*a*E^
(3/4)*Erf[1 + I*ArcSin[a + b*x]] - E^2*Erf[3/2 + I*ArcSin[a + b*x]])))/b^3
```

### 3.458.3 Rubi [A] (verified)

Time = 0.66 (sec) , antiderivative size = 245, normalized size of antiderivative = 0.92, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {5335, 7292, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int x^2e^{\arcsin(a+bx)^2}\,dx$$
$$\Big\downarrow \text{5335}$$
$$\frac{\int e^{\arcsin(a+bx)^2}\left(\frac{a}{b}-\frac{a+bx}{b}\right)^2\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$
$$\Big\downarrow \text{7292}$$
$$\frac{\int e^{\arcsin(a+bx)^2}x^2\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$
$$\Big\downarrow \text{27}$$
$$\frac{\int b^2e^{\arcsin(a+bx)^2}x^2\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b^3}$$
$$\Big\downarrow \text{7293}$$

$$\frac{\int \left(e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}a^2 - 2e^{\arcsin(a+bx)^2}(a+bx)\sqrt{1-(a+bx)^2}a + e^{\arcsin(a+bx)^2}(a+bx)^2\sqrt{1-(a+bx)^2}\right.}{b^3}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{\frac{1}{4}\sqrt[4]{e}\sqrt{\pi}a^2\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)+\frac{1}{4}\sqrt[4]{e}\sqrt{\pi}a^2\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+i)\right)-\frac{1}{4}e\sqrt{\pi}a\text{erf}(1-i\arcsin(a+bx)}{}$$

input
```
Int[E^ArcSin[a + b*x]^2*x^2,x]
```

output
```
(-1/4*(a*E*Sqrt[Pi]*Erf[1 - I*ArcSin[a + b*x]]) - (a*E*Sqrt[Pi]*Erf[1 + I*
ArcSin[a + b*x]])/4 + (E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/2])/
16 + (a^2*E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/2])/4 + (E^(1/4)*
Sqrt[Pi]*Erfi[(I + 2*ArcSin[a + b*x])/2])/16 + (a^2*E^(1/4)*Sqrt[Pi]*Erfi[
(I + 2*ArcSin[a + b*x])/2])/4 - (E^(9/4)*Sqrt[Pi]*Erfi[(-3*I + 2*ArcSin[a
+ b*x])/2])/16 - (E^(9/4)*Sqrt[Pi]*Erfi[(3*I + 2*ArcSin[a + b*x])/2])/16)/
b^3
```

### 3.458.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### 3.458.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(bx+a)^2} x^2 dx$$

input
```
int(exp(arcsin(b*x+a)^2)*x^2,x)
```

output
```
int(exp(arcsin(b*x+a)^2)*x^2,x)
```

### 3.458.5 Fricas [F]

$$\int e^{\arcsin(a+bx)^2} x^2 \, dx = \int x^2 e^{\left(\arcsin(bx+a)^2\right)} \, dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)*x^2,x, algorithm="fricas")
```

output
```
integral(x^2*e^(arcsin(b*x + a)^2), x)
```

### 3.458.6 Sympy [F]

$$\int e^{\arcsin(a+bx)^2} x^2 \, dx = \int x^2 e^{\operatorname{asin}^2(a+bx)} \, dx$$

input
```
integrate(exp(asin(b*x+a)**2)*x**2,x)
```

output
```
Integral(x**2*exp(asin(a + b*x)**2), x)
```

### 3.458.7 Maxima [F]

$$\int e^{\arcsin(a+bx)^2}x^2\,dx=\int x^2e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)*x^2,x, algorithm="maxima")
```

output
```
integrate(x^2*e^(arcsin(b*x + a)^2), x)
```

### 3.458.8 Giac [F]

$$\int e^{\arcsin(a+bx)^2}x^2\,dx=\int x^2e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)*x^2,x, algorithm="giac")
```

output
```
integrate(x^2*e^(arcsin(b*x + a)^2), x)
```

### 3.458.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)^2}x^2\,dx=\int x^2\,\mathrm{e}^{\mathrm{asin}(a+b\,x)^2}\,dx$$

input
```
int(x^2*exp(asin(a + b*x)^2),x)
```

output
```
int(x^2*exp(asin(a + b*x)^2), x)
```

# 3.459 $\int e^{\arcsin(a+bx)^2} x\,dx$



## 3.459.1 Optimal result

Integrand size = 12, antiderivative size = 123

$$\int e^{\arcsin(a+bx)^2} x\,dx = \frac{e\sqrt{\pi}\operatorname{erf}(1-i\arcsin(a+bx))}{8b^2} + \frac{e\sqrt{\pi}\operatorname{erf}(1+i\arcsin(a+bx))}{8b^2} - \frac{a\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b^2} - \frac{a\sqrt[4]{e}\sqrt{\pi}\operatorname{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b^2}$$

output
```
1/8*I*exp(1)*erfi(-I+arcsin(b*x+a))*Pi^(1/2)/b^2-1/8*I*exp(1)*erfi(I+arcsi
n(b*x+a))*Pi^(1/2)/b^2-1/4*a*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/
b^2-1/4*a*exp(1/4)*erfi(1/2*I+arcsin(b*x+a))*Pi^(1/2)/b^2
```

## 3.459.2 Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.76

$$\int e^{\arcsin(a+bx)^2} x\,dx = \frac{\sqrt{\pi}\left(e\operatorname{erf}(1-i\arcsin(a+bx)) + e\operatorname{erf}(1+i\arcsin(a+bx)) - 2a\sqrt[4]{e}\operatorname{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right) - 2a\sqrt[4]{e}\right.}{8b^2}$$

input
```
Integrate[E^ArcSin[a + b*x]^2*x,x]
```

output
```
(Sqrt[Pi]*(E*Erf[1 - I*ArcSin[a + b*x]] + E*Erf[1 + I*ArcSin[a + b*x]] - 2
*a*E^(1/4)*Erfi[(-I + 2*ArcSin[a + b*x])/2] - 2*a*E^(1/4)*Erfi[(I + 2*ArcS
in[a + b*x])/2]))/(8*b^2)
```

### 3.459.3 Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 116, normalized size of antiderivative = 0.94, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.500$, Rules used = {5335, 25, 7292, 27, 7293, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int xe^{\arcsin(a+bx)^2}dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int -e^{\arcsin(a+bx)^2}\left(\frac{a}{b}-\frac{a+bx}{b}\right)\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int e^{\arcsin(a+bx)^2}\left(\frac{a}{b}-\frac{a+bx}{b}\right)\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{7292}$$

$$-\frac{\int -e^{\arcsin(a+bx)^2}x\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\frac{\int -be^{\arcsin(a+bx)^2}x\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \text{7293}$$

$$-\frac{\int \left(ae^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}-e^{\arcsin(a+bx)^2}(a+bx)\sqrt{1-(a+bx)^2}\right)d\arcsin(a+bx)}{b^2}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{-\frac{1}{8}e\sqrt{\pi}\text{erf}(1-i\arcsin(a+bx))-\frac{1}{8}e\sqrt{\pi}\text{erf}(1+i\arcsin(a+bx))+\frac{1}{4}\sqrt[4]{e}\sqrt{\pi}a\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)+\frac{1}{4}\sqrt[4]{}}{b^2}$$

input
```
Int[E^ArcSin[a + b*x]^2*x,x]
```

3.459. $\int e^{\arcsin(a+bx)^2}x\,dx$

output
```
-((-1/8*(E*Sqrt[Pi]*Erf[1 - I*ArcSin[a + b*x]]) - (E*Sqrt[Pi]*Erf[1 + I*Ar
cSin[a + b*x]])/8 + (a*E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/2])/
4 + (a*E^(1/4)*Sqrt[Pi]*Erfi[(I + 2*ArcSin[a + b*x])/2])/4)/b^2)
```

### 3.459.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7293
```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

## 3.459.4 Maple [F]

$$\int e^{\arcsin(bx+a)^2} x dx$$

input
```
int(exp(arcsin(b*x+a)^2)*x,x)
```

output
```
int(exp(arcsin(b*x+a)^2)*x,x)
```

### 3.459.5 Fricas [F]

$$\int e^{\arcsin(a+bx)^2}x\,dx=\int xe^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)*x,x, algorithm="fricas")
```

output
```
integral(x*e^(arcsin(b*x + a)^2), x)
```

### 3.459.6 Sympy [F]

$$\int e^{\arcsin(a+bx)^2}x\,dx=\int xe^{\operatorname{asin}^2(a+bx)}\,dx$$

input
```
integrate(exp(asin(b*x+a)**2)*x,x)
```

output
```
Integral(x*exp(asin(a + b*x)**2), x)
```

### 3.459.7 Maxima [F]

$$\int e^{\arcsin(a+bx)^2}x\,dx=\int xe^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)*x,x, algorithm="maxima")
```

output
```
integrate(x*e^(arcsin(b*x + a)^2), x)
```

### 3.459.8 Giac [F]

$$\int e^{\arcsin(a+bx)^2}x\,dx=\int xe^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)*x,x, algorithm="giac")
```

output
```
integrate(x*e^(arcsin(b*x + a)^2), x)
```

### 3.459.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)^2}x\,dx=\int x\,\mathrm{e}^{\mathrm{asin}(a+b\,x)^2}\,dx$$

input
```
int(x*exp(asin(a + b*x)^2),x)
```

output
```
int(x*exp(asin(a + b*x)^2), x)
```

# 3.460 $\int e^{\arcsin(a+bx)^2}\,dx$



## 3.460.1 Optimal result

Integrand size = 10, antiderivative size = 69

$$\int e^{\arcsin(a+bx)^2}\,dx = \frac{\sqrt[4]{e}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)}{4b}+\frac{\sqrt[4]{e}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)}{4b}$$

output
```
1/4*exp(1/4)*erfi(-1/2*I+arcsin(b*x+a))*Pi^(1/2)/b+1/4*exp(1/4)*erfi(1/2*I
+arcsin(b*x+a))*Pi^(1/2)/b
```

## 3.460.2 Mathematica [A] (verified)

Time = 0.01 (sec) , antiderivative size = 52, normalized size of antiderivative = 0.75

$$\int e^{\arcsin(a+bx)^2}\,dx = \frac{\sqrt[4]{e}\sqrt{\pi}\left(\mathrm{erfi}\left(\frac{1}{2}(-i+2\arcsin(a+bx))\right)+\mathrm{erfi}\left(\frac{1}{2}(i+2\arcsin(a+bx))\right)\right)}{4b}$$

input
```
Integrate[E^ArcSin[a + b*x]^2,x]
```

output
```
(E^(1/4)*Sqrt[Pi]*(Erfi[(-I + 2*ArcSin[a + b*x])/2] + Erfi[(I + 2*ArcSin[a
 + b*x])/2]))/(4*b)
```

## 3.460.3 Rubi [A] (verified)

Time = 0.25 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.97, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {5335, 4976, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int e^{\arcsin(a+bx)^2}dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{4976}$$

$$\frac{\int \left(\frac{1}{2}e^{\arcsin(a+bx)^2-i\arcsin(a+bx)}+\frac{1}{2}e^{\arcsin(a+bx)^2+i\arcsin(a+bx)}\right)d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{2009}$$

$$\frac{\frac{1}{4}\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)-i)\right)+\frac{1}{4}\sqrt[4]{e}\sqrt{\pi}\text{erfi}\left(\frac{1}{2}(2\arcsin(a+bx)+i)\right)}{b}$$

input
```
Int[E^ArcSin[a + b*x]^2,x]
```

output
```
((E^(1/4)*Sqrt[Pi]*Erfi[(-I + 2*ArcSin[a + b*x])/2])/4 + (E^(1/4)*Sqrt[Pi]
*Erfi[(I + 2*ArcSin[a + b*x])/2])/4)/b
```

### 3.460.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

rule 4976
```
Int[Cos[v_]^(n_.)*(F_)^(u_), x_Symbol] :> Int[ExpandTrigToExp[F^u, Cos[v]^n
, x], x] /; FreeQ[F, x] && (LinearQ[u, x] || PolyQ[u, x, 2]) && (LinearQ[v,
 x] || PolyQ[v, x, 2]) && IGtQ[n, 0]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

### 3.460.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(bx+a)^2}dx$$

input
```
int(exp(arcsin(b*x+a)^2),x)
```

output
```
int(exp(arcsin(b*x+a)^2),x)
```

### 3.460.5 Fricas [F]

$$\int e^{\arcsin(a+bx)^2}\,dx = \int e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2),x, algorithm="fricas")
```

output
```
integral(e^(arcsin(b*x + a)^2), x)
```

### 3.460.6 Sympy [F]

$$\int e^{\arcsin(a+bx)^2}\,dx = \int e^{\operatorname{asin}^2(a+bx)}\,dx$$

input
```
integrate(exp(asin(b*x+a)**2),x)
```

output
```
Integral(exp(asin(a + b*x)**2), x)
```

### 3.460.7 Maxima [F]

$$\int e^{\arcsin(a+bx)^2}\,dx = \int e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2),x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(b*x + a)^2), x)
```

### 3.460.8 Giac [F]

$$\int e^{\arcsin(a+bx)^2}\,dx = \int e^{\left(\arcsin(bx+a)^2\right)}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2),x, algorithm="giac")
```

output
```
integrate(e^(arcsin(b*x + a)^2), x)
```

### 3.460.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(a+bx)^2}\,dx = \int \mathrm{e}^{\mathrm{asin}(a+b\,x)^2}\,dx$$

input
```
int(exp(asin(a + b*x)^2),x)
```

output
```
int(exp(asin(a + b*x)^2), x)
```

# 3.461 $\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx$



## 3.461.1 Optimal result

Integrand size = 14, antiderivative size = 14

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = b\text{Int}\left(\frac{e^{\arcsin(a+bx)^2}}{bx},x\right)$$

output
```
b*CannotIntegrate(exp(arcsin(b*x+a)^2)/b/x,x)
```

## 3.461.2 Mathematica [N/A]

Not integrable

Time = 0.16 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.14

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx$$

input
```
Integrate[E^ArcSin[a + b*x]^2/x,x]
```

output
```
Integrate[E^ArcSin[a + b*x]^2/x, x]
```

### 3.461.3 Rubi [N/A]

Not integrable

Time = 0.46 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5335, 25, 7292, 27, 7299}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int -\frac{e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}}{\frac{a}{b}-\frac{a+bx}{b}}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{25}$$

$$-\frac{\int \frac{e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}}{\frac{a}{b}-\frac{a+bx}{b}}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{7292}$$

$$-\frac{\int -\frac{e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}}{x}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$-\int -\frac{e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}}{bx}d\arcsin(a+bx)$$

$$\Big\downarrow \text{7299}$$

$$-\int -\frac{e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}}{bx}d\arcsin(a+bx)$$

input
```
Int[E^ArcSin[a + b*x]^2/x,x]
```

output
```
$Aborted
```

3.461. $\int \frac{e^{\arcsin(a+bx)^2}}{x}dx$

### 3.461.3.1 Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7299
```
Int[u_, x_] :> CannotIntegrate[u, x]
```

## 3.461.4 Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.93

$$\int \frac{\mathrm{e}^{\arcsin(bx+a)^2}}{x}dx$$

input
```
int(exp(arcsin(b*x+a)^2)/x,x)
```

output
```
int(exp(arcsin(b*x+a)^2)/x,x)
```

### 3.461.5 Fricas [N/A]

Not integrable

Time = 0.25 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)/x,x, algorithm="fricas")
```

output
```
integral(e^(arcsin(b*x + a)^2)/x, x)
```

### 3.461.6 Sympy [N/A]

Not integrable

Time = 0.42 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.86

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\operatorname{asin}^2(a+bx)}}{x}\,dx$$

input
```
integrate(exp(asin(b*x+a)**2)/x,x)
```

output
```
Integral(exp(asin(a + b*x)**2)/x, x)
```

### 3.461.7 Maxima [N/A]

Not integrable

Time = 0.48 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x}\,dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)/x,x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(b*x + a)^2)/x, x)
```

### 3.461.8 Giac [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x} dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x} dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)/x,x, algorithm="giac")
```

output
```
integrate(e^(arcsin(b*x + a)^2)/x, x)
```

### 3.461.9 Mupad [N/A]

Not integrable

Time = 0.28 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x} dx = \int \frac{e^{\mathrm{asin}(a+b\,x)^2}}{x} dx$$

input
```
int(exp(asin(a + b*x)^2)/x,x)
```

output
```
int(exp(asin(a + b*x)^2)/x, x)
```

# 3.462 $\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx$



## 3.462.1 Optimal result

Integrand size = 14, antiderivative size = 14

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = b^2\text{Int}\left(\frac{e^{\arcsin(a+bx)^2}}{b^2x^2},x\right)$$

output
```
b^2*CannotIntegrate(exp(arcsin(b*x+a)^2)/b^2/x^2,x)
```

## 3.462.2 Mathematica [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.14

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = \int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx$$

input
```
Integrate[E^ArcSin[a + b*x]^2/x^2,x]
```

output
```
Integrate[E^ArcSin[a + b*x]^2/x^2, x]
```

### 3.462.3 Rubi [N/A]

Not integrable

Time = 0.48 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {5335, 7292, 27, 7299}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2} \, dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int \frac{e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}}{\left(\frac{a}{b}-\frac{a+bx}{b}\right)^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{7292}$$

$$\frac{\int \frac{e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}}{x^2}d\arcsin(a+bx)}{b}$$

$$\Big\downarrow \text{27}$$

$$b\int \frac{e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}}{b^2x^2}d\arcsin(a+bx)$$

$$\Big\downarrow \text{7299}$$

$$b\int \frac{e^{\arcsin(a+bx)^2}\sqrt{1-(a+bx)^2}}{b^2x^2}d\arcsin(a+bx)$$

input
```
Int[E^ArcSin[a + b*x]^2/x^2,x]
```

output
```
$Aborted
```

### 3.462.3.1 Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

rule 7299
```
Int[u_, x_] :> CannotIntegrate[u, x]
```

## 3.462.4 Maple [N/A] (verified)

Not integrable

Time = 0.03 (sec) , antiderivative size = 13, normalized size of antiderivative = 0.93

$$\int \frac{\mathrm{e}^{\arcsin(bx+a)^2}}{x^2}dx$$

input
```
int(exp(arcsin(b*x+a)^2)/x^2,x)
```

output
```
int(exp(arcsin(b*x+a)^2)/x^2,x)
```

## 3.462.5 Fricas [N/A]

Not integrable

Time = 0.24 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)/x^2,x, algorithm="fricas")
```

output
```
integral(e^(arcsin(b*x + a)^2)/x^2, x)
```

### 3.462.6 Sympy [N/A]

Not integrable

Time = 0.47 (sec) , antiderivative size = 14, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = \int \frac{e^{\operatorname{asin}^2(a+bx)}}{x^2}\,dx$$

input
```
integrate(exp(asin(b*x+a)**2)/x**2,x)
```

output
```
Integral(exp(asin(a + b*x)**2)/x**2, x)
```

### 3.462.7 Maxima [N/A]

Not integrable

Time = 0.48 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)/x^2,x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(b*x + a)^2)/x^2, x)
```

### 3.462.8 Giac [N/A]

Not integrable

Time = 0.37 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = \int \frac{e^{\left(\arcsin(bx+a)^2\right)}}{x^2}\,dx$$

input
```
integrate(exp(arcsin(b*x+a)^2)/x^2,x, algorithm="giac")
```

output
```
integrate(e^(arcsin(b*x + a)^2)/x^2, x)
```

## 3.462.9 Mupad [N/A]

Not integrable

Time = 0.27 (sec) , antiderivative size = 15, normalized size of antiderivative = 1.07

$$\int \frac{e^{\arcsin(a+bx)^2}}{x^2}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a+b\,x)^2}}{x^2}\,dx$$

input
```
int(exp(asin(a + b*x)^2)/x^2,x)
```

output
```
int(exp(asin(a + b*x)^2)/x^2, x)
```

# 3.463 $\int e^{\arcsin(ax)}(1-a^2x^2)^{5/2}\,dx$



## 3.463.1 Optimal result

Integrand size = 21, antiderivative size = 162

$$\begin{aligned}\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx &= \frac{144e^{\arcsin(ax)}}{629a}+\frac{144}{629}e^{\arcsin(ax)}x\sqrt{1-a^2x^2}\\ &+\frac{72e^{\arcsin(ax)}(1-a^2x^2)}{629a}+\frac{120}{629}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2}\\ &+\frac{30e^{\arcsin(ax)}(1-a^2x^2)^2}{629a}+\frac{6}{37}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{5/2}+\frac{e^{\arcsin(ax)}(1-a^2x^2)^3}{37a}\end{aligned}$$

output
```
144/629*exp(arcsin(a*x))/a+72/629*exp(arcsin(a*x))*(-a^2*x^2+1)/a+120/629*
exp(arcsin(a*x))*x*(-a^2*x^2+1)^(3/2)+30/629*exp(arcsin(a*x))*(-a^2*x^2+1)
^2/a+6/37*exp(arcsin(a*x))*x*(-a^2*x^2+1)^(5/2)+1/37*exp(arcsin(a*x))*(-a^
2*x^2+1)^3/a+144/629*exp(arcsin(a*x))*x*(-a^2*x^2+1)^(1/2)
```

## 3.463.2 Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.43

$$\int e^{\arcsin(ax)}(1-a^2x^2)^{5/2}\,dx = \frac{e^{\arcsin(ax)}(6290+1887\cos(2\arcsin(ax))+222\cos(4\arcsin(ax))+17\cos(6\arcsin(ax))+37}{20128a}$$

input
```
Integrate[E^ArcSin[a*x]*(1 - a^2*x^2)^(5/2),x]
```

output
```
(E^ArcSin[a*x]*(6290 + 1887*Cos[2*ArcSin[a*x]] + 222*Cos[4*ArcSin[a*x]] +
17*Cos[6*ArcSin[a*x]] + 3774*Sin[2*ArcSin[a*x]] + 888*Sin[4*ArcSin[a*x]] +
 102*Sin[6*ArcSin[a*x]]))/(20128*a)
```

### 3.463.3 Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.03, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5335, 7292, 7271, 4935, 4935, 4935, 2624}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(1-a^2x^2\right)^{5/2} e^{\arcsin(ax)} dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^3 d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{4935}$$

$$\frac{\frac{30}{37}\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^2 d\arcsin(ax)+\frac{1}{37}\left(1-a^2x^2\right)^3 e^{\arcsin(ax)}+\frac{6}{37}ax\left(1-a^2x^2\right)^{5/2} e^{\arcsin(ax)}}{a}$$

$$\Big\downarrow \text{4935}$$

$$\frac{\frac{30}{37}\left(\frac{12}{17}\int e^{\arcsin(ax)}\left(1-a^2x^2\right) d\arcsin(ax)+\frac{1}{17}\left(1-a^2x^2\right)^2 e^{\arcsin(ax)}+\frac{4}{17}ax\left(1-a^2x^2\right)^{3/2} e^{\arcsin(ax)}\right)+\frac{1}{37}\left(1-a^2\right.}{a}$$

$$\Big\downarrow \text{4935}$$

$$\frac{\frac{30}{37}\left(\frac{12}{17}\left(\frac{2}{5}\int e^{\arcsin(ax)}d\arcsin(ax)+\frac{2}{5}ax\sqrt{1-a^2x^2}e^{\arcsin(ax)}+\frac{1}{5}\left(1-a^2x^2\right) e^{\arcsin(ax)}\right)+\frac{1}{17}\left(1-a^2x^2\right)^2 e^{\arcsin(ax)}\right.}{a}$$

$$\Big\downarrow \text{2624}$$

$$\frac{\frac{1}{37}\left(1-a^2x^2\right)^3 e^{\arcsin(ax)}+\frac{6}{37}ax\left(1-a^2x^2\right)^{5/2} e^{\arcsin(ax)}+\frac{30}{37}\left(\frac{1}{17}\left(1-a^2x^2\right)^2 e^{\arcsin(ax)}+\frac{4}{17}ax\left(1-a^2x^2\right)^{3/2} e^{\arcsin}\right.}{a}$$

input
```
Int[E^ArcSin[a*x]*(1 - a^2*x^2)^(5/2),x]
```

3.463. $\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2} dx$

output
```
((6*a*E^ArcSin[a*x]*x*(1 - a^2*x^2)^(5/2))/37 + (E^ArcSin[a*x]*(1 - a^2*x^
2)^3)/37 + (30*((4*a*E^ArcSin[a*x]*x*(1 - a^2*x^2)^(3/2))/17 + (E^ArcSin[a
*x]*(1 - a^2*x^2)^2)/17 + (12*((2*E^ArcSin[a*x])/5 + (2*a*E^ArcSin[a*x]*x*
Sqrt[1 - a^2*x^2])/5 + (E^ArcSin[a*x]*(1 - a^2*x^2))/5))/17))/37)/a
```

### 3.463.3.1 Defintions of rubi rules used

rule 2624
```
Int[((F_)^(v_))^(n_.), x_Symbol] :> Simp[(F^v)^n/(n*Log[F]*D[v, x]), x] /;
FreeQ[{F, n}, x] && LinearQ[v, x]
```

rule 4935
```
Int[Cos[(d_.) + (e_.)*(x_)]^(m_)*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbo
l] :> Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]^m/(e^2*m^2 + b^2*c^2*Lo
g[F]^2)), x] + (Simp[e*m*F^(c*(a + b*x))*Sin[d + e*x]*(Cos[d + e*x]^(m - 1)
/(e^2*m^2 + b^2*c^2*Log[F]^2)), x] + Simp[(m*(m - 1)*e^2)/(e^2*m^2 + b^2*c^
2*Log[F]^2)   Int[F^(c*(a + b*x))*Cos[d + e*x]^(m - 2), x], x]) /; FreeQ[{F
, a, b, c, d, e}, x] && NeQ[e^2*m^2 + b^2*c^2*Log[F]^2, 0] && GtQ[m, 1]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7271
```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Simp[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p]))   Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p},
x] &&  !IntegerQ[p] &&  !FreeQ[v, x] &&  !(EqQ[a, 1] && EqQ[m, 1]) &&  !(Eq
Q[v, x] && EqQ[m, 1])
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

## 3.463. $\int e^{\arcsin(ax)}(1-a^2x^2)^{5/2}\,dx$

### 3.463.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)} \left(-a^2x^2+1\right)^{\frac{5}{2}} dx$$

input
```
int(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x)
```

output
```
int(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x)
```

### 3.463.5 Fricas [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 71, normalized size of antiderivative = 0.44

$$\int e^{\arcsin(ax)} \left(1-a^2x^2\right)^{5/2} dx = -\frac{\left(17\,a^6x^6-81\,a^4x^4+183\,a^2x^2-6\,(17\,a^5x^5-54\,a^3x^3+61\,ax)\sqrt{-a^2x^2+1}-263\right)e^{(\arcsin(ax))}}{629\,a}$$

input
```
integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x, algorithm="fricas")
```

output
```
-1/629*(17*a^6*x^6 - 81*a^4*x^4 + 183*a^2*x^2 - 6*(17*a^5*x^5 - 54*a^3*x^3
 + 61*a*x)*sqrt(-a^2*x^2 + 1) - 263)*e^(arcsin(a*x))/a
```

### 3.463.6 Sympy [A] (verification not implemented)

Time = 13.73 (sec) , antiderivative size = 141, normalized size of antiderivative = 0.87

$$\int e^{\arcsin(ax)} \left(1-a^2x^2\right)^{5/2} dx = \begin{cases} -\frac{a^5x^6e^{\operatorname{asin}(ax)}}{37} + \frac{6a^4x^5\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{37} + \frac{81a^3x^4e^{\operatorname{asin}(ax)}}{629} - \frac{324a^2x^3\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{629} - \frac{183ax^2e^{\operatorname{asin}(ax)}}{629} \\ x \end{cases}$$

input
```
integrate(exp(asin(a*x))*(-a**2*x**2+1)**(5/2),x)
```

output
```
Piecewise((-a**5*x**6*exp(asin(a*x))/37 + 6*a**4*x**5*sqrt(-a**2*x**2 + 1)
*exp(asin(a*x))/37 + 81*a**3*x**4*exp(asin(a*x))/629 - 324*a**2*x**3*sqrt(
-a**2*x**2 + 1)*exp(asin(a*x))/629 - 183*a*x**2*exp(asin(a*x))/629 + 366*x
*sqrt(-a**2*x**2 + 1)*exp(asin(a*x))/629 + 263*exp(asin(a*x))/(629*a), Ne(
a, 0)), (x, True))
```

### 3.463.7 Maxima [F]

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx=\int \left(-a^2x^2+1\right)^{\frac{5}{2}}e^{(\arcsin(ax))}\,dx$$

input
```
integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x, algorithm="maxima")
```

output
```
integrate((-a^2*x^2 + 1)^(5/2)*e^(arcsin(a*x)), x)
```

### 3.463.8 Giac [F(-2)]

Exception generated.

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(5/2),x, algorithm="giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.463.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{5/2}\,dx=\int e^{\mathrm{asin}(a\,x)}\,\left(1-a^2\,x^2\right)^{5/2}\,dx$$

input
```
int(exp(asin(a*x))*(1 - a^2*x^2)^(5/2),x)
```

output
```
int(exp(asin(a*x))*(1 - a^2*x^2)^(5/2), x)
```

# 3.464 $\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx$



## 3.464.1 Optimal result

Integrand size = 21, antiderivative size = 112

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx=\frac{24e^{\arcsin(ax)}}{85a}+\frac{24}{85}e^{\arcsin(ax)}x\sqrt{1-a^2x^2}+\frac{12e^{\arcsin(ax)}(1-a^2x^2)}{85a}+\frac{4}{17}e^{\arcsin(ax)}x\left(1-a^2x^2\right)^{3/2}+\frac{e^{\arcsin(ax)}(1-a^2x^2)^2}{17a}$$

output
```
24/85*exp(arcsin(a*x))/a+12/85*exp(arcsin(a*x))*(-a^2*x^2+1)/a+4/17*exp(ar
csin(a*x))*x*(-a^2*x^2+1)^(3/2)+1/17*exp(arcsin(a*x))*(-a^2*x^2+1)^2/a+24/
85*exp(arcsin(a*x))*x*(-a^2*x^2+1)^(1/2)
```

## 3.464.2 Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 51, normalized size of antiderivative = 0.46

$$\int e^{\arcsin(ax)}(1-a^2x^2)^{3/2}\,dx=\frac{e^{\arcsin(ax)}(255+68\cos(2\arcsin(ax))+5\cos(4\arcsin(ax))+136\sin(2\arcsin(ax))+20\sin(4\arcsin(ax)))}{680a}$$

input
```
Integrate[E^ArcSin[a*x]*(1 - a^2*x^2)^(3/2),x]
```

output
```
(E^ArcSin[a*x]*(255 + 68*Cos[2*ArcSin[a*x]] + 5*Cos[4*ArcSin[a*x]] + 136*S
in[2*ArcSin[a*x]] + 20*Sin[4*ArcSin[a*x]]))/(680*a)
```

### 3.464.3 Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 114, normalized size of antiderivative = 1.02, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {5335, 7292, 7271, 4935, 4935, 2624}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(1-a^2x^2\right)^{3/2} e^{\arcsin(ax)}\,dx$$

$$\Big\downarrow \; 5335$$

$$\frac{\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^2 d\arcsin(ax)}{a}$$

$$\Big\downarrow \; 4935$$

$$\frac{\frac{12}{17}\int e^{\arcsin(ax)}\left(1-a^2x^2\right) d\arcsin(ax)+\frac{1}{17}\left(1-a^2x^2\right)^2 e^{\arcsin(ax)}+\frac{4}{17}ax\left(1-a^2x^2\right)^{3/2} e^{\arcsin(ax)}}{a}$$

$$\Big\downarrow \; 4935$$

$$\frac{\frac{12}{17}\left(\frac{2}{5}\int e^{\arcsin(ax)}d\arcsin(ax)+\frac{2}{5}ax\sqrt{1-a^2x^2}e^{\arcsin(ax)}+\frac{1}{5}\left(1-a^2x^2\right)e^{\arcsin(ax)}\right)+\frac{1}{17}\left(1-a^2x^2\right)^2 e^{\arcsin(ax)}+\frac{4}{17}\cdots}{a}$$

$$\Big\downarrow \; 2624$$

$$\frac{\frac{1}{17}\left(1-a^2x^2\right)^2 e^{\arcsin(ax)}+\frac{4}{17}ax\left(1-a^2x^2\right)^{3/2} e^{\arcsin(ax)}+\frac{12}{17}\left(\frac{2}{5}ax\sqrt{1-a^2x^2}e^{\arcsin(ax)}+\frac{1}{5}\left(1-a^2x^2\right)e^{\arcsin(ax)}+\cdots\right.}{a}$$

input
```
Int[E^ArcSin[a*x]*(1 - a^2*x^2)^(3/2),x]
```

output
```
((4*a*E^ArcSin[a*x]*x*(1 - a^2*x^2)^(3/2))/17 + (E^ArcSin[a*x]*(1 - a^2*x^
2)^2)/17 + (12*((2*E^ArcSin[a*x])/5 + (2*a*E^ArcSin[a*x]*x*Sqrt[1 - a^2*x^
2])/5 + (E^ArcSin[a*x]*(1 - a^2*x^2))/5))/17)/a
```

### 3.464.3.1 Defintions of rubi rules used

rule 2624
```
Int[((F_)^(v_))^(n_.), x_Symbol] :> Simp[(F^v)^n/(n*Log[F]*D[v, x]), x] /;
FreeQ[{F, n}, x] && LinearQ[v, x]
```

rule 4935
```
Int[Cos[(d_.) + (e_.)*(x_)]^(m_)*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbo
l] :> Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]^m/(e^2*m^2 + b^2*c^2*Lo
g[F]^2)), x] + (Simp[e*m*F^(c*(a + b*x))*Sin[d + e*x]*(Cos[d + e*x]^(m - 1)
/(e^2*m^2 + b^2*c^2*Log[F]^2)), x] + Simp[(m*(m - 1)*e^2)/(e^2*m^2 + b^2*c^
2*Log[F]^2)   Int[F^(c*(a + b*x))*Cos[d + e*x]^(m - 2), x], x]) /; FreeQ[{F
, a, b, c, d, e}, x] && NeQ[e^2*m^2 + b^2*c^2*Log[F]^2, 0] && GtQ[m, 1]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7271
```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Simp[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p]))   Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p},
x] &&  !IntegerQ[p] &&  !FreeQ[v, x] &&  !(EqQ[a, 1] && EqQ[m, 1]) &&  !(Eq
Q[v, x] && EqQ[m, 1])
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

## 3.464.4 Maple [F]

$$\int \mathrm{e}^{\arcsin(ax)} \left(-a^2x^2+1\right)^{\frac{3}{2}} dx$$

input
```
int(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x)
```

output
```
int(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x)
```

### 3.464.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.49

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx = \frac{\left(5\,a^4x^4-22\,a^2x^2-4\left(5\,a^3x^3-11\,ax\right)\sqrt{-a^2x^2+1}+41\right)e^{(\arcsin(ax))}}{85\,a}$$

input
```
integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x, algorithm="fricas")
```

output
```
1/85*(5*a^4*x^4 - 22*a^2*x^2 - 4*(5*a^3*x^3 - 11*a*x)*sqrt(-a^2*x^2 + 1) +
 41)*e^(arcsin(a*x))/a
```

### 3.464.6 Sympy [A] (verification not implemented)

Time = 1.39 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.85

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx = \begin{cases} \frac{a^3x^4e^{\operatorname{asin}(ax)}}{17}-\frac{4a^2x^3\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{17}-\frac{22ax^2e^{\operatorname{asin}(ax)}}{85}+\frac{44x\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{85}+\frac{41e^{\operatorname{asin}(ax)}}{85a} & \text{for } a \ne \\ x & \text{otherw} \end{cases}$$

input
```
integrate(exp(asin(a*x))*(-a**2*x**2+1)**(3/2),x)
```

output
```
Piecewise((a**3*x**4*exp(asin(a*x))/17 - 4*a**2*x**3*sqrt(-a**2*x**2 + 1)*
exp(asin(a*x))/17 - 22*a*x**2*exp(asin(a*x))/85 + 44*x*sqrt(-a**2*x**2 + 1
)*exp(asin(a*x))/85 + 41*exp(asin(a*x))/(85*a), Ne(a, 0)), (x, True))
```

### 3.464.7 Maxima [F]

$$\int e^{\arcsin(ax)}\left(1-a^2x^2\right)^{3/2}\,dx = \int\left(-a^2x^2+1\right)^{\frac{3}{2}}e^{(\arcsin(ax))}\,dx$$

input
```
integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x, algorithm="maxima")
```

output
```
integrate((-a^2*x^2 + 1)^(3/2)*e^(arcsin(a*x)), x)
```

### 3.464.8 Giac [F(-2)]

Exception generated.

$$\int e^{\arcsin(ax)} (1 - a^2x^2)^{3/2} \, dx = \text{Exception raised: TypeError}$$

input
```
integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(3/2),x, algorithm="giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.464.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)} (1 - a^2x^2)^{3/2} \, dx = \int e^{\operatorname{asin}(a\,x)} \left(1 - a^2\,x^2\right)^{3/2} dx$$

input
```
int(exp(asin(a*x))*(1 - a^2*x^2)^(3/2),x)
```

output
```
int(exp(asin(a*x))*(1 - a^2*x^2)^(3/2), x)
```

# 3.465 $\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx$



## 3.465.1 Optimal result

Integrand size = 21, antiderivative size = 62

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx=\frac{2e^{\arcsin(ax)}}{5a}+\frac{2}{5}e^{\arcsin(ax)}x\sqrt{1-a^2x^2}+\frac{e^{\arcsin(ax)}(1-a^2x^2)}{5a}$$

output
```
2/5*exp(arcsin(a*x))/a+1/5*exp(arcsin(a*x))*(-a^2*x^2+1)/a+2/5*exp(arcsin(
a*x))*x*(-a^2*x^2+1)^(1/2)
```

## 3.465.2 Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 31, normalized size of antiderivative = 0.50

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx=\frac{e^{\arcsin(ax)}(5+\cos(2\arcsin(ax))+2\sin(2\arcsin(ax)))}{10a}$$

input
```
Integrate[E^ArcSin[a*x]*Sqrt[1 - a^2*x^2],x]
```

output
```
(E^ArcSin[a*x]*(5 + Cos[2*ArcSin[a*x]] + 2*Sin[2*ArcSin[a*x]]))/(10*a)
```

### 3.465.3 Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 61, normalized size of antiderivative = 0.98, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {5335, 7292, 7271, 4935, 2624}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \sqrt{1-a^2x^2}e^{\arcsin(ax)}\,dx$$

$$\Big\downarrow \; 5335$$

$$\frac{\int e^{\arcsin(ax)}\left(1-a^2x^2\right)d\arcsin(ax)}{a}$$

$$\Big\downarrow \; 4935$$

$$\frac{\frac{2}{5}\int e^{\arcsin(ax)}d\arcsin(ax)+\frac{2}{5}ax\sqrt{1-a^2x^2}e^{\arcsin(ax)}+\frac{1}{5}\left(1-a^2x^2\right)e^{\arcsin(ax)}}{a}$$

$$\Big\downarrow \; 2624$$

$$\frac{\frac{2}{5}ax\sqrt{1-a^2x^2}e^{\arcsin(ax)}+\frac{1}{5}\left(1-a^2x^2\right)e^{\arcsin(ax)}+\frac{2}{5}e^{\arcsin(ax)}}{a}$$

input
```
Int[E^ArcSin[a*x]*Sqrt[1 - a^2*x^2],x]
```

output
```
((2*E^ArcSin[a*x])/5 + (2*a*E^ArcSin[a*x]*x*Sqrt[1 - a^2*x^2])/5 + (E^ArcS
in[a*x]*(1 - a^2*x^2))/5)/a
```

#### 3.465.3.1 Defintions of rubi rules used

rule 2624
```
Int[((F_)^(v_))^(n_.), x_Symbol] :> Simp[(F^v)^n/(n*Log[F]*D[v, x]), x] /;
FreeQ[{F, n}, x] && LinearQ[v, x]
```

rule 4935
```
Int[Cos[(d_.) + (e_.)*(x_)]^(m_)*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbo
l] :> Simp[b*c*Log[F]*F^(c*(a + b*x))*(Cos[d + e*x]^m/(e^2*m^2 + b^2*c^2*Lo
g[F]^2)), x] + (Simp[e*m*F^(c*(a + b*x))*Sin[d + e*x]*(Cos[d + e*x]^(m - 1)
/(e^2*m^2 + b^2*c^2*Log[F]^2)), x] + Simp[(m*(m - 1)*e^2)/(e^2*m^2 + b^2*c^
2*Log[F]^2)   Int[F^(c*(a + b*x))*Cos[d + e*x]^(m - 2), x], x]) /; FreeQ[{F
, a, b, c, d, e}, x] && NeQ[e^2*m^2 + b^2*c^2*Log[F]^2, 0] && GtQ[m, 1]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7271
```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Simp[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p]))   Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p},
x] &&  !IntegerQ[p] &&  !FreeQ[v, x] &&  !(EqQ[a, 1] && EqQ[m, 1]) &&  !(Eq
Q[v, x] && EqQ[m, 1])
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

## 3.465.4 Maple [F]

$$\int e^{\arcsin(ax)}\sqrt{-a^2x^2+1}dx$$

input
```
int(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x)
```

output
```
int(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x)
```

## 3.465.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 35, normalized size of antiderivative = 0.56

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = -\frac{\left(a^2x^2-2\sqrt{-a^2x^2+1}ax-3\right)e^{(\arcsin(ax))}}{5\,a}$$

input
```
integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

output
```
-1/5*(a^2*x^2 - 2*sqrt(-a^2*x^2 + 1)*a*x - 3)*e^(arcsin(a*x))/a
```

### 3.465.6 Sympy [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 49, normalized size of antiderivative = 0.79

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = \begin{cases} -\frac{ax^2e^{\operatorname{asin}(ax)}}{5} + \frac{2x\sqrt{-a^2x^2+1}e^{\operatorname{asin}(ax)}}{5} + \frac{3e^{\operatorname{asin}(ax)}}{5a} & \text{for } a \neq 0 \\ x & \text{otherwise} \end{cases}$$

input
```
integrate(exp(asin(a*x))*(-a**2*x**2+1)**(1/2),x)
```

output
```
Piecewise((-a*x**2*exp(asin(a*x))/5 + 2*x*sqrt(-a**2*x**2 + 1)*exp(asin(a*
x))/5 + 3*exp(asin(a*x))/(5*a), Ne(a, 0)), (x, True))
```

### 3.465.7 Maxima [F]

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = \int \sqrt{-a^2x^2+1}e^{(\arcsin(ax))}\,dx$$

input
```
integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(-a^2*x^2 + 1)*e^(arcsin(a*x)), x)
```

### 3.465.8 Giac [F(-2)]

Exception generated.

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate(exp(arcsin(a*x))*(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:sym2poly/r2sym(const gen & e,const
index_m & i,const vecteur & l) Error: Bad Argument Value
```

### 3.465.9 Mupad [F(-1)]

Timed out.

$$\int e^{\arcsin(ax)}\sqrt{1-a^2x^2}\,dx = \int e^{\mathrm{asin}(a\,x)}\,\sqrt{1-a^2\,x^2}\,dx$$

input
```
int(exp(asin(a*x))*(1 - a^2*x^2)^(1/2),x)
```

output
```
int(exp(asin(a*x))*(1 - a^2*x^2)^(1/2), x)
```

# 3.466 $\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx$



## 3.466.1 Optimal result

Integrand size = 21, antiderivative size = 10

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{\arcsin(ax)}}{a}$$

output
```
exp(arcsin(a*x))/a
```

## 3.466.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 10, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{\arcsin(ax)}}{a}$$

input
```
Integrate[E^ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]
```

output
```
E^ArcSin[a*x]/a
```

## 3.466.3 Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {5335, 7292, 7271, 2624}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int e^{\arcsin(ax)}d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{2624}$$

$$\frac{e^{\arcsin(ax)}}{a}$$

input
```
Int[E^ArcSin[a*x]/Sqrt[1 - a^2*x^2],x]
```

output
```
E^ArcSin[a*x]/a
```

### 3.466.3.1 Defintions of rubi rules used

rule 2624
```
Int[((F_)^(v_))^(n_.), x_Symbol] :> Simp[(F^v)^n/(n*Log[F]*D[v, x]), x] /;
FreeQ[{F, n}, x] && LinearQ[v, x]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7271
```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Simp[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p]))   Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p},
x] &&  !IntegerQ[p] &&  !FreeQ[v, x] &&  !(EqQ[a, 1] && EqQ[m, 1]) &&  !(Eq
Q[v, x] && EqQ[m, 1])
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

### 3.466.4 Maple [A] (verified)

Time = 0.35 (sec) , antiderivative size = 10, normalized size of antiderivative = 1.00

| method | result | size |
|---|---|---|
| derivativedivides | $\frac{\mathrm{e}^{\arcsin(ax)}}{a}$ | 10 |
| default | $\frac{\mathrm{e}^{\arcsin(ax)}}{a}$ | 10 |

input
```
int(exp(arcsin(a*x))/(-a^2*x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
exp(arcsin(a*x))/a
```

### 3.466.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 9, normalized size of antiderivative = 0.90

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{(\arcsin(ax))}}{a}$$

input
```
integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(1/2),x, algorithm="fricas")
```

output
```
e^(arcsin(a*x))/a
```

### 3.466.6 Sympy [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 8, normalized size of antiderivative = 0.80

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \begin{cases} \frac{e^{\operatorname{asin}(ax)}}{a} & \text{for } a \neq 0 \\ x & \text{otherwise} \end{cases}$$

input
```
integrate(exp(asin(a*x))/(-a**2*x**2+1)**(1/2),x)
```

output
```
Piecewise((exp(asin(a*x))/a, Ne(a, 0)), (x, True))
```

### 3.466.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 9, normalized size of antiderivative = 0.90

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{(\arcsin(ax))}}{a}$$

input
```
integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(1/2),x, algorithm="maxima")
```

output
```
e^(arcsin(a*x))/a
```

### 3.466.8 Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 9, normalized size of antiderivative = 0.90

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{(\arcsin(ax))}}{a}$$

input
```
integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(1/2),x, algorithm="giac")
```

output
```
e^(arcsin(a*x))/a
```

### 3.466.9 Mupad [B] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 9, normalized size of antiderivative = 0.90

$$\int \frac{e^{\arcsin(ax)}}{\sqrt{1-a^2x^2}}\,dx = \frac{e^{\mathrm{asin}(a\,x)}}{a}$$

input
```
int(exp(asin(a*x))/(1 - a^2*x^2)^(1/2),x)
```

output
```
exp(asin(a*x))/a
```

# 3.467 $\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx$



## 3.467.1 Optimal result

Integrand size = 21, antiderivative size = 45

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \frac{\left(\frac{4}{5}-\frac{8i}{5}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

output
```
(4/5-8/5*I)*exp((1+2*I)*arcsin(a*x))*hypergeom([2, 1-1/2*I],[2-1/2*I],-(I*
a*x+(-a^2*x^2+1)^(1/2))^2)/a
```

## 3.467.2 Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \frac{\left(\frac{4}{5}-\frac{8i}{5}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

input
```
Integrate[E^ArcSin[a*x]/(1 - a^2*x^2)^(3/2),x]
```

output
```
((4/5 - (8*I)/5)*E^((1 + 2*I)*ArcSin[a*x])*Hypergeometric2F1[1 - I/2, 2, 2
 - I/2, -E^((2*I)*ArcSin[a*x])])/a
```

### 3.467.3 Rubi [A] (verified)

Time = 0.52 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {5335, 7292, 7271, 4951}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int \frac{e^{\arcsin(ax)}}{1-a^2x^2}d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{4951}$$

$$\frac{\left(\frac{4}{5}-\frac{8i}{5}\right)e^{(1+2i)\arcsin(ax)}\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

input
```
Int[E^ArcSin[a*x]/(1 - a^2*x^2)^(3/2),x]
```

output
```
((4/5 - (8*I)/5)*E^((1 + 2*I)*ArcSin[a*x])*Hypergeometric2F1[1 - I/2, 2, 2
 - I/2, -E^((2*I)*ArcSin[a*x])])/a
```

#### 3.467.3.1 Defintions of rubi rules used

rule 4951
```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sec[(d_.) + (e_.)*(x_)]^(n_.), x_Symb
ol] :> Simp[2^n*E^(I*n*(d + e*x))*(F^(c*(a + b*x))/(I*e*n + b*c*Log[F]))*Hy
pergeometric2F1[n, n/2 - I*b*c*(Log[F]/(2*e)), 1 + n/2 - I*b*c*(Log[F]/(2*e
)), -E^(2*I*(d + e*x))], x] /; FreeQ[{F, a, b, c, d, e}, x] && IntegerQ[n]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7271
```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Simp[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p]))   Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p},
x] && !IntegerQ[p] && !FreeQ[v, x] && !(EqQ[a, 1] && EqQ[m, 1]) && !(Eq
Q[v, x] && EqQ[m, 1])
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

## 3.467.4 Maple [F]

$$\int \frac{\mathrm{e}^{\arcsin(ax)}}{\left(-a^2x^2+1\right)^{\frac{3}{2}}}dx$$

input
```
int(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x)
```

output
```
int(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x)
```

## 3.467.5 Fricas [F]

$$\int \frac{e^{\arcsin(ax)}}{\left(1-a^2x^2\right)^{3/2}}\,dx = \int \frac{e^{\left(\arcsin(ax)\right)}}{\left(-a^2x^2+1\right)^{\frac{3}{2}}}\,dx$$

input
```
integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x, algorithm="fricas")
```

output
```
integral(sqrt(-a^2*x^2 + 1)*e^(arcsin(a*x))/(a^4*x^4 - 2*a^2*x^2 + 1), x)
```

## 3.467.6 Sympy [F]

$$\int \frac{e^{\arcsin(ax)}}{\left(1-a^2x^2\right)^{3/2}}\,dx = \int \frac{e^{\operatorname{asin}(ax)}}{\left(-\left(ax-1\right)\left(ax+1\right)\right)^{\frac{3}{2}}}\,dx$$

input
```
integrate(exp(asin(a*x))/(-a**2*x**2+1)**(3/2),x)
```

output
```
Integral(exp(asin(a*x))/(-(a*x - 1)*(a*x + 1))**(3/2), x)
```

### 3.467.7 Maxima [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \int \frac{e^{(\arcsin(ax))}}{(-a^2x^2+1)^{\frac{3}{2}}}\,dx$$

input
```
integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(a*x))/(-a^2*x^2 + 1)^(3/2), x)
```

### 3.467.8 Giac [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \int \frac{e^{(\arcsin(ax))}}{(-a^2x^2+1)^{\frac{3}{2}}}\,dx$$

input
```
integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(3/2),x, algorithm="giac")
```

output
```
integrate(e^(arcsin(a*x))/(-a^2*x^2 + 1)^(3/2), x)
```

### 3.467.9 Mupad [F(-1)]

Timed out.

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{3/2}}\,dx = \int \frac{e^{\mathrm{asin}(a\,x)}}{(1-a^2\,x^2)^{3/2}}\,dx$$

input
```
int(exp(asin(a*x))/(1 - a^2*x^2)^(3/2),x)
```

output
```
int(exp(asin(a*x))/(1 - a^2*x^2)^(3/2), x)
```

# 3.468 $\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx$



## 3.468.1 Optimal result

Integrand size = 21, antiderivative size = 96

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \frac{e^{\arcsin(ax)}x}{3(1-a^2x^2)^{3/2}} - \frac{e^{\arcsin(ax)}}{6a(1-a^2x^2)} + \frac{\left(\frac{2}{3}-\frac{4i}{3}\right)e^{(1+2i)\arcsin(ax)}\,\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

output
```
1/3*exp(arcsin(a*x))*x/(-a^2*x^2+1)^(3/2)-1/6*exp(arcsin(a*x))/a/(-a^2*x^2
+1)+(2/3-4/3*I)*exp((1+2*I)*arcsin(a*x))*hypergeom([2, 1-1/2*I],[2-1/2*I],
-(I*a*x+(-a^2*x^2+1)^(1/2))^2)/a
```

## 3.468.2 Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.88

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \frac{e^{\arcsin(ax)}\left(-1+\frac{2ax}{\sqrt{1-a^2x^2}}+(1-2i)\left(1+e^{2i\arcsin(ax)}\right)^2\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2\right.\right.}{6(a-a^3x^2)}$$

input
```
Integrate[E^ArcSin[a*x]/(1 - a^2*x^2)^(5/2),x]
```

output
```
(E^ArcSin[a*x]*(-1 + (2*a*x)/Sqrt[1 - a^2*x^2] + (1 - 2*I)*(1 + E^((2*I)*A
rcSin[a*x]))^2*Hypergeometric2F1[1 - I/2, 2, 2 - I/2, -E^((2*I)*ArcSin[a*x
])]))/(6*(a - a^3*x^2))
```

### 3.468.3 Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.99, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {5335, 7292, 7271, 4948, 4951}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx$$

$$\Big\downarrow \text{5335}$$

$$\frac{\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^2}d\arcsin(ax)}{a}$$

$$\Big\downarrow \text{4948}$$

$$\frac{\frac{5}{6}\int \frac{e^{\arcsin(ax)}}{1-a^2x^2}d\arcsin(ax)+\frac{axe^{\arcsin(ax)}}{3(1-a^2x^2)^{3/2}}-\frac{e^{\arcsin(ax)}}{6(1-a^2x^2)}}{a}$$

$$\Big\downarrow \text{4951}$$

$$\frac{\frac{axe^{\arcsin(ax)}}{3(1-a^2x^2)^{3/2}}-\frac{e^{\arcsin(ax)}}{6(1-a^2x^2)}+\left(\frac{2}{3}-\frac{4i}{3}\right)e^{(1+2i)\arcsin(ax)}\text{Hypergeometric2F1}\left(1-\frac{i}{2},2,2-\frac{i}{2},-e^{2i\arcsin(ax)}\right)}{a}$$

input
```
Int[E^ArcSin[a*x]/(1 - a^2*x^2)^(5/2),x]
```

output
```
((a*E^ArcSin[a*x]*x)/(3*(1 - a^2*x^2)^(3/2)) - E^ArcSin[a*x]/(6*(1 - a^2*x
^2)) + (2/3 - (4*I)/3)*E^((1 + 2*I)*ArcSin[a*x])*Hypergeometric2F1[1 - I/2
, 2, 2 - I/2, -E^((2*I)*ArcSin[a*x])])/a
```

#### 3.468.3.1 Defintions of rubi rules used

rule 4948
```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sec[(d_.) + (e_.)*(x_)]^(n_), x_Symbo
l] :> Simp[(-b)*c*Log[F]*F^(c*(a + b*x))*(Sec[d + e*x]^(n - 2)/(e^2*(n - 1)
*(n - 2))), x] + (Simp[F^(c*(a + b*x))*Sec[d + e*x]^(n - 1)*(Sin[d + e*x]/(
e*(n - 1))), x] + Simp[(e^2*(n - 2)^2 + b^2*c^2*Log[F]^2)/(e^2*(n - 1)*(n -
 2))   Int[F^(c*(a + b*x))*Sec[d + e*x]^(n - 2), x], x]) /; FreeQ[{F, a, b,
 c, d, e}, x] && NeQ[b^2*c^2*Log[F]^2 + e^2*(n - 2)^2, 0] && GtQ[n, 1] && N
eQ[n, 2]
```

rule 4951
```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sec[(d_.) + (e_.)*(x_)]^(n_.), x_Symb
ol] :> Simp[2^n*E^(I*n*(d + e*x))*(F^(c*(a + b*x))/(I*e*n + b*c*Log[F]))*Hy
pergeometric2F1[n, n/2 - I*b*c*(Log[F]/(2*e)), 1 + n/2 - I*b*c*(Log[F]/(2*e
)), -E^(2*I*(d + e*x))], x] /; FreeQ[{F, a, b, c, d, e}, x] && IntegerQ[n]
```

rule 5335
```
Int[(u_.)*(f_)^(ArcSin[(a_.) + (b_.)*(x_)]^(n_.)*(c_.)), x_Symbol] :> Simp[
1/b   Subst[Int[(u /. x -> -a/b + Sin[x]/b)*f^(c*x^n)*Cos[x], x], x, ArcSin
[a + b*x]], x] /; FreeQ[{a, b, c, f}, x] && IGtQ[n, 0]
```

rule 7271
```
Int[(u_.)*((a_.)*(v_)^(m_.))^(p_), x_Symbol] :> Simp[a^IntPart[p]*((a*v^m)^
FracPart[p]/v^(m*FracPart[p]))   Int[u*v^(m*p), x], x] /; FreeQ[{a, m, p},
x] &&  !IntegerQ[p] &&  !FreeQ[v, x] &&  !(EqQ[a, 1] && EqQ[m, 1]) &&  !(Eq
Q[v, x] && EqQ[m, 1])
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

## 3.468.4 Maple [F]

$$\int \frac{\mathrm{e}^{\arcsin(ax)}}{(-a^2x^2+1)^{\frac{5}{2}}}dx$$

input
```
int(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x)
```

output
```
int(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x)
```

## 3.468.5 Fricas [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{e^{(\arcsin(ax))}}{(-a^2x^2+1)^{\frac{5}{2}}}\,dx$$

input
```
integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x, algorithm="fricas")
```

output
```
integral(-sqrt(-a^2*x^2 + 1)*e^(arcsin(a*x))/(a^6*x^6 - 3*a^4*x^4 + 3*a^2*
x^2 - 1), x)
```

### 3.468.6 Sympy [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{e^{\operatorname{asin}(ax)}}{(-(ax-1)(ax+1))^{\frac{5}{2}}}\,dx$$

input
```
integrate(exp(asin(a*x))/(-a**2*x**2+1)**(5/2),x)
```

output
```
Integral(exp(asin(a*x))/(-(a*x - 1)*(a*x + 1))**(5/2), x)
```

### 3.468.7 Maxima [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{e^{(\arcsin(ax))}}{(-a^2x^2+1)^{\frac{5}{2}}}\,dx$$

input
```
integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x, algorithm="maxima")
```

output
```
integrate(e^(arcsin(a*x))/(-a^2*x^2 + 1)^(5/2), x)
```

### 3.468.8 Giac [F]

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{e^{(\arcsin(ax))}}{(-a^2x^2+1)^{\frac{5}{2}}}\,dx$$

input
```
integrate(exp(arcsin(a*x))/(-a^2*x^2+1)^(5/2),x, algorithm="giac")
```

output
```
integrate(e^(arcsin(a*x))/(-a^2*x^2 + 1)^(5/2), x)
```

### 3.468.9 Mupad [F(-1)]

Timed out.

$$\int \frac{e^{\arcsin(ax)}}{(1-a^2x^2)^{5/2}}\,dx = \int \frac{\mathrm{e}^{\mathrm{asin}(a\,x)}}{(1-a^2\,x^2)^{5/2}}\,dx$$

input
```
int(exp(asin(a*x))/(1 - a^2*x^2)^(5/2),x)
```

output
```
int(exp(asin(a*x))/(1 - a^2*x^2)^(5/2), x)
```

# 3.469 $\int \arcsin\left(\frac{c}{a+bx}\right) \, dx$



## 3.469.1 Optimal result

Integrand size = 10, antiderivative size = 47

$$\int \arcsin\left(\frac{c}{a+bx}\right) dx = \frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b} + \frac{c\operatorname{arctanh}\left(\sqrt{1-\frac{c^2}{(a+bx)^2}}\right)}{b}$$

output
```
(b*x+a)*arccsc(a/c+b*x/c)/b+c*arctanh((1-c^2/(b*x+a)^2)^(1/2))/b
```

## 3.469.2 Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 529 vs. $2(47) = 94$.

Time = 2.78 (sec) , antiderivative size = 529, normalized size of antiderivative = 11.26

$$\int \arcsin\left(\frac{c}{a+bx}\right) dx = x\arcsin\left(\frac{c}{a+bx}\right) - \frac{(a+bx)\sqrt{\frac{a^2-c^2+2abx+b^2x^2}{(a+bx)^2}}\left(\left(-c+\sqrt{-a^2+c^2}\right)\sqrt{-a^2+2c\left(c+\sqrt{-a^2+c^2}\right)}\arctan\left(\frac{b\sqrt{-a^2+2c\left(c+\sqrt{-\cdots}\right.}}{a\left(\sqrt{a^2-c^2}-\sqrt{a^2-c^2+\cdots}\right.}\right.\right.}{\cdots}$$

input
```
Integrate[ArcSin[c/(a + b*x)],x]
```

output
```
x*ArcSin[c/(a + b*x)] - ((a + b*x)*Sqrt[(a^2 - c^2 + 2*a*b*x + b^2*x^2)/(a
 + b*x)^2]*((-c + Sqrt[-a^2 + c^2])*Sqrt[-a^2 + 2*c*(c + Sqrt[-a^2 + c^2])
]*ArcTan[(b*Sqrt[-a^2 + 2*c*(c + Sqrt[-a^2 + c^2])]*x)/(a*(Sqrt[a^2 - c^2]
 - Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2]))] + (c + Sqrt[-a^2 + c^2])*Sqrt[a^
2 + 2*c*(-c + Sqrt[-a^2 + c^2])]*ArcTanh[(b*Sqrt[a^2 - 2*c^2 + 2*c*Sqrt[-a
^2 + c^2]]*x)/(a*Sqrt[a^2 - c^2] - a*Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2])]
 + a*(a*ArcTan[(b^2*c*Sqrt[a^2 - c^2]*x^2)/(a^4 + a^3*b*x + b^2*c^2*x^2 -
a^2*(c^2 + Sqrt[a^2 - c^2]*Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2]))] + c*(-Lo
g[Sqrt[a^2 - c^2] - b*x - Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2]] + Log[b^2*(
Sqrt[a^2 - c^2] + b*x - Sqrt[a^2 - c^2 + 2*a*b*x + b^2*x^2])]))))/(a*b*Sqr
t[a^2 - c^2 + 2*a*b*x + b^2*x^2])
```

### 3.469.3 Rubi [A] (warning: unable to verify)

Time = 0.25 (sec) , antiderivative size = 48, normalized size of antiderivative = 1.02, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.600$, Rules used = {5331, 5774, 895, 798, 73, 219}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \arcsin\left(\frac{c}{a+bx}\right)dx$$

$$\Big\downarrow \text{ 5331}$$

$$\int \csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)dx$$

$$\Big\downarrow \text{ 5774}$$

$$\int \frac{1}{\left(\frac{a}{c}+\frac{bx}{c}\right)\sqrt{1-\frac{1}{\left(\frac{a}{c}+\frac{bx}{c}\right)^2}}}dx+\frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}$$

$$\Big\downarrow \text{ 895}$$

$$\frac{c\int \frac{1}{\left(\frac{a}{c}+\frac{bx}{c}\right)\sqrt{1-\frac{1}{\left(\frac{a}{c}+\frac{bx}{c}\right)^2}}}d\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}+\frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}$$

$$\Big\downarrow \text{ 798}$$

$$\frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}-\frac{c\int \frac{\left(\frac{a}{c}+\frac{bx}{c}\right)^2}{\sqrt{-\frac{a}{c}-\frac{bx}{c}+1}}d\frac{1}{\left(\frac{a}{c}+\frac{bx}{c}\right)^2}}{2b}$$

$$\downarrow 73$$

$$\frac{c\int \frac{1}{1-\frac{1}{\left(\frac{a}{c}+\frac{bx}{c}\right)^4}}d\sqrt{-\frac{a}{c}-\frac{bx}{c}+1}}{b}+\frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}$$

$$\downarrow 219$$

$$\frac{c\text{arctanh}\left(\sqrt{-\frac{a}{c}-\frac{bx}{c}+1}\right)}{b}+\frac{(a+bx)\csc^{-1}\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}$$

input
```
Int[ArcSin[c/(a + b*x)],x]
```

output
```
((a + b*x)*ArcCsc[a/c + (b*x)/c])/b + (c*ArcTanh[Sqrt[1 - a/c - (b*x)/c]])
/b
```

### 3.469.3.1 Defintions of rubi rules used

rule 73
```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Simp[p/b   Subst[Int[x^(p*(m + 1) - 1)*(c - a*(d/b) +
 d*(x^p/b))^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && Lt
Q[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Denominator[m]] && IntL
inearQ[a, b, c, d, m, n, x]
```

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 798
```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[1/n   Subst
[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a,
b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

rule 895
```
Int[(u_)^(m_.)*((a_) + (b_.)*(v_)^(n_))^(p_.), x_Symbol] :> Simp[u^m/(Coeff
icient[v, x, 1]*v^m)   Subst[Int[x^m*(a + b*x^n)^p, x], x, v], x] /; FreeQ[
{a, b, m, n, p}, x] && LinearPairQ[u, v, x]
```

3.469. $\int \arcsin\left(\frac{c}{a+bx}\right)\,dx$

rule 5331
```
Int[ArcSin[(c_.)/((a_.) + (b_.)*(x_)^(n_.))]^(m_.)*(u_.), x_Symbol] :> Int[
u*ArcCsc[a/c + b*(x^n/c)]^m, x] /; FreeQ[{a, b, c, n, m}, x]
```

rule 5774
```
Int[ArcCsc[(c_) + (d_.)*(x_)], x_Symbol] :> Simp[(c + d*x)*(ArcCsc[c + d*x]
/d), x] + Int[1/((c + d*x)*Sqrt[1 - 1/(c + d*x)^2]), x] /; FreeQ[{c, d}, x]
```

## 3.469.4 Maple [A] (verified)

Time = 0.59 (sec) , antiderivative size = 47, normalized size of antiderivative = 1.00

| method | result |
|---|---|
| derivativedivides | $-\frac{c\left(-\frac{(bx+a)\arcsin\left(\frac{c}{bx+a}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{(bx+a)^2}}}\right)\right)}{b}$ |
| default | $-\frac{c\left(-\frac{(bx+a)\arcsin\left(\frac{c}{bx+a}\right)}{c}-\operatorname{arctanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{(bx+a)^2}}}\right)\right)}{b}$ |
| parts | $x\arcsin\left(\frac{c}{bx+a}\right)+\frac{c\sqrt{b^2x^2+2abx+a^2-c^2}\left(a\ln\left(\frac{2\left(\sqrt{-c^2}\sqrt{b^2x^2+2abx+a^2-c^2}-c^2\right)b}{bx+a}\right)\sqrt{b^2}+\ln\left(\frac{b^2x+\sqrt{b^2x^2+2abx+}}{\sqrt{b^2}}\right.\right.}{b\sqrt{\frac{b^2x^2+2abx+a^2-c^2}{(bx+a)^2}}\,(bx+a)\sqrt{b^2}\,\sqrt{-c^2}}$ |

input
```
int(arcsin(c/(b*x+a)),x,method=_RETURNVERBOSE)
```

output
```
-1/b*c*(-1/c*(b*x+a)*arcsin(c/(b*x+a))-arctanh(1/(1-c^2/(b*x+a)^2)^(1/2)))
```

## 3.469.5 Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 141 vs. 2(45) = 90.

Time = 0.26 (sec) , antiderivative size = 141, normalized size of antiderivative = 3.00

$$\int \arcsin\left(\frac{c}{a+bx}\right)\,dx$$
$$=\frac{bx\arcsin\left(\frac{c}{bx+a}\right)-2\,a\arctan\left(-\frac{bx-(bx+a)\sqrt{\frac{b^2x^2+2\,abx+a^2-c^2}{b^2x^2+2\,abx+a^2}}+a}{c}\right)-c\log\left(-bx+(bx+a)\sqrt{\frac{b^2x^2+2\,abx+a^2-c^2}{b^2x^2+2\,abx+a^2}}\right.-}{b}$$

input
```
integrate(arcsin(c/(b*x+a)),x, algorithm="fricas")
```

output
```
(b*x*arcsin(c/(b*x + a)) - 2*a*arctan(-(b*x - (b*x + a)*sqrt((b^2*x^2 + 2*
a*b*x + a^2 - c^2)/(b^2*x^2 + 2*a*b*x + a^2)) + a)/c) - c*log(-b*x + (b*x
+ a)*sqrt((b^2*x^2 + 2*a*b*x + a^2 - c^2)/(b^2*x^2 + 2*a*b*x + a^2)) - a))
/b
```

### 3.469.6 Sympy [F]

$$\int \arcsin\left(\frac{c}{a+bx}\right) dx = \int \operatorname{asin}\left(\frac{c}{a+bx}\right) dx$$

input
```
integrate(asin(c/(b*x+a)),x)
```

output
```
Integral(asin(c/(a + b*x)), x)
```

### 3.469.7 Maxima [F]

$$\int \arcsin\left(\frac{c}{a+bx}\right) dx = \int \arcsin\left(\frac{c}{bx+a}\right) dx$$

input
```
integrate(arcsin(c/(b*x+a)),x, algorithm="maxima")
```

output
```
x*arctan2(c, sqrt(b*x + a + c)*sqrt(b*x + a - c)) + integrate((b^2*c*x^2 +
 a*b*c*x)*e^(1/2*log(b*x + a + c) + 1/2*log(b*x + a - c))/(b^2*c^2*x^2 + 2
*a*b*c^2*x + a^2*c^2 - c^4 + (b^2*x^2 + 2*a*b*x + a^2 - c^2)*e^(log(b*x +
a + c) + log(b*x + a - c))), x)
```

### 3.469.8 Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 95 vs. $2(45) = 90$.

Time = 0.32 (sec) , antiderivative size = 95, normalized size of antiderivative = 2.02

$$\int \arcsin\left(\frac{c}{a+bx}\right)\,dx = \frac{b\left(\frac{c^2\left(\log\left(\sqrt{-\frac{c^2}{(bx+a)^2}+1}+1\right)-\log\left(-\sqrt{-\frac{c^2}{(bx+a)^2}+1}+1\right)\right)}{b^2}+\frac{2\,(bx+a)c\arcsin\left(-\frac{c}{(bx+a)\left(\frac{a}{bx+a}-1\right)-a}\right)}{b^2}\right)}{2\,c}$$

input
```
integrate(arcsin(c/(b*x+a)),x, algorithm="giac")
```

output
```
1/2*b*(c^2*(log(sqrt(-c^2/(b*x + a)^2 + 1) + 1) - log(-sqrt(-c^2/(b*x + a)
^2 + 1) + 1))/b^2 + 2*(b*x + a)*c*arcsin(-c/((b*x + a)*(a/(b*x + a) - 1) -
 a))/b^2)/c
```

### 3.469.9 Mupad [B] (verification not implemented)

Time = 0.74 (sec) , antiderivative size = 42, normalized size of antiderivative = 0.89

$$\int \arcsin\left(\frac{c}{a+bx}\right)\,dx = \frac{c\,\mathrm{atanh}\left(\frac{1}{\sqrt{1-\frac{c^2}{(a+b\,x)^2}}}\right)}{b}+\frac{\mathrm{asin}\left(\frac{c}{a+b\,x}\right)\,(a+b\,x)}{b}$$

input
```
int(asin(c/(a + b*x)),x)
```

output
```
(c*atanh(1/(1 - c^2/(a + b*x)^2)^(1/2)))/b + (asin(c/(a + b*x))*(a + b*x))
/b
```

# 3.470 $\int \frac{x}{\arcsin(\sin(x))}\,dx$



## 3.470.1 Optimal result

Integrand size = 7, antiderivative size = 27

$$\int \frac{x}{\arcsin(\sin(x))}\,dx = \arcsin(\sin(x)) + \log(\arcsin(\sin(x)))\left(-\arcsin(\sin(x)) + x\sqrt{\cos^2(x)}\sec(x)\right)$$

output
```
arcsin(sin(x))+ln(arcsin(sin(x)))*(-arcsin(sin(x))+x*sec(x)*(cos(x)^2)^(1/
2))
```

## 3.470.2 Mathematica [A] (verified)

Time = 0.48 (sec) , antiderivative size = 28, normalized size of antiderivative = 1.04

$$\int \frac{x}{\arcsin(\sin(x))}\,dx = -\arcsin(\sin(x))(-1+\log(\arcsin(\sin(x)))) + x\sqrt{\cos^2(x)}\log(\arcsin(\sin(x)))\sec(x)$$

input
```
Integrate[x/ArcSin[Sin[x]],x]
```

output
```
-(ArcSin[Sin[x]]*(-1 + Log[ArcSin[Sin[x]]])) + x*Sqrt[Cos[x]^2]*Log[ArcSin
[Sin[x]]]*Sec[x]
```

### 3.470.3 Rubi [F]

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x}{\arcsin(\sin(x))} \, dx$$
$$\Big\downarrow \; 7299$$
$$\int \frac{x}{\arcsin(\sin(x))}dx$$

input
```
Int[x/ArcSin[Sin[x]],x]
```

output
```
$Aborted
```

#### 3.470.3.1 Defintions of rubi rules used

rule 7299
```
Int[u_, x_] :> CannotIntegrate[u, x]
```

### 3.470.4 Maple [F]

$$\int \frac{x}{\arcsin\left(\sin\left(x\right)\right)}dx$$

input
```
int(x/arcsin(sin(x)),x)
```

output
```
int(x/arcsin(sin(x)),x)
```

### 3.470.5 Fricas [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 3, normalized size of antiderivative = 0.11

$$\int \frac{x}{\arcsin(\sin(x))} \, dx = -x$$

input
```
integrate(x/arcsin(sin(x)),x, algorithm="fricas")
```

output
```
-x
```

### 3.470.6 Sympy [F]

$$\int \frac{x}{\arcsin(\sin(x))}\,dx = \int \frac{x}{\operatorname{asin}(\sin(x))}\,dx$$

input
```
integrate(x/asin(sin(x)),x)
```

output
```
Integral(x/asin(sin(x)), x)
```

### 3.470.7 Maxima [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 1, normalized size of antiderivative = 0.04

$$\int \frac{x}{\arcsin(\sin(x))}\,dx = x$$

input
```
integrate(x/arcsin(sin(x)),x, algorithm="maxima")
```

output
```
x
```

### 3.470.8 Giac [F]

$$\int \frac{x}{\arcsin(\sin(x))}\,dx = \int \frac{x}{\arcsin(\sin(x))}\,dx$$

input
```
integrate(x/arcsin(sin(x)),x, algorithm="giac")
```

output
```
sage0*x
```

### 3.470.9 Mupad [F(-1)]

Timed out.

$$\int \frac{x}{\arcsin(\sin(x))}\,dx = \int \frac{x}{\mathrm{asin}\left(\sin\left(x\right)\right)}\,dx$$

input
```
int(x/asin(sin(x)),x)
```

output
```
int(x/asin(sin(x)), x)
```

# 3.471 $\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx$



## 3.471.1 Optimal result

Integrand size = 26, antiderivative size = 38

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \frac{\sqrt{-bx^2}\arcsin\left(\sqrt{1+bx^2}\right)^{1+n}}{b(1+n)x}$$

output
```
arcsin((b*x^2+1)^(1/2))^(1+n)*(-b*x^2)^(1/2)/b/(1+n)/x
```

## 3.471.2 Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \frac{\sqrt{-bx^2}\arcsin\left(\sqrt{1+bx^2}\right)^{1+n}}{b(1+n)x}$$

input
```
Integrate[ArcSin[Sqrt[1 + b*x^2]]^n/Sqrt[1 + b*x^2],x]
```

output
```
(Sqrt[-(b*x^2)]*ArcSin[Sqrt[1 + b*x^2]]^(1 + n))/(b*(1 + n)*x)
```

### 3.471.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {5333, 5152}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{\arcsin\left(\sqrt{bx^2+1}\right)^n}{\sqrt{bx^2+1}}dx$$

$$\Big\downarrow \text{5333}$$

$$\frac{\sqrt{-bx^2}\int \frac{\arcsin\left(\sqrt{bx^2+1}\right)^n}{\sqrt{-bx^2}}d\sqrt{bx^2+1}}{bx}$$

$$\Big\downarrow \text{5152}$$

$$\frac{\sqrt{-bx^2}\arcsin\left(\sqrt{bx^2+1}\right)^{n+1}}{b(n+1)x}$$

input
```
Int[ArcSin[Sqrt[1 + b*x^2]]^n/Sqrt[1 + b*x^2],x]
```

output
```
(Sqrt[-(b*x^2)]*ArcSin[Sqrt[1 + b*x^2]]^(1 + n))/(b*(1 + n)*x)
```

#### 3.471.3.1 Defintions of rubi rules used

rule 5152
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Simp[(1/(b*c*(n + 1)))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*(a
 + b*ArcSin[c*x])^(n + 1), x] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[c^2*d
+ e, 0] && NeQ[n, -1]
```

rule 5333
```
Int[ArcSin[Sqrt[1 + (b_.)*(x_)^2]]^(n_.)/Sqrt[1 + (b_.)*(x_)^2], x_Symbol]
:> Simp[Sqrt[(-b)*x^2]/(b*x)   Subst[Int[ArcSin[x]^n/Sqrt[1 - x^2], x], x,
Sqrt[1 + b*x^2]], x] /; FreeQ[{b, n}, x]
```

### 3.471.4 Maple [F]

$$\int \frac{\arcsin\left(\sqrt{b\,x^{2}+1}\right)^{n}}{\sqrt{b\,x^{2}+1}}dx$$

input
```
int(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x)
```

output
```
int(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x)
```

### 3.471.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 41, normalized size of antiderivative = 1.08

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \frac{\sqrt{-bx^2}\arcsin\left(\sqrt{bx^2+1}\right)^n\arcsin\left(\sqrt{bx^2+1}\right)}{(bn+b)x}$$

input
```
integrate(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x, algorithm="fricas")
```

output
```
sqrt(-b*x^2)*arcsin(sqrt(b*x^2 + 1))^n*arcsin(sqrt(b*x^2 + 1))/((b*n + b)*
x)
```

### 3.471.6 Sympy [F]

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \begin{cases} \frac{2x}{\pi} & \text{for}\: b=0 \wedge n=-1 \\ x\left(\frac{\pi}{2}\right)^n & \text{for}\: b=0 \\ \int \frac{1}{\sqrt{bx^2+1}\operatorname{asin}\left(\sqrt{bx^2+1}\right)}\,dx & \text{for}\: n=-1 \\ \frac{\sqrt{-bx^2}\operatorname{asin}\left(\sqrt{bx^2+1}\right)\operatorname{asin}^n\left(\sqrt{bx^2+1}\right)}{bnx+bx} & \text{otherwise} \end{cases}$$

input
```
integrate(asin((b*x**2+1)**(1/2))**n/(b*x**2+1)**(1/2),x)
```

output
```
Piecewise((2*x/pi, Eq(b, 0) & Eq(n, -1)), (x*(pi/2)**n, Eq(b, 0)), (Integr
al(1/(sqrt(b*x**2 + 1)*asin(sqrt(b*x**2 + 1))), x), Eq(n, -1)), (sqrt(-b*x
**2)*asin(sqrt(b*x**2 + 1))*asin(sqrt(b*x**2 + 1))**n/(b*n*x + b*x), True)
)
```

### 3.471.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt(-_SAGE_VAR_b)
```

### 3.471.8 Giac [F]

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \int \frac{\arcsin\left(\sqrt{bx^2+1}\right)^n}{\sqrt{bx^2+1}}\,dx$$

input
```
integrate(arcsin((b*x^2+1)^(1/2))^n/(b*x^2+1)^(1/2),x, algorithm="giac")
```

output
```
sage0*x
```

### 3.471.9 Mupad [F(-1)]

Timed out.

$$\int \frac{\arcsin\left(\sqrt{1+bx^2}\right)^n}{\sqrt{1+bx^2}}\,dx = \int \frac{\mathrm{asin}\left(\sqrt{b\,x^2+1}\right)^n}{\sqrt{b\,x^2+1}}\,dx$$

input
```
int(asin((b*x^2 + 1)^(1/2))^n/(b*x^2 + 1)^(1/2),x)
```

output
```
int(asin((b*x^2 + 1)^(1/2))^n/(b*x^2 + 1)^(1/2), x)
```

# 3.472 $\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx$



## 3.472.1 Optimal result

Integrand size = 26, antiderivative size = 30

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx=\frac{\sqrt{-bx^2}\log\left(\arcsin\left(\sqrt{1+bx^2}\right)\right)}{bx}$$

output
```
ln(arcsin((b*x^2+1)^(1/2)))*(-b*x^2)^(1/2)/b/x
```

## 3.472.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx=-\frac{x\log\left(\arcsin\left(\sqrt{1+bx^2}\right)\right)}{\sqrt{-bx^2}}$$

input
```
Integrate[1/(Sqrt[1 + b*x^2]*ArcSin[Sqrt[1 + b*x^2]]),x]
```

output
```
-((x*Log[ArcSin[Sqrt[1 + b*x^2]]])/Sqrt[-(b*x^2)])
```

## 3.472.3 Rubi [A] (verified)

Time = 0.27 (sec) , antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {5333, 5150}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{1}{\sqrt{bx^2+1}\arcsin\left(\sqrt{bx^2+1}\right)}dx$$

$$\Big\downarrow \text{5333}$$

$$\frac{\sqrt{-bx^2}\int \frac{1}{\sqrt{-bx^2}\arcsin\left(\sqrt{bx^2+1}\right)}d\sqrt{bx^2+1}}{bx}$$

$$\Big\downarrow \text{5150}$$

$$\frac{\sqrt{-bx^2}\log\left(\arcsin\left(\sqrt{bx^2+1}\right)\right)}{bx}$$

input
```
Int[1/(Sqrt[1 + b*x^2]*ArcSin[Sqrt[1 + b*x^2]]),x]
```

output
```
(Sqrt[-(b*x^2)]*Log[ArcSin[Sqrt[1 + b*x^2]]])/(b*x)
```

### 3.472.3.1 Defintions of rubi rules used

rule 5150
```
Int[1/(((a_.) + ArcSin[(c_.)*(x_)]*(b_.))*Sqrt[(d_) + (e_.)*(x_)^2]), x_Sym
bol] :> Simp[(1/(b*c))*Simp[Sqrt[1 - c^2*x^2]/Sqrt[d + e*x^2]]*Log[a + b*Ar
cSin[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[c^2*d + e, 0]
```

rule 5333
```
Int[ArcSin[Sqrt[1 + (b_.)*(x_)^2]]^(n_.)/Sqrt[1 + (b_.)*(x_)^2], x_Symbol]
:> Simp[Sqrt[(-b)*x^2]/(b*x)   Subst[Int[ArcSin[x]^n/Sqrt[1 - x^2], x], x,
Sqrt[1 + b*x^2]], x] /; FreeQ[{b, n}, x]
```

### 3.472.4 Maple [F]

$$\int \frac{1}{\arcsin\left(\sqrt{b\,x^{2}+1}\right)\sqrt{b\,x^{2}+1}}dx$$

input
```
int(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x)
```

output
```
int(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x)
```

### 3.472.5 Fricas [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 28, normalized size of antiderivative = 0.93

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx=\frac{\sqrt{-bx^2}\log\left(-\arcsin\left(\sqrt{bx^2+1}\right)\right)}{bx}$$

input
```
integrate(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x, algorithm="fricas")
```

output
```
sqrt(-b*x^2)*log(-arcsin(sqrt(b*x^2 + 1)))/(b*x)
```

### 3.472.6 Sympy [F]

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx=\int \frac{1}{\sqrt{bx^2+1}\operatorname{asin}\left(\sqrt{bx^2+1}\right)}\,dx$$

input
```
integrate(1/asin((b*x**2+1)**(1/2))/(b*x**2+1)**(1/2),x)
```

output
```
Integral(1/(sqrt(b*x**2 + 1)*asin(sqrt(b*x**2 + 1))), x)
```

### 3.472.7 Maxima [F(-2)]

Exception generated.

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = \text{Exception raised: RuntimeError}$$

input
```
integrate(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x, algorithm="maxima")
```

output
```
Exception raised: RuntimeError >> ECL says: sign: argument cannot be imagi
nary; found sqrt(-_SAGE_VAR_b)
```

### 3.472.8 Giac [F]

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = \int \frac{1}{\sqrt{bx^2+1}\arcsin\left(\sqrt{bx^2+1}\right)}\,dx$$

input
```
integrate(1/arcsin((b*x^2+1)^(1/2))/(b*x^2+1)^(1/2),x, algorithm="giac")
```

output
```
integrate(1/(sqrt(b*x^2 + 1)*arcsin(sqrt(b*x^2 + 1))), x)
```

### 3.472.9 Mupad [B] (verification not implemented)

Time = 0.35 (sec) , antiderivative size = 26, normalized size of antiderivative = 0.87

$$\int \frac{1}{\sqrt{1+bx^2}\arcsin\left(\sqrt{1+bx^2}\right)}\,dx = -\frac{\ln\left(\mathrm{asin}\left(\sqrt{b\,x^2+1}\right)\right)\,\sqrt{x^2}}{\sqrt{-b}\,x}$$

input
```
int(1/(asin((b*x^2 + 1)^(1/2))*(b*x^2 + 1)^(1/2)),x)
```

output
```
-(log(asin((b*x^2 + 1)^(1/2)))*(x^2)^(1/2))/((-b)^(1/2)*x)
```

# 3.473 $\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx$



## 3.473.1 Optimal result

Integrand size = 28, antiderivative size = 16

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=-\frac{1}{2}\log\left(1-x^2\right)+\log(\arcsin(x))$$

output
```
-1/2*ln(-x^2+1)+ln(arcsin(x))
```

## 3.473.2 Mathematica [A] (verified)

Time = 0.02 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=-\frac{1}{2}\log\left(1-x^2\right)+\log(\arcsin(x))$$

input
```
Integrate[x/(1 - x^2) + 1/(Sqrt[1 - x^2]*ArcSin[x]),x]
```

output
```
-1/2*Log[1 - x^2] + Log[ArcSin[x]]
```

## 3.473.3 Rubi [A] (verified)

Time = 0.16 (sec) , antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.036, Rules used = {2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \left(\frac{1}{\sqrt{1-x^2}\arcsin(x)}+\frac{x}{1-x^2}\right) dx$$

$$\Big\downarrow \text{ 2009}$$

$$\log(\arcsin(x))-\frac{1}{2}\log\left(1-x^2\right)$$

input
```
Int[x/(1 - x^2) + 1/(Sqrt[1 - x^2]*ArcSin[x]),x]
```

output
```
-1/2*Log[1 - x^2] + Log[ArcSin[x]]
```

### 3.473.3.1 Defintions of rubi rules used

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

## 3.473.4 Maple [A] (verified)

Time = 0.49 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.06

| method | result | size |
|---|---|---|
| default | $-\frac{\ln(x-1)}{2}-\frac{\ln(x+1)}{2}+\ln\left(\arcsin\left(x\right)\right)$ | 17 |
| parts | $-\frac{\ln(x-1)}{2}-\frac{\ln(x+1)}{2}+\ln\left(\arcsin\left(x\right)\right)$ | 17 |

input
```
int(x/(-x^2+1)+1/arcsin(x)/(-x^2+1)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/2*ln(x-1)-1/2*ln(x+1)+ln(arcsin(x))
```

### 3.473.5 Fricas [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.88

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=-\frac{1}{2}\,\log\left(x^2-1\right)+\log\left(-\arcsin\left(x\right)\right)$$

input
```
integrate(x/(-x^2+1)+1/arcsin(x)/(-x^2+1)^(1/2),x, algorithm="fricas")
```

output
```
-1/2*log(x^2 - 1) + log(-arcsin(x))
```

### 3.473.6 Sympy [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.75

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=-\frac{\log\left(x^2-1\right)}{2}+\log\left(\operatorname{asin}\left(x\right)\right)$$

input
```
integrate(x/(-x**2+1)+1/asin(x)/(-x**2+1)**(1/2),x)
```

output
```
-log(x**2 - 1)/2 + log(asin(x))
```

### 3.473.7 Maxima [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.75

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=-\frac{1}{2}\,\log\left(x^2-1\right)+\log\left(\arcsin\left(x\right)\right)$$

input
```
integrate(x/(-x^2+1)+1/arcsin(x)/(-x^2+1)^(1/2),x, algorithm="maxima")
```

output
```
-1/2*log(x^2 - 1) + log(arcsin(x))
```

### 3.473.8 Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.88

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=-\frac{1}{2}\,\log\left(\left|x^2-1\right|\right)+\log\left(\left|\arcsin\left(x\right)\right|\right)$$

input
```
integrate(x/(-x^2+1)+1/arcsin(x)/(-x^2+1)^(1/2),x, algorithm="giac")
```

output
```
-1/2*log(abs(x^2 - 1)) + log(abs(arcsin(x)))
```

### 3.473.9 Mupad [B] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.75

$$\int \left(\frac{x}{1-x^2}+\frac{1}{\sqrt{1-x^2}\arcsin(x)}\right)\,dx=\ln\left(\mathrm{asin}(x)\right)-\frac{\ln\left(x^2-1\right)}{2}$$

input
```
int(1/(asin(x)*(1 - x^2)^(1/2)) - x/(x^2 - 1),x)
```

output
```
log(asin(x)) - log(x^2 - 1)/2
```

# 3.474 $\int \frac{\sqrt{1-x^2}+x \arcsin(x)}{\arcsin(x)-x^2 \arcsin(x)} \, dx$



## 3.474.1 Optimal result

Integrand size = 29, antiderivative size = 16

$$\int \frac{\sqrt{1-x^2}+x \arcsin(x)}{\arcsin(x)-x^2 \arcsin(x)} \, dx = -\frac{1}{2} \log \left(1-x^2\right) + \log(\arcsin(x))$$

output
```
-1/2*ln(-x^2+1)+ln(arcsin(x))
```

## 3.474.2 Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 22, normalized size of antiderivative = 1.38

$$\int \frac{\sqrt{1-x^2}+x \arcsin(x)}{\arcsin(x)-x^2 \arcsin(x)} \, dx = -\frac{1}{2} \log(1-x) - \frac{1}{2} \log(1+x) + \log(\arcsin(x))$$

input
```
Integrate[(Sqrt[1 - x^2] + x*ArcSin[x])/(ArcSin[x] - x^2*ArcSin[x]),x]
```

output
```
-1/2*Log[1 - x] - Log[1 + x]/2 + Log[ArcSin[x]]
```

## 3.474.3 Rubi [F]

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{x \arcsin(x)+\sqrt{1-x^2}}{\arcsin(x)-x^2\arcsin(x)}\,dx$$
$$\Big\downarrow \text{ 7292}$$
$$\int \frac{x \arcsin(x)+\sqrt{1-x^2}}{(1-x^2)\arcsin(x)}dx$$
$$\Big\downarrow \text{ 5300}$$
$$\int \frac{x \arcsin(x)+\sqrt{1-x^2}}{(1-x^2)\arcsin(x)}dx$$

input
```
Int[(Sqrt[1 - x^2] + x*ArcSin[x])/(ArcSin[x] - x^2*ArcSin[x]),x]
```

output
```
$Aborted
```

### 3.474.3.1 Defintions of rubi rules used

rule 5300
```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)*(u_.), x_Symbol] :> Unintegrab
le[u*(a + b*ArcSin[c*x])^n, x] /; FreeQ[{a, b, c, n}, x]
```

rule 7292
```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

## 3.474.4 Maple [A] (verified)

Time = 0.34 (sec) , antiderivative size = 17, normalized size of antiderivative = 1.06

| method | result | size |
|---|---|---|
| default | $-\frac{\ln(x-1)}{2}-\frac{\ln(x+1)}{2}+\ln(\arcsin(x))$ | 17 |
| parts | $-\frac{\ln(x-1)}{2}-\frac{\ln(x+1)}{2}+\ln(\arcsin(x))$ | 17 |

input
```
int((x*arcsin(x)+(-x^2+1)^(1/2))/(arcsin(x)-x^2*arcsin(x)),x,method=_RETUR
NVERBOSE)
```

output
```
-1/2*ln(x-1)-1/2*ln(x+1)+ln(arcsin(x))
```

### 3.474.5 Fricas [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 14, normalized size of antiderivative = 0.88

$$\int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx = -\frac{1}{2}\log\left(x^2-1\right)+\log\left(-\arcsin\left(x\right)\right)$$

input
```
integrate((x*arcsin(x)+(-x^2+1)^(1/2))/(arcsin(x)-x^2*arcsin(x)),x, algori
thm="fricas")
```

output
```
-1/2*log(x^2 - 1) + log(-arcsin(x))
```

### 3.474.6 Sympy [F]

$$\int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx = -\int \frac{\sqrt{1-x^2}}{x^2\operatorname{asin}\left(x\right)-\operatorname{asin}\left(x\right)}\,dx-\int \frac{x\operatorname{asin}\left(x\right)}{x^2\operatorname{asin}\left(x\right)-\operatorname{asin}\left(x\right)}\,dx$$

input
```
integrate((x*asin(x)+(-x**2+1)**(1/2))/(asin(x)-x**2*asin(x)),x)
```

output
```
-Integral(sqrt(1 - x**2)/(x**2*asin(x) - asin(x)), x) - Integral(x*asin(x)
/(x**2*asin(x) - asin(x)), x)
```

### 3.474.7 Maxima [F]

$$\int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx=\int -\frac{x\arcsin\left(x\right)+\sqrt{-x^2+1}}{x^2\arcsin\left(x\right)-\arcsin\left(x\right)}\,dx$$

input
```
integrate((x*arcsin(x)+(-x^2+1)^(1/2))/(arcsin(x)-x^2*arcsin(x)),x, algori
thm="maxima")
```

output
```
-integrate(sqrt(x + 1)*sqrt(-x + 1)/((x^2 - 1)*arctan2(x, sqrt(x + 1)*sqrt
(-x + 1))), x) - 1/2*log(x + 1) - 1/2*log(x - 1)
```

### 3.474.8 Giac [A] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 20, normalized size of antiderivative = 1.25

$$\int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx=-\log\left(2\right)-\frac{1}{2}\log\left(\left|-x^2+1\right|\right)+\log\left(\left|\arcsin\left(x\right)\right|\right)$$

input
```
integrate((x*arcsin(x)+(-x^2+1)^(1/2))/(arcsin(x)-x^2*arcsin(x)),x, algori
thm="giac")
```

output
```
-log(2) - 1/2*log(abs(-x^2 + 1)) + log(abs(arcsin(x)))
```

### 3.474.9 Mupad [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 12, normalized size of antiderivative = 0.75

$$\int \frac{\sqrt{1-x^2}+x\arcsin(x)}{\arcsin(x)-x^2\arcsin(x)}\,dx=\ln\left(\mathrm{asin}(x)\right)-\frac{\ln\left(x^2-1\right)}{2}$$

input
```
int((x*asin(x) + (1 - x^2)^(1/2))/(asin(x) - x^2*asin(x)),x)
```

output
```
log(asin(x)) - log(x^2 - 1)/2
```

# CHAPTER 4

# Appendix



## 4.1 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

### 4.1.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* Nasser: April 7,2022. add second output which gives reason for the grade *)
(*                       Small rewrite of logic in main function to make it*)
(*                       match Maple's logic. No change in functionality otherwise*)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)



(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
```

```
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] := Module[{expnResult,expnOptimal,leafCountResult,leafC
    expnResult  = ExpnType[result];
    expnOptimal = ExpnType[optimal];
    leafCountResult = LeafCount[result];
    leafCountOptimal = LeafCount[optimal];

    (*Print["expnResult=",expnResult," expnOptimal=",expnOptimal];*)
    If[expnResult<=expnOptimal,
        If[Not[FreeQ[result,Complex]], (*result contains complex*)
            If[Not[FreeQ[optimal,Complex]], (*optimal contains complex*)
                If[leafCountResult<=2*leafCountOptimal,
                    finalresult={"A"," "}
                    ,(*ELSE*)
                    finalresult={"B","Both result and optimal contain complex but leaf count
                  ]
            ,(*ELSE*)
                finalresult={"C","Result contains complex when optimal does not."}
            ]
        ,(*ELSE*)(*result does not contains complex*)
            If[leafCountResult<=2*leafCountOptimal,
               finalresult={"A"," "}
            ,(*ELSE*)
               finalresult={"B","Leaf count is larger than twice the leaf count of optimal. $
              ]
        ]
    ,(*ELSE*) (*expnResult>expnOptimal*)
        If[FreeQ[result,Integrate] && FreeQ[result,Int],
            finalresult={"C","Result contains higher order function than in optimal. Order "<
            ,
            finalresult={"F","Contains unresolved integral."}
        ]
    ];

    finalresult
]
```

```
(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]
```

```
ElementaryFunctionQ[func_] :=
  MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

### 4.1.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
```

```
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
#Nasser 4/07/2022   add second output which gives reason for the grade

GradeAntiderivative := proc(result,optimal)
local leaf_count_result,
        leaf_count_optimal,
        ExpnType_result,
        ExpnType_optimal,
        debug:=false;

        leaf_count_result:=leafcount(result);
        #do NOT call ExpnType() if leaf size is too large. Recursion problem
        if leaf_count_result > 500000 then
            return "B","result has leaf size over 500,000. Avoiding possible recursion issues
        fi;

        leaf_count_optimal := leafcount(optimal);
        ExpnType_result  := ExpnType(result);
        ExpnType_optimal := ExpnType(optimal);

        if debug then
            print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
        fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

    #This check below actually is not needed, since I only
    #call this grading only for passed integrals. i.e. I check
    #for "F" before calling this. But no harm of keeping it here.
    #just in case.


    if not type(result,freeof('int')) then
        return "F","Result contains unresolved integral";
    fi;
```

```
    if ExpnType_result<=ExpnType_optimal then
        if debug then
             print("ExpnType_result<=ExpnType_optimal");
        fi;
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                if debug then
                        print("both result and optimal complex");
                fi;
                if leaf_count_result<=2*leaf_count_optimal then
                    return "A"," ";
                else
                   return "B",cat("Both result and optimal contain complex but leaf count of
                                   convert(leaf_count_result,string)," vs. $2 (",
                                   convert(leaf_count_optimal,string)," ) = ",convert(2*leaf_
                end if
            else #result contains complex but optimal is not
                if debug then
                        print("result contains complex but optimal is not");
                fi;
                return "C","Result contains complex when optimal does not.";
            fi;
        else # result do not contain complex
             # this assumes optimal do not as well. No check is needed here.
            if debug then
                   print("result do not contain complex, this assumes optimal do not as well"
            fi;
            if leaf_count_result<=2*leaf_count_optimal then
                if debug then
                    print("leaf_count_result<=2*leaf_count_optimal");
                fi;
                return "A"," ";
            else
                if debug then
                    print("leaf_count_result>2*leaf_count_optimal");
                fi;
                return "B",cat("Leaf count of result is larger than twice the leaf count of o
                                convert(leaf_count_result,string),"$ vs. $2(",
                                convert(leaf_count_optimal,string),")=",convert(2*leaf_cou
            fi;
        fi;
```

```
    else #ExpnType(result) > ExpnType(optimal)
        if debug then
            print("ExpnType(result) > ExpnType(optimal)");
        fi;
        return "C",cat("Result contains higher order function than in optimal. Order ",
                       convert(ExpnType_result,string)," vs. order ",
                       convert(ExpnType_optimal,string),".");
    fi;

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
```

```
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
```

```
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

### 4.1.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#             Port of original Maple grading function by
#             Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#             added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
```

```
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]

def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
```

```
        return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))   #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):    #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):   #type(op(2,expn),'integer')
            return expnType(expn.args[0])    #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):   #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))   #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnT
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)   #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):   #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))   #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)    #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
```

```
def grade_antiderivative(result,optimal):

    #print ("Enter grade_antiderivative for sagemath")
    #print("Enter grade_antiderivative, result=",result," optimal=",optimal)

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    #print("leaf_count_result=",leaf_count_result)
    #print("leaf_count_optimal=",leaf_count_optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        grade = "F"
        grade_annotation =""
    else:
        if expnType_result <= expnType_optimal:
            if result.has(I):
                if optimal.has(I): #both result and optimal complex
                    if leaf_count_result <= 2*leaf_count_optimal:
                        grade = "A"
                        grade_annotation =""
                    else:
                        grade = "B"
                        grade_annotation ="Both result and optimal contain complex but leaf count of result is large
                else: #result contains complex but optimal is not
                    grade = "C"
                    grade_annotation ="Result contains complex when optimal does not."
            else: # result do not contain complex, this assumes optimal do not as well
                if leaf_count_result <= 2*leaf_count_optimal:
                    grade = "A"
                    grade_annotation =""
                else:
                    grade = "B"
                    grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(le
        else:
            grade = "C"
            grade_annotation ="Result contains higher order function than in optimal. Order "+str(ExpnType_


    #print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)
```

```
    return grade, grade_annotation
```

### 4.1.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#               Albert Rich to use with Sagemath. This is used to
#               grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#               'arctan2','floor','abs','log_integral'
#June 4, 2022  Made default grade_annotation "none" instead of "" due
#               issue later when reading the file.
#July 14, 2022. Added ellipticF. This is until they fix sagemath, then remove it.

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    #print("Enter tree_size, expr is ",expr)

    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
```

```
        return False
    else:
        return False

def is_elementary_function(func):
    #debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    #debug=False
    if debug:
        print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
          'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
          'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
          'polylog','lambert_w','elliptic_f','elliptic_e','ellipticF',
          'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m
```

```
def is_hypergeometric_function(func):
   return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
   return func.name() in ['hypergeometric']   #[appellf1] can't find this in sagemath

def is_atom(expn):

   #debug=False
   if debug:
       print ("Enter is_atom, expn=",expn)

   if not hasattr(expn, 'parent'):
      return False


   #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-
   try:
      if expn.parent() is SR:
         return expn.operator() is None
      if expn.parent() in (ZZ, QQ, AA, QQbar):
         return expn in expn.parent() # Should always return True
      if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
         return expn in expn.parent().base_ring() or expn in expn.parent().gens()

      return False

   except AttributeError as error:
      print("Exception,AttributeError in  is_atom")
      print ("cought exception" , type(error).__name__ )
      return False


def expnType(expn):

   if debug:
      print (">>>>>Enter expnType, expn=", expn)
      print (">>>>>is_atom(expn)=", is_atom(expn))

   if is_atom(expn):
      return 1
   elif type(expn)==list:   #isinstance(expn,list):
```

```
        return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
    elif is_sqrt(expn):
        if type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:   #isinstance(expn.args[1],Integer)
            return expnType(expn.operands()[0])    #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:   #isinstance(expn.args[1],Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinst
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):
```

```
if debug:
   print ("Enter grade_antiderivative for sagemath")
   print("Enter grade_antiderivative, result=",result)
   print("Enter grade_antiderivative, optimal=",optimal)
   print("type(anti)=",type(result))
   print("type(optimal)=",type(optimal))

leaf_count_result  = tree_size(result) #leaf_count(result)
leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

#if debug: print ("leaf_count_result=", leaf_count_result, "leaf_count_optimal=",leaf_count_optimal)


expnType_result  = expnType(result)
expnType_optimal = expnType(optimal)

if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",expnType_optimal)

if expnType_result <= expnType_optimal:
   if result.has(I):
      if optimal.has(I): #both result and optimal complex
         if leaf_count_result <= 2*leaf_count_optimal:
            grade = "A"
            grade_annotation =" "
         else:
            grade = "B"
            grade_annotation ="Both result and optimal contain complex but leaf count of result is larger t
      else: #result contains complex but optimal is not
         grade = "C"
         grade_annotation ="Result contains complex when optimal does not."
   else: # result do not contain complex, this assumes optimal do not as well
      if leaf_count_result <= 2*leaf_count_optimal:
         grade = "A"
         grade_annotation =" "
      else:
         grade = "B"
         grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(leaf_
else:
   grade = "C"
   grade_annotation ="Result contains higher order function than in optimal. Order "+str(expnType_resu


print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)
```

```
return grade, grade_annotation
```