Computer Algebra Independent Integration Tests

Summer 2024

1-Algebraic-functions/1.2-Trinomial/1.2.1-Quadratic-trinomial/1.2.1.3/100-1.2.1.3-f0

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Contents

CHAPTER 1

Introduction

This report gives the result of running the computer algebra independent integration test.The download section in on the main webpage contains links to download the problems in plain text format used for all CAS systems. The number of integrals in this report is [**172**]. This is test number [100].

1.1 Listing of CAS systems tested

The following are the CAS systems tested:

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

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

Sympy was run directly in Python not via sagemath.

Reduce was called directly.

1.2 Results

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

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

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

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

System	% solved	% Failed
Mathematica	100.00 (172)	0.00 (0)
Maple	98.26 (169)	1.74 (3)
Rubi	97.09 (167)	2.91 (5)
Fricas	97.09 (167)	2.91 (5)
Giac	76.16 (131)	23.84 (41)
Reduce	73.84 (127)	26.16 (45)
Mupad	58.72 (101)	41.28 (71)
Maxima	50.58 (87)	49.42 (85)
Sympy	45.35 (78)	54.65 (94)

Table 1.1: Percentage solved for each CAS

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

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

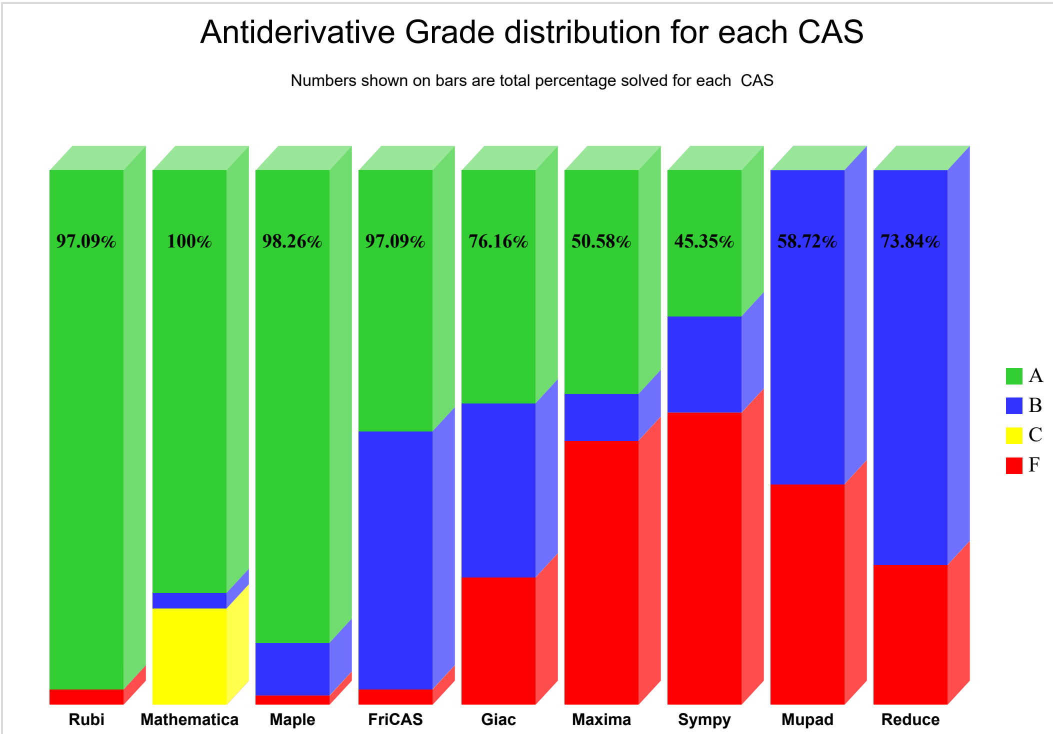
Table 1.2: Description of grading applied to integration result

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

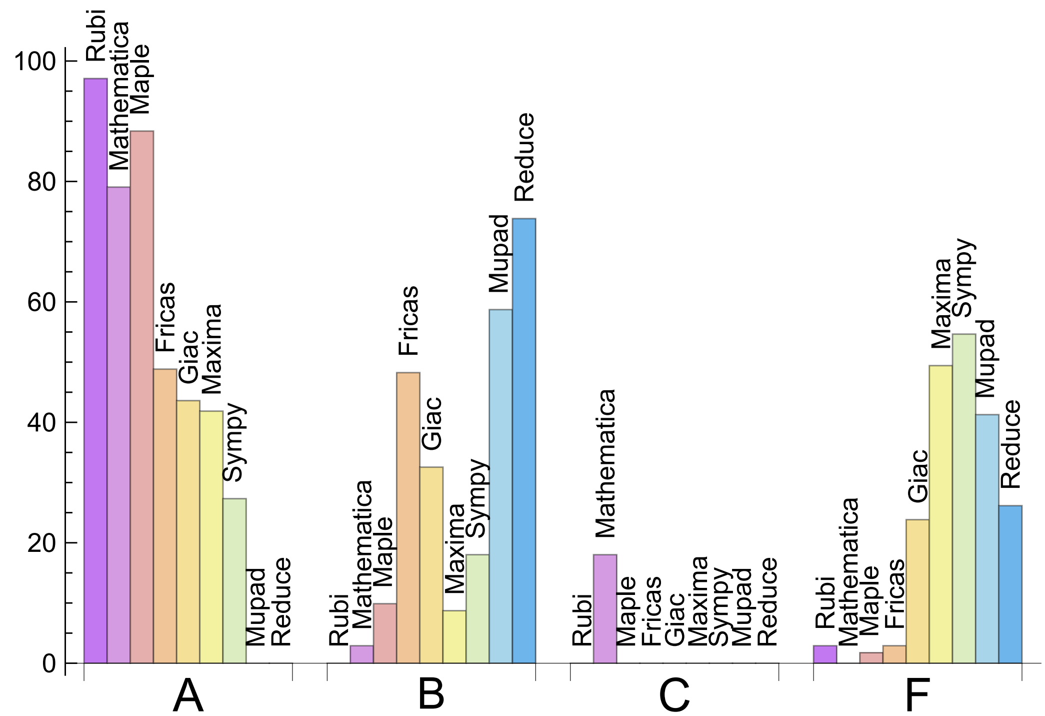
System	% A grade	% B grade	% C grade	% F grade
Rubi	97.093	0.000	0.000	2.907
Maple	88.372	9.884	0.000	1.744
Mathematica	79.070	2.907	18.023	0.000
Fricas	48.837	48.256	0.000	2.907
Giac	43.605	32.558	0.000	23.837
Maxima	41.860	8.721	0.000	49.419
Sympy	27.326	18.023	0.000	54.651
Mupad	0.000	58.721	0.000	41.279
Reduce	0.000	73.837	0.000	26.163

Table 1.3: Antiderivative Grade distribution of each CAS

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



The figure below compares the grades of the CAS systems.



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

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

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

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Mathematica	0	0.00	0.00	0.00
Maple	3	100.00	0.00	0.00
Rubi	5	100.00	0.00	0.00
Fricas	5	60.00	40.00	0.00
Giac	41	78.05	9.76	12.20
Reduce	45	100.00	0.00	0.00
Mupad	71	0.00	100.00	0.00
Maxima	85	37.65	0.00	62.35
Sympy	94	62.77	37.23	0.00

Table 1.4: Failure statistics for each CAS

1.3 Time and leaf size Performance

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

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

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

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

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

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

System	Mean time (sec)
Maxima	0.04
Giac	0.26
Rubi	0.97
Reduce	1.41
Maple	1.51
Mathematica	6.23
Fricas	6.49
Sympy	6.95
Mupad	8.96

Table 1.5: Time performance for each CAS

System	Mean size	Normalized mean	Median size	Normalized median
Rubi	277.48	0.98	256.00	1.00
Mathematica	330.66	1.07	268.50	0.98
Maxima	330.87	1.47	291.00	1.36
Maple	365.99	1.19	283.00	1.01
Giac	767.34	2.53	390.00	1.71
Reduce	1155.68	4.21	553.00	2.72
Fricas	1271.57	3.83	644.00	2.27
Sympy	1514.27	5.02	377.50	1.72
Mupad	2468.24	8.75	331.00	1.54

Table 1.6: Leaf size performance for each CAS

1.4 Performance based on number of rules Rubi used

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

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

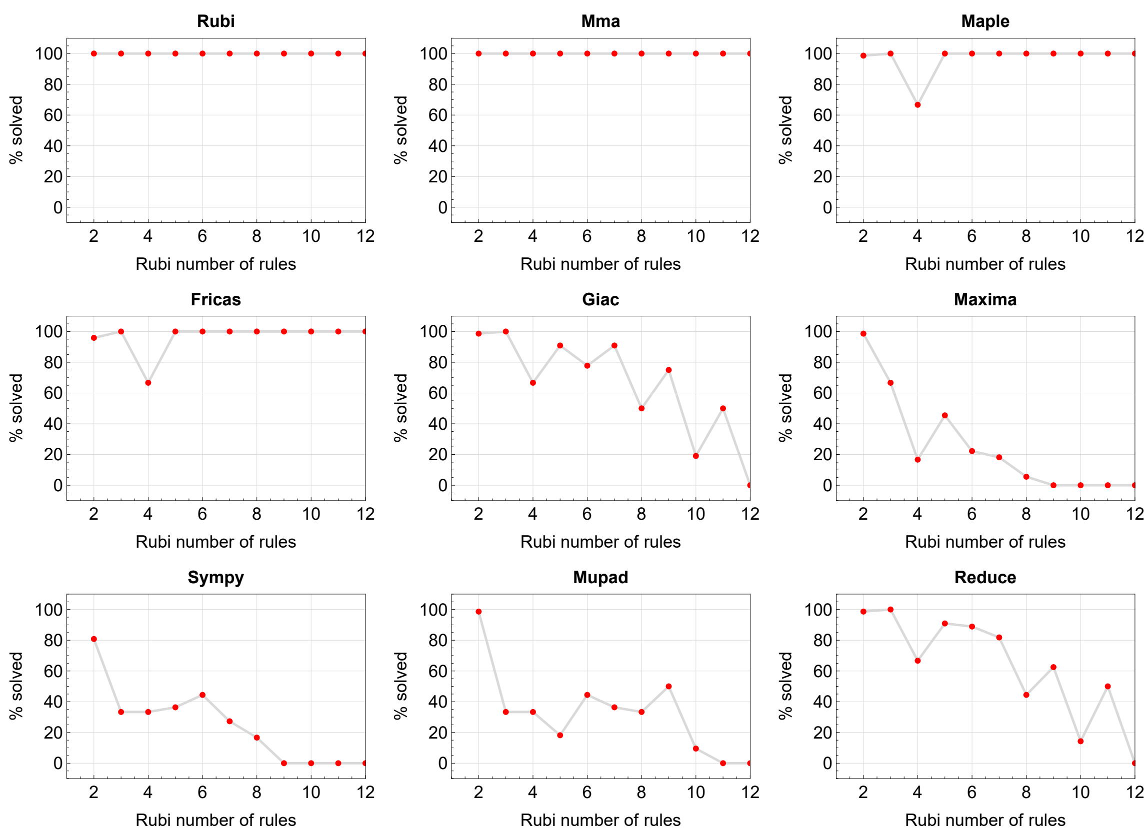


Figure 1.1: Solving statistics per number of Rubi rules used

1.5 Performance based on number of steps Rubi used

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

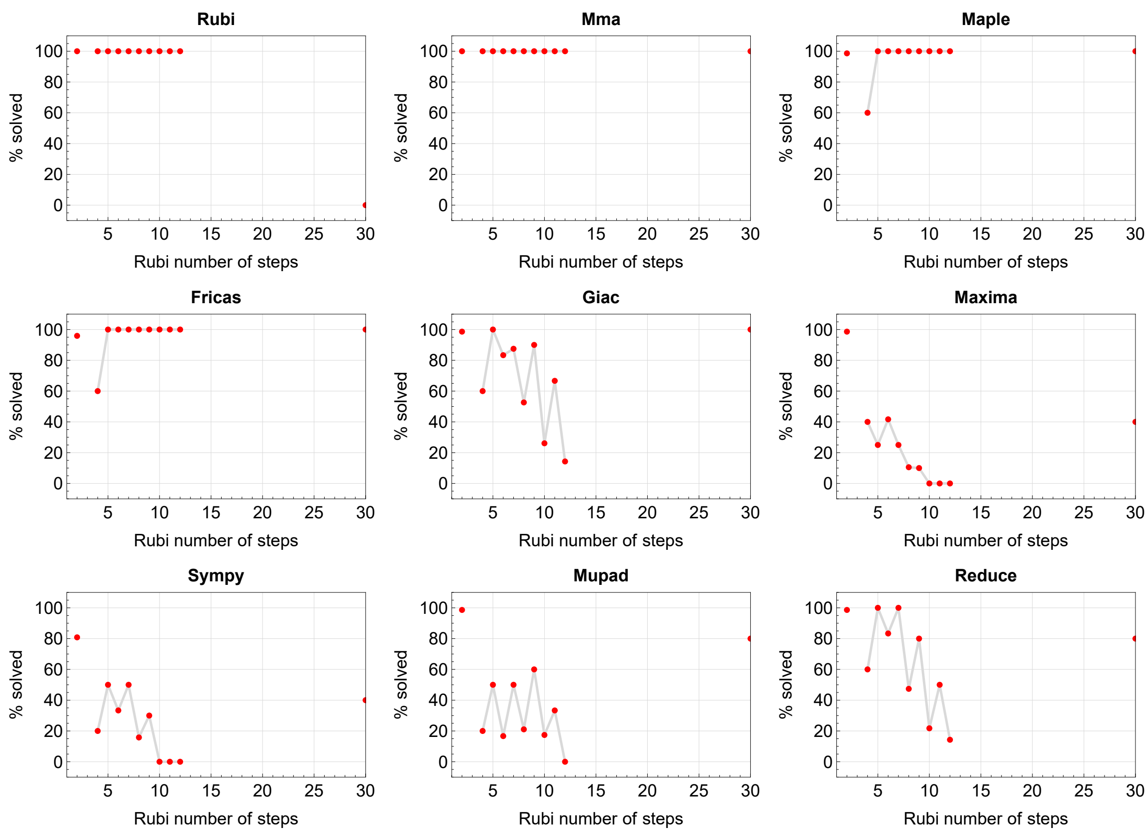


Figure 1.2: Solving statistics per number of Rubi steps used

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

1.6 Solved integrals histogram based on leaf size of result

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

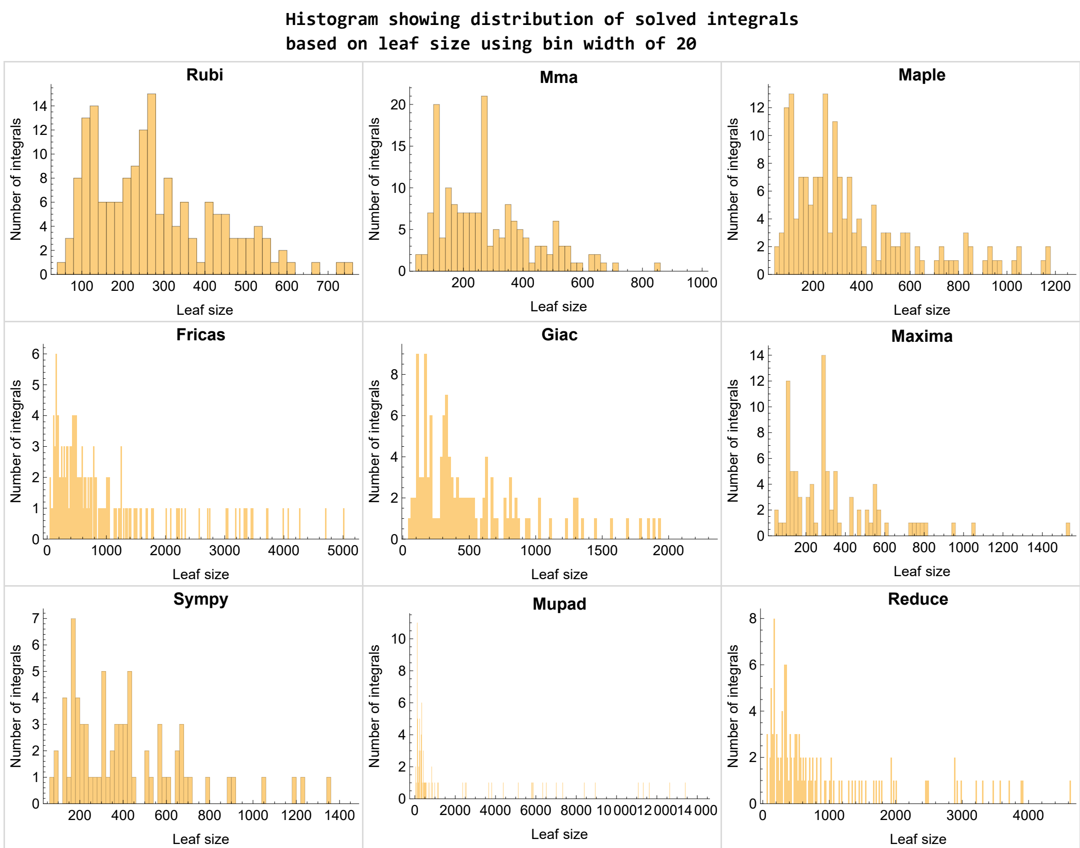


Figure 1.3: Solved integrals based on leaf size distribution

1.7 Solved integrals histogram based on CPU time used

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

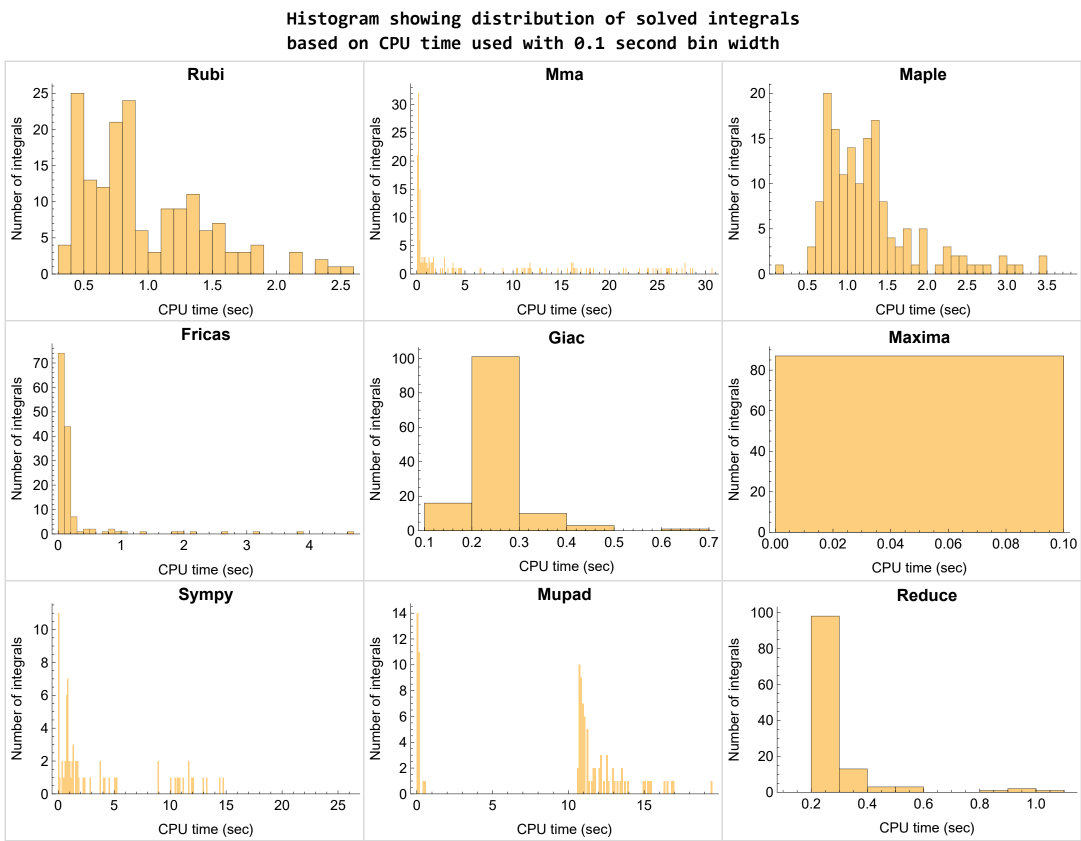


Figure 1.4: Solved integrals histogram based on CPU time used

1.8 Leaf size vs. CPU time used

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

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

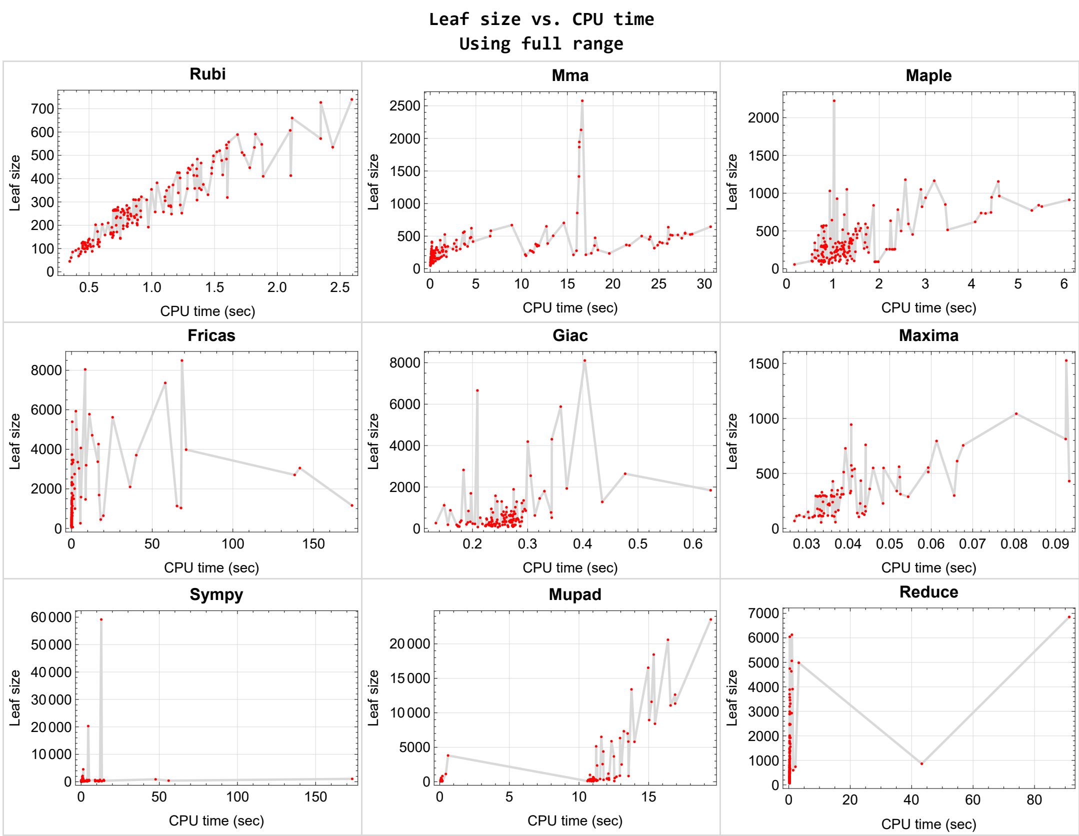


Figure 1.5: Leaf size vs. CPU time. Full range

1.9 list of integrals with no known antiderivative

{}

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Reduce {}

Mupad {}

1.11 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {}

Maple {}

Maxima Verification phase not currently implemented.

Fricas Verification phase not currently implemented.

Sympy Verification phase not currently implemented.

Giac Verification phase not currently implemented.

Reduce Verification phase not currently implemented.

Mupad Verification phase not currently implemented.

1.12 Timing

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

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

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

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

1.13 Verification

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

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

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

1.14 Important notes about some of the results

Important note about Maxima results

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

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

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

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

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

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

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

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

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

Important note about FriCAS result

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

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

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

Important note about finding leaf size of antiderivative

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

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

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

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

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

  except Exception as ee:
        leafCount =1
```

Important note about Mupad results

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

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

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

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

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

1.15 Current tree layout of integration tests

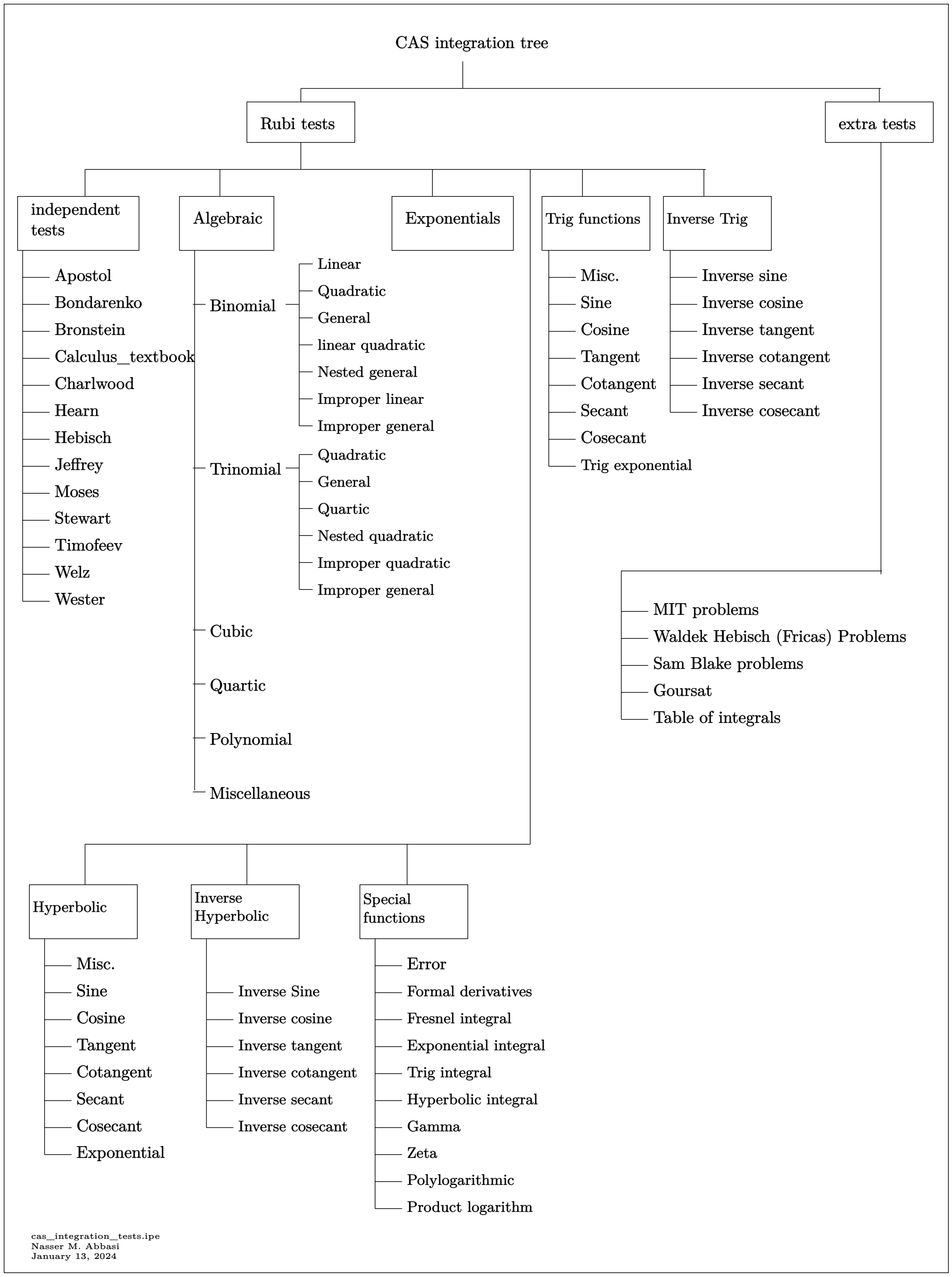
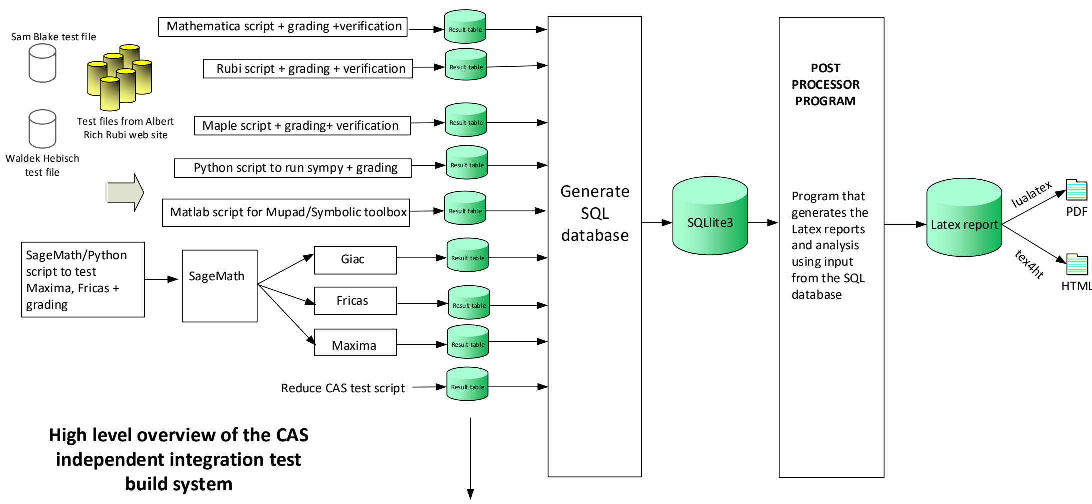


Figure 1.6: CAS integration tests tree

1.16 Design of the test system

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



One record (line) per one integral result. The line is CSV comma separated. This is description of each record

1. integer, the problem number.
2. integer. 0 for failed, 1 for passed, -1 for timeout, -2 for CAS specific exception. (this is not the grade field)
3. integer. Leaf size of result.
4. integer. Leaf size of the optimal antiderivative.
5. number. CPU time used to solve this integral. 0 if failed.
6. string. The integral in Latex format
7. string. The input used in CAS own syntax.
8. string. The result (antiderivative) produced by CAS in Latex format
9. string. The optimal antiderivative in Latex format.
10. integer. 0 or 1. Indicates if problem has known antiderivative or not
11. String. The result (antiderivative) in CAS own syntax.
12. String. The grade of the antiderivative. Can be "A", "B", "C", or "F"
13. String. Small string description of why the grade was given.
14. integer. 1 if result was verified or 0 if not verified. (For mma, rubi and maple only)

*The following fields are present only in **Rubi** Table file*

15. integer. Number of steps used.
16. integer. Number of rules used.
17. integer. Integrand leaf size.
18. real number. Ratio. Field 16 over field 17
19. String of form "{n,n,..}" which is list of the rules used by Rubi
20. String. The optimal antiderivative in Mathematica syntx

Nasser M. Abbasi
January 13, 2024
Design.vsdx

CHAPTER 2

DETAILED SUMMARY TABLES OF RESULTS

2.1 List of integrals sorted by grade for each CAS

Rubi

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 88, 90, 91, 92, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172 }

B grade { }

C grade { }

F normal fail { 86, 87, 89, 93, 119 }

F(-1) timedout fail { }

F(-2) exception fail { }

Mma

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 97, 98, 99, 100, 101, 102, 103, 105, 106, 109, 110, 111, 112, 113, 114, 115, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 167, 168, 169, 170, 171, 172 }

B grade { 107, 108, 116, 117, 118 }

C grade { 96, 104, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166 }

F normal fail { }

F(-1) timedout fail { }

F(-2) exception fail { }

Maple

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 142, 143, 146, 147, 148, 149, 150, 153, 158, 159, 160, 163, 164, 165, 166 }

B grade { 26, 27, 140, 141, 144, 145, 151, 152, 154, 155, 156, 157, 161, 162, 167, 168, 169 }

C grade { }

F normal fail { 170, 171, 172 }

F(-1) timedout fail { }

F(-2) exception fail { }

Fricas

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 19, 20, 21, 22, 23, 24, 25, 30, 31, 32, 33, 34, 54, 55, 56, 57, 58, 59, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 77, 78, 79, 80, 93, 94, 95, 96, 102, 103, 104, 105, 112, 113, 114, 115, 116, 119, 120, 121, 122, 123, 126, 127, 128, 132, 133, 134, 135, 138, 139, 140, 143, 144, 145, 147, 148, 149, 150, 154 }

B grade { 15, 16, 17, 18, 26, 27, 28, 29, 35, 36, 37, 38, 39, 40, 41, 42, 43, 45, 46, 47, 48, 49, 50, 52, 53, 60, 61, 74, 75, 76, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 97, 98, 99, 100, 101, 106, 107, 108, 109, 110, 111, 117, 118, 124, 125, 129, 130, 131, 136, 137, 141, 142, 146, 151, 152, 153, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169 }

C grade { }

F normal fail { 170, 171, 172 }

F(-1) timedout fail { 44, 51 }

F(-2) exception fail { }

Maxima

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 39, 40, 41, 42, 46, 47, 48, 49, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 93, 94, 95, 102, 103, 112, 113, 119, 120, 121, 127, 128, 135 }

B grade { 26, 37, 38, 43, 44, 45, 50, 51, 126, 132, 133, 134, 167, 168, 169 }

C grade { }

F normal fail { 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 170, 171, 172 }

F(-1) timedout fail { }

F(-2) exception fail { 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 96, 97, 98, 99, 100, 101, 104, 105, 106, 107, 108, 109, 110, 111, 114, 115, 116, 117, 118, 122, 123, 124, 125, 129, 130, 131, 136, 137 }

Giac

A grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17, 19, 20, 21, 22, 23, 24, 25, 28, 29, 30, 31, 32, 33, 34, 36, 39, 40, 41, 42, 46, 48, 49, 56, 57, 58, 59, 64, 65, 66, 67, 70, 71, 72, 73, 74, 75, 80, 81, 82, 83, 84, 85, 93, 94, 95, 102, 103, 112, 113, 119, 120, 121, 126, 127, 128, 129, 132, 133, 134, 135 }

B grade { 14, 15, 18, 26, 27, 35, 37, 38, 43, 44, 45, 47, 50, 51, 52, 53, 54, 55, 60, 61, 62, 63, 68, 69, 76, 77, 78, 79, 86, 87, 88, 89, 90, 91, 92, 98, 99, 100, 101, 106, 107, 109, 110, 111, 116, 117, 123, 124, 125, 130, 131, 136, 137, 167, 168, 169 }

C grade { }

F normal fail { 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 170, 171, 172 }

F(-1) timedout fail { 97, 105, 115, 118 }

F(-2) exception fail { 96, 104, 108, 114, 122 }

Mupad

A grade { }

B grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 128, 134, 135, 167, 168, 169 }

C grade { }

F normal fail { }

F(-1) timedout fail { 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 129, 130, 131, 132, 133, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 170, 171, 172 }

F(-2) exception fail { }

Sympy

A grade { 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25, 28, 29, 30, 54, 55, 56, 57, 61, 62, 63, 64, 65, 66, 68, 69, 70, 74, 75, 76, 93, 94, 95, 119, 120, 121 }

B grade { 1, 26, 27, 31, 32, 33, 38, 39, 40, 41, 45, 46, 47, 48, 49, 52, 53, 58, 59, 60, 67, 71, 72, 73, 102, 103, 112, 113, 167, 168, 169 }

C grade { }

F normal fail { 96, 97, 98, 99, 100, 101, 104, 105, 106, 107, 108, 109, 110, 111, 114, 115, 116, 117, 118, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 156, 157, 158, 159, 160, 170, 171, 172 }

F(-1) timedout fail { 20, 21, 34, 35, 36, 37, 42, 43, 44, 50, 51, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 154, 155, 161, 162, 163, 164, 165, 166 }

F(-2) exception fail { }

Reduce

A grade { }

B grade { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 94, 95, 96, 97, 98, 99, 100, 102, 103, 104, 105, 106, 113, 114, 115, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 133, 134, 135, 136, 167, 168, 169 }

C grade { }

F normal fail { 93, 101, 107, 108, 109, 110, 111, 112, 116, 117, 118, 132, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 170, 171, 172 }

F(-1) timedout fail { }

F(-2) exception fail { }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	177	190	178	178	230	218	222	182
N.S.	1	1.00	1.50	1.61	1.51	1.51	1.95	1.85	1.88	1.54
time (sec)	N/A	0.569	0.074	0.550	0.033	0.063	0.031	0.204	0.245	10.746

Problem 2	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	135	147	137	137	177	168	169	146
N.S.	1	1.00	1.14	1.25	1.16	1.16	1.50	1.42	1.43	1.24
time (sec)	N/A	0.509	0.054	0.609	0.043	0.070	0.031	0.236	0.254	10.956

Problem 3	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	91	103	96	96	121	117	116	102
N.S.	1	1.00	0.92	1.04	0.97	0.97	1.22	1.18	1.17	1.03
time (sec)	N/A	0.460	0.050	0.546	0.031	0.061	0.024	0.241	0.255	10.895

Problem 4	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	55	56	55	55	66	65	63	57
N.S.	1	1.00	0.90	0.92	0.90	0.90	1.08	1.07	1.03	0.93
time (sec)	N/A	0.358	0.028	0.171	0.033	0.060	0.019	0.210	0.255	0.053

Problem 5	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	88	101	105	106	95	118	140	113
N.S.	1	1.00	1.01	1.16	1.21	1.22	1.09	1.36	1.61	1.30
time (sec)	N/A	0.437	0.052	0.802	0.043	0.068	0.183	0.223	0.257	0.075

Problem 6	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	93	104	109	170	121	169	206	116
N.S.	1	1.00	0.94	1.05	1.10	1.72	1.22	1.71	2.08	1.17
time (sec)	N/A	0.487	0.091	0.694	0.037	0.069	0.343	0.231	0.264	0.094

Problem 7	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	96	108	120	186	138	113	251	123
N.S.	1	1.00	0.92	1.04	1.15	1.79	1.33	1.09	2.41	1.18
time (sec)	N/A	0.484	0.094	0.759	0.033	0.071	0.695	0.250	0.260	0.115

Problem 8	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	112	109	137	168	158	119	169	134
N.S.	1	1.00	1.01	0.98	1.23	1.51	1.42	1.07	1.52	1.21
time (sec)	N/A	0.493	0.062	0.701	0.034	0.072	1.326	0.235	0.255	10.969

Problem 9	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	101	102	140	140	168	168	133	134
N.S.	1	1.00	0.87	0.88	1.21	1.21	1.45	1.45	1.15	1.16
time (sec)	N/A	0.473	0.054	0.776	0.042	0.068	2.360	0.278	0.263	10.892

Problem 10	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	104	110	156	156	185	120	167	154
N.S.	1	1.00	0.88	0.93	1.32	1.32	1.57	1.02	1.42	1.31
time (sec)	N/A	0.472	0.059	0.751	0.044	0.069	4.193	0.275	0.253	10.786

Problem 11	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	228	228	228	247	239	239	301	291	289	234
N.S.	1	1.00	1.00	1.08	1.05	1.05	1.32	1.28	1.27	1.03
time (sec)	N/A	0.811	0.100	0.610	0.036	0.075	0.036	0.230	0.250	0.103

Problem 12	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	162	172	171	171	212	205	201	161
N.S.	1	1.00	1.00	1.06	1.06	1.06	1.31	1.27	1.24	0.99
time (sec)	N/A	0.672	0.075	0.685	0.033	0.063	0.034	0.229	0.254	0.059

Problem 13	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	101	97	103	103	121	117	113	102
N.S.	1	1.00	1.01	0.97	1.03	1.03	1.21	1.17	1.13	1.02
time (sec)	N/A	0.468	0.038	0.560	0.031	0.065	0.027	0.234	0.251	10.610

Problem 14	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	156	279	282	283	280	338	370	308
N.S.	1	1.00	0.97	1.73	1.75	1.76	1.74	2.10	2.30	1.91
time (sec)	N/A	0.687	0.171	0.817	0.038	0.070	0.366	0.261	0.250	0.081

Problem 15	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	194	194	184	304	291	420	316	395	485	371
N.S.	1	1.00	0.95	1.57	1.50	2.16	1.63	2.04	2.50	1.91
time (sec)	N/A	0.806	0.092	0.751	0.033	0.077	0.705	0.273	0.252	0.113

Problem 16	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	219	292	302	483	362	323	604	334
N.S.	1	1.00	0.94	1.26	1.30	2.08	1.56	1.39	2.60	1.44
time (sec)	N/A	0.864	0.182	0.788	0.036	0.073	1.824	0.258	0.254	0.138

Problem 17	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	238	238	220	292	311	505	374	315	659	328
N.S.	1	1.00	0.92	1.23	1.31	2.12	1.57	1.32	2.77	1.38
time (sec)	N/A	0.860	0.186	0.868	0.039	0.081	5.207	0.244	0.269	0.139

Problem 18	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	240	240	275	288	321	475	381	474	561	338
N.S.	1	1.00	1.15	1.20	1.34	1.98	1.59	1.98	2.34	1.41
time (sec)	N/A	0.808	0.165	0.783	0.040	0.076	14.717	0.225	0.247	10.775

Problem 19	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	269	292	340	407	405	316	397	343
N.S.	1	1.00	1.08	1.18	1.37	1.64	1.63	1.27	1.60	1.38
time (sec)	N/A	0.831	0.150	0.835	0.041	0.077	55.969	0.255	0.251	10.883

Problem 20	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	253	253	257	283	340	340	0	338	341	337
N.S.	1	1.00	1.02	1.12	1.34	1.34	0.00	1.34	1.35	1.33
time (sec)	N/A	0.783	0.133	0.846	0.052	0.076	0.000	0.289	0.253	0.133

Problem 21	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	260	291	359	359	0	340	407	357
N.S.	1	1.00	1.02	1.14	1.41	1.41	0.00	1.33	1.60	1.40
time (sec)	N/A	0.809	0.138	0.746	0.045	0.073	0.000	0.267	0.253	10.833

Problem 22	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	412	412	412	444	428	428	564	540	532	445
N.S.	1	1.00	1.00	1.08	1.04	1.04	1.37	1.31	1.29	1.08
time (sec)	N/A	1.360	0.190	0.688	0.036	0.069	0.053	0.262	0.255	11.034

Problem 23	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	305	305	305	342	329	329	430	416	409	340
N.S.	1	1.00	1.00	1.12	1.08	1.08	1.41	1.36	1.34	1.11
time (sec)	N/A	1.106	0.148	0.609	0.034	0.066	0.051	0.235	0.256	0.112

Problem 24	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	225	240	242	242	303	292	286	235
N.S.	1	1.00	1.00	1.07	1.08	1.08	1.35	1.30	1.27	1.04
time (sec)	N/A	0.819	0.103	0.665	0.034	0.071	0.045	0.272	0.259	0.094

Problem 25	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	141	138	149	149	177	169	163	147
N.S.	1	1.00	1.01	0.99	1.07	1.07	1.27	1.22	1.17	1.06
time (sec)	N/A	0.575	0.058	0.635	0.030	0.069	0.034	0.275	0.261	10.796

Problem 26	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	257	257	248	547	530	531	578	666	705	560
N.S.	1	1.00	0.96	2.13	2.06	2.07	2.25	2.59	2.74	2.18
time (sec)	N/A	1.093	0.132	0.782	0.041	0.076	0.701	0.260	0.255	0.099

Problem 27	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	A	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	274	571	541	722	619	707	865	997
N.S.	1	1.00	0.95	1.99	1.89	2.52	2.16	2.46	3.01	3.47
time (sec)	N/A	1.227	0.152	0.856	0.042	0.088	1.384	0.277	0.265	10.789

Problem 28	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	359	359	342	571	550	819	660	636	1032	828
N.S.	1	1.00	0.95	1.59	1.53	2.28	1.84	1.77	2.87	2.31
time (sec)	N/A	1.379	0.181	0.801	0.046	0.094	3.753	0.254	0.258	0.192

Problem 29	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	422	422	400	563	561	910	700	618	1191	676
N.S.	1	1.00	0.95	1.33	1.33	2.16	1.66	1.46	2.82	1.60
time (sec)	N/A	1.476	0.193	0.757	0.052	0.088	12.070	0.256	0.283	11.025

Problem 30	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	207	207	187	308	309	331	396	348	416	322
N.S.	1	1.00	0.90	1.49	1.49	1.60	1.91	1.68	2.01	1.56
time (sec)	N/A	0.807	0.159	0.861	0.038	0.085	4.074	0.268	0.268	11.214

Problem 31	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	118	196	200	216	264	216	269	208
N.S.	1	1.00	0.92	1.53	1.56	1.69	2.06	1.69	2.10	1.62
time (sec)	N/A	0.572	0.091	0.759	0.044	0.077	2.841	0.218	0.249	10.906

Problem 32	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	74	111	115	125	163	119	156	122
N.S.	1	1.00	0.96	1.44	1.49	1.62	2.12	1.55	2.03	1.58
time (sec)	N/A	0.431	0.053	0.814	0.036	0.077	1.762	0.224	0.247	0.197

Problem 33	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	46	55	57	57	88	56	71	58
N.S.	1	1.00	1.02	1.22	1.27	1.27	1.96	1.24	1.58	1.29
time (sec)	N/A	0.347	0.028	0.750	0.037	0.073	0.851	0.246	0.247	0.177

Problem 34	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	63	69	68	65	0	83	75	67
N.S.	1	1.00	0.93	1.01	1.00	0.96	0.00	1.22	1.10	0.99
time (sec)	N/A	0.418	0.055	0.914	0.027	0.767	0.000	0.273	0.243	11.027

Problem 35	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	106	111	150	260	0	322	323	141
N.S.	1	1.00	0.96	1.01	1.36	2.36	0.00	2.93	2.94	1.28
time (sec)	N/A	0.534	0.147	1.056	0.037	5.518	0.000	0.268	0.251	11.254

Problem 36	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	169	171	312	644	0	314	809	284
N.S.	1	1.00	0.99	1.00	1.82	3.77	0.00	1.84	4.73	1.66
time (sec)	N/A	0.722	0.234	1.060	0.053	19.736	0.000	0.285	0.257	11.762

Problem 37	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	B	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	245	245	241	245	553	1133	0	494	1444	471
N.S.	1	1.00	0.98	1.00	2.26	4.62	0.00	2.02	5.89	1.92
time (sec)	N/A	0.879	0.385	1.108	0.059	65.348	0.000	0.257	0.265	12.009

Problem 38	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	155	303	310	517	644	326	633	331
N.S.	1	1.00	0.99	1.94	1.99	3.31	4.13	2.09	4.06	2.12
time (sec)	N/A	0.694	0.099	0.800	0.037	0.096	8.928	0.257	0.260	11.033

Problem 39	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	128	220	225	362	502	233	463	212
N.S.	1	1.00	1.00	1.72	1.76	2.83	3.92	1.82	3.62	1.66
time (sec)	N/A	0.584	0.082	0.783	0.035	0.085	5.118	0.200	0.263	10.879

Problem 40	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	101	156	165	258	367	166	330	154
N.S.	1	1.00	0.94	1.44	1.53	2.39	3.40	1.54	3.06	1.43
time (sec)	N/A	0.515	0.128	0.796	0.038	0.075	2.263	0.225	0.253	10.800

Problem 41	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	80	97	106	184	233	108	205	117
N.S.	1	1.00	0.93	1.13	1.23	2.14	2.71	1.26	2.38	1.36
time (sec)	N/A	0.470	0.115	0.706	0.029	0.074	0.757	0.236	0.263	0.123

Problem 42	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	146	147	227	450	0	265	553	201
N.S.	1	1.00	0.99	1.00	1.54	3.06	0.00	1.80	3.76	1.37
time (sec)	N/A	0.687	0.181	0.983	0.048	18.101	0.000	0.245	0.262	11.327

Problem 43	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	B	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	201	201	201	203	467	1034	0	678	1745	410
N.S.	1	1.00	1.00	1.01	2.32	5.14	0.00	3.37	8.68	2.04
time (sec)	N/A	0.885	0.348	0.977	0.052	67.867	0.000	0.274	0.280	12.025

Problem 44	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	F(-1)	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	283	283	279	285	813	0	0	773	3202	726
N.S.	1	1.00	0.99	1.01	2.87	0.00	0.00	2.73	11.31	2.57
time (sec)	N/A	1.135	0.542	1.089	0.092	0.000	0.000	0.237	0.282	12.687

Problem 45	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	257	257	254	493	513	889	1057	522	1145	498
N.S.	1	1.00	0.99	1.92	2.00	3.46	4.11	2.03	4.46	1.94
time (sec)	N/A	1.027	0.150	0.812	0.059	0.147	173.395	0.234	0.313	11.072

Problem 46	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	235	235	228	404	430	736	881	432	947	403
N.S.	1	1.00	0.97	1.72	1.83	3.13	3.75	1.84	4.03	1.71
time (sec)	N/A	0.913	0.191	0.799	0.093	0.110	47.644	0.226	0.267	10.972

Problem 47	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	177	319	347	627	653	390	807	345
N.S.	1	1.00	0.96	1.72	1.88	3.39	3.53	2.11	4.36	1.86
time (sec)	N/A	0.772	0.141	0.842	0.037	0.088	14.472	0.274	0.246	10.993

Problem 48	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	198	198	190	259	293	558	660	320	741	319
N.S.	1	1.00	0.96	1.31	1.48	2.82	3.33	1.62	3.74	1.61
time (sec)	N/A	0.773	0.292	0.840	0.036	0.086	5.052	0.261	0.245	10.847

Problem 49	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	168	168	162	179	217	410	449	216	510	223
N.S.	1	1.00	0.96	1.07	1.29	2.44	2.67	1.29	3.04	1.33
time (sec)	N/A	0.674	0.163	0.773	0.035	0.110	1.613	0.249	0.241	10.824

Problem 50	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	B	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	279	279	276	287	612	1161	0	660	1492	512
N.S.	1	1.00	0.99	1.03	2.19	4.16	0.00	2.37	5.35	1.84
time (sec)	N/A	1.153	1.296	1.004	0.066	173.855	0.000	0.269	0.250	12.145

Problem 51	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	F(-1)	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	331	331	328	339	1043	0	0	1350	3700	879
N.S.	1	1.00	0.99	1.02	3.15	0.00	0.00	4.08	11.18	2.66
time (sec)	N/A	1.448	0.700	1.145	0.080	0.000	0.000	0.293	0.266	12.937

Problem 52	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	113	92	112	271	683	1304	334	111
N.S.	1	1.00	0.90	0.73	0.89	2.15	5.42	10.35	2.65	0.88
time (sec)	N/A	0.490	0.172	1.978	0.032	0.081	0.720	0.245	0.252	0.095

Problem 53	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	113	92	112	230	581	944	281	111
N.S.	1	1.00	0.90	0.73	0.89	1.83	4.61	7.49	2.23	0.88
time (sec)	N/A	0.467	0.171	1.980	0.028	0.077	0.527	0.234	0.244	10.911

Problem 54	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	114	92	112	190	180	632	228	111
N.S.	1	1.00	0.90	0.73	0.89	1.51	1.43	5.02	1.81	0.88
time (sec)	N/A	0.456	0.150	1.916	0.034	0.078	1.249	0.267	0.253	0.069

Problem 55	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	113	91	112	148	180	367	175	111
N.S.	1	1.00	0.90	0.72	0.89	1.17	1.43	2.91	1.39	0.88
time (sec)	N/A	0.452	0.137	1.905	0.033	0.074	1.109	0.270	0.245	0.072

Problem 56	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	113	92	112	108	178	160	122	111
N.S.	1	1.00	0.91	0.74	0.90	0.87	1.44	1.29	0.98	0.90
time (sec)	N/A	0.444	0.130	1.931	0.034	0.072	1.064	0.272	0.238	0.072

Problem 57	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	110	106	120	118	160	167	124	124
N.S.	1	1.00	0.90	0.87	0.98	0.97	1.31	1.37	1.02	1.02
time (sec)	N/A	0.444	0.138	0.793	0.028	0.075	3.707	0.255	0.237	10.788

Problem 58	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	110	96	116	128	539	151	130	137
N.S.	1	1.00	0.90	0.79	0.95	1.05	4.42	1.24	1.07	1.12
time (sec)	N/A	0.451	0.144	0.757	0.032	0.075	0.475	0.273	0.206	0.086

Problem 59	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	111	95	117	141	784	141	142	120
N.S.	1	1.00	0.91	0.78	0.96	1.16	6.43	1.16	1.16	0.98
time (sec)	N/A	0.456	0.176	0.826	0.035	0.086	0.681	0.264	0.251	10.890

Problem 60	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	273	259	291	562	1352	2546	692	254
N.S.	1	1.00	1.02	0.97	1.09	2.10	5.06	9.54	2.59	0.95
time (sec)	N/A	0.805	0.384	2.341	0.036	0.082	1.037	0.306	0.241	10.960

Problem 61	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	B	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	273	256	291	494	437	1888	604	254
N.S.	1	1.00	1.02	0.96	1.09	1.85	1.64	7.07	2.26	0.95
time (sec)	N/A	0.710	0.370	2.280	0.033	0.087	1.703	0.275	0.239	10.770

Problem 62	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	272	258	291	425	437	1302	516	254
N.S.	1	1.00	1.02	0.97	1.09	1.59	1.64	4.88	1.93	0.95
time (sec)	N/A	0.715	0.331	2.226	0.037	0.084	1.602	0.253	0.241	0.060

Problem 63	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	273	257	291	357	437	788	428	254
N.S.	1	1.00	1.02	0.96	1.09	1.34	1.64	2.95	1.60	0.95
time (sec)	N/A	0.705	0.317	2.158	0.033	0.080	1.517	0.262	0.247	10.657

Problem 64	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	265	265	273	256	291	290	435	358	340	254
N.S.	1	1.00	1.03	0.97	1.10	1.09	1.64	1.35	1.28	0.96
time (sec)	N/A	0.697	0.289	2.319	0.035	0.076	1.525	0.279	0.237	10.723

Problem 65	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	273	259	299	299	384	443	342	296
N.S.	1	1.00	1.04	0.98	1.14	1.14	1.46	1.68	1.30	1.13
time (sec)	N/A	0.714	0.345	1.160	0.034	0.077	10.411	0.258	0.233	10.728

Problem 66	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	271	253	297	310	354	424	349	316
N.S.	1	1.00	1.03	0.96	1.13	1.18	1.35	1.61	1.33	1.20
time (sec)	N/A	0.701	0.348	1.082	0.033	0.085	10.780	0.283	0.244	0.075

Problem 67	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	272	257	298	322	1833	419	360	312
N.S.	1	1.00	1.03	0.98	1.13	1.22	6.97	1.59	1.37	1.19
time (sec)	N/A	0.693	0.354	1.237	0.034	0.084	0.750	0.245	0.238	10.806

Problem 68	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	228	252	239	224	0	1468	403	460	712	6515
N.S.	1	1.11	1.05	0.98	0.00	6.44	1.77	2.02	3.12	28.57
time (sec)	N/A	1.239	0.558	1.486	0.000	8.693	10.687	0.275	0.264	11.604

Problem 69	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	173	192	167	167	0	1000	303	303	471	5138
N.S.	1	1.11	0.97	0.97	0.00	5.78	1.75	1.75	2.72	29.70
time (sec)	N/A	0.973	0.394	1.377	0.000	2.132	10.015	0.269	0.244	11.231

Problem 70	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	145	123	129	0	640	236	187	273	3810
N.S.	1	1.11	0.94	0.98	0.00	4.89	1.80	1.43	2.08	29.08
time (sec)	N/A	0.749	0.288	1.411	0.000	0.425	11.700	0.259	0.244	0.597

Problem 71	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	108	101	103	0	444	197	109	136	2368
N.S.	1	1.07	1.00	1.02	0.00	4.40	1.95	1.08	1.35	23.45
time (sec)	N/A	0.580	0.364	1.460	0.000	0.130	8.992	0.287	0.243	11.298

Problem 72	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	88	84	69	0	483	172	75	178	1130
N.S.	1	1.02	0.98	0.80	0.00	5.62	2.00	0.87	2.07	13.14
time (sec)	N/A	0.525	0.322	1.301	0.000	0.146	11.137	0.265	0.238	0.439

Problem 73	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	B	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	143	118	111	0	787	206	121	335	3674
N.S.	1	1.21	1.00	0.94	0.00	6.67	1.75	1.03	2.84	31.14
time (sec)	N/A	0.750	0.582	1.317	0.000	0.236	13.271	0.272	0.251	12.505

Problem 74	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	208	159	155	0	1664	258	208	921	6340
N.S.	1	1.27	0.97	0.95	0.00	10.15	1.57	1.27	5.62	38.66
time (sec)	N/A	0.882	0.723	1.276	0.000	0.909	10.891	0.242	0.246	12.948

Problem 75	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	225	284	246	213	0	3036	326	376	1788	13404
N.S.	1	1.26	1.09	0.95	0.00	13.49	1.45	1.67	7.95	59.57
time (sec)	N/A	1.151	1.071	1.313	0.000	4.628	11.637	0.268	0.253	13.769

Problem 76	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	A	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	301	375	363	285	0	4712	410	604	2890	11601
N.S.	1	1.25	1.21	0.95	0.00	15.65	1.36	2.01	9.60	38.54
time (sec)	N/A	1.411	1.556	1.737	0.000	12.785	11.990	0.268	0.266	15.208

Problem 77	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	389	413	336	333	0	2706	0	834	1701	12636
N.S.	1	1.06	0.86	0.86	0.00	6.96	0.00	2.14	4.37	32.48
time (sec)	N/A	2.107	1.671	1.408	0.000	138.318	0.000	0.270	0.277	16.900

Problem 78	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	295	319	262	275	0	2098	0	625	1345	7328
N.S.	1	1.08	0.89	0.93	0.00	7.11	0.00	2.12	4.56	24.84
time (sec)	N/A	1.602	1.367	1.350	0.000	36.302	0.000	0.313	0.253	13.223

Problem 79	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	228	248	205	233	0	1583	0	452	1026	5878
N.S.	1	1.09	0.90	1.02	0.00	6.94	0.00	1.98	4.50	25.78
time (sec)	N/A	1.157	1.500	1.358	0.000	5.865	0.000	0.280	0.256	12.332

Problem 80	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	197	172	183	0	1140	0	316	735	4391
N.S.	1	1.07	0.93	0.99	0.00	6.20	0.00	1.72	3.99	23.86
time (sec)	N/A	0.801	1.123	1.240	0.000	0.518	0.000	0.234	0.257	11.745

Problem 81	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	170	151	166	0	1568	0	214	1009	2558
N.S.	1	0.99	0.88	0.97	0.00	9.17	0.00	1.25	5.90	14.96
time (sec)	N/A	0.696	0.979	1.249	0.000	0.307	0.000	0.239	0.246	11.696

Problem 82	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	195	223	183	192	0	1496	0	293	1297	5828
N.S.	1	1.14	0.94	0.98	0.00	7.67	0.00	1.50	6.65	29.89
time (sec)	N/A	0.887	1.778	1.223	0.000	1.369	0.000	0.269	0.275	13.541

Problem 83	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	308	263	219	0	3196	0	482	1965	8946
N.S.	1	1.17	1.00	0.83	0.00	12.15	0.00	1.83	7.47	34.02
time (sec)	N/A	1.360	1.738	1.246	0.000	9.050	0.000	0.282	0.264	15.036

Problem 84	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	351	410	385	267	0	5620	0	589	3890	18450
N.S.	1	1.17	1.10	0.76	0.00	16.01	0.00	1.68	11.08	52.56
time (sec)	N/A	1.887	2.632	1.675	0.000	25.460	0.000	0.273	0.282	15.366

Problem 85	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	466	535	553	347	0	8492	0	858	6046	20597
N.S.	1	1.15	1.19	0.74	0.00	18.22	0.00	1.84	12.97	44.20
time (sec)	N/A	2.442	3.616	1.693	0.000	68.452	0.000	0.297	0.326	16.388

Problem 86	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	F	A	A	F(-2)	B	F(-1)	B	B	B
verified	N/A	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	474	0	441	452	0	3983	0	1225	2894	16542
N.S.	1	0.00	0.93	0.95	0.00	8.40	0.00	2.58	6.11	34.90
time (sec)	N/A	0.000	2.873	1.523	0.000	71.044	0.000	0.290	0.302	14.969

Problem 87	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	F	A	A	F(-2)	B	F(-1)	B	B	B
verified	N/A	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	381	0	382	399	0	3372	0	1025	2453	11072
N.S.	1	0.00	1.00	1.05	0.00	8.85	0.00	2.69	6.44	29.06
time (sec)	N/A	0.000	3.734	1.374	0.000	16.286	0.000	0.278	0.283	16.577

Problem 88	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	373	358	334	360	0	2748	0	817	2012	7001
N.S.	1	0.96	0.90	0.97	0.00	7.37	0.00	2.19	5.39	18.77
time (sec)	N/A	1.343	2.862	1.368	0.000	1.885	0.000	0.291	0.285	13.494

Problem 89	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	F	A	A	F(-2)	B	F(-1)	B	B	B
verified	N/A	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	335	0	279	314	0	3465	0	635	2488	5796
N.S.	1	0.00	0.83	0.94	0.00	10.34	0.00	1.90	7.43	17.30
time (sec)	N/A	0.000	2.874	1.240	0.000	1.019	0.000	0.270	0.279	13.984

Problem 90	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	355	352	342	337	0	3353	0	813	2990	8411
N.S.	1	0.99	0.96	0.95	0.00	9.45	0.00	2.29	8.42	23.69
time (sec)	N/A	1.395	4.093	1.358	0.000	3.865	0.000	0.275	0.295	15.454

Problem 91	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	418	447	416	379	0	4265	0	1020	3571	11338
N.S.	1	1.07	1.00	0.91	0.00	10.20	0.00	2.44	8.54	27.12
time (sec)	N/A	1.781	4.684	1.430	0.000	16.733	0.000	0.262	0.318	16.903

Problem 92	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F(-1)	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	530	572	622	407	0	7357	0	1291	4744	23541
N.S.	1	1.08	1.17	0.77	0.00	13.88	0.00	2.44	8.95	44.42
time (sec)	N/A	2.345	4.511	1.521	0.000	58.105	0.000	0.280	0.339	19.466

Problem 93	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	F	A	A	A	A	A	A	F	B
verified	N/A	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	506	0	500	354	760	1023	906	534	26	827
N.S.	1	0.00	0.99	0.70	1.50	2.02	1.79	1.06	0.05	1.63
time (sec)	N/A	0.000	6.560	1.115	0.044	0.098	0.821	0.290	200.044	13.558

Problem 94	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	348	237	302	239	512	685	578	349	597	537
N.S.	1	0.68	0.87	0.69	1.47	1.97	1.66	1.00	1.72	1.54
time (sec)	N/A	0.723	3.289	1.091	0.039	0.093	0.765	0.236	1.429	12.566

Problem 95	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	213	136	186	144	295	409	311	194	326	299
N.S.	1	0.64	0.87	0.68	1.38	1.92	1.46	0.91	1.53	1.40
time (sec)	N/A	0.495	1.267	0.872	0.032	0.088	0.826	0.235	0.260	12.158

Problem 96	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F(-2)	A	F	F(-2)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	210	483	165	0	793	0	0	437	0
N.S.	1	1.06	2.43	0.83	0.00	3.98	0.00	0.00	2.20	0.00
time (sec)	N/A	0.845	4.468	1.157	0.000	0.510	0.000	0.000	0.294	0.000

Problem 97	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	F(-1)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	194	191	251	173	0	1509	0	0	1383	0
N.S.	1	0.98	1.29	0.89	0.00	7.78	0.00	0.00	7.13	0.00
time (sec)	N/A	0.682	11.292	1.250	0.000	0.280	0.000	0.000	0.395	0.000

Problem 98	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	262	364	255	0	2230	0	808	3315	0
N.S.	1	1.17	1.62	1.14	0.00	9.96	0.00	3.61	14.80	0.00
time (sec)	N/A	0.911	11.713	1.184	0.000	0.900	0.000	0.256	0.505	0.000

Problem 99	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	204	199	213	0	1213	0	1576	3909	0
N.S.	1	0.76	0.74	0.79	0.00	4.53	0.00	5.88	14.59	0.00
time (sec)	N/A	0.605	10.484	1.322	0.000	0.112	0.000	0.242	1.231	0.000

Problem 100	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	413	309	279	355	0	2187	0	1841	6853	0
N.S.	1	0.75	0.68	0.86	0.00	5.30	0.00	4.46	16.59	0.00
time (sec)	N/A	0.871	10.941	1.266	0.000	0.155	0.000	0.632	91.311	0.000

Problem 101	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	586	442	387	528	0	3451	0	4192	26	0
N.S.	1	0.75	0.66	0.90	0.00	5.89	0.00	7.15	0.04	0.00
time (sec)	N/A	1.357	12.848	1.490	0.000	0.258	0.000	0.300	200.041	0.000

Problem 102	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	498	274	471	336	728	988	1224	518	863	0
N.S.	1	0.55	0.95	0.67	1.46	1.98	2.46	1.04	1.73	0.00
time (sec)	N/A	0.820	4.366	1.054	0.039	0.101	0.826	0.214	43.313	0.000

Problem 103	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	317	173	301	212	434	604	666	302	490	0
N.S.	1	0.55	0.95	0.67	1.37	1.91	2.10	0.95	1.55	0.00
time (sec)	N/A	0.568	2.492	0.958	0.043	0.086	0.932	0.178	0.306	0.000

Problem 104	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F(-2)	A	F	F(-2)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	410	416	669	344	0	1688	0	0	1075	0
N.S.	1	1.01	1.63	0.84	0.00	4.12	0.00	0.00	2.62	0.00
time (sec)	N/A	1.565	8.929	1.201	0.000	17.085	0.000	0.000	0.361	0.000

Problem 105	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	F	F(-1)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	367	339	353	314	0	2012	0	0	1676	0
N.S.	1	0.92	0.96	0.86	0.00	5.48	0.00	0.00	4.57	0.00
time (sec)	N/A	1.212	11.877	1.240	0.000	1.905	0.000	0.000	0.472	0.000

Problem 106	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	382	322	702	351	0	3337	0	933	4983	0
N.S.	1	0.84	1.84	0.92	0.00	8.74	0.00	2.44	13.04	0.00
time (sec)	N/A	1.105	14.614	1.365	0.000	0.838	0.000	0.295	3.260	0.000

Problem 107	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	A	F(-2)	B	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	465	446	1416	502	0	5001	0	1796	26	0
N.S.	1	0.96	3.05	1.08	0.00	10.75	0.00	3.86	0.06	0.00
time (sec)	N/A	1.478	16.265	1.578	0.000	3.158	0.000	0.330	200.052	0.000

Problem 108	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	A	F(-2)	B	F	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	413	473	1867	464	0	5777	0	0	26	0
N.S.	1	1.15	4.52	1.12	0.00	13.99	0.00	0.00	0.06	0.00
time (sec)	N/A	1.492	16.300	1.332	0.000	11.082	0.000	0.000	200.033	0.000

Problem 109	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	526	277	268	387	0	2335	0	4306	26	0
N.S.	1	0.53	0.51	0.74	0.00	4.44	0.00	8.19	0.05	0.00
time (sec)	N/A	0.730	11.145	1.377	0.000	0.162	0.000	0.344	200.034	0.000

Problem 110	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	709	382	352	598	0	3731	0	5881	26	0
N.S.	1	0.54	0.50	0.84	0.00	5.26	0.00	8.29	0.04	0.00
time (sec)	N/A	1.042	11.675	1.549	0.000	0.259	0.000	0.360	200.035	0.000

Problem 111	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	968	515	505	839	0	5395	0	8108	26	0
N.S.	1	0.53	0.52	0.87	0.00	5.57	0.00	8.38	0.03	0.00
time (sec)	N/A	1.518	13.448	1.879	0.000	0.431	0.000	0.404	200.040	0.000

Problem 112	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	648	311	582	643	944	1293	2140	681	26	0
N.S.	1	0.48	0.90	0.99	1.46	2.00	3.30	1.05	0.04	0.00
time (sec)	N/A	0.898	6.630	0.979	0.041	0.102	0.973	0.253	200.039	0.000

Problem 113	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	B	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	418	210	371	397	573	803	1188	406	654	0
N.S.	1	0.50	0.89	0.95	1.37	1.92	2.84	0.97	1.56	0.00
time (sec)	N/A	0.652	3.801	0.945	0.041	0.093	1.299	0.270	0.436	0.000

Problem 114	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	F	F(-2)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	739	740	650	927	0	3052	0	0	1922	0
N.S.	1	1.00	0.88	1.25	0.00	4.13	0.00	0.00	2.60	0.00
time (sec)	N/A	2.594	12.710	1.090	0.000	141.516	0.000	0.000	0.531	0.000

Problem 115	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	F	F(-1)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	659	607	855	1051	0	3704	0	0	2929	0
N.S.	1	0.92	1.30	1.59	0.00	5.62	0.00	0.00	4.44	0.00
time (sec)	N/A	2.103	16.077	1.302	0.000	40.123	0.000	0.000	0.941	0.000

Problem 116	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	A	F(-2)	A	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	645	534	1945	498	0	4068	0	1448	26	0
N.S.	1	0.83	3.02	0.77	0.00	6.31	0.00	2.24	0.04	0.00
time (sec)	N/A	1.818	16.307	1.496	0.000	5.779	0.000	0.322	200.040	0.000

Problem 117	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	A	F(-2)	B	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	659	512	2131	455	0	5929	0	1929	26	0
N.S.	1	0.78	3.23	0.69	0.00	9.00	0.00	2.93	0.04	0.00
time (sec)	N/A	1.719	16.499	1.717	0.000	2.693	0.000	0.371	200.042	0.000

Problem 118	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	B	A	F(-2)	B	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	780	660	2578	593	0	8041	0	0	26	0
N.S.	1	0.85	3.31	0.76	0.00	10.31	0.00	0.00	0.03	0.00
time (sec)	N/A	2.118	16.637	1.704	0.000	8.468	0.000	0.000	200.043	0.000

Problem 119	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	F	A	A	A	A	A	A	B	F(-1)
verified	N/A	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	320	0	286	225	474	622	518	320	562	0
N.S.	1	0.00	0.89	0.70	1.48	1.94	1.62	1.00	1.76	0.00
time (sec)	N/A	0.000	0.822	1.079	0.041	0.108	0.868	0.196	0.300	0.000

Problem 120	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	205	200	192	148	299	392	347	196	342	0
N.S.	1	0.98	0.94	0.72	1.46	1.91	1.69	0.96	1.67	0.00
time (sec)	N/A	0.716	0.493	1.035	0.066	0.096	0.843	0.189	0.231	0.000

Problem 121	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	A	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	99	123	86	159	218	202	103	173	0
N.S.	1	0.85	1.06	0.74	1.37	1.88	1.74	0.89	1.49	0.00
time (sec)	N/A	0.417	0.258	0.799	0.034	0.085	0.900	0.174	0.287	0.000

Problem 122	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	F	F(-2)	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	113	158	78	0	527	0	0	285	0
N.S.	1	1.18	1.65	0.81	0.00	5.49	0.00	0.00	2.97	0.00
time (sec)	N/A	0.473	0.486	0.984	0.000	0.118	0.000	0.000	0.233	0.000

Problem 123	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	A	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	128	149	96	0	393	0	519	783	0
N.S.	1	1.17	1.37	0.88	0.00	3.61	0.00	4.76	7.18	0.00
time (sec)	N/A	0.452	0.885	1.137	0.000	0.107	0.000	0.344	0.264	0.000

Problem 124	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	231	217	187	0	951	0	772	3460	0
N.S.	1	1.16	1.09	0.94	0.00	4.78	0.00	3.88	17.39	0.00
time (sec)	N/A	0.716	10.393	1.109	0.000	0.108	0.000	0.342	0.394	0.000

Problem 125	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	314	364	345	294	0	1776	0	1693	6129	0
N.S.	1	1.16	1.10	0.94	0.00	5.66	0.00	5.39	19.52	0.00
time (sec)	N/A	1.137	11.701	1.346	0.000	0.149	0.000	0.197	1.022	0.000

Problem 126	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	A	F	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	201	245	287	218	367	695	0	258	555	0
N.S.	1	1.22	1.43	1.08	1.83	3.46	0.00	1.28	2.76	0.00
time (sec)	N/A	0.778	1.393	1.036	0.038	0.091	0.000	0.134	0.330	0.000

Problem 127	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	F	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	158	162	145	227	447	0	155	340	0
N.S.	1	1.21	1.24	1.11	1.73	3.41	0.00	1.18	2.60	0.00
time (sec)	N/A	0.627	0.877	1.047	0.043	0.089	0.000	0.230	0.264	0.000

Problem 128	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	F	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	85	101	88	125	255	0	90	163	101
N.S.	1	0.92	1.10	0.96	1.36	2.77	0.00	0.98	1.77	1.10
time (sec)	N/A	0.369	0.304	0.915	0.044	0.092	0.000	0.176	0.252	12.536

Problem 129	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	141	159	120	0	540	0	179	486	0
N.S.	1	1.08	1.21	0.92	0.00	4.12	0.00	1.37	3.71	0.00
time (sec)	N/A	0.502	0.705	1.162	0.000	0.092	0.000	0.156	0.366	0.000

Problem 130	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	238	262	265	228	0	1236	0	1281	2471	0
N.S.	1	1.10	1.11	0.96	0.00	5.19	0.00	5.38	10.38	0.00
time (sec)	N/A	0.773	1.746	1.254	0.000	0.115	0.000	0.435	0.496	0.000

Problem 131	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	384	403	377	363	0	2279	0	1117	5061	0
N.S.	1	1.05	0.98	0.95	0.00	5.93	0.00	2.91	13.18	0.00
time (sec)	N/A	1.226	11.539	1.395	0.000	0.235	0.000	0.149	0.982	0.000

Problem 132	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	A	F	A	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	298	357	326	300	795	975	0	377	26	0
N.S.	1	1.20	1.09	1.01	2.67	3.27	0.00	1.27	0.09	0.00
time (sec)	N/A	1.284	1.298	1.195	0.061	0.109	0.000	0.180	200.045	0.000

Problem 133	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	A	F	A	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	237	232	251	235	550	672	0	289	741	0
N.S.	1	0.98	1.06	0.99	2.32	2.84	0.00	1.22	3.13	0.00
time (sec)	N/A	0.751	0.971	1.058	0.049	0.099	0.000	0.192	2.177	0.000

Problem 134	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	B	A	F	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	92	149	128	347	189	0	174	504	190
N.S.	1	0.51	0.82	0.71	1.92	1.04	0.00	0.96	2.78	1.05
time (sec)	N/A	0.395	0.784	0.944	0.036	0.083	0.000	0.171	0.302	11.239

Problem 135	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	A	A	F	A	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	111	107	116	211	152	0	127	326	134
N.S.	1	0.71	0.68	0.74	1.34	0.97	0.00	0.81	2.08	0.85
time (sec)	N/A	0.450	0.394	0.925	0.035	0.080	0.000	0.174	0.265	11.066

Problem 136	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	B	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	292	309	341	280	0	1387	0	877	1558	0
N.S.	1	1.06	1.17	0.96	0.00	4.75	0.00	3.00	5.34	0.00
time (sec)	N/A	0.960	1.929	1.224	0.000	0.126	0.000	0.160	0.509	0.000

Problem 137	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	A	F(-2)	B	F	B	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	451	484	568	454	0	2579	0	2640	26	0
N.S.	1	1.07	1.26	1.01	0.00	5.72	0.00	5.85	0.06	0.00
time (sec)	N/A	1.595	3.748	1.441	0.000	0.260	0.000	0.477	200.038	0.000

Problem 138	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	462	445	473	716	0	580	0	0	1351	0
N.S.	1	0.96	1.02	1.55	0.00	1.26	0.00	0.00	2.92	0.00
time (sec)	N/A	1.293	18.034	1.246	0.000	0.116	0.000	0.000	8.875	0.000

Problem 139	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	341	322	355	516	0	465	0	0	1084	0
N.S.	1	0.94	1.04	1.51	0.00	1.36	0.00	0.00	3.18	0.00
time (sec)	N/A	0.917	17.972	1.212	0.000	0.109	0.000	0.000	6.018	0.000

Problem 140	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	320	285	287	544	0	496	0	0	1016	0
N.S.	1	0.89	0.90	1.70	0.00	1.55	0.00	0.00	3.18	0.00
time (sec)	N/A	0.801	18.336	1.750	0.000	0.117	0.000	0.000	4.113	0.000

Problem 141	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	347	354	357	635	0	749	0	0	0	0
N.S.	1	1.02	1.03	1.83	0.00	2.16	0.00	0.00	0.00	0.00
time (sec)	N/A	0.998	21.785	2.246	0.000	0.144	0.000	0.000	9.153	0.000

Problem 142	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	497	498	501	850	0	1256	0	0	0	0
N.S.	1	1.00	1.01	1.71	0.00	2.53	0.00	0.00	0.00	0.00
time (sec)	N/A	1.491	23.125	3.429	0.000	0.113	0.000	0.000	14.327	0.000

Problem 143	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	627	589	637	1050	0	717	0	0	0	0
N.S.	1	0.94	1.02	1.67	0.00	1.14	0.00	0.00	0.00	0.00
time (sec)	N/A	1.683	26.036	2.901	0.000	0.124	0.000	0.000	14.688	0.000

Problem 144	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	533	458	518	1179	0	837	0	0	0	0
N.S.	1	0.86	0.97	2.21	0.00	1.57	0.00	0.00	0.00	0.00
time (sec)	N/A	1.324	27.082	2.566	0.000	0.137	0.000	0.000	9.712	0.000

Problem 145	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	516	425	454	939	0	872	0	0	0	0
N.S.	1	0.82	0.88	1.82	0.00	1.69	0.00	0.00	0.00	0.00
time (sec)	N/A	1.220	26.116	3.002	0.000	0.153	0.000	0.000	23.413	0.000

Problem 146	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	564	520	540	962	0	1248	0	0	0	0
N.S.	1	0.92	0.96	1.71	0.00	2.21	0.00	0.00	0.00	0.00
time (sec)	N/A	1.541	27.874	4.594	0.000	0.187	0.000	0.000	23.150	0.000

Problem 147	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	459	478	490	782	0	580	0	0	0	0
N.S.	1	1.04	1.07	1.70	0.00	1.26	0.00	0.00	0.00	0.00
time (sec)	N/A	1.557	24.063	2.403	0.000	0.118	0.000	0.000	8.805	0.000

Problem 148	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	337	349	365	536	0	468	0	0	1213	0
N.S.	1	1.04	1.08	1.59	0.00	1.39	0.00	0.00	3.60	0.00
time (sec)	N/A	1.118	21.446	1.602	0.000	0.108	0.000	0.000	4.636	0.000

Problem 149	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	256	276	399	0	382	0	0	946	0
N.S.	1	1.02	1.10	1.58	0.00	1.52	0.00	0.00	3.75	0.00
time (sec)	N/A	0.755	16.000	1.388	0.000	0.108	0.000	0.000	2.268	0.000

Problem 150	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	A	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	214	214	0	307	0	0	90	0
N.S.	1	1.00	1.06	1.06	0.00	1.52	0.00	0.00	0.45	0.00
time (sec)	N/A	0.553	17.024	1.770	0.000	0.102	0.000	0.000	1.465	0.000

Problem 151	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	259	269	234	453	0	449	0	0	143	0
N.S.	1	1.04	0.90	1.75	0.00	1.73	0.00	0.00	0.55	0.00
time (sec)	N/A	0.766	19.586	2.722	0.000	0.091	0.000	0.000	1.444	0.000

Problem 152	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	363	373	361	620	0	787	0	0	195	0
N.S.	1	1.03	0.99	1.71	0.00	2.17	0.00	0.00	0.54	0.00
time (sec)	N/A	1.169	24.875	4.073	0.000	0.109	0.000	0.000	3.504	0.000

Problem 153	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	504	531	518	841	0	1350	0	0	247	0
N.S.	1	1.05	1.03	1.67	0.00	2.68	0.00	0.00	0.49	0.00
time (sec)	N/A	1.598	26.279	5.445	0.000	0.127	0.000	0.000	5.529	0.000

Problem 154	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	A	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	541	547	512	1164	0	924	0	0	0	0
N.S.	1	1.01	0.95	2.15	0.00	1.71	0.00	0.00	0.00	0.00
time (sec)	N/A	1.876	26.478	3.189	0.000	0.148	0.000	0.000	14.347	0.000

Problem 155	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	B	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	410	414	408	820	0	749	0	0	0	0
N.S.	1	1.01	1.00	2.00	0.00	1.83	0.00	0.00	0.00	0.00
time (sec)	N/A	1.335	25.096	2.925	0.000	0.131	0.000	0.000	8.919	0.000

Problem 156	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	304	308	316	593	0	586	0	0	0	0
N.S.	1	1.01	1.04	1.95	0.00	1.93	0.00	0.00	0.00	0.00
time (sec)	N/A	0.896	24.506	2.632	0.000	0.125	0.000	0.000	5.187	0.000

Problem 157	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	275	264	213	499	0	463	0	0	1320	0
N.S.	1	0.96	0.77	1.81	0.00	1.68	0.00	0.00	4.80	0.00
time (sec)	N/A	0.731	15.666	2.473	0.000	0.093	0.000	0.000	3.087	0.000

Problem 158	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	309	310	237	514	0	562	0	0	522	0
N.S.	1	1.00	0.77	1.66	0.00	1.82	0.00	0.00	1.69	0.00
time (sec)	N/A	0.855	17.621	3.478	0.000	0.088	0.000	0.000	2.902	0.000

Problem 159	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	426	426	386	737	0	1045	0	0	0	0
N.S.	1	1.00	0.91	1.73	0.00	2.45	0.00	0.00	0.00	0.00
time (sec)	N/A	1.204	25.922	4.201	0.000	0.100	0.000	0.000	5.099	0.000

Problem 160	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	583	591	525	823	0	1784	0	0	0	0
N.S.	1	1.01	0.90	1.41	0.00	3.06	0.00	0.00	0.00	0.00
time (sec)	N/A	1.826	28.436	5.513	0.000	0.173	0.000	0.000	8.401	0.000

Problem 161	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	B	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	555	545	548	1155	0	1259	0	0	0	0
N.S.	1	0.98	0.99	2.08	0.00	2.27	0.00	0.00	0.00	0.00
time (sec)	N/A	1.595	27.865	4.573	0.000	0.181	0.000	0.000	22.711	0.000

Problem 162	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	B	F	B	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	502	467	468	945	0	1041	0	0	0	0
N.S.	1	0.93	0.93	1.88	0.00	2.07	0.00	0.00	0.00	0.00
time (sec)	N/A	1.393	27.510	4.428	0.000	0.120	0.000	0.000	17.901	0.000

Problem 163	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	442	425	395	745	0	820	0	0	0	0
N.S.	1	0.96	0.89	1.69	0.00	1.86	0.00	0.00	0.00	0.00
time (sec)	N/A	1.285	25.381	4.415	0.000	0.103	0.000	0.000	15.651	0.000

Problem 164	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	477	439	450	732	0	1012	0	0	0	0
N.S.	1	0.92	0.94	1.53	0.00	2.12	0.00	0.00	0.00	0.00
time (sec)	N/A	1.305	23.946	4.297	0.000	0.106	0.000	0.000	11.167	0.000

Problem 165	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	581	557	531	771	0	1324	0	0	0	0
N.S.	1	0.96	0.91	1.33	0.00	2.28	0.00	0.00	0.00	0.00
time (sec)	N/A	1.613	28.639	5.297	0.000	0.118	0.000	0.000	9.934	0.000

Problem 166	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	C	A	F	B	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	741	727	644	912	0	2207	0	0	0	0
N.S.	1	0.98	0.87	1.23	0.00	2.98	0.00	0.00	0.00	0.00
time (sec)	N/A	2.346	30.662	6.105	0.000	0.206	0.000	0.000	14.684	0.000

Problem 167	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	484	484	525	2224	1527	3254	59148	6661	4635	2500
N.S.	1	1.00	1.08	4.60	3.15	6.72	122.21	13.76	9.58	5.17
time (sec)	N/A	1.363	1.601	1.028	0.093	0.131	12.900	0.209	0.844	13.059

Problem 168	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	309	1030	755	1417	20284	2823	1922	1176
N.S.	1	1.00	1.10	3.65	2.68	5.02	71.93	10.01	6.82	4.17
time (sec)	N/A	0.876	0.673	0.935	0.068	0.096	4.533	0.184	0.290	12.110

Problem 169	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	118	357	288	427	4537	841	544	400
N.S.	1	1.00	0.87	2.62	2.12	3.14	33.36	6.18	4.00	2.94
time (sec)	N/A	0.531	0.229	0.824	0.054	0.093	1.345	0.193	0.210	11.517

Problem 170	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	103	102	93	0	0	0	0	0	188	0
N.S.	1	0.99	0.90	0.00	0.00	0.00	0.00	0.00	1.83	0.00
time (sec)	N/A	0.449	0.178	0.000	0.000	0.000	0.000	0.000	0.223	0.000

Problem 171	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	221	240	207	0	0	0	0	0	0	0
N.S.	1	1.09	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	0.836	0.397	0.000	0.000	0.000	0.000	0.000	0.500	0.000

Problem 172	Optimal	Rubi	MMA	Maple	Maxima	Fricas	Sympy	Giac	Reduce	Mupad
grade	N/A	A	A	F	F	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	485	501	437	0	0	0	0	0	0	0
N.S.	1	1.03	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
time (sec)	N/A	1.736	1.099	0.000	0.000	0.000	0.000	0.000	0.322	0.000

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi only. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is also given. The larger this ratio is, the harder the integral is to solve. In this test file, problem number [114] had the largest ratio of [.4230769999999999981]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	2	2	1.00	22	0.091
2	A	2	2	1.00	22	0.091
3	A	2	2	1.00	22	0.091
4	A	2	2	1.00	20	0.100
5	A	2	2	1.00	22	0.091
6	A	2	2	1.00	22	0.091
7	A	2	2	1.00	22	0.091
8	A	2	2	1.00	22	0.091
9	A	2	2	1.00	22	0.091
10	A	2	2	1.00	22	0.091
11	A	2	2	1.00	24	0.083
12	A	2	2	1.00	24	0.083
13	A	2	2	1.00	22	0.091
14	A	2	2	1.00	24	0.083
15	A	2	2	1.00	24	0.083
16	A	2	2	1.00	24	0.083
17	A	2	2	1.00	24	0.083
18	A	2	2	1.00	24	0.083
19	A	2	2	1.00	24	0.083
20	A	2	2	1.00	24	0.083
21	A	2	2	1.00	24	0.083

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
22	A	2	2	1.00	24	0.083
23	A	2	2	1.00	24	0.083
24	A	2	2	1.00	24	0.083
25	A	2	2	1.00	22	0.091
26	A	2	2	1.00	24	0.083
27	A	2	2	1.00	24	0.083
28	A	2	2	1.00	24	0.083
29	A	2	2	1.00	24	0.083
30	A	2	2	1.00	24	0.083
31	A	2	2	1.00	24	0.083
32	A	2	2	1.00	24	0.083
33	A	2	2	1.00	22	0.091
34	A	2	2	1.00	24	0.083
35	A	2	2	1.00	24	0.083
36	A	2	2	1.00	24	0.083
37	A	2	2	1.00	24	0.083
38	A	2	2	1.00	24	0.083
39	A	2	2	1.00	24	0.083
40	A	2	2	1.00	24	0.083
41	A	2	2	1.00	22	0.091
42	A	2	2	1.00	24	0.083
43	A	2	2	1.00	24	0.083
44	A	2	2	1.00	24	0.083
45	A	2	2	1.00	24	0.083
46	A	2	2	1.00	24	0.083
47	A	2	2	1.00	24	0.083
48	A	2	2	1.00	24	0.083
49	A	2	2	1.00	22	0.091
50	A	2	2	1.00	24	0.083
51	A	2	2	1.00	24	0.083
52	A	2	2	1.00	24	0.083
53	A	2	2	1.00	24	0.083

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
54	A	2	2	1.00	24	0.083
55	A	2	2	1.00	24	0.083
56	A	2	2	1.00	24	0.083
57	A	2	2	1.00	24	0.083
58	A	2	2	1.00	24	0.083
59	A	2	2	1.00	24	0.083
60	A	2	2	1.00	26	0.077
61	A	2	2	1.00	26	0.077
62	A	2	2	1.00	26	0.077
63	A	2	2	1.00	26	0.077
64	A	2	2	1.00	26	0.077
65	A	2	2	1.00	26	0.077
66	A	2	2	1.00	26	0.077
67	A	2	2	1.00	26	0.077
68	A	9	8	1.11	26	0.308
69	A	8	7	1.11	26	0.269
70	A	7	6	1.11	26	0.231
71	A	6	5	1.07	26	0.192
72	A	5	4	1.02	26	0.154
73	A	6	5	1.21	26	0.192
74	A	7	6	1.27	26	0.231
75	A	8	7	1.26	26	0.269
76	A	9	8	1.25	26	0.308
77	A	11	10	1.06	26	0.385
78	A	10	9	1.08	26	0.346
79	A	9	8	1.09	26	0.308
80	A	7	6	1.07	26	0.231
81	A	8	7	0.99	26	0.269
82	A	8	7	1.14	26	0.269
83	A	9	8	1.17	26	0.308
84	A	10	9	1.17	26	0.346
85	A	11	10	1.15	26	0.385

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
86	F	0	0	N/A	0.000	N/A
87	F	0	0	N/A	0.000	N/A
88	A	9	8	0.96	26	0.308
89	F	0	0	N/A	0.000	N/A
90	A	10	9	0.99	26	0.346
91	A	9	8	1.07	26	0.308
92	A	10	9	1.08	26	0.346
93	F	0	0	N/A	0.000	N/A
94	A	7	6	0.68	26	0.231
95	A	5	4	0.64	24	0.167
96	A	8	7	1.06	26	0.269
97	A	7	6	0.98	26	0.231
98	A	8	7	1.17	26	0.269
99	A	5	4	0.76	26	0.154
100	A	7	6	0.75	26	0.231
101	A	10	9	0.75	26	0.346
102	A	8	7	0.55	26	0.269
103	A	6	5	0.55	24	0.208
104	A	10	9	1.01	26	0.346
105	A	9	8	0.92	26	0.308
106	A	9	8	0.84	26	0.308
107	A	10	9	0.96	26	0.346
108	A	10	9	1.15	26	0.346
109	A	6	5	0.53	26	0.192
110	A	9	8	0.54	26	0.308
111	A	11	10	0.53	26	0.385
112	A	9	8	0.48	26	0.308
113	A	7	6	0.50	24	0.250
114	A	12	11	1.00	26	0.423
115	A	11	10	0.92	26	0.385
116	A	11	10	0.83	26	0.385
117	A	12	11	0.78	26	0.423

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
118	A	11	10	0.85	26	0.385
119	F	0	0	N/A	0.000	N/A
120	A	6	5	0.98	26	0.192
121	A	4	3	0.85	24	0.125
122	A	6	5	1.18	26	0.192
123	A	4	3	1.17	26	0.115
124	A	6	5	1.16	26	0.192
125	A	8	7	1.16	26	0.269
126	A	6	5	1.22	26	0.192
127	A	6	5	1.21	26	0.192
128	A	4	3	0.92	24	0.125
129	A	5	4	1.08	26	0.154
130	A	6	5	1.10	26	0.192
131	A	8	7	1.05	26	0.269
132	A	8	7	1.20	26	0.269
133	A	6	5	0.98	26	0.192
134	A	2	2	0.51	26	0.077
135	A	2	2	0.71	24	0.083
136	A	7	6	1.06	26	0.231
137	A	8	7	1.07	26	0.269
138	A	10	10	0.96	29	0.345
139	A	8	8	0.94	29	0.276
140	A	8	8	0.89	29	0.276
141	A	8	8	1.02	29	0.276
142	A	10	10	1.00	29	0.345
143	A	10	10	0.94	29	0.345
144	A	10	10	0.86	29	0.345
145	A	10	10	0.82	29	0.345
146	A	10	10	0.92	29	0.345
147	A	12	12	1.04	29	0.414
148	A	10	10	1.04	29	0.345
149	A	8	8	1.02	29	0.276

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
150	A	6	6	1.00	29	0.207
151	A	8	8	1.04	29	0.276
152	A	10	10	1.03	29	0.345
153	A	12	12	1.05	29	0.414
154	A	12	12	1.01	29	0.414
155	A	10	10	1.01	29	0.345
156	A	8	8	1.01	29	0.276
157	A	8	8	0.96	29	0.276
158	A	8	8	1.00	29	0.276
159	A	10	10	1.00	29	0.345
160	A	12	12	1.01	29	0.414
161	A	10	10	0.98	29	0.345
162	A	10	10	0.93	29	0.345
163	A	10	10	0.96	29	0.345
164	A	10	10	0.92	29	0.345
165	A	10	10	0.96	29	0.345
166	A	12	12	0.98	29	0.414
167	A	2	2	1.00	24	0.083
168	A	2	2	1.00	24	0.083
169	A	2	2	1.00	22	0.091
170	A	2	2	0.99	24	0.083
171	A	4	4	1.09	24	0.167
172	A	4	4	1.03	24	0.167

CHAPTER 3

Listing of integrals

3.1 $\int (A+Bx)(d+ex)^4 \left(bx+cx^2\right) \, dx$

Optimal result

Integrand size = 22, antiderivative size = 118

$$\int (A+Bx)(d+ex)^4 \left(bx+cx^2\right) \, dx = -\frac{d(Bd-Ae)(cd-be)(d+ex)^5}{5e^4} + \frac{(Bd(3cd-2be)-Ae(2cd-be))(d+ex)^6}{6e^4} - \frac{(3Bcd-bBe-Ace)(d+ex)^7}{7e^4} + \frac{Bc(d+ex)^8}{8e^4}$$

output
```
-1/5*d*(-A*e+B*d)*(-b*e+c*d)*(e*x+d)^5/e^4+1/6*(B*d*(-2*b*e+3*c*d)-A*e*(-b
*e+2*c*d))*(e*x+d)^6/e^4-1/7*(-A*c*e-B*b*e+3*B*c*d)*(e*x+d)^7/e^4+1/8*B*c*
(e*x+d)^8/e^4
```

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.50

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)\,dx=\frac{1}{2}Abd^4x^2+\frac{1}{3}d^3(bBd+Acd+4Abe)x^3+\frac{1}{4}d^2(2Ae(2cd+3be)+Bd(cd+4be))x^4+\frac{2}{5}de(Ae(3cd+2be)+Bd(2cd+3be))x^5+\frac{1}{6}e^2(Ae(4cd+be)+2Bd(3cd+2be))x^6+\frac{1}{7}e^3(4Bcd+bBe+Ace)x^7+\frac{1}{8}Bce^4x^8$$

input
```
Integrate[(A + B*x)*(d + e*x)^4*(b*x + c*x^2),x]
```

output
```
(A*b*d^4*x^2)/2 + (d^3*(b*B*d + A*c*d + 4*A*b*e)*x^3)/3 + (d^2*(2*A*e*(2*c
*d + 3*b*e) + B*d*(c*d + 4*b*e))*x^4)/4 + (2*d*e*(A*e*(3*c*d + 2*b*e) + B*
d*(2*c*d + 3*b*e))*x^5)/5 + (e^2*(A*e*(4*c*d + b*e) + 2*B*d*(3*c*d + 2*b*e
))*x^6)/6 + (e^3*(4*B*c*d + b*B*e + A*c*e)*x^7)/7 + (B*c*e^4*x^8)/8
```

Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)(d+ex)^4\,dx$$

$$\Big\downarrow \text{ 1195}$$

$$\int \left(\frac{(d+ex)^6(Ace+bBe-3Bcd)}{e^3}+\frac{(d+ex)^5(Bd(3cd-2be)-Ae(2cd-be))}{e^3}-\frac{d(d+ex)^4(Bd-Ae)(cd-b

$$-\frac{(d+ex)^7(-Ace-bBe+3Bcd)}{7e^4}+\frac{(d+ex)^6(Bd(3cd-2be)-Ae(2cd-be))}{6e^4}-\frac{d(d+ex)^5(Bd-Ae)(cd-be)}{5e^4}+\frac{Bc(d+ex)^8}{8e^4}$$

input

```
Int[(A + B*x)*(d + e*x)^4*(b*x + c*x^2),x]
```

output

```
-1/5*(d*(B*d - A*e)*(c*d - b*e)*(d + e*x)^5)/e^4 + ((B*d*(3*c*d - 2*b*e) -
 A*e*(2*c*d - b*e))*(d + e*x)^6)/(6*e^4) - ((3*B*c*d - b*B*e - A*c*e)*(d +
 e*x)^7)/(7*e^4) + (B*c*(d + e*x)^8)/(8*e^4)
```

Defintions of rubi rules used

rule 1195

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

rule 2009

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

Maple [A] (verified)

Time = 0.55 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.61

method	result
norman	$\frac{B e^4 c x^8}{8}+\left(\frac{1}{7}Ac e^4+\frac{1}{7}B e^4 b+\frac{4}{7}Bcd e^3\right)x^7+\left(\frac{1}{6}Ab e^4+\frac{2}{3}Acd e^3+\frac{2}{3}Bbd e^3+Bc d^2e^2\right)x^6+$
default	$\frac{B e^4 c x^8}{8}+\frac{\left(\left(A e^4+4Bd e^3\right)c+B e^4 b\right)x^7}{7}+\frac{\left(\left(4Ad e^3+6B d^2e^2\right)c+\left(A e^4+4Bd e^3\right)b\right)x^6}{6}+\frac{\left(\left(6A d^2e^2+4B d^3e\right)c+\left(4Ad e^3\right.\right.}{5}$
gosper	$x^2\left(105B e^4c x^6+120x^5Ac e^4+120x^5B e^4b+480x^5Bcd e^3+140x^4Ab e^4+560x^4Acd e^3+560x^4Bbd e^3+840x^4Bc d^2e^2+672x^3\right.$
risch	$\frac{1}{8}B e^4c x^8+\frac{1}{7}x^7Ac e^4+\frac{1}{7}x^7B e^4b+\frac{4}{7}x^7Bcd e^3+\frac{1}{6}x^6Ab e^4+\frac{2}{3}x^6Acd e^3+\frac{2}{3}x^6Bbd e^3+x^6$
parallelrisch	$\frac{1}{8}B e^4c x^8+\frac{1}{7}x^7Ac e^4+\frac{1}{7}x^7B e^4b+\frac{4}{7}x^7Bcd e^3+\frac{1}{6}x^6Ab e^4+\frac{2}{3}x^6Acd e^3+\frac{2}{3}x^6Bbd e^3+x^6$
orering	$x\left(105B e^4c x^6+120x^5Ac e^4+120x^5B e^4b+480x^5Bcd e^3+140x^4Ab e^4+560x^4Acd e^3+560x^4Bbd e^3+840x^4Bc d^2e^2+672x^3\right.$

input
```
int((B*x+A)*(e*x+d)^4*(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
1/8*B*e^4*c*x^8+(1/7*A*c*e^4+1/7*B*e^4*b+4/7*B*c*d*e^3)*x^7+(1/6*A*b*e^4+2
/3*A*c*d*e^3+2/3*B*b*d*e^3+B*c*d^2*e^2)*x^6+(4/5*A*b*d*e^3+6/5*A*c*d^2*e^2
+6/5*B*b*d^2*e^2+4/5*B*c*d^3*e)*x^5+(3/2*A*b*d^2*e^2+A*c*d^3*e+B*b*d^3*e+1
/4*B*c*d^4)*x^4+(4/3*A*b*d^3*e+1/3*A*c*d^4+1/3*B*b*d^4)*x^3+1/2*A*d^4*b*x^
2
```

Fricas [A] (verification not implemented)

Time = 0.06 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.51

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)\,dx=\frac{1}{8}\,Bce^4x^8+\frac{1}{2}\,Abd^4x^2+\frac{1}{7}\left(4\,Bcde^3+(Bb+Ac)e^4\right)x^7+\frac{1}{6}\left(6\,Bcd^2e^2+Abe^4+4\,(Bb+Ac)de^3\right)x^6+\frac{2}{5}\left(2\,Bcd^3e+2\,Abde^3+3\,(Bb+Ac)d^2e^2\right)x^5+\frac{1}{4}\left(Bcd^4+6\,Abd^2e^2+4\,(Bb+Ac)d^3e\right)x^4+\frac{1}{3}\left(4\,Abd^3e+(Bb+Ac)d^4\right)x^3$$

input
```
integrate((B*x+A)*(e*x+d)^4*(c*x^2+b*x),x, algorithm="fricas")
```

output
```
1/8*B*c*e^4*x^8 + 1/2*A*b*d^4*x^2 + 1/7*(4*B*c*d*e^3 + (B*b + A*c)*e^4)*x^
7 + 1/6*(6*B*c*d^2*e^2 + A*b*e^4 + 4*(B*b + A*c)*d*e^3)*x^6 + 2/5*(2*B*c*d
^3*e + 2*A*b*d*e^3 + 3*(B*b + A*c)*d^2*e^2)*x^5 + 1/4*(B*c*d^4 + 6*A*b*d^2
*e^2 + 4*(B*b + A*c)*d^3*e)*x^4 + 1/3*(4*A*b*d^3*e + (B*b + A*c)*d^4)*x^3
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 230 vs. $2(112) = 224$.

Time = 0.03 (sec) , antiderivative size = 230, normalized size of antiderivative = 1.95

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)\,dx = \frac{Abd^4x^2}{2} + \frac{Bce^4x^8}{8} + x^7\left(\frac{Ace^4}{7} + \frac{Bbe^4}{7} + \frac{4Bcde^3}{7}\right) + x^6\left(\frac{Abe^4}{6} + \frac{2Acde^3}{3} + \frac{2Bbde^3}{3} + Bcd^2e^2\right) + x^5 \cdot \left(\frac{4Abde^3}{5} + \frac{6Acd^2e^2}{5} + \frac{6Bbd^2e^2}{5} + \frac{4Bcd^3e}{5}\right) + x^4 \cdot \left(\frac{3Abd^2e^2}{2} + Acd^3e + Bbd^3e + \frac{Bcd^4}{4}\right) + x^3 \cdot \left(\frac{4Abd^3e}{3} + \frac{Acd^4}{3} + \frac{Bbd^4}{3}\right)$$

input
```
integrate((B*x+A)*(e*x+d)**4*(c*x**2+b*x),x)
```

output
```
A*b*d**4*x**2/2 + B*c*e**4*x**8/8 + x**7*(A*c*e**4/7 + B*b*e**4/7 + 4*B*c*
d*e**3/7) + x**6*(A*b*e**4/6 + 2*A*c*d*e**3/3 + 2*B*b*d*e**3/3 + B*c*d**2*
e**2) + x**5*(4*A*b*d*e**3/5 + 6*A*c*d**2*e**2/5 + 6*B*b*d**2*e**2/5 + 4*B
*c*d**3*e/5) + x**4*(3*A*b*d**2*e**2/2 + A*c*d**3*e + B*b*d**3*e + B*c*d**
4/4) + x**3*(4*A*b*d**3*e/3 + A*c*d**4/3 + B*b*d**4/3)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.51

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)\,dx = \frac{1}{8}\,Bce^4x^8 + \frac{1}{2}\,Abd^4x^2 + \frac{1}{7}\left(4\,Bcde^3 + (Bb+Ac)e^4\right)x^7 + \frac{1}{6}\left(6\,Bcd^2e^2 + Abe^4 + 4\,(Bb+Ac)de^3\right)x^6 + \frac{2}{5}\left(2\,Bcd^3e + 2\,Abde^3 + 3\,(Bb+Ac)d^2e^2\right)x^5 + \frac{1}{4}\left(Bcd^4 + 6\,Abd^2e^2 + 4\,(Bb+Ac)d^3e\right)x^4 + \frac{1}{3}\left(4\,Abd^3e + (Bb+Ac)d^4\right)x^3$$

input
```
integrate((B*x+A)*(e*x+d)^4*(c*x^2+b*x),x, algorithm="maxima")
```

output
```
1/8*B*c*e^4*x^8 + 1/2*A*b*d^4*x^2 + 1/7*(4*B*c*d*e^3 + (B*b + A*c)*e^4)*x^
7 + 1/6*(6*B*c*d^2*e^2 + A*b*e^4 + 4*(B*b + A*c)*d*e^3)*x^6 + 2/5*(2*B*c*d
^3*e + 2*A*b*d*e^3 + 3*(B*b + A*c)*d^2*e^2)*x^5 + 1/4*(B*c*d^4 + 6*A*b*d^2
*e^2 + 4*(B*b + A*c)*d^3*e)*x^4 + 1/3*(4*A*b*d^3*e + (B*b + A*c)*d^4)*x^3
```

Giac [A] (verification not implemented)

Time = 0.20 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.85

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)\,dx = \frac{1}{8}Bce^4x^8 + \frac{4}{7}Bcde^3x^7 + \frac{1}{7}Bbe^4x^7 + \frac{1}{7}Ace^4x^7 + Bcd^2e^2x^6 + \frac{2}{3}Bbde^3x^6 + \frac{2}{3}Acde^3x^6 + \frac{1}{6}Abe^4x^6 + \frac{4}{5}Bcd^3ex^5 + \frac{6}{5}Bbd^2e^2x^5 + \frac{6}{5}Acd^2e^2x^5 + \frac{4}{5}Abde^3x^5 + \frac{1}{4}Bcd^4x^4 + Bbd^3ex^4 + Acd^3ex^4 + \frac{3}{2}Abd^2e^2x^4 + \frac{1}{3}Bbd^4x^3 + \frac{1}{3}Acd^4x^3 + \frac{4}{3}Abd^3ex^3 + \frac{1}{2}Abd^4x^2$$

input
```
integrate((B*x+A)*(e*x+d)^4*(c*x^2+b*x),x, algorithm="giac")
```

output
```
1/8*B*c*e^4*x^8 + 4/7*B*c*d*e^3*x^7 + 1/7*B*b*e^4*x^7 + 1/7*A*c*e^4*x^7 +
B*c*d^2*e^2*x^6 + 2/3*B*b*d*e^3*x^6 + 2/3*A*c*d*e^3*x^6 + 1/6*A*b*e^4*x^6
+ 4/5*B*c*d^3*e*x^5 + 6/5*B*b*d^2*e^2*x^5 + 6/5*A*c*d^2*e^2*x^5 + 4/5*A*b*
d*e^3*x^5 + 1/4*B*c*d^4*x^4 + B*b*d^3*e*x^4 + A*c*d^3*e*x^4 + 3/2*A*b*d^2*
e^2*x^4 + 1/3*B*b*d^4*x^3 + 1/3*A*c*d^4*x^3 + 4/3*A*b*d^3*e*x^3 + 1/2*A*b*
d^4*x^2
```

Mupad [B] (verification not implemented)

Time = 10.75 (sec) , antiderivative size = 182, normalized size of antiderivative = 1.54

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)\,dx$$
$$=x^4\left(\frac{B\,c\,d^4}{4}+A\,c\,d^3\,e+B\,b\,d^3\,e+\frac{3\,A\,b\,d^2\,e^2}{2}\right)$$
$$+x^6\left(\frac{A\,b\,e^4}{6}+\frac{2\,A\,c\,d\,e^3}{3}+\frac{2\,B\,b\,d\,e^3}{3}+B\,c\,d^2\,e^2\right)$$
$$+x^3\left(\frac{A\,c\,d^4}{3}+\frac{B\,b\,d^4}{3}+\frac{4\,A\,b\,d^3\,e}{3}\right)+x^7\left(\frac{A\,c\,e^4}{7}+\frac{B\,b\,e^4}{7}+\frac{4\,B\,c\,d\,e^3}{7}\right)$$
$$+\frac{2\,d\,e\,x^5\,(2\,A\,b\,e^2+2\,B\,c\,d^2+3\,A\,c\,d\,e+3\,B\,b\,d\,e)}{5}+\frac{A\,b\,d^4\,x^2}{2}+\frac{B\,c\,e^4\,x^8}{8}$$

input
```
int((b*x + c*x^2)*(A + B*x)*(d + e*x)^4,x)
```

output
```
x^4*((B*c*d^4)/4 + A*c*d^3*e + B*b*d^3*e + (3*A*b*d^2*e^2)/2) + x^6*((A*b*
e^4)/6 + (2*A*c*d*e^3)/3 + (2*B*b*d*e^3)/3 + B*c*d^2*e^2) + x^3*((A*c*d^4)
/3 + (B*b*d^4)/3 + (4*A*b*d^3*e)/3) + x^7*((A*c*e^4)/7 + (B*b*e^4)/7 + (4*
B*c*d*e^3)/7) + (2*d*e*x^5*(2*A*b*e^2 + 2*B*c*d^2 + 3*A*c*d*e + 3*B*b*d*e)
)/5 + (A*b*d^4*x^2)/2 + (B*c*e^4*x^8)/8
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 222, normalized size of antiderivative = 1.88

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)\,dx$$
$$=\frac{x^2(105bc\,e^4x^6+120ac\,e^4x^5+120b^2e^4x^5+480bcd\,e^3x^5+140ab\,e^4x^4+560acd\,e^3x^4+560b^2d\,e^3x^4+840b}{}$$

input
```
int((B*x+A)*(e*x+d)^4*(c*x^2+b*x),x)
```

output

```
(x**2*(420*a*b*d**4 + 1120*a*b*d**3*e*x + 1260*a*b*d**2*e**2*x**2 + 672*a*
b*d*e**3*x**3 + 140*a*b*e**4*x**4 + 280*a*c*d**4*x + 840*a*c*d**3*e*x**2 +
 1008*a*c*d**2*e**2*x**3 + 560*a*c*d*e**3*x**4 + 120*a*c*e**4*x**5 + 280*b
**2*d**4*x + 840*b**2*d**3*e*x**2 + 1008*b**2*d**2*e**2*x**3 + 560*b**2*d*
e**3*x**4 + 120*b**2*e**4*x**5 + 210*b*c*d**4*x**2 + 672*b*c*d**3*e*x**3 +
 840*b*c*d**2*e**2*x**4 + 480*b*c*d*e**3*x**5 + 105*b*c*e**4*x**6))/840
```

3.2 $\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right) \, dx$

Optimal result

Integrand size = 22, antiderivative size = 118

$$\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right) \, dx = -\frac{d(Bd-Ae)(cd-be)(d+ex)^4}{4e^4} + \frac{(Bd(3cd-2be)-Ae(2cd-be))(d+ex)^5}{5e^4} - \frac{(3Bcd-bBe-Ace)(d+ex)^6}{6e^4} + \frac{Bc(d+ex)^7}{7e^4}$$

output
```
-1/4*d*(-A*e+B*d)*(-b*e+c*d)*(e*x+d)^4/e^4+1/5*(B*d*(-2*b*e+3*c*d)-A*e*(-b
*e+2*c*d))*(e*x+d)^5/e^4-1/6*(-A*c*e-B*b*e+3*B*c*d)*(e*x+d)^6/e^4+1/7*B*c*
(e*x+d)^7/e^4
```

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 135, normalized size of antiderivative = 1.14

$$\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right) \, dx = \frac{1}{2}Abd^3x^2 + \frac{1}{3}d^2(bBd+Acd+3Abe)x^3 + \frac{1}{4}d(3Ae(cd+be)+Bd(cd+3be))x^4 + \frac{1}{5}e(3Bd(cd+be)+Ae(3cd+be))x^5 + \frac{1}{6}e^2(3Bcd+bBe+Ace)x^6 + \frac{1}{7}Bce^3x^7$$

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

output
```
(A*b*d^3*x^2)/2 + (d^2*(b*B*d + A*c*d + 3*A*b*e)*x^3)/3 + (d*(3*A*e*(c*d +
 b*e) + B*d*(c*d + 3*b*e))*x^4)/4 + (e*(3*B*d*(c*d + b*e) + A*e*(3*c*d + b
*e))*x^5)/5 + (e^2*(3*B*c*d + b*B*e + A*c*e)*x^6)/6 + (B*c*e^3*x^7)/7
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)(d+ex)^3\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{(d+ex)^5(Ace+bBe-3Bcd)}{e^3}+\frac{(d+ex)^4(Bd(3cd-2be)-Ae(2cd-be))}{e^3}-\frac{d(d+ex)^3(Bd-Ae)(cd-be)}{e^3}\right.$$

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

$$-\frac{(d+ex)^6(-Ace-bBe+3Bcd)}{6e^4}+\frac{(d+ex)^5(Bd(3cd-2be)-Ae(2cd-be))}{5e^4}-\frac{d(d+ex)^4(Bd-Ae)(cd-be)}{4e^4}+\frac{Bc(d+ex)^7}{7e^4}$$

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

output
```
-1/4*(d*(B*d - A*e)*(c*d - b*e)*(d + e*x)^4)/e^4 + ((B*d*(3*c*d - 2*b*e) -
 A*e*(2*c*d - b*e))*(d + e*x)^5)/(5*e^4) - ((3*B*c*d - b*B*e - A*c*e)*(d +
 e*x)^6)/(6*e^4) + (B*c*(d + e*x)^7)/(7*e^4)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.61 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.25

method	result
norman	$\frac{B\,e^{3} c\,x^{7}}{7}+\left(\frac{1}{6} A c\,e^{3}+\frac{1}{6} B\,e^{3} b+\frac{1}{2} B c d\,e^{2}\right) x^{6}+\left(\frac{1}{5} A b\,e^{3}+\frac{3}{5} A c d\,e^{2}+\frac{3}{5} B b d\,e^{2}+\frac{3}{5} B c\,d^{2} e\right) x^{5}+$
default	$\frac{B\,e^{3} c\,x^{7}}{7}+\frac{\left(\left(A\,e^{3}+3 B d\,e^{2}\right) c+B\,e^{3} b\right) x^{6}}{6}+\frac{\left(\left(3 A d\,e^{2}+3 e B\,d^{2}\right) c+\left(A\,e^{3}+3 B d\,e^{2}\right) b\right) x^{5}}{5}+\frac{\left(\left(3 A\,d^{2} e+B\,d^{3}\right) c+\left(3 A d\,e^{2}+3 e\right.\right.}{4}$
gosper	$\frac{x^{2}\left(60 B\,e^{3} c\,x^{5}+70 x^{4} A c\,e^{3}+70 x^{4} B\,e^{3} b+210 x^{4} B c d\,e^{2}+84 x^{3} A b\,e^{3}+252 x^{3} A c d\,e^{2}+252 x^{3} B b d\,e^{2}+252 x^{3} B c\,d^{2} e+315 x^{2} A b d\,e^{2}\right.}{420}$
risch	$\frac{1}{7} B\,e^{3} c\,x^{7}+\frac{1}{6} x^{6} A c\,e^{3}+\frac{1}{6} x^{6} B\,e^{3} b+\frac{1}{2} x^{6} B c d\,e^{2}+\frac{1}{5} x^{5} A b\,e^{3}+\frac{3}{5} x^{5} A c d\,e^{2}+\frac{3}{5} x^{5} B b d\,e^{2}+\frac{3}{5} x$
parallelrisch	$\frac{1}{7} B\,e^{3} c\,x^{7}+\frac{1}{6} x^{6} A c\,e^{3}+\frac{1}{6} x^{6} B\,e^{3} b+\frac{1}{2} x^{6} B c d\,e^{2}+\frac{1}{5} x^{5} A b\,e^{3}+\frac{3}{5} x^{5} A c d\,e^{2}+\frac{3}{5} x^{5} B b d\,e^{2}+\frac{3}{5} x$
orering	$\frac{x\left(60 B\,e^{3} c\,x^{5}+70 x^{4} A c\,e^{3}+70 x^{4} B\,e^{3} b+210 x^{4} B c d\,e^{2}+84 x^{3} A b\,e^{3}+252 x^{3} A c d\,e^{2}+252 x^{3} B b d\,e^{2}+252 x^{3} B c\,d^{2} e+315 x^{2} A b d\,e^{2}+\right.}{420 c x+420 b}$

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

output
```
1/7*B*e^3*c*x^7+(1/6*A*c*e^3+1/6*B*e^3*b+1/2*B*c*d*e^2)*x^6+(1/5*A*b*e^3+3
/5*A*c*d*e^2+3/5*B*b*d*e^2+3/5*B*c*d^2*e)*x^5+(3/4*A*b*d*e^2+3/4*A*c*d^2*e
+3/4*B*b*d^2*e+1/4*B*c*d^3)*x^4+(A*b*d^2*e+1/3*A*c*d^3+1/3*B*b*d^3)*x^3+1/
2*A*b*d^3*x^2
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.16

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)\,dx = \frac{1}{7}\,Bce^3x^7+\frac{1}{2}\,Abd^3x^2 + \frac{1}{6}\,\left(3\,Bcde^2+(Bb+Ac)e^3\right)x^6 + \frac{1}{5}\,\left(3\,Bcd^2e+Abe^3+3\,(Bb+Ac)de^2\right)x^5 + \frac{1}{4}\,\left(Bcd^3+3\,Abde^2+3\,(Bb+Ac)d^2e\right)x^4 + \frac{1}{3}\,\left(3\,Abd^2e+(Bb+Ac)d^3\right)x^3$$

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

output
```
1/7*B*c*e^3*x^7 + 1/2*A*b*d^3*x^2 + 1/6*(3*B*c*d*e^2 + (B*b + A*c)*e^3)*x^
6 + 1/5*(3*B*c*d^2*e + A*b*e^3 + 3*(B*b + A*c)*d*e^2)*x^5 + 1/4*(B*c*d^3 +
 3*A*b*d*e^2 + 3*(B*b + A*c)*d^2*e)*x^4 + 1/3*(3*A*b*d^2*e + (B*b + A*c)*d
^3)*x^3
```

Sympy [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.50

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)\,dx = \frac{Abd^3x^2}{2}+\frac{Bce^3x^7}{7}+x^6\left(\frac{Ace^3}{6}+\frac{Bbe^3}{6}+\frac{Bcde^2}{2}\right) + x^5\left(\frac{Abe^3}{5}+\frac{3Acde^2}{5}+\frac{3Bbde^2}{5}+\frac{3Bcd^2e}{5}\right) + x^4\cdot\left(\frac{3Abde^2}{4}+\frac{3Acd^2e}{4}+\frac{3Bbd^2e}{4}+\frac{Bcd^3}{4}\right) + x^3\left(Abd^2e+\frac{Acd^3}{3}+\frac{Bbd^3}{3}\right)$$

input
```
integrate((B*x+A)*(e*x+d)**3*(c*x**2+b*x),x)
```

output
```
A*b*d**3*x**2/2 + B*c*e**3*x**7/7 + x**6*(A*c*e**3/6 + B*b*e**3/6 + B*c*d*
e**2/2) + x**5*(A*b*e**3/5 + 3*A*c*d*e**2/5 + 3*B*b*d*e**2/5 + 3*B*c*d**2*
e/5) + x**4*(3*A*b*d*e**2/4 + 3*A*c*d**2*e/4 + 3*B*b*d**2*e/4 + B*c*d**3/4
) + x**3*(A*b*d**2*e + A*c*d**3/3 + B*b*d**3/3)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.16

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)\,dx = \frac{1}{7}\,Bce^3x^7 + \frac{1}{2}\,Abd^3x^2 + \frac{1}{6}\left(3\,Bcde^2 + (Bb+Ac)e^3\right)x^6 + \frac{1}{5}\left(3\,Bcd^2e + Abe^3 + 3\,(Bb+Ac)de^2\right)x^5 + \frac{1}{4}\left(Bcd^3 + 3\,Abde^2 + 3\,(Bb+Ac)d^2e\right)x^4 + \frac{1}{3}\left(3\,Abd^2e + (Bb+Ac)d^3\right)x^3$$

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

output
```
1/7*B*c*e^3*x^7 + 1/2*A*b*d^3*x^2 + 1/6*(3*B*c*d*e^2 + (B*b + A*c)*e^3)*x^
6 + 1/5*(3*B*c*d^2*e + A*b*e^3 + 3*(B*b + A*c)*d*e^2)*x^5 + 1/4*(B*c*d^3 +
 3*A*b*d*e^2 + 3*(B*b + A*c)*d^2*e)*x^4 + 1/3*(3*A*b*d^2*e + (B*b + A*c)*d
^3)*x^3
```

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.42

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)\,dx = \frac{1}{7}\,Bce^3x^7 + \frac{1}{2}\,Bcde^2x^6 + \frac{1}{6}\,Bbe^3x^6 + \frac{1}{6}\,Ace^3x^6 + \frac{3}{5}\,Bcd^2ex^5 + \frac{3}{5}\,Bbde^2x^5 + \frac{3}{5}\,Acde^2x^5 + \frac{1}{5}\,Abe^3x^5 + \frac{1}{4}\,Bcd^3x^4 + \frac{3}{4}\,Bbd^2ex^4 + \frac{3}{4}\,Acd^2ex^4 + \frac{3}{4}\,Abde^2x^4 + \frac{1}{3}\,Bbd^3x^3 + \frac{1}{3}\,Acd^3x^3 + Abd^2ex^3 + \frac{1}{2}\,Abd^3x^2$$

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

output
```
1/7*B*c*e^3*x^7 + 1/2*B*c*d*e^2*x^6 + 1/6*B*b*e^3*x^6 + 1/6*A*c*e^3*x^6 +
3/5*B*c*d^2*e*x^5 + 3/5*B*b*d*e^2*x^5 + 3/5*A*c*d*e^2*x^5 + 1/5*A*b*e^3*x^
5 + 1/4*B*c*d^3*x^4 + 3/4*B*b*d^2*e*x^4 + 3/4*A*c*d^2*e*x^4 + 3/4*A*b*d*e^
2*x^4 + 1/3*B*b*d^3*x^3 + 1/3*A*c*d^3*x^3 + A*b*d^2*e*x^3 + 1/2*A*b*d^3*x^
2
```

Mupad [B] (verification not implemented)

Time = 10.96 (sec) , antiderivative size = 146, normalized size of antiderivative = 1.24

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)\,dx = x^3\left(\frac{A\,c\,d^3}{3}+\frac{B\,b\,d^3}{3}+A\,b\,d^2\,e\right)+x^6\left(\frac{A\,c\,e^3}{6}+\frac{B\,b\,e^3}{6}+\frac{B\,c\,d\,e^2}{2}\right)+x^4\left(\frac{B\,c\,d^3}{4}+\frac{3\,A\,b\,d\,e^2}{4}+\frac{3\,A\,c\,d^2\,e}{4}+\frac{3\,B\,b\,d^2\,e}{4}\right)+x^5\left(\frac{A\,b\,e^3}{5}+\frac{3\,A\,c\,d\,e^2}{5}+\frac{3\,B\,b\,d\,e^2}{5}+\frac{3\,B\,c\,d^2\,e}{5}\right)+\frac{A\,b\,d^3\,x^2}{2}+\frac{B\,c\,e^3\,x^7}{7}$$

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

output
```
x^3*((A*c*d^3)/3 + (B*b*d^3)/3 + A*b*d^2*e) + x^6*((A*c*e^3)/6 + (B*b*e^3)
/6 + (B*c*d*e^2)/2) + x^4*((B*c*d^3)/4 + (3*A*b*d*e^2)/4 + (3*A*c*d^2*e)/4
 + (3*B*b*d^2*e)/4) + x^5*((A*b*e^3)/5 + (3*A*c*d*e^2)/5 + (3*B*b*d*e^2)/5
 + (3*B*c*d^2*e)/5) + (A*b*d^3*x^2)/2 + (B*c*e^3*x^7)/7
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.43

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)\,dx$$
$$= \frac{x^2(60bc\,e^3x^5+70ac\,e^3x^4+70b^2e^3x^4+210bcd\,e^2x^4+84ab\,e^3x^3+252acd\,e^2x^3+252b^2d\,e^2x^3+252bc\,d^2e$$

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

output
```
(x**2*(210*a*b*d**3 + 420*a*b*d**2*e*x + 315*a*b*d*e**2*x**2 + 84*a*b*e**3
*x**3 + 140*a*c*d**3*x + 315*a*c*d**2*e*x**2 + 252*a*c*d*e**2*x**3 + 70*a*
c*e**3*x**4 + 140*b**2*d**3*x + 315*b**2*d**2*e*x**2 + 252*b**2*d*e**2*x**
3 + 70*b**2*e**3*x**4 + 105*b*c*d**3*x**2 + 252*b*c*d**2*e*x**3 + 210*b*c*
d*e**2*x**4 + 60*b*c*e**3*x**5))/420
```

3.3 $\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right) \, dx$

Optimal result

Integrand size = 22, antiderivative size = 99

$$\begin{aligned}\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right) \, dx &= \frac{1}{2}Abd^2x^2 + \frac{1}{3}d(bBd+Acd+2Abe)x^3 \\ &\quad + \frac{1}{4}(Ae(2cd+be)+Bd(cd+2be))x^4 \\ &\quad + \frac{1}{5}e(2Bcd+bBe+Ace)x^5 + \frac{1}{6}Bce^2x^6\end{aligned}$$

output
```
1/2*A*b*d^2*x^2+1/3*d*(2*A*b*e+A*c*d+B*b*d)*x^3+1/4*(A*e*(b*e+2*c*d)+B*d*(
2*b*e+c*d))*x^4+1/5*e*(A*c*e+B*b*e+2*B*c*d)*x^5+1/6*B*c*e^2*x^6
```

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.92

$$\begin{aligned}\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right) \, dx &= \frac{1}{60}x^2 \left(30Abd^2 + 20d(bBd+Acd+2Abe)x\right. \\ &\quad + 15(Ae(2cd+be)+Bd(cd+2be))x^2 \\ &\quad \left.+ 12e(2Bcd+bBe+Ace)x^3 + 10Bce^2x^4\right)\end{aligned}$$

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

output
```
(x^2*(30*A*b*d^2 + 20*d*(b*B*d + A*c*d + 2*A*b*e)*x + 15*(A*e*(2*c*d + b*e
) + B*d*(c*d + 2*b*e))*x^2 + 12*e*(2*B*c*d + b*B*e + A*c*e)*x^3 + 10*B*c*e
^2*x^4))/60
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)(d+ex)^2\,dx$$

$$\Big\downarrow \ 1195$$

$$\int \left(ex^4(Ace+bBe+2Bcd)+x^3(Ae(be+2cd)+Bd(2be+cd))+dx^2(2Abe+Acd+bBd)+Abd^2x+Bce^2x^5\right)$$

$$\Big\downarrow \ 2009$$

$$\frac{1}{5}ex^5(Ace+bBe+2Bcd)+\frac{1}{4}x^4(Ae(be+2cd)+Bd(2be+cd))+\frac{1}{3}dx^3(2Abe+Acd+bBd)+\frac{1}{2}Abd^2x^2+\frac{1}{6}Bce^2x^6$$

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

output
```
(A*b*d^2*x^2)/2 + (d*(b*B*d + A*c*d + 2*A*b*e)*x^3)/3 + ((A*e*(2*c*d + b*e
) + B*d*(c*d + 2*b*e))*x^4)/4 + (e*(2*B*c*d + b*B*e + A*c*e)*x^5)/5 + (B*c
*e^2*x^6)/6
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.55 (sec) , antiderivative size = 103, normalized size of antiderivative = 1.04

method	result
norman	$\frac{B\,e^{2} c\,x^{6}}{6}+\left(\frac{1}{5}Ac\,e^{2}+\frac{1}{5}B\,e^{2} b+\frac{2}{5}Bcde\right) x^{5}+\left(\frac{1}{4}Ab\,e^{2}+\frac{1}{2}Acde+\frac{1}{2}Bbde+\frac{1}{4}Bc\,d^{2}\right) x^{4}+\left(\frac{2}{3}A\right.$
default	$\frac{B\,e^{2} c\,x^{6}}{6}+\frac{\left(\left(A\,e^{2}+2Bde\right) c+B\,e^{2} b\right) x^{5}}{5}+\frac{\left(\left(2Ade+B\,d^{2}\right) c+\left(A\,e^{2}+2Bde\right) b\right) x^{4}}{4}+\frac{\left(Ac\,d^{2}+\left(2Ade+B\,d^{2}\right) b\right) x^{3}}{3}+\frac{Ab\,d^{2} x}{2}$
gosper	$\frac{x^{2} \left(10B\,e^{2} c\,x^{4}+12x^{3} Ac\,e^{2}+12x^{3} B\,e^{2} b+24x^{3} Bcde+15x^{2} Ab\,e^{2}+30x^{2} Acde+30x^{2} Bbde+15Bc\,d^{2} x^{2}+40xAbde+20Ac\,d^{2} x+20\right.}{60}$
risch	$\frac{1}{6}B\,e^{2} c\,x^{6}+\frac{1}{5}x^{5} Ac\,e^{2}+\frac{1}{5}x^{5} B\,e^{2} b+\frac{2}{5}x^{5} Bcde+\frac{1}{4}x^{4} Ab\,e^{2}+\frac{1}{2}x^{4} Acde+\frac{1}{2}x^{4} Bbde+\frac{1}{4}x^{4} Bc$
parallelrisch	$\frac{1}{6}B\,e^{2} c\,x^{6}+\frac{1}{5}x^{5} Ac\,e^{2}+\frac{1}{5}x^{5} B\,e^{2} b+\frac{2}{5}x^{5} Bcde+\frac{1}{4}x^{4} Ab\,e^{2}+\frac{1}{2}x^{4} Acde+\frac{1}{2}x^{4} Bbde+\frac{1}{4}x^{4} Bc$
orering	$\frac{x \left(10B\,e^{2} c\,x^{4}+12x^{3} Ac\,e^{2}+12x^{3} B\,e^{2} b+24x^{3} Bcde+15x^{2} Ab\,e^{2}+30x^{2} Acde+30x^{2} Bbde+15Bc\,d^{2} x^{2}+40xAbde+20Ac\,d^{2} x+20\right.}{60cx+60b}$

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

output
```
1/6*B*e^2*c*x^6+(1/5*A*c*e^2+1/5*B*e^2*b+2/5*B*c*d*e)*x^5+(1/4*A*b*e^2+1/2
*A*c*d*e+1/2*B*b*d*e+1/4*B*c*d^2)*x^4+(2/3*A*b*d*e+1/3*A*c*d^2+1/3*B*b*d^2
)*x^3+1/2*A*b*d^2*x^2
```

Fricas [A] (verification not implemented)

Time = 0.06 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.97

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)\,dx=\frac{1}{6}\,Bce^2x^6+\frac{1}{2}\,Abd^2x^2+\frac{1}{5}\,\left(2\,Bcde+(Bb+Ac)e^2\right)x^5+\frac{1}{4}\,\left(Bcd^2+Abe^2+2\,(Bb+Ac)de\right)x^4+\frac{1}{3}\,\left(2\,Abde+(Bb+Ac)d^2\right)x^3$$

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

output
```
1/6*B*c*e^2*x^6 + 1/2*A*b*d^2*x^2 + 1/5*(2*B*c*d*e + (B*b + A*c)*e^2)*x^5
+ 1/4*(B*c*d^2 + A*b*e^2 + 2*(B*b + A*c)*d*e)*x^4 + 1/3*(2*A*b*d*e + (B*b
+ A*c)*d^2)*x^3
```

Sympy [A] (verification not implemented)

Time = 0.02 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.22

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)\,dx=\frac{Abd^2x^2}{2}+\frac{Bce^2x^6}{6}+x^5\left(\frac{Ace^2}{5}+\frac{Bbe^2}{5}+\frac{2Bcde}{5}\right)+x^4\left(\frac{Abe^2}{4}+\frac{Acde}{2}+\frac{Bbde}{2}+\frac{Bcd^2}{4}\right)+x^3\cdot\left(\frac{2Abde}{3}+\frac{Acd^2}{3}+\frac{Bbd^2}{3}\right)$$

input
```
integrate((B*x+A)*(e*x+d)**2*(c*x**2+b*x),x)
```

output
```
A*b*d**2*x**2/2 + B*c*e**2*x**6/6 + x**5*(A*c*e**2/5 + B*b*e**2/5 + 2*B*c*
d*e/5) + x**4*(A*b*e**2/4 + A*c*d*e/2 + B*b*d*e/2 + B*c*d**2/4) + x**3*(2*
A*b*d*e/3 + A*c*d**2/3 + B*b*d**2/3)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.97

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right) dx = \frac{1}{6} Bce^2x^6 + \frac{1}{2} Abd^2x^2 + \frac{1}{5} \left(2 Bcde + (Bb+Ac)e^2\right)x^5 + \frac{1}{4} \left(Bcd^2 + Abe^2 + 2 (Bb+Ac)de\right)x^4 + \frac{1}{3} \left(2 Abde + (Bb+Ac)d^2\right)x^3$$

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

output
```
1/6*B*c*e^2*x^6 + 1/2*A*b*d^2*x^2 + 1/5*(2*B*c*d*e + (B*b + A*c)*e^2)*x^5
+ 1/4*(B*c*d^2 + A*b*e^2 + 2*(B*b + A*c)*d*e)*x^4 + 1/3*(2*A*b*d*e + (B*b
+ A*c)*d^2)*x^3
```

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.18

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right) dx = \frac{1}{6} Bce^2x^6 + \frac{2}{5} Bcdex^5 + \frac{1}{5} Bbe^2x^5 + \frac{1}{5} Ace^2x^5 + \frac{1}{4} Bcd^2x^4 + \frac{1}{2} Bbdex^4 + \frac{1}{2} Acdex^4 + \frac{1}{4} Abe^2x^4 + \frac{1}{3} Bbd^2x^3 + \frac{1}{3} Acd^2x^3 + \frac{2}{3} Abdex^3 + \frac{1}{2} Abd^2x^2$$

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

output
```
1/6*B*c*e^2*x^6 + 2/5*B*c*d*e*x^5 + 1/5*B*b*e^2*x^5 + 1/5*A*c*e^2*x^5 + 1/
4*B*c*d^2*x^4 + 1/2*B*b*d*e*x^4 + 1/2*A*c*d*e*x^4 + 1/4*A*b*e^2*x^4 + 1/3*
B*b*d^2*x^3 + 1/3*A*c*d^2*x^3 + 2/3*A*b*d*e*x^3 + 1/2*A*b*d^2*x^2
```

Mupad [B] (verification not implemented)

Time = 10.90 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.03

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)\,dx = x^4\left(\frac{A\,b\,e^2}{4}+\frac{B\,c\,d^2}{4}+\frac{A\,c\,d\,e}{2}+\frac{B\,b\,d\,e}{2}\right) + x^3\left(\frac{A\,c\,d^2}{3}+\frac{B\,b\,d^2}{3}+\frac{2\,A\,b\,d\,e}{3}\right) + x^5\left(\frac{A\,c\,e^2}{5}+\frac{B\,b\,e^2}{5}+\frac{2\,B\,c\,d\,e}{5}\right) + \frac{A\,b\,d^2\,x^2}{2}+\frac{B\,c\,e^2\,x^6}{6}$$

input
```
int((b*x + c*x^2)*(A + B*x)*(d + e*x)^2,x)
```

output
```
x^4*((A*b*e^2)/4 + (B*c*d^2)/4 + (A*c*d*e)/2 + (B*b*d*e)/2) + x^3*((A*c*d^
2)/3 + (B*b*d^2)/3 + (2*A*b*d*e)/3) + x^5*((A*c*e^2)/5 + (B*b*e^2)/5 + (2*
B*c*d*e)/5) + (A*b*d^2*x^2)/2 + (B*c*e^2*x^6)/6
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.17

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)\,dx = \frac{x^2(10bc\,e^2x^4+12ac\,e^2x^3+12b^2e^2x^3+24bcde\,x^3+15ab\,e^2x^2+30acde\,x^2+30b^2de\,x^2+15bc\,d^2x^2+40a}{60}$$

input
```
int((B*x+A)*(e*x+d)^2*(c*x^2+b*x),x)
```

output
```
(x**2*(30*a*b*d**2 + 40*a*b*d*e*x + 15*a*b*e**2*x**2 + 20*a*c*d**2*x + 30*
a*c*d*e*x**2 + 12*a*c*e**2*x**3 + 20*b**2*d**2*x + 30*b**2*d*e*x**2 + 12*b
**2*e**2*x**3 + 15*b*c*d**2*x**2 + 24*b*c*d*e*x**3 + 10*b*c*e**2*x**4))/60
```

3.4 $\int (A+Bx)(d+ex)\left(bx+cx^2\right)\,dx$

Optimal result

Integrand size = 20, antiderivative size = 61

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)\,dx=\frac{1}{2}Abdx^2+\frac{1}{3}(bBd+Acd+Abe)x^3+\frac{1}{4}(Bcd+bBe+Ace)x^4+\frac{1}{5}Bcex^5$$

output
```
1/2*A*b*d*x^2+1/3*(A*b*e+A*c*d+B*b*d)*x^3+1/4*(A*c*e+B*b*e+B*c*d)*x^4+1/5*
B*c*e*x^5
```

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.90

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)\,dx=\frac{1}{60}x^2\left(30Abd+20(bBd+Acd+Abe)x+15(Bcd+bBe+Ace)x^2+12Bcex^3\right)$$

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

output
```
(x^2*(30*A*b*d + 20*(b*B*d + A*c*d + A*b*e)*x + 15*(B*c*d + b*B*e + A*c*e)
*x^2 + 12*B*c*e*x^3))/60
```

Rubi [A] (verified)

Time = 0.36 (sec) , antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)(d+ex)\,dx$$

$$\big\downarrow \ 1195$$

$$\int \left(x^3(Ace+bBe+Bcd)+x^2(Abe+Acd+bBd)+Abdx+Bcex^4\right)dx$$

$$\big\downarrow \ 2009$$

$$\frac{1}{4}x^4(Ace+bBe+Bcd)+\frac{1}{3}x^3(Abe+Acd+bBd)+\frac{1}{2}Abdx^2+\frac{1}{5}Bcex^5$$

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

output
```
(A*b*d*x^2)/2 + ((b*B*d + A*c*d + A*b*e)*x^3)/3 + ((B*c*d + b*B*e + A*c*e)
*x^4)/4 + (B*c*e*x^5)/5
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.17 (sec) , antiderivative size = 56, normalized size of antiderivative = 0.92

method	result	size
default	$\frac{Bce\,x^5}{5}+\frac{((Ae+Bd)c+Bbe)x^4}{4}+\frac{(Acd+b(Ae+Bd))x^3}{3}+\frac{Abd\,x^2}{2}$	56
norman	$\frac{Bce\,x^5}{5}+\left(\frac{1}{4}Ace+\frac{1}{4}Bbe+\frac{1}{4}Bcd\right)x^4+\left(\frac{1}{3}Abe+\frac{1}{3}Acd+\frac{1}{3}Bbd\right)x^3+\frac{Abd\,x^2}{2}$	58
gosper	$\frac{x^2(12Bce\,x^3+15Ace\,x^2+15Bbe\,x^2+15Bcd\,x^2+20Abex+20cxAd+20Bbdx+30Abd)}{60}$	62
risch	$\frac{1}{5}Bce\,x^5+\frac{1}{4}x^4Ace+\frac{1}{4}x^4Bbe+\frac{1}{4}x^4Bcd+\frac{1}{3}x^3Abe+\frac{1}{3}x^3Acd+\frac{1}{3}Bbd\,x^3+\frac{1}{2}Abd\,x^2$	66
parallelrisch	$\frac{1}{5}Bce\,x^5+\frac{1}{4}x^4Ace+\frac{1}{4}x^4Bbe+\frac{1}{4}x^4Bcd+\frac{1}{3}x^3Abe+\frac{1}{3}x^3Acd+\frac{1}{3}Bbd\,x^3+\frac{1}{2}Abd\,x^2$	66
orering	$\frac{x(12Bce\,x^3+15Ace\,x^2+15Bbe\,x^2+15Bcd\,x^2+20Abex+20cxAd+20Bbdx+30Abd)(c\,x^2+bx)}{60cx+60b}$	76

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

output
```
1/5*B*c*e*x^5+1/4*((A*e+B*d)*c+B*b*e)*x^4+1/3*(A*c*d+b*(A*e+B*d))*x^3+1/2*
A*b*d*x^2
```

Fricas [A] (verification not implemented)

Time = 0.06 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.90

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)\,dx=\frac{1}{5}\,Bcex^5+\frac{1}{2}\,Abdx^2+\frac{1}{4}\,(Bcd+(Bb+Ac)e)x^4+\frac{1}{3}\,(Abe+(Bb+Ac)d)x^3$$

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

output
```
1/5*B*c*e*x^5 + 1/2*A*b*d*x^2 + 1/4*(B*c*d + (B*b + A*c)*e)*x^4 + 1/3*(A*b
*e + (B*b + A*c)*d)*x^3
```

Sympy [A] (verification not implemented)

Time = 0.02 (sec) , antiderivative size = 66, normalized size of antiderivative = 1.08

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)\,dx = \frac{Abdx^2}{2}+\frac{Bcex^5}{5}+x^4\left(\frac{Ace}{4}+\frac{Bbe}{4}+\frac{Bcd}{4}\right)+x^3\left(\frac{Abe}{3}+\frac{Acd}{3}+\frac{Bbd}{3}\right)$$

input

```
integrate((B*x+A)*(e*x+d)*(c*x**2+b*x),x)
```

output

```
A*b*d*x**2/2 + B*c*e*x**5/5 + x**4*(A*c*e/4 + B*b*e/4 + B*c*d/4) + x**3*(A
*b*e/3 + A*c*d/3 + B*b*d/3)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 55, normalized size of antiderivative = 0.90

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)\,dx = \frac{1}{5}\,Bcex^5+\frac{1}{2}\,Abdx^2+\frac{1}{4}\,(Bcd+(Bb+Ac)e)x^4+\frac{1}{3}\,(Abe+(Bb+Ac)d)x^3$$

input

```
integrate((B*x+A)*(e*x+d)*(c*x^2+b*x),x, algorithm="maxima")
```

output

```
1/5*B*c*e*x^5 + 1/2*A*b*d*x^2 + 1/4*(B*c*d + (B*b + A*c)*e)*x^4 + 1/3*(A*b
*e + (B*b + A*c)*d)*x^3
```

Giac [A] (verification not implemented)

Time = 0.21 (sec) , antiderivative size = 65, normalized size of antiderivative = 1.07

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)\,dx=\frac{1}{5}\,Bcex^5+\frac{1}{4}\,Bcdx^4+\frac{1}{4}\,Bbex^4+\frac{1}{4}\,Acex^4+\frac{1}{3}\,Bbdx^3+\frac{1}{3}\,Acdx^3+\frac{1}{3}\,Abex^3+\frac{1}{2}\,Abdx^2$$

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

output
```
1/5*B*c*e*x^5 + 1/4*B*c*d*x^4 + 1/4*B*b*e*x^4 + 1/4*A*c*e*x^4 + 1/3*B*b*d*
x^3 + 1/3*A*c*d*x^3 + 1/3*A*b*e*x^3 + 1/2*A*b*d*x^2
```

Mupad [B] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 57, normalized size of antiderivative = 0.93

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)\,dx=\frac{B\,c\,e\,x^5}{5}+\left(\frac{A\,c\,e}{4}+\frac{B\,b\,e}{4}+\frac{B\,c\,d}{4}\right)\,x^4+\left(\frac{A\,b\,e}{3}+\frac{A\,c\,d}{3}+\frac{B\,b\,d}{3}\right)\,x^3+\frac{A\,b\,d\,x^2}{2}$$

input
```
int((b*x + c*x^2)*(A + B*x)*(d + e*x),x)
```

output
```
x^3*((A*b*e)/3 + (A*c*d)/3 + (B*b*d)/3) + x^4*((A*c*e)/4 + (B*b*e)/4 + (B*
c*d)/4) + (A*b*d*x^2)/2 + (B*c*e*x^5)/5
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 63, normalized size of antiderivative = 1.03

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)\,dx$$
$$=\frac{x^2(12bce\,x^3+15ace\,x^2+15b^2e\,x^2+15bcd\,x^2+20abex+20acdx+20b^2dx+30abd)}{60}$$

input
```
int((B*x+A)*(e*x+d)*(c*x^2+b*x),x)
```

output
```
(x**2*(30*a*b*d + 20*a*b*e*x + 20*a*c*d*x + 15*a*c*e*x**2 + 20*b**2*d*x +
15*b**2*e*x**2 + 15*b*c*d*x**2 + 12*b*c*e*x**3))/60
```

3.5 $\int \frac{(A+Bx)(bx+cx^2)}{d+ex}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 87

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{d+ex}\,dx = \frac{(Bd-Ae)(cd-be)x}{e^3} - \frac{(Bcd-bBe-Ace)x^2}{2e^2} + \frac{Bcx^3}{3e} - \frac{d(Bd-Ae)(cd-be)\log(d+ex)}{e^4}$$

output
```
(-A*e+B*d)*(-b*e+c*d)*x/e^3-1/2*(-A*c*e-B*b*e+B*c*d)*x^2/e^2+1/3*B*c*x^3/e
-d*(-A*e+B*d)*(-b*e+c*d)*ln(e*x+d)/e^4
```

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.01

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{d+ex}\,dx = \frac{ex(3bBe(-2d+ex)+3Ae(-2cd+2be+cex)+Bc(6d^2-3dex+2e^2x^2))-6d(Bd-Ae)(cd-be)\log}{6e^4}$$

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

output
```
(e*x*(3*b*B*e*(-2*d + e*x) + 3*A*e*(-2*c*d + 2*b*e + c*e*x) + B*c*(6*d^2 -
 3*d*e*x + 2*e^2*x^2)) - 6*d*(B*d - A*e)*(c*d - b*e)*Log[d + e*x])/(6*e^4)
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{d+ex}dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(-\frac{d(Bd-Ae)(cd-be)}{e^3(d+ex)}+\frac{(Ae-Bd)(be-cd)}{e^3}+\frac{x(Ace+bBe-Bcd)}{e^2}+\frac{Bcx^2}{e}\right)dx$$

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

$$-\frac{d(Bd-Ae)(cd-be)\log(d+ex)}{e^4}+\frac{x(Bd-Ae)(cd-be)}{e^3}-\frac{x^2(-Ace-bBe+Bcd)}{2e^2}+\frac{Bcx^3}{3e}$$

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

output
```
((B*d - A*e)*(c*d - b*e)*x)/e^3 - ((B*c*d - b*B*e - A*c*e)*x^2)/(2*e^2) +
(B*c*x^3)/(3*e) - (d*(B*d - A*e)*(c*d - b*e)*Log[d + e*x])/e^4
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.16

method	result
norman	$\frac{(Ab\,e^2-Acde-Bbde+Bc\,d^2)x}{e^3}+\frac{(Ace+Bbe-Bcd)x^2}{2e^2}+\frac{Bc\,x^3}{3e}-\frac{d(Ab\,e^2-Acde-Bbde+Bc\,d^2)\ln(ex+d)}{e^4}$
default	$\frac{\frac{1}{3}Bc\,x^3e^2+\frac{1}{2}Ac\,e^2x^2+\frac{1}{2}Bb\,e^2x^2-\frac{1}{2}Bcde\,x^2+Ab\,e^2x-Acdex-Bbdex+Bc\,d^2x}{e^3}-\frac{d(Ab\,e^2-Acde-Bbde+Bc\,d^2)\ln(ex+d)}{e^4}$
risch	$\frac{Bc\,x^3}{3e}+\frac{Ac\,x^2}{2e}+\frac{Bb\,x^2}{2e}-\frac{Bcd\,x^2}{2e^2}+\frac{Abx}{e}-\frac{Acdx}{e^2}-\frac{Bbdx}{e^2}+\frac{Bc\,d^2x}{e^3}-\frac{d\ln(ex+d)Ab}{e^2}+\frac{d^2\ln(ex+d)Ac}{e^3}+\frac{d^2}{}$
parallelrisch	$-\frac{-2Bc\,x^3e^3-3A\,x^2c\,e^3-3B\,x^2b\,e^3+3B\,x^2cd\,e^2+6A\ln(ex+d)bd\,e^2-6A\ln(ex+d)c\,d^2e-6Axb\,e^3+6Axcd\,e^2-6B\ln(ex+d)b}{6e^4}$

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

output
```
(A*b*e^2-A*c*d*e-B*b*d*e+B*c*d^2)/e^3*x+1/2/e^2*(A*c*e+B*b*e-B*c*d)*x^2+1/
3*B*c*x^3/e-d*(A*b*e^2-A*c*d*e-B*b*d*e+B*c*d^2)/e^4*ln(e*x+d)
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.22

$$\int\frac{(A+Bx)\,(bx+cx^2)}{d+ex}\,dx$$
$$=\frac{2\,Bce^3x^3-3\,(Bcde^2-(Bb+Ac)e^3)x^2+6\,(Bcd^2e+Abe^3-(Bb+Ac)de^2)x-6\,(Bcd^3+Abde^2-(Bb}{6\,e^4}$$

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

output
```
1/6*(2*B*c*e^3*x^3 - 3*(B*c*d*e^2 - (B*b + A*c)*e^3)*x^2 + 6*(B*c*d^2*e +
A*b*e^3 - (B*b + A*c)*d*e^2)*x - 6*(B*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*
e)*log(e*x + d))/e^4
```

Sympy [A] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 95, normalized size of antiderivative = 1.09

$$\int \frac{(A+Bx)\,(bx+cx^2)}{d+ex}\,dx = \frac{Bcx^3}{3e} + \frac{d(-Ae+Bd)\,(be-cd)\log{(d+ex)}}{e^4} + x^2\left(\frac{Ac}{2e}+\frac{Bb}{2e}-\frac{Bcd}{2e^2}\right) + x\left(\frac{Ab}{e}-\frac{Acd}{e^2}-\frac{Bbd}{e^2}+\frac{Bcd^2}{e^3}\right)$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d),x)
```

output
```
B*c*x**3/(3*e) + d*(-A*e + B*d)*(b*e - c*d)*log(d + e*x)/e**4 + x**2*(A*c/
(2*e) + B*b/(2*e) - B*c*d/(2*e**2)) + x*(A*b/e - A*c*d/e**2 - B*b*d/e**2 +
 B*c*d**2/e**3)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 105, normalized size of antiderivative = 1.21

$$\int \frac{(A+Bx)\,(bx+cx^2)}{d+ex}\,dx = \frac{2\,Bce^2x^3 - 3\,(Bcde-(Bb+Ac)e^2)x^2 + 6\,(Bcd^2+Abe^2-(Bb+Ac)de)x}{6\,e^3} - \frac{(Bcd^3+Abde^2-(Bb+Ac)d^2e)\log{(ex+d)}}{e^4}$$

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

output
```
1/6*(2*B*c*e^2*x^3 - 3*(B*c*d*e - (B*b + A*c)*e^2)*x^2 + 6*(B*c*d^2 + A*b*
e^2 - (B*b + A*c)*d*e)*x)/e^3 - (B*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)*
log(e*x + d)/e^4
```

Giac [A] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.36

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{d+ex}\,dx = \frac{2\,Bce^2x^3-3\,Bcdex^2+3\,Bbe^2x^2+3\,Ace^2x^2+6\,Bcd^2x-6\,Bbdex-6\,Acdex+6\,Abe^2x}{6\,e^3} - \frac{\left(Bcd^3-Bbd^2e-Acd^2e+Abde^2\right)\log\left(|ex+d|\right)}{e^4}$$

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

output
```
1/6*(2*B*c*e^2*x^3 - 3*B*c*d*e*x^2 + 3*B*b*e^2*x^2 + 3*A*c*e^2*x^2 + 6*B*c
*d^2*x - 6*B*b*d*e*x - 6*A*c*d*e*x + 6*A*b*e^2*x)/e^3 - (B*c*d^3 - B*b*d^2
*e - A*c*d^2*e + A*b*d*e^2)*log(abs(e*x + d))/e^4
```

Mupad [B] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.30

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{d+ex}\,dx = x^2\left(\frac{A\,c+B\,b}{2\,e}-\frac{B\,c\,d}{2\,e^2}\right)-x\left(\frac{d\left(\frac{A\,c+B\,b}{e}-\frac{B\,c\,d}{e^2}\right)}{e}-\frac{A\,b}{e}\right) - \frac{\ln\left(d+e\,x\right)\,\left(B\,c\,d^3+A\,b\,d\,e^2-A\,c\,d^2\,e-B\,b\,d^2\,e\right)}{e^4} + \frac{B\,c\,x^3}{3\,e}$$

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

output
```
x^2*((A*c + B*b)/(2*e) - (B*c*d)/(2*e^2)) - x*((d*((A*c + B*b)/e - (B*c*d)
/e^2))/e - (A*b)/e) - (log(d + e*x)*(B*c*d^3 + A*b*d*e^2 - A*c*d^2*e - B*b
*d^2*e))/e^4 + (B*c*x^3)/(3*e)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.61

$$\int \frac{(A+Bx)\,(bx+cx^2)}{d+ex}\,dx$$
$$= \frac{-6\log(ex+d)\,abd\,e^2+6\log(ex+d)\,ac\,d^2e+6\log(ex+d)\,b^2d^2e-6\log(ex+d)\,bc\,d^3+6ab\,e^3x-6acd}{6e^4}$$

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

output
```
( - 6*log(d + e*x)*a*b*d*e**2 + 6*log(d + e*x)*a*c*d**2*e + 6*log(d + e*x)
*b**2*d**2*e - 6*log(d + e*x)*b*c*d**3 + 6*a*b*e**3*x - 6*a*c*d*e**2*x + 3
*a*c*e**3*x**2 - 6*b**2*d*e**2*x + 3*b**2*e**3*x**2 + 6*b*c*d**2*e*x - 3*b
*c*d*e**2*x**2 + 2*b*c*e**3*x**3)/(6*e**4)
```

3.6 $\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^2}\, dx$

Optimal result

Integrand size = 22, antiderivative size = 99

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^2}\, dx = -\frac{(2Bcd-bBe-Ace)x}{e^3}+\frac{Bcx^2}{2e^2}+\frac{d(Bd-Ae)(cd-be)}{e^4(d+ex)} + \frac{(Bd(3cd-2be)-Ae(2cd-be))\log(d+ex)}{e^4}$$

output
```
-(-A*c*e-B*b*e+2*B*c*d)*x/e^3+1/2*B*c*x^2/e^2+d*(-A*e+B*d)*(-b*e+c*d)/e^4/
(e*x+d)+(B*d*(-2*b*e+3*c*d)-A*e*(-b*e+2*c*d))*ln(e*x+d)/e^4
```

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.94

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^2}\, dx = \frac{2e(-2Bcd+bBe+Ace)x+Bce^2x^2+\frac{2d(Bd-Ae)(cd-be)}{d+ex}+2(Bd(3cd-2be)+Ae(-2cd+be))\log(d+ex}{2e^4}$$

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

output
```
(2*e*(-2*B*c*d + b*B*e + A*c*e)*x + B*c*e^2*x^2 + (2*d*(B*d - A*e)*(c*d -
b*e))/(d + e*x) + 2*(B*d*(3*c*d - 2*b*e) + A*e*(-2*c*d + b*e))*Log[d + e*x
])/(2*e^4)
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^2}\,dx$$

$$\big\downarrow \text{1195}$$

$$\int \left(-\frac{d(Bd-Ae)(cd-be)}{e^3(d+ex)^2}+\frac{Bd(3cd-2be)-Ae(2cd-be)}{e^3(d+ex)}+\frac{Ace+bBe-2Bcd}{e^3}+\frac{Bcx}{e^2}\right)dx$$

$$\big\downarrow \text{2009}$$

$$\frac{d(Bd-Ae)(cd-be)}{e^4(d+ex)}+\frac{\log(d+ex)(Bd(3cd-2be)-Ae(2cd-be))}{e^4}-\frac{x(-Ace-bBe+2Bcd)}{e^3}+\frac{Bcx^2}{2e^2}$$

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

output
```
-(((2*B*c*d - b*B*e - A*c*e)*x)/e^3) + (B*c*x^2)/(2*e^2) + (d*(B*d - A*e)*
(c*d - b*e))/(e^4*(d + e*x)) + ((B*d*(3*c*d - 2*b*e) - A*e*(2*c*d - b*e))*
Log[d + e*x])/e^4
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.69 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.05

method	result
default	$\frac{\frac{1}{2}Bce\,x^2+Acex+Bbex-2Bcdx}{e^3}+\frac{\left(Ab\,e^2-2Acde-2Bbde+3Bc\,d^2\right)\ln\left(ex+d\right)}{e^4}+\frac{d\left(Ab\,e^2-Acde-Bbde+Bc\,d^2\right)}{e^4\left(ex+d\right)}$
norman	$\frac{\frac{(2Ace+2Bbe-3Bcd)x^2}{2e^2}+\frac{Bc\,x^3}{2e}-\frac{\left(Abd\,e^2-2Ac\,d^2e-2Bb\,d^2e+3Bc\,d^3\right)x}{d\,e^3}}{ex+d}+\frac{\left(Ab\,e^2-2Acde-2Bbde+3Bc\,d^2\right)\ln\left(ex+d\right)}{e^4}$
risch	$\frac{Bc\,x^2}{2e^2}+\frac{Acx}{e^2}+\frac{Bbx}{e^2}-\frac{2Bcdx}{e^3}+\frac{\ln\left(ex+d\right)Ab}{e^2}-\frac{2\ln\left(ex+d\right)Acd}{e^3}-\frac{2\ln\left(ex+d\right)Bbd}{e^3}+\frac{3\ln\left(ex+d\right)Bc\,d^2}{e^4}+\frac{dAb}{e^2(ex+}$
parallelrisch	$\frac{Bc\,x^3e^3+2A\ln\left(ex+d\right)xb\,e^3-4A\ln\left(ex+d\right)xcd\,e^2+2A\,x^2c\,e^3-4B\ln\left(ex+d\right)xbd\,e^2+6B\ln\left(ex+d\right)xc\,d^2e+2B\,x^2b\,e^3-3B\,x^2cd\,e}{2e^4(ex+d}$

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

output
```
1/e^3*(1/2*B*c*e*x^2+A*c*e*x+B*b*e*x-2*B*c*d*x)+1/e^4*(A*b*e^2-2*A*c*d*e-2
*B*b*d*e+3*B*c*d^2)*ln(e*x+d)+d*(A*b*e^2-A*c*d*e-B*b*d*e+B*c*d^2)/e^4/(e*x
+d)
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 170, normalized size of antiderivative = 1.72

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^2}\,dx$$
$$= \frac{Bce^3x^3 + 2\,Bcd^3 + 2\,Abde^2 - 2\,(Bb+Ac)d^2e - (3\,Bcde^2 - 2\,(Bb+Ac)e^3)x^2 - 2\,(2\,Bcd^2e - (Bb+Ac}{2\,(e^5x+}$$

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

output
```
1/2*(B*c*e^3*x^3 + 2*B*c*d^3 + 2*A*b*d*e^2 - 2*(B*b + A*c)*d^2*e - (3*B*c*
d*e^2 - 2*(B*b + A*c)*e^3)*x^2 - 2*(2*B*c*d^2*e - (B*b + A*c)*d*e^2)*x + 2
*(3*B*c*d^3 + A*b*d*e^2 - 2*(B*b + A*c)*d^2*e + (3*B*c*d^2*e + A*b*e^3 - 2
*(B*b + A*c)*d*e^2)*x)*log(e*x + d))/(e^5*x + d*e^4)
```

Sympy [A] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.22

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^2}\,dx = \frac{Bcx^2}{2e^2} + x\left(\frac{Ac}{e^2} + \frac{Bb}{e^2} - \frac{2Bcd}{e^3}\right) + \frac{Abde^2 - Acd^2e - Bbd^2e + Bcd^3}{de^4 + e^5x} - \frac{(-Abe^2 + 2Acde + 2Bbde - 3Bcd^2)\log(d+ex)}{e^4}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d)**2,x)
```

output
```
B*c*x**2/(2*e**2) + x*(A*c/e**2 + B*b/e**2 - 2*B*c*d/e**3) + (A*b*d*e**2 -
 A*c*d**2*e - B*b*d**2*e + B*c*d**3)/(d*e**4 + e**5*x) - (-A*b*e**2 + 2*A*
c*d*e + 2*B*b*d*e - 3*B*c*d**2)*log(d + e*x)/e**4
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.10

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^2}\,dx = \frac{Bcd^3+Abde^2-(Bb+Ac)d^2e}{e^5x+de^4} + \frac{Bcex^2-2(2Bcd-(Bb+Ac)e)x}{2e^3} + \frac{(3Bcd^2+Abe^2-2(Bb+Ac)de)\log(ex+d)}{e^4}$$

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

output
```
(B*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)/(e^5*x + d*e^4) + 1/2*(B*c*e*x^2
 - 2*(2*B*c*d - (B*b + A*c)*e)*x)/e^3 + (3*B*c*d^2 + A*b*e^2 - 2*(B*b + A*
c)*d*e)*log(e*x + d)/e^4
```

Giac [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.71

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^2}\,dx = \frac{\left(Bc-\frac{2(3Bcde-Bbe^2-Ace^2)}{(ex+d)e}\right)(ex+d)^2}{2e^4} - \frac{(3Bcd^2-2Bbde-2Acde+Abe^2)\log\left(\frac{|ex+d|}{(ex+d)^2|e|}\right)}{e^4} + \frac{\frac{Bcd^3e^2}{ex+d}-\frac{Bbd^2e^3}{ex+d}-\frac{Acd^2e^3}{ex+d}+\frac{Abde^4}{ex+d}}{e^6}$$

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

output
```
1/2*(B*c - 2*(3*B*c*d*e - B*b*e^2 - A*c*e^2)/((e*x + d)*e))*(e*x + d)^2/e^
4 - (3*B*c*d^2 - 2*B*b*d*e - 2*A*c*d*e + A*b*e^2)*log(abs(e*x + d)/((e*x +
 d)^2*abs(e)))/e^4 + (B*c*d^3*e^2/(e*x + d) - B*b*d^2*e^3/(e*x + d) - A*c*
d^2*e^3/(e*x + d) + A*b*d*e^4/(e*x + d))/e^6
```

Mupad [B] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.17

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^2}\,dx = x\left(\frac{A\,c+B\,b}{e^2}-\frac{2\,B\,c\,d}{e^3}\right) + \frac{\ln\left(d+e\,x\right)\,\left(A\,b\,e^2+3\,B\,c\,d^2-2\,A\,c\,d\,e-2\,B\,b\,d\,e\right)}{e^4} + \frac{B\,c\,d^3+A\,b\,d\,e^2-A\,c\,d^2\,e-B\,b\,d^2\,e}{e\,\left(x\,e^4+d\,e^3\right)} + \frac{B\,c\,x^2}{2\,e^2}$$

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

output
```
x*((A*c + B*b)/e^2 - (2*B*c*d)/e^3) + (log(d + e*x)*(A*b*e^2 + 3*B*c*d^2 -
 2*A*c*d*e - 2*B*b*d*e))/e^4 + (B*c*d^3 + A*b*d*e^2 - A*c*d^2*e - B*b*d^2*
e)/(e*(d*e^3 + e^4*x)) + (B*c*x^2)/(2*e^2)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 206, normalized size of antiderivative = 2.08

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^2}\,dx = \frac{2\log(ex+d)\,abd\,e^2+2\log(ex+d)\,ab\,e^3x-4\log(ex+d)\,ac\,d^2e-4\log(ex+d)\,acd\,e^2x-4\log(ex+d)}{}$$

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

output
```
(2*log(d + e*x)*a*b*d*e**2 + 2*log(d + e*x)*a*b*e**3*x - 4*log(d + e*x)*a*
c*d**2*e - 4*log(d + e*x)*a*c*d*e**2*x - 4*log(d + e*x)*b**2*d**2*e - 4*lo
g(d + e*x)*b**2*d*e**2*x + 6*log(d + e*x)*b*c*d**3 + 6*log(d + e*x)*b*c*d*
*2*e*x - 2*a*b*e**3*x + 4*a*c*d*e**2*x + 2*a*c*e**3*x**2 + 4*b**2*d*e**2*x
 + 2*b**2*e**3*x**2 - 6*b*c*d**2*e*x - 3*b*c*d*e**2*x**2 + b*c*e**3*x**3)/
(2*e**4*(d + e*x))
```

3.7 $\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^3} dx$

Optimal result

Integrand size = 22, antiderivative size = 104

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^3} dx = \frac{Bcx}{e^3} + \frac{d(Bd-Ae)(cd-be)}{2e^4(d+ex)^2} - \frac{Bd(3cd-2be)-Ae(2cd-be)}{e^4(d+ex)} - \frac{(3Bcd-bBe-Ace)\log(d+ex)}{e^4}$$

output
```
B*c*x/e^3+1/2*d*(-A*e+B*d)*(-b*e+c*d)/e^4/(e*x+d)^2-(B*d*(-2*b*e+3*c*d)-A*
e*(-b*e+2*c*d))/e^4/(e*x+d)-(-A*c*e-B*b*e+3*B*c*d)*ln(e*x+d)/e^4
```

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.92

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^3} dx = \frac{2Bcex + \frac{d(Bd-Ae)(cd-be)}{(d+ex)^2} + \frac{-6Bcd^2+4bBde+4Acde-2Abe^2}{d+ex} + 2(-3Bcd+bBe+Ace)\log(d+ex)}{2e^4}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2))/(d + e*x)^3,x]
```

output
```
(2*B*c*e*x + (d*(B*d - A*e)*(c*d - b*e))/(d + e*x)^2 + (-6*B*c*d^2 + 4*b*B
*d*e + 4*A*c*d*e - 2*A*b*e^2)/(d + e*x) + 2*(-3*B*c*d + b*B*e + A*c*e)*Log
[d + e*x])/(2*e^4)
```

Rubi [A] (verified)

Time = 0.48 (sec) , antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^3}\,dx$$

$$\Big\downarrow \text{ 1195}$$

$$\int \left(\frac{Ace+bBe-3Bcd}{e^3(d+ex)}+\frac{Bd(3cd-2be)-Ae(2cd-be)}{e^3(d+ex)^2}-\frac{d(Bd-Ae)(cd-be)}{e^3(d+ex)^3}+\frac{Bc}{e^3}\right)dx$$

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

$$\frac{d(Bd-Ae)(cd-be)}{2e^4(d+ex)^2}-\frac{Bd(3cd-2be)-Ae(2cd-be)}{e^4(d+ex)}-\frac{\log(d+ex)(-Ace-bBe+3Bcd)}{e^4}+\frac{Bcx}{e^3}$$

input
```
Int[((A + B*x)*(b*x + c*x^2))/(d + e*x)^3,x]
```

output
```
(B*c*x)/e^3 + (d*(B*d - A*e)*(c*d - b*e))/(2*e^4*(d + e*x)^2) - (B*d*(3*c*
d - 2*b*e) - A*e*(2*c*d - b*e))/(e^4*(d + e*x)) - ((3*B*c*d - b*B*e - A*c*
e)*Log[d + e*x])/e^4
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.76 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.04

method	result
norman	$\frac{\frac{B c\,x^{3}}{e}-\frac{d\left(A b\,e^{2}-3 A c d e-3 B b d e+9 B c\,d^{2}\right)}{2 e^{4}}-\frac{\left(A b\,e^{2}-2 A c d e-2 B b d e+6 B c\,d^{2}\right) x}{e^{3}}}{\left(e x+d\right)^{2}}+\frac{\left(A c e+B b e-3 B c d\right) \ln \left(e x+d\right)}{e^{4}}$
default	$\frac{B c x}{e^{3}}+\frac{\left(A c e+B b e-3 B c d\right) \ln \left(e x+d\right)}{e^{4}}-\frac{A b\,e^{2}-2 A c d e-2 B b d e+3 B c\,d^{2}}{e^{4} \left(e x+d\right)}+\frac{d \left(A b\,e^{2}-A c d e-B b d e+B c\,d^{2}\right)}{2 e^{4} \left(e x+d\right)^{2}}$
risch	$\frac{B c x}{e^{3}}+\frac{\left(-A b\,e^{2}+2 A c d e+2 B b d e-3 B c\,d^{2}\right) x-\frac{d\left(A b\,e^{2}-3 A c d e-3 B b d e+5 B c\,d^{2}\right)}{2 e}}{e^{3} \left(e x+d\right)^{2}}+\frac{\ln \left(e x+d\right) A c}{e^{3}}+\frac{\ln \left(e x+d\right) B b}{e^{3}}-\frac{3 \ln (ex+$
parallelrisch	$\frac{2 A \ln \left(e x+d\right) x^{2} c\,e^{3}+2 B \ln \left(e x+d\right) x^{2} b\,e^{3}-6 B \ln \left(e x+d\right) x^{2} c d\,e^{2}+2 B c\,x^{3} e^{3}+4 A \ln \left(e x+d\right) x c d\,e^{2}+4 B \ln \left(e x+d\right) x b d\,e^{2}-12 B \ln (e}{}$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
(B*c*x^3/e-1/2*d*(A*b*e^2-3*A*c*d*e-3*B*b*d*e+9*B*c*d^2)/e^4-(A*b*e^2-2*A*
c*d*e-2*B*b*d*e+6*B*c*d^2)/e^3*x)/(e*x+d)^2+1/e^4*(A*c*e+B*b*e-3*B*c*d)*ln
(e*x+d)
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 186, normalized size of antiderivative = 1.79

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^3}\,dx$$
$$= \frac{2\,Bce^3x^3+4\,Bcde^2x^2-5\,Bcd^3-Abde^2+3\,(Bb+Ac)d^2e-2\,(2\,Bcd^2e+Abe^3-2\,(Bb+Ac)de^2)x-2}{2\,(e^6x^2+2\,de}$$

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

output
```
1/2*(2*B*c*e^3*x^3 + 4*B*c*d*e^2*x^2 - 5*B*c*d^3 - A*b*d*e^2 + 3*(B*b + A*
c)*d^2*e - 2*(2*B*c*d^2*e + A*b*e^3 - 2*(B*b + A*c)*d*e^2)*x - 2*(3*B*c*d^
3 - (B*b + A*c)*d^2*e + (3*B*c*d*e^2 - (B*b + A*c)*e^3)*x^2 + 2*(3*B*c*d^2
*e - (B*b + A*c)*d*e^2)*x)*log(e*x + d))/(e^6*x^2 + 2*d*e^5*x + d^2*e^4)
```

Sympy [A] (verification not implemented)

Time = 0.69 (sec) , antiderivative size = 138, normalized size of antiderivative = 1.33

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^3}\,dx$$
$$= \frac{Bcx}{e^3} + \frac{-Abde^2+3Acd^2e+3Bbd^2e-5Bcd^3+x(-2Abe^3+4Acde^2+4Bbde^2-6Bcd^2e)}{2d^2e^4+4de^5x+2e^6x^2} + \frac{(Ace+Bbe-3Bcd)\log{(d+ex)}}{e^4}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d)**3,x)
```

output
```
B*c*x/e**3 + (-A*b*d*e**2 + 3*A*c*d**2*e + 3*B*b*d**2*e - 5*B*c*d**3 + x*(
-2*A*b*e**3 + 4*A*c*d*e**2 + 4*B*b*d*e**2 - 6*B*c*d**2*e))/(2*d**2*e**4 +
4*d*e**5*x + 2*e**6*x**2) + (A*c*e + B*b*e - 3*B*c*d)*log(d + e*x)/e**4
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.15

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^3}\,dx$$
$$= -\frac{5\,Bcd^3+Abde^2-3\,(Bb+Ac)d^2e+2\,(3\,Bcd^2e+Abe^3-2\,(Bb+Ac)de^2)x}{2\,(e^6x^2+2\,de^5x+d^2e^4)}$$
$$+\frac{Bcx}{e^3}-\frac{(3\,Bcd-(Bb+Ac)e)\log(ex+d)}{e^4}$$

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

output
```
-1/2*(5*B*c*d^3 + A*b*d*e^2 - 3*(B*b + A*c)*d^2*e + 2*(3*B*c*d^2*e + A*b*e
^3 - 2*(B*b + A*c)*d*e^2)*x)/(e^6*x^2 + 2*d*e^5*x + d^2*e^4) + B*c*x/e^3 -
 (3*B*c*d - (B*b + A*c)*e)*log(e*x + d)/e^4
```

Giac [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.09

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^3}\,dx$$
$$= \frac{Bcx}{e^3}-\frac{(3\,Bcd-Bbe-Ace)\log(|ex+d|)}{e^4}$$
$$-\frac{5\,Bcd^3-3\,Bbd^2e-3\,Acd^2e+Abde^2+2\,(3\,Bcd^2e-2\,Bbde^2-2\,Acde^2+Abe^3)x}{2\,(ex+d)^2e^4}$$

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

output
```
B*c*x/e^3 - (3*B*c*d - B*b*e - A*c*e)*log(abs(e*x + d))/e^4 - 1/2*(5*B*c*d
^3 - 3*B*b*d^2*e - 3*A*c*d^2*e + A*b*d*e^2 + 2*(3*B*c*d^2*e - 2*B*b*d*e^2
- 2*A*c*d*e^2 + A*b*e^3)*x)/((e*x + d)^2*e^4)
```

Mupad [B] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.18

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^3}\,dx$$
$$= \frac{\ln(d+e\,x)\,(A\,c\,e+B\,b\,e-3\,B\,c\,d)}{e^4} - \frac{x\,(A\,b\,e^2+3\,B\,c\,d^2-2\,A\,c\,d\,e-2\,B\,b\,d\,e)+\frac{5\,B\,c\,d^3+A\,b\,d\,e^2-3\,A\,c\,d^2\,e-3\,B\,b\,d^2\,e}{2\,e}}{d^2\,e^3+2\,d\,e^4\,x+e^5\,x^2}+\frac{B\,c\,x}{e^3}$$

input
```
int(((b*x + c*x^2)*(A + B*x))/(d + e*x)^3,x)
```

output
```
(log(d + e*x)*(A*c*e + B*b*e - 3*B*c*d))/e^4 - (x*(A*b*e^2 + 3*B*c*d^2 - 2
*A*c*d*e - 2*B*b*d*e) + (5*B*c*d^3 + A*b*d*e^2 - 3*A*c*d^2*e - 3*B*b*d^2*e
)/(2*e))/(d^2*e^3 + e^5*x^2 + 2*d*e^4*x) + (B*c*x)/e^3
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 251, normalized size of antiderivative = 2.41

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^3}\,dx$$
$$= \frac{2\log(ex+d)\,ac\,d^3e+4\log(ex+d)\,ac\,d^2e^2x+2\log(ex+d)\,acd\,e^3x^2+2\log(ex+d)\,b^2d^3e+4\log(ex+$$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^3,x)
```

output
```
(2*log(d + e*x)*a*c*d**3*e + 4*log(d + e*x)*a*c*d**2*e**2*x + 2*log(d + e*
x)*a*c*d*e**3*x**2 + 2*log(d + e*x)*b**2*d**3*e + 4*log(d + e*x)*b**2*d**2
*e**2*x + 2*log(d + e*x)*b**2*d*e**3*x**2 - 6*log(d + e*x)*b*c*d**4 - 12*l
og(d + e*x)*b*c*d**3*e*x - 6*log(d + e*x)*b*c*d**2*e**2*x**2 + a*b*e**4*x*
*2 + a*c*d**3*e - 2*a*c*d*e**3*x**2 + b**2*d**3*e - 2*b**2*d*e**3*x**2 - 3
*b*c*d**4 + 6*b*c*d**2*e**2*x**2 + 2*b*c*d*e**3*x**3)/(2*d*e**4*(d**2 + 2*
d*e*x + e**2*x**2))
```

3.8 $\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^4} \, dx$

Optimal result

Integrand size = 22, antiderivative size = 111

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^4} \, dx = \frac{d(Bd-Ae)(cd-be)}{3e^4(d+ex)^3} - \frac{Bd(3cd-2be)-Ae(2cd-be)}{2e^4(d+ex)^2} + \frac{3Bcd-bBe-Ace}{e^4(d+ex)} + \frac{Bc\log(d+ex)}{e^4}$$

output
```
1/3*d*(-A*e+B*d)*(-b*e+c*d)/e^4/(e*x+d)^3-1/2*(B*d*(-2*b*e+3*c*d)-A*e*(-b*
e+2*c*d))/e^4/(e*x+d)^2+(-A*c*e-B*b*e+3*B*c*d)/e^4/(e*x+d)+B*c*ln(e*x+d)/e
^4
```

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 112, normalized size of antiderivative = 1.01

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^4} \, dx = \frac{-Ae(be(d+3ex)+2c(d^2+3dex+3e^2x^2))+B(-2be(d^2+3dex+3e^2x^2)+cd(11d^2+27dex+18e^2x^2}{6e^4(d+ex)^3}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2))/(d + e*x)^4,x]
```

output
```
(-(A*e*(b*e*(d + 3*e*x) + 2*c*(d^2 + 3*d*e*x + 3*e^2*x^2))) + B*(-2*b*e*(d
^2 + 3*d*e*x + 3*e^2*x^2) + c*d*(11*d^2 + 27*d*e*x + 18*e^2*x^2)) + 6*B*c*
(d + e*x)^3*Log[d + e*x])/(6*e^4*(d + e*x)^3)
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^4}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{Ace+bBe-3Bcd}{e^3(d+ex)^2}+\frac{Bd(3cd-2be)-Ae(2cd-be)}{e^3(d+ex)^3}-\frac{d(Bd-Ae)(cd-be)}{e^3(d+ex)^4}+\frac{Bc}{e^3(d+ex)}\right)dx$$

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

$$\frac{d(Bd-Ae)(cd-be)}{3e^4(d+ex)^3}+\frac{-Ace-bBe+3Bcd}{e^4(d+ex)}-\frac{Bd(3cd-2be)-Ae(2cd-be)}{2e^4(d+ex)^2}+\frac{Bc\log(d+ex)}{e^4}$$

input
```
Int[((A + B*x)*(b*x + c*x^2))/(d + e*x)^4,x]
```

output
```
(d*(B*d - A*e)*(c*d - b*e))/(3*e^4*(d + e*x)^3) - (B*d*(3*c*d - 2*b*e) - A
*e*(2*c*d - b*e))/(2*e^4*(d + e*x)^2) + (3*B*c*d - b*B*e - A*c*e)/(e^4*(d
+ e*x)) + (B*c*Log[d + e*x])/e^4
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.70 (sec) , antiderivative size = 109, normalized size of antiderivative = 0.98

method	result
norman	$\frac{-\frac{d\left(Ab\,e^2+2Acde+2Bbde-11Bc\,d^2\right)}{6e^4}-\frac{(Ace+Bbe-3Bcd)x^2}{e^2}-\frac{\left(Ab\,e^2+2Acde+2Bbde-9Bc\,d^2\right)x}{2e^3}}{(ex+d)^3}+\frac{Bc\ln(ex+d)}{e^4}$
risch	$\frac{-\frac{d\left(Ab\,e^2+2Acde+2Bbde-11Bc\,d^2\right)}{6e^4}-\frac{(Ace+Bbe-3Bcd)x^2}{e^2}-\frac{\left(Ab\,e^2+2Acde+2Bbde-9Bc\,d^2\right)x}{2e^3}}{(ex+d)^3}+\frac{Bc\ln(ex+d)}{e^4}$
default	$\frac{d(Ab\,e^2-Acde-Bbde+Bc\,d^2)}{3e^4(ex+d)^3}+\frac{Bc\ln(ex+d)}{e^4}-\frac{Ace+Bbe-3Bcd}{e^4(ex+d)}-\frac{Ab\,e^2-2Acde-2Bbde+3Bc\,d^2}{2e^4(ex+d)^2}$
parallelrisch	$-\frac{-6B\ln(ex+d)x^3c\,e^3-18B\ln(ex+d)x^2cd\,e^2+6A\,x^2c\,e^3-18B\ln(ex+d)xc\,d^2e+6B\,x^2b\,e^3-18B\,x^2cd\,e^2+3Axb\,e^3+6Axcd}{6e^4(ex+d)^3}$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
(-1/6*d*(A*b*e^2+2*A*c*d*e+2*B*b*d*e-11*B*c*d^2)/e^4-(A*c*e+B*b*e-3*B*c*d)
/e^2*x^2-1/2*(A*b*e^2+2*A*c*d*e+2*B*b*d*e-9*B*c*d^2)/e^3*x)/(e*x+d)^3+B*c*
ln(e*x+d)/e^4
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.51

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^4}\,dx = \frac{11\,Bcd^3 - Abde^2 - 2\,(Bb+Ac)d^2e + 6\,(3\,Bcde^2 - (Bb+Ac)e^3)x^2 + 3\,(9\,Bcd^2e - Abe^3 - 2\,(Bb+Ac)d}{6\,(e^7x^3 + 3\,de^6x^2 + 3\,d^2e^5x + d^3e^4)}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^4,x, algorithm="fricas")
```

output
```
1/6*(11*B*c*d^3 - A*b*d*e^2 - 2*(B*b + A*c)*d^2*e + 6*(3*B*c*d*e^2 - (B*b
+ A*c)*e^3)*x^2 + 3*(9*B*c*d^2*e - A*b*e^3 - 2*(B*b + A*c)*d*e^2)*x + 6*(B
*c*e^3*x^3 + 3*B*c*d*e^2*x^2 + 3*B*c*d^2*e*x + B*c*d^3)*log(e*x + d))/(e^7
*x^3 + 3*d*e^6*x^2 + 3*d^2*e^5*x + d^3*e^4)
```

Sympy [A] (verification not implemented)

Time = 1.33 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.42

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^4}\,dx = \frac{Bc\log{(d+ex)}}{e^4} + \frac{-Abde^2 - 2Acd^2e - 2Bbd^2e + 11Bcd^3 + x^2(-6Ace^3 - 6Bbe^3 + 18Bcde^2) + x(-3Abe^3 - 6Acde^2 - 6}{6d^3e^4 + 18d^2e^5x + 18de^6x^2 + 6e^7x^3}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d)**4,x)
```

output
```
B*c*log(d + e*x)/e**4 + (-A*b*d*e**2 - 2*A*c*d**2*e - 2*B*b*d**2*e + 11*B*
c*d**3 + x**2*(-6*A*c*e**3 - 6*B*b*e**3 + 18*B*c*d*e**2) + x*(-3*A*b*e**3
- 6*A*c*d*e**2 - 6*B*b*d*e**2 + 27*B*c*d**2*e))/(6*d**3*e**4 + 18*d**2*e**
5*x + 18*d*e**6*x**2 + 6*e**7*x**3)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.23

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^4}\,dx = \frac{11\,Bcd^3 - Abde^2 - 2\,(Bb+Ac)d^2e + 6\,(3\,Bcde^2 - (Bb+Ac)e^3)x^2 + 3\,(9\,Bcd^2e - Abe^3 - 2\,(Bb+Ac)c}{6\,(e^7x^3 + 3\,de^6x^2 + 3\,d^2e^5x + d^3e^4)} + \frac{Bc\log(ex+d)}{e^4}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^4,x, algorithm="maxima")
```

output
```
1/6*(11*B*c*d^3 - A*b*d*e^2 - 2*(B*b + A*c)*d^2*e + 6*(3*B*c*d*e^2 - (B*b
+ A*c)*e^3)*x^2 + 3*(9*B*c*d^2*e - A*b*e^3 - 2*(B*b + A*c)*d*e^2)*x)/(e^7*
x^3 + 3*d*e^6*x^2 + 3*d^2*e^5*x + d^3*e^4) + B*c*log(e*x + d)/e^4
```

Giac [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.07

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^4}\,dx = \frac{Bc\log(|ex+d|)}{e^4} + \frac{6\,(3\,Bcde - Bbe^2 - Ace^2)x^2 + 3\,(9\,Bcd^2 - 2\,Bbde - 2\,Acde - Abe^2)x + \frac{11\,Bcd^3 - 2\,Bbd^2e - 2\,Acd^2e - Abde^2}{e}}{6\,(ex+d)^3e^3}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^4,x, algorithm="giac")
```

output
```
B*c*log(abs(e*x + d))/e^4 + 1/6*(6*(3*B*c*d*e - B*b*e^2 - A*c*e^2)*x^2 + 3
*(9*B*c*d^2 - 2*B*b*d*e - 2*A*c*d*e - A*b*e^2)*x + (11*B*c*d^3 - 2*B*b*d^2
*e - 2*A*c*d^2*e - A*b*d*e^2)/e)/((e*x + d)^3*e^3)
```

Mupad [B] (verification not implemented)

Time = 10.97 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.21

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^4}\,dx$$
$$= \frac{B\,c\,\ln(d+e\,x)}{e^4} - \frac{\frac{A\,b\,d\,e^2-11\,B\,c\,d^3+2\,A\,c\,d^2\,e+2\,B\,b\,d^2\,e}{6\,e^4}+\frac{x\,(A\,b\,e^2-9\,B\,c\,d^2+2\,A\,c\,d\,e+2\,B\,b\,d\,e)}{2\,e^3}+\frac{x^2\,(A\,c\,e+B\,b\,e-3\,B\,c\,d)}{e^2}}{d^3+3\,d^2\,e\,x+3\,d\,e^2\,x^2+e^3\,x^3}$$

input
```
int(((b*x + c*x^2)*(A + B*x))/(d + e*x)^4,x)
```

output
```
(B*c*log(d + e*x))/e^4 - ((A*b*d*e^2 - 11*B*c*d^3 + 2*A*c*d^2*e + 2*B*b*d^
2*e)/(6*e^4) + (x*(A*b*e^2 - 9*B*c*d^2 + 2*A*c*d*e + 2*B*b*d*e))/(2*e^3) +
 (x^2*(A*c*e + B*b*e - 3*B*c*d))/e^2)/(d^3 + e^3*x^3 + 3*d*e^2*x^2 + 3*d^2
*e*x)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.52

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^4}\,dx$$
$$= \frac{6\log(ex+d)\,bc\,d^4+18\log(ex+d)\,bc\,d^3ex+18\log(ex+d)\,bc\,d^2e^2x^2+6\log(ex+d)\,bcd\,e^3x^3-ab\,d^2e^2}{6d\,e^4\,(e^3x^3+3d\,e^2x^2+3d^2ex+d^3)}$$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^4,x)
```

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

3.9 $\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^5} \, dx$

Optimal result

Integrand size = 22, antiderivative size = 116

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^5} \, dx = \frac{d(Bd-Ae)(cd-be)}{4e^4(d+ex)^4} - \frac{Bd(3cd-2be)-Ae(2cd-be)}{3e^4(d+ex)^3} + \frac{3Bcd-bBe-Ace}{2e^4(d+ex)^2} - \frac{Bc}{e^4(d+ex)}$$

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

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.87

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^5} \, dx = -\frac{Ae(be(d+4ex)+c(d^2+4dex+6e^2x^2))+B(be(d^2+4dex+6e^2x^2)+3c(d^3+4d^2ex+6de^2x^2+4e^3}{12e^4(d+ex)^4}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2))/(d + e*x)^5,x]
```

output
```
-1/12*(A*e*(b*e*(d + 4*e*x) + c*(d^2 + 4*d*e*x + 6*e^2*x^2)) + B*(b*e*(d^2
 + 4*d*e*x + 6*e^2*x^2) + 3*c*(d^3 + 4*d^2*e*x + 6*d*e^2*x^2 + 4*e^3*x^3))
)/(e^4*(d + e*x)^4)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^5}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{Ace+bBe-3Bcd}{e^3(d+ex)^3}+\frac{Bd(3cd-2be)-Ae(2cd-be)}{e^3(d+ex)^4}-\frac{d(Bd-Ae)(cd-be)}{e^3(d+ex)^5}+\frac{Bc}{e^3(d+ex)^2}\right)dx$$

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

$$\frac{-Ace-bBe+3Bcd}{2e^4(d+ex)^2}-\frac{Bd(3cd-2be)-Ae(2cd-be)}{3e^4(d+ex)^3}+\frac{d(Bd-Ae)(cd-be)}{4e^4(d+ex)^4}-\frac{Bc}{e^4(d+ex)}$$

input
```
Int[((A + B*x)*(b*x + c*x^2))/(d + e*x)^5,x]
```

output
```
(d*(B*d - A*e)*(c*d - b*e))/(4*e^4*(d + e*x)^4) - (B*d*(3*c*d - 2*b*e) - A
*e*(2*c*d - b*e))/(3*e^4*(d + e*x)^3) + (3*B*c*d - b*B*e - A*c*e)/(2*e^4*(
d + e*x)^2) - (B*c)/(e^4*(d + e*x))
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.78 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.88

method	result
norman	$\frac{-\frac{Bc\,x^3}{e}-\frac{(Ace+Bbe+3Bcd)x^2}{2e^2}-\frac{\left(Ab\,e^2+Acde+Bbde+3Bc\,d^2\right)x}{3e^3}-\frac{d\left(Ab\,e^2+Acde+Bbde+3Bc\,d^2\right)}{12e^4}}{(ex+d)^4}$
risch	$\frac{-\frac{Bc\,x^3}{e}-\frac{(Ace+Bbe+3Bcd)x^2}{2e^2}-\frac{\left(Ab\,e^2+Acde+Bbde+3Bc\,d^2\right)x}{3e^3}-\frac{d\left(Ab\,e^2+Acde+Bbde+3Bc\,d^2\right)}{12e^4}}{(ex+d)^4}$
gosper	$-\frac{12Bc\,x^3e^3+6A\,x^2c\,e^3+6B\,x^2b\,e^3+18B\,x^2cd\,e^2+4Axb\,e^3+4Axcd\,e^2+4Bxbd\,e^2+12Bxc\,d^2e+Abd\,e^2+Ac\,d^2e+Bb\,d^2e+3B}{12e^4(ex+d)^4}$
default	$-\frac{Ab\,e^2-2Acde-2Bbde+3Bc\,d^2}{3e^4(ex+d)^3}+\frac{d\left(Ab\,e^2-Acde-Bbde+Bc\,d^2\right)}{4e^4(ex+d)^4}-\frac{Bc}{e^4(ex+d)}-\frac{Ace+Bbe-3Bcd}{2e^4(ex+d)^2}$
parallelrisch	$-\frac{12Bc\,x^3e^3+6A\,x^2c\,e^3+6B\,x^2b\,e^3+18B\,x^2cd\,e^2+4Axb\,e^3+4Axcd\,e^2+4Bxbd\,e^2+12Bxc\,d^2e+Abd\,e^2+Ac\,d^2e+Bb\,d^2e+3B}{12e^4(ex+d)^4}$
orering	$-\frac{(12Bc\,x^3e^3+6A\,x^2c\,e^3+6B\,x^2b\,e^3+18B\,x^2cd\,e^2+4Axb\,e^3+4Axcd\,e^2+4Bxbd\,e^2+12Bxc\,d^2e+Abd\,e^2+Ac\,d^2e+Bb\,d^2e+3}{12e^4x(cx+b)(ex+d)^4}$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

output
```
(-B*c*x^3/e-1/2*(A*c*e+B*b*e+3*B*c*d)/e^2*x^2-1/3*(A*b*e^2+A*c*d*e+B*b*d*e
+3*B*c*d^2)/e^3*x-1/12*d*(A*b*e^2+A*c*d*e+B*b*d*e+3*B*c*d^2)/e^4)/(e*x+d)^
4
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.21

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^5}\,dx = -\frac{12\,Bce^3x^3+3\,Bcd^3+Abde^2+(Bb+Ac)d^2e+6\left(3\,Bcde^2+(Bb+Ac)e^3\right)x^2+4\left(3\,Bcd^2e+Abe^3+\right.}{12\left(e^8x^4+4\,de^7x^3+6\,d^2e^6x^2+4\,d^3e^5x+d^4e^4\right)}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^5,x, algorithm="fricas")
```

output
```
-1/12*(12*B*c*e^3*x^3 + 3*B*c*d^3 + A*b*d*e^2 + (B*b + A*c)*d^2*e + 6*(3*B
*c*d*e^2 + (B*b + A*c)*e^3)*x^2 + 4*(3*B*c*d^2*e + A*b*e^3 + (B*b + A*c)*d
*e^2)*x)/(e^8*x^4 + 4*d*e^7*x^3 + 6*d^2*e^6*x^2 + 4*d^3*e^5*x + d^4*e^4)
```

Sympy [A] (verification not implemented)

Time = 2.36 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.45

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^5}\,dx = \frac{-Abde^2-Acd^2e-Bbd^2e-3Bcd^3-12Bce^3x^3+x^2\left(-6Ace^3-6Bbe^3-18Bcde^2\right)+x\left(-4Abe^3-4Ac\right.}{12d^4e^4+48d^3e^5x+72d^2e^6x^2+48de^7x^3+12e^8x^4}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d)**5,x)
```

output
```
(-A*b*d*e**2 - A*c*d**2*e - B*b*d**2*e - 3*B*c*d**3 - 12*B*c*e**3*x**3 + x
**2*(-6*A*c*e**3 - 6*B*b*e**3 - 18*B*c*d*e**2) + x*(-4*A*b*e**3 - 4*A*c*d*
e**2 - 4*B*b*d*e**2 - 12*B*c*d**2*e))/(12*d**4*e**4 + 48*d**3*e**5*x + 72*
d**2*e**6*x**2 + 48*d*e**7*x**3 + 12*e**8*x**4)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 140, normalized size of antiderivative = 1.21

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^5}\,dx = -\frac{12\,Bce^3x^3+3\,Bcd^3+Abde^2+(Bb+Ac)d^2e+6\,(3\,Bcde^2+(Bb+Ac)e^3)x^2+4\,(3\,Bcd^2e+Abe^3+ \cdots}{12\,(e^8x^4+4\,de^7x^3+6\,d^2e^6x^2+4\,d^3e^5x+d^4e^4)}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^5,x, algorithm="maxima")
```

output
```
-1/12*(12*B*c*e^3*x^3 + 3*B*c*d^3 + A*b*d*e^2 + (B*b + A*c)*d^2*e + 6*(3*B
*c*d*e^2 + (B*b + A*c)*e^3)*x^2 + 4*(3*B*c*d^2*e + A*b*e^3 + (B*b + A*c)*d
*e^2)*x)/(e^8*x^4 + 4*d*e^7*x^3 + 6*d^2*e^6*x^2 + 4*d^3*e^5*x + d^4*e^4)
```

Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.45

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^5}\,dx = -\frac{\frac{6\,Bb}{(ex+d)^2}+\frac{6\,Ac}{(ex+d)^2}-\frac{8\,Bbd}{(ex+d)^3}-\frac{8\,Acd}{(ex+d)^3}+\frac{3\,Bbd^2}{(ex+d)^4}+\frac{3\,Acd^2}{(ex+d)^4}+\frac{12\,Bc}{(ex+d)e}-\frac{18\,Bcd}{(ex+d)^2e}+\frac{12\,Bcd^2}{(ex+d)^3e}-\frac{3\,Bcd^3}{(ex+d)^4e}+\frac{4\,A \cdots}{(ex+ \cdots}}{12\,e^3}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^5,x, algorithm="giac")
```

output
```
-1/12*(6*B*b/(e*x + d)^2 + 6*A*c/(e*x + d)^2 - 8*B*b*d/(e*x + d)^3 - 8*A*c
*d/(e*x + d)^3 + 3*B*b*d^2/(e*x + d)^4 + 3*A*c*d^2/(e*x + d)^4 + 12*B*c/((
e*x + d)*e) - 18*B*c*d/((e*x + d)^2*e) + 12*B*c*d^2/((e*x + d)^3*e) - 3*B*
c*d^3/((e*x + d)^4*e) + 4*A*b*e/(e*x + d)^3 - 3*A*b*d*e/(e*x + d)^4)/e^3
```

Mupad [B] (verification not implemented)

Time = 10.89 (sec) , antiderivative size = 134, normalized size of antiderivative = 1.16

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^5}\,dx = -\frac{\frac{d\,\left(A\,b\,e^2+3\,B\,c\,d^2+A\,c\,d\,e+B\,b\,d\,e\right)}{12\,e^4}+\frac{x\,\left(A\,b\,e^2+3\,B\,c\,d^2+A\,c\,d\,e+B\,b\,d\,e\right)}{3\,e^3}+\frac{x^2\,\left(A\,c\,e+B\,b\,e+3\,B\,c\,d\right)}{2\,e^2}+\frac{B\,c\,x^3}{e}}{d^4+4\,d^3\,e\,x+6\,d^2\,e^2\,x^2+4\,d\,e^3\,x^3+e^4\,x^4}$$

input
```
int(((b*x + c*x^2)*(A + B*x))/(d + e*x)^5,x)
```

output
```
-((d*(A*b*e^2 + 3*B*c*d^2 + A*c*d*e + B*b*d*e))/(12*e^4) + (x*(A*b*e^2 + 3
*B*c*d^2 + A*c*d*e + B*b*d*e))/(3*e^3) + (x^2*(A*c*e + B*b*e + 3*B*c*d))/(
2*e^2) + (B*c*x^3)/e)/(d^4 + e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3
*e*x)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 133, normalized size of antiderivative = 1.15

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^5}\,dx = \frac{3bc\,e^3x^4-6acd\,e^2x^2-6b^2d\,e^2x^2-4abd\,e^2x-4ac\,d^2ex-4b^2d^2ex-ab\,d^2e-ac\,d^3-b^2d^3}{12d\,e^3\left(e^4x^4+4d\,e^3x^3+6d^2e^2x^2+4d^3ex+d^4\right)}$$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^5,x)
```

output
```
( - a*b*d**2*e - 4*a*b*d*e**2*x - a*c*d**3 - 4*a*c*d**2*e*x - 6*a*c*d*e**2
*x**2 - b**2*d**3 - 4*b**2*d**2*e*x - 6*b**2*d*e**2*x**2 + 3*b*c*e**3*x**4
)/(12*d*e**3*(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 + e**4*
x**4))
```

3.10 $\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^6}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 118

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^6}\,dx = \frac{d(Bd-Ae)(cd-be)}{5e^4(d+ex)^5} - \frac{Bd(3cd-2be)-Ae(2cd-be)}{4e^4(d+ex)^4} + \frac{3Bcd-bBe-Ace}{3e^4(d+ex)^3} - \frac{Bc}{2e^4(d+ex)^2}$$

output
```
1/5*d*(-A*e+B*d)*(-b*e+c*d)/e^4/(e*x+d)^5-1/4*(B*d*(-2*b*e+3*c*d)-A*e*(-b*
e+2*c*d))/e^4/(e*x+d)^4+1/3*(-A*c*e-B*b*e+3*B*c*d)/e^4/(e*x+d)^3-1/2*B*c/e
^4/(e*x+d)^2
```

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 104, normalized size of antiderivative = 0.88

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^6}\,dx = -\frac{Ae(3be(d+5ex)+2c(d^2+5dex+10e^2x^2))+B(2be(d^2+5dex+10e^2x^2)+3c(d^3+5d^2ex+10de^2x}{60e^4(d+ex)^5}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2))/(d + e*x)^6,x]
```

output
```
-1/60*(A*e*(3*b*e*(d + 5*e*x) + 2*c*(d^2 + 5*d*e*x + 10*e^2*x^2)) + B*(2*b
*e*(d^2 + 5*d*e*x + 10*e^2*x^2) + 3*c*(d^3 + 5*d^2*e*x + 10*d*e^2*x^2 + 10
*e^3*x^3)))/(e^4*(d + e*x)^5)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^6}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{Ace+bBe-3Bcd}{e^3(d+ex)^4}+\frac{Bd(3cd-2be)-Ae(2cd-be)}{e^3(d+ex)^5}-\frac{d(Bd-Ae)(cd-be)}{e^3(d+ex)^6}+\frac{Bc}{e^3(d+ex)^3}\right)dx$$

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

$$\frac{-Ace-bBe+3Bcd}{3e^4(d+ex)^3}-\frac{Bd(3cd-2be)-Ae(2cd-be)}{4e^4(d+ex)^4}+\frac{d(Bd-Ae)(cd-be)}{5e^4(d+ex)^5}-\frac{Bc}{2e^4(d+ex)^2}$$

input
```
Int[((A + B*x)*(b*x + c*x^2))/(d + e*x)^6,x]
```

output
```
(d*(B*d - A*e)*(c*d - b*e))/(5*e^4*(d + e*x)^5) - (B*d*(3*c*d - 2*b*e) - A
*e*(2*c*d - b*e))/(4*e^4*(d + e*x)^4) + (3*B*c*d - b*B*e - A*c*e)/(3*e^4*(
d + e*x)^3) - (B*c)/(2*e^4*(d + e*x)^2)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.93

method	result
risch	$\frac{-\frac{Bc\,x^3}{2e}-\frac{(2Ace+2Bbe+3Bcd)x^2}{6e^2}-\frac{\left(3Ab\,e^2+2Acde+2Bbde+3Bc\,d^2\right)x}{12e^3}-\frac{d\left(3Ab\,e^2+2Acde+2Bbde+3Bc\,d^2\right)}{60e^4}}{(ex+d)^5}$
default	$-\frac{Ace+Bbe-3Bcd}{3e^4(ex+d)^3}-\frac{Ab\,e^2-2Acde-2Bbde+3Bc\,d^2}{4e^4(ex+d)^4}+\frac{d(Ab\,e^2-Acde-Bbde+Bc\,d^2)}{5e^4(ex+d)^5}-\frac{Bc}{2e^4(ex+d)^2}$
gosper	$-\frac{30Bc\,x^3e^3+20A\,x^2c\,e^3+20B\,x^2b\,e^3+30B\,x^2cd\,e^2+15Axb\,e^3+10Axcd\,e^2+10Bxbd\,e^2+15Bxc\,d^2e+3Abd\,e^2+2Ac\,d^2e+2B}{60e^4(ex+d)^5}$
norman	$\frac{-\frac{Bc\,x^3}{2e}-\frac{\left(2Ac\,e^2+2B\,e^2b+3Bcde\right)x^2}{6e^3}-\frac{\left(3Ab\,e^3+2Acd\,e^2+2Bbd\,e^2+3Bc\,d^2e\right)x}{12e^4}-\frac{d\left(3Ab\,e^3+2Acd\,e^2+2Bbd\,e^2+3Bc\,d^2e\right)}{60e^5}}{(ex+d)^5}$
parallelrisch	$-\frac{30Bc\,x^3e^4+20Ac\,e^4x^2+20Bb\,e^4x^2+30Bcd\,e^3x^2+15Ab\,e^4x+10Acd\,e^3x+10Bbd\,e^3x+15Bc\,d^2e^2x+3Abd\,e^3+2Ac\,d^2e^2+2I}{60e^5(ex+d)^5}$
orering	$-\frac{(30Bc\,x^3e^3+20A\,x^2c\,e^3+20B\,x^2b\,e^3+30B\,x^2cd\,e^2+15Axb\,e^3+10Axcd\,e^2+10Bxbd\,e^2+15Bxc\,d^2e+3Abd\,e^2+2Ac\,d^2e+2I}{60e^4x(cx+b)(ex+d)^5}$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

output
```
(-1/2*B*c*x^3/e-1/6/e^2*(2*A*c*e+2*B*b*e+3*B*c*d)*x^2-1/12/e^3*(3*A*b*e^2+
2*A*c*d*e+2*B*b*d*e+3*B*c*d^2)*x-1/60*d/e^4*(3*A*b*e^2+2*A*c*d*e+2*B*b*d*e
+3*B*c*d^2))/(e*x+d)^5
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.32

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^6}\,dx = -\frac{30\,Bce^3x^3+3\,Bcd^3+3\,Abde^2+2\,(Bb+Ac)d^2e+10\,\left(3\,Bcde^2+2\,(Bb+Ac)e^3\right)x^2+5\,\left(3\,Bcd^2e+3\right.}{60\,\left(e^9x^5+5\,de^8x^4+10\,d^2e^7x^3+10\,d^3e^6x^2+5\,d^4e^5x+d^5e^4\right)}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^6,x, algorithm="fricas")
```

output
```
-1/60*(30*B*c*e^3*x^3 + 3*B*c*d^3 + 3*A*b*d*e^2 + 2*(B*b + A*c)*d^2*e + 10
*(3*B*c*d*e^2 + 2*(B*b + A*c)*e^3)*x^2 + 5*(3*B*c*d^2*e + 3*A*b*e^3 + 2*(B
*b + A*c)*d*e^2)*x)/(e^9*x^5 + 5*d*e^8*x^4 + 10*d^2*e^7*x^3 + 10*d^3*e^6*x
^2 + 5*d^4*e^5*x + d^5*e^4)
```

Sympy [A] (verification not implemented)

Time = 4.19 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.57

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^6}\,dx = \frac{-3Abde^2-2Acd^2e-2Bbd^2e-3Bcd^3-30Bce^3x^3+x^2\left(-20Ace^3-20Bbe^3-30Bcde^2\right)+x\left(-15Abe^3\right.}{60d^5e^4+300d^4e^5x+600d^3e^6x^2+600d^2e^7x^3+300de^8x^4+60e^9x^5}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d)**6,x)
```

output
```
(-3*A*b*d*e**2 - 2*A*c*d**2*e - 2*B*b*d**2*e - 3*B*c*d**3 - 30*B*c*e**3*x*
*3 + x**2*(-20*A*c*e**3 - 20*B*b*e**3 - 30*B*c*d*e**2) + x*(-15*A*b*e**3 -
 10*A*c*d*e**2 - 10*B*b*d*e**2 - 15*B*c*d**2*e))/(60*d**5*e**4 + 300*d**4*
e**5*x + 600*d**3*e**6*x**2 + 600*d**2*e**7*x**3 + 300*d*e**8*x**4 + 60*e*
*9*x**5)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.32

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^6}\,dx = -\frac{30\,Bce^3x^3+3\,Bcd^3+3\,Abde^2+2\,(Bb+Ac)d^2e+10\,(3\,Bcde^2+2\,(Bb+Ac)e^3)x^2+5\,(3\,Bcd^2e+3\,\ldots}{60\,(e^9x^5+5\,de^8x^4+10\,d^2e^7x^3+10\,d^3e^6x^2+5\,d^4e^5x+d^5e^4)}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^6,x, algorithm="maxima")
```

output
```
-1/60*(30*B*c*e^3*x^3 + 3*B*c*d^3 + 3*A*b*d*e^2 + 2*(B*b + A*c)*d^2*e + 10
*(3*B*c*d*e^2 + 2*(B*b + A*c)*e^3)*x^2 + 5*(3*B*c*d^2*e + 3*A*b*e^3 + 2*(B
*b + A*c)*d*e^2)*x)/(e^9*x^5 + 5*d*e^8*x^4 + 10*d^2*e^7*x^3 + 10*d^3*e^6*x
^2 + 5*d^4*e^5*x + d^5*e^4)
```

Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 120, normalized size of antiderivative = 1.02

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^6}\,dx = -\frac{30\,Bce^3x^3+30\,Bcde^2x^2+20\,Bbe^3x^2+20\,Ace^3x^2+15\,Bcd^2ex+10\,Bbde^2x+10\,Acde^2x+15\,Abe^3x\,\ldots}{60\,(ex+d)^5e^4}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^6,x, algorithm="giac")
```

output
```
-1/60*(30*B*c*e^3*x^3 + 30*B*c*d*e^2*x^2 + 20*B*b*e^3*x^2 + 20*A*c*e^3*x^2
 + 15*B*c*d^2*e*x + 10*B*b*d*e^2*x + 10*A*c*d*e^2*x + 15*A*b*e^3*x + 3*B*c
*d^3 + 2*B*b*d^2*e + 2*A*c*d^2*e + 3*A*b*d*e^2)/((e*x + d)^5*e^4)
```

Mupad [B] (verification not implemented)

Time = 10.79 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.31

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^6}\,dx = -\frac{\frac{d\,(3\,A\,b\,e^2+3\,B\,c\,d^2+2\,A\,c\,d\,e+2\,B\,b\,d\,e)}{60\,e^4}+\frac{x\,(3\,A\,b\,e^2+3\,B\,c\,d^2+2\,A\,c\,d\,e+2\,B\,b\,d\,e)}{12\,e^3}+\frac{x^2\,(2\,A\,c\,e+2\,B\,b\,e+3\,B\,c\,d)}{6\,e^2}+\frac{B\,c\,x^3}{2\,e}}{d^5+5\,d^4\,e\,x+10\,d^3\,e^2\,x^2+10\,d^2\,e^3\,x^3+5\,d\,e^4\,x^4+e^5\,x^5}$$

input
```
int(((b*x + c*x^2)*(A + B*x))/(d + e*x)^6,x)
```

output
```
-((d*(3*A*b*e^2 + 3*B*c*d^2 + 2*A*c*d*e + 2*B*b*d*e))/(60*e^4) + (x*(3*A*b
*e^2 + 3*B*c*d^2 + 2*A*c*d*e + 2*B*b*d*e))/(12*e^3) + (x^2*(2*A*c*e + 2*B*
b*e + 3*B*c*d))/(6*e^2) + (B*c*x^3)/(2*e))/(d^5 + e^5*x^5 + 5*d*e^4*x^4 +
10*d^3*e^2*x^2 + 10*d^2*e^3*x^3 + 5*d^4*e*x)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.42

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^6}\,dx = \frac{-30bc\,e^3x^3-20ac\,e^3x^2-20b^2e^3x^2-30bcd\,e^2x^2-15ab\,e^3x-10acd\,e^2x-10b^2d\,e^2x-15bc\,d^2ex-3ab}{60e^4\left(e^5x^5+5d\,e^4x^4+10d^2e^3x^3+10d^3e^2x^2+5d^4ex+d^5\right)}$$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^6,x)
```

output
```
( - 3*a*b*d*e**2 - 15*a*b*e**3*x - 2*a*c*d**2*e - 10*a*c*d*e**2*x - 20*a*c
*e**3*x**2 - 2*b**2*d**2*e - 10*b**2*d*e**2*x - 20*b**2*e**3*x**2 - 3*b*c*
d**3 - 15*b*c*d**2*e*x - 30*b*c*d*e**2*x**2 - 30*b*c*e**3*x**3)/(60*e**4*(
d**5 + 5*d**4*e*x + 10*d**3*e**2*x**2 + 10*d**2*e**3*x**3 + 5*d*e**4*x**4
+ e**5*x**5))
```

3.11 $\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right)^2 \, dx$

Optimal result

Integrand size = 24, antiderivative size = 228

$$\begin{aligned}\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right)^2 \, dx &= \frac{1}{3}Ab^2d^3x^3 + \frac{1}{4}bd^2(bBd+2Acd+3Abe)x^4 \\ &\quad + \frac{1}{5}d\big(Ac^2d^2+3b^2e(Bd+Ae) \\ &\quad + 2bcd(Bd+3Ae)\big)\,x^5 \\ &\quad + \frac{1}{6}\big(Ae\big(3c^2d^2+6bcde+b^2e^2\big) \\ &\quad + Bd\big(c^2d^2+6bcde+3b^2e^2\big)\big)\,x^6 \\ &\quad + \frac{1}{7}e\big(Ace(3cd+2be) \\ &\quad + B\big(3c^2d^2+6bcde+b^2e^2\big)\big)\,x^7 \\ &\quad + \frac{1}{8}ce^2(3Bcd+2bBe+Ace)x^8 + \frac{1}{9}Bc^2e^3x^9\end{aligned}$$

output
```
1/3*A*b^2*d^3*x^3+1/4*b*d^2*(3*A*b*e+2*A*c*d+B*b*d)*x^4+1/5*d*(A*c^2*d^2+3
*b^2*e*(A*e+B*d)+2*b*c*d*(3*A*e+B*d))*x^5+1/6*(A*e*(b^2*e^2+6*b*c*d*e+3*c^
2*d^2)+B*d*(3*b^2*e^2+6*b*c*d*e+c^2*d^2))*x^6+1/7*e*(A*c*e*(2*b*e+3*c*d)+B
*(b^2*e^2+6*b*c*d*e+3*c^2*d^2))*x^7+1/8*c*e^2*(A*c*e+2*B*b*e+3*B*c*d)*x^8+
1/9*B*c^2*e^3*x^9
```

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 228, normalized size of antiderivative = 1.00

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^2\,dx=\frac{1}{3}Ab^2d^3x^3+\frac{1}{4}bd^2(bBd+2Acd+3Abe)x^4+\frac{1}{5}d\left(Ac^2d^2+3b^2e(Bd+Ae)+2bcd(Bd+3Ae)\right)x^5+\frac{1}{6}\left(Ae\left(3c^2d^2+6bcde+b^2e^2\right)+Bd\left(c^2d^2+6bcde+3b^2e^2\right)\right)x^6+\frac{1}{7}e\left(Ace(3cd+2be)+B\left(3c^2d^2+6bcde+b^2e^2\right)\right)x^7+\frac{1}{8}ce^2(3Bcd+2bBe+Ace)x^8+\frac{1}{9}Bc^2e^3x^9$$

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

output
```
(A*b^2*d^3*x^3)/3 + (b*d^2*(b*B*d + 2*A*c*d + 3*A*b*e)*x^4)/4 + (d*(A*c^2*
d^2 + 3*b^2*e*(B*d + A*e) + 2*b*c*d*(B*d + 3*A*e))*x^5)/5 + ((A*e*(3*c^2*d
^2 + 6*b*c*d*e + b^2*e^2) + B*d*(c^2*d^2 + 6*b*c*d*e + 3*b^2*e^2))*x^6)/6
+ (e*(A*c*e*(3*c*d + 2*b*e) + B*(3*c^2*d^2 + 6*b*c*d*e + b^2*e^2))*x^7)/7
+ (c*e^2*(3*B*c*d + 2*b*B*e + A*c*e)*x^8)/8 + (B*c^2*e^3*x^9)/9
```

Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 228, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^2(d+ex)^3\,dx$$

$$\Big\downarrow \text{ 1195}$$

$$\int \left(ex^6\left(Ace(2be+3cd)+B\left(b^2e^2+6bcde+3c^2d^2\right)\right)+x^5\left(Ae\left(b^2e^2+6bcde+3c^2d^2\right)+Bd\left(3b^2e^2+6bcde+c^2d^2\right)\right)\right.$$

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

$$\frac{1}{7}ex^7\left(Ace(2be+3cd)+B\left(b^2e^2+6bcde+3c^2d^2\right)\right)+\frac{1}{6}x^6\left(Ae\left(b^2e^2+6bcde+3c^2d^2\right)+Bd\left(3b^2e^2+6bcde+c^2d^2\right)\right)+\frac{1}{5}dx^5\left(3b^2e(Ae+Bd)+2bcd(3Ae+Bd)+Ac^2d^2\right)+\frac{1}{3}Ab^2d^3x^3+\frac{1}{4}bd^2x^4(3Abe+2Acd+bBd)+\frac{1}{8}ce^2x^8(Ace+2bBe+3Bcd)+\frac{1}{9}Bc^2e^3x^9$$

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

output
```
(A*b^2*d^3*x^3)/3 + (b*d^2*(b*B*d + 2*A*c*d + 3*A*b*e)*x^4)/4 + (d*(A*c^2*
d^2 + 3*b^2*e*(B*d + A*e) + 2*b*c*d*(B*d + 3*A*e))*x^5)/5 + ((A*e*(3*c^2*d
^2 + 6*b*c*d*e + b^2*e^2) + B*d*(c^2*d^2 + 6*b*c*d*e + 3*b^2*e^2))*x^6)/6
+ (e*(A*c*e*(3*c*d + 2*b*e) + B*(3*c^2*d^2 + 6*b*c*d*e + b^2*e^2))*x^7)/7
+ (c*e^2*(3*B*c*d + 2*b*B*e + A*c*e)*x^8)/8 + (B*c^2*e^3*x^9)/9
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.61 (sec) , antiderivative size = 247, normalized size of antiderivative = 1.08

method	result
default	$\frac{B e^3 c^2 x^9}{9}+\frac{((A e^3+3Bd e^2)c^2+2B e^3 bc)x^8}{8}+\frac{((3Ad e^2+3eB d^2)c^2+2(A e^3+3Bd e^2)bc+B e^3 b^2)x^7}{7}+\frac{((3A d^2 e+B d^3$
norman	$\frac{B e^3 c^2 x^9}{9}+\left(\frac{1}{8}A c^2 e^3+\frac{1}{4}B e^3 bc+\frac{3}{8}B c^2 d e^2\right)x^8+\left(\frac{2}{7}Abc e^3+\frac{3}{7}A c^2 d e^2+\frac{1}{7}B e^3 b^2+\frac{6}{7}Bbcd e$
gosper	$\frac{x^3(280B e^3 c^2 x^6+315x^5 A c^2 e^3+630x^5 B e^3 bc+945x^5 B c^2 d e^2+720x^4 Abc e^3+1080x^4 A c^2 d e^2+360x^4 B e^3 b^2+2160x^4 Bbcd e^2}{}$
risch	$\frac{1}{9}B e^3 c^2 x^9+\frac{1}{8}x^8 A c^2 e^3+\frac{1}{4}x^8 B e^3 bc+\frac{3}{8}x^8 B c^2 d e^2+\frac{2}{7}x^7 Abc e^3+\frac{3}{7}x^7 A c^2 d e^2+\frac{1}{7}x^7 B e^3 b^2$
parallelrisch	$\frac{1}{9}B e^3 c^2 x^9+\frac{1}{8}x^8 A c^2 e^3+\frac{1}{4}x^8 B e^3 bc+\frac{3}{8}x^8 B c^2 d e^2+\frac{2}{7}x^7 Abc e^3+\frac{3}{7}x^7 A c^2 d e^2+\frac{1}{7}x^7 B e^3 b^2$
orering	$\frac{x(280B e^3 c^2 x^6+315x^5 A c^2 e^3+630x^5 B e^3 bc+945x^5 B c^2 d e^2+720x^4 Abc e^3+1080x^4 A c^2 d e^2+360x^4 B e^3 b^2+2160x^4 Bbcd e^2-}{}$

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

output
```
1/9*B*e^3*c^2*x^9+1/8*((A*e^3+3*B*d*e^2)*c^2+2*B*e^3*b*c)*x^8+1/7*((3*A*d*
e^2+3*B*d^2*e)*c^2+2*(A*e^3+3*B*d*e^2)*b*c+B*e^3*b^2)*x^7+1/6*((3*A*d^2*e+
B*d^3)*c^2+2*(3*A*d*e^2+3*B*d^2*e)*b*c+(A*e^3+3*B*d*e^2)*b^2)*x^6+1/5*(A*c
^2*d^3+2*(3*A*d^2*e+B*d^3)*b*c+(3*A*d*e^2+3*B*d^2*e)*b^2)*x^5+1/4*(2*A*d^3
*b*c+(3*A*d^2*e+B*d^3)*b^2)*x^4+1/3*A*b^2*d^3*x^3
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 239, normalized size of antiderivative = 1.05

$$\begin{aligned}\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^2\,dx &= \frac{1}{9}Bc^2e^3x^9+\frac{1}{3}Ab^2d^3x^3+\frac{1}{8}\left(3\,Bc^2de^2+\left(2\,Bbc+Ac^2\right)e^3\right)x^8\\&+\frac{1}{7}\left(3\,Bc^2d^2e+3\left(2\,Bbc+Ac^2\right)de^2+\left(Bb^2+2\,Abc\right)e^3\right)x^7\\&+\frac{1}{6}\left(Bc^2d^3+Ab^2e^3+3\left(2\,Bbc+Ac^2\right)d^2e+3\left(Bb^2+2\,Abc\right)de^2\right)x^6\\&+\frac{1}{5}\left(3\,Ab^2de^2+\left(2\,Bbc+Ac^2\right)d^3+3\left(Bb^2+2\,Abc\right)d^2e\right)x^5\\&+\frac{1}{4}\left(3\,Ab^2d^2e+\left(Bb^2+2\,Abc\right)d^3\right)x^4\end{aligned}$$

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

output
```
1/9*B*c^2*e^3*x^9 + 1/3*A*b^2*d^3*x^3 + 1/8*(3*B*c^2*d*e^2 + (2*B*b*c + A*
c^2)*e^3)*x^8 + 1/7*(3*B*c^2*d^2*e + 3*(2*B*b*c + A*c^2)*d*e^2 + (B*b^2 +
2*A*b*c)*e^3)*x^7 + 1/6*(B*c^2*d^3 + A*b^2*e^3 + 3*(2*B*b*c + A*c^2)*d^2*e
 + 3*(B*b^2 + 2*A*b*c)*d*e^2)*x^6 + 1/5*(3*A*b^2*d*e^2 + (2*B*b*c + A*c^2)
*d^3 + 3*(B*b^2 + 2*A*b*c)*d^2*e)*x^5 + 1/4*(3*A*b^2*d^2*e + (B*b^2 + 2*A*
b*c)*d^3)*x^4
```

Sympy [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 301, normalized size of antiderivative = 1.32

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^2\,dx = \frac{Ab^2d^3x^3}{3} + \frac{Bc^2e^3x^9}{9} + x^8\left(\frac{Ac^2e^3}{8} + \frac{Bbce^3}{4} + \frac{3Bc^2de^2}{8}\right) + x^7 \cdot \left(\frac{2Abce^3}{7} + \frac{3Ac^2de^2}{7} + \frac{Bb^2e^3}{7} + \frac{6Bbcde^2}{7} + \frac{3Bc^2d^2e}{7}\right) + x^6\left(\frac{Ab^2e^3}{6} + Abcde^2 + \frac{Ac^2d^2e}{2} + \frac{Bb^2de^2}{2} + Bbcd^2e + \frac{Bc^2d^3}{6}\right) + x^5 \cdot \left(\frac{3Ab^2de^2}{5} + \frac{6Abcd^2e}{5} + \frac{Ac^2d^3}{5} + \frac{3Bb^2d^2e}{5} + \frac{2Bbcd^3}{5}\right) + x^4 \cdot \left(\frac{3Ab^2d^2e}{4} + \frac{Abcd^3}{2} + \frac{Bb^2d^3}{4}\right)$$

input
```
integrate((B*x+A)*(e*x+d)**3*(c*x**2+b*x)**2,x)
```

output
```
A*b**2*d**3*x**3/3 + B*c**2*e**3*x**9/9 + x**8*(A*c**2*e**3/8 + B*b*c*e**3
/4 + 3*B*c**2*d*e**2/8) + x**7*(2*A*b*c*e**3/7 + 3*A*c**2*d*e**2/7 + B*b**
2*e**3/7 + 6*B*b*c*d*e**2/7 + 3*B*c**2*d**2*e/7) + x**6*(A*b**2*e**3/6 + A
*b*c*d*e**2 + A*c**2*d**2*e/2 + B*b**2*d*e**2/2 + B*b*c*d**2*e + B*c**2*d*
*3/6) + x**5*(3*A*b**2*d*e**2/5 + 6*A*b*c*d**2*e/5 + A*c**2*d**3/5 + 3*B*b
**2*d**2*e/5 + 2*B*b*c*d**3/5) + x**4*(3*A*b**2*d**2*e/4 + A*b*c*d**3/2 +
B*b**2*d**3/4)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 239, normalized size of antiderivative = 1.05

$$\begin{aligned}
&\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^2\,dx \\
&= \frac{1}{9}Bc^2e^3x^9 + \frac{1}{3}Ab^2d^3x^3 + \frac{1}{8}\left(3\,Bc^2de^2 + \left(2\,Bbc + Ac^2\right)e^3\right)x^8 \\
&\quad + \frac{1}{7}\left(3\,Bc^2d^2e + 3\left(2\,Bbc + Ac^2\right)de^2 + \left(Bb^2 + 2\,Abc\right)e^3\right)x^7 \\
&\quad + \frac{1}{6}\left(Bc^2d^3 + Ab^2e^3 + 3\left(2\,Bbc + Ac^2\right)d^2e + 3\left(Bb^2 + 2\,Abc\right)de^2\right)x^6 \\
&\quad + \frac{1}{5}\left(3\,Ab^2de^2 + \left(2\,Bbc + Ac^2\right)d^3 + 3\left(Bb^2 + 2\,Abc\right)d^2e\right)x^5 \\
&\quad + \frac{1}{4}\left(3\,Ab^2d^2e + \left(Bb^2 + 2\,Abc\right)d^3\right)x^4
\end{aligned}$$

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

output
```
1/9*B*c^2*e^3*x^9 + 1/3*A*b^2*d^3*x^3 + 1/8*(3*B*c^2*d*e^2 + (2*B*b*c + A*
c^2)*e^3)*x^8 + 1/7*(3*B*c^2*d^2*e + 3*(2*B*b*c + A*c^2)*d*e^2 + (B*b^2 +
2*A*b*c)*e^3)*x^7 + 1/6*(B*c^2*d^3 + A*b^2*e^3 + 3*(2*B*b*c + A*c^2)*d^2*e
 + 3*(B*b^2 + 2*A*b*c)*d*e^2)*x^6 + 1/5*(3*A*b^2*d*e^2 + (2*B*b*c + A*c^2)
*d^3 + 3*(B*b^2 + 2*A*b*c)*d^2*e)*x^5 + 1/4*(3*A*b^2*d^2*e + (B*b^2 + 2*A*
b*c)*d^3)*x^4
```

Giac [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.28

$$\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right)^2 \, dx = \frac{1}{9} Bc^2e^3x^9 + \frac{3}{8} Bc^2de^2x^8 + \frac{1}{4} Bbce^3x^8 + \frac{1}{8} Ac^2e^3x^8 + \frac{3}{7} Bc^2d^2ex^7 + \frac{6}{7} Bbcde^2x^7 + \frac{3}{7} Ac^2de^2x^7 + \frac{1}{7} Bb^2e^3x^7 + \frac{2}{7} Abce^3x^7 + \frac{1}{6} Bc^2d^3x^6 + Bbcd^2ex^6 + \frac{1}{2} Ac^2d^2ex^6 + \frac{1}{2} Bb^2de^2x^6 + Abcde^2x^6 + \frac{1}{6} Ab^2e^3x^6 + \frac{2}{5} Bbcd^3x^5 + \frac{1}{5} Ac^2d^3x^5 + \frac{3}{5} Bb^2d^2ex^5 + \frac{6}{5} Abcd^2ex^5 + \frac{3}{5} Ab^2de^2x^5 + \frac{1}{4} Bb^2d^3x^4 + \frac{1}{2} Abcd^3x^4 + \frac{3}{4} Ab^2d^2ex^4 + \frac{1}{3} Ab^2d^3x^3$$

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

output
```
1/9*B*c^2*e^3*x^9 + 3/8*B*c^2*d*e^2*x^8 + 1/4*B*b*c*e^3*x^8 + 1/8*A*c^2*e^
3*x^8 + 3/7*B*c^2*d^2*e*x^7 + 6/7*B*b*c*d*e^2*x^7 + 3/7*A*c^2*d*e^2*x^7 +
1/7*B*b^2*e^3*x^7 + 2/7*A*b*c*e^3*x^7 + 1/6*B*c^2*d^3*x^6 + B*b*c*d^2*e*x^
6 + 1/2*A*c^2*d^2*e*x^6 + 1/2*B*b^2*d*e^2*x^6 + A*b*c*d*e^2*x^6 + 1/6*A*b^
2*e^3*x^6 + 2/5*B*b*c*d^3*x^5 + 1/5*A*c^2*d^3*x^5 + 3/5*B*b^2*d^2*e*x^5 +
6/5*A*b*c*d^2*e*x^5 + 3/5*A*b^2*d*e^2*x^5 + 1/4*B*b^2*d^3*x^4 + 1/2*A*b*c*
d^3*x^4 + 3/4*A*b^2*d^2*e*x^4 + 1/3*A*b^2*d^3*x^3
```

Mupad [B] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 234, normalized size of antiderivative = 1.03

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^2\,dx = x^6\left(\frac{B\,b^2\,d\,e^2}{2}+\frac{A\,b^2\,e^3}{6}+B\,b\,c\,d^2\,e+A\,b\,c\,d\,e^2+\frac{B\,c^2\,d^3}{6}+\frac{A\,c^2\,d^2\,e}{2}\right)+x^5\left(\frac{3\,B\,b^2\,d^2\,e}{5}+\frac{3\,A\,b^2\,d\,e^2}{5}+\frac{2\,B\,b\,c\,d^3}{5}+\frac{6\,A\,b\,c\,d^2\,e}{5}+\frac{A\,c^2\,d^3}{5}\right)+x^7\left(\frac{B\,b^2\,e^3}{7}+\frac{6\,B\,b\,c\,d\,e^2}{7}+\frac{2\,A\,b\,c\,e^3}{7}+\frac{3\,B\,c^2\,d^2\,e}{7}+\frac{3\,A\,c^2\,d\,e^2}{7}\right)+\frac{b\,d^2\,x^4\,(3\,A\,b\,e+2\,A\,c\,d+B\,b\,d)}{4}+\frac{c\,e^2\,x^8\,(A\,c\,e+2\,B\,b\,e+3\,B\,c\,d)}{8}+\frac{A\,b^2\,d^3\,x^3}{3}+\frac{B\,c^2\,e^3\,x^9}{9}$$

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

output
```
x^6*((A*b^2*e^3)/6 + (B*c^2*d^3)/6 + (A*c^2*d^2*e)/2 + (B*b^2*d*e^2)/2 + A
*b*c*d*e^2 + B*b*c*d^2*e) + x^5*((A*c^2*d^3)/5 + (2*B*b*c*d^3)/5 + (3*A*b^
2*d*e^2)/5 + (3*B*b^2*d^2*e)/5 + (6*A*b*c*d^2*e)/5) + x^7*((B*b^2*e^3)/7 +
 (2*A*b*c*e^3)/7 + (3*A*c^2*d*e^2)/7 + (3*B*c^2*d^2*e)/7 + (6*B*b*c*d*e^2)
/7) + (b*d^2*x^4*(3*A*b*e + 2*A*c*d + B*b*d))/4 + (c*e^2*x^8*(A*c*e + 2*B*
b*e + 3*B*c*d))/8 + (A*b^2*d^3*x^3)/3 + (B*c^2*e^3*x^9)/9
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 289, normalized size of antiderivative = 1.27

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^2\,dx$$
$$=\frac{x^3(280b\,c^2e^3x^6+315a\,c^2e^3x^5+630b^2c\,e^3x^5+945b\,c^2d\,e^2x^5+720abc\,e^3x^4+1080a\,c^2d\,e^2x^4+360b^3e^3x^4}{}$$

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

output
```
(x**3*(840*a*b**2*d**3 + 1890*a*b**2*d**2*e*x + 1512*a*b**2*d*e**2*x**2 +
420*a*b**2*e**3*x**3 + 1260*a*b*c*d**3*x + 3024*a*b*c*d**2*e*x**2 + 2520*a
*b*c*d*e**2*x**3 + 720*a*b*c*e**3*x**4 + 504*a*c**2*d**3*x**2 + 1260*a*c**
2*d**2*e*x**3 + 1080*a*c**2*d*e**2*x**4 + 315*a*c**2*e**3*x**5 + 630*b**3*
d**3*x + 1512*b**3*d**2*e*x**2 + 1260*b**3*d*e**2*x**3 + 360*b**3*e**3*x**
4 + 1008*b**2*c*d**3*x**2 + 2520*b**2*c*d**2*e*x**3 + 2160*b**2*c*d*e**2*x
**4 + 630*b**2*c*e**3*x**5 + 420*b*c**2*d**3*x**3 + 1080*b*c**2*d**2*e*x**
4 + 945*b*c**2*d*e**2*x**5 + 280*b*c**2*e**3*x**6))/2520
```

3.12 $\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^2 \, dx$

Optimal result

Integrand size = 24, antiderivative size = 162

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^2 \, dx = \frac{1}{3}Ab^2d^2x^3+\frac{1}{4}bd(bBd+2Acd+2Abe)x^4+\frac{1}{5}\left(Ac^2d^2 + b^2e(2Bd+Ae)+2bcd(Bd+2Ae)\right)x^5 + \frac{1}{6}\left(2Ace(cd+be)+B\left(c^2d^2+4bcde+b^2e^2\right)\right)x^6 + \frac{1}{7}ce(Ace+2B(cd+be))x^7+\frac{1}{8}Bc^2e^2x^8$$

output
```
1/3*A*b^2*d^2*x^3+1/4*b*d*(2*A*b*e+2*A*c*d+B*b*d)*x^4+1/5*(A*c^2*d^2+b^2*e
*(A*e+2*B*d)+2*b*c*d*(2*A*e+B*d))*x^5+1/6*(2*A*c*e*(b*e+c*d)+B*(b^2*e^2+4*
b*c*d*e+c^2*d^2))*x^6+1/7*c*e*(A*c*e+2*B*(b*e+c*d))*x^7+1/8*B*c^2*e^2*x^8
```

Mathematica [A] (verified)

Time = 0.07 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.00

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^2 \, dx = \frac{1}{3}Ab^2d^2x^3+\frac{1}{4}bd(bBd+2Acd+2Abe)x^4+\frac{1}{5}\left(Ac^2d^2 + b^2e(2Bd+Ae)+2bcd(Bd+2Ae)\right)x^5 + \frac{1}{6}\left(2Ace(cd+be)+B\left(c^2d^2+4bcde+b^2e^2\right)\right)x^6 + \frac{1}{7}ce(Ace+2B(cd+be))x^7+\frac{1}{8}Bc^2e^2x^8$$

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

output
```
(A*b^2*d^2*x^3)/3 + (b*d*(b*B*d + 2*A*c*d + 2*A*b*e)*x^4)/4 + ((A*c^2*d^2
+ b^2*e*(2*B*d + A*e) + 2*b*c*d*(B*d + 2*A*e))*x^5)/5 + ((2*A*c*e*(c*d + b
*e) + B*(c^2*d^2 + 4*b*c*d*e + b^2*e^2))*x^6)/6 + (c*e*(A*c*e + 2*B*(c*d +
 b*e))*x^7)/7 + (B*c^2*e^2*x^8)/8
```

Rubi [A] (verified)

Time = 0.67 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^2(d+ex)^2\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(x^5\left(2Ace(be+cd)+B\left(b^2e^2+4bcde+c^2d^2\right)\right)+x^4\left(b^2e(Ae+2Bd)+2bcd(2Ae+Bd)+Ac^2d^2\right)+Ab^2d^2x^2\right.$$

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

$$\frac{1}{6}x^6\left(2Ace(be+cd)+B\left(b^2e^2+4bcde+c^2d^2\right)\right)+\frac{1}{5}x^5\left(b^2e(Ae+2Bd)+2bcd(2Ae+Bd)+Ac^2d^2\right)+\frac{1}{3}Ab^2d^2x^3+\frac{1}{7}cex^7(Ace+2B(be+cd))+\frac{1}{4}bdx^4(2Abe+2Acd+bBd)+\frac{1}{8}Bc^2e^2x^8$$

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

output

```
(A*b^2*d^2*x^3)/3 + (b*d*(b*B*d + 2*A*c*d + 2*A*b*e)*x^4)/4 + ((A*c^2*d^2
+ b^2*e*(2*B*d + A*e) + 2*b*c*d*(B*d + 2*A*e))*x^5)/5 + ((2*A*c*e*(c*d + b
*e) + B*(c^2*d^2 + 4*b*c*d*e + b^2*e^2))*x^6)/6 + (c*e*(A*c*e + 2*B*(c*d +
 b*e))*x^7)/7 + (B*c^2*e^2*x^8)/8
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.68 (sec) , antiderivative size = 172, normalized size of antiderivative = 1.06

method	result
default	$\frac{B\,e^{2} c^{2} x^{8}}{8}+\frac{\left(\left(A\,e^{2}+2 B d e \right) c^{2}+2 B\,e^{2} b c \right) x^{7}}{7}+\frac{\left(\left(2 A d e +B\,d^{2}\right) c^{2}+2 \left(A\,e^{2}+2 B d e \right) b c +B\,e^{2} b^{2}\right) x^{6}}{6}+\frac{(A\,c^{2} d^{2}+2 (2 A d e+B\,d$
norman	$\frac{B\,e^{2} c^{2} x^{8}}{8}+\left(\frac{1}{7} A\,c^{2} e^{2}+\frac{2}{7} B\,e^{2} b c +\frac{2}{7} B\,c^{2} d e \right) x^{7}+\left(\frac{1}{3} A b c\,e^{2}+\frac{1}{3} A\,c^{2} d e +\frac{1}{6} B\,e^{2} b^{2}+\frac{2}{3} B b c d e +\right.$
gosper	$\frac{x^{3} (105 B\,e^{2} c^{2} x^{5}+120 x^{4} A\,c^{2} e^{2}+240 x^{4} B\,e^{2} b c +240 x^{4} B\,c^{2} d e +280 x^{3} A b c\,e^{2}+280 x^{3} A\,c^{2} d e +140 x^{3} B\,e^{2} b^{2}+560 x^{3} B b c d e +140 x}{}$
risch	$\frac{1}{8} B\,e^{2} c^{2} x^{8}+\frac{1}{7} x^{7} A\,c^{2} e^{2}+\frac{2}{7} x^{7} B\,e^{2} b c +\frac{2}{7} x^{7} B\,c^{2} d e +\frac{1}{3} x^{6} A b c\,e^{2}+\frac{1}{3} x^{6} A\,c^{2} d e +\frac{1}{6} x^{6} B\,e^{2} b^{2}+$
parallelrisch	$\frac{1}{8} B\,e^{2} c^{2} x^{8}+\frac{1}{7} x^{7} A\,c^{2} e^{2}+\frac{2}{7} x^{7} B\,e^{2} b c +\frac{2}{7} x^{7} B\,c^{2} d e +\frac{1}{3} x^{6} A b c\,e^{2}+\frac{1}{3} x^{6} A\,c^{2} d e +\frac{1}{6} x^{6} B\,e^{2} b^{2}+$
orering	$\frac{x (105 B\,e^{2} c^{2} x^{5}+120 x^{4} A\,c^{2} e^{2}+240 x^{4} B\,e^{2} b c +240 x^{4} B\,c^{2} d e +280 x^{3} A b c\,e^{2}+280 x^{3} A\,c^{2} d e +140 x^{3} B\,e^{2} b^{2}+560 x^{3} B b c d e +140 x^{3}}{}$

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

output
```
1/8*B*e^2*c^2*x^8+1/7*((A*e^2+2*B*d*e)*c^2+2*B*e^2*b*c)*x^7+1/6*((2*A*d*e+
B*d^2)*c^2+2*(A*e^2+2*B*d*e)*b*c+B*e^2*b^2)*x^6+1/5*(A*c^2*d^2+2*(2*A*d*e+
B*d^2)*b*c+(A*e^2+2*B*d*e)*b^2)*x^5+1/4*(2*A*b*c*d^2+(2*A*d*e+B*d^2)*b^2)*
x^4+1/3*A*b^2*d^2*x^3
```

Fricas [A] (verification not implemented)

Time = 0.06 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.06

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^2 \, dx = \frac{1}{8} Bc^2e^2x^8 + \frac{1}{3} Ab^2d^2x^3 + \frac{1}{7} \left(2 Bc^2de + \left(2 Bbc + Ac^2\right)e^2\right)x^7 + \frac{1}{6} \left(Bc^2d^2 + 2 \left(2 Bbc + Ac^2\right)de + \left(Bb^2 + 2 Abc\right)e^2\right)x^6 + \frac{1}{5} \left(Ab^2e^2 + \left(2 Bbc + Ac^2\right)d^2 + 2 \left(Bb^2 + 2 Abc\right)de\right)x^5 + \frac{1}{4} \left(2 Ab^2de + \left(Bb^2 + 2 Abc\right)d^2\right)x^4$$

input

```
integrate((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^2,x, algorithm="fricas")
```

output

```
1/8*B*c^2*e^2*x^8 + 1/3*A*b^2*d^2*x^3 + 1/7*(2*B*c^2*d*e + (2*B*b*c + A*c^
2)*e^2)*x^7 + 1/6*(B*c^2*d^2 + 2*(2*B*b*c + A*c^2)*d*e + (B*b^2 + 2*A*b*c)
*e^2)*x^6 + 1/5*(A*b^2*e^2 + (2*B*b*c + A*c^2)*d^2 + 2*(B*b^2 + 2*A*b*c)*d
*e)*x^5 + 1/4*(2*A*b^2*d*e + (B*b^2 + 2*A*b*c)*d^2)*x^4
```

Sympy [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 212, normalized size of antiderivative = 1.31

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^2 \, dx = \frac{Ab^2d^2x^3}{3} + \frac{Bc^2e^2x^8}{8} + x^7 \left(\frac{Ac^2e^2}{7} + \frac{2Bbce^2}{7} + \frac{2Bc^2de}{7}\right) + x^6 \left(\frac{Abce^2}{3} + \frac{Ac^2de}{3} + \frac{Bb^2e^2}{6} + \frac{2Bbcde}{3} + \frac{Bc^2d^2}{6}\right) + x^5 \left(\frac{Ab^2e^2}{5} + \frac{4Abcde}{5} + \frac{Ac^2d^2}{5} + \frac{2Bb^2de}{5} + \frac{2Bbcd^2}{5}\right) + x^4 \left(\frac{Ab^2de}{2} + \frac{Abcd^2}{2} + \frac{Bb^2d^2}{4}\right)$$

input

```
integrate((B*x+A)*(e*x+d)**2*(c*x**2+b*x)**2,x)
```

output
```
A*b**2*d**2*x**3/3 + B*c**2*e**2*x**8/8 + x**7*(A*c**2*e**2/7 + 2*B*b*c*e*
*2/7 + 2*B*c**2*d*e/7) + x**6*(A*b*c*e**2/3 + A*c**2*d*e/3 + B*b**2*e**2/6
 + 2*B*b*c*d*e/3 + B*c**2*d**2/6) + x**5*(A*b**2*e**2/5 + 4*A*b*c*d*e/5 +
A*c**2*d**2/5 + 2*B*b**2*d*e/5 + 2*B*b*c*d**2/5) + x**4*(A*b**2*d*e/2 + A*
b*c*d**2/2 + B*b**2*d**2/4)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.06

$$
\begin{aligned}
&\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^2\,dx\\
&=\frac{1}{8}\,Bc^2e^2x^8+\frac{1}{3}\,Ab^2d^2x^3+\frac{1}{7}\left(2\,Bc^2de+\left(2\,Bbc+Ac^2\right)e^2\right)x^7\\
&\quad+\frac{1}{6}\left(Bc^2d^2+2\left(2\,Bbc+Ac^2\right)de+\left(Bb^2+2\,Abc\right)e^2\right)x^6\\
&\quad+\frac{1}{5}\left(Ab^2e^2+\left(2\,Bbc+Ac^2\right)d^2+2\left(Bb^2+2\,Abc\right)de\right)x^5\\
&\quad+\frac{1}{4}\left(2\,Ab^2de+\left(Bb^2+2\,Abc\right)d^2\right)x^4
\end{aligned}
$$

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

output
```
1/8*B*c^2*e^2*x^8 + 1/3*A*b^2*d^2*x^3 + 1/7*(2*B*c^2*d*e + (2*B*b*c + A*c^
2)*e^2)*x^7 + 1/6*(B*c^2*d^2 + 2*(2*B*b*c + A*c^2)*d*e + (B*b^2 + 2*A*b*c)
*e^2)*x^6 + 1/5*(A*b^2*e^2 + (2*B*b*c + A*c^2)*d^2 + 2*(B*b^2 + 2*A*b*c)*d
*e)*x^5 + 1/4*(2*A*b^2*d*e + (B*b^2 + 2*A*b*c)*d^2)*x^4
```

Giac [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 205, normalized size of antiderivative = 1.27

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^2\,dx = \frac{1}{8}Bc^2e^2x^8 + \frac{2}{7}Bc^2dex^7 + \frac{2}{7}Bbce^2x^7 + \frac{1}{7}Ac^2e^2x^7 + \frac{1}{6}Bc^2d^2x^6 + \frac{2}{3}Bbcdex^6 + \frac{1}{3}Ac^2dex^6 + \frac{1}{6}Bb^2e^2x^6 + \frac{1}{3}Abce^2x^6 + \frac{2}{5}Bbcd^2x^5 + \frac{1}{5}Ac^2d^2x^5 + \frac{2}{5}Bb^2dex^5 + \frac{4}{5}Abcdex^5 + \frac{1}{5}Ab^2e^2x^5 + \frac{1}{4}Bb^2d^2x^4 + \frac{1}{2}Abcd^2x^4 + \frac{1}{2}Ab^2dex^4 + \frac{1}{3}Ab^2d^2x^3$$

input

```
integrate((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^2,x, algorithm="giac")
```

output

```
1/8*B*c^2*e^2*x^8 + 2/7*B*c^2*d*e*x^7 + 2/7*B*b*c*e^2*x^7 + 1/7*A*c^2*e^2*
x^7 + 1/6*B*c^2*d^2*x^6 + 2/3*B*b*c*d*e*x^6 + 1/3*A*c^2*d*e*x^6 + 1/6*B*b^
2*e^2*x^6 + 1/3*A*b*c*e^2*x^6 + 2/5*B*b*c*d^2*x^5 + 1/5*A*c^2*d^2*x^5 + 2/
5*B*b^2*d*e*x^5 + 4/5*A*b*c*d*e*x^5 + 1/5*A*b^2*e^2*x^5 + 1/4*B*b^2*d^2*x^
4 + 1/2*A*b*c*d^2*x^4 + 1/2*A*b^2*d*e*x^4 + 1/3*A*b^2*d^2*x^3
```

Mupad [B] (verification not implemented)

Time = 0.06 (sec) , antiderivative size = 161, normalized size of antiderivative = 0.99

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^2\,dx = x^5\left(\frac{2\,B\,b^2\,d\,e}{5} + \frac{A\,b^2\,e^2}{5} + \frac{2\,B\,b\,c\,d^2}{5} + \frac{4\,A\,b\,c\,d\,e}{5} + \frac{A\,c^2\,d^2}{5}\right) + x^6\left(\frac{B\,b^2\,e^2}{6} + \frac{2\,B\,b\,c\,d\,e}{3} + \frac{A\,b\,c\,e^2}{3} + \frac{B\,c^2\,d^2}{6} + \frac{A\,c^2\,d\,e}{3}\right) + \frac{b\,d\,x^4\,(2\,A\,b\,e + 2\,A\,c\,d + B\,b\,d)}{4} + \frac{c\,e\,x^7\,(A\,c\,e + 2\,B\,b\,e + 2\,B\,c\,d)}{7} + \frac{A\,b^2\,d^2\,x^3}{3} + \frac{B\,c^2\,e^2\,x^8}{8}$$

input
```
int((b*x + c*x^2)^2*(A + B*x)*(d + e*x)^2,x)
```

output
```
x^5*((A*b^2*e^2)/5 + (A*c^2*d^2)/5 + (2*B*b*c*d^2)/5 + (2*B*b^2*d*e)/5 + (
4*A*b*c*d*e)/5) + x^6*((B*b^2*e^2)/6 + (B*c^2*d^2)/6 + (A*b*c*e^2)/3 + (A*
c^2*d*e)/3 + (2*B*b*c*d*e)/3) + (b*d*x^4*(2*A*b*e + 2*A*c*d + B*b*d))/4 +
(c*e*x^7*(A*c*e + 2*B*b*e + 2*B*c*d))/7 + (A*b^2*d^2*x^3)/3 + (B*c^2*e^2*x
^8)/8
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.24

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^2 \, dx$$
$$= \frac{x^3(105b\,c^2e^2x^5 + 120a\,c^2e^2x^4 + 240b^2c\,e^2x^4 + 240b\,c^2de\,x^4 + 280abc\,e^2x^3 + 280a\,c^2de\,x^3 + 140b^3e^2x^3 + 5}{}$$

input
```
int((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^2,x)
```

output
```
(x**3*(280*a*b**2*d**2 + 420*a*b**2*d*e*x + 168*a*b**2*e**2*x**2 + 420*a*b
*c*d**2*x + 672*a*b*c*d*e*x**2 + 280*a*b*c*e**2*x**3 + 168*a*c**2*d**2*x**
2 + 280*a*c**2*d*e*x**3 + 120*a*c**2*e**2*x**4 + 210*b**3*d**2*x + 336*b**
3*d*e*x**2 + 140*b**3*e**2*x**3 + 336*b**2*c*d**2*x**2 + 560*b**2*c*d*e*x*
*3 + 240*b**2*c*e**2*x**4 + 140*b*c**2*d**2*x**3 + 240*b*c**2*d*e*x**4 + 1
05*b*c**2*e**2*x**5))/840
```

3.13 $\int (A+Bx)(d+ex)\left(bx+cx^2\right)^2\,dx$

Optimal result

Integrand size = 22, antiderivative size = 100

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^2\,dx = \frac{1}{3}Ab^2dx^3+\frac{1}{4}b(bBd+2Acd+Abe)x^4 + \frac{1}{5}\left(Ac^2d+b^2Be+2bc(Bd+Ae)\right)x^5 + \frac{1}{6}c(Bcd+2bBe+Ace)x^6+\frac{1}{7}Bc^2ex^7$$

output
```
1/3*A*b^2*d*x^3+1/4*b*(A*b*e+2*A*c*d+B*b*d)*x^4+1/5*(A*c^2*d+b^2*B*e+2*b*c
*(A*e+B*d))*x^5+1/6*c*(A*c*e+2*B*b*e+B*c*d)*x^6+1/7*B*c^2*e*x^7
```

Mathematica [A] (verified)

Time = 0.04 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.01

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^2\,dx = \frac{1}{3}Ab^2dx^3+\frac{1}{4}b(bBd+2Acd+Abe)x^4 + \frac{1}{5}\left(2bBcd+Ac^2d+b^2Be+2Abce\right)x^5 + \frac{1}{6}c(Bcd+2bBe+Ace)x^6+\frac{1}{7}Bc^2ex^7$$

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

output
```
(A*b^2*d*x^3)/3 + (b*(b*B*d + 2*A*c*d + A*b*e)*x^4)/4 + ((2*b*B*c*d + A*c^
2*d + b^2*B*e + 2*A*b*c*e)*x^5)/5 + (c*(B*c*d + 2*b*B*e + A*c*e)*x^6)/6 +
(B*c^2*e*x^7)/7
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^2(d+ex)\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(x^4\left(2bc(Ae+Bd)+Ac^2d+b^2Be\right)+Ab^2dx^2+cx^5(Ace+2bBe+Bcd)+bx^3(Abe+2Acd+bBd)+Bc^2ex^6\right.$$

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

$$\frac{1}{5}x^5\left(2bc(Ae+Bd)+Ac^2d+b^2Be\right)+\frac{1}{3}Ab^2dx^3+\frac{1}{6}cx^6(Ace+2bBe+Bcd)+\frac{1}{4}bx^4(Abe+2Acd+bBd)+\frac{1}{7}Bc^2ex^7$$

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

output
```
(A*b^2*d*x^3)/3 + (b*(b*B*d + 2*A*c*d + A*b*e)*x^4)/4 + ((A*c^2*d + b^2*B*
e + 2*b*c*(B*d + A*e))*x^5)/5 + (c*(B*c*d + 2*b*B*e + A*c*e)*x^6)/6 + (B*c
^2*e*x^7)/7
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.56 (sec) , antiderivative size = 97, normalized size of antiderivative = 0.97

method	result
default	$\frac{B\,c^2 e\,x^7}{7}+\frac{\left(\left(Ae+Bd\right)c^2+2Bebc\right)x^6}{6}+\frac{\left(A\,c^2 d+b^2 Be+2bc\left(Ae+Bd\right)\right)x^5}{5}+\frac{\left(2Abcd+\left(Ae+Bd\right)b^2\right)x^4}{4}+\frac{A\,b^2 d\,x^3}{3}$
norman	$\frac{B\,c^2 e\,x^7}{7}+\left(\frac{1}{6}A\,c^2 e+\frac{1}{3}Bebc+\frac{1}{6}B\,c^2 d\right)x^6+\left(\frac{2}{5}Abce+\frac{1}{5}A\,c^2 d+\frac{1}{5}b^2 Be+\frac{2}{5}Bbcd\right)x^5+\left(\frac{1}{4}A\right.$
gosper	$\frac{x^3\left(60B\,c^2 e\,x^4+70x^3 A\,c^2 e+140x^3 Bebc+70x^3 B\,c^2 d+168x^2 Abce+84A\,c^2 d\,x^2+84x^2 b^2 Be+168x^2 Bbcd+105xA\,b^2 e+210Abc\right.}{420}$
risch	$\frac{1}{7}B\,c^2 e\,x^7+\frac{1}{6}x^6 A\,c^2 e+\frac{1}{3}x^6 Bebc+\frac{1}{6}x^6 B\,c^2 d+\frac{2}{5}x^5 Abce+\frac{1}{5}x^5 A\,c^2 d+\frac{1}{5}x^5 b^2 Be+\frac{2}{5}x^5 Bbc$
parallelrisch	$\frac{1}{7}B\,c^2 e\,x^7+\frac{1}{6}x^6 A\,c^2 e+\frac{1}{3}x^6 Bebc+\frac{1}{6}x^6 B\,c^2 d+\frac{2}{5}x^5 Abce+\frac{1}{5}x^5 A\,c^2 d+\frac{1}{5}x^5 b^2 Be+\frac{2}{5}x^5 Bbc$
orering	$\frac{x\left(60B\,c^2 e\,x^4+70x^3 A\,c^2 e+140x^3 Bebc+70x^3 B\,c^2 d+168x^2 Abce+84A\,c^2 d\,x^2+84x^2 b^2 Be+168x^2 Bbcd+105xA\,b^2 e+210Abcd\right.}{420\left(cx+b\right)^2}$

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

output
```
1/7*B*c^2*e*x^7+1/6*((A*e+B*d)*c^2+2*B*e*b*c)*x^6+1/5*(A*c^2*d+b^2*B*e+2*b
*c*(A*e+B*d))*x^5+1/4*(2*A*b*c*d+(A*e+B*d)*b^2)*x^4+1/3*A*b^2*d*x^3
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 103, normalized size of antiderivative = 1.03

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^2\,dx = \frac{1}{7}\,Bc^2ex^7+\frac{1}{3}\,Ab^2dx^3+\frac{1}{6}\left(Bc^2d+\left(2\,Bbc+Ac^2\right)e\right)x^6+\frac{1}{5}\left(\left(2\,Bbc+Ac^2\right)d+\left(Bb^2+2\,Abc\right)e\right)x^5+\frac{1}{4}\left(Ab^2e+\left(Bb^2+2\,Abc\right)d\right)x^4$$

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

output
```
1/7*B*c^2*e*x^7 + 1/3*A*b^2*d*x^3 + 1/6*(B*c^2*d + (2*B*b*c + A*c^2)*e)*x^
6 + 1/5*((2*B*b*c + A*c^2)*d + (B*b^2 + 2*A*b*c)*e)*x^5 + 1/4*(A*b^2*e + (
B*b^2 + 2*A*b*c)*d)*x^4
```

Sympy [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.21

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^2\,dx = \frac{Ab^2dx^3}{3}+\frac{Bc^2ex^7}{7}+x^6\left(\frac{Ac^2e}{6}+\frac{Bbce}{3}+\frac{Bc^2d}{6}\right)+x^5\cdot\left(\frac{2Abce}{5}+\frac{Ac^2d}{5}+\frac{Bb^2e}{5}+\frac{2Bbcd}{5}\right)+x^4\left(\frac{Ab^2e}{4}+\frac{Abcd}{2}+\frac{Bb^2d}{4}\right)$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x**2+b*x)**2,x)
```

output
```
A*b**2*d*x**3/3 + B*c**2*e*x**7/7 + x**6*(A*c**2*e/6 + B*b*c*e/3 + B*c**2*
d/6) + x**5*(2*A*b*c*e/5 + A*c**2*d/5 + B*b**2*e/5 + 2*B*b*c*d/5) + x**4*(
A*b**2*e/4 + A*b*c*d/2 + B*b**2*d/4)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 103, normalized size of antiderivative = 1.03

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^2\,dx=\frac{1}{7}Bc^2ex^7+\frac{1}{3}Ab^2dx^3+\frac{1}{6}\left(Bc^2d+\left(2Bbc+Ac^2\right)e\right)x^6+\frac{1}{5}\left(\left(2Bbc+Ac^2\right)d+\left(Bb^2+2Abc\right)e\right)x^5+\frac{1}{4}\left(Ab^2e+\left(Bb^2+2Abc\right)d\right)x^4$$

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

output
```
1/7*B*c^2*e*x^7 + 1/3*A*b^2*d*x^3 + 1/6*(B*c^2*d + (2*B*b*c + A*c^2)*e)*x^
6 + 1/5*((2*B*b*c + A*c^2)*d + (B*b^2 + 2*A*b*c)*e)*x^5 + 1/4*(A*b^2*e + (
B*b^2 + 2*A*b*c)*d)*x^4
```

Giac [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.17

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^2\,dx=\frac{1}{7}Bc^2ex^7+\frac{1}{6}Bc^2dx^6+\frac{1}{3}Bbcex^6+\frac{1}{6}Ac^2ex^6+\frac{2}{5}Bbcdx^5+\frac{1}{5}Ac^2dx^5+\frac{1}{5}Bb^2ex^5+\frac{2}{5}Abcex^5+\frac{1}{4}Bb^2dx^4+\frac{1}{2}Abcdx^4+\frac{1}{4}Ab^2ex^4+\frac{1}{3}Ab^2dx^3$$

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

output
```
1/7*B*c^2*e*x^7 + 1/6*B*c^2*d*x^6 + 1/3*B*b*c*e*x^6 + 1/6*A*c^2*e*x^6 + 2/
5*B*b*c*d*x^5 + 1/5*A*c^2*d*x^5 + 1/5*B*b^2*e*x^5 + 2/5*A*b*c*e*x^5 + 1/4*
B*b^2*d*x^4 + 1/2*A*b*c*d*x^4 + 1/4*A*b^2*e*x^4 + 1/3*A*b^2*d*x^3
```

Mupad [B] (verification not implemented)

Time = 10.61 (sec) , antiderivative size = 102, normalized size of antiderivative = 1.02

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^2\,dx = x^5\left(\frac{A\,c^2\,d}{5}+\frac{B\,b^2\,e}{5}+\frac{2\,A\,b\,c\,e}{5}+\frac{2\,B\,b\,c\,d}{5}\right)+x^4\left(\frac{A\,b^2\,e}{4}+\frac{B\,b^2\,d}{4}+\frac{A\,b\,c\,d}{2}\right)+x^6\left(\frac{A\,c^2\,e}{6}+\frac{B\,c^2\,d}{6}+\frac{B\,b\,c\,e}{3}\right)+\frac{A\,b^2\,d\,x^3}{3}+\frac{B\,c^2\,e\,x^7}{7}$$

input
```
int((b*x + c*x^2)^2*(A + B*x)*(d + e*x),x)
```

output
```
x^5*((A*c^2*d)/5 + (B*b^2*e)/5 + (2*A*b*c*e)/5 + (2*B*b*c*d)/5) + x^4*((A*
b^2*e)/4 + (B*b^2*d)/4 + (A*b*c*d)/2) + x^6*((A*c^2*e)/6 + (B*c^2*d)/6 + (
B*b*c*e)/3) + (A*b^2*d*x^3)/3 + (B*c^2*e*x^7)/7
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.13

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^2\,dx = \frac{x^3(60b\,c^2e\,x^4+70a\,c^2e\,x^3+140b^2ce\,x^3+70b\,c^2d\,x^3+168abce\,x^2+84a\,c^2d\,x^2+84b^3e\,x^2+168b^2cd\,x^2+}{420}$$

input
```
int((B*x+A)*(e*x+d)*(c*x^2+b*x)^2,x)
```

output
```
(x**3*(140*a*b**2*d + 105*a*b**2*e*x + 210*a*b*c*d*x + 168*a*b*c*e*x**2 +
84*a*c**2*d*x**2 + 70*a*c**2*e*x**3 + 105*b**3*d*x + 84*b**3*e*x**2 + 168*
b**2*c*d*x**2 + 140*b**2*c*e*x**3 + 70*b*c**2*d*x**3 + 60*b*c**2*e*x**4))/
420
```

3.14 $\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 161

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx = \frac{d(Bd-Ae)(cd-be)^2x}{e^5} - \frac{(Bd-Ae)(cd-be)^2x^2}{2e^4} - \frac{\left(Ace(cd-2be)-B(cd-be)^2\right)x^3}{3e^3} - \frac{c(Bcd-2bBe-Ace)x^4}{4e^2} + \frac{Bc^2x^5}{5e} - \frac{d^2(Bd-Ae)(cd-be)^2\log(d+ex)}{e^6}$$

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

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 156, normalized size of antiderivative = 0.97

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx = \frac{60de(Bd-Ae)(cd-be)^2x+30e^2(-Bd+Ae)(cd-be)^2x^2+20e^3\left(B(cd-be)^2+Ace(-cd+2be)\right)x^3+\ldots}{60e^6}$$

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

output
```
(60*d*e*(B*d - A*e)*(c*d - b*e)^2*x + 30*e^2*(-(B*d) + A*e)*(c*d - b*e)^2*
x^2 + 20*e^3*(B*(c*d - b*e)^2 + A*c*e*(-(c*d) + 2*b*e))*x^3 + 15*c*e^4*(-(
B*c*d) + 2*b*B*e + A*c*e)*x^4 + 12*B*c^2*e^5*x^5 - 60*d^2*(B*d - A*e)*(c*d
 - b*e)^2*Log[d + e*x])/(60*e^6)
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(-\frac{d^2(Bd-Ae)(cd-be)^2}{e^5(d+ex)}+\frac{d(Bd-Ae)(cd-be)^2}{e^5}+\frac{x(Ae-Bd)(be-cd)^2}{e^4}+\frac{x^2\left(B(cd-be)^2-Ace(cd-\ldots\right)}{e^3}\ldots\right)$$

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

$$-\frac{d^2(Bd-Ae)(cd-be)^2\log(d+ex)}{e^6}+\frac{dx(Bd-Ae)(cd-be)^2}{e^5}-\frac{x^2(Bd-Ae)(cd-be)^2}{2e^4}-\frac{x^3\left(Ace(cd-2be)-B(cd-be)^2\right)}{3e^3}-\frac{cx^4(-Ace-2bBe+Bcd)}{4e^2}+\frac{Bc^2x^5}{5e}$$

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

output
```
(d*(B*d - A*e)*(c*d - b*e)^2*x)/e^5 - ((B*d - A*e)*(c*d - b*e)^2*x^2)/(2*e
^4) - ((A*c*e*(c*d - 2*b*e) - B*(c*d - b*e)^2)*x^3)/(3*e^3) - (c*(B*c*d -
2*b*B*e - A*c*e)*x^4)/(4*e^2) + (B*c^2*x^5)/(5*e) - (d^2*(B*d - A*e)*(c*d
- b*e)^2*Log[d + e*x])/e^6
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.82 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.73

method	result
norman	$\frac{\left(A b^2 e^3-2Abcd e^2+A c^2 d^2 e-B b^2 d e^2+2Bbc d^2 e-B c^2 d^3\right)x^2}{2e^4}+\frac{\left(2Abc e^2-A c^2 de+B e^2 b^2-2Bbcde+B c^2 d^2\right)x^3}{3e^3}+\frac{B c^2 x^5}{5e}$
default	$-\frac{-\frac{1}{5}B c^2 x^5 e^4-\frac{1}{4}A c^2 e^4 x^4-\frac{1}{2}Bbc e^4 x^4+\frac{1}{4}B c^2 d e^3 x^4-\frac{2}{3}Abc e^4 x^3+\frac{1}{3}A c^2 d e^3 x^3-\frac{1}{3}B b^2 e^4 x^3+\frac{2}{3}Bbcd e^3 x^3-\frac{1}{3}B c^2 d^2 e^2 x^3-}{}$
risch	$-\frac{2Bbcd x^3}{3e^2}+\frac{d^2\ln(ex+d)A b^2}{e^3}+\frac{d^4\ln(ex+d)A c^2}{e^5}-\frac{d^3\ln(ex+d)B b^2}{e^4}-\frac{A c^2 d^3 x}{e^4}+\frac{Bbc d^2 x^2}{e^3}+\frac{2Abc d^2 x}{e^3}-\frac{2B}{}$
parallelrisch	$\frac{-30B x^2 c^2 d^3 e^2-60Ax b^2 d e^4-60Ax c^2 d^3 e^2+60Bx b^2 d^2 e^3+60Bx c^2 d^4 e+30B x^4 bc e^5+60A\ln(ex+d)b^2 d^2 e^3-20A x^3 c^2 d e^4-}{}$

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

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

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.76

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx$$
$$= \frac{12\,Bc^2e^5x^5 - 15\,(Bc^2de^4 - (2\,Bbc + Ac^2)e^5)x^4 + 20\,(Bc^2d^2e^3 - (2\,Bbc + Ac^2)de^4 + (Bb^2 + 2\,Abc)e^5)x^3}{}$$

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

output
```
1/60*(12*B*c^2*e^5*x^5 - 15*(B*c^2*d*e^4 - (2*B*b*c + A*c^2)*e^5)*x^4 + 20
*(B*c^2*d^2*e^3 - (2*B*b*c + A*c^2)*d*e^4 + (B*b^2 + 2*A*b*c)*e^5)*x^3 - 3
0*(B*c^2*d^3*e^2 - A*b^2*e^5 - (2*B*b*c + A*c^2)*d^2*e^3 + (B*b^2 + 2*A*b*
c)*d*e^4)*x^2 + 60*(B*c^2*d^4*e - A*b^2*d*e^4 - (2*B*b*c + A*c^2)*d^3*e^2
+ (B*b^2 + 2*A*b*c)*d^2*e^3)*x - 60*(B*c^2*d^5 - A*b^2*d^2*e^3 - (2*B*b*c
+ A*c^2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2)*log(e*x + d))/e^6
```

Sympy [A] (verification not implemented)

Time = 0.37 (sec) , antiderivative size = 280, normalized size of antiderivative = 1.74

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx = \frac{Bc^2x^5}{5e} - \frac{d^2(-Ae+Bd)\,(be-cd)^2\log{(d+ex)}}{e^6} + x^4\left(\frac{Ac^2}{4e}+\frac{Bbc}{2e}-\frac{Bc^2d}{4e^2}\right) + x^3 \cdot \left(\frac{2Abc}{3e}-\frac{Ac^2d}{3e^2}+\frac{Bb^2}{3e}-\frac{2Bbcd}{3e^2}+\frac{Bc^2d^2}{3e^3}\right) + x^2\left(\frac{Ab^2}{2e}-\frac{Abcd}{e^2}+\frac{Ac^2d^2}{2e^3}-\frac{Bb^2d}{2e^2}+\frac{Bbcd^2}{e^3}-\frac{Bc^2d^3}{2e^4}\right) + x\left(-\frac{Ab^2d}{e^2}+\frac{2Abcd^2}{e^3}-\frac{Ac^2d^3}{e^4}+\frac{Bb^2d^2}{e^3}-\frac{2Bbcd^3}{e^4}+\frac{Bc^2d^4}{e^5}\right)$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d),x)
```

output
```
B*c**2*x**5/(5*e) - d**2*(-A*e + B*d)*(b*e - c*d)**2*log(d + e*x)/e**6 + x
**4*(A*c**2/(4*e) + B*b*c/(2*e) - B*c**2*d/(4*e**2)) + x**3*(2*A*b*c/(3*e)
 - A*c**2*d/(3*e**2) + B*b**2/(3*e) - 2*B*b*c*d/(3*e**2) + B*c**2*d**2/(3*
e**3)) + x**2*(A*b**2/(2*e) - A*b*c*d/e**2 + A*c**2*d**2/(2*e**3) - B*b**2
*d/(2*e**2) + B*b*c*d**2/e**3 - B*c**2*d**3/(2*e**4)) + x*(-A*b**2*d/e**2
+ 2*A*b*c*d**2/e**3 - A*c**2*d**3/e**4 + B*b**2*d**2/e**3 - 2*B*b*c*d**3/e
**4 + B*c**2*d**4/e**5)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 282, normalized size of antiderivative = 1.75

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx = \frac{12\,Bc^2e^4x^5 - 15\,(Bc^2de^3 - (2\,Bbc+Ac^2)e^4)x^4 + 20\,(Bc^2d^2e^2 - (2\,Bbc+Ac^2)de^3 + (Bb^2+2\,Abc)e^4)x^3}{} - \frac{(Bc^2d^5 - Ab^2d^2e^3 - (2\,Bbc+Ac^2)d^4e + (Bb^2+2\,Abc)d^3e^2)\log{(ex+d)}}{e^6}$$

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

output
```
1/60*(12*B*c^2*e^4*x^5 - 15*(B*c^2*d*e^3 - (2*B*b*c + A*c^2)*e^4)*x^4 + 20
*(B*c^2*d^2*e^2 - (2*B*b*c + A*c^2)*d*e^3 + (B*b^2 + 2*A*b*c)*e^4)*x^3 - 3
0*(B*c^2*d^3*e - A*b^2*e^4 - (2*B*b*c + A*c^2)*d^2*e^2 + (B*b^2 + 2*A*b*c)
*d*e^3)*x^2 + 60*(B*c^2*d^4 - A*b^2*d*e^3 - (2*B*b*c + A*c^2)*d^3*e + (B*b
^2 + 2*A*b*c)*d^2*e^2)*x)/e^5 - (B*c^2*d^5 - A*b^2*d^2*e^3 - (2*B*b*c + A*
c^2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2)*log(e*x + d)/e^6
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 338 vs. $2(153) = 306$.

Time = 0.26 (sec) , antiderivative size = 338, normalized size of antiderivative = 2.10

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx$$
$$= 12\,Bc^2e^4x^5 - 15\,Bc^2de^3x^4 + 30\,Bbce^4x^4 + 15\,Ac^2e^4x^4 + 20\,Bc^2d^2e^2x^3 - 40\,Bbcde^3x^3 - 20\,Ac^2de^3x^3 + 2$$
$$- \frac{\left(Bc^2d^5 - 2\,Bbcd^4e - Ac^2d^4e + Bb^2d^3e^2 + 2\,Abcd^3e^2 - Ab^2d^2e^3\right)\log\left(|ex+d|\right)}{e^6}$$

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

output
```
1/60*(12*B*c^2*e^4*x^5 - 15*B*c^2*d*e^3*x^4 + 30*B*b*c*e^4*x^4 + 15*A*c^2*
e^4*x^4 + 20*B*c^2*d^2*e^2*x^3 - 40*B*b*c*d*e^3*x^3 - 20*A*c^2*d*e^3*x^3 +
 20*B*b^2*e^4*x^3 + 40*A*b*c*e^4*x^3 - 30*B*c^2*d^3*e*x^2 + 60*B*b*c*d^2*e
^2*x^2 + 30*A*c^2*d^2*e^2*x^2 - 30*B*b^2*d*e^3*x^2 - 60*A*b*c*d*e^3*x^2 +
30*A*b^2*e^4*x^2 + 60*B*c^2*d^4*x - 120*B*b*c*d^3*e*x - 60*A*c^2*d^3*e*x +
 60*B*b^2*d^2*e^2*x + 120*A*b*c*d^2*e^2*x - 60*A*b^2*d*e^3*x)/e^5 - (B*c^2
*d^5 - 2*B*b*c*d^4*e - A*c^2*d^4*e + B*b^2*d^3*e^2 + 2*A*b*c*d^3*e^2 - A*b
^2*d^2*e^3)*log(abs(e*x + d))/e^6
```

Mupad [B] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.91

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx$$
$$= x^4\left(\frac{A\,c^2+2\,B\,b\,c}{4\,e}-\frac{B\,c^2\,d}{4\,e^2}\right)+x^3\left(\frac{B\,b^2+2\,A\,c\,b}{3\,e}-\frac{d\left(\frac{A\,c^2+2\,B\,b\,c}{e}-\frac{B\,c^2\,d}{e^2}\right)}{3\,e}\right)$$
$$+x^2\left(\frac{A\,b^2}{2\,e}-\frac{d\left(\frac{B\,b^2+2\,A\,c\,b}{e}-\frac{d\left(\frac{A\,c^2+2\,B\,b\,c}{e}-\frac{B\,c^2\,d}{e^2}\right)}{e}\right)}{2\,e}\right)$$
$$-\frac{\ln(d+e\,x)\,\left(B\,b^2\,d^3\,e^2-A\,b^2\,d^2\,e^3-2\,B\,b\,c\,d^4\,e+2\,A\,b\,c\,d^3\,e^2+B\,c^2\,d^5-A\,c^2\,d^4\,e\right)}{e^6}$$
$$-\frac{d\,x\left(\frac{A\,b^2}{e}-\frac{d\left(\frac{B\,b^2+2\,A\,c\,b}{e}-\frac{d\left(\frac{A\,c^2+2\,B\,b\,c}{e}-\frac{B\,c^2\,d}{e^2}\right)}{e}\right)}{e}\right)}{e}+\frac{B\,c^2\,x^5}{5\,e}$$

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

output
```
x^4*((A*c^2 + 2*B*b*c)/(4*e) - (B*c^2*d)/(4*e^2)) + x^3*((B*b^2 + 2*A*b*c)
/(3*e) - (d*((A*c^2 + 2*B*b*c)/e - (B*c^2*d)/e^2))/(3*e)) + x^2*((A*b^2)/(
2*e) - (d*((B*b^2 + 2*A*b*c)/e - (d*((A*c^2 + 2*B*b*c)/e - (B*c^2*d)/e^2))
/e))/(2*e)) - (log(d + e*x)*(B*c^2*d^5 - A*c^2*d^4*e - A*b^2*d^2*e^3 + B*b
^2*d^3*e^2 - 2*B*b*c*d^4*e + 2*A*b*c*d^3*e^2))/e^6 - (d*x*((A*b^2)/e - (d*
((B*b^2 + 2*A*b*c)/e - (d*((A*c^2 + 2*B*b*c)/e - (B*c^2*d)/e^2))/e))/e))/e
 + (B*c^2*x^5)/(5*e)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 370, normalized size of antiderivative = 2.30

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{d+ex}\,dx$$
$$= \frac{-120\log(ex+d)\,abc\,d^3e^2+120abc\,d^2e^3x-60abcd\,e^4x^2-60\log(ex+d)\,b^3d^3e^2-60\log(ex+d)\,b\,c^2d^5}{}$$

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

output
```
(60*log(d + e*x)*a*b**2*d**2*e**3 - 120*log(d + e*x)*a*b*c*d**3*e**2 + 60*
log(d + e*x)*a*c**2*d**4*e - 60*log(d + e*x)*b**3*d**3*e**2 + 120*log(d +
e*x)*b**2*c*d**4*e - 60*log(d + e*x)*b*c**2*d**5 - 60*a*b**2*d*e**4*x + 30
*a*b**2*e**5*x**2 + 120*a*b*c*d**2*e**3*x - 60*a*b*c*d*e**4*x**2 + 40*a*b*
c*e**5*x**3 - 60*a*c**2*d**3*e**2*x + 30*a*c**2*d**2*e**3*x**2 - 20*a*c**2
*d*e**4*x**3 + 15*a*c**2*e**5*x**4 + 60*b**3*d**2*e**3*x - 30*b**3*d*e**4*
x**2 + 20*b**3*e**5*x**3 - 120*b**2*c*d**3*e**2*x + 60*b**2*c*d**2*e**3*x*
*2 - 40*b**2*c*d*e**4*x**3 + 30*b**2*c*e**5*x**4 + 60*b*c**2*d**4*e*x - 30
*b*c**2*d**3*e**2*x**2 + 20*b*c**2*d**2*e**3*x**3 - 15*b*c**2*d*e**4*x**4
+ 12*b*c**2*e**5*x**5)/(60*e**6)
```

3.15 $\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^2} dx$

Optimal result

Integrand size = 24, antiderivative size = 194

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^2} dx = -\frac{(cd-be)(2Bd(2cd-be)-Ae(3cd-be))x}{e^5} + \frac{(cd-be)(3Bcd-bBe-2Ace)x^2}{2e^4} - \frac{c(2Bcd-2bBe-Ace)x^3}{3e^3} + \frac{Bc^2x^4}{4e^2} + \frac{d^2(Bd-Ae)(cd-be)^2}{e^6(d+ex)} + \frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))\log(d+ex)}{e^6}$$

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

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 184, normalized size of antiderivative = 0.95

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^2}\,dx$$
$$= \frac{12e(-cd+be)(2Bd(2cd-be)+Ae(-3cd+be))x+6e^2(-cd+be)(-3Bcd+bBe+2Ace)x^2+4ce^3(-}{}$$

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

output
```
(12*e*(-(c*d) + b*e)*(2*B*d*(2*c*d - b*e) + A*e*(-3*c*d + b*e))*x + 6*e^2*
(-(c*d) + b*e)*(-3*B*c*d + b*B*e + 2*A*c*e)*x^2 + 4*c*e^3*(-2*B*c*d + 2*b*
B*e + A*c*e)*x^3 + 3*B*c^2*e^4*x^4 + (12*d^2*(B*d - A*e)*(c*d - b*e)^2)/(d
 + e*x) + 12*d*(c*d - b*e)*(B*d*(5*c*d - 3*b*e) + 2*A*e*(-2*c*d + b*e))*Lo
g[d + e*x])/(12*e^6)
```

Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 194, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^2}\,dx$$
$$\Big\downarrow \ 1195$$
$$\int \left(-\frac{d^2(Bd-Ae)(cd-be)^2}{e^5(d+ex)^2}+\frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{e^5(d+ex)}+\frac{(cd-be)(Ae(3cd-be)-2Bd(2}{e^5}\right.$$
$$\Big\downarrow \ 2009$$

$$\frac{d^2(Bd-Ae)(cd-be)^2}{e^6(d+ex)}+\frac{d(cd-be)\log(d+ex)(Bd(5cd-3be)-2Ae(2cd-be))}{e^6}-\frac{x(cd-be)(2Bd(2cd-be)-Ae(3cd-be))}{e^5}+\frac{x^2(cd-be)(-2Ace-bBe+3Bcd)}{2e^4}-\frac{cx^3(-Ace-2bBe+2Bcd)}{3e^3}+\frac{Bc^2x^4}{4e^2}$$

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

output
```
-((((c*d - b*e)*(2*B*d*(2*c*d - b*e) - A*e*(3*c*d - b*e))*x)/e^5) + ((c*d -
 b*e)*(3*B*c*d - b*B*e - 2*A*c*e)*x^2)/(2*e^4) - (c*(2*B*c*d - 2*b*B*e - A
*c*e)*x^3)/(3*e^3) + (B*c^2*x^4)/(4*e^2) + (d^2*(B*d - A*e)*(c*d - b*e)^2)
/(e^6*(d + e*x)) + (d*(c*d - b*e)*(B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*
e))*Log[d + e*x])/e^6
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 304, normalized size of antiderivative = 1.57

method	result
norman	$\frac{\frac{\left(2A\,b^2d^2e^3-6Abc\,d^3e^2+4A\,c^2d^4e-3B\,b^2d^3e^2+8Bbc\,d^4e-5B\,c^2d^5\right)x}{d\,e^5}+\frac{\left(2A\,b^2e^3-6Abcd\,e^2+4A\,c^2d^2e-3B\,b^2d\,e^2+8Bbc\,d^2e-5B\,c^2d^3\right)x}{2e^4}}{ex+d}$
default	$\frac{\frac{1}{4}B\,c^2e^3x^4+\frac{1}{3}A\,c^2e^3x^3+\frac{2}{3}Bbc\,e^3x^3-\frac{2}{3}B\,c^2d\,e^2x^3+Abc\,e^3x^2-A\,c^2d\,e^2x^2+\frac{1}{2}B\,b^2e^3x^2-2Bbcd\,e^2x^2+\frac{3}{2}B\,c^2d^2e\,x^2+A\,b^2e^3x}{e^5}$
risch	$-\frac{2Bbcd\,x^2}{e^3}-\frac{4Abcdx}{e^3}-\frac{A\,c^2d\,x^2}{e^3}+\frac{A\,c^2x^3}{3e^2}+\frac{B\,b^2x^2}{2e^2}+\frac{A\,b^2x}{e^2}+\frac{2d^3Abc}{e^4(ex+d)}-\frac{2d^4Bbc}{e^5(ex+d)}-\frac{8d^3\ln(ex+d)Bbc}{e^5}-$
parallelrisch	$-\frac{30B\,x^2c^2d^3e^2-72Abc\,d^3e^2+96Bbc\,d^4e-72A\ln(ex+d)xbc\,d^2e^3-8B\,x^4bc\,e^5+24A\ln(ex+d)b^2d^2e^3+8A\,x^3c^2d\,e^4-10B\,x^3c}{}$

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

output
```
((2*A*b^2*d^2*e^3-6*A*b*c*d^3*e^2+4*A*c^2*d^4*e-3*B*b^2*d^3*e^2+8*B*b*c*d^
4*e-5*B*c^2*d^5)/d/e^5*x+1/2/e^4*(2*A*b^2*e^3-6*A*b*c*d*e^2+4*A*c^2*d^2*e-
3*B*b^2*d*e^2+8*B*b*c*d^2*e-5*B*c^2*d^3)*x^2+1/6*(6*A*b*c*e^2-4*A*c^2*d*e+
3*B*b^2*e^2-8*B*b*c*d*e+5*B*c^2*d^2)/e^3*x^3+1/4*B*c^2*x^5/e+1/12*c*(4*A*c
*e+8*B*b*e-5*B*c*d)/e^2*x^4)/(e*x+d)-d/e^6*(2*A*b^2*e^3-6*A*b*c*d*e^2+4*A*
c^2*d^2*e-3*B*b^2*d*e^2+8*B*b*c*d^2*e-5*B*c^2*d^3)*ln(e*x+d)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 420 vs. $2(188) = 376$.

Time = 0.08 (sec) , antiderivative size = 420, normalized size of antiderivative = 2.16

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^2}\,dx$$
$$= \frac{3\,Bc^2e^5x^5+12\,Bc^2d^5-12\,Ab^2d^2e^3-12\,(2\,Bbc+Ac^2)d^4e+12\,(Bb^2+2\,Abc)d^3e^2-(5\,Bc^2de^4-4\,(2\,B}{}$$

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

output
```
1/12*(3*B*c^2*e^5*x^5 + 12*B*c^2*d^5 - 12*A*b^2*d^2*e^3 - 12*(2*B*b*c + A*
c^2)*d^4*e + 12*(B*b^2 + 2*A*b*c)*d^3*e^2 - (5*B*c^2*d*e^4 - 4*(2*B*b*c +
A*c^2)*e^5)*x^4 + 2*(5*B*c^2*d^2*e^3 - 4*(2*B*b*c + A*c^2)*d*e^4 + 3*(B*b^
2 + 2*A*b*c)*e^5)*x^3 - 6*(5*B*c^2*d^3*e^2 - 2*A*b^2*e^5 - 4*(2*B*b*c + A*
c^2)*d^2*e^3 + 3*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 - 12*(4*B*c^2*d^4*e - A*b^2*
d*e^4 - 3*(2*B*b*c + A*c^2)*d^3*e^2 + 2*(B*b^2 + 2*A*b*c)*d^2*e^3)*x + 12*
(5*B*c^2*d^5 - 2*A*b^2*d^2*e^3 - 4*(2*B*b*c + A*c^2)*d^4*e + 3*(B*b^2 + 2*
A*b*c)*d^3*e^2 + (5*B*c^2*d^4*e - 2*A*b^2*d*e^4 - 4*(2*B*b*c + A*c^2)*d^3*
e^2 + 3*(B*b^2 + 2*A*b*c)*d^2*e^3)*x)*log(e*x + d))/(e^7*x + d*e^6)
```

Sympy [A] (verification not implemented)

Time = 0.70 (sec) , antiderivative size = 316, normalized size of antiderivative = 1.63

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^2}\,dx = \frac{Bc^2x^4}{4e^2} + \frac{d(be-cd)\left(-2Abe^2+4Acde+3Bbde-5Bcd^2\right)\log(d+ex)}{e^6} + x^3\left(\frac{Ac^2}{3e^2}+\frac{2Bbc}{3e^2}-\frac{2Bc^2d}{3e^3}\right) + x^2\left(\frac{Abc}{e^2}-\frac{Ac^2d}{e^3}+\frac{Bb^2}{2e^2}-\frac{2Bbcd}{e^3}+\frac{3Bc^2d^2}{2e^4}\right) + x\left(\frac{Ab^2}{e^2}-\frac{4Abcd}{e^3}+\frac{3Ac^2d^2}{e^4}-\frac{2Bb^2d}{e^3}+\frac{6Bbcd^2}{e^4}-\frac{4Bc^2d^3}{e^5}\right) + \frac{-Ab^2d^2e^3+2Abcd^3e^2-Ac^2d^4e+Bb^2d^3e^2-2Bbcd^4e+Bc^2d^5}{de^6+e^7x}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**2,x)
```

output
```
B*c**2*x**4/(4*e**2) + d*(b*e - c*d)*(-2*A*b*e**2 + 4*A*c*d*e + 3*B*b*d*e
- 5*B*c*d**2)*log(d + e*x)/e**6 + x**3*(A*c**2/(3*e**2) + 2*B*b*c/(3*e**2)
 - 2*B*c**2*d/(3*e**3)) + x**2*(A*b*c/e**2 - A*c**2*d/e**3 + B*b**2/(2*e**
2) - 2*B*b*c*d/e**3 + 3*B*c**2*d**2/(2*e**4)) + x*(A*b**2/e**2 - 4*A*b*c*d
/e**3 + 3*A*c**2*d**2/e**4 - 2*B*b**2*d/e**3 + 6*B*b*c*d**2/e**4 - 4*B*c**
2*d**3/e**5) + (-A*b**2*d**2*e**3 + 2*A*b*c*d**3*e**2 - A*c**2*d**4*e + B*
b**2*d**3*e**2 - 2*B*b*c*d**4*e + B*c**2*d**5)/(d*e**6 + e**7*x)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.50

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^2}\,dx = \frac{Bc^2d^5-Ab^2d^2e^3-(2\,Bbc+Ac^2)d^4e+(Bb^2+2\,Abc)d^3e^2}{e^7x+de^6} + \frac{3\,Bc^2e^3x^4-4\,(2\,Bc^2de^2-(2\,Bbc+Ac^2)e^3)x^3+6\,(3\,Bc^2d^2e-2\,(2\,Bbc+Ac^2)de^2+(Bb^2+2\,Abc)e^3}{12\,e^5} + \frac{(5\,Bc^2d^4-2\,Ab^2de^3-4\,(2\,Bbc+Ac^2)d^3e+3\,(Bb^2+2\,Abc)d^2e^2)\log(ex+d)}{e^6}$$

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

output
```
(B*c^2*d^5 - A*b^2*d^2*e^3 - (2*B*b*c + A*c^2)*d^4*e + (B*b^2 + 2*A*b*c)*d
^3*e^2)/(e^7*x + d*e^6) + 1/12*(3*B*c^2*e^3*x^4 - 4*(2*B*c^2*d*e^2 - (2*B*
b*c + A*c^2)*e^3)*x^3 + 6*(3*B*c^2*d^2*e - 2*(2*B*b*c + A*c^2)*d*e^2 + (B*
b^2 + 2*A*b*c)*e^3)*x^2 - 12*(4*B*c^2*d^3 - A*b^2*e^3 - 3*(2*B*b*c + A*c^2
)*d^2*e + 2*(B*b^2 + 2*A*b*c)*d*e^2)*x)/e^5 + (5*B*c^2*d^4 - 2*A*b^2*d*e^3
 - 4*(2*B*b*c + A*c^2)*d^3*e + 3*(B*b^2 + 2*A*b*c)*d^2*e^2)*log(e*x + d)/e
^6
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 395 vs. $2(188) = 376$.

Time = 0.27 (sec) , antiderivative size = 395, normalized size of antiderivative = 2.04

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^2}\,dx$$

$$= \frac{\left(3\,Bc^2 - \frac{4\,(5\,Bc^2de-2\,Bbce^2-Ac^2e^2)}{(ex+d)e} + \frac{6\,(10\,Bc^2d^2e^2-8\,Bbcde^3-4\,Ac^2de^3+Bb^2e^4+2\,Abce^4)}{(ex+d)^2e^2} - \frac{12\,(10\,Bc^2d^3e^3-12\,Bbcd^2e^4-6\,Ac^2\cdots}{(ex+\cdots}\right.}{12\,e^6}$$

$$- \frac{\left(5\,Bc^2d^4 - 8\,Bbcd^3e - 4\,Ac^2d^3e + 3\,Bb^2d^2e^2 + 6\,Abcd^2e^2 - 2\,Ab^2de^3\right)\log\left(\frac{|ex+d|}{(ex+d)^2|e|}\right)}{e^6}$$

$$+ \frac{\frac{Bc^2d^5e^4}{ex+d} - \frac{2\,Bbcd^4e^5}{ex+d} - \frac{Ac^2d^4e^5}{ex+d} + \frac{Bb^2d^3e^6}{ex+d} + \frac{2\,Abcd^3e^6}{ex+d} - \frac{Ab^2d^2e^7}{ex+d}}{e^{10}}$$

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

output
```
1/12*(3*B*c^2 - 4*(5*B*c^2*d*e - 2*B*b*c*e^2 - A*c^2*e^2)/((e*x + d)*e) +
6*(10*B*c^2*d^2*e^2 - 8*B*b*c*d*e^3 - 4*A*c^2*d*e^3 + B*b^2*e^4 + 2*A*b*c*
e^4)/((e*x + d)^2*e^2) - 12*(10*B*c^2*d^3*e^3 - 12*B*b*c*d^2*e^4 - 6*A*c^2
*d^2*e^4 + 3*B*b^2*d*e^5 + 6*A*b*c*d*e^5 - A*b^2*e^6)/((e*x + d)^3*e^3))*(
e*x + d)^4/e^6 - (5*B*c^2*d^4 - 8*B*b*c*d^3*e - 4*A*c^2*d^3*e + 3*B*b^2*d^
2*e^2 + 6*A*b*c*d^2*e^2 - 2*A*b^2*d*e^3)*log(abs(e*x + d)/((e*x + d)^2*abs
(e)))/e^6 + (B*c^2*d^5*e^4/(e*x + d) - 2*B*b*c*d^4*e^5/(e*x + d) - A*c^2*d
^4*e^5/(e*x + d) + B*b^2*d^3*e^6/(e*x + d) + 2*A*b*c*d^3*e^6/(e*x + d) - A
*b^2*d^2*e^7/(e*x + d))/e^10
```

Mupad [B] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 371, normalized size of antiderivative = 1.91

$$\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^2}\,dx = x\left(\frac{A\,b^2}{e^2}-\frac{d^2\left(\frac{A\,c^2+2\,B\,b\,c}{e^2}-\frac{2\,B\,c^2\,d}{e^3}\right)}{e^2}+\frac{2\,d\left(\frac{2\,d\left(\frac{A\,c^2+2\,B\,b\,c}{e^2}-\frac{2\,B\,c^2\,d}{e^3}\right)}{e}-\frac{B\,b^2+2\,A\,c\,b}{e^2}+\frac{B\,c^2\,d^2}{e^4}\right)}{e}\right)+x^3\left(\frac{A\,c^2+2\,B\,b\,c}{3\,e^2}-\frac{2\,B\,c^2\,d}{3\,e^3}\right)-x^2\left(\frac{d\left(\frac{A\,c^2+2\,B\,b\,c}{e^2}-\frac{2\,B\,c^2\,d}{e^3}\right)}{e}-\frac{B\,b^2+2\,A\,c\,b}{2\,e^2}+\frac{B\,c^2\,d^2}{2\,e^4}\right)+\frac{B\,b^2\,d^3\,e^2-A\,b^2\,d^2\,e^3-2\,B\,b\,c\,d^4\,e+2\,A\,b\,c\,d^3\,e^2+B\,c^2\,d^5-A\,c^2\,d^4\,e}{e\,\left(x\,e^6+d\,e^5\right)}+\frac{\ln\left(d+e\,x\right)\,\left(3\,B\,b^2\,d^2\,e^2-2\,A\,b^2\,d\,e^3-8\,B\,b\,c\,d^3\,e+6\,A\,b\,c\,d^2\,e^2+5\,B\,c^2\,d^4-4\,A\,c^2\,d^3\,e\right)}{e^6}+\frac{B\,c^2\,x^4}{4\,e^2}$$

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

output
```
x*((A*b^2)/e^2 - (d^2*((A*c^2 + 2*B*b*c)/e^2 - (2*B*c^2*d)/e^3))/e^2 + (2*
d*((2*d*((A*c^2 + 2*B*b*c)/e^2 - (2*B*c^2*d)/e^3))/e - (B*b^2 + 2*A*b*c)/e
^2 + (B*c^2*d^2)/e^4))/e) + x^3*((A*c^2 + 2*B*b*c)/(3*e^2) - (2*B*c^2*d)/(
3*e^3)) - x^2*((d*((A*c^2 + 2*B*b*c)/e^2 - (2*B*c^2*d)/e^3))/e - (B*b^2 +
2*A*b*c)/(2*e^2) + (B*c^2*d^2)/(2*e^4)) + (B*c^2*d^5 - A*c^2*d^4*e - A*b^2
*d^2*e^3 + B*b^2*d^3*e^2 - 2*B*b*c*d^4*e + 2*A*b*c*d^3*e^2)/(e*(d*e^5 + e^
6*x)) + (log(d + e*x)*(5*B*c^2*d^4 - 2*A*b^2*d*e^3 - 4*A*c^2*d^3*e + 3*B*b
^2*d^2*e^2 - 8*B*b*c*d^3*e + 6*A*b*c*d^2*e^2))/e^6 + (B*c^2*x^4)/(4*e^2)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 485, normalized size of antiderivative = 2.50

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^2}\,dx = \frac{72\log(ex+d)\,abc\,d^3e^2-72abc\,d^2e^3x-36abcd\,e^4x^2+36\log(ex+d)\,b^3d^3e^2+60\log(ex+d)\,b\,c^2d^5+12}{}$$

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

output
```
( - 24*log(d + e*x)*a*b**2*d**2*e**3 - 24*log(d + e*x)*a*b**2*d*e**4*x + 7
2*log(d + e*x)*a*b*c*d**3*e**2 + 72*log(d + e*x)*a*b*c*d**2*e**3*x - 48*lo
g(d + e*x)*a*c**2*d**4*e - 48*log(d + e*x)*a*c**2*d**3*e**2*x + 36*log(d +
 e*x)*b**3*d**3*e**2 + 36*log(d + e*x)*b**3*d**2*e**3*x - 96*log(d + e*x)*
b**2*c*d**4*e - 96*log(d + e*x)*b**2*c*d**3*e**2*x + 60*log(d + e*x)*b*c**
2*d**5 + 60*log(d + e*x)*b*c**2*d**4*e*x + 24*a*b**2*d*e**4*x + 12*a*b**2*
e**5*x**2 - 72*a*b*c*d**2*e**3*x - 36*a*b*c*d*e**4*x**2 + 12*a*b*c*e**5*x*
*3 + 48*a*c**2*d**3*e**2*x + 24*a*c**2*d**2*e**3*x**2 - 8*a*c**2*d*e**4*x*
*3 + 4*a*c**2*e**5*x**4 - 36*b**3*d**2*e**3*x - 18*b**3*d*e**4*x**2 + 6*b*
*3*e**5*x**3 + 96*b**2*c*d**3*e**2*x + 48*b**2*c*d**2*e**3*x**2 - 16*b**2*
c*d*e**4*x**3 + 8*b**2*c*e**5*x**4 - 60*b*c**2*d**4*e*x - 30*b*c**2*d**3*e
**2*x**2 + 10*b*c**2*d**2*e**3*x**3 - 5*b*c**2*d*e**4*x**4 + 3*b*c**2*e**5
*x**5)/(12*e**6*(d + e*x))
```

3.16 $\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^3} dx$

Optimal result

Integrand size = 24, antiderivative size = 232

$$\begin{aligned}
&\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^3}\,dx \\
&= -\frac{(Ace(3cd-2be)-B(6c^2d^2-6bcde+b^2e^2))\,x}{e^5}-\frac{c(3Bcd-2bBe-Ace)x^2}{2e^4} \\
&\quad+\frac{Bc^2x^3}{3e^3}+\frac{d^2(Bd-Ae)(cd-be)^2}{2e^6(d+ex)^2}-\frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{e^6(d+ex)} \\
&\quad+\frac{(Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2))\log(d+ex)}{e^6}
\end{aligned}$$

output
```
-(A*c*e*(-2*b*e+3*c*d)-B*(b^2*e^2-6*b*c*d*e+6*c^2*d^2))*x/e^5-1/2*c*(-A*c*
e-2*B*b*e+3*B*c*d)*x^2/e^4+1/3*B*c^2*x^3/e^3+1/2*d^2*(-A*e+B*d)*(-b*e+c*d)
^2/e^6/(e*x+d)^2-d*(-b*e+c*d)*(B*d*(-3*b*e+5*c*d)-2*A*e*(-b*e+2*c*d))/e^6/
(e*x+d)+(A*e*(b^2*e^2-6*b*c*d*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^
2*d^2))*ln(e*x+d)/e^6
```

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 219, normalized size of antiderivative = 0.94

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^3}\,dx$$
$$= \frac{6e(Ace(-3cd+2be)+B(6c^2d^2-6bcde+b^2e^2))\,x+3ce^2(-3Bcd+2bBe+Ace)x^2+2Bc^2e^3x^3+\frac{3d^2(B}{}}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^3,x]
```

output
```
(6*e*(A*c*e*(-3*c*d + 2*b*e) + B*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2))*x + 3*
c*e^2*(-3*B*c*d + 2*b*B*e + A*c*e)*x^2 + 2*B*c^2*e^3*x^3 + (3*d^2*(B*d - A
*e)*(c*d - b*e)^2)/(d + e*x)^2 - (6*d*(c*d - b*e)*(B*d*(5*c*d - 3*b*e) + 2
*A*e*(-2*c*d + b*e)))/(d + e*x) + 6*(B*d*(-10*c^2*d^2 + 12*b*c*d*e - 3*b^2
*e^2) + A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2))*Log[d + e*x])/(6*e^6)
```

Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 232, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^3}\,dx$$
$$\Big\downarrow \text{1195}$$
$$\int \left(\frac{Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)}{e^5(d+ex)}+\frac{B\left(b^2e^2-6bcde+6c^2d^2\right)-Ace(3cd-2be)}{e^5}-\right.$$
$$\Big\downarrow \text{2009}$$

$$\frac{\log(d+ex)\left(Ae(b^2e^2-6bcde+6c^2d^2)-Bd(3b^2e^2-12bcde+10c^2d^2)\right)}{e^6}-\frac{x\left(Ace(3cd-2be)-B\left(b^2e^2-6bcde+6c^2d^2\right)\right)}{e^5}+\frac{d^2(Bd-Ae)(cd-be)^2}{2e^6(d+ex)^2}-\frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{e^6(d+ex)}-\frac{cx^2(-Ace-2bBe+3Bcd)}{2e^4}+\frac{Bc^2x^3}{3e^3}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^3,x]
```

output
```
-(((A*c*e*(3*c*d - 2*b*e) - B*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2))*x)/e^5) -
 (c*(3*B*c*d - 2*b*B*e - A*c*e)*x^2)/(2*e^4) + (B*c^2*x^3)/(3*e^3) + (d^2*
(B*d - A*e)*(c*d - b*e)^2)/(2*e^6*(d + e*x)^2) - (d*(c*d - b*e)*(B*d*(5*c*
d - 3*b*e) - 2*A*e*(2*c*d - b*e)))/(e^6*(d + e*x)) + ((A*e*(6*c^2*d^2 - 6*
b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2))*Log[d + e*
x])/e^6
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.79 (sec) , antiderivative size = 292, normalized size of antiderivative = 1.26

method	result
norman	$\frac{\frac{d^{2}\left(3A\,b^{2}e^{3}-18Abcd\,e^{2}+18A\,c^{2}d^{2}e-9B\,b^{2}d\,e^{2}+36Bbc\,d^{2}e-30B\,c^{2}d^{3}\right)}{2e^{6}}+\frac{\left(6Abc\,e^{2}-6A\,c^{2}de+3B\,e^{2}b^{2}-12Bbcde+10B\,c^{2}d^{2}\right)x^{3}}{3e^{3}}+\frac{B\,c^{2}x^{5}}{3e}}{\left(ex+d\right)^{2}}$
default	$\frac{\frac{1}{3}B\,c^{2}x^{3}e^{2}+\frac{1}{2}A\,c^{2}e^{2}x^{2}+Bbc\,e^{2}x^{2}-\frac{3}{2}B\,c^{2}de\,x^{2}+2Abc\,e^{2}x-3A\,c^{2}dex+B\,e^{2}b^{2}x-6Bbcdex+6c^{2}xB\,d^{2}}{e^{5}}+\frac{\left(A\,b^{2}e^{3}-6Abcd\,e^{2}\right.}{}$
risch	$\frac{B\,c^{2}x^{3}}{3e^{3}}+\frac{A\,c^{2}x^{2}}{2e^{3}}+\frac{Bbc\,x^{2}}{e^{3}}-\frac{3B\,c^{2}d\,x^{2}}{2e^{4}}+\frac{2Abcx}{e^{3}}-\frac{3A\,c^{2}dx}{e^{4}}+\frac{B\,b^{2}x}{e^{3}}-\frac{6Bbcdx}{e^{4}}+\frac{6c^{2}xB\,d^{2}}{e^{5}}+\frac{\left(2A\,b^{2}d\,e^{3}-6\right.}{}$
parallelrisch	$\frac{12Ax\,b^{2}d\,e^{4}+72Ax\,c^{2}d^{3}e^{2}-54Abc\,d^{3}e^{2}+108Bbc\,d^{4}e-36A\ln(ex+d)x^{2}bcd\,e^{4}-72A\ln(ex+d)xbc\,d^{2}e^{3}-36Bx\,b^{2}d^{2}e^{3}-120Bx}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
(1/2*d^2*(3*A*b^2*e^3-18*A*b*c*d*e^2+18*A*c^2*d^2*e-9*B*b^2*d*e^2+36*B*b*c
*d^2*e-30*B*c^2*d^3)/e^6+1/3*(6*A*b*c*e^2-6*A*c^2*d*e+3*B*b^2*e^2-12*B*b*c
*d*e+10*B*c^2*d^2)/e^3*x^3+1/3*B*c^2*x^5/e+1/6*c*(3*A*c*e+6*B*b*e-5*B*c*d)
/e^2*x^4+2*d*(A*b^2*e^3-6*A*b*c*d*e^2+6*A*c^2*d^2*e-3*B*b^2*d*e^2+12*B*b*c
*d^2*e-10*B*c^2*d^3)/e^5*x)/(e*x+d)^2+1/e^6*(A*b^2*e^3-6*A*b*c*d*e^2+6*A*c
^2*d^2*e-3*B*b^2*d*e^2+12*B*b*c*d^2*e-10*B*c^2*d^3)*ln(e*x+d)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 483 vs. 2(227) = 454.

Time = 0.07 (sec) , antiderivative size = 483, normalized size of antiderivative = 2.08

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^3}\,dx$$
$$= \frac{2\,Bc^2e^5x^5-27\,Bc^2d^5+9\,Ab^2d^2e^3+21\,(2\,Bbc+Ac^2)d^4e-15\,(Bb^2+2\,Abc)d^3e^2-(5\,Bc^2de^4-3\,(2\,Bb}{}$$

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

output
```
1/6*(2*B*c^2*e^5*x^5 - 27*B*c^2*d^5 + 9*A*b^2*d^2*e^3 + 21*(2*B*b*c + A*c^
2)*d^4*e - 15*(B*b^2 + 2*A*b*c)*d^3*e^2 - (5*B*c^2*d*e^4 - 3*(2*B*b*c + A*
c^2)*e^5)*x^4 + 2*(10*B*c^2*d^2*e^3 - 6*(2*B*b*c + A*c^2)*d*e^4 + 3*(B*b^2
 + 2*A*b*c)*e^5)*x^3 + 3*(21*B*c^2*d^3*e^2 - 11*(2*B*b*c + A*c^2)*d^2*e^3
+ 4*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 6*(B*c^2*d^4*e + 2*A*b^2*d*e^4 + (2*B*b
*c + A*c^2)*d^3*e^2 - 2*(B*b^2 + 2*A*b*c)*d^2*e^3)*x - 6*(10*B*c^2*d^5 - A
*b^2*d^2*e^3 - 6*(2*B*b*c + A*c^2)*d^4*e + 3*(B*b^2 + 2*A*b*c)*d^3*e^2 + (
10*B*c^2*d^3*e^2 - A*b^2*e^5 - 6*(2*B*b*c + A*c^2)*d^2*e^3 + 3*(B*b^2 + 2*
A*b*c)*d*e^4)*x^2 + 2*(10*B*c^2*d^4*e - A*b^2*d*e^4 - 6*(2*B*b*c + A*c^2)*
d^3*e^2 + 3*(B*b^2 + 2*A*b*c)*d^2*e^3)*x)*log(e*x + d))/(e^8*x^2 + 2*d*e^7
*x + d^2*e^6)
```

Sympy [A] (verification not implemented)

Time = 1.82 (sec) , antiderivative size = 362, normalized size of antiderivative = 1.56

$$\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^3}\,dx$$
$$= \frac{Bc^2x^3}{3e^3} + x^2\left(\frac{Ac^2}{2e^3} + \frac{Bbc}{e^3} - \frac{3Bc^2d}{2e^4}\right) + x\left(\frac{2Abc}{e^3} - \frac{3Ac^2d}{e^4} + \frac{Bb^2}{e^3} - \frac{6Bbcd}{e^4} + \frac{6Bc^2d^2}{e^5}\right)$$
$$+ \frac{3Ab^2d^2e^3 - 10Abcd^3e^2 + 7Ac^2d^4e - 5Bb^2d^3e^2 + 14Bbcd^4e - 9Bc^2d^5 + x(4Ab^2de^4 - 12Abcd^2e^3 + 8A\ldots}{2d^2e^6 + 4de^7x + 2e^8x^2}$$
$$- \frac{(-Ab^2e^3 + 6Abcde^2 - 6Ac^2d^2e + 3Bb^2de^2 - 12Bbcd^2e + 10Bc^2d^3)\log(d+ex)}{e^6}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**3,x)
```

output
```
B*c**2*x**3/(3*e**3) + x**2*(A*c**2/(2*e**3) + B*b*c/e**3 - 3*B*c**2*d/(2*
e**4)) + x*(2*A*b*c/e**3 - 3*A*c**2*d/e**4 + B*b**2/e**3 - 6*B*b*c*d/e**4
+ 6*B*c**2*d**2/e**5) + (3*A*b**2*d**2*e**3 - 10*A*b*c*d**3*e**2 + 7*A*c**
2*d**4*e - 5*B*b**2*d**3*e**2 + 14*B*b*c*d**4*e - 9*B*c**2*d**5 + x*(4*A*b
**2*d*e**4 - 12*A*b*c*d**2*e**3 + 8*A*c**2*d**3*e**2 - 6*B*b**2*d**2*e**3
+ 16*B*b*c*d**3*e**2 - 10*B*c**2*d**4*e))/(2*d**2*e**6 + 4*d*e**7*x + 2*e*
*8*x**2) - (-A*b**2*e**3 + 6*A*b*c*d*e**2 - 6*A*c**2*d**2*e + 3*B*b**2*d*e
**2 - 12*B*b*c*d**2*e + 10*B*c**2*d**3)*log(d + e*x)/e**6
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 302, normalized size of antiderivative = 1.30

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^3}\,dx = -\frac{9\,Bc^2d^5-3\,Ab^2d^2e^3-7\,(2\,Bbc+Ac^2)d^4e+5\,(Bb^2+2\,Abc)d^3e^2+2\,(5\,Bc^2d^4e-2\,Ab^2de^4-4\,(2\,Bbc}{2\,(e^8x^2+2\,de^7x+d^2e^6)} + \frac{2\,Bc^2e^2x^3-3\,(3\,Bc^2de-(2\,Bbc+Ac^2)e^2)x^2+6\,(6\,Bc^2d^2-3\,(2\,Bbc+Ac^2)de+(Bb^2+2\,Abc)e^2)x}{6\,e^5} - \frac{(10\,Bc^2d^3-Ab^2e^3-6\,(2\,Bbc+Ac^2)d^2e+3\,(Bb^2+2\,Abc)de^2)\log(ex+d)}{e^6}$$

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

output
```
-1/2*(9*B*c^2*d^5 - 3*A*b^2*d^2*e^3 - 7*(2*B*b*c + A*c^2)*d^4*e + 5*(B*b^2
 + 2*A*b*c)*d^3*e^2 + 2*(5*B*c^2*d^4*e - 2*A*b^2*d*e^4 - 4*(2*B*b*c + A*c^
2)*d^3*e^2 + 3*(B*b^2 + 2*A*b*c)*d^2*e^3)*x)/(e^8*x^2 + 2*d*e^7*x + d^2*e^
6) + 1/6*(2*B*c^2*e^2*x^3 - 3*(3*B*c^2*d*e - (2*B*b*c + A*c^2)*e^2)*x^2 +
6*(6*B*c^2*d^2 - 3*(2*B*b*c + A*c^2)*d*e + (B*b^2 + 2*A*b*c)*e^2)*x)/e^5 -
 (10*B*c^2*d^3 - A*b^2*e^3 - 6*(2*B*b*c + A*c^2)*d^2*e + 3*(B*b^2 + 2*A*b*
c)*d*e^2)*log(e*x + d)/e^6
```

Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 323, normalized size of antiderivative = 1.39

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^3}\,dx = -\frac{(10\,Bc^2d^3-12\,Bbcd^2e-6\,Ac^2d^2e+3\,Bb^2de^2+6\,Abcde^2-Ab^2e^3)\log(|ex+d|)}{e^6} - \frac{9\,Bc^2d^5-14\,Bbcd^4e-7\,Ac^2d^4e+5\,Bb^2d^3e^2+10\,Abcd^3e^2-3\,Ab^2d^2e^3+2\,(5\,Bc^2d^4e-8\,Bbcd^3e^2-4}{2\,(ex+d)^2e^6} + \frac{2\,Bc^2e^6x^3-9\,Bc^2de^5x^2+6\,Bbce^6x^2+3\,Ac^2e^6x^2+36\,Bc^2d^2e^4x-36\,Bbcde^5x-18\,Ac^2de^5x+6\,Bb^2e}{6\,e^9}$$

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

output
```
-(10*B*c^2*d^3 - 12*B*b*c*d^2*e - 6*A*c^2*d^2*e + 3*B*b^2*d*e^2 + 6*A*b*c*
d*e^2 - A*b^2*e^3)*log(abs(e*x + d))/e^6 - 1/2*(9*B*c^2*d^5 - 14*B*b*c*d^4
*e - 7*A*c^2*d^4*e + 5*B*b^2*d^3*e^2 + 10*A*b*c*d^3*e^2 - 3*A*b^2*d^2*e^3
+ 2*(5*B*c^2*d^4*e - 8*B*b*c*d^3*e^2 - 4*A*c^2*d^3*e^2 + 3*B*b^2*d^2*e^3 +
 6*A*b*c*d^2*e^3 - 2*A*b^2*d*e^4)*x)/((e*x + d)^2*e^6) + 1/6*(2*B*c^2*e^6*
x^3 - 9*B*c^2*d*e^5*x^2 + 6*B*b*c*e^6*x^2 + 3*A*c^2*e^6*x^2 + 36*B*c^2*d^2
*e^4*x - 36*B*b*c*d*e^5*x - 18*A*c^2*d*e^5*x + 6*B*b^2*e^6*x + 12*A*b*c*e^
6*x)/e^9
```

Mupad [B] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 334, normalized size of antiderivative = 1.44

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^3}\,dx = x^2\left(\frac{A\,c^2+2\,B\,b\,c}{2\,e^3}-\frac{3\,B\,c^2\,d}{2\,e^4}\right)$$
$$-x\left(\frac{3\,d\left(\frac{A\,c^2+2\,B\,b\,c}{e^3}-\frac{3\,B\,c^2\,d}{e^4}\right)}{e}-\frac{B\,b^2+2\,A\,c\,b}{e^3}+\frac{3\,B\,c^2\,d^2}{e^5}\right)$$
$$-\frac{\frac{5\,B\,b^2\,d^3\,e^2-3\,A\,b^2\,d^2\,e^3-14\,B\,b\,c\,d^4\,e+10\,A\,b\,c\,d^3\,e^2+9\,B\,c^2\,d^5-7\,A\,c^2\,d^4\,e}{2\,e}+x\left(3\,B\,b^2\,d^2\,e^2-2\,A\,b^2\,d\,e^3-8\,B\,b\,c\,d^3\,e+6\right.}{d^2\,e^5+2\,d\,e^6\,x+e^7\,x^2}$$
$$+\frac{\ln\left(d+e\,x\right)\left(-3\,B\,b^2\,d\,e^2+A\,b^2\,e^3+12\,B\,b\,c\,d^2\,e-6\,A\,b\,c\,d\,e^2-10\,B\,c^2\,d^3+6\,A\,c^2\,d^2\,e\right)}{e^6}$$
$$+\frac{B\,c^2\,x^3}{3\,e^3}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^3,x)
```

output
```
x^2*((A*c^2 + 2*B*b*c)/(2*e^3) - (3*B*c^2*d)/(2*e^4)) - x*((3*d*((A*c^2 +
2*B*b*c)/e^3 - (3*B*c^2*d)/e^4))/e - (B*b^2 + 2*A*b*c)/e^3 + (3*B*c^2*d^2)
/e^5) - ((9*B*c^2*d^5 - 7*A*c^2*d^4*e - 3*A*b^2*d^2*e^3 + 5*B*b^2*d^3*e^2
- 14*B*b*c*d^4*e + 10*A*b*c*d^3*e^2)/(2*e) + x*(5*B*c^2*d^4 - 2*A*b^2*d*e^
3 - 4*A*c^2*d^3*e + 3*B*b^2*d^2*e^2 - 8*B*b*c*d^3*e + 6*A*b*c*d^2*e^2))/(d
^2*e^5 + e^7*x^2 + 2*d*e^6*x) + (log(d + e*x)*(A*b^2*e^3 - 10*B*c^2*d^3 +
6*A*c^2*d^2*e - 3*B*b^2*d*e^2 - 6*A*b*c*d*e^2 + 12*B*b*c*d^2*e))/e^6 + (B*
c^2*x^3)/(3*e^3)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 604, normalized size of antiderivative = 2.60

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^3}\,dx$$
$$= \frac{36\log(ex+d)\,a\,c^2d^2e^3x^2 + 72\log(ex+d)\,b^2c\,d^2e^3x^2 - 60\log(ex+d)\,b\,c^2d^3e^2x^2 - 36\log(ex+d)\,abc\,d^3e}{}$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^3,x)
```

output
```
(6*log(d + e*x)*a*b**2*d**2*e**3 + 12*log(d + e*x)*a*b**2*d*e**4*x + 6*log
(d + e*x)*a*b**2*e**5*x**2 - 36*log(d + e*x)*a*b*c*d**3*e**2 - 72*log(d +
e*x)*a*b*c*d**2*e**3*x - 36*log(d + e*x)*a*b*c*d*e**4*x**2 + 36*log(d + e*
x)*a*c**2*d**4*e + 72*log(d + e*x)*a*c**2*d**3*e**2*x + 36*log(d + e*x)*a*
c**2*d**2*e**3*x**2 - 18*log(d + e*x)*b**3*d**3*e**2 - 36*log(d + e*x)*b**
3*d**2*e**3*x - 18*log(d + e*x)*b**3*d*e**4*x**2 + 72*log(d + e*x)*b**2*c*
d**4*e + 144*log(d + e*x)*b**2*c*d**3*e**2*x + 72*log(d + e*x)*b**2*c*d**2
*e**3*x**2 - 60*log(d + e*x)*b*c**2*d**5 - 120*log(d + e*x)*b*c**2*d**4*e*
x - 60*log(d + e*x)*b*c**2*d**3*e**2*x**2 + 3*a*b**2*d**2*e**3 - 6*a*b**2*
e**5*x**2 - 18*a*b*c*d**3*e**2 + 36*a*b*c*d*e**4*x**2 + 12*a*b*c*e**5*x**3
 + 18*a*c**2*d**4*e - 36*a*c**2*d**2*e**3*x**2 - 12*a*c**2*d*e**4*x**3 + 3
*a*c**2*e**5*x**4 - 9*b**3*d**3*e**2 + 18*b**3*d*e**4*x**2 + 6*b**3*e**5*x
**3 + 36*b**2*c*d**4*e - 72*b**2*c*d**2*e**3*x**2 - 24*b**2*c*d*e**4*x**3
+ 6*b**2*c*e**5*x**4 - 30*b*c**2*d**5 + 60*b*c**2*d**3*e**2*x**2 + 20*b*c*
*2*d**2*e**3*x**3 - 5*b*c**2*d*e**4*x**4 + 2*b*c**2*e**5*x**5)/(6*e**6*(d*
*2 + 2*d*e*x + e**2*x**2))
```

3.17 $\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^4} dx$

Optimal result

Integrand size = 24, antiderivative size = 238

$$\begin{aligned}\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^4} dx &= -\frac{c(4Bcd-2bBe-Ace)x}{e^5}+\frac{Bc^2x^2}{2e^4}+\frac{d^2(Bd-Ae)(cd-be)^2}{3e^6(d+ex)^3}\\ &\quad -\frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{2e^6(d+ex)^2}\\ &\quad -\frac{Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2)}{e^6(d+ex)}\\ &\quad -\frac{(2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2))\log(d+ex)}{e^6}\end{aligned}$$

output
```
-c*(-A*c*e-2*B*b*e+4*B*c*d)*x/e^5+1/2*B*c^2*x^2/e^4+1/3*d^2*(-A*e+B*d)*(-b
*e+c*d)^2/e^6/(e*x+d)^3-1/2*d*(-b*e+c*d)*(B*d*(-3*b*e+5*c*d)-2*A*e*(-b*e+2
*c*d))/e^6/(e*x+d)^2-(A*e*(b^2*e^2-6*b*c*d*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*
b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)-(2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*
e+10*c^2*d^2))*ln(e*x+d)/e^6
```

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 220, normalized size of antiderivative = 0.92

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^4}\,dx$$
$$= \frac{6ce(-4Bcd+2bBe+Ace)x+3Bc^2e^2x^2+\frac{2d^2(Bd-Ae)(cd-be)^2}{(d+ex)^3}-\frac{3d(cd-be)(Bd(5cd-3be)+2Ae(-2cd+be))}{(d+ex)^2}-\frac{6(Bd(-}{}}{6e^6}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^4,x]
```

output
```
(6*c*e*(-4*B*c*d + 2*b*B*e + A*c*e)*x + 3*B*c^2*e^2*x^2 + (2*d^2*(B*d - A*
e)*(c*d - b*e)^2)/(d + e*x)^3 - (3*d*(c*d - b*e)*(B*d*(5*c*d - 3*b*e) + 2*
A*e*(-2*c*d + b*e)))/(d + e*x)^2 - (6*(B*d*(-10*c^2*d^2 + 12*b*c*d*e - 3*b
^2*e^2) + A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2)))/(d + e*x) + 6*(2*A*c*e*(
-2*c*d + b*e) + B*(10*c^2*d^2 - 8*b*c*d*e + b^2*e^2))*Log[d + e*x])/(6*e^6
)
```

Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^4}\,dx$$
$$\Big\downarrow \text{1195}$$
$$\int \left(\frac{B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)}{e^5(d+ex)}+\frac{Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)}{e^5(d+ex)^2}\right.$$
$$\Big\downarrow \text{2009}$$

$$-\frac{Ae(b^2e^2-6bcde+6c^2d^2)-Bd(3b^2e^2-12bcde+10c^2d^2)}{e^6(d+ex)}-\frac{\log(d+ex)\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{e^6}+\frac{d^2(Bd-Ae)(cd-be)^2}{3e^6(d+ex)^3}-\frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{2e^6(d+ex)^2}-\frac{cx(-Ace-2bBe+4Bcd)}{e^5}+\frac{Bc^2x^2}{2e^4}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^4,x]
```

output
```
-((c*(4*B*c*d - 2*b*B*e - A*c*e)*x)/e^5) + (B*c^2*x^2)/(2*e^4) + (d^2*(B*d
 - A*e)*(c*d - b*e)^2)/(3*e^6*(d + e*x)^3) - (d*(c*d - b*e)*(B*d*(5*c*d -
3*b*e) - 2*A*e*(2*c*d - b*e)))/(2*e^6*(d + e*x)^2) - (A*e*(6*c^2*d^2 - 6*b
*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2))/(e^6*(d + e
*x)) - ((2*A*c*e*(2*c*d - b*e) - B*(10*c^2*d^2 - 8*b*c*d*e + b^2*e^2))*Log
[d + e*x])/e^6
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.87 (sec) , antiderivative size = 292, normalized size of antiderivative = 1.23

method	result
default	$\frac{c\left(\frac{1}{2}Bce\,x^2+Acex+2Bbex-4Bcdx\right)}{e^5}-\frac{d^2\left(A\,b^2e^3-2Abcd\,e^2+A\,c^2d^2e-B\,b^2d\,e^2+2Bbc\,d^2e-B\,c^2d^3\right)}{3e^6(ex+d)^3}+\frac{(2Abc\,e^2-4A\,c^2d}{}$
norman	$\frac{-\frac{d^2\left(2A\,b^2e^3-22Abcd\,e^2+44A\,c^2d^2e-11B\,b^2d\,e^2+88Bbc\,d^2e-110B\,c^2d^3\right)}{6e^6}-\frac{\left(A\,b^2e^3-6Abcd\,e^2+12A\,c^2d^2e-3B\,b^2d\,e^2+24Bbc\,d^2e-30B\right.}{e^4}}{(ex+d)^3}$
risch	$\frac{B\,c^2x^2}{2e^4}+\frac{c^2Ax}{e^4}+\frac{2cBbx}{e^4}-\frac{4c^2Bdx}{e^5}+\frac{\left(-b^2A\,e^4+6Abcd\,e^3-6A\,d^2e^2c^2+3B\,b^2d\,e^3-12Bbc\,d^2e^2+10B\,c^2d^3e\right)x^2-\frac{d(2A}{}}{}$
parallelrisch	$\frac{180B\,x^2c^2d^3e^2-6Ax\,b^2d\,e^4-108Ax\,c^2d^3e^2+22Abc\,d^3e^2-88Bbc\,d^4e+60B\ln(ex+d)x^3c^2d^2e^3+12A\ln(ex+d)x^3bc\,e^5+36A\ln}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
c/e^5*(1/2*B*c*e*x^2+A*c*e*x+2*B*b*e*x-4*B*c*d*x)-1/3*d^2*(A*b^2*e^3-2*A*b
*c*d*e^2+A*c^2*d^2*e-B*b^2*d*e^2+2*B*b*c*d^2*e-B*c^2*d^3)/e^6/(e*x+d)^3+1/
e^6*(2*A*b*c*e^2-4*A*c^2*d*e+B*b^2*e^2-8*B*b*c*d*e+10*B*c^2*d^2)*ln(e*x+d)
-1/e^6*(A*b^2*e^3-6*A*b*c*d*e^2+6*A*c^2*d^2*e-3*B*b^2*d*e^2+12*B*b*c*d^2*e
-10*B*c^2*d^3)/(e*x+d)+1/2*d/e^6*(2*A*b^2*e^3-6*A*b*c*d*e^2+4*A*c^2*d^2*e-
3*B*b^2*d*e^2+8*B*b*c*d^2*e-5*B*c^2*d^3)/(e*x+d)^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 505 vs. 2(231) = 462.

Time = 0.08 (sec) , antiderivative size = 505, normalized size of antiderivative = 2.12

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^4}\,dx$$
$$=\frac{3\,Bc^2e^5x^5+47\,Bc^2d^5-2\,Ab^2d^2e^3-26\,(2\,Bbc+Ac^2)d^4e+11\,(Bb^2+2\,Abc)d^3e^2-3\,(5\,Bc^2de^4-2\,(2\,B}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^4,x, algorithm="fricas")
```

output
```
1/6*(3*B*c^2*e^5*x^5 + 47*B*c^2*d^5 - 2*A*b^2*d^2*e^3 - 26*(2*B*b*c + A*c^
2)*d^4*e + 11*(B*b^2 + 2*A*b*c)*d^3*e^2 - 3*(5*B*c^2*d*e^4 - 2*(2*B*b*c +
A*c^2)*e^5)*x^4 - 9*(7*B*c^2*d^2*e^3 - 2*(2*B*b*c + A*c^2)*d*e^4)*x^3 - 3*
(3*B*c^2*d^3*e^2 + 2*A*b^2*e^5 + 6*(2*B*b*c + A*c^2)*d^2*e^3 - 6*(B*b^2 +
2*A*b*c)*d*e^4)*x^2 + 3*(27*B*c^2*d^4*e - 2*A*b^2*d*e^4 - 18*(2*B*b*c + A*
c^2)*d^3*e^2 + 9*(B*b^2 + 2*A*b*c)*d^2*e^3)*x + 6*(10*B*c^2*d^5 - 4*(2*B*b
*c + A*c^2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2 + (10*B*c^2*d^2*e^3 - 4*(2*B
*b*c + A*c^2)*d*e^4 + (B*b^2 + 2*A*b*c)*e^5)*x^3 + 3*(10*B*c^2*d^3*e^2 - 4
*(2*B*b*c + A*c^2)*d^2*e^3 + (B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 3*(10*B*c^2*d^
4*e - 4*(2*B*b*c + A*c^2)*d^3*e^2 + (B*b^2 + 2*A*b*c)*d^2*e^3)*x)*log(e*x
+ d))/(e^9*x^3 + 3*d*e^8*x^2 + 3*d^2*e^7*x + d^3*e^6)
```

Sympy [A] (verification not implemented)

Time = 5.21 (sec) , antiderivative size = 374, normalized size of antiderivative = 1.57

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^4}\,dx = \frac{Bc^2x^2}{2e^4} + x\left(\frac{Ac^2}{e^4} + \frac{2Bbc}{e^4} - \frac{4Bc^2d}{e^5}\right) + \frac{-2Ab^2d^2e^3 + 22Abcd^3e^2 - 26Ac^2d^4e + 11Bb^2d^3e^2 - 52Bbcd^4e + 47Bc^2d^5 + x^2(-6Ab^2e^5 + 36Abcde^4}{} + \frac{(2Abce^2 - 4Ac^2de + Bb^2e^2 - 8Bbcde + 10Bc^2d^2)\log(d+ex)}{e^6}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**4,x)
```

output
```
B*c**2*x**2/(2*e**4) + x*(A*c**2/e**4 + 2*B*b*c/e**4 - 4*B*c**2*d/e**5) +
(-2*A*b**2*d**2*e**3 + 22*A*b*c*d**3*e**2 - 26*A*c**2*d**4*e + 11*B*b**2*d
**3*e**2 - 52*B*b*c*d**4*e + 47*B*c**2*d**5 + x**2*(-6*A*b**2*e**5 + 36*A*
b*c*d*e**4 - 36*A*c**2*d**2*e**3 + 18*B*b**2*d*e**4 - 72*B*b*c*d**2*e**3 +
 60*B*c**2*d**3*e**2) + x*(-6*A*b**2*d*e**4 + 54*A*b*c*d**2*e**3 - 60*A*c*
*2*d**3*e**2 + 27*B*b**2*d**2*e**3 - 120*B*b*c*d**3*e**2 + 105*B*c**2*d**4
*e))/(6*d**3*e**6 + 18*d**2*e**7*x + 18*d*e**8*x**2 + 6*e**9*x**3) + (2*A*
b*c*e**2 - 4*A*c**2*d*e + B*b**2*e**2 - 8*B*b*c*d*e + 10*B*c**2*d**2)*log(
d + e*x)/e**6
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.31

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^4}\,dx = \frac{47\,Bc^2d^5-2\,Ab^2d^2e^3-26\,(2\,Bbc+Ac^2)d^4e+11\,(Bb^2+2\,Abc)d^3e^2+6\,(10\,Bc^2d^3e^2-Ab^2e^5-6\,(2\,Bbc}{6\,(e^9x^3+3\,d} + \frac{Bc^2ex^2-2\,(4\,Bc^2d-(2\,Bbc+Ac^2)e)x}{2\,e^5} + \frac{(10\,Bc^2d^2-4\,(2\,Bbc+Ac^2)de+(Bb^2+2\,Abc)e^2)\log(ex+d)}{e^6}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^4,x, algorithm="maxima")
```

output
```
1/6*(47*B*c^2*d^5 - 2*A*b^2*d^2*e^3 - 26*(2*B*b*c + A*c^2)*d^4*e + 11*(B*b
^2 + 2*A*b*c)*d^3*e^2 + 6*(10*B*c^2*d^3*e^2 - A*b^2*e^5 - 6*(2*B*b*c + A*c
^2)*d^2*e^3 + 3*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 3*(35*B*c^2*d^4*e - 2*A*b^2
*d*e^4 - 20*(2*B*b*c + A*c^2)*d^3*e^2 + 9*(B*b^2 + 2*A*b*c)*d^2*e^3)*x)/(e
^9*x^3 + 3*d*e^8*x^2 + 3*d^2*e^7*x + d^3*e^6) + 1/2*(B*c^2*e*x^2 - 2*(4*B*
c^2*d - (2*B*b*c + A*c^2)*e)*x)/e^5 + (10*B*c^2*d^2 - 4*(2*B*b*c + A*c^2)*
d*e + (B*b^2 + 2*A*b*c)*e^2)*log(e*x + d)/e^6
```

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 315, normalized size of antiderivative = 1.32

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^4}\,dx = \frac{(10\,Bc^2d^2-8\,Bbcde-4\,Ac^2de+Bb^2e^2+2\,Abce^2)\log(|ex+d|)}{e^6} + \frac{Bc^2e^4x^2-8\,Bc^2de^3x+4\,Bbce^4x+2\,Ac^2e^4x}{2\,e^8} + \frac{47\,Bc^2d^5-52\,Bbcd^4e-26\,Ac^2d^4e+11\,Bb^2d^3e^2+22\,Abcd^3e^2-2\,Ab^2d^2e^3+6\,(10\,Bc^2d^3e^2-12\,Bbcd}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^4,x, algorithm="giac")
```

output
```
(10*B*c^2*d^2 - 8*B*b*c*d*e - 4*A*c^2*d*e + B*b^2*e^2 + 2*A*b*c*e^2)*log(a
bs(e*x + d))/e^6 + 1/2*(B*c^2*e^4*x^2 - 8*B*c^2*d*e^3*x + 4*B*b*c*e^4*x +
2*A*c^2*e^4*x)/e^8 + 1/6*(47*B*c^2*d^5 - 52*B*b*c*d^4*e - 26*A*c^2*d^4*e +
 11*B*b^2*d^3*e^2 + 22*A*b*c*d^3*e^2 - 2*A*b^2*d^2*e^3 + 6*(10*B*c^2*d^3*e
^2 - 12*B*b*c*d^2*e^3 - 6*A*c^2*d^2*e^3 + 3*B*b^2*d*e^4 + 6*A*b*c*d*e^4 -
A*b^2*e^5)*x^2 + 3*(35*B*c^2*d^4*e - 40*B*b*c*d^3*e^2 - 20*A*c^2*d^3*e^2 +
 9*B*b^2*d^2*e^3 + 18*A*b*c*d^2*e^3 - 2*A*b^2*d*e^4)*x)/((e*x + d)^3*e^6)
```

Mupad [B] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 328, normalized size of antiderivative = 1.38

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^4}\,dx = x\left(\frac{A\,c^2+2\,B\,b\,c}{e^4}-\frac{4\,B\,c^2\,d}{e^5}\right) + \frac{\frac{11\,B\,b^2\,d^3\,e^2-2\,A\,b^2\,d^2\,e^3-52\,B\,b\,c\,d^4\,e+22\,A\,b\,c\,d^3\,e^2+47\,B\,c^2\,d^5-26\,A\,c^2\,d^4\,e}{6\,e}-x^2\,\left(-3\,B\,b^2\,d\,e^3+A\,b^2\,e^4+12\,B\,b\,c\,d^2\,e^2\right.}{d^3\,e^5+} + \frac{\ln\left(d+e\,x\right)\,\left(B\,b^2\,e^2-8\,B\,b\,c\,d\,e+2\,A\,b\,c\,e^2+10\,B\,c^2\,d^2-4\,A\,c^2\,d\,e\right)}{e^6} + \frac{B\,c^2\,x^2}{2\,e^4}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^4,x)
```

output
```
x*((A*c^2 + 2*B*b*c)/e^4 - (4*B*c^2*d)/e^5) + ((47*B*c^2*d^5 - 26*A*c^2*d^
4*e - 2*A*b^2*d^2*e^3 + 11*B*b^2*d^3*e^2 - 52*B*b*c*d^4*e + 22*A*b*c*d^3*e
^2)/(6*e) - x^2*(A*b^2*e^4 - 3*B*b^2*d*e^3 - 10*B*c^2*d^3*e + 6*A*c^2*d^2*
e^2 - 6*A*b*c*d*e^3 + 12*B*b*c*d^2*e^2) + x*((35*B*c^2*d^4)/2 - A*b^2*d*e^
3 - 10*A*c^2*d^3*e + (9*B*b^2*d^2*e^2)/2 - 20*B*b*c*d^3*e + 9*A*b*c*d^2*e^
2))/(d^3*e^5 + e^8*x^3 + 3*d^2*e^6*x + 3*d*e^7*x^2) + (log(d + e*x)*(B*b^2
*e^2 + 10*B*c^2*d^2 + 2*A*b*c*e^2 - 4*A*c^2*d*e - 8*B*b*c*d*e))/e^6 + (B*c
^2*x^2)/(2*e^4)
```

Reduce [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 659, normalized size of antiderivative = 2.77

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^4}\,dx$$
$$= \frac{18\log(ex+d)\,b^3d^2e^4x^2+6\log(ex+d)\,b^3d\,e^5x^3-48\log(ex+d)\,b^2c\,d^5e+10abc\,d^4e^2-36a\,c^2d^4e^2x+2\cdots}{}$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^4,x)
```

output
```
(12*log(d + e*x)*a*b*c*d**4*e**2 + 36*log(d + e*x)*a*b*c*d**3*e**3*x + 36*
log(d + e*x)*a*b*c*d**2*e**4*x**2 + 12*log(d + e*x)*a*b*c*d*e**5*x**3 - 24
*log(d + e*x)*a*c**2*d**5*e - 72*log(d + e*x)*a*c**2*d**4*e**2*x - 72*log(
d + e*x)*a*c**2*d**3*e**3*x**2 - 24*log(d + e*x)*a*c**2*d**2*e**4*x**3 + 6
*log(d + e*x)*b**3*d**4*e**2 + 18*log(d + e*x)*b**3*d**3*e**3*x + 18*log(d
 + e*x)*b**3*d**2*e**4*x**2 + 6*log(d + e*x)*b**3*d*e**5*x**3 - 48*log(d +
 e*x)*b**2*c*d**5*e - 144*log(d + e*x)*b**2*c*d**4*e**2*x - 144*log(d + e*
x)*b**2*c*d**3*e**3*x**2 - 48*log(d + e*x)*b**2*c*d**2*e**4*x**3 + 60*log(
d + e*x)*b*c**2*d**6 + 180*log(d + e*x)*b*c**2*d**5*e*x + 180*log(d + e*x)
*b*c**2*d**4*e**2*x**2 + 60*log(d + e*x)*b*c**2*d**3*e**3*x**3 + 2*a*b**2*
e**6*x**3 + 10*a*b*c*d**4*e**2 + 18*a*b*c*d**3*e**3*x - 12*a*b*c*d*e**5*x*
*3 - 20*a*c**2*d**5*e - 36*a*c**2*d**4*e**2*x + 24*a*c**2*d**2*e**4*x**3 +
 6*a*c**2*d*e**5*x**4 + 5*b**3*d**4*e**2 + 9*b**3*d**3*e**3*x - 6*b**3*d*e
**5*x**3 - 40*b**2*c*d**5*e - 72*b**2*c*d**4*e**2*x + 48*b**2*c*d**2*e**4*
x**3 + 12*b**2*c*d*e**5*x**4 + 50*b*c**2*d**6 + 90*b*c**2*d**5*e*x - 60*b*
c**2*d**3*e**3*x**3 - 15*b*c**2*d**2*e**4*x**4 + 3*b*c**2*d*e**5*x**5)/(6*
d*e**6*(d**3 + 3*d**2*e*x + 3*d*e**2*x**2 + e**3*x**3))
```

3.18 $\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^5} dx$

Optimal result

Integrand size = 24, antiderivative size = 240

$$\begin{aligned}\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^5} dx &= \frac{Bc^2x}{e^5} + \frac{d^2(Bd-Ae)(cd-be)^2}{4e^6(d+ex)^4} - \frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{3e^6(d+ex)^3} \\ &\quad - \frac{Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2)}{2e^6(d+ex)^2} \\ &\quad + \frac{2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2)}{e^6(d+ex)} - \frac{c(5Bcd-2bBe-Ace)\log(d+ex)}{e^6}\end{aligned}$$

output
```
B*c^2*x/e^5+1/4*d^2*(-A*e+B*d)*(-b*e+c*d)^2/e^6/(e*x+d)^4-1/3*d*(-b*e+c*d)
*(B*d*(-3*b*e+5*c*d)-2*A*e*(-b*e+2*c*d))/e^6/(e*x+d)^3-1/2*(A*e*(b^2*e^2-6
*b*c*d*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)^2+(
2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)-c*(-A*c
*e-2*B*b*e+5*B*c*d)*ln(e*x+d)/e^6
```

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 275, normalized size of antiderivative = 1.15

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^5}\,dx =$$
$$-\frac{Ae(b^2e^2(d^2+4dex+6e^2x^2)+6bce(d^3+4d^2ex+6de^2x^2+4e^3x^3)-c^2d(25d^3+88d^2ex+108de^2x^2+$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^5,x]
```

output
```
-1/12*(A*e*(b^2*e^2*(d^2 + 4*d*e*x + 6*e^2*x^2) + 6*b*c*e*(d^3 + 4*d^2*e*x
 + 6*d*e^2*x^2 + 4*e^3*x^3) - c^2*d*(25*d^3 + 88*d^2*e*x + 108*d*e^2*x^2 +
 48*e^3*x^3)) + B*(3*b^2*e^2*(d^3 + 4*d^2*e*x + 6*d*e^2*x^2 + 4*e^3*x^3) -
 2*b*c*d*e*(25*d^3 + 88*d^2*e*x + 108*d*e^2*x^2 + 48*e^3*x^3) + c^2*(77*d^
5 + 248*d^4*e*x + 252*d^3*e^2*x^2 + 48*d^2*e^3*x^3 - 48*d*e^4*x^4 - 12*e^5
*x^5)) + 12*c*(5*B*c*d - 2*b*B*e - A*c*e)*(d + e*x)^4*Log[d + e*x])/(e^6*(
d + e*x)^4)
```

Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 240, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^5}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)}{e^5(d+ex)^2}+\frac{Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)}{e^5(d+ex)^3}\right.$$

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

$$
\frac{2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)}{e^6(d+ex)} - \frac{Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)}{2e^6(d+ex)^2} + \frac{d^2(Bd-Ae)(cd-be)^2}{4e^6(d+ex)^4} - \frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{3e^6(d+ex)^3} - \frac{c\log(d+ex)(-Ace-2bBe+5Bcd)}{e^6} + \frac{Bc^2x}{e^5}
$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^5,x]
```

output
```
(B*c^2*x)/e^5 + (d^2*(B*d - A*e)*(c*d - b*e)^2)/(4*e^6*(d + e*x)^4) - (d*(
c*d - b*e)*(B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e)))/(3*e^6*(d + e*x)^3
) - (A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e
+ 3*b^2*e^2))/(2*e^6*(d + e*x)^2) + (2*A*c*e*(2*c*d - b*e) - B*(10*c^2*d^2
 - 8*b*c*d*e + b^2*e^2))/(e^6*(d + e*x)) - (c*(5*B*c*d - 2*b*B*e - A*c*e)*
Log[d + e*x])/e^6
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.78 (sec) , antiderivative size = 288, normalized size of antiderivative = 1.20

method	result
norman	$\frac{\frac{B c^2 x^5}{e} - \frac{d^2 \left(A b^2 e^3 + 6 A b c d e^2 - 25 A c^2 d^2 e + 3 B b^2 d e^2 - 50 B b c d^2 e + 125 B c^2 d^3\right)}{12 e^6} - \frac{\left(2 A b c e^2 - 4 A c^2 d e + B e^2 b^2 - 8 B b c d e + 20 B c^2 d^2\right) x^3}{e^3} - \frac{(}{}}{(ex}$
default	$\frac{B c^2 x}{e^5} + \frac{d(2 A b^2 e^3 - 6 A b c d e^2 + 4 A c^2 d^2 e - 3 B b^2 d e^2 + 8 B b c d^2 e - 5 B c^2 d^3)}{3 e^6 (ex+d)^3} - \frac{d^2 (A b^2 e^3 - 2 A b c d e^2 + A c^2 d^2 e - B b^2 d e^2 + 2}{4 e^6 (ex+d)^4}$
risch	$\frac{B c^2 x}{e^5} + \frac{(-2 A b c e^4 + 4 A c^2 d e^3 - B b^2 e^4 + 8 B b c d e^3 - 10 B c^2 d^2 e^2) x^3 - \frac{e\left(A b^2 e^3 + 6 A b c d e^2 - 18 A c^2 d^2 e + 3 B b^2 d e^2 - 36 B b c d^2 e + 50\right.}{2}}{}$
parallelrisch	$\frac{-540 B x^2 c^2 d^3 e^2 - 4 A x b^2 d e^4 + 88 A x c^2 d^3 e^2 - 6 A b c d^3 e^2 + 50 B b c d^4 e - 240 B \ln(ex+d) x^3 c^2 d^2 e^3 + 12 A \ln(ex+d) x^4 c^2 e^5 - 12 B x}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

output
```
(B*c^2*x^5/e-1/12*d^2*(A*b^2*e^3+6*A*b*c*d*e^2-25*A*c^2*d^2*e+3*B*b^2*d*e^
2-50*B*b*c*d^2*e+125*B*c^2*d^3)/e^6-(2*A*b*c*e^2-4*A*c^2*d*e+B*b^2*e^2-8*B
*b*c*d*e+20*B*c^2*d^2)/e^3*x^3-1/2*(A*b^2*e^3+6*A*b*c*d*e^2-18*A*c^2*d^2*e
+3*B*b^2*d*e^2-36*B*b*c*d^2*e+90*B*c^2*d^3)/e^4*x^2-1/3*d*(A*b^2*e^3+6*A*b
*c*d*e^2-22*A*c^2*d^2*e+3*B*b^2*d*e^2-44*B*b*c*d^2*e+110*B*c^2*d^3)/e^5*x)
/(e*x+d)^4+c/e^6*(A*c*e+2*B*b*e-5*B*c*d)*ln(e*x+d)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 475 vs. 2(234) = 468.

Time = 0.08 (sec) , antiderivative size = 475, normalized size of antiderivative = 1.98

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^5}\,dx$$
$$= \frac{12\,Bc^2e^5x^5 + 48\,Bc^2de^4x^4 - 77\,Bc^2d^5 - Ab^2d^2e^3 + 25\,(2\,Bbc + Ac^2)d^4e - 3\,(Bb^2 + 2\,Abc)d^3e^2 - 12\,(4\,B}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^5,x, algorithm="fricas")
```

output
```
1/12*(12*B*c^2*e^5*x^5 + 48*B*c^2*d*e^4*x^4 - 77*B*c^2*d^5 - A*b^2*d^2*e^3
 + 25*(2*B*b*c + A*c^2)*d^4*e - 3*(B*b^2 + 2*A*b*c)*d^3*e^2 - 12*(4*B*c^2*
d^2*e^3 - 4*(2*B*b*c + A*c^2)*d*e^4 + (B*b^2 + 2*A*b*c)*e^5)*x^3 - 6*(42*B
*c^2*d^3*e^2 + A*b^2*e^5 - 18*(2*B*b*c + A*c^2)*d^2*e^3 + 3*(B*b^2 + 2*A*b
*c)*d*e^4)*x^2 - 4*(62*B*c^2*d^4*e + A*b^2*d*e^4 - 22*(2*B*b*c + A*c^2)*d^
3*e^2 + 3*(B*b^2 + 2*A*b*c)*d^2*e^3)*x - 12*(5*B*c^2*d^5 - (2*B*b*c + A*c^
2)*d^4*e + (5*B*c^2*d*e^4 - (2*B*b*c + A*c^2)*e^5)*x^4 + 4*(5*B*c^2*d^2*e^
3 - (2*B*b*c + A*c^2)*d*e^4)*x^3 + 6*(5*B*c^2*d^3*e^2 - (2*B*b*c + A*c^2)*
d^2*e^3)*x^2 + 4*(5*B*c^2*d^4*e - (2*B*b*c + A*c^2)*d^3*e^2)*x)*log(e*x +
d))/(e^10*x^4 + 4*d*e^9*x^3 + 6*d^2*e^8*x^2 + 4*d^3*e^7*x + d^4*e^6)
```

Sympy [A] (verification not implemented)

Time = 14.72 (sec) , antiderivative size = 381, normalized size of antiderivative = 1.59

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^5}\,dx = \frac{Bc^2x}{e^5} + \frac{c(Ace+2Bbe-5Bcd)\log(d+ex)}{e^6} + \frac{-Ab^2d^2e^3-6Abcd^3e^2+25Ac^2d^4e-3Bb^2d^3e^2+50Bbcd^4e-77Bc^2d^5+x^3(-24Abce^5+48Ac^2de^4-}{}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**5,x)
```

output
```
B*c**2*x/e**5 + c*(A*c*e + 2*B*b*e - 5*B*c*d)*log(d + e*x)/e**6 + (-A*b**2
*d**2*e**3 - 6*A*b*c*d**3*e**2 + 25*A*c**2*d**4*e - 3*B*b**2*d**3*e**2 + 5
0*B*b*c*d**4*e - 77*B*c**2*d**5 + x**3*(-24*A*b*c*e**5 + 48*A*c**2*d*e**4
- 12*B*b**2*e**5 + 96*B*b*c*d*e**4 - 120*B*c**2*d**2*e**3) + x**2*(-6*A*b*
*2*e**5 - 36*A*b*c*d*e**4 + 108*A*c**2*d**2*e**3 - 18*B*b**2*d*e**4 + 216*
B*b*c*d**2*e**3 - 300*B*c**2*d**3*e**2) + x*(-4*A*b**2*d*e**4 - 24*A*b*c*d
**2*e**3 + 88*A*c**2*d**3*e**2 - 12*B*b**2*d**2*e**3 + 176*B*b*c*d**3*e**2
 - 260*B*c**2*d**4*e))/(12*d**4*e**6 + 48*d**3*e**7*x + 72*d**2*e**8*x**2
+ 48*d*e**9*x**3 + 12*e**10*x**4)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 321, normalized size of antiderivative = 1.34

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^5}\,dx = -\frac{77\,Bc^2d^5 + Ab^2d^2e^3 - 25\,(2\,Bbc + Ac^2)d^4e + 3\,(Bb^2 + 2\,Abc)d^3e^2 + 12\,(10\,Bc^2d^2e^3 - 4\,(2\,Bbc + Ac^2)}{} + \frac{Bc^2x}{e^5} - \frac{(5\,Bc^2d - (2\,Bbc + Ac^2)e)\log(ex+d)}{e^6}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^5,x, algorithm="maxima")
```

output
```
-1/12*(77*B*c^2*d^5 + A*b^2*d^2*e^3 - 25*(2*B*b*c + A*c^2)*d^4*e + 3*(B*b^
2 + 2*A*b*c)*d^3*e^2 + 12*(10*B*c^2*d^2*e^3 - 4*(2*B*b*c + A*c^2)*d*e^4 +
(B*b^2 + 2*A*b*c)*e^5)*x^3 + 6*(50*B*c^2*d^3*e^2 + A*b^2*e^5 - 18*(2*B*b*c
 + A*c^2)*d^2*e^3 + 3*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 4*(65*B*c^2*d^4*e + A
*b^2*d*e^4 - 22*(2*B*b*c + A*c^2)*d^3*e^2 + 3*(B*b^2 + 2*A*b*c)*d^2*e^3)*x
)/(e^10*x^4 + 4*d*e^9*x^3 + 6*d^2*e^8*x^2 + 4*d^3*e^7*x + d^4*e^6) + B*c^2
*x/e^5 - (5*B*c^2*d - (2*B*b*c + A*c^2)*e)*log(e*x + d)/e^6
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 474 vs. $2(234) = 468$.

Time = 0.23 (sec) , antiderivative size = 474, normalized size of antiderivative = 1.98

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^5}\,dx = \frac{(ex+d)Bc^2}{e^6} + \frac{(5\,Bc^2d - 2\,Bbce - Ac^2e)\log\left(\frac{|ex+d|}{(ex+d)^2|e|}\right)}{e^6} - \frac{\frac{120\,Bc^2d^2e^{22}}{ex+d} - \frac{60\,Bc^2d^3e^{22}}{(ex+d)^2} + \frac{20\,Bc^2d^4e^{22}}{(ex+d)^3} - \frac{3\,Bc^2d^5e^{22}}{(ex+d)^4} - \frac{96\,Bbcde^{23}}{ex+d} - \frac{48\,Ac^2de^{23}}{ex+d} + \frac{72\,Bbcd^2e^{23}}{(ex+d)^2} + \frac{36\,Ac^2d^2e^{23}}{(ex+d)^2} - \frac{32\,B}{(ex}}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^5,x, algorithm="giac")
```

output
```
(e*x + d)*B*c^2/e^6 + (5*B*c^2*d - 2*B*b*c*e - A*c^2*e)*log(abs(e*x + d)/(
(e*x + d)^2*abs(e)))/e^6 - 1/12*(120*B*c^2*d^2*e^22/(e*x + d) - 60*B*c^2*d
^3*e^22/(e*x + d)^2 + 20*B*c^2*d^4*e^22/(e*x + d)^3 - 3*B*c^2*d^5*e^22/(e*
x + d)^4 - 96*B*b*c*d*e^23/(e*x + d) - 48*A*c^2*d*e^23/(e*x + d) + 72*B*b*
c*d^2*e^23/(e*x + d)^2 + 36*A*c^2*d^2*e^23/(e*x + d)^2 - 32*B*b*c*d^3*e^23
/(e*x + d)^3 - 16*A*c^2*d^3*e^23/(e*x + d)^3 + 6*B*b*c*d^4*e^23/(e*x + d)^
4 + 3*A*c^2*d^4*e^23/(e*x + d)^4 + 12*B*b^2*e^24/(e*x + d) + 24*A*b*c*e^24
/(e*x + d) - 18*B*b^2*d*e^24/(e*x + d)^2 - 36*A*b*c*d*e^24/(e*x + d)^2 + 1
2*B*b^2*d^2*e^24/(e*x + d)^3 + 24*A*b*c*d^2*e^24/(e*x + d)^3 - 3*B*b^2*d^3
*e^24/(e*x + d)^4 - 6*A*b*c*d^3*e^24/(e*x + d)^4 + 6*A*b^2*e^25/(e*x + d)^
2 - 8*A*b^2*d*e^25/(e*x + d)^3 + 3*A*b^2*d^2*e^25/(e*x + d)^4)/e^28
```

Mupad [B] (verification not implemented)

Time = 10.77 (sec) , antiderivative size = 338, normalized size of antiderivative = 1.41

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^5}\,dx = \frac{\ln(d+e\,x)\,\left(A\,c^2\,e-5\,B\,c^2\,d+2\,B\,b\,c\,e\right)}{e^6}$$
$$-\frac{x^2\left(\frac{3\,B\,b^2\,d\,e^3}{2}+\frac{A\,b^2\,e^4}{2}-18\,B\,b\,c\,d^2\,e^2+3\,A\,b\,c\,d\,e^3+25\,B\,c^2\,d^3\,e-9\,A\,c^2\,d^2\,e^2\right)+\frac{3\,B\,b^2\,d^3\,e^2+A\,b^2\,d^2\,e^3-50}{}}{}$$
$$+\frac{B\,c^2\,x}{e^5}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^5,x)
```

output
```
(log(d + e*x)*(A*c^2*e - 5*B*c^2*d + 2*B*b*c*e))/e^6 - (x^2*((A*b^2*e^4)/2
 + (3*B*b^2*d*e^3)/2 + 25*B*c^2*d^3*e - 9*A*c^2*d^2*e^2 + 3*A*b*c*d*e^3 -
18*B*b*c*d^2*e^2) + (77*B*c^2*d^5 - 25*A*c^2*d^4*e + A*b^2*d^2*e^3 + 3*B*b
^2*d^3*e^2 - 50*B*b*c*d^4*e + 6*A*b*c*d^3*e^2)/(12*e) + x*((65*B*c^2*d^4)/
3 + (A*b^2*d*e^3)/3 - (22*A*c^2*d^3*e)/3 + B*b^2*d^2*e^2 - (44*B*b*c*d^3*e
)/3 + 2*A*b*c*d^2*e^2) + x^3*(B*b^2*e^4 + 2*A*b*c*e^4 - 4*A*c^2*d*e^3 + 10
*B*c^2*d^2*e^2 - 8*B*b*c*d*e^3))/(d^4*e^5 + e^9*x^4 + 4*d^3*e^6*x + 4*d*e^
8*x^3 + 6*d^2*e^7*x^2) + (B*c^2*x)/e^5
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 561, normalized size of antiderivative = 2.34

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^5}\,dx$$
$$= \frac{24\log(ex+d)\,b^2c\,d^5e+40a\,c^2d^4e^2x-12a\,c^2d\,e^5x^4+80b^2c\,d^4e^2x-24b^2cd\,e^5x^4-200b\,c^2d^5ex+60b\,c^2d}{}$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^5,x)
```

output
```
(12*log(d + e*x)*a*c**2*d**5*e + 48*log(d + e*x)*a*c**2*d**4*e**2*x + 72*l
og(d + e*x)*a*c**2*d**3*e**3*x**2 + 48*log(d + e*x)*a*c**2*d**2*e**4*x**3
+ 12*log(d + e*x)*a*c**2*d*e**5*x**4 + 24*log(d + e*x)*b**2*c*d**5*e + 96*
log(d + e*x)*b**2*c*d**4*e**2*x + 144*log(d + e*x)*b**2*c*d**3*e**3*x**2 +
 96*log(d + e*x)*b**2*c*d**2*e**4*x**3 + 24*log(d + e*x)*b**2*c*d*e**5*x**
4 - 60*log(d + e*x)*b*c**2*d**6 - 240*log(d + e*x)*b*c**2*d**5*e*x - 360*l
og(d + e*x)*b*c**2*d**4*e**2*x**2 - 240*log(d + e*x)*b*c**2*d**3*e**3*x**3
 - 60*log(d + e*x)*b*c**2*d**2*e**4*x**4 - a*b**2*d**3*e**3 - 4*a*b**2*d**
2*e**4*x - 6*a*b**2*d*e**5*x**2 + 6*a*b*c*e**6*x**4 + 13*a*c**2*d**5*e + 4
0*a*c**2*d**4*e**2*x + 36*a*c**2*d**3*e**3*x**2 - 12*a*c**2*d*e**5*x**4 +
3*b**3*e**6*x**4 + 26*b**2*c*d**5*e + 80*b**2*c*d**4*e**2*x + 72*b**2*c*d*
*3*e**3*x**2 - 24*b**2*c*d*e**5*x**4 - 65*b*c**2*d**6 - 200*b*c**2*d**5*e*
x - 180*b*c**2*d**4*e**2*x**2 + 60*b*c**2*d**2*e**4*x**4 + 12*b*c**2*d*e**
5*x**5)/(12*d*e**6*(d**4 + 4*d**3*e*x + 6*d**2*e**2*x**2 + 4*d*e**3*x**3 +
 e**4*x**4))
```

3.19 $\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^6}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 248

$$\begin{aligned}\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^6}\,dx &= \frac{d^2(Bd-Ae)(cd-be)^2}{5e^6(d+ex)^5}-\frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{4e^6(d+ex)^4}\\&\quad-\frac{Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2)}{3e^6(d+ex)^3}\\&\quad+\frac{2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2)}{2e^6(d+ex)^2}\\&\quad+\frac{c(5Bcd-2bBe-Ace)}{e^6(d+ex)}+\frac{Bc^2\log(d+ex)}{e^6}\end{aligned}$$

output
```
1/5*d^2*(-A*e+B*d)*(-b*e+c*d)^2/e^6/(e*x+d)^5-1/4*d*(-b*e+c*d)*(B*d*(-3*b*
e+5*c*d)-2*A*e*(-b*e+2*c*d))/e^6/(e*x+d)^4-1/3*(A*e*(b^2*e^2-6*b*c*d*e+6*c
^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)^3+1/2*(2*A*c*e*
(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)^2+c*(-A*c*e-2*B
*b*e+5*B*c*d)/e^6/(e*x+d)+B*c^2*ln(e*x+d)/e^6
```

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 269, normalized size of antiderivative = 1.08

$$\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^6}\,dx$$
$$= \frac{-2Ae(b^2e^2(d^2+5dex+10e^2x^2)+3bce(d^3+5d^2ex+10de^2x^2+10e^3x^3)+6c^2(d^4+5d^3ex+10d^2e^2x^2-}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^6,x]
```

output
```
(-2*A*e*(b^2*e^2*(d^2 + 5*d*e*x + 10*e^2*x^2) + 3*b*c*e*(d^3 + 5*d^2*e*x +
 10*d*e^2*x^2 + 10*e^3*x^3) + 6*c^2*(d^4 + 5*d^3*e*x + 10*d^2*e^2*x^2 + 10
*d*e^3*x^3 + 5*e^4*x^4)) + B*(-3*b^2*e^2*(d^3 + 5*d^2*e*x + 10*d*e^2*x^2 +
 10*e^3*x^3) - 24*b*c*e*(d^4 + 5*d^3*e*x + 10*d^2*e^2*x^2 + 10*d*e^3*x^3 +
 5*e^4*x^4) + c^2*d*(137*d^4 + 625*d^3*e*x + 1100*d^2*e^2*x^2 + 900*d*e^3*
x^3 + 300*e^4*x^4)) + 60*B*c^2*(d + e*x)^5*Log[d + e*x])/(60*e^6*(d + e*x)
^5)
```

Rubi [A] (verified)

Time = 0.83 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^6}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{B(b^2e^2-8bcde+10c^2d^2)-2Ace(2cd-be)}{e^5(d+ex)^3}+\frac{Ae(b^2e^2-6bcde+6c^2d^2)-Bd(3b^2e^2-12bcde+10c^2d^2)}{e^5(d+ex)^4}\right.$$

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

$$\frac{2Ace(2cd-be)-B(b^2e^2-8bcde+10c^2d^2)}{2e^6(d+ex)^2}-\frac{Ae(b^2e^2-6bcde+6c^2d^2)-Bd(3b^2e^2-12bcde+10c^2d^2)}{3e^6(d+ex)^3}+\frac{d^2(Bd-Ae)(cd-be)^2}{5e^6(d+ex)^5}+\frac{c(-Ace-2bBe+5Bcd)}{e^6(d+ex)}-\frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{4e^6(d+ex)^4}+\frac{Bc^2\log(d+ex)}{e^6}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^6,x]
```

output
```
(d^2*(B*d - A*e)*(c*d - b*e)^2)/(5*e^6*(d + e*x)^5) - (d*(c*d - b*e)*(B*d*
(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e)))/(4*e^6*(d + e*x)^4) - (A*e*(6*c^2*
d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2))/(3
*e^6*(d + e*x)^3) + (2*A*c*e*(2*c*d - b*e) - B*(10*c^2*d^2 - 8*b*c*d*e + b
^2*e^2))/(2*e^6*(d + e*x)^2) + (c*(5*B*c*d - 2*b*B*e - A*c*e))/(e^6*(d + e
*x)) + (B*c^2*Log[d + e*x])/e^6
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 292, normalized size of antiderivative = 1.18

method	result
risch	$-\frac{c(Ace+2Bbe-5Bcd)x^4}{e^2}-\frac{\left(2Abc\,e^2+4A\,c^2de+B\,e^2b^2+8Bbcde-30B\,c^2d^2\right)x^3}{2e^3}-\frac{\left(2A\,b^2e^3+6Abcd\,e^2+12A\,c^2d^2e+3B\,b^2d\,e^2+24Bbc\,d^2e-\right.}{6e^4}$
norman	$-\frac{d^2\left(2A\,b^2e^3+6Abcd\,e^2+12A\,c^2d^2e+3B\,b^2d\,e^2+24Bbc\,d^2e-137B\,c^2d^3\right)}{60e^6}-\frac{\left(A\,c^2e+2Bebc-5B\,c^2d\right)x^4}{e^2}-\frac{\left(2Abc\,e^2+4A\,c^2de+B\,e^2b^2+8B\right.}{2e^3}$
default	$-\frac{A\,b^2e^3-6Abcd\,e^2+6A\,c^2d^2e-3B\,b^2d\,e^2+12Bbc\,d^2e-10B\,c^2d^3}{3e^6(ex+d)^3}+\frac{d(2A\,b^2e^3-6Abcd\,e^2+4A\,c^2d^2e-3B\,b^2d\,e^2+8Bbc\,d^2e-}{4e^6(ex+d)^4}$
parallelrisch	$-\frac{-1100B\,x^2c^2d^3e^2+10Ax\,b^2d\,e^4+60Ax\,c^2d^3e^2+6Abc\,d^3e^2+24Bbc\,d^4e-600B\ln(ex+d)x^3c^2d^2e^3+15Bx\,b^2d^2e^3-625Bx\,c^2}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

output
```
(-c*(A*c*e+2*B*b*e-5*B*c*d)/e^2*x^4-1/2*(2*A*b*c*e^2+4*A*c^2*d*e+B*b^2*e^2
+8*B*b*c*d*e-30*B*c^2*d^2)/e^3*x^3-1/6*(2*A*b^2*e^3+6*A*b*c*d*e^2+12*A*c^2
*d^2*e+3*B*b^2*d*e^2+24*B*b*c*d^2*e-110*B*c^2*d^3)/e^4*x^2-1/12*d*(2*A*b^2
*e^3+6*A*b*c*d*e^2+12*A*c^2*d^2*e+3*B*b^2*d*e^2+24*B*b*c*d^2*e-125*B*c^2*d
^3)/e^5*x-1/60*d^2*(2*A*b^2*e^3+6*A*b*c*d*e^2+12*A*c^2*d^2*e+3*B*b^2*d*e^2
+24*B*b*c*d^2*e-137*B*c^2*d^3)/e^6)/(e*x+d)^5+B*c^2*ln(e*x+d)/e^6
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 407, normalized size of antiderivative = 1.64

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^6}\,dx$$
$$=\frac{137\,Bc^2d^5-2\,Ab^2d^2e^3-12\,(2\,Bbc+Ac^2)d^4e-3\,(Bb^2+2\,Abc)d^3e^2+60\,(5\,Bc^2de^4-(2\,Bbc+Ac^2)e^5)}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^6,x, algorithm="fricas")
```

output
```
1/60*(137*B*c^2*d^5 - 2*A*b^2*d^2*e^3 - 12*(2*B*b*c + A*c^2)*d^4*e - 3*(B*
b^2 + 2*A*b*c)*d^3*e^2 + 60*(5*B*c^2*d*e^4 - (2*B*b*c + A*c^2)*e^5)*x^4 +
30*(30*B*c^2*d^2*e^3 - 4*(2*B*b*c + A*c^2)*d*e^4 - (B*b^2 + 2*A*b*c)*e^5)*
x^3 + 10*(110*B*c^2*d^3*e^2 - 2*A*b^2*e^5 - 12*(2*B*b*c + A*c^2)*d^2*e^3 -
 3*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 5*(125*B*c^2*d^4*e - 2*A*b^2*d*e^4 - 12*
(2*B*b*c + A*c^2)*d^3*e^2 - 3*(B*b^2 + 2*A*b*c)*d^2*e^3)*x + 60*(B*c^2*e^5
*x^5 + 5*B*c^2*d*e^4*x^4 + 10*B*c^2*d^2*e^3*x^3 + 10*B*c^2*d^3*e^2*x^2 + 5
*B*c^2*d^4*e*x + B*c^2*d^5)*log(e*x + d))/(e^11*x^5 + 5*d*e^10*x^4 + 10*d^
2*e^9*x^3 + 10*d^3*e^8*x^2 + 5*d^4*e^7*x + d^5*e^6)
```

Sympy [A] (verification not implemented)

Time = 55.97 (sec) , antiderivative size = 405, normalized size of antiderivative = 1.63

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^6}\,dx = \frac{Bc^2\log(d+ex)}{e^6} + \frac{-2Ab^2d^2e^3 - 6Abcd^3e^2 - 12Ac^2d^4e - 3Bb^2d^3e^2 - 24Bbcd^4e + 137Bc^2d^5 + x^4(-60Ac^2e^5 - 120Bbce^5}{}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**6,x)
```

output
```
B*c**2*log(d + e*x)/e**6 + (-2*A*b**2*d**2*e**3 - 6*A*b*c*d**3*e**2 - 12*A
*c**2*d**4*e - 3*B*b**2*d**3*e**2 - 24*B*b*c*d**4*e + 137*B*c**2*d**5 + x*
*4*(-60*A*c**2*e**5 - 120*B*b*c*e**5 + 300*B*c**2*d*e**4) + x**3*(-60*A*b*
c*e**5 - 120*A*c**2*d*e**4 - 30*B*b**2*e**5 - 240*B*b*c*d*e**4 + 900*B*c**
2*d**2*e**3) + x**2*(-20*A*b**2*e**5 - 60*A*b*c*d*e**4 - 120*A*c**2*d**2*e
**3 - 30*B*b**2*d*e**4 - 240*B*b*c*d**2*e**3 + 1100*B*c**2*d**3*e**2) + x*
(-10*A*b**2*d*e**4 - 30*A*b*c*d**2*e**3 - 60*A*c**2*d**3*e**2 - 15*B*b**2*
d**2*e**3 - 120*B*b*c*d**3*e**2 + 625*B*c**2*d**4*e))/(60*d**5*e**6 + 300*
d**4*e**7*x + 600*d**3*e**8*x**2 + 600*d**2*e**9*x**3 + 300*d*e**10*x**4 +
 60*e**11*x**5)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.37

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^6}\,dx$$
$$= \frac{137\,Bc^2d^5-2\,Ab^2d^2e^3-12\,(2\,Bbc+Ac^2)d^4e-3\,(Bb^2+2\,Abc)d^3e^2+60\,(5\,Bc^2de^4-(2\,Bbc+Ac^2)e^5)}{}$$
$$+\frac{Bc^2\log(ex+d)}{e^6}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^6,x, algorithm="maxima")
```

output
```
1/60*(137*B*c^2*d^5 - 2*A*b^2*d^2*e^3 - 12*(2*B*b*c + A*c^2)*d^4*e - 3*(B*
b^2 + 2*A*b*c)*d^3*e^2 + 60*(5*B*c^2*d*e^4 - (2*B*b*c + A*c^2)*e^5)*x^4 +
30*(30*B*c^2*d^2*e^3 - 4*(2*B*b*c + A*c^2)*d*e^4 - (B*b^2 + 2*A*b*c)*e^5)*
x^3 + 10*(110*B*c^2*d^3*e^2 - 2*A*b^2*e^5 - 12*(2*B*b*c + A*c^2)*d^2*e^3 -
 3*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 5*(125*B*c^2*d^4*e - 2*A*b^2*d*e^4 - 12*
(2*B*b*c + A*c^2)*d^3*e^2 - 3*(B*b^2 + 2*A*b*c)*d^2*e^3)*x)/(e^11*x^5 + 5*
d*e^10*x^4 + 10*d^2*e^9*x^3 + 10*d^3*e^8*x^2 + 5*d^4*e^7*x + d^5*e^6) + B*
c^2*log(e*x + d)/e^6
```

Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 316, normalized size of antiderivative = 1.27

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^6}\,dx = \frac{Bc^2\log(|ex+d|)}{e^6}$$
$$+\frac{60\,(5\,Bc^2de^3-2\,Bbce^4-Ac^2e^4)x^4+30\,(30\,Bc^2d^2e^2-8\,Bbcde^3-4\,Ac^2de^3-Bb^2e^4-2\,Abce^4)x^3+}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^6,x, algorithm="giac")
```

output
```
B*c^2*log(abs(e*x + d))/e^6 + 1/60*(60*(5*B*c^2*d*e^3 - 2*B*b*c*e^4 - A*c^
2*e^4)*x^4 + 30*(30*B*c^2*d^2*e^2 - 8*B*b*c*d*e^3 - 4*A*c^2*d*e^3 - B*b^2*
e^4 - 2*A*b*c*e^4)*x^3 + 10*(110*B*c^2*d^3*e - 24*B*b*c*d^2*e^2 - 12*A*c^2
*d^2*e^2 - 3*B*b^2*d*e^3 - 6*A*b*c*d*e^3 - 2*A*b^2*e^4)*x^2 + 5*(125*B*c^2
*d^4 - 24*B*b*c*d^3*e - 12*A*c^2*d^3*e - 3*B*b^2*d^2*e^2 - 6*A*b*c*d^2*e^2
 - 2*A*b^2*d*e^3)*x + (137*B*c^2*d^5 - 24*B*b*c*d^4*e - 12*A*c^2*d^4*e - 3
*B*b^2*d^3*e^2 - 6*A*b*c*d^3*e^2 - 2*A*b^2*d^2*e^3)/e)/((e*x + d)^5*e^5)
```

Mupad [B] (verification not implemented)

Time = 10.88 (sec) , antiderivative size = 343, normalized size of antiderivative = 1.38

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^6}\,dx = \frac{B\,c^2\,\ln\left(d+e\,x\right)}{e^6} - \frac{\frac{3\,B\,b^2\,d^3\,e^2+2\,A\,b^2\,d^2\,e^3+24\,B\,b\,c\,d^4\,e+6\,A\,b\,c\,d^3\,e^2-137\,B\,c^2\,d^5+12\,A\,c^2\,d^4\,e}{60\,e^6}+\frac{x^3\,\left(B\,b^2\,e^2+8\,B\,b\,c\,d\,e+2\,A\,b\,c\,e^2-30\,B\,c^2\,d^2+4\,A\,c^2\,d\,e\right)}{2\,e^3}}{d^5+5\,\ldots}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^6,x)
```

output
```
(B*c^2*log(d + e*x))/e^6 - ((12*A*c^2*d^4*e - 137*B*c^2*d^5 + 2*A*b^2*d^2*
e^3 + 3*B*b^2*d^3*e^2 + 24*B*b*c*d^4*e + 6*A*b*c*d^3*e^2)/(60*e^6) + (x^3*
(B*b^2*e^2 - 30*B*c^2*d^2 + 2*A*b*c*e^2 + 4*A*c^2*d*e + 8*B*b*c*d*e))/(2*e
^3) + (x*(2*A*b^2*d*e^3 - 125*B*c^2*d^4 + 12*A*c^2*d^3*e + 3*B*b^2*d^2*e^2
 + 24*B*b*c*d^3*e + 6*A*b*c*d^2*e^2))/(12*e^5) + (x^2*(2*A*b^2*e^3 - 110*B
*c^2*d^3 + 12*A*c^2*d^2*e + 3*B*b^2*d*e^2 + 6*A*b*c*d*e^2 + 24*B*b*c*d^2*e
))/(6*e^4) + (c*x^4*(A*c*e + 2*B*b*e - 5*B*c*d))/e^2)/(d^5 + e^5*x^5 + 5*d
*e^4*x^4 + 10*d^3*e^2*x^2 + 10*d^2*e^3*x^3 + 5*d^4*e*x)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 397, normalized size of antiderivative = 1.60

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^6}\,dx = \frac{60\log(ex+d)\,b\,c^2d^6+300\log(ex+d)\,b\,c^2d^5ex+600\log(ex+d)\,b\,c^2d^4e^2x^2+600\log(ex+d)\,b\,c^2d^3e^3x^3\ldots}{\ldots}$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^6,x)
```

output
```
(60*log(d + e*x)*b*c**2*d**6 + 300*log(d + e*x)*b*c**2*d**5*e*x + 600*log(
d + e*x)*b*c**2*d**4*e**2*x**2 + 600*log(d + e*x)*b*c**2*d**3*e**3*x**3 +
300*log(d + e*x)*b*c**2*d**2*e**4*x**4 + 60*log(d + e*x)*b*c**2*d*e**5*x**
5 - 2*a*b**2*d**3*e**3 - 10*a*b**2*d**2*e**4*x - 20*a*b**2*d*e**5*x**2 - 6
*a*b*c*d**4*e**2 - 30*a*b*c*d**3*e**3*x - 60*a*b*c*d**2*e**4*x**2 - 60*a*b
*c*d*e**5*x**3 + 12*a*c**2*e**6*x**5 - 3*b**3*d**4*e**2 - 15*b**3*d**3*e**
3*x - 30*b**3*d**2*e**4*x**2 - 30*b**3*d*e**5*x**3 + 24*b**2*c*e**6*x**5 +
 77*b*c**2*d**6 + 325*b*c**2*d**5*e*x + 500*b*c**2*d**4*e**2*x**2 + 300*b*
c**2*d**3*e**3*x**3 - 60*b*c**2*d*e**5*x**5)/(60*d*e**6*(d**5 + 5*d**4*e*x
 + 10*d**3*e**2*x**2 + 10*d**2*e**3*x**3 + 5*d*e**4*x**4 + e**5*x**5))
```

3.20 $\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^7} dx$

Optimal result

Integrand size = 24, antiderivative size = 253

$$\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^7} dx = \frac{d^2(Bd-Ae)(cd-be)^2}{6e^6(d+ex)^6} - \frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{5e^6(d+ex)^5} - \frac{Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2)}{4e^6(d+ex)^4} + \frac{2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2)}{3e^6(d+ex)^3} + \frac{c(5Bcd-2bBe-Ace)}{2e^6(d+ex)^2} - \frac{Bc^2}{e^6(d+ex)}$$

output
```
1/6*d^2*(-A*e+B*d)*(-b*e+c*d)^2/e^6/(e*x+d)^6-1/5*d*(-b*e+c*d)*(B*d*(-3*b*
e+5*c*d)-2*A*e*(-b*e+2*c*d))/e^6/(e*x+d)^5-1/4*(A*e*(b^2*e^2-6*b*c*d*e+6*c
^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)^4+1/3*(2*A*c*e*
(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)^3+1/2*c*(-A*c*e
-2*B*b*e+5*B*c*d)/e^6/(e*x+d)^2-B*c^2/e^6/(e*x+d)
```

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.02

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^7}\,dx = -\frac{Ae(b^2e^2(d^2+6dex+15e^2x^2)+2bce(d^3+6d^2ex+15de^2x^2+20e^3x^3)+2c^2(d^4+6d^3ex+15d^2e^2x^2+$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^7,x]
```

output
```
-1/60*(A*e*(b^2*e^2*(d^2 + 6*d*e*x + 15*e^2*x^2) + 2*b*c*e*(d^3 + 6*d^2*e*
x + 15*d*e^2*x^2 + 20*e^3*x^3) + 2*c^2*(d^4 + 6*d^3*e*x + 15*d^2*e^2*x^2 +
 20*d*e^3*x^3 + 15*e^4*x^4)) + B*(b^2*e^2*(d^3 + 6*d^2*e*x + 15*d*e^2*x^2
+ 20*e^3*x^3) + 4*b*c*e*(d^4 + 6*d^3*e*x + 15*d^2*e^2*x^2 + 20*d*e^3*x^3 +
 15*e^4*x^4) + 10*c^2*(d^5 + 6*d^4*e*x + 15*d^3*e^2*x^2 + 20*d^2*e^3*x^3 +
 15*d*e^4*x^4 + 6*e^5*x^5)))/(e^6*(d + e*x)^6)
```

Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 253, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^7}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)}{e^5(d+ex)^4}+\frac{Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)}{e^5(d+ex)^5}\right.$$

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

$$\frac{2Ace(2cd-be)-B(b^2e^2-8bcde+10c^2d^2)}{3e^6(d+ex)^3}-\frac{Ae(b^2e^2-6bcde+6c^2d^2)-Bd(3b^2e^2-12bcde+10c^2d^2)}{4e^6(d+ex)^4}+\frac{d^2(Bd-Ae)(cd-be)^2}{6e^6(d+ex)^6}+\frac{c(-Ace-2bBe+5Bcd)}{2e^6(d+ex)^2}-\frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{5e^6(d+ex)^5}-\frac{Bc^2}{e^6(d+ex)}$$

input

```
Int[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^7,x]
```

output

```
(d^2*(B*d - A*e)*(c*d - b*e)^2)/(6*e^6*(d + e*x)^6) - (d*(c*d - b*e)*(B*d*
(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e)))/(5*e^6*(d + e*x)^5) - (A*e*(6*c^2*
d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2))/(4
*e^6*(d + e*x)^4) + (2*A*c*e*(2*c*d - b*e) - B*(10*c^2*d^2 - 8*b*c*d*e + b
^2*e^2))/(3*e^6*(d + e*x)^3) + (c*(5*B*c*d - 2*b*B*e - A*c*e))/(2*e^6*(d +
 e*x)^2) - (B*c^2)/(e^6*(d + e*x))
```

Defintions of rubi rules used

rule 1195

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

rule 2009

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

Maple [A] (verified)

Time = 0.85 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.12

method	result
risch	$\frac{-\frac{B c^2 x^5}{e}-\frac{c(Ace+2Bbe+5Bcd)x^4}{2e^2}-\frac{\left(2Abc e^2+2A c^2 de+B e^2 b^2+4Bbcde+10B c^2 d^2\right)x^3}{3e^3}-\frac{\left(A b^2 e^3+2Abcd e^2+2A c^2 d^2 e+B b^2 d e^2+4Bbc\right.}{4e^4}}{}$
norman	$\frac{-\frac{B c^2 x^5}{e}-\frac{\left(A c^2 e+2Bebc+5B c^2 d\right)x^4}{2e^2}-\frac{\left(2Abc e^2+2A c^2 de+B e^2 b^2+4Bbcde+10B c^2 d^2\right)x^3}{3e^3}-\frac{\left(A b^2 e^3+2Abcd e^2+2A c^2 d^2 e+B b^2 d e^2+\right.}{4e^4}}{}$
default	$-\frac{2Abc e^2-4A c^2 de+B e^2 b^2-8Bbcde+10B c^2 d^2}{3e^6 (ex+d)^3}-\frac{A b^2 e^3-6Abcd e^2+6A c^2 d^2 e-3B b^2 d e^2+12Bbc d^2 e-10B c^2 d^3}{4e^6 (ex+d)^4}+\frac{d(2}{}$
gosper	$-\frac{60B x^5 c^2 e^5+30A x^4 c^2 e^5+60B x^4 bc e^5+150B x^4 c^2 d e^4+40A x^3 bc e^5+40A x^3 c^2 d e^4+20B x^3 b^2 e^5+80B x^3 bcd e^4+200B x^3}{}$
parallelrisch	$-\frac{60B x^5 c^2 e^5+30A x^4 c^2 e^5+60B x^4 bc e^5+150B x^4 c^2 d e^4+40A x^3 bc e^5+40A x^3 c^2 d e^4+20B x^3 b^2 e^5+80B x^3 bcd e^4+200B x^3}{}$
orering	$-\frac{(60B x^5 c^2 e^5+30A x^4 c^2 e^5+60B x^4 bc e^5+150B x^4 c^2 d e^4+40A x^3 bc e^5+40A x^3 c^2 d e^4+20B x^3 b^2 e^5+80B x^3 bcd e^4+200B x}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^7,x,method=_RETURNVERBOSE)
```

output
```
(-B*c^2*x^5/e-1/2*c*(A*c*e+2*B*b*e+5*B*c*d)/e^2*x^4-1/3*(2*A*b*c*e^2+2*A*c
^2*d*e+B*b^2*e^2+4*B*b*c*d*e+10*B*c^2*d^2)/e^3*x^3-1/4*(A*b^2*e^3+2*A*b*c*
d*e^2+2*A*c^2*d^2*e+B*b^2*d*e^2+4*B*b*c*d^2*e+10*B*c^2*d^3)/e^4*x^2-1/10*d
*(A*b^2*e^3+2*A*b*c*d*e^2+2*A*c^2*d^2*e+B*b^2*d*e^2+4*B*b*c*d^2*e+10*B*c^2
*d^3)/e^5*x-1/60*d^2*(A*b^2*e^3+2*A*b*c*d*e^2+2*A*c^2*d^2*e+B*b^2*d*e^2+4*
B*b*c*d^2*e+10*B*c^2*d^3)/e^6)/(e*x+d)^6
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.34

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^7}\,dx = -\frac{60\,Bc^2e^5x^5+10\,Bc^2d^5+Ab^2d^2e^3+2\,(2\,Bbc+Ac^2)d^4e+(Bb^2+2\,Abc)d^3e^2+30\,(5\,Bc^2de^4+(2\,Bbc}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^7,x, algorithm="fricas")
```

output
```
-1/60*(60*B*c^2*e^5*x^5 + 10*B*c^2*d^5 + A*b^2*d^2*e^3 + 2*(2*B*b*c + A*c^
2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2 + 30*(5*B*c^2*d*e^4 + (2*B*b*c + A*c^
2)*e^5)*x^4 + 20*(10*B*c^2*d^2*e^3 + 2*(2*B*b*c + A*c^2)*d*e^4 + (B*b^2 +
2*A*b*c)*e^5)*x^3 + 15*(10*B*c^2*d^3*e^2 + A*b^2*e^5 + 2*(2*B*b*c + A*c^2)
*d^2*e^3 + (B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 6*(10*B*c^2*d^4*e + A*b^2*d*e^4
+ 2*(2*B*b*c + A*c^2)*d^3*e^2 + (B*b^2 + 2*A*b*c)*d^2*e^3)*x)/(e^12*x^6 +
6*d*e^11*x^5 + 15*d^2*e^10*x^4 + 20*d^3*e^9*x^3 + 15*d^4*e^8*x^2 + 6*d^5*e
^7*x + d^6*e^6)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^7}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**7,x)
```

output
```
Timed out
```

Maxima [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.34

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^7}\,dx = -\frac{60\,Bc^2e^5x^5 + 10\,Bc^2d^5 + Ab^2d^2e^3 + 2\,(2\,Bbc + Ac^2)d^4e + (Bb^2 + 2\,Abc)d^3e^2 + 30\,(5\,Bc^2de^4 + (2\,Bbc}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^7,x, algorithm="maxima")
```

output
```
-1/60*(60*B*c^2*e^5*x^5 + 10*B*c^2*d^5 + A*b^2*d^2*e^3 + 2*(2*B*b*c + A*c^
2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2 + 30*(5*B*c^2*d*e^4 + (2*B*b*c + A*c^
2)*e^5)*x^4 + 20*(10*B*c^2*d^2*e^3 + 2*(2*B*b*c + A*c^2)*d*e^4 + (B*b^2 +
2*A*b*c)*e^5)*x^3 + 15*(10*B*c^2*d^3*e^2 + A*b^2*e^5 + 2*(2*B*b*c + A*c^2)
*d^2*e^3 + (B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 6*(10*B*c^2*d^4*e + A*b^2*d*e^4
+ 2*(2*B*b*c + A*c^2)*d^3*e^2 + (B*b^2 + 2*A*b*c)*d^2*e^3)*x)/(e^12*x^6 +
6*d*e^11*x^5 + 15*d^2*e^10*x^4 + 20*d^3*e^9*x^3 + 15*d^4*e^8*x^2 + 6*d^5*e
^7*x + d^6*e^6)
```

Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 338, normalized size of antiderivative = 1.34

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^7}\,dx = -\frac{60\,Bc^2e^5x^5+150\,Bc^2de^4x^4+60\,Bbce^5x^4+30\,Ac^2e^5x^4+200\,Bc^2d^2e^3x^3+80\,Bbcde^4x^3+40\,Ac^2de^4x}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^7,x, algorithm="giac")
```

output
```
-1/60*(60*B*c^2*e^5*x^5 + 150*B*c^2*d*e^4*x^4 + 60*B*b*c*e^5*x^4 + 30*A*c^
2*e^5*x^4 + 200*B*c^2*d^2*e^3*x^3 + 80*B*b*c*d*e^4*x^3 + 40*A*c^2*d*e^4*x^
3 + 20*B*b^2*e^5*x^3 + 40*A*b*c*e^5*x^3 + 150*B*c^2*d^3*e^2*x^2 + 60*B*b*c
*d^2*e^3*x^2 + 30*A*c^2*d^2*e^3*x^2 + 15*B*b^2*d*e^4*x^2 + 30*A*b*c*d*e^4*
x^2 + 15*A*b^2*e^5*x^2 + 60*B*c^2*d^4*e*x + 24*B*b*c*d^3*e^2*x + 12*A*c^2*
d^3*e^2*x + 6*B*b^2*d^2*e^3*x + 12*A*b*c*d^2*e^3*x + 6*A*b^2*d*e^4*x + 10*
B*c^2*d^5 + 4*B*b*c*d^4*e + 2*A*c^2*d^4*e + B*b^2*d^3*e^2 + 2*A*b*c*d^3*e^
2 + A*b^2*d^2*e^3)/((e*x + d)^6*e^6)
```

Mupad [B] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 337, normalized size of antiderivative = 1.33

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^7}\,dx = -\frac{\frac{x^3\,\left(B\,b^2\,e^2+4\,B\,b\,c\,d\,e+2\,A\,b\,c\,e^2+10\,B\,c^2\,d^2+2\,A\,c^2\,d\,e\right)}{3\,e^3}+\frac{d^2\,\left(B\,b^2\,d\,e^2+A\,b^2\,e^3+4\,B\,b\,c\,d^2\,e+2\,A\,b\,c\,d\,e^2+10\,B\,c^2\,d^3+2\,A\,c^2\,d^2\,e\right)}{60\,e^6}+\frac{x^2}{}}{d^6+6\,d^5\,e\,x+15}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^7,x)
```

output
```
-((x^3*(B*b^2*e^2 + 10*B*c^2*d^2 + 2*A*b*c*e^2 + 2*A*c^2*d*e + 4*B*b*c*d*e
))/(3*e^3) + (d^2*(A*b^2*e^3 + 10*B*c^2*d^3 + 2*A*c^2*d^2*e + B*b^2*d*e^2
+ 2*A*b*c*d*e^2 + 4*B*b*c*d^2*e))/(60*e^6) + (x^2*(A*b^2*e^3 + 10*B*c^2*d^
3 + 2*A*c^2*d^2*e + B*b^2*d*e^2 + 2*A*b*c*d*e^2 + 4*B*b*c*d^2*e))/(4*e^4)
+ (d*x*(A*b^2*e^3 + 10*B*c^2*d^3 + 2*A*c^2*d^2*e + B*b^2*d*e^2 + 2*A*b*c*d
*e^2 + 4*B*b*c*d^2*e))/(10*e^5) + (c*x^4*(A*c*e + 2*B*b*e + 5*B*c*d))/(2*e
^2) + (B*c^2*x^5)/e)/(d^6 + e^6*x^6 + 6*d*e^5*x^5 + 15*d^4*e^2*x^2 + 20*d^
3*e^3*x^3 + 15*d^2*e^4*x^4 + 6*d^5*e*x)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.35

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^7}\,dx = \frac{10b\,c^2e^5x^6-30a\,c^2d\,e^4x^4-60b^2cd\,e^4x^4-40abcd\,e^4x^3-40a\,c^2d^2e^3x^3-20b^3d\,e^4x^3-80b^2c\,d^2e^3x^3-15a}{}$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^7,x)
```

output
```
( - a*b**2*d**3*e**2 - 6*a*b**2*d**2*e**3*x - 15*a*b**2*d*e**4*x**2 - 2*a*
b*c*d**4*e - 12*a*b*c*d**3*e**2*x - 30*a*b*c*d**2*e**3*x**2 - 40*a*b*c*d*e
**4*x**3 - 2*a*c**2*d**5 - 12*a*c**2*d**4*e*x - 30*a*c**2*d**3*e**2*x**2 -
 40*a*c**2*d**2*e**3*x**3 - 30*a*c**2*d*e**4*x**4 - b**3*d**4*e - 6*b**3*d
**3*e**2*x - 15*b**3*d**2*e**3*x**2 - 20*b**3*d*e**4*x**3 - 4*b**2*c*d**5
- 24*b**2*c*d**4*e*x - 60*b**2*c*d**3*e**2*x**2 - 80*b**2*c*d**2*e**3*x**3
 - 60*b**2*c*d*e**4*x**4 + 10*b*c**2*e**5*x**6)/(60*d*e**5*(d**6 + 6*d**5*
e*x + 15*d**4*e**2*x**2 + 20*d**3*e**3*x**3 + 15*d**2*e**4*x**4 + 6*d*e**5
*x**5 + e**6*x**6))
```

3.21 $\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^8} dx$

Optimal result

Integrand size = 24, antiderivative size = 255

$$\begin{aligned}\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^8} dx &= \frac{d^2(Bd-Ae)(cd-be)^2}{7e^6(d+ex)^7} - \frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{6e^6(d+ex)^6} \\ &\quad - \frac{Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2)}{5e^6(d+ex)^5} \\ &\quad + \frac{2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2)}{4e^6(d+ex)^4} \\ &\quad + \frac{c(5Bcd-2bBe-Ace)}{3e^6(d+ex)^3} - \frac{Bc^2}{2e^6(d+ex)^2}\end{aligned}$$

output
```
1/7*d^2*(-A*e+B*d)*(-b*e+c*d)^2/e^6/(e*x+d)^7-1/6*d*(-b*e+c*d)*(B*d*(-3*b*
e+5*c*d)-2*A*e*(-b*e+2*c*d))/e^6/(e*x+d)^6-1/5*(A*e*(b^2*e^2-6*b*c*d*e+6*c
^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)^5+1/4*(2*A*c*e*
(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)^4+1/3*c*(-A*c*e
-2*B*b*e+5*B*c*d)/e^6/(e*x+d)^3-1/2*B*c^2/e^6/(e*x+d)^2
```

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 260, normalized size of antiderivative = 1.02

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^8}\,dx = -\frac{2Ae(2b^2e^2(d^2+7dex+21e^2x^2)+3bce(d^3+7d^2ex+21de^2x^2+35e^3x^3)+2c^2(d^4+7d^3ex+21d^2e^2x^2}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^8,x]
```

output
```
-1/420*(2*A*e*(2*b^2*e^2*(d^2 + 7*d*e*x + 21*e^2*x^2) + 3*b*c*e*(d^3 + 7*d
^2*e*x + 21*d*e^2*x^2 + 35*e^3*x^3) + 2*c^2*(d^4 + 7*d^3*e*x + 21*d^2*e^2*
x^2 + 35*d*e^3*x^3 + 35*e^4*x^4)) + B*(3*b^2*e^2*(d^3 + 7*d^2*e*x + 21*d*e
^2*x^2 + 35*e^3*x^3) + 8*b*c*e*(d^4 + 7*d^3*e*x + 21*d^2*e^2*x^2 + 35*d*e^
3*x^3 + 35*e^4*x^4) + 10*c^2*(d^5 + 7*d^4*e*x + 21*d^3*e^2*x^2 + 35*d^2*e^
3*x^3 + 35*d*e^4*x^4 + 21*e^5*x^5)))/(e^6*(d + e*x)^7)
```

Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^8}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)}{e^5(d+ex)^5}+\frac{Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)}{e^5(d+ex)^6}\right.$$

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

$$\frac{2Ace(2cd-be)-B(b^2e^2-8bcde+10c^2d^2)}{4e^6(d+ex)^4}-\frac{Ae(b^2e^2-6bcde+6c^2d^2)-Bd(3b^2e^2-12bcde+10c^2d^2)}{5e^6(d+ex)^5}+\frac{d^2(Bd-Ae)(cd-be)^2}{7e^6(d+ex)^7}+\frac{c(-Ace-2bBe+5Bcd)}{3e^6(d+ex)^3}-\frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{6e^6(d+ex)^6}-\frac{Bc^2}{2e^6(d+ex)^2}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^8,x]
```

output
```
(d^2*(B*d - A*e)*(c*d - b*e)^2)/(7*e^6*(d + e*x)^7) - (d*(c*d - b*e)*(B*d*
(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e)))/(6*e^6*(d + e*x)^6) - (A*e*(6*c^2*
d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2))/(5
*e^6*(d + e*x)^5) + (2*A*c*e*(2*c*d - b*e) - B*(10*c^2*d^2 - 8*b*c*d*e + b
^2*e^2))/(4*e^6*(d + e*x)^4) + (c*(5*B*c*d - 2*b*B*e - A*c*e))/(3*e^6*(d +
 e*x)^3) - (B*c^2)/(2*e^6*(d + e*x)^2)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.14

method	result
risch	$\frac{-\frac{B c^2 x^5}{2e}-\frac{c(2Ace+4Bbe+5Bcd)x^4}{6e^2}-\frac{\left(6Abc\,e^2+4A\,c^2de+3B\,e^2b^2+8Bbcde+10B\,c^2d^2\right)x^3}{12e^3}-\frac{\left(4A\,b^2e^3+6Abcd\,e^2+4A\,c^2d^2e+3B\,b^2d\,e^2+\right.}{20e^4}}{}$
default	$-\frac{c(Ace+2Bbe-5Bcd)}{3e^6(ex+d)^3}-\frac{2Abc\,e^2-4A\,c^2de+B\,e^2b^2-8Bbcde+10B\,c^2d^2}{4e^6(ex+d)^4}-\frac{d^2\left(A\,b^2e^3-2Abcd\,e^2+A\,c^2d^2e-B\,b^2d\,e^2+2B\right.}{7e^6(ex+d)^7}$
norman	$\frac{-\frac{B c^2 x^5}{2e}-\frac{\left(2A\,c^2e^2+4B\,e^2bc+5B\,c^2de\right)x^4}{6e^3}-\frac{\left(6Abc\,e^3+4A\,c^2d\,e^2+3B\,e^3b^2+8Bbcd\,e^2+10B\,c^2d^2e\right)x^3}{12e^4}-\frac{\left(4b^2A\,e^4+6Abcd\,e^3+4A\,d^2e^2c\right.}{}}{}$
gosper	$-\frac{210B\,x^5c^2e^5+140A\,x^4c^2e^5+280B\,x^4bc\,e^5+350B\,x^4c^2d\,e^4+210A\,x^3bc\,e^5+140A\,x^3c^2d\,e^4+105B\,x^3b^2e^5+280B\,x^3bcd\,e^4+}{}$
parallelrisch	$-\frac{210B\,c^2x^5e^6+140A\,c^2e^6x^4+280Bbc\,e^6x^4+350B\,c^2d\,e^5x^4+210Abc\,e^6x^3+140A\,c^2d\,e^5x^3+105B\,b^2e^6x^3+280Bbcd\,e^5x^3+3}{}$
orering	$-\frac{\left(210B\,x^5c^2e^5+140A\,x^4c^2e^5+280B\,x^4bc\,e^5+350B\,x^4c^2d\,e^4+210A\,x^3bc\,e^5+140A\,x^3c^2d\,e^4+105B\,x^3b^2e^5+280B\,x^3bcd\,e^4\right.}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^8,x,method=_RETURNVERBOSE)
```

output
```
(-1/2*B*c^2*x^5/e-1/6*c/e^2*(2*A*c*e+4*B*b*e+5*B*c*d)*x^4-1/12/e^3*(6*A*b*
c*e^2+4*A*c^2*d*e+3*B*b^2*e^2+8*B*b*c*d*e+10*B*c^2*d^2)*x^3-1/20/e^4*(4*A*
b^2*e^3+6*A*b*c*d*e^2+4*A*c^2*d^2*e+3*B*b^2*d*e^2+8*B*b*c*d^2*e+10*B*c^2*d
^3)*x^2-1/60*d/e^5*(4*A*b^2*e^3+6*A*b*c*d*e^2+4*A*c^2*d^2*e+3*B*b^2*d*e^2+
8*B*b*c*d^2*e+10*B*c^2*d^3)*x-1/420*d^2/e^6*(4*A*b^2*e^3+6*A*b*c*d*e^2+4*A
*c^2*d^2*e+3*B*b^2*d*e^2+8*B*b*c*d^2*e+10*B*c^2*d^3))/(e*x+d)^7
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 359, normalized size of antiderivative = 1.41

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^8}\,dx = -\frac{210\,Bc^2e^5x^5+10\,Bc^2d^5+4\,Ab^2d^2e^3+4\,(2\,Bbc+Ac^2)d^4e+3\,(Bb^2+2\,Abc)d^3e^2+70\,(5\,Bc^2de^4+2\,(}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^8,x, algorithm="fricas")
```

output
```
-1/420*(210*B*c^2*e^5*x^5 + 10*B*c^2*d^5 + 4*A*b^2*d^2*e^3 + 4*(2*B*b*c +
A*c^2)*d^4*e + 3*(B*b^2 + 2*A*b*c)*d^3*e^2 + 70*(5*B*c^2*d*e^4 + 2*(2*B*b*
c + A*c^2)*e^5)*x^4 + 35*(10*B*c^2*d^2*e^3 + 4*(2*B*b*c + A*c^2)*d*e^4 + 3
*(B*b^2 + 2*A*b*c)*e^5)*x^3 + 21*(10*B*c^2*d^3*e^2 + 4*A*b^2*e^5 + 4*(2*B*
b*c + A*c^2)*d^2*e^3 + 3*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 7*(10*B*c^2*d^4*e
+ 4*A*b^2*d*e^4 + 4*(2*B*b*c + A*c^2)*d^3*e^2 + 3*(B*b^2 + 2*A*b*c)*d^2*e^
3)*x)/(e^13*x^7 + 7*d*e^12*x^6 + 21*d^2*e^11*x^5 + 35*d^3*e^10*x^4 + 35*d^
4*e^9*x^3 + 21*d^5*e^8*x^2 + 7*d^6*e^7*x + d^7*e^6)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^8}\,dx=\text{Timed out}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**8,x)
```

output
```
Timed out
```

Maxima [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 359, normalized size of antiderivative = 1.41

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^8}\,dx = -\frac{210\,Bc^2e^5x^5+10\,Bc^2d^5+4\,Ab^2d^2e^3+4\,(2\,Bbc+Ac^2)d^4e+3\,(Bb^2+2\,Abc)d^3e^2+70\,(5\,Bc^2de^4+2\,(\cdots}{\cdots}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^8,x, algorithm="maxima")
```

output
```
-1/420*(210*B*c^2*e^5*x^5 + 10*B*c^2*d^5 + 4*A*b^2*d^2*e^3 + 4*(2*B*b*c +
A*c^2)*d^4*e + 3*(B*b^2 + 2*A*b*c)*d^3*e^2 + 70*(5*B*c^2*d*e^4 + 2*(2*B*b*
c + A*c^2)*e^5)*x^4 + 35*(10*B*c^2*d^2*e^3 + 4*(2*B*b*c + A*c^2)*d*e^4 + 3
*(B*b^2 + 2*A*b*c)*e^5)*x^3 + 21*(10*B*c^2*d^3*e^2 + 4*A*b^2*e^5 + 4*(2*B*
b*c + A*c^2)*d^2*e^3 + 3*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 7*(10*B*c^2*d^4*e
+ 4*A*b^2*d*e^4 + 4*(2*B*b*c + A*c^2)*d^3*e^2 + 3*(B*b^2 + 2*A*b*c)*d^2*e^
3)*x)/(e^13*x^7 + 7*d*e^12*x^6 + 21*d^2*e^11*x^5 + 35*d^3*e^10*x^4 + 35*d^
4*e^9*x^3 + 21*d^5*e^8*x^2 + 7*d^6*e^7*x + d^7*e^6)
```

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.33

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^8}\,dx = -\frac{210\,Bc^2e^5x^5+350\,Bc^2de^4x^4+280\,Bbce^5x^4+140\,Ac^2e^5x^4+350\,Bc^2d^2e^3x^3+280\,Bbcde^4x^3+140\,Ac^2}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^8,x, algorithm="giac")
```

output
```
-1/420*(210*B*c^2*e^5*x^5 + 350*B*c^2*d*e^4*x^4 + 280*B*b*c*e^5*x^4 + 140*
A*c^2*e^5*x^4 + 350*B*c^2*d^2*e^3*x^3 + 280*B*b*c*d*e^4*x^3 + 140*A*c^2*d*
e^4*x^3 + 105*B*b^2*e^5*x^3 + 210*A*b*c*e^5*x^3 + 210*B*c^2*d^3*e^2*x^2 +
168*B*b*c*d^2*e^3*x^2 + 84*A*c^2*d^2*e^3*x^2 + 63*B*b^2*d*e^4*x^2 + 126*A*
b*c*d*e^4*x^2 + 84*A*b^2*e^5*x^2 + 70*B*c^2*d^4*e*x + 56*B*b*c*d^3*e^2*x +
 28*A*c^2*d^3*e^2*x + 21*B*b^2*d^2*e^3*x + 42*A*b*c*d^2*e^3*x + 28*A*b^2*d
*e^4*x + 10*B*c^2*d^5 + 8*B*b*c*d^4*e + 4*A*c^2*d^4*e + 3*B*b^2*d^3*e^2 +
6*A*b*c*d^3*e^2 + 4*A*b^2*d^2*e^3)/((e*x + d)^7*e^6)
```

Mupad [B] (verification not implemented)

Time = 10.83 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.40

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^8}\,dx =$$
$$-\frac{\frac{x^3\,(3\,B\,b^2\,e^2+8\,B\,b\,c\,d\,e+6\,A\,b\,c\,e^2+10\,B\,c^2\,d^2+4\,A\,c^2\,d\,e)}{12\,e^3}+\frac{d^2\,(3\,B\,b^2\,d\,e^2+4\,A\,b^2\,e^3+8\,B\,b\,c\,d^2\,e+6\,A\,b\,c\,d\,e^2+10\,B\,c^2\,d^3+4\,A\,c^2\,d^2\,e)}{420\,e^6}+}{d^7+7\,d^6\,e\,x+21\,d}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^8,x)
```

output
```
-((x^3*(3*B*b^2*e^2 + 10*B*c^2*d^2 + 6*A*b*c*e^2 + 4*A*c^2*d*e + 8*B*b*c*d
*e))/(12*e^3) + (d^2*(4*A*b^2*e^3 + 10*B*c^2*d^3 + 4*A*c^2*d^2*e + 3*B*b^2
*d*e^2 + 6*A*b*c*d*e^2 + 8*B*b*c*d^2*e))/(420*e^6) + (x^2*(4*A*b^2*e^3 + 1
0*B*c^2*d^3 + 4*A*c^2*d^2*e + 3*B*b^2*d*e^2 + 6*A*b*c*d*e^2 + 8*B*b*c*d^2*
e))/(20*e^4) + (d*x*(4*A*b^2*e^3 + 10*B*c^2*d^3 + 4*A*c^2*d^2*e + 3*B*b^2*
d*e^2 + 6*A*b*c*d*e^2 + 8*B*b*c*d^2*e))/(60*e^5) + (c*x^4*(2*A*c*e + 4*B*b
*e + 5*B*c*d))/(6*e^2) + (B*c^2*x^5)/(2*e))/(d^7 + e^7*x^7 + 7*d*e^6*x^6 +
 21*d^5*e^2*x^2 + 35*d^4*e^3*x^3 + 35*d^3*e^4*x^4 + 21*d^2*e^5*x^5 + 7*d^6
*e*x)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 407, normalized size of antiderivative = 1.60

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^8}\,dx$$
$$=\frac{-210b\,c^2e^5x^5-140a\,c^2e^5x^4-280b^2c\,e^5x^4-350b\,c^2d\,e^4x^4-210abc\,e^5x^3-140a\,c^2d\,e^4x^3-105b^3e^5x^3-}{}$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^8,x)
```

output

```
( - 4*a*b**2*d**2*e**3 - 28*a*b**2*d*e**4*x - 84*a*b**2*e**5*x**2 - 6*a*b*
c*d**3*e**2 - 42*a*b*c*d**2*e**3*x - 126*a*b*c*d*e**4*x**2 - 210*a*b*c*e**
5*x**3 - 4*a*c**2*d**4*e - 28*a*c**2*d**3*e**2*x - 84*a*c**2*d**2*e**3*x**
2 - 140*a*c**2*d*e**4*x**3 - 140*a*c**2*e**5*x**4 - 3*b**3*d**3*e**2 - 21*
b**3*d**2*e**3*x - 63*b**3*d*e**4*x**2 - 105*b**3*e**5*x**3 - 8*b**2*c*d**
4*e - 56*b**2*c*d**3*e**2*x - 168*b**2*c*d**2*e**3*x**2 - 280*b**2*c*d*e**
4*x**3 - 280*b**2*c*e**5*x**4 - 10*b*c**2*d**5 - 70*b*c**2*d**4*e*x - 210*
b*c**2*d**3*e**2*x**2 - 350*b*c**2*d**2*e**3*x**3 - 350*b*c**2*d*e**4*x**4
 - 210*b*c**2*e**5*x**5)/(420*e**6*(d**7 + 7*d**6*e*x + 21*d**5*e**2*x**2
+ 35*d**4*e**3*x**3 + 35*d**3*e**4*x**4 + 21*d**2*e**5*x**5 + 7*d*e**6*x**
6 + e**7*x**7))
```

3.22 $\int (A+Bx)(d+ex)^4 \left(bx+cx^2\right)^3 \, dx$

Optimal result

Integrand size = 24, antiderivative size = 412

$$\begin{aligned}\int (A+Bx)(d+ex)^4 \left(bx+cx^2\right)^3 \, dx = {} & \frac{1}{4}Ab^3d^4x^4+\frac{1}{5}b^2d^3(bBd+3Acd+4Abe)x^5 \\ & +\frac{1}{6}bd^2\left(3Ac^2d^2+2b^2e(2Bd+3Ae)\right. \\ & \left.+3bcd(Bd+4Ae)\right)x^6 \\ & +\frac{1}{7}d\left(Ac^3d^3+2b^3e^2(3Bd+2Ae)\right. \\ & \left.+6b^2cde(2Bd+3Ae)+3bc^2d^2(Bd+4Ae)\right)x^7 \\ & +\frac{1}{8}\left(Ae\left(4c^3d^3+18bc^2d^2e+12b^2cde^2+b^3e^3\right)\right. \\ & \left.+Bd\left(c^3d^3+12bc^2d^2e+18b^2cde^2+4b^3e^3\right)\right)x^8 \\ & +\frac{1}{9}e\left(3Ace\left(2c^2d^2+4bcde+b^2e^2\right)\right. \\ & \left.+B\left(4c^3d^3+18bc^2d^2e+12b^2cde^2+b^3e^3\right)\right)x^9 \\ & +\frac{1}{10}ce^2\left(Ace(4cd+3be)\right. \\ & \left.+3B\left(2c^2d^2+4bcde+b^2e^2\right)\right)x^{10} \\ & +\frac{1}{11}c^2e^3(4Bcd+3bBe+Ace)x^{11}+\frac{1}{12}Bc^3e^4x^{12}\end{aligned}$$

output
```
1/4*A*b^3*d^4*x^4+1/5*b^2*d^3*(4*A*b*e+3*A*c*d+B*b*d)*x^5+1/6*b*d^2*(3*A*c
^2*d^2+2*b^2*e*(3*A*e+2*B*d)+3*b*c*d*(4*A*e+B*d))*x^6+1/7*d*(A*c^3*d^3+2*b
^3*e^2*(2*A*e+3*B*d)+6*b^2*c*d*e*(3*A*e+2*B*d)+3*b*c^2*d^2*(4*A*e+B*d))*x^
7+1/8*(A*e*(b^3*e^3+12*b^2*c*d*e^2+18*b*c^2*d^2*e+4*c^3*d^3)+B*d*(4*b^3*e^
3+18*b^2*c*d*e^2+12*b*c^2*d^2*e+c^3*d^3))*x^8+1/9*e*(3*A*c*e*(b^2*e^2+4*b*
c*d*e+2*c^2*d^2)+B*(b^3*e^3+12*b^2*c*d*e^2+18*b*c^2*d^2*e+4*c^3*d^3))*x^9+
1/10*c*e^2*(A*c*e*(3*b*e+4*c*d)+3*B*(b^2*e^2+4*b*c*d*e+2*c^2*d^2))*x^10+1/
11*c^2*e^3*(A*c*e+3*B*b*e+4*B*c*d)*x^11+1/12*B*c^3*e^4*x^12
```

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 412, normalized size of antiderivative = 1.00

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)^3\,dx = \frac{1}{4}Ab^3d^4x^4+\frac{1}{5}b^2d^3(bBd+3Acd+4Abe)x^5 + \frac{1}{6}bd^2\left(3Ac^2d^2+2b^2e(2Bd+3Ae) + 3bcd(Bd+4Ae)\right)x^6 + \frac{1}{7}d\left(Ac^3d^3+2b^3e^2(3Bd+2Ae) + 6b^2cde(2Bd+3Ae)+3bc^2d^2(Bd+4Ae)\right)x^7 + \frac{1}{8}\left(Ae\left(4c^3d^3+18bc^2d^2e+12b^2cde^2+b^3e^3\right) + Bd\left(c^3d^3+12bc^2d^2e+18b^2cde^2+4b^3e^3\right)\right)x^8 + \frac{1}{9}e\left(3Ace\left(2c^2d^2+4bcde+b^2e^2\right) + B\left(4c^3d^3+18bc^2d^2e+12b^2cde^2+b^3e^3\right)\right)x^9 + \frac{1}{10}ce^2\left(Ace(4cd+3be) + 3B\left(2c^2d^2+4bcde+b^2e^2\right)\right)x^{10} + \frac{1}{11}c^2e^3(4Bcd+3bBe+Ace)x^{11}+\frac{1}{12}Bc^3e^4x^{12}$$

input
```
Integrate[(A + B*x)*(d + e*x)^4*(b*x + c*x^2)^3,x]
```

output
```
(A*b^3*d^4*x^4)/4 + (b^2*d^3*(b*B*d + 3*A*c*d + 4*A*b*e)*x^5)/5 + (b*d^2*(
3*A*c^2*d^2 + 2*b^2*e*(2*B*d + 3*A*e) + 3*b*c*d*(B*d + 4*A*e))*x^6)/6 + (d
*(A*c^3*d^3 + 2*b^3*e^2*(3*B*d + 2*A*e) + 6*b^2*c*d*e*(2*B*d + 3*A*e) + 3*
b*c^2*d^2*(B*d + 4*A*e))*x^7)/7 + ((A*e*(4*c^3*d^3 + 18*b*c^2*d^2*e + 12*b
^2*c*d*e^2 + b^3*e^3) + B*d*(c^3*d^3 + 12*b*c^2*d^2*e + 18*b^2*c*d*e^2 + 4
*b^3*e^3))*x^8)/8 + (e*(3*A*c*e*(2*c^2*d^2 + 4*b*c*d*e + b^2*e^2) + B*(4*c
^3*d^3 + 18*b*c^2*d^2*e + 12*b^2*c*d*e^2 + b^3*e^3))*x^9)/9 + (c*e^2*(A*c*
e*(4*c*d + 3*b*e) + 3*B*(2*c^2*d^2 + 4*b*c*d*e + b^2*e^2))*x^10)/10 + (c^2
*e^3*(4*B*c*d + 3*b*B*e + A*c*e)*x^11)/11 + (B*c^3*e^4*x^12)/12
```

Rubi [A] (verified)

Time = 1.36 (sec) , antiderivative size = 412, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^3(d+ex)^4\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(Ab^3d^4x^3+ce^2x^9\left(Ace(3be+4cd)+3B\left(b^2e^2+4bcde+2c^2d^2\right)\right)+bd^2x^5\left(2b^2e(3Ae+2Bd)+3bcd(4Ae+Bd\right.\right.$$

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

$$\frac{1}{4}Ab^3d^4x^4+\frac{1}{10}ce^2x^{10}\left(Ace(3be+4cd)+3B\left(b^2e^2+4bcde+2c^2d^2\right)\right)+\frac{1}{6}bd^2x^6\left(2b^2e(3Ae+2Bd)+3bcd(4Ae+Bd)+3Ac^2d^2\right)+\frac{1}{5}b^2d^3x^5(4Abe+3Acd+bBd)+\frac{1}{7}dx^7\left(2b^3e^2(2Ae+3Bd)+6b^2cde(3Ae+2Bd)+3bc^2d^2(4Ae+Bd)+Ac^3d^3\right)+\frac{1}{9}ex^9\left(3Ace\left(b^2e^2+4bcde+2c^2d^2\right)+B\left(b^3e^3+12b^2cde^2+18bc^2d^2e+4c^3d^3\right)\right)+\frac{1}{8}x^8\left(Ae\left(b^3e^3+12b^2cde^2+18bc^2d^2e+4c^3d^3\right)+Bd\left(4b^3e^3+18b^2cde^2+12bc^2d^2e+c^3d^3\right)\right)+\frac{1}{11}c^2e^3x^{11}(Ace+3bBe+4Bcd)+\frac{1}{12}Bc^3e^4x^{12}$$

input
```
Int[(A + B*x)*(d + e*x)^4*(b*x + c*x^2)^3,x]
```

output
```
(A*b^3*d^4*x^4)/4 + (b^2*d^3*(b*B*d + 3*A*c*d + 4*A*b*e)*x^5)/5 + (b*d^2*(
3*A*c^2*d^2 + 2*b^2*e*(2*B*d + 3*A*e) + 3*b*c*d*(B*d + 4*A*e))*x^6)/6 + (d
*(A*c^3*d^3 + 2*b^3*e^2*(3*B*d + 2*A*e) + 6*b^2*c*d*e*(2*B*d + 3*A*e) + 3*
b*c^2*d^2*(B*d + 4*A*e))*x^7)/7 + ((A*e*(4*c^3*d^3 + 18*b*c^2*d^2*e + 12*b
^2*c*d*e^2 + b^3*e^3) + B*d*(c^3*d^3 + 12*b*c^2*d^2*e + 18*b^2*c*d*e^2 + 4
*b^3*e^3))*x^8)/8 + (e*(3*A*c*e*(2*c^2*d^2 + 4*b*c*d*e + b^2*e^2) + B*(4*c
^3*d^3 + 18*b*c^2*d^2*e + 12*b^2*c*d*e^2 + b^3*e^3))*x^9)/9 + (c*e^2*(A*c*
e*(4*c*d + 3*b*e) + 3*B*(2*c^2*d^2 + 4*b*c*d*e + b^2*e^2))*x^10)/10 + (c^2
*e^3*(4*B*c*d + 3*b*B*e + A*c*e)*x^11)/11 + (B*c^3*e^4*x^12)/12
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.69 (sec) , antiderivative size = 444, normalized size of antiderivative = 1.08

method	result
default	$\frac{B e^4 c^3 x^{12}}{12}+\frac{((A e^4+4Bd e^3)c^3+3B e^4 b c^2)x^{11}}{11}+\frac{((4Ad e^3+6B d^2 e^2)c^3+3(A e^4+4Bd e^3)b c^2+3B e^4 b^2 c)x^{10}}{10}+\frac{((6A$
norman	$\frac{B e^4 c^3 x^{12}}{12}+\left(\frac{1}{11}A c^3 e^4+\frac{3}{11}B e^4 b c^2+\frac{4}{11}B c^3 d e^3\right)x^{11}+\left(\frac{3}{10}Ab c^2 e^4+\frac{2}{5}A c^3 d e^3+\frac{3}{10}B e^4 b^2 c\right.$
gosper	$\frac{x^4(2310B e^4 c^3 x^8+2520x^7 A c^3 e^4+7560x^7 B e^4 b c^2+10080x^7 B c^3 d e^3+8316x^6 Ab c^2 e^4+11088x^6 A c^3 d e^3+8316x^6 B e^4 b^2 c+3}{}$
risch	$\frac{1}{2}x^6 B b^2 c d^4+\frac{4}{3}x^9 Ab c^2 d e^3+\frac{4}{3}x^9 B b^2 cd e^3+\frac{6}{5}x^{10} Bb c^2 d e^3+\frac{1}{12}B e^4 c^3 x^{12}+\frac{3}{11}x^{11} B e^4 b c^2$
parallelrisch	$\frac{1}{2}x^6 B b^2 c d^4+\frac{4}{3}x^9 Ab c^2 d e^3+\frac{4}{3}x^9 B b^2 cd e^3+\frac{6}{5}x^{10} Bb c^2 d e^3+\frac{1}{12}B e^4 c^3 x^{12}+\frac{3}{11}x^{11} B e^4 b c^2$
orering	$\frac{x(2310B e^4 c^3 x^8+2520x^7 A c^3 e^4+7560x^7 B e^4 b c^2+10080x^7 B c^3 d e^3+8316x^6 Ab c^2 e^4+11088x^6 A c^3 d e^3+8316x^6 B e^4 b^2 c+33}{}$

input
```
int((B*x+A)*(e*x+d)^4*(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
1/12*B*e^4*c^3*x^12+1/11*((A*e^4+4*B*d*e^3)*c^3+3*B*e^4*b*c^2)*x^11+1/10*(
(4*A*d*e^3+6*B*d^2*e^2)*c^3+3*(A*e^4+4*B*d*e^3)*b*c^2+3*B*e^4*b^2*c)*x^10+
1/9*((6*A*d^2*e^2+4*B*d^3*e)*c^3+3*(4*A*d*e^3+6*B*d^2*e^2)*b*c^2+3*(A*e^4+
4*B*d*e^3)*b^2*c+B*e^4*b^3)*x^9+1/8*((4*A*d^3*e+B*d^4)*c^3+3*(6*A*d^2*e^2+
4*B*d^3*e)*b*c^2+3*(4*A*d*e^3+6*B*d^2*e^2)*b^2*c+(A*e^4+4*B*d*e^3)*b^3)*x^
8+1/7*(A*d^4*c^3+3*(4*A*d^3*e+B*d^4)*b*c^2+3*(6*A*d^2*e^2+4*B*d^3*e)*b^2*c
+(4*A*d*e^3+6*B*d^2*e^2)*b^3)*x^7+1/6*(3*A*d^4*b*c^2+3*(4*A*d^3*e+B*d^4)*b
^2*c+(6*A*d^2*e^2+4*B*d^3*e)*b^3)*x^6+1/5*(3*A*d^4*b^2*c+(4*A*d^3*e+B*d^4)
*b^3)*x^5+1/4*A*b^3*d^4*x^4
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 428, normalized size of antiderivative = 1.04

$$\begin{aligned}
&\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)^3\,dx \\
&= \frac{1}{12}\,Bc^3e^4x^{12}+\frac{1}{4}\,Ab^3d^4x^4+\frac{1}{11}\left(4\,Bc^3de^3+\left(3\,Bbc^2+Ac^3\right)e^4\right)x^{11} \\
&\quad+\frac{1}{10}\left(6\,Bc^3d^2e^2+4\left(3\,Bbc^2+Ac^3\right)de^3+3\left(Bb^2c+Abc^2\right)e^4\right)x^{10} \\
&\quad+\frac{1}{9}\left(4\,Bc^3d^3e+6\left(3\,Bbc^2+Ac^3\right)d^2e^2+12\left(Bb^2c+Abc^2\right)de^3+\left(Bb^3+3\,Ab^2c\right)e^4\right)x^9 \\
&\quad+\frac{1}{8}\left(Bc^3d^4+Ab^3e^4+4\left(3\,Bbc^2+Ac^3\right)d^3e+18\left(Bb^2c+Abc^2\right)d^2e^2+4\left(Bb^3+3\,Ab^2c\right)de^3\right)x^8 \\
&\quad+\frac{1}{7}\left(4\,Ab^3de^3+\left(3\,Bbc^2+Ac^3\right)d^4+12\left(Bb^2c+Abc^2\right)d^3e+6\left(Bb^3+3\,Ab^2c\right)d^2e^2\right)x^7 \\
&\quad+\frac{1}{6}\left(6\,Ab^3d^2e^2+3\left(Bb^2c+Abc^2\right)d^4+4\left(Bb^3+3\,Ab^2c\right)d^3e\right)x^6 \\
&\quad+\frac{1}{5}\left(4\,Ab^3d^3e+\left(Bb^3+3\,Ab^2c\right)d^4\right)x^5
\end{aligned}$$

input
```
integrate((B*x+A)*(e*x+d)^4*(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
1/12*B*c^3*e^4*x^12 + 1/4*A*b^3*d^4*x^4 + 1/11*(4*B*c^3*d*e^3 + (3*B*b*c^2
 + A*c^3)*e^4)*x^11 + 1/10*(6*B*c^3*d^2*e^2 + 4*(3*B*b*c^2 + A*c^3)*d*e^3
+ 3*(B*b^2*c + A*b*c^2)*e^4)*x^10 + 1/9*(4*B*c^3*d^3*e + 6*(3*B*b*c^2 + A*
c^3)*d^2*e^2 + 12*(B*b^2*c + A*b*c^2)*d*e^3 + (B*b^3 + 3*A*b^2*c)*e^4)*x^9
 + 1/8*(B*c^3*d^4 + A*b^3*e^4 + 4*(3*B*b*c^2 + A*c^3)*d^3*e + 18*(B*b^2*c
+ A*b*c^2)*d^2*e^2 + 4*(B*b^3 + 3*A*b^2*c)*d*e^3)*x^8 + 1/7*(4*A*b^3*d*e^3
 + (3*B*b*c^2 + A*c^3)*d^4 + 12*(B*b^2*c + A*b*c^2)*d^3*e + 6*(B*b^3 + 3*A
*b^2*c)*d^2*e^2)*x^7 + 1/6*(6*A*b^3*d^2*e^2 + 3*(B*b^2*c + A*b*c^2)*d^4 +
4*(B*b^3 + 3*A*b^2*c)*d^3*e)*x^6 + 1/5*(4*A*b^3*d^3*e + (B*b^3 + 3*A*b^2*c
)*d^4)*x^5
```

Sympy [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 564, normalized size of antiderivative = 1.37

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)^3\,dx = \frac{Ab^3d^4x^4}{4} + \frac{Bc^3e^4x^{12}}{12} + x^{11}\left(\frac{Ac^3e^4}{11} + \frac{3Bbc^2e^4}{11} + \frac{4Bc^3de^3}{11}\right) + x^{10} \cdot \left(\frac{3Abc^2e^4}{10} + \frac{2Ac^3de^3}{5} + \frac{3Bb^2ce^4}{10} + \frac{6Bbc^2de^3}{5} + \frac{3Bc^3d^2e^2}{5}\right) + x^9\left(\frac{Ab^2ce^4}{3} + \frac{4Abc^2de^3}{3} + \frac{2Ac^3d^2e^2}{3} + \frac{Bb^3e^4}{9} + \frac{4Bb^2cde^3}{3} + 2Bbc^2d^2e^2 + \frac{4Bc^3d^3e}{9}\right) + x^8\left(\frac{Ab^3e^4}{8} + \frac{3Ab^2cde^3}{2} + \frac{9Abc^2d^2e^2}{4} + \frac{Ac^3d^3e}{2} + \frac{Bb^3de^3}{2} + \frac{9Bb^2cd^2e^2}{4} + \frac{3Bbc^2d^3e}{2} + \frac{Bc^3d^4}{8}\right) + x^7 \cdot \left(\frac{4Ab^3de^3}{7} + \frac{18Ab^2cd^2e^2}{7} + \frac{12Abc^2d^3e}{7} + \frac{Ac^3d^4}{7} + \frac{6Bb^3d^2e^2}{7} + \frac{12Bb^2cd^3e}{7} + \frac{3Bbc^2d^4}{7}\right) + x^6\left(Ab^3d^2e^2 + 2Ab^2cd^3e + \frac{Abc^2d^4}{2} + \frac{2Bb^3d^3e}{3} + \frac{Bb^2cd^4}{2}\right) + x^5 \cdot \left(\frac{4Ab^3d^3e}{5} + \frac{3Ab^2cd^4}{5} + \frac{Bb^3d^4}{5}\right)$$

input
```
integrate((B*x+A)*(e*x+d)**4*(c*x**2+b*x)**3,x)
```

output
```
A*b**3*d**4*x**4/4 + B*c**3*e**4*x**12/12 + x**11*(A*c**3*e**4/11 + 3*B*b*
c**2*e**4/11 + 4*B*c**3*d*e**3/11) + x**10*(3*A*b*c**2*e**4/10 + 2*A*c**3*
d*e**3/5 + 3*B*b**2*c*e**4/10 + 6*B*b*c**2*d*e**3/5 + 3*B*c**3*d**2*e**2/5
) + x**9*(A*b**2*c*e**4/3 + 4*A*b*c**2*d*e**3/3 + 2*A*c**3*d**2*e**2/3 + B
*b**3*e**4/9 + 4*B*b**2*c*d*e**3/3 + 2*B*b*c**2*d**2*e**2 + 4*B*c**3*d**3*
e/9) + x**8*(A*b**3*e**4/8 + 3*A*b**2*c*d*e**3/2 + 9*A*b*c**2*d**2*e**2/4
+ A*c**3*d**3*e/2 + B*b**3*d*e**3/2 + 9*B*b**2*c*d**2*e**2/4 + 3*B*b*c**2*
d**3*e/2 + B*c**3*d**4/8) + x**7*(4*A*b**3*d*e**3/7 + 18*A*b**2*c*d**2*e**
2/7 + 12*A*b*c**2*d**3*e/7 + A*c**3*d**4/7 + 6*B*b**3*d**2*e**2/7 + 12*B*b
**2*c*d**3*e/7 + 3*B*b*c**2*d**4/7) + x**6*(A*b**3*d**2*e**2 + 2*A*b**2*c*
d**3*e + A*b*c**2*d**4/2 + 2*B*b**3*d**3*e/3 + B*b**2*c*d**4/2) + x**5*(4*
A*b**3*d**3*e/5 + 3*A*b**2*c*d**4/5 + B*b**3*d**4/5)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 428, normalized size of antiderivative = 1.04

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)^3\,dx$$
$$= \frac{1}{12}\,Bc^3e^4x^{12} + \frac{1}{4}\,Ab^3d^4x^4 + \frac{1}{11}\left(4\,Bc^3de^3 + \left(3\,Bbc^2 + Ac^3\right)e^4\right)x^{11}$$
$$+ \frac{1}{10}\left(6\,Bc^3d^2e^2 + 4\left(3\,Bbc^2 + Ac^3\right)de^3 + 3\left(Bb^2c + Abc^2\right)e^4\right)x^{10}$$
$$+ \frac{1}{9}\left(4\,Bc^3d^3e + 6\left(3\,Bbc^2 + Ac^3\right)d^2e^2 + 12\left(Bb^2c + Abc^2\right)de^3 + \left(Bb^3 + 3\,Ab^2c\right)e^4\right)x^9$$
$$+ \frac{1}{8}\left(Bc^3d^4 + Ab^3e^4 + 4\left(3\,Bbc^2 + Ac^3\right)d^3e + 18\left(Bb^2c + Abc^2\right)d^2e^2 + 4\left(Bb^3 + 3\,Ab^2c\right)de^3\right)x^8$$
$$+ \frac{1}{7}\left(4\,Ab^3de^3 + \left(3\,Bbc^2 + Ac^3\right)d^4 + 12\left(Bb^2c + Abc^2\right)d^3e + 6\left(Bb^3 + 3\,Ab^2c\right)d^2e^2\right)x^7$$
$$+ \frac{1}{6}\left(6\,Ab^3d^2e^2 + 3\left(Bb^2c + Abc^2\right)d^4 + 4\left(Bb^3 + 3\,Ab^2c\right)d^3e\right)x^6$$
$$+ \frac{1}{5}\left(4\,Ab^3d^3e + \left(Bb^3 + 3\,Ab^2c\right)d^4\right)x^5$$

input
```
integrate((B*x+A)*(e*x+d)^4*(c*x^2+b*x)^3,x, algorithm="maxima")
```

output
```
1/12*B*c^3*e^4*x^12 + 1/4*A*b^3*d^4*x^4 + 1/11*(4*B*c^3*d*e^3 + (3*B*b*c^2
 + A*c^3)*e^4)*x^11 + 1/10*(6*B*c^3*d^2*e^2 + 4*(3*B*b*c^2 + A*c^3)*d*e^3
+ 3*(B*b^2*c + A*b*c^2)*e^4)*x^10 + 1/9*(4*B*c^3*d^3*e + 6*(3*B*b*c^2 + A*
c^3)*d^2*e^2 + 12*(B*b^2*c + A*b*c^2)*d*e^3 + (B*b^3 + 3*A*b^2*c)*e^4)*x^9
 + 1/8*(B*c^3*d^4 + A*b^3*e^4 + 4*(3*B*b*c^2 + A*c^3)*d^3*e + 18*(B*b^2*c
+ A*b*c^2)*d^2*e^2 + 4*(B*b^3 + 3*A*b^2*c)*d*e^3)*x^8 + 1/7*(4*A*b^3*d*e^3
 + (3*B*b*c^2 + A*c^3)*d^4 + 12*(B*b^2*c + A*b*c^2)*d^3*e + 6*(B*b^3 + 3*A
*b^2*c)*d^2*e^2)*x^7 + 1/6*(6*A*b^3*d^2*e^2 + 3*(B*b^2*c + A*b*c^2)*d^4 +
4*(B*b^3 + 3*A*b^2*c)*d^3*e)*x^6 + 1/5*(4*A*b^3*d^3*e + (B*b^3 + 3*A*b^2*c
)*d^4)*x^5
```

Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 540, normalized size of antiderivative = 1.31

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)^3\,dx = \frac{1}{12}Bc^3e^4x^{12}+\frac{4}{11}Bc^3de^3x^{11}+\frac{3}{11}Bbc^2e^4x^{11}+\frac{1}{11}Ac^3e^4x^{11}+\frac{3}{5}Bc^3d^2e^2x^{10}+\frac{6}{5}Bbc^2de^3x^{10}+\frac{2}{5}Ac^3de^3x^{10}+\frac{3}{10}Bb^2ce^4x^{10}+\frac{3}{10}Abc^2e^4x^{10}+\frac{4}{9}Bc^3d^3ex^9+2\,Bbc^2d^2e^2x^9+\frac{2}{3}Ac^3d^2e^2x^9+\frac{4}{3}Bb^2cde^3x^9+\frac{4}{3}Abc^2de^3x^9+\frac{1}{9}Bb^3e^4x^9+\frac{1}{3}Ab^2ce^4x^9+\frac{1}{8}Bc^3d^4x^8+\frac{3}{2}Bbc^2d^3ex^8+\frac{1}{2}Ac^3d^3ex^8+\frac{9}{4}Bb^2cd^2e^2x^8+\frac{9}{4}Abc^2d^2e^2x^8+\frac{1}{2}Bb^3de^3x^8+\frac{3}{2}Ab^2cde^3x^8+\frac{1}{8}Ab^3e^4x^8+\frac{3}{7}Bbc^2d^4x^7+\frac{1}{7}Ac^3d^4x^7+\frac{12}{7}Bb^2cd^3ex^7+\frac{12}{7}Abc^2d^3ex^7+\frac{6}{7}Bb^3d^2e^2x^7+\frac{18}{7}Ab^2cd^2e^2x^7+\frac{4}{7}Ab^3de^3x^7+\frac{1}{2}Bb^2cd^4x^6+\frac{1}{2}Abc^2d^4x^6+\frac{2}{3}Bb^3d^3ex^6+2\,Ab^2cd^3ex^6+Ab^3d^2e^2x^6+\frac{1}{5}Bb^3d^4x^5+\frac{3}{5}Ab^2cd^4x^5+\frac{4}{5}Ab^3d^3ex^5+\frac{1}{4}Ab^3d^4x^4$$

input
```
integrate((B*x+A)*(e*x+d)^4*(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
1/12*B*c^3*e^4*x^12 + 4/11*B*c^3*d*e^3*x^11 + 3/11*B*b*c^2*e^4*x^11 + 1/11
*A*c^3*e^4*x^11 + 3/5*B*c^3*d^2*e^2*x^10 + 6/5*B*b*c^2*d*e^3*x^10 + 2/5*A*
c^3*d*e^3*x^10 + 3/10*B*b^2*c*e^4*x^10 + 3/10*A*b*c^2*e^4*x^10 + 4/9*B*c^3
*d^3*e*x^9 + 2*B*b*c^2*d^2*e^2*x^9 + 2/3*A*c^3*d^2*e^2*x^9 + 4/3*B*b^2*c*d
*e^3*x^9 + 4/3*A*b*c^2*d*e^3*x^9 + 1/9*B*b^3*e^4*x^9 + 1/3*A*b^2*c*e^4*x^9
 + 1/8*B*c^3*d^4*x^8 + 3/2*B*b*c^2*d^3*e*x^8 + 1/2*A*c^3*d^3*e*x^8 + 9/4*B
*b^2*c*d^2*e^2*x^8 + 9/4*A*b*c^2*d^2*e^2*x^8 + 1/2*B*b^3*d*e^3*x^8 + 3/2*A
*b^2*c*d*e^3*x^8 + 1/8*A*b^3*e^4*x^8 + 3/7*B*b*c^2*d^4*x^7 + 1/7*A*c^3*d^4
*x^7 + 12/7*B*b^2*c*d^3*e*x^7 + 12/7*A*b*c^2*d^3*e*x^7 + 6/7*B*b^3*d^2*e^2
*x^7 + 18/7*A*b^2*c*d^2*e^2*x^7 + 4/7*A*b^3*d*e^3*x^7 + 1/2*B*b^2*c*d^4*x^
6 + 1/2*A*b*c^2*d^4*x^6 + 2/3*B*b^3*d^3*e*x^6 + 2*A*b^2*c*d^3*e*x^6 + A*b^
3*d^2*e^2*x^6 + 1/5*B*b^3*d^4*x^5 + 3/5*A*b^2*c*d^4*x^5 + 4/5*A*b^3*d^3*e*
x^5 + 1/4*A*b^3*d^4*x^4
```

Mupad [B] (verification not implemented)

Time = 11.03 (sec) , antiderivative size = 445, normalized size of antiderivative = 1.08

$$\int (A+Bx)(d+ex)^4 \left(bx+cx^2\right)^3 \, dx = x^6 \left(\frac{2\,B\,b^3\,d^3\,e}{3}+A\,b^3\,d^2\,e^2+\frac{B\,b^2\,c\,d^4}{2}+2\,A\,b^2\,c\,d^3\,e+\frac{A\,b\,c^2\,d^4}{2}\right)+x^{10}\left(\frac{3\,B\,b^2\,c\,e^4}{10}+\frac{6\,B\,b\,c^2\,d\,e^3}{5}+\frac{3\,A\,b\,c^2\,e^4}{10}+\frac{3\,B\,c^3\,d^2\,e^2}{5}+\frac{2\,A\,c^3\,d\,e^3}{5}\right)+x^8\left(\frac{B\,b^3\,d\,e^3}{2}+\frac{A\,b^3\,e^4}{8}+\frac{9\,B\,b^2\,c\,d^2\,e^2}{4}+\frac{3\,A\,b^2\,c\,d\,e^3}{2}+\frac{3\,B\,b\,c^2\,d^3\,e}{2}+\frac{9\,A\,b\,c^2\,d^2\,e^2}{4}+\frac{B\,c^3\,d^4}{8}+\frac{A\,c^3\,d^3\,e}{2}\right)+x^7\left(\frac{6\,B\,b^3\,d^2\,e^2}{7}+\frac{4\,A\,b^3\,d\,e^3}{7}+\frac{12\,B\,b^2\,c\,d^3\,e}{7}+\frac{18\,A\,b^2\,c\,d^2\,e^2}{7}+\frac{3\,B\,b\,c^2\,d^4}{7}+\frac{12\,A\,b\,c^2\,d^3\,e}{7}+\frac{A\,c^3\,d^4}{7}\right)+x^9\left(\frac{B\,b^3\,e^4}{9}+\frac{4\,B\,b^2\,c\,d\,e^3}{3}+\frac{A\,b^2\,c\,e^4}{3}+2\,B\,b\,c^2\,d^2\,e^2+\frac{4\,A\,b\,c^2\,d\,e^3}{3}+\frac{4\,B\,c^3\,d^3\,e}{9}+\frac{2\,A\,c^3\,d^2\,e^2}{3}\right)+\frac{b^2\,d^3\,x^5\,(4\,A\,b\,e+3\,A\,c\,d+B\,b\,d)}{5}+\frac{c^2\,e^3\,x^{11}\,(A\,c\,e+3\,B\,b\,e+4\,B\,c\,d)}{11}+\frac{A\,b^3\,d^4\,x^4}{4}+\frac{B\,c^3\,e^4\,x^{12}}{12}$$

input
```
int((b*x + c*x^2)^3*(A + B*x)*(d + e*x)^4,x)
```

output
```
x^6*((A*b*c^2*d^4)/2 + (B*b^2*c*d^4)/2 + (2*B*b^3*d^3*e)/3 + A*b^3*d^2*e^2
 + 2*A*b^2*c*d^3*e) + x^10*((3*A*b*c^2*e^4)/10 + (3*B*b^2*c*e^4)/10 + (2*A
*c^3*d*e^3)/5 + (3*B*c^3*d^2*e^2)/5 + (6*B*b*c^2*d*e^3)/5) + x^8*((A*b^3*e
^4)/8 + (B*c^3*d^4)/8 + (A*c^3*d^3*e)/2 + (B*b^3*d*e^3)/2 + (9*A*b*c^2*d^2
*e^2)/4 + (9*B*b^2*c*d^2*e^2)/4 + (3*A*b^2*c*d*e^3)/2 + (3*B*b*c^2*d^3*e)/
2) + x^7*((A*c^3*d^4)/7 + (3*B*b*c^2*d^4)/7 + (4*A*b^3*d*e^3)/7 + (6*B*b^3
*d^2*e^2)/7 + (18*A*b^2*c*d^2*e^2)/7 + (12*A*b*c^2*d^3*e)/7 + (12*B*b^2*c*
d^3*e)/7) + x^9*((B*b^3*e^4)/9 + (A*b^2*c*e^4)/3 + (4*B*c^3*d^3*e)/9 + (2*
A*c^3*d^2*e^2)/3 + 2*B*b*c^2*d^2*e^2 + (4*A*b*c^2*d*e^3)/3 + (4*B*b^2*c*d*
e^3)/3) + (b^2*d^3*x^5*(4*A*b*e + 3*A*c*d + B*b*d))/5 + (c^2*e^3*x^11*(A*c
*e + 3*B*b*e + 4*B*c*d))/11 + (A*b^3*d^4*x^4)/4 + (B*c^3*e^4*x^12)/12
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 532, normalized size of antiderivative = 1.29

$$\int (A+Bx)(d+ex)^4\left(bx+cx^2\right)^3\,dx$$
$$=\frac{x^4(2310b\,c^3e^4x^8+2520a\,c^3e^4x^7+7560b^2c^2e^4x^7+10080b\,c^3d\,e^3x^7+8316ab\,c^2e^4x^6+11088a\,c^3d\,e^3x^6+8}{}$$

input
```
int((B*x+A)*(e*x+d)^4*(c*x^2+b*x)^3,x)
```

output
```
(x**4*(6930*a*b**3*d**4 + 22176*a*b**3*d**3*e*x + 27720*a*b**3*d**2*e**2*x
**2 + 15840*a*b**3*d*e**3*x**3 + 3465*a*b**3*e**4*x**4 + 16632*a*b**2*c*d*
*4*x + 55440*a*b**2*c*d**3*e*x**2 + 71280*a*b**2*c*d**2*e**2*x**3 + 41580*
a*b**2*c*d*e**3*x**4 + 9240*a*b**2*c*e**4*x**5 + 13860*a*b*c**2*d**4*x**2
+ 47520*a*b*c**2*d**3*e*x**3 + 62370*a*b*c**2*d**2*e**2*x**4 + 36960*a*b*c
**2*d*e**3*x**5 + 8316*a*b*c**2*e**4*x**6 + 3960*a*c**3*d**4*x**3 + 13860*
a*c**3*d**3*e*x**4 + 18480*a*c**3*d**2*e**2*x**5 + 11088*a*c**3*d*e**3*x**
6 + 2520*a*c**3*e**4*x**7 + 5544*b**4*d**4*x + 18480*b**4*d**3*e*x**2 + 23
760*b**4*d**2*e**2*x**3 + 13860*b**4*d*e**3*x**4 + 3080*b**4*e**4*x**5 + 1
3860*b**3*c*d**4*x**2 + 47520*b**3*c*d**3*e*x**3 + 62370*b**3*c*d**2*e**2*
x**4 + 36960*b**3*c*d*e**3*x**5 + 8316*b**3*c*e**4*x**6 + 11880*b**2*c**2*
d**4*x**3 + 41580*b**2*c**2*d**3*e*x**4 + 55440*b**2*c**2*d**2*e**2*x**5 +
 33264*b**2*c**2*d*e**3*x**6 + 7560*b**2*c**2*e**4*x**7 + 3465*b*c**3*d**4
*x**4 + 12320*b*c**3*d**3*e*x**5 + 16632*b*c**3*d**2*e**2*x**6 + 10080*b*c
**3*d*e**3*x**7 + 2310*b*c**3*e**4*x**8))/27720
```

3.23 $\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right)^3 \, dx$

Optimal result

Integrand size = 24, antiderivative size = 305

$$\begin{aligned}\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right)^3 \, dx &= \frac{1}{4}Ab^3d^3x^4+\frac{1}{5}b^2d^2(bBd+3Acd+3Abe)x^5 \\ &+\frac{1}{2}bd\left(Ac^2d^2+b^2e(Bd+Ae)+bcd(Bd+3Ae)\right)x^6 \\ &+\frac{1}{7}\left(Ac^3d^3+9b^2cde(Bd+Ae)+b^3e^2(3Bd+Ae)\right. \\ &\left.+3bc^2d^2(Bd+3Ae)\right)x^7 \\ &+\frac{1}{8}\left(3Ace\left(c^2d^2+3bcde+b^2e^2\right)\right. \\ &\left.+B\left(c^3d^3+9bc^2d^2e+9b^2cde^2+b^3e^3\right)\right)x^8 \\ &+\frac{1}{3}ce\left(Ace(cd+be)+B\left(c^2d^2+3bcde+b^2e^2\right)\right)x^9 \\ &+\frac{1}{10}c^2e^2(Ace+3B(cd+be))x^{10}+\frac{1}{11}Bc^3e^3x^{11}\end{aligned}$$

output

```
1/4*A*b^3*d^3*x^4+1/5*b^2*d^2*(3*A*b*e+3*A*c*d+B*b*d)*x^5+1/2*b*d*(A*c^2*d
^2+b^2*e*(A*e+B*d)+b*c*d*(3*A*e+B*d))*x^6+1/7*(A*c^3*d^3+9*b^2*c*d*e*(A*e+
B*d)+b^3*e^2*(A*e+3*B*d)+3*b*c^2*d^2*(3*A*e+B*d))*x^7+1/8*(3*A*c*e*(b^2*e^
2+3*b*c*d*e+c^2*d^2)+B*(b^3*e^3+9*b^2*c*d*e^2+9*b*c^2*d^2*e+c^3*d^3))*x^8+
1/3*c*e*(A*c*e*(b*e+c*d)+B*(b^2*e^2+3*b*c*d*e+c^2*d^2))*x^9+1/10*c^2*e^2*(
A*c*e+3*B*(b*e+c*d))*x^10+1/11*B*c^3*e^3*x^11
```

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 305, normalized size of antiderivative = 1.00

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^3\,dx=\frac{1}{4}Ab^3d^3x^4+\frac{1}{5}b^2d^2(bBd+3Acd+3Abe)x^5+\frac{1}{2}bd\left(Ac^2d^2+b^2e(Bd+Ae)+bcd(Bd+3Ae)\right)x^6+\frac{1}{7}\left(Ac^3d^3+9b^2cde(Bd+Ae)+b^3e^2(3Bd+Ae)+3bc^2d^2(Bd+3Ae)\right)x^7+\frac{1}{8}\left(3Ace\left(c^2d^2+3bcde+b^2e^2\right)+B\left(c^3d^3+9bc^2d^2e+9b^2cde^2+b^3e^3\right)\right)x^8+\frac{1}{3}ce\left(Ace(cd+be)+B\left(c^2d^2+3bcde+b^2e^2\right)\right)x^9+\frac{1}{10}c^2e^2(Ace+3B(cd+be))x^{10}+\frac{1}{11}Bc^3e^3x^{11}$$

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

output
```
(A*b^3*d^3*x^4)/4 + (b^2*d^2*(b*B*d + 3*A*c*d + 3*A*b*e)*x^5)/5 + (b*d*(A*
c^2*d^2 + b^2*e*(B*d + A*e) + b*c*d*(B*d + 3*A*e))*x^6)/2 + ((A*c^3*d^3 +
9*b^2*c*d*e*(B*d + A*e) + b^3*e^2*(3*B*d + A*e) + 3*b*c^2*d^2*(B*d + 3*A*e
))*x^7)/7 + ((3*A*c*e*(c^2*d^2 + 3*b*c*d*e + b^2*e^2) + B*(c^3*d^3 + 9*b*c
^2*d^2*e + 9*b^2*c*d*e^2 + b^3*e^3))*x^8)/8 + (c*e*(A*c*e*(c*d + b*e) + B*
(c^2*d^2 + 3*b*c*d*e + b^2*e^2))*x^9)/3 + (c^2*e^2*(A*c*e + 3*B*(c*d + b*e
))*x^10)/10 + (B*c^3*e^3*x^11)/11
```

Rubi [A] (verified)

Time = 1.11 (sec) , antiderivative size = 305, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^3(d+ex)^3\,dx$$

$$\Big\downarrow \ 1195$$

$$\int \left(Ab^3d^3x^3+3cex^8\left(Ace(be+cd)+B\left(b^2e^2+3bcde+c^2d^2\right)\right)+3bdx^5\left(b^2e(Ae+Bd)+bcd(3Ae+Bd)+Ac^2d\right.\right.$$

$$\Big\downarrow \ 2009$$

$$\frac{1}{4}Ab^3d^3x^4+\frac{1}{3}cex^9\left(Ace(be+cd)+B\left(b^2e^2+3bcde+c^2d^2\right)\right)+\frac{1}{2}bdx^6\left(b^2e(Ae+Bd)+bcd(3Ae+Bd)+Ac^2d^2\right)+\frac{1}{5}b^2d^2x^5(3Abe+3Acd+bBd)+\frac{1}{7}x^7\left(b^3e^2(Ae+3Bd)+9b^2cde(Ae+Bd)+3bc^2d^2(3Ae+Bd)+Ac^3d^3\right)+\frac{1}{8}x^8\left(3Ace\left(b^2e^2+3bcde+c^2d^2\right)+B\left(b^3e^3+9b^2cde^2+9bc^2d^2e+c^3d^3\right)\right)+\frac{1}{10}c^2e^2x^{10}(Ace+3B(be+cd))+\frac{1}{11}Bc^3e^3x^{11}$$

input

```
Int[(A + B*x)*(d + e*x)^3*(b*x + c*x^2)^3,x]
```

output

```
(A*b^3*d^3*x^4)/4 + (b^2*d^2*(b*B*d + 3*A*c*d + 3*A*b*e)*x^5)/5 + (b*d*(A*
c^2*d^2 + b^2*e*(B*d + A*e) + b*c*d*(B*d + 3*A*e))*x^6)/2 + ((A*c^3*d^3 +
9*b^2*c*d*e*(B*d + A*e) + b^3*e^2*(3*B*d + A*e) + 3*b*c^2*d^2*(B*d + 3*A*e
))*x^7)/7 + ((3*A*c*e*(c^2*d^2 + 3*b*c*d*e + b^2*e^2) + B*(c^3*d^3 + 9*b*c
^2*d^2*e + 9*b^2*c*d*e^2 + b^3*e^3))*x^8)/8 + (c*e*(A*c*e*(c*d + b*e) + B*
(c^2*d^2 + 3*b*c*d*e + b^2*e^2))*x^9)/3 + (c^2*e^2*(A*c*e + 3*B*(c*d + b*e
))*x^10)/10 + (B*c^3*e^3*x^11)/11
```

Defintions of rubi rules used

rule 1195

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

rule 2009

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

Maple [A] (verified)

Time = 0.61 (sec) , antiderivative size = 342, normalized size of antiderivative = 1.12

method	result
default	$\frac{B e^3 c^3 x^{11}}{11}+\frac{((A e^3+3Bd e^2)c^3+3B e^3 b c^2)x^{10}}{10}+\frac{((3Ad e^2+3eB d^2)c^3+3(A e^3+3Bd e^2)b c^2+3B e^3 b^2 c)x^9}{9}+\frac{((3A d^2$
norman	$\frac{B e^3 c^3 x^{11}}{11}+\left(\frac{1}{10}A c^3 e^3+\frac{3}{10}B e^3 b c^2+\frac{3}{10}B c^3 d e^2\right)x^{10}+\left(\frac{1}{3}Ab c^2 e^3+\frac{1}{3}A c^3 d e^2+\frac{1}{3}B e^3 b^2 c+\right.$
gosper	$x^4(840B e^3 c^3 x^7+924x^6 A c^3 e^3+2772x^6 B e^3 b c^2+2772x^6 B c^3 d e^2+3080x^5 Ab c^2 e^3+3080x^5 A c^3 d e^2+3080x^5 B e^3 b^2 c+9240x$
risch	$\frac{9}{7}x^7 A b^2 cd e^2+\frac{9}{7}x^7 Ab c^2 d^2 e+\frac{9}{7}x^7 b^2 Bc d^2 e+\frac{3}{2}x^6 A b^2 c d^2 e+\frac{3}{10}x^{10} B e^3 b c^2+\frac{3}{10}x^{10} B c^3 d e^2$
parallelrisch	$\frac{9}{7}x^7 A b^2 cd e^2+\frac{9}{7}x^7 Ab c^2 d^2 e+\frac{9}{7}x^7 b^2 Bc d^2 e+\frac{3}{2}x^6 A b^2 c d^2 e+\frac{3}{10}x^{10} B e^3 b c^2+\frac{3}{10}x^{10} B c^3 d e^2$
orering	$x(840B e^3 c^3 x^7+924x^6 A c^3 e^3+2772x^6 B e^3 b c^2+2772x^6 B c^3 d e^2+3080x^5 Ab c^2 e^3+3080x^5 A c^3 d e^2+3080x^5 B e^3 b^2 c+9240x^5$

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

output
```
1/11*B*e^3*c^3*x^11+1/10*((A*e^3+3*B*d*e^2)*c^3+3*B*e^3*b*c^2)*x^10+1/9*((
3*A*d*e^2+3*B*d^2*e)*c^3+3*(A*e^3+3*B*d*e^2)*b*c^2+3*B*e^3*b^2*c)*x^9+1/8*
((3*A*d^2*e+B*d^3)*c^3+3*(3*A*d*e^2+3*B*d^2*e)*b*c^2+3*(A*e^3+3*B*d*e^2)*b
^2*c+B*e^3*b^3)*x^8+1/7*(A*c^3*d^3+3*(3*A*d^2*e+B*d^3)*b*c^2+3*(3*A*d*e^2+
3*B*d^2*e)*b^2*c+(A*e^3+3*B*d*e^2)*b^3)*x^7+1/6*(3*A*d^3*b*c^2+3*(3*A*d^2*
e+B*d^3)*b^2*c+(3*A*d*e^2+3*B*d^2*e)*b^3)*x^6+1/5*(3*A*d^3*b^2*c+(3*A*d^2*
e+B*d^3)*b^3)*x^5+1/4*A*b^3*d^3*x^4
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.08

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^3\,dx$$
$$= \frac{1}{11}Bc^3e^3x^{11} + \frac{1}{4}Ab^3d^3x^4 + \frac{1}{10}\left(3\,Bc^3de^2 + \left(3\,Bbc^2 + Ac^3\right)e^3\right)x^{10}$$
$$+ \frac{1}{3}\left(Bc^3d^2e + \left(3\,Bbc^2 + Ac^3\right)de^2 + \left(Bb^2c + Abc^2\right)e^3\right)x^9$$
$$+ \frac{1}{8}\left(Bc^3d^3 + 3\left(3\,Bbc^2 + Ac^3\right)d^2e + 9\left(Bb^2c + Abc^2\right)de^2 + \left(Bb^3 + 3\,Ab^2c\right)e^3\right)x^8$$
$$+ \frac{1}{7}\left(Ab^3e^3 + \left(3\,Bbc^2 + Ac^3\right)d^3 + 9\left(Bb^2c + Abc^2\right)d^2e + 3\left(Bb^3 + 3\,Ab^2c\right)de^2\right)x^7$$
$$+ \frac{1}{2}\left(Ab^3de^2 + \left(Bb^2c + Abc^2\right)d^3 + \left(Bb^3 + 3\,Ab^2c\right)d^2e\right)x^6$$
$$+ \frac{1}{5}\left(3\,Ab^3d^2e + \left(Bb^3 + 3\,Ab^2c\right)d^3\right)x^5$$

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

output
```
1/11*B*c^3*e^3*x^11 + 1/4*A*b^3*d^3*x^4 + 1/10*(3*B*c^3*d*e^2 + (3*B*b*c^2
 + A*c^3)*e^3)*x^10 + 1/3*(B*c^3*d^2*e + (3*B*b*c^2 + A*c^3)*d*e^2 + (B*b^
2*c + A*b*c^2)*e^3)*x^9 + 1/8*(B*c^3*d^3 + 3*(3*B*b*c^2 + A*c^3)*d^2*e + 9
*(B*b^2*c + A*b*c^2)*d*e^2 + (B*b^3 + 3*A*b^2*c)*e^3)*x^8 + 1/7*(A*b^3*e^3
 + (3*B*b*c^2 + A*c^3)*d^3 + 9*(B*b^2*c + A*b*c^2)*d^2*e + 3*(B*b^3 + 3*A*
b^2*c)*d*e^2)*x^7 + 1/2*(A*b^3*d*e^2 + (B*b^2*c + A*b*c^2)*d^3 + (B*b^3 +
3*A*b^2*c)*d^2*e)*x^6 + 1/5*(3*A*b^3*d^2*e + (B*b^3 + 3*A*b^2*c)*d^3)*x^5
```

Sympy [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 430, normalized size of antiderivative = 1.41

$$\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^3\,dx = \frac{Ab^3d^3x^4}{4}+\frac{Bc^3e^3x^{11}}{11}+x^{10}\left(\frac{Ac^3e^3}{10}+\frac{3Bbc^2e^3}{10}+\frac{3Bc^3de^2}{10}\right)+x^9\left(\frac{Abc^2e^3}{3}+\frac{Ac^3de^2}{3}+\frac{Bb^2ce^3}{3}+Bbc^2de^2+\frac{Bc^3d^2e}{3}\right)+x^8\cdot\left(\frac{3Ab^2ce^3}{8}+\frac{9Abc^2de^2}{8}+\frac{3Ac^3d^2e}{8}+\frac{Bb^3e^3}{8}+\frac{9Bb^2cde^2}{8}+\frac{9Bbc^2d^2e}{8}+\frac{Bc^3d^3}{8}\right)+x^7\left(\frac{Ab^3e^3}{7}+\frac{9Ab^2cde^2}{7}+\frac{9Abc^2d^2e}{7}+\frac{Ac^3d^3}{7}+\frac{3Bb^3de^2}{7}+\frac{9Bb^2cd^2e}{7}+\frac{3Bbc^2d^3}{7}\right)+x^6\left(\frac{Ab^3de^2}{2}+\frac{3Ab^2cd^2e}{2}+\frac{Abc^2d^3}{2}+\frac{Bb^3d^2e}{2}+\frac{Bb^2cd^3}{2}\right)+x^5\cdot\left(\frac{3Ab^3d^2e}{5}+\frac{3Ab^2cd^3}{5}+\frac{Bb^3d^3}{5}\right)$$

input
```
integrate((B*x+A)*(e*x+d)**3*(c*x**2+b*x)**3,x)
```

output
```
A*b**3*d**3*x**4/4 + B*c**3*e**3*x**11/11 + x**10*(A*c**3*e**3/10 + 3*B*b*
c**2*e**3/10 + 3*B*c**3*d*e**2/10) + x**9*(A*b*c**2*e**3/3 + A*c**3*d*e**2
/3 + B*b**2*c*e**3/3 + B*b*c**2*d*e**2 + B*c**3*d**2*e/3) + x**8*(3*A*b**2
*c*e**3/8 + 9*A*b*c**2*d*e**2/8 + 3*A*c**3*d**2*e/8 + B*b**3*e**3/8 + 9*B*
b**2*c*d*e**2/8 + 9*B*b*c**2*d**2*e/8 + B*c**3*d**3/8) + x**7*(A*b**3*e**3
/7 + 9*A*b**2*c*d*e**2/7 + 9*A*b*c**2*d**2*e/7 + A*c**3*d**3/7 + 3*B*b**3*
d*e**2/7 + 9*B*b**2*c*d**2*e/7 + 3*B*b*c**2*d**3/7) + x**6*(A*b**3*d*e**2/
2 + 3*A*b**2*c*d**2*e/2 + A*b*c**2*d**3/2 + B*b**3*d**2*e/2 + B*b**2*c*d**
3/2) + x**5*(3*A*b**3*d**2*e/5 + 3*A*b**2*c*d**3/5 + B*b**3*d**3/5)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 329, normalized size of antiderivative = 1.08

$$\begin{aligned}\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^3\,dx &= \frac{1}{11}Bc^3e^3x^{11}+\frac{1}{4}Ab^3d^3x^4+\frac{1}{10}\left(3\,Bc^3de^2+\left(3\,Bbc^2+Ac^3\right)e^3\right)x^{10}\\ &+\frac{1}{3}\left(Bc^3d^2e+\left(3\,Bbc^2+Ac^3\right)de^2+\left(Bb^2c+Abc^2\right)e^3\right)x^9\\ &+\frac{1}{8}\left(Bc^3d^3+3\left(3\,Bbc^2+Ac^3\right)d^2e+9\left(Bb^2c+Abc^2\right)de^2+\left(Bb^3+3\,Ab^2c\right)e^3\right)x^8\\ &+\frac{1}{7}\left(Ab^3e^3+\left(3\,Bbc^2+Ac^3\right)d^3+9\left(Bb^2c+Abc^2\right)d^2e+3\left(Bb^3+3\,Ab^2c\right)de^2\right)x^7\\ &+\frac{1}{2}\left(Ab^3de^2+\left(Bb^2c+Abc^2\right)d^3+\left(Bb^3+3\,Ab^2c\right)d^2e\right)x^6\\ &+\frac{1}{5}\left(3\,Ab^3d^2e+\left(Bb^3+3\,Ab^2c\right)d^3\right)x^5\end{aligned}$$

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

output
```
1/11*B*c^3*e^3*x^11 + 1/4*A*b^3*d^3*x^4 + 1/10*(3*B*c^3*d*e^2 + (3*B*b*c^2
 + A*c^3)*e^3)*x^10 + 1/3*(B*c^3*d^2*e + (3*B*b*c^2 + A*c^3)*d*e^2 + (B*b^
2*c + A*b*c^2)*e^3)*x^9 + 1/8*(B*c^3*d^3 + 3*(3*B*b*c^2 + A*c^3)*d^2*e + 9
*(B*b^2*c + A*b*c^2)*d*e^2 + (B*b^3 + 3*A*b^2*c)*e^3)*x^8 + 1/7*(A*b^3*e^3
 + (3*B*b*c^2 + A*c^3)*d^3 + 9*(B*b^2*c + A*b*c^2)*d^2*e + 3*(B*b^3 + 3*A*
b^2*c)*d*e^2)*x^7 + 1/2*(A*b^3*d*e^2 + (B*b^2*c + A*b*c^2)*d^3 + (B*b^3 +
3*A*b^2*c)*d^2*e)*x^6 + 1/5*(3*A*b^3*d^2*e + (B*b^3 + 3*A*b^2*c)*d^3)*x^5
```

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 416, normalized size of antiderivative = 1.36

$$
\begin{aligned}
\int (A+Bx)(d+ex)^3\left(bx+cx^2\right)^3\,dx &= \frac{1}{11}Bc^3e^3x^{11}+\frac{3}{10}Bc^3de^2x^{10}+\frac{3}{10}Bbc^2e^3x^{10} \\
&+\frac{1}{10}Ac^3e^3x^{10}+\frac{1}{3}Bc^3d^2ex^9+Bbc^2de^2x^9 \\
&+\frac{1}{3}Ac^3de^2x^9+\frac{1}{3}Bb^2ce^3x^9+\frac{1}{3}Abc^2e^3x^9 \\
&+\frac{1}{8}Bc^3d^3x^8+\frac{9}{8}Bbc^2d^2ex^8+\frac{3}{8}Ac^3d^2ex^8 \\
&+\frac{9}{8}Bb^2cde^2x^8+\frac{9}{8}Abc^2de^2x^8 \\
&+\frac{1}{8}Bb^3e^3x^8+\frac{3}{8}Ab^2ce^3x^8+\frac{3}{7}Bbc^2d^3x^7 \\
&+\frac{1}{7}Ac^3d^3x^7+\frac{9}{7}Bb^2cd^2ex^7+\frac{9}{7}Abc^2d^2ex^7 \\
&+\frac{3}{7}Bb^3de^2x^7+\frac{9}{7}Ab^2cde^2x^7+\frac{1}{7}Ab^3e^3x^7 \\
&+\frac{1}{2}Bb^2cd^3x^6+\frac{1}{2}Abc^2d^3x^6+\frac{1}{2}Bb^3d^2ex^6 \\
&+\frac{3}{2}Ab^2cd^2ex^6+\frac{1}{2}Ab^3de^2x^6+\frac{1}{5}Bb^3d^3x^5 \\
&+\frac{3}{5}Ab^2cd^3x^5+\frac{3}{5}Ab^3d^2ex^5+\frac{1}{4}Ab^3d^3x^4
\end{aligned}
$$

input

```
integrate((B*x+A)*(e*x+d)^3*(c*x^2+b*x)^3,x, algorithm="giac")
```

output

```
1/11*B*c^3*e^3*x^11 + 3/10*B*c^3*d*e^2*x^10 + 3/10*B*b*c^2*e^3*x^10 + 1/10
*A*c^3*e^3*x^10 + 1/3*B*c^3*d^2*e*x^9 + B*b*c^2*d*e^2*x^9 + 1/3*A*c^3*d*e^
2*x^9 + 1/3*B*b^2*c*e^3*x^9 + 1/3*A*b*c^2*e^3*x^9 + 1/8*B*c^3*d^3*x^8 + 9/
8*B*b*c^2*d^2*e*x^8 + 3/8*A*c^3*d^2*e*x^8 + 9/8*B*b^2*c*d*e^2*x^8 + 9/8*A*
b*c^2*d*e^2*x^8 + 1/8*B*b^3*e^3*x^8 + 3/8*A*b^2*c*e^3*x^8 + 3/7*B*b*c^2*d^
3*x^7 + 1/7*A*c^3*d^3*x^7 + 9/7*B*b^2*c*d^2*e*x^7 + 9/7*A*b*c^2*d^2*e*x^7
+ 3/7*B*b^3*d*e^2*x^7 + 9/7*A*b^2*c*d*e^2*x^7 + 1/7*A*b^3*e^3*x^7 + 1/2*B*
b^2*c*d^3*x^6 + 1/2*A*b*c^2*d^3*x^6 + 1/2*B*b^3*d^2*e*x^6 + 3/2*A*b^2*c*d^
2*e*x^6 + 1/2*A*b^3*d*e^2*x^6 + 1/5*B*b^3*d^3*x^5 + 3/5*A*b^2*c*d^3*x^5 +
3/5*A*b^3*d^2*e*x^5 + 1/4*A*b^3*d^3*x^4
```

Mupad [B] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.11

$$\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right)^3 \, dx = x^6 \left(\frac{B\,b^3\,d^2\,e}{2}+\frac{A\,b^3\,d\,e^2}{2}+\frac{B\,b^2\,c\,d^3}{2}+\frac{3\,A\,b^2\,c\,d^2\,e}{2}+\frac{A\,b\,c^2\,d^3}{2}\right)+x^9\left(\frac{B\,b^2\,c\,e^3}{3}+B\,b\,c^2\,d\,e^2+\frac{A\,b\,c^2\,e^3}{3}+\frac{B\,c^3\,d^2\,e}{3}+\frac{A\,c^3\,d\,e^2}{3}\right)+x^7\left(\frac{3\,B\,b^3\,d\,e^2}{7}+\frac{A\,b^3\,e^3}{7}+\frac{9\,B\,b^2\,c\,d^2\,e}{7}+\frac{9\,A\,b^2\,c\,d\,e^2}{7}+\frac{3\,B\,b\,c^2\,d^3}{7}+\frac{9\,A\,b\,c^2\,d^2\,e}{7}+\frac{A\,c^3\,d^3}{7}\right)+x^8\left(\frac{B\,b^3\,e^3}{8}+\frac{9\,B\,b^2\,c\,d\,e^2}{8}+\frac{3\,A\,b^2\,c\,e^3}{8}+\frac{9\,B\,b\,c^2\,d^2\,e}{8}+\frac{9\,A\,b\,c^2\,d\,e^2}{8}+\frac{B\,c^3\,d^3}{8}+\frac{3\,A\,c^3\,d^2\,e}{8}\right)+\frac{b^2\,d^2\,x^5\,(3\,A\,b\,e+3\,A\,c\,d+B\,b\,d)}{5}+\frac{c^2\,e^2\,x^{10}\,(A\,c\,e+3\,B\,b\,e+3\,B\,c\,d)}{10}+\frac{A\,b^3\,d^3\,x^4}{4}+\frac{B\,c^3\,e^3\,x^{11}}{11}$$

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

output
```
x^6*((A*b*c^2*d^3)/2 + (B*b^2*c*d^3)/2 + (A*b^3*d*e^2)/2 + (B*b^3*d^2*e)/2
 + (3*A*b^2*c*d^2*e)/2) + x^9*((A*b*c^2*e^3)/3 + (B*b^2*c*e^3)/3 + (A*c^3*
d*e^2)/3 + (B*c^3*d^2*e)/3 + B*b*c^2*d*e^2) + x^7*((A*b^3*e^3)/7 + (A*c^3*
d^3)/7 + (3*B*b*c^2*d^3)/7 + (3*B*b^3*d*e^2)/7 + (9*A*b*c^2*d^2*e)/7 + (9*
A*b^2*c*d*e^2)/7 + (9*B*b^2*c*d^2*e)/7) + x^8*((B*b^3*e^3)/8 + (B*c^3*d^3)
/8 + (3*A*b^2*c*e^3)/8 + (3*A*c^3*d^2*e)/8 + (9*A*b*c^2*d*e^2)/8 + (9*B*b*
c^2*d^2*e)/8 + (9*B*b^2*c*d*e^2)/8) + (b^2*d^2*x^5*(3*A*b*e + 3*A*c*d + B*
b*d))/5 + (c^2*e^2*x^10*(A*c*e + 3*B*b*e + 3*B*c*d))/10 + (A*b^3*d^3*x^4)/
4 + (B*c^3*e^3*x^11)/11
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 409, normalized size of antiderivative = 1.34

$$\int (A+Bx)(d+ex)^3 \left(bx+cx^2\right)^3 \, dx$$
$$= \frac{x^4(840b\,c^3e^3x^7+924a\,c^3e^3x^6+2772b^2c^2e^3x^6+2772b\,c^3d\,e^2x^6+3080ab\,c^2e^3x^5+3080a\,c^3d\,e^2x^5+3080b}{}$$

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

output
```
(x**4*(2310*a*b**3*d**3 + 5544*a*b**3*d**2*e*x + 4620*a*b**3*d*e**2*x**2 +
 1320*a*b**3*e**3*x**3 + 5544*a*b**2*c*d**3*x + 13860*a*b**2*c*d**2*e*x**2
 + 11880*a*b**2*c*d*e**2*x**3 + 3465*a*b**2*c*e**3*x**4 + 4620*a*b*c**2*d*
*3*x**2 + 11880*a*b*c**2*d**2*e*x**3 + 10395*a*b*c**2*d*e**2*x**4 + 3080*a
*b*c**2*e**3*x**5 + 1320*a*c**3*d**3*x**3 + 3465*a*c**3*d**2*e*x**4 + 3080
*a*c**3*d*e**2*x**5 + 924*a*c**3*e**3*x**6 + 1848*b**4*d**3*x + 4620*b**4*
d**2*e*x**2 + 3960*b**4*d*e**2*x**3 + 1155*b**4*e**3*x**4 + 4620*b**3*c*d*
*3*x**2 + 11880*b**3*c*d**2*e*x**3 + 10395*b**3*c*d*e**2*x**4 + 3080*b**3*
c*e**3*x**5 + 3960*b**2*c**2*d**3*x**3 + 10395*b**2*c**2*d**2*e*x**4 + 924
0*b**2*c**2*d*e**2*x**5 + 2772*b**2*c**2*e**3*x**6 + 1155*b*c**3*d**3*x**4
 + 3080*b*c**3*d**2*e*x**5 + 2772*b*c**3*d*e**2*x**6 + 840*b*c**3*e**3*x**
7))/9240
```

3.24 $\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^3 \, dx$

Optimal result

Integrand size = 24, antiderivative size = 225

$$\begin{aligned}\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^3 \, dx &= \frac{1}{4}Ab^3d^2x^4+\frac{1}{5}b^2d(bBd+3Acd+2Abe)x^5 \\ &+\frac{1}{6}b\big(3Ac^2d^2+b^2e(2Bd+Ae) \\ &+3bcd(Bd+2Ae)\big)\,x^6 \\ &+\frac{1}{7}\big(Ac^3d^2+b^3Be^2+3b^2ce(2Bd+Ae) \\ &+3bc^2d(Bd+2Ae)\big)\,x^7+\frac{1}{8}c\big(Ace(2cd+3be) \\ &+B\left(c^2d^2+6bcde+3b^2e^2\right)\big)\,x^8 \\ &+\frac{1}{9}c^2e(2Bcd+3bBe+Ace)x^9+\frac{1}{10}Bc^3e^2x^{10}\end{aligned}$$

output
```
1/4*A*b^3*d^2*x^4+1/5*b^2*d*(2*A*b*e+3*A*c*d+B*b*d)*x^5+1/6*b*(3*A*c^2*d^2
+b^2*e*(A*e+2*B*d)+3*b*c*d*(2*A*e+B*d))*x^6+1/7*(A*c^3*d^2+b^3*B*e^2+3*b^2
*c*e*(A*e+2*B*d)+3*b*c^2*d*(2*A*e+B*d))*x^7+1/8*c*(A*c*e*(3*b*e+2*c*d)+B*(
3*b^2*e^2+6*b*c*d*e+c^2*d^2))*x^8+1/9*c^2*e*(A*c*e+3*B*b*e+2*B*c*d)*x^9+1/
10*B*c^3*e^2*x^10
```

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.00

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^3 \, dx = \frac{1}{4}Ab^3d^2x^4+\frac{1}{5}b^2d(bBd+3Acd+2Abe)x^5 + \frac{1}{6}b\left(3Ac^2d^2+b^2e(2Bd+Ae) + 3bcd(Bd+2Ae)\right)x^6 + \frac{1}{7}\left(Ac^3d^2+b^3Be^2+3b^2ce(2Bd+Ae) + 3bc^2d(Bd+2Ae)\right)x^7+\frac{1}{8}c\left(Ace(2cd+3be) + B\left(c^2d^2+6bcde+3b^2e^2\right)\right)x^8 + \frac{1}{9}c^2e(2Bcd+3bBe+Ace)x^9+\frac{1}{10}Bc^3e^2x^{10}$$

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

output
```
(A*b^3*d^2*x^4)/4 + (b^2*d*(b*B*d + 3*A*c*d + 2*A*b*e)*x^5)/5 + (b*(3*A*c^
2*d^2 + b^2*e*(2*B*d + A*e) + 3*b*c*d*(B*d + 2*A*e))*x^6)/6 + ((A*c^3*d^2
+ b^3*B*e^2 + 3*b^2*c*e*(2*B*d + A*e) + 3*b*c^2*d*(B*d + 2*A*e))*x^7)/7 +
(c*(A*c*e*(2*c*d + 3*b*e) + B*(c^2*d^2 + 6*b*c*d*e + 3*b^2*e^2))*x^8)/8 +
(c^2*e*(2*B*c*d + 3*b*B*e + A*c*e)*x^9)/9 + (B*c^3*e^2*x^10)/10
```

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^3(d+ex)^2dx$$

$$\Big\downarrow \text{ 1195}$$

$$\int \left(Ab^3d^2x^3 + cx^7\left(Ace(3be+2cd) + B\left(3b^2e^2+6bcde+c^2d^2\right)\right) + bx^5\left(b^2e(Ae+2Bd) + 3bcd(2Ae+Bd) + 3Ac\right.\right.$$

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

$$\frac{1}{4}Ab^3d^2x^4 + \frac{1}{8}cx^8\left(Ace(3be+2cd) + B\left(3b^2e^2+6bcde+c^2d^2\right)\right) + \frac{1}{6}bx^6\left(b^2e(Ae+2Bd) + 3bcd(2Ae+Bd) + 3Ac^2d^2\right) + \frac{1}{5}b^2dx^5(2Abe+3Acd+bBd) + \frac{1}{7}x^7\left(3b^2ce(Ae+2Bd) + 3bc^2d(2Ae+Bd) + Ac^3d^2 + b^3Be^2\right) + \frac{1}{9}c^2ex^9(Ace+3bBe+2Bcd) + \frac{1}{10}Bc^3e^2x^{10}$$

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

output
```
(A*b^3*d^2*x^4)/4 + (b^2*d*(b*B*d + 3*A*c*d + 2*A*b*e)*x^5)/5 + (b*(3*A*c^
2*d^2 + b^2*e*(2*B*d + A*e) + 3*b*c*d*(B*d + 2*A*e))*x^6)/6 + ((A*c^3*d^2
+ b^3*B*e^2 + 3*b^2*c*e*(2*B*d + A*e) + 3*b*c^2*d*(B*d + 2*A*e))*x^7)/7 +
(c*(A*c*e*(2*c*d + 3*b*e) + B*(c^2*d^2 + 6*b*c*d*e + 3*b^2*e^2))*x^8)/8 +
(c^2*e*(2*B*c*d + 3*b*B*e + A*c*e)*x^9)/9 + (B*c^3*e^2*x^10)/10
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.66 (sec) , antiderivative size = 240, normalized size of antiderivative = 1.07

method	result
default	$\frac{B\,e^{2} c^{3} x^{10}}{10}+\frac{\left(\left(A\,e^{2}+2 B d e\right) c^{3}+3 B\,e^{2} b\,c^{2}\right) x^{9}}{9}+\frac{\left(\left(2 A d e+B\,d^{2}\right) c^{3}+3 \left(A\,e^{2}+2 B d e\right) b\,c^{2}+3 B\,e^{2} b^{2} c\right) x^{8}}{8}+\left(A\,c^{3} d^{2}+3 (2 A d\right.$
norman	$\frac{B\,e^{2} c^{3} x^{10}}{10}+\left(\frac{1}{9} A\,c^{3} e^{2}+\frac{1}{3} B\,e^{2} b\,c^{2}+\frac{2}{9} B\,c^{3} d e\right) x^{9}+\left(\frac{3}{8} A b\,c^{2} e^{2}+\frac{1}{4} A\,c^{3} d e+\frac{3}{8} B\,e^{2} b^{2} c+\frac{3}{4} B b\,c^{2}\right.$
gosper	$x^{4} \left(252 B\,e^{2} c^{3} x^{6}+280 x^{5} A\,c^{3} e^{2}+840 x^{5} B\,e^{2} b\,c^{2}+560 x^{5} B\,c^{3} d e+945 x^{4} A b\,c^{2} e^{2}+630 x^{4} A\,c^{3} d e+945 x^{4} B\,e^{2} b^{2} c+1890 x^{4} B b\,c^{2} d e\right.$
risch	$\frac{1}{10} B\,e^{2} c^{3} x^{10}+\frac{1}{9} x^{9} A\,c^{3} e^{2}+\frac{1}{3} x^{9} B\,e^{2} b\,c^{2}+\frac{2}{9} x^{9} B\,c^{3} d e+\frac{3}{8} x^{8} A b\,c^{2} e^{2}+\frac{1}{4} x^{8} A\,c^{3} d e+\frac{3}{8} x^{8} B\,e^{2}$
parallelrisch	$\frac{1}{10} B\,e^{2} c^{3} x^{10}+\frac{1}{9} x^{9} A\,c^{3} e^{2}+\frac{1}{3} x^{9} B\,e^{2} b\,c^{2}+\frac{2}{9} x^{9} B\,c^{3} d e+\frac{3}{8} x^{8} A b\,c^{2} e^{2}+\frac{1}{4} x^{8} A\,c^{3} d e+\frac{3}{8} x^{8} B\,e^{2}$
orering	$x \left(252 B\,e^{2} c^{3} x^{6}+280 x^{5} A\,c^{3} e^{2}+840 x^{5} B\,e^{2} b\,c^{2}+560 x^{5} B\,c^{3} d e+945 x^{4} A b\,c^{2} e^{2}+630 x^{4} A\,c^{3} d e+945 x^{4} B\,e^{2} b^{2} c+1890 x^{4} B b\,c^{2} d e+\right.$

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

output
```
1/10*B*e^2*c^3*x^10+1/9*((A*e^2+2*B*d*e)*c^3+3*B*e^2*b*c^2)*x^9+1/8*((2*A*
d*e+B*d^2)*c^3+3*(A*e^2+2*B*d*e)*b*c^2+3*B*e^2*b^2*c)*x^8+1/7*(A*c^3*d^2+3
*(2*A*d*e+B*d^2)*b*c^2+3*(A*e^2+2*B*d*e)*b^2*c+b^3*B*e^2)*x^7+1/6*(3*A*d^2
*b*c^2+3*(2*A*d*e+B*d^2)*b^2*c+(A*e^2+2*B*d*e)*b^3)*x^6+1/5*(3*A*d^2*b^2*c
+(2*A*d*e+B*d^2)*b^3)*x^5+1/4*A*b^3*d^2*x^4
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 242, normalized size of antiderivative = 1.08

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^3 \, dx$$
$$= \frac{1}{10} Bc^3e^2x^{10} + \frac{1}{4} Ab^3d^2x^4 + \frac{1}{9} \left(2 Bc^3de + \left(3 Bbc^2 + Ac^3\right)e^2\right)x^9$$
$$+ \frac{1}{8} \left(Bc^3d^2 + 2\left(3 Bbc^2 + Ac^3\right)de + 3\left(Bb^2c + Abc^2\right)e^2\right)x^8$$
$$+ \frac{1}{7} \left(\left(3 Bbc^2 + Ac^3\right)d^2 + 6\left(Bb^2c + Abc^2\right)de + \left(Bb^3 + 3 Ab^2c\right)e^2\right)x^7$$
$$+ \frac{1}{6} \left(Ab^3e^2 + 3\left(Bb^2c + Abc^2\right)d^2 + 2\left(Bb^3 + 3 Ab^2c\right)de\right)x^6$$
$$+ \frac{1}{5} \left(2 Ab^3de + \left(Bb^3 + 3 Ab^2c\right)d^2\right)x^5$$

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

output
```
1/10*B*c^3*e^2*x^10 + 1/4*A*b^3*d^2*x^4 + 1/9*(2*B*c^3*d*e + (3*B*b*c^2 +
A*c^3)*e^2)*x^9 + 1/8*(B*c^3*d^2 + 2*(3*B*b*c^2 + A*c^3)*d*e + 3*(B*b^2*c
+ A*b*c^2)*e^2)*x^8 + 1/7*((3*B*b*c^2 + A*c^3)*d^2 + 6*(B*b^2*c + A*b*c^2)
*d*e + (B*b^3 + 3*A*b^2*c)*e^2)*x^7 + 1/6*(A*b^3*e^2 + 3*(B*b^2*c + A*b*c^
2)*d^2 + 2*(B*b^3 + 3*A*b^2*c)*d*e)*x^6 + 1/5*(2*A*b^3*d*e + (B*b^3 + 3*A*
b^2*c)*d^2)*x^5
```

Sympy [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 303, normalized size of antiderivative = 1.35

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^3\,dx=\frac{Ab^3d^2x^4}{4}+\frac{Bc^3e^2x^{10}}{10}+x^9\left(\frac{Ac^3e^2}{9}+\frac{Bbc^2e^2}{3}+\frac{2Bc^3de}{9}\right)+x^8\cdot\left(\frac{3Abc^2e^2}{8}+\frac{Ac^3de}{4}+\frac{3Bb^2ce^2}{8}+\frac{3Bbc^2de}{4}+\frac{Bc^3d^2}{8}\right)+x^7\cdot\left(\frac{3Ab^2ce^2}{7}+\frac{6Abc^2de}{7}+\frac{Ac^3d^2}{7}+\frac{Bb^3e^2}{7}+\frac{6Bb^2cde}{7}+\frac{3Bbc^2d^2}{7}\right)+x^6\left(\frac{Ab^3e^2}{6}+Ab^2cde+\frac{Abc^2d^2}{2}+\frac{Bb^3de}{3}+\frac{Bb^2cd^2}{2}\right)+x^5\cdot\left(\frac{2Ab^3de}{5}+\frac{3Ab^2cd^2}{5}+\frac{Bb^3d^2}{5}\right)$$

input
```
integrate((B*x+A)*(e*x+d)**2*(c*x**2+b*x)**3,x)
```

output
```
A*b**3*d**2*x**4/4 + B*c**3*e**2*x**10/10 + x**9*(A*c**3*e**2/9 + B*b*c**2
*e**2/3 + 2*B*c**3*d*e/9) + x**8*(3*A*b*c**2*e**2/8 + A*c**3*d*e/4 + 3*B*b
**2*c*e**2/8 + 3*B*b*c**2*d*e/4 + B*c**3*d**2/8) + x**7*(3*A*b**2*c*e**2/7
 + 6*A*b*c**2*d*e/7 + A*c**3*d**2/7 + B*b**3*e**2/7 + 6*B*b**2*c*d*e/7 + 3
*B*b*c**2*d**2/7) + x**6*(A*b**3*e**2/6 + A*b**2*c*d*e + A*b*c**2*d**2/2 +
 B*b**3*d*e/3 + B*b**2*c*d**2/2) + x**5*(2*A*b**3*d*e/5 + 3*A*b**2*c*d**2/
5 + B*b**3*d**2/5)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 242, normalized size of antiderivative = 1.08

$$\begin{aligned}\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^3\,dx &= \frac{1}{10}\,Bc^3e^2x^{10} + \frac{1}{4}\,Ab^3d^2x^4 + \frac{1}{9}\left(2\,Bc^3de + \left(3\,Bbc^2 + Ac^3\right)e^2\right)x^9\\ &\quad + \frac{1}{8}\left(Bc^3d^2 + 2\left(3\,Bbc^2 + Ac^3\right)de + 3\left(Bb^2c + Abc^2\right)e^2\right)x^8\\ &\quad + \frac{1}{7}\left(\left(3\,Bbc^2 + Ac^3\right)d^2 + 6\left(Bb^2c + Abc^2\right)de + \left(Bb^3 + 3\,Ab^2c\right)e^2\right)x^7\\ &\quad + \frac{1}{6}\left(Ab^3e^2 + 3\left(Bb^2c + Abc^2\right)d^2 + 2\left(Bb^3 + 3\,Ab^2c\right)de\right)x^6\\ &\quad + \frac{1}{5}\left(2\,Ab^3de + \left(Bb^3 + 3\,Ab^2c\right)d^2\right)x^5\end{aligned}$$

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

output
```
1/10*B*c^3*e^2*x^10 + 1/4*A*b^3*d^2*x^4 + 1/9*(2*B*c^3*d*e + (3*B*b*c^2 +
A*c^3)*e^2)*x^9 + 1/8*(B*c^3*d^2 + 2*(3*B*b*c^2 + A*c^3)*d*e + 3*(B*b^2*c
+ A*b*c^2)*e^2)*x^8 + 1/7*((3*B*b*c^2 + A*c^3)*d^2 + 6*(B*b^2*c + A*b*c^2)
*d*e + (B*b^3 + 3*A*b^2*c)*e^2)*x^7 + 1/6*(A*b^3*e^2 + 3*(B*b^2*c + A*b*c^
2)*d^2 + 2*(B*b^3 + 3*A*b^2*c)*d*e)*x^6 + 1/5*(2*A*b^3*d*e + (B*b^3 + 3*A*
b^2*c)*d^2)*x^5
```

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 292, normalized size of antiderivative = 1.30

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^3\,dx = \frac{1}{10}Bc^3e^2x^{10}+\frac{2}{9}Bc^3dex^9+\frac{1}{3}Bbc^2e^2x^9+\frac{1}{9}Ac^3e^2x^9+\frac{1}{8}Bc^3d^2x^8+\frac{3}{4}Bbc^2dex^8+\frac{1}{4}Ac^3dex^8+\frac{3}{8}Bb^2ce^2x^8+\frac{3}{8}Abc^2e^2x^8+\frac{3}{7}Bbc^2d^2x^7+\frac{1}{7}Ac^3d^2x^7+\frac{6}{7}Bb^2cdex^7+\frac{6}{7}Abc^2dex^7+\frac{1}{7}Bb^3e^2x^7+\frac{3}{7}Ab^2ce^2x^7+\frac{1}{2}Bb^2cd^2x^6+\frac{1}{2}Abc^2d^2x^6+\frac{1}{3}Bb^3dex^6+Ab^2cdex^6+\frac{1}{6}Ab^3e^2x^6+\frac{1}{5}Bb^3d^2x^5+\frac{3}{5}Ab^2cd^2x^5+\frac{2}{5}Ab^3dex^5+\frac{1}{4}Ab^3d^2x^4$$

input

```
integrate((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^3,x, algorithm="giac")
```

output

```
1/10*B*c^3*e^2*x^10 + 2/9*B*c^3*d*e*x^9 + 1/3*B*b*c^2*e^2*x^9 + 1/9*A*c^3*
e^2*x^9 + 1/8*B*c^3*d^2*x^8 + 3/4*B*b*c^2*d*e*x^8 + 1/4*A*c^3*d*e*x^8 + 3/
8*B*b^2*c*e^2*x^8 + 3/8*A*b*c^2*e^2*x^8 + 3/7*B*b*c^2*d^2*x^7 + 1/7*A*c^3*
d^2*x^7 + 6/7*B*b^2*c*d*e*x^7 + 6/7*A*b*c^2*d*e*x^7 + 1/7*B*b^3*e^2*x^7 +
3/7*A*b^2*c*e^2*x^7 + 1/2*B*b^2*c*d^2*x^6 + 1/2*A*b*c^2*d^2*x^6 + 1/3*B*b^
3*d*e*x^6 + A*b^2*c*d*e*x^6 + 1/6*A*b^3*e^2*x^6 + 1/5*B*b^3*d^2*x^5 + 3/5*
A*b^2*c*d^2*x^5 + 2/5*A*b^3*d*e*x^5 + 1/4*A*b^3*d^2*x^4
```

Mupad [B] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.04

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^3\,dx = x^7\left(\frac{B\,b^3\,e^2}{7}+\frac{6\,B\,b^2\,c\,d\,e}{7}+\frac{3\,A\,b^2\,c\,e^2}{7}+\frac{3\,B\,b\,c^2\,d^2}{7}+\frac{6\,A\,b\,c^2\,d\,e}{7}+\frac{A\,c^3\,d^2}{7}\right)+x^6\left(\frac{B\,b^3\,d\,e}{3}+\frac{A\,b^3\,e^2}{6}+\frac{B\,b^2\,c\,d^2}{2}+A\,b^2\,c\,d\,e+\frac{A\,b\,c^2\,d^2}{2}\right)+x^8\left(\frac{3\,B\,b^2\,c\,e^2}{8}+\frac{3\,B\,b\,c^2\,d\,e}{4}+\frac{3\,A\,b\,c^2\,e^2}{8}+\frac{B\,c^3\,d^2}{8}+\frac{A\,c^3\,d\,e}{4}\right)+\frac{b^2\,d\,x^5\,(2\,A\,b\,e+3\,A\,c\,d+B\,b\,d)}{5}+\frac{c^2\,e\,x^9\,(A\,c\,e+3\,B\,b\,e+2\,B\,c\,d)}{9}+\frac{A\,b^3\,d^2\,x^4}{4}+\frac{B\,c^3\,e^2\,x^{10}}{10}$$

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

output
```
x^7*((A*c^3*d^2)/7 + (B*b^3*e^2)/7 + (3*A*b^2*c*e^2)/7 + (3*B*b*c^2*d^2)/7
 + (6*A*b*c^2*d*e)/7 + (6*B*b^2*c*d*e)/7) + x^6*((A*b^3*e^2)/6 + (B*b^3*d*
e)/3 + (A*b*c^2*d^2)/2 + (B*b^2*c*d^2)/2 + A*b^2*c*d*e) + x^8*((B*c^3*d^2)
/8 + (A*c^3*d*e)/4 + (3*A*b*c^2*e^2)/8 + (3*B*b^2*c*e^2)/8 + (3*B*b*c^2*d*
e)/4) + (b^2*d*x^5*(2*A*b*e + 3*A*c*d + B*b*d))/5 + (c^2*e*x^9*(A*c*e + 3*
B*b*e + 2*B*c*d))/9 + (A*b^3*d^2*x^4)/4 + (B*c^3*e^2*x^10)/10
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 286, normalized size of antiderivative = 1.27

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^3\,dx$$
$$= \frac{x^4(252b\,c^3e^2x^6+280a\,c^3e^2x^5+840b^2c^2e^2x^5+560b\,c^3de\,x^5+945ab\,c^2e^2x^4+630a\,c^3de\,x^4+945b^3c\,e^2x^4}{}$$

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

output
```
(x**4*(630*a*b**3*d**2 + 1008*a*b**3*d*e*x + 420*a*b**3*e**2*x**2 + 1512*a
*b**2*c*d**2*x + 2520*a*b**2*c*d*e*x**2 + 1080*a*b**2*c*e**2*x**3 + 1260*a
*b*c**2*d**2*x**2 + 2160*a*b*c**2*d*e*x**3 + 945*a*b*c**2*e**2*x**4 + 360*
a*c**3*d**2*x**3 + 630*a*c**3*d*e*x**4 + 280*a*c**3*e**2*x**5 + 504*b**4*d
**2*x + 840*b**4*d*e*x**2 + 360*b**4*e**2*x**3 + 1260*b**3*c*d**2*x**2 + 2
160*b**3*c*d*e*x**3 + 945*b**3*c*e**2*x**4 + 1080*b**2*c**2*d**2*x**3 + 18
90*b**2*c**2*d*e*x**4 + 840*b**2*c**2*e**2*x**5 + 315*b*c**3*d**2*x**4 + 5
60*b*c**3*d*e*x**5 + 252*b*c**3*e**2*x**6))/2520
```

3.25 $\int (A+Bx)(d+ex)\left(bx+cx^2\right)^3\,dx$

Optimal result

Integrand size = 22, antiderivative size = 139

$$\begin{aligned}\int (A+Bx)(d+ex)\left(bx+cx^2\right)^3\,dx &= \frac{1}{4}Ab^3dx^4+\frac{1}{5}b^2(bBd+3Acd+Abe)x^5\\ &\quad+\frac{1}{6}b\left(3Ac^2d+b^2Be+3bc(Bd+Ae)\right)x^6\\ &\quad+\frac{1}{7}c\left(Ac^2d+3b^2Be+3bc(Bd+Ae)\right)x^7\\ &\quad+\frac{1}{8}c^2(Bcd+3bBe+Ace)x^8+\frac{1}{9}Bc^3ex^9\end{aligned}$$

output
```
1/4*A*b^3*d*x^4+1/5*b^2*(A*b*e+3*A*c*d+B*b*d)*x^5+1/6*b*(3*A*c^2*d+b^2*B*e
+3*b*c*(A*e+B*d))*x^6+1/7*c*(A*c^2*d+3*b^2*B*e+3*b*c*(A*e+B*d))*x^7+1/8*c^
2*(A*c*e+3*B*b*e+B*c*d)*x^8+1/9*B*c^3*e*x^9
```

Mathematica [A] (verified)

Time = 0.06 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.01

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^3\,dx=\frac{1}{4}Ab^3dx^4+\frac{1}{5}b^2(bBd+3Acd+Abe)x^5+\frac{1}{6}b\left(3bBcd+3Ac^2d+b^2Be+3Abce\right)x^6+\frac{1}{7}c\left(3bBcd+Ac^2d+3b^2Be+3Abce\right)x^7+\frac{1}{8}c^2(Bcd+3bBe+Ace)x^8+\frac{1}{9}Bc^3ex^9$$

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

output
```
(A*b^3*d*x^4)/4 + (b^2*(b*B*d + 3*A*c*d + A*b*e)*x^5)/5 + (b*(3*b*B*c*d +
3*A*c^2*d + b^2*B*e + 3*A*b*c*e)*x^6)/6 + (c*(3*b*B*c*d + A*c^2*d + 3*b^2*
B*e + 3*A*b*c*e)*x^7)/7 + (c^2*(B*c*d + 3*b*B*e + A*c*e)*x^8)/8 + (B*c^3*e
*x^9)/9
```

Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^3(d+ex)\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(Ab^3dx^3+cx^6\left(3bc(Ae+Bd)+Ac^2d+3b^2Be\right)+bx^5\left(3bc(Ae+Bd)+3Ac^2d+b^2Be\right)+b^2x^4(Abe+3Acd+$$

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

$$\frac{1}{4}Ab^3dx^4+\frac{1}{7}cx^7\left(3bc(Ae+Bd)+Ac^2d+3b^2Be\right)+\frac{1}{6}bx^6\left(3bc(Ae+Bd)+3Ac^2d+b^2Be\right)+\frac{1}{5}b^2x^5(Abe+3Acd+bBd)+\frac{1}{8}c^2x^8(Ace+3bBe+Bcd)+\frac{1}{9}Bc^3ex^9$$

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

output
```
(A*b^3*d*x^4)/4 + (b^2*(b*B*d + 3*A*c*d + A*b*e)*x^5)/5 + (b*(3*A*c^2*d +
b^2*B*e + 3*b*c*(B*d + A*e))*x^6)/6 + (c*(A*c^2*d + 3*b^2*B*e + 3*b*c*(B*d
 + A*e))*x^7)/7 + (c^2*(B*c*d + 3*b*B*e + A*c*e)*x^8)/8 + (B*c^3*e*x^9)/9
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.64 (sec) , antiderivative size = 138, normalized size of antiderivative = 0.99

method	result
default	$\frac{B\,c^3e\,x^9}{9}+\frac{\left((Ae+Bd)c^3+3Beb\,c^2\right)x^8}{8}+\frac{\left(A\,c^3d+3(Ae+Bd)b\,c^2+3Be\,b^2c\right)x^7}{7}+\frac{\left(3Ab\,c^2d+3(Ae+Bd)b^2c+Be\,b^3\right)x^6}{6}+$
norman	$\frac{B\,c^3e\,x^9}{9}+\left(\frac{1}{8}A\,c^3e+\frac{3}{8}Beb\,c^2+\frac{1}{8}B\,c^3d\right)x^8+\left(\frac{3}{7}Ab\,c^2e+\frac{1}{7}A\,c^3d+\frac{3}{7}Be\,b^2c+\frac{3}{7}Bb\,c^2d\right)x^7+$
gosper	$\frac{x^4\left(280B\,c^3e\,x^5+315x^4A\,c^3e+945x^4Beb\,c^2+315x^4B\,c^3d+1080x^3Ab\,c^2e+360x^3A\,c^3d+1080x^3Be\,b^2c+1080x^3Bb\,c^2d+1260\right.}{2520}$
risch	$\frac{1}{9}B\,c^3e\,x^9+\frac{1}{8}x^8A\,c^3e+\frac{3}{8}x^8Beb\,c^2+\frac{1}{8}x^8B\,c^3d+\frac{3}{7}x^7Ab\,c^2e+\frac{1}{7}x^7A\,c^3d+\frac{3}{7}x^7Be\,b^2c+\frac{3}{7}x^7$
parallelrisch	$\frac{1}{9}B\,c^3e\,x^9+\frac{1}{8}x^8A\,c^3e+\frac{3}{8}x^8Beb\,c^2+\frac{1}{8}x^8B\,c^3d+\frac{3}{7}x^7Ab\,c^2e+\frac{1}{7}x^7A\,c^3d+\frac{3}{7}x^7Be\,b^2c+\frac{3}{7}x^7$
orering	$\frac{x\left(280B\,c^3e\,x^5+315x^4A\,c^3e+945x^4Beb\,c^2+315x^4B\,c^3d+1080x^3Ab\,c^2e+360x^3A\,c^3d+1080x^3Be\,b^2c+1080x^3Bb\,c^2d+1260x\right.}{2520(cx+b}$

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

output
```
1/9*B*c^3*e*x^9+1/8*((A*e+B*d)*c^3+3*B*e*b*c^2)*x^8+1/7*(A*c^3*d+3*(A*e+B*
d)*b*c^2+3*B*e*b^2*c)*x^7+1/6*(3*A*b*c^2*d+3*(A*e+B*d)*b^2*c+B*e*b^3)*x^6+
1/5*(3*A*b^2*c*d+(A*e+B*d)*b^3)*x^5+1/4*A*b^3*d*x^4
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.07

$$\begin{aligned}\int(A+Bx)(d+ex)\left(bx+cx^2\right)^3\,dx=&\ \frac{1}{9}\,Bc^3ex^9+\frac{1}{4}\,Ab^3dx^4\\&+\frac{1}{8}\left(Bc^3d+\left(3\,Bbc^2+Ac^3\right)e\right)x^8\\&+\frac{1}{7}\left(\left(3\,Bbc^2+Ac^3\right)d+3\left(Bb^2c+Abc^2\right)e\right)x^7\\&+\frac{1}{6}\left(3\left(Bb^2c+Abc^2\right)d+\left(Bb^3+3\,Ab^2c\right)e\right)x^6\\&+\frac{1}{5}\left(Ab^3e+\left(Bb^3+3\,Ab^2c\right)d\right)x^5\end{aligned}$$

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

output
```
1/9*B*c^3*e*x^9 + 1/4*A*b^3*d*x^4 + 1/8*(B*c^3*d + (3*B*b*c^2 + A*c^3)*e)*
x^8 + 1/7*((3*B*b*c^2 + A*c^3)*d + 3*(B*b^2*c + A*b*c^2)*e)*x^7 + 1/6*(3*(
B*b^2*c + A*b*c^2)*d + (B*b^3 + 3*A*b^2*c)*e)*x^6 + 1/5*(A*b^3*e + (B*b^3
+ 3*A*b^2*c)*d)*x^5
```

Sympy [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 177, normalized size of antiderivative = 1.27

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^3\,dx = \frac{Ab^3dx^4}{4}+\frac{Bc^3ex^9}{9}+x^8\left(\frac{Ac^3e}{8}+\frac{3Bbc^2e}{8}+\frac{Bc^3d}{8}\right)+x^7\cdot\left(\frac{3Abc^2e}{7}+\frac{Ac^3d}{7}+\frac{3Bb^2ce}{7}+\frac{3Bbc^2d}{7}\right)+x^6\left(\frac{Ab^2ce}{2}+\frac{Abc^2d}{2}+\frac{Bb^3e}{6}+\frac{Bb^2cd}{2}\right)+x^5\left(\frac{Ab^3e}{5}+\frac{3Ab^2cd}{5}+\frac{Bb^3d}{5}\right)$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x**2+b*x)**3,x)
```

output
```
A*b**3*d*x**4/4 + B*c**3*e*x**9/9 + x**8*(A*c**3*e/8 + 3*B*b*c**2*e/8 + B*
c**3*d/8) + x**7*(3*A*b*c**2*e/7 + A*c**3*d/7 + 3*B*b**2*c*e/7 + 3*B*b*c**
2*d/7) + x**6*(A*b**2*c*e/2 + A*b*c**2*d/2 + B*b**3*e/6 + B*b**2*c*d/2) +
x**5*(A*b**3*e/5 + 3*A*b**2*c*d/5 + B*b**3*d/5)
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.07

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^3\,dx = \frac{1}{9}\,Bc^3ex^9+\frac{1}{4}\,Ab^3dx^4+\frac{1}{8}\left(Bc^3d+\left(3\,Bbc^2+Ac^3\right)e\right)x^8+\frac{1}{7}\left(\left(3\,Bbc^2+Ac^3\right)d+3\left(Bb^2c+Abc^2\right)e\right)x^7+\frac{1}{6}\left(3\left(Bb^2c+Abc^2\right)d+\left(Bb^3+3\,Ab^2c\right)e\right)x^6+\frac{1}{5}\left(Ab^3e+\left(Bb^3+3\,Ab^2c\right)d\right)x^5$$

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

output
```
1/9*B*c^3*e*x^9 + 1/4*A*b^3*d*x^4 + 1/8*(B*c^3*d + (3*B*b*c^2 + A*c^3)*e)*
x^8 + 1/7*((3*B*b*c^2 + A*c^3)*d + 3*(B*b^2*c + A*b*c^2)*e)*x^7 + 1/6*(3*(
B*b^2*c + A*b*c^2)*d + (B*b^3 + 3*A*b^2*c)*e)*x^6 + 1/5*(A*b^3*e + (B*b^3
+ 3*A*b^2*c)*d)*x^5
```

Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 169, normalized size of antiderivative = 1.22

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^3\,dx = \frac{1}{9}\,Bc^3ex^9+\frac{1}{8}\,Bc^3dx^8+\frac{3}{8}\,Bbc^2ex^8+\frac{1}{8}\,Ac^3ex^8+\frac{3}{7}\,Bbc^2dx^7+\frac{1}{7}\,Ac^3dx^7+\frac{3}{7}\,Bb^2cex^7+\frac{3}{7}\,Abc^2ex^7+\frac{1}{2}\,Bb^2cdx^6+\frac{1}{2}\,Abc^2dx^6+\frac{1}{6}\,Bb^3ex^6+\frac{1}{2}\,Ab^2cex^6+\frac{1}{5}\,Bb^3dx^5+\frac{3}{5}\,Ab^2cdx^5+\frac{1}{5}\,Ab^3ex^5+\frac{1}{4}\,Ab^3dx^4$$

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

output
```
1/9*B*c^3*e*x^9 + 1/8*B*c^3*d*x^8 + 3/8*B*b*c^2*e*x^8 + 1/8*A*c^3*e*x^8 +
3/7*B*b*c^2*d*x^7 + 1/7*A*c^3*d*x^7 + 3/7*B*b^2*c*e*x^7 + 3/7*A*b*c^2*e*x^
7 + 1/2*B*b^2*c*d*x^6 + 1/2*A*b*c^2*d*x^6 + 1/6*B*b^3*e*x^6 + 1/2*A*b^2*c*
e*x^6 + 1/5*B*b^3*d*x^5 + 3/5*A*b^2*c*d*x^5 + 1/5*A*b^3*e*x^5 + 1/4*A*b^3*
d*x^4
```

Mupad [B] (verification not implemented)

Time = 10.80 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.06

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^3\,dx = x^5\left(\frac{A\,b^3\,e}{5}+\frac{B\,b^3\,d}{5}+\frac{3\,A\,b^2\,c\,d}{5}\right)+x^8\left(\frac{A\,c^3\,e}{8}+\frac{B\,c^3\,d}{8}+\frac{3\,B\,b\,c^2\,e}{8}\right)+x^6\left(\frac{B\,b^3\,e}{6}+\frac{A\,b\,c^2\,d}{2}+\frac{A\,b^2\,c\,e}{2}+\frac{B\,b^2\,c\,d}{2}\right)+x^7\left(\frac{A\,c^3\,d}{7}+\frac{3\,A\,b\,c^2\,e}{7}+\frac{3\,B\,b\,c^2\,d}{7}+\frac{3\,B\,b^2\,c\,e}{7}\right)+\frac{A\,b^3\,d\,x^4}{4}+\frac{B\,c^3\,e\,x^9}{9}$$

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

output
```
x^5*((A*b^3*e)/5 + (B*b^3*d)/5 + (3*A*b^2*c*d)/5) + x^8*((A*c^3*e)/8 + (B*
c^3*d)/8 + (3*B*b*c^2*e)/8) + x^6*((B*b^3*e)/6 + (A*b*c^2*d)/2 + (A*b^2*c*
e)/2 + (B*b^2*c*d)/2) + x^7*((A*c^3*d)/7 + (3*A*b*c^2*e)/7 + (3*B*b*c^2*d)
/7 + (3*B*b^2*c*e)/7) + (A*b^3*d*x^4)/4 + (B*c^3*e*x^9)/9
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.17

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^3\,dx = \frac{x^4(280b\,c^3e\,x^5+315a\,c^3e\,x^4+945b^2c^2e\,x^4+315b\,c^3d\,x^4+1080ab\,c^2e\,x^3+360a\,c^3d\,x^3+1080b^3ce\,x^3+1}{}$$

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

output

```
(x**4*(630*a*b**3*d + 504*a*b**3*e*x + 1512*a*b**2*c*d*x + 1260*a*b**2*c*e
*x**2 + 1260*a*b*c**2*d*x**2 + 1080*a*b*c**2*e*x**3 + 360*a*c**3*d*x**3 +
315*a*c**3*e*x**4 + 504*b**4*d*x + 420*b**4*e*x**2 + 1260*b**3*c*d*x**2 +
1080*b**3*c*e*x**3 + 1080*b**2*c**2*d*x**3 + 945*b**2*c**2*e*x**4 + 315*b*
c**3*d*x**4 + 280*b*c**3*e*x**5))/2520
```

3.26 $\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{d+ex}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 257

$$\begin{aligned}\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{d+ex}\,dx = {} & \frac{d^2(Bd-Ae)(cd-be)^3x}{e^7}-\frac{d(Bd-Ae)(cd-be)^3x^2}{2e^6} \\ & +\frac{(Bd-Ae)(cd-be)^3x^3}{3e^5} \\ & -\frac{\left(B(cd-be)^3-Ace\left(c^2d^2-3bcde+3b^2e^2\right)\right)x^4}{4e^4} \\ & -\frac{c\left(Ace(cd-3be)-B\left(c^2d^2-3bcde+3b^2e^2\right)\right)x^5}{5e^3} \\ & -\frac{c^2(Bcd-3bBe-Ace)x^6}{6e^2}+\frac{Bc^3x^7}{7e} \\ & -\frac{d^3(Bd-Ae)(cd-be)^3\log(d+ex)}{e^8}\end{aligned}$$

output
```
d^2*(-A*e+B*d)*(-b*e+c*d)^3*x/e^7-1/2*d*(-A*e+B*d)*(-b*e+c*d)^3*x^2/e^6+1/
3*(-A*e+B*d)*(-b*e+c*d)^3*x^3/e^5-1/4*(B*(-b*e+c*d)^3-A*c*e*(3*b^2*e^2-3*b
*c*d*e+c^2*d^2))*x^4/e^4-1/5*c*(A*c*e*(-3*b*e+c*d)-B*(3*b^2*e^2-3*b*c*d*e+
c^2*d^2))*x^5/e^3-1/6*c^2*(-A*c*e-3*B*b*e+B*c*d)*x^6/e^2+1/7*B*c^3*x^7/e-d
^3*(-A*e+B*d)*(-b*e+c*d)^3*ln(e*x+d)/e^8
```

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 248, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{d+ex}\,dx$$
$$= \frac{420d^2e(Bd-Ae)(cd-be)^3x-210de^2(Bd-Ae)(cd-be)^3x^2+140e^3(-Bd+Ae)(-cd+be)^3x^3+105}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^3)/(d + e*x),x]
```

output
```
(420*d^2*e*(B*d - A*e)*(c*d - b*e)^3*x - 210*d*e^2*(B*d - A*e)*(c*d - b*e)
^3*x^2 + 140*e^3*(-(B*d) + A*e)*(-(c*d) + b*e)^3*x^3 + 105*e^4*(-(B*(c*d -
 b*e)^3) + A*c*e*(c^2*d^2 - 3*b*c*d*e + 3*b^2*e^2))*x^4 + 84*c*e^5*(A*c*e*
(-(c*d) + 3*b*e) + B*(c^2*d^2 - 3*b*c*d*e + 3*b^2*e^2))*x^5 + 70*c^2*e^6*(
-(B*c*d) + 3*b*B*e + A*c*e)*x^6 + 60*B*c^3*e^7*x^7 - 420*d^3*(B*d - A*e)*(
c*d - b*e)^3*Log[d + e*x])/(420*e^8)
```

Rubi [A] (verified)

Time = 1.09 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{d+ex}\,dx$$
$$\Big\downarrow \text{1195}$$
$$\int \left(\frac{x^3\left(Ace\left(3b^2e^2-3bcde+c^2d^2\right)-B(cd-be)^3\right)}{e^4}+\frac{cx^4\left(B\left(3b^2e^2-3bcde+c^2d^2\right)-Ace(cd-3be)\right)}{e^3}+\frac{c^2x^5(A\right.$$
$$\Big\downarrow \text{2009}$$

$$-\frac{x^4\left(B(cd-be)^3-Ace\left(3b^2e^2-3bcde+c^2d^2\right)\right)}{4e^4}-\frac{cx^5\left(Ace(cd-3be)-B\left(3b^2e^2-3bcde+c^2d^2\right)\right)}{5e^3}-\frac{c^2x^6(-Ace-3bBe+Bcd)}{6e^2}-\frac{d^3(Bd-Ae)(cd-be)^3\log(d+ex)}{e^8}+\frac{d^2x(Bd-Ae)(cd-be)^3}{e^7}-\frac{dx^2(Bd-Ae)(cd-be)^3}{2e^6}+\frac{x^3(Bd-Ae)(cd-be)^3}{3e^5}+\frac{Bc^3x^7}{7e}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^3)/(d + e*x),x]
```

output
```
(d^2*(B*d - A*e)*(c*d - b*e)^3*x)/e^7 - (d*(B*d - A*e)*(c*d - b*e)^3*x^2)/
(2*e^6) + ((B*d - A*e)*(c*d - b*e)^3*x^3)/(3*e^5) - ((B*(c*d - b*e)^3 - A*
c*e*(c^2*d^2 - 3*b*c*d*e + 3*b^2*e^2))*x^4)/(4*e^4) - (c*(A*c*e*(c*d - 3*b
*e) - B*(c^2*d^2 - 3*b*c*d*e + 3*b^2*e^2))*x^5)/(5*e^3) - (c^2*(B*c*d - 3*
b*B*e - A*c*e)*x^6)/(6*e^2) + (B*c^3*x^7)/(7*e) - (d^3*(B*d - A*e)*(c*d -
b*e)^3*Log[d + e*x])/e^8
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 546 vs. $2(245) = 490$.

Time = 0.78 (sec) , antiderivative size = 547, normalized size of antiderivative = 2.13

method	result
norman	$\frac{d^2(A b^3 e^4-3A b^2 cd e^3+3Ab c^2 d^2 e^2-A c^3 d^3 e-B b^3 d e^3+3B b^2 c d^2 e^2-3Bb c^2 d^3 e+B c^3 d^4)x}{e^7}+\frac{(A b^3 e^4-3A b^2 cd e^3+3Ab c^2}{}$
default	$\frac{-A b^2 cd e^5 x^3+3Ab c^2 d^4 e^2 x+B b^2 c d^2 e^4 x^3+Ab c^2 d^2 e^4 x^3+\frac{3}{5}B b^2 c e^6 x^5+\frac{1}{2}Bb c^2 e^6 x^6+\frac{1}{2}B b^3 d^2 e^4 x^2+A b^3 d^2 e^4 x-B b^3 d^3 e^3 x}{}$
risch	$-\frac{A b^3 d x^2}{2e^2}+\frac{A c^3 d^4 x^2}{2e^5}-\frac{B c^3 d^5 x^2}{2e^6}+\frac{B c^3 d^6 x}{e^7}+\frac{3d^6 \ln(ex+d)Bb c^2}{e^7}+\frac{3d^4 \ln(ex+d)A b^2 c}{e^5}+\frac{A b^3 d^2 x}{e^3}-\frac{B b^3 d^3 x}{e^4}$
parallelrisch	$-\frac{-140B x^3 c^3 d^4 e^3+210A x^2 b^3 d e^6-210B x^6 b c^2 e^7+420A \ln(ex+d) b^3 d^3 e^4-420A \ln(ex+d) c^3 d^6 e-84B x^5 c^3 d^2 e^5-315A x^4 b}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^3/(e*x+d),x,method=_RETURNVERBOSE)
```

output
```
d^2*(A*b^3*e^4-3*A*b^2*c*d*e^3+3*A*b*c^2*d^2*e^2-A*c^3*d^3*e-B*b^3*d*e^3+3
*B*b^2*c*d^2*e^2-3*B*b*c^2*d^3*e+B*c^3*d^4)/e^7*x+1/3/e^5*(A*b^3*e^4-3*A*b
^2*c*d*e^3+3*A*b*c^2*d^2*e^2-A*c^3*d^3*e-B*b^3*d*e^3+3*B*b^2*c*d^2*e^2-3*B
*b*c^2*d^3*e+B*c^3*d^4)*x^3+1/4/e^4*(3*A*b^2*c*e^3-3*A*b*c^2*d*e^2+A*c^3*d
^2*e+B*b^3*e^3-3*B*b^2*c*d*e^2+3*B*b*c^2*d^2*e-B*c^3*d^3)*x^4+1/7*B*c^3*x^
7/e+1/5*c/e^3*(3*A*b*c*e^2-A*c^2*d*e+3*B*b^2*e^2-3*B*b*c*d*e+B*c^2*d^2)*x^
5+1/6*c^2/e^2*(A*c*e+3*B*b*e-B*c*d)*x^6-1/2*d/e^6*(A*b^3*e^4-3*A*b^2*c*d*e
^3+3*A*b*c^2*d^2*e^2-A*c^3*d^3*e-B*b^3*d*e^3+3*B*b^2*c*d^2*e^2-3*B*b*c^2*d
^3*e+B*c^3*d^4)*x^2-d^3*(A*b^3*e^4-3*A*b^2*c*d*e^3+3*A*b*c^2*d^2*e^2-A*c^3
*d^3*e-B*b^3*d*e^3+3*B*b^2*c*d^2*e^2-3*B*b*c^2*d^3*e+B*c^3*d^4)/e^8*ln(e*x
+d)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 531 vs. $2(245) = 490$.

Time = 0.08 (sec) , antiderivative size = 531, normalized size of antiderivative = 2.07

$$\int \frac{(A+Bx)(bx+cx^2)^3}{d+ex}\,dx$$
$$= \frac{60\,Bc^3e^7x^7 - 70\,(Bc^3de^6 - (3\,Bbc^2 + Ac^3)e^7)x^6 + 84\,(Bc^3d^2e^5 - (3\,Bbc^2 + Ac^3)de^6 + 3\,(Bb^2c + Abc^2)e}{}$$

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

output
```
1/420*(60*B*c^3*e^7*x^7 - 70*(B*c^3*d*e^6 - (3*B*b*c^2 + A*c^3)*e^7)*x^6 +
 84*(B*c^3*d^2*e^5 - (3*B*b*c^2 + A*c^3)*d*e^6 + 3*(B*b^2*c + A*b*c^2)*e^7
)*x^5 - 105*(B*c^3*d^3*e^4 - (3*B*b*c^2 + A*c^3)*d^2*e^5 + 3*(B*b^2*c + A*
b*c^2)*d*e^6 - (B*b^3 + 3*A*b^2*c)*e^7)*x^4 + 140*(B*c^3*d^4*e^3 + A*b^3*e
^7 - (3*B*b*c^2 + A*c^3)*d^3*e^4 + 3*(B*b^2*c + A*b*c^2)*d^2*e^5 - (B*b^3
+ 3*A*b^2*c)*d*e^6)*x^3 - 210*(B*c^3*d^5*e^2 + A*b^3*d*e^6 - (3*B*b*c^2 +
A*c^3)*d^4*e^3 + 3*(B*b^2*c + A*b*c^2)*d^3*e^4 - (B*b^3 + 3*A*b^2*c)*d^2*e
^5)*x^2 + 420*(B*c^3*d^6*e + A*b^3*d^2*e^5 - (3*B*b*c^2 + A*c^3)*d^5*e^2 +
 3*(B*b^2*c + A*b*c^2)*d^4*e^3 - (B*b^3 + 3*A*b^2*c)*d^3*e^4)*x - 420*(B*c
^3*d^7 + A*b^3*d^3*e^4 - (3*B*b*c^2 + A*c^3)*d^6*e + 3*(B*b^2*c + A*b*c^2)
*d^5*e^2 - (B*b^3 + 3*A*b^2*c)*d^4*e^3)*log(e*x + d))/e^8
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 578 vs. $2(241) = 482$.

Time = 0.70 (sec) , antiderivative size = 578, normalized size of antiderivative = 2.25

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{d+ex}\,dx = \frac{Bc^3x^7}{7e} + \frac{d^3(-Ae+Bd)\,(be-cd)^3\log\left(d+ex\right)}{e^8} + x^6\left(\frac{Ac^3}{6e} + \frac{Bbc^2}{2e} - \frac{Bc^3d}{6e^2}\right) + x^5 \cdot \left(\frac{3Abc^2}{5e} - \frac{Ac^3d}{5e^2} + \frac{3Bb^2c}{5e} - \frac{3Bbc^2d}{5e^2} + \frac{Bc^3d^2}{5e^3}\right) + x^4 \cdot \left(\frac{3Ab^2c}{4e} - \frac{3Abc^2d}{4e^2} + \frac{Ac^3d^2}{4e^3} + \frac{Bb^3}{4e} - \frac{3Bb^2cd}{4e^2} + \frac{3Bbc^2d^2}{4e^3} - \frac{Bc^3d^3}{4e^4}\right) + x^3\left(\frac{Ab^3}{3e} - \frac{Ab^2cd}{e^2} + \frac{Abc^2d^2}{e^3} - \frac{Ac^3d^3}{3e^4} - \frac{Bb^3d}{3e^2} + \frac{Bb^2cd^2}{e^3} - \frac{Bbc^2d^3}{e^4} + \frac{Bc^3d^4}{3e^5}\right) + x^2\left(-\frac{Ab^3d}{2e^2} + \frac{3Ab^2cd^2}{2e^3} - \frac{3Abc^2d^3}{2e^4} + \frac{Ac^3d^4}{2e^5} + \frac{Bb^3d^2}{2e^3} - \frac{3Bb^2cd^3}{2e^4} + \frac{3Bbc^2d^4}{2e^5} - \frac{Bc^3d^5}{2e^6}\right) + x\left(\frac{Ab^3d^2}{e^3} - \frac{3Ab^2cd^3}{e^4} + \frac{3Abc^2d^4}{e^5} - \frac{Ac^3d^5}{e^6} - \frac{Bb^3d^3}{e^4} + \frac{3Bb^2cd^4}{e^5} - \frac{3Bbc^2d^5}{e^6} + \frac{Bc^3d^6}{e^7}\right)$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**3/(e*x+d),x)
```

output
```
B*c**3*x**7/(7*e) + d**3*(-A*e + B*d)*(b*e - c*d)**3*log(d + e*x)/e**8 + x
**6*(A*c**3/(6*e) + B*b*c**2/(2*e) - B*c**3*d/(6*e**2)) + x**5*(3*A*b*c**2
/(5*e) - A*c**3*d/(5*e**2) + 3*B*b**2*c/(5*e) - 3*B*b*c**2*d/(5*e**2) + B*
c**3*d**2/(5*e**3)) + x**4*(3*A*b**2*c/(4*e) - 3*A*b*c**2*d/(4*e**2) + A*c
**3*d**2/(4*e**3) + B*b**3/(4*e) - 3*B*b**2*c*d/(4*e**2) + 3*B*b*c**2*d**2
/(4*e**3) - B*c**3*d**3/(4*e**4)) + x**3*(A*b**3/(3*e) - A*b**2*c*d/e**2 +
 A*b*c**2*d**2/e**3 - A*c**3*d**3/(3*e**4) - B*b**3*d/(3*e**2) + B*b**2*c*
d**2/e**3 - B*b*c**2*d**3/e**4 + B*c**3*d**4/(3*e**5)) + x**2*(-A*b**3*d/(
2*e**2) + 3*A*b**2*c*d**2/(2*e**3) - 3*A*b*c**2*d**3/(2*e**4) + A*c**3*d**
4/(2*e**5) + B*b**3*d**2/(2*e**3) - 3*B*b**2*c*d**3/(2*e**4) + 3*B*b*c**2*
d**4/(2*e**5) - B*c**3*d**5/(2*e**6)) + x*(A*b**3*d**2/e**3 - 3*A*b**2*c*d
**3/e**4 + 3*A*b*c**2*d**4/e**5 - A*c**3*d**5/e**6 - B*b**3*d**3/e**4 + 3*
B*b**2*c*d**4/e**5 - 3*B*b*c**2*d**5/e**6 + B*c**3*d**6/e**7)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 530 vs. $2(245) = 490$.

Time = 0.04 (sec) , antiderivative size = 530, normalized size of antiderivative = 2.06

$$\int \frac{(A+Bx)\,(bx+cx^2)^3}{d+ex}\,dx$$
$$= \frac{60\,Bc^3e^6x^7 - 70\,(Bc^3de^5 - (3\,Bbc^2 + Ac^3)e^6)x^6 + 84\,(Bc^3d^2e^4 - (3\,Bbc^2 + Ac^3)de^5 + 3\,(Bb^2c + Abc^2)e}{}$$
$$- \frac{(Bc^3d^7 + Ab^3d^3e^4 - (3\,Bbc^2 + Ac^3)d^6e + 3\,(Bb^2c + Abc^2)d^5e^2 - (Bb^3 + 3\,Ab^2c)d^4e^3)\log(ex + d)}{e^8}$$

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

output
```
1/420*(60*B*c^3*e^6*x^7 - 70*(B*c^3*d*e^5 - (3*B*b*c^2 + A*c^3)*e^6)*x^6 +
 84*(B*c^3*d^2*e^4 - (3*B*b*c^2 + A*c^3)*d*e^5 + 3*(B*b^2*c + A*b*c^2)*e^6
)*x^5 - 105*(B*c^3*d^3*e^3 - (3*B*b*c^2 + A*c^3)*d^2*e^4 + 3*(B*b^2*c + A*
b*c^2)*d*e^5 - (B*b^3 + 3*A*b^2*c)*e^6)*x^4 + 140*(B*c^3*d^4*e^2 + A*b^3*e
^6 - (3*B*b*c^2 + A*c^3)*d^3*e^3 + 3*(B*b^2*c + A*b*c^2)*d^2*e^4 - (B*b^3
+ 3*A*b^2*c)*d*e^5)*x^3 - 210*(B*c^3*d^5*e + A*b^3*d*e^5 - (3*B*b*c^2 + A*
c^3)*d^4*e^2 + 3*(B*b^2*c + A*b*c^2)*d^3*e^3 - (B*b^3 + 3*A*b^2*c)*d^2*e^4
)*x^2 + 420*(B*c^3*d^6 + A*b^3*d^2*e^4 - (3*B*b*c^2 + A*c^3)*d^5*e + 3*(B*
b^2*c + A*b*c^2)*d^4*e^2 - (B*b^3 + 3*A*b^2*c)*d^3*e^3)*x)/e^7 - (B*c^3*d^
7 + A*b^3*d^3*e^4 - (3*B*b*c^2 + A*c^3)*d^6*e + 3*(B*b^2*c + A*b*c^2)*d^5*
e^2 - (B*b^3 + 3*A*b^2*c)*d^4*e^3)*log(e*x + d)/e^8
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 666 vs. $2(245) = 490$.

Time = 0.26 (sec) , antiderivative size = 666, normalized size of antiderivative = 2.59

$$\int \frac{(A+Bx)(bx+cx^2)^3}{d+ex}\,dx$$
$$= \frac{60\,Bc^3e^6x^7 - 70\,Bc^3de^5x^6 + 210\,Bbc^2e^6x^6 + 70\,Ac^3e^6x^6 + 84\,Bc^3d^2e^4x^5 - 252\,Bbc^2de^5x^5 - 84\,Ac^3de^5x}{}$$
$$- \frac{(Bc^3d^7 - 3\,Bbc^2d^6e - Ac^3d^6e + 3\,Bb^2cd^5e^2 + 3\,Abc^2d^5e^2 - Bb^3d^4e^3 - 3\,Ab^2cd^4e^3 + Ab^3d^3e^4)\log(|ex}{e^8}$$

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

output
```
1/420*(60*B*c^3*e^6*x^7 - 70*B*c^3*d*e^5*x^6 + 210*B*b*c^2*e^6*x^6 + 70*A*
c^3*e^6*x^6 + 84*B*c^3*d^2*e^4*x^5 - 252*B*b*c^2*d*e^5*x^5 - 84*A*c^3*d*e^
5*x^5 + 252*B*b^2*c*e^6*x^5 + 252*A*b*c^2*e^6*x^5 - 105*B*c^3*d^3*e^3*x^4
+ 315*B*b*c^2*d^2*e^4*x^4 + 105*A*c^3*d^2*e^4*x^4 - 315*B*b^2*c*d*e^5*x^4
- 315*A*b*c^2*d*e^5*x^4 + 105*B*b^3*e^6*x^4 + 315*A*b^2*c*e^6*x^4 + 140*B*
c^3*d^4*e^2*x^3 - 420*B*b*c^2*d^3*e^3*x^3 - 140*A*c^3*d^3*e^3*x^3 + 420*B*
b^2*c*d^2*e^4*x^3 + 420*A*b*c^2*d^2*e^4*x^3 - 140*B*b^3*d*e^5*x^3 - 420*A*
b^2*c*d*e^5*x^3 + 140*A*b^3*e^6*x^3 - 210*B*c^3*d^5*e*x^2 + 630*B*b*c^2*d^
4*e^2*x^2 + 210*A*c^3*d^4*e^2*x^2 - 630*B*b^2*c*d^3*e^3*x^2 - 630*A*b*c^2*
d^3*e^3*x^2 + 210*B*b^3*d^2*e^4*x^2 + 630*A*b^2*c*d^2*e^4*x^2 - 210*A*b^3*
d*e^5*x^2 + 420*B*c^3*d^6*x - 1260*B*b*c^2*d^5*e*x - 420*A*c^3*d^5*e*x + 1
260*B*b^2*c*d^4*e^2*x + 1260*A*b*c^2*d^4*e^2*x - 420*B*b^3*d^3*e^3*x - 126
0*A*b^2*c*d^3*e^3*x + 420*A*b^3*d^2*e^4*x)/e^7 - (B*c^3*d^7 - 3*B*b*c^2*d^
6*e - A*c^3*d^6*e + 3*B*b^2*c*d^5*e^2 + 3*A*b*c^2*d^5*e^2 - B*b^3*d^4*e^3
- 3*A*b^2*c*d^4*e^3 + A*b^3*d^3*e^4)*log(abs(e*x + d))/e^8
```

Mupad [B] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 560, normalized size of antiderivative = 2.18

$$\int \frac{(A+Bx)(bx+cx^2)^3}{d+ex}\,dx$$

$$= x^4\left(\frac{B\,b^3+3\,A\,c\,b^2}{4\,e}+\frac{d\left(\frac{d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e}-\frac{B\,c^3\,d}{e^2}\right)}{e}-\frac{3\,b\,c\,(A\,c+B\,b)}{e}\right)}{4\,e}\right)$$
$$-x^5\left(\frac{d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e}-\frac{B\,c^3\,d}{e^2}\right)}{5\,e}-\frac{3\,b\,c\,(A\,c+B\,b)}{5\,e}\right)$$
$$+x^3\left(\frac{A\,b^3}{3\,e}-\frac{d\left(\frac{B\,b^3+3\,A\,c\,b^2}{e}+\frac{d\left(\frac{d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e}-\frac{B\,c^3\,d}{e^2}\right)}{e}-\frac{3\,b\,c\,(A\,c+B\,b)}{e}\right)}{e}\right)}{3\,e}\right)$$
$$+x^6\left(\frac{A\,c^3+3\,B\,b\,c^2}{6\,e}-\frac{B\,c^3\,d}{6\,e^2}\right)$$
$$-\frac{\ln(d+e\,x)\,(-B\,b^3\,d^4\,e^3+A\,b^3\,d^3\,e^4+3\,B\,b^2\,c\,d^5\,e^2-3\,A\,b^2\,c\,d^4\,e^3-3\,B\,b\,c^2\,d^6\,e+3\,A\,b\,c^2\,d^5\,e^2+B}{e^8}$$
$$-\frac{d\,x^2\left(\frac{A\,b^3}{e}-\frac{d\left(\frac{B\,b^3+3\,A\,c\,b^2}{e}+\frac{d\left(\frac{d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e}-\frac{B\,c^3\,d}{e^2}\right)}{e}-\frac{3\,b\,c\,(A\,c+B\,b)}{e}\right)}{e}\right)}{e}\right)}{2\,e}$$
$$+\frac{d^2\,x\left(\frac{A\,b^3}{e}-\frac{d\left(\frac{B\,b^3+3\,A\,c\,b^2}{e}+\frac{d\left(\frac{d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e}-\frac{B\,c^3\,d}{e^2}\right)}{e}-\frac{3\,b\,c\,(A\,c+B\,b)}{e}\right)}{e}\right)}{e}\right)}{e^2}+\frac{B\,c^3\,x^7}{7\,e}$$

input
```
int(((b*x + c*x^2)^3*(A + B*x))/(d + e*x),x)
```

output
```
x^4*((B*b^3 + 3*A*b^2*c)/(4*e) + (d*((d*((A*c^3 + 3*B*b*c^2)/e - (B*c^3*d)
/e^2))/e - (3*b*c*(A*c + B*b))/e))/(4*e)) - x^5*((d*((A*c^3 + 3*B*b*c^2)/e
 - (B*c^3*d)/e^2))/(5*e) - (3*b*c*(A*c + B*b))/(5*e)) + x^3*((A*b^3)/(3*e)
 - (d*((B*b^3 + 3*A*b^2*c)/e + (d*((d*((A*c^3 + 3*B*b*c^2)/e - (B*c^3*d)/e
^2))/e - (3*b*c*(A*c + B*b))/e))/e))/(3*e)) + x^6*((A*c^3 + 3*B*b*c^2)/(6*
e) - (B*c^3*d)/(6*e^2)) - (log(d + e*x)*(B*c^3*d^7 - A*c^3*d^6*e + A*b^3*d
^3*e^4 - B*b^3*d^4*e^3 + 3*A*b*c^2*d^5*e^2 - 3*A*b^2*c*d^4*e^3 + 3*B*b^2*c
*d^5*e^2 - 3*B*b*c^2*d^6*e))/e^8 - (d*x^2*((A*b^3)/e - (d*((B*b^3 + 3*A*b^
2*c)/e + (d*((d*((A*c^3 + 3*B*b*c^2)/e - (B*c^3*d)/e^2))/e - (3*b*c*(A*c +
 B*b))/e))/e))/e))/(2*e) + (d^2*x*((A*b^3)/e - (d*((B*b^3 + 3*A*b^2*c)/e +
 (d*((d*((A*c^3 + 3*B*b*c^2)/e - (B*c^3*d)/e^2))/e - (3*b*c*(A*c + B*b))/e
))/e))/e))/e^2 + (B*c^3*x^7)/(7*e)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 705, normalized size of antiderivative = 2.74

$$\int \frac{(A+Bx)\,(bx+cx^2)^3}{d+ex}\,dx$$
$$= \frac{-420\log(ex+d)\,a\,b^3d^3e^4+420\log(ex+d)\,a\,c^3d^6e-1260\log(ex+d)\,b^3c\,d^5e^2+1260\log(ex+d)\,b^2c^2d}{}$$

input
```
int((B*x+A)*(c*x^2+b*x)^3/(e*x+d),x)
```

output
```
( - 420*log(d + e*x)*a*b**3*d**3*e**4 + 1260*log(d + e*x)*a*b**2*c*d**4*e*
*3 - 1260*log(d + e*x)*a*b*c**2*d**5*e**2 + 420*log(d + e*x)*a*c**3*d**6*e
 + 420*log(d + e*x)*b**4*d**4*e**3 - 1260*log(d + e*x)*b**3*c*d**5*e**2 +
1260*log(d + e*x)*b**2*c**2*d**6*e - 420*log(d + e*x)*b*c**3*d**7 + 420*a*
b**3*d**2*e**5*x - 210*a*b**3*d*e**6*x**2 + 140*a*b**3*e**7*x**3 - 1260*a*
b**2*c*d**3*e**4*x + 630*a*b**2*c*d**2*e**5*x**2 - 420*a*b**2*c*d*e**6*x**
3 + 315*a*b**2*c*e**7*x**4 + 1260*a*b*c**2*d**4*e**3*x - 630*a*b*c**2*d**3
*e**4*x**2 + 420*a*b*c**2*d**2*e**5*x**3 - 315*a*b*c**2*d*e**6*x**4 + 252*
a*b*c**2*e**7*x**5 - 420*a*c**3*d**5*e**2*x + 210*a*c**3*d**4*e**3*x**2 -
140*a*c**3*d**3*e**4*x**3 + 105*a*c**3*d**2*e**5*x**4 - 84*a*c**3*d*e**6*x
**5 + 70*a*c**3*e**7*x**6 - 420*b**4*d**3*e**4*x + 210*b**4*d**2*e**5*x**2
 - 140*b**4*d*e**6*x**3 + 105*b**4*e**7*x**4 + 1260*b**3*c*d**4*e**3*x - 6
30*b**3*c*d**3*e**4*x**2 + 420*b**3*c*d**2*e**5*x**3 - 315*b**3*c*d*e**6*x
**4 + 252*b**3*c*e**7*x**5 - 1260*b**2*c**2*d**5*e**2*x + 630*b**2*c**2*d*
*4*e**3*x**2 - 420*b**2*c**2*d**3*e**4*x**3 + 315*b**2*c**2*d**2*e**5*x**4
 - 252*b**2*c**2*d*e**6*x**5 + 210*b**2*c**2*e**7*x**6 + 420*b*c**3*d**6*e
*x - 210*b*c**3*d**5*e**2*x**2 + 140*b*c**3*d**4*e**3*x**3 - 105*b*c**3*d*
*3*e**4*x**4 + 84*b*c**3*d**2*e**5*x**5 - 70*b*c**3*d*e**6*x**6 + 60*b*c**
3*e**7*x**7)/(420*e**8)
```

3.27 $\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 287

$$\begin{aligned}\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^2}\,dx &= \frac{d(cd-be)^2(Ae(5cd-2be)-3Bd(2cd-be))x}{e^7} \\ &+ \frac{(cd-be)^2(Bd(5cd-2be)-Ae(4cd-be))x^2}{2e^6} \\ &- \frac{(cd-be)^2(4Bcd-bBe-3Ace)x^3}{3e^5} - \frac{c\left(Ace(2cd-3be)-3B(cd-be)^2\right)x^4}{4e^4} \\ &- \frac{c^2(2Bcd-3bBe-Ace)x^5}{5e^3} + \frac{Bc^3x^6}{6e^2} + \frac{d^3(Bd-Ae)(cd-be)^3}{e^8(d+ex)} \\ &+ \frac{d^2(cd-be)^2(Bd(7cd-4be)-3Ae(2cd-be))\log(d+ex)}{e^8}\end{aligned}$$

output

```
d*(-b*e+c*d)^2*(A*e*(-2*b*e+5*c*d)-3*B*d*(-b*e+2*c*d))*x/e^7+1/2*(-b*e+c*d
)^2*(B*d*(-2*b*e+5*c*d)-A*e*(-b*e+4*c*d))*x^2/e^6-1/3*(-b*e+c*d)^2*(-3*A*c
*e-B*b*e+4*B*c*d)*x^3/e^5-1/4*c*(A*c*e*(-3*b*e+2*c*d)-3*B*(-b*e+c*d)^2)*x^
4/e^4-1/5*c^2*(-A*c*e-3*B*b*e+2*B*c*d)*x^5/e^3+1/6*B*c^3*x^6/e^2+d^3*(-A*e
+B*d)*(-b*e+c*d)^3/e^8/(e*x+d)+d^2*(-b*e+c*d)^2*(B*d*(-4*b*e+7*c*d)-3*A*e*
(-b*e+2*c*d))*ln(e*x+d)/e^8
```

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 274, normalized size of antiderivative = 0.95

$$\int \frac{(A+Bx)\,(bx+cx^2)^3}{(d+ex)^2}\,dx$$
$$= \frac{-60de(cd-be)^2(3Bd(2cd-be)+Ae(-5cd+2be))x+30e^2(cd-be)^2(Bd(5cd-2be)+Ae(-4cd+be}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^3)/(d + e*x)^2,x]
```

output
```
(-60*d*e*(c*d - b*e)^2*(3*B*d*(2*c*d - b*e) + A*e*(-5*c*d + 2*b*e))*x + 30
*e^2*(c*d - b*e)^2*(B*d*(5*c*d - 2*b*e) + A*e*(-4*c*d + b*e))*x^2 + 20*e^3
*(c*d - b*e)^2*(-4*B*c*d + b*B*e + 3*A*c*e)*x^3 - 15*c*e^4*(A*c*e*(2*c*d -
 3*b*e) - 3*B*(c*d - b*e)^2)*x^4 + 12*c^2*e^5*(-2*B*c*d + 3*b*B*e + A*c*e)
*x^5 + 10*B*c^3*e^6*x^6 + (60*d^3*(B*d - A*e)*(c*d - b*e)^3)/(d + e*x) + 6
0*d^2*(c*d - b*e)^2*(B*d*(7*c*d - 4*b*e) + 3*A*e*(-2*c*d + b*e))*Log[d + e
*x])/(60*e^8)
```

Rubi [A] (verified)

Time = 1.23 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\,(bx+cx^2)^3}{(d+ex)^2}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{c^2x^4(Ace+3bBe-2Bcd)}{e^3}-\frac{d^3(Bd-Ae)(cd-be)^3}{e^7(d+ex)^2}+\frac{d^2(cd-be)^2(Bd(7cd-4be)-3Ae(2cd-be))}{e^7(d+ex)}+\frac{d(}{}\right.$$

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

$$-\frac{c^2x^5(-Ace-3bBe+2Bcd)}{5e^3}+\frac{d^3(Bd-Ae)(cd-be)^3}{e^8(d+ex)}+\frac{d^2(cd-be)^2\log(d+ex)(Bd(7cd-4be)-3Ae(2cd-be))}{e^8}+\frac{dx(cd-be)^2(Ae(5cd-2be)-3Bd(2cd-be))}{e^7}+\frac{x^2(cd-be)^2(Bd(5cd-2be)-Ae(4cd-be))}{2e^6}-\frac{x^3(cd-be)^2(-3Ace-bBe+4Bcd)}{3e^5}-\frac{cx^4\left(Ace(2cd-3be)-3B(cd-be)^2\right)}{4e^4}+\frac{Bc^3x^6}{6e^2}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^3)/(d + e*x)^2,x]
```

output
```
(d*(c*d - b*e)^2*(A*e*(5*c*d - 2*b*e) - 3*B*d*(2*c*d - b*e))*x)/e^7 + ((c*
d - b*e)^2*(B*d*(5*c*d - 2*b*e) - A*e*(4*c*d - b*e))*x^2)/(2*e^6) - ((c*d
- b*e)^2*(4*B*c*d - b*B*e - 3*A*c*e)*x^3)/(3*e^5) - (c*(A*c*e*(2*c*d - 3*b
*e) - 3*B*(c*d - b*e)^2)*x^4)/(4*e^4) - (c^2*(2*B*c*d - 3*b*B*e - A*c*e)*x
^5)/(5*e^3) + (B*c^3*x^6)/(6*e^2) + (d^3*(B*d - A*e)*(c*d - b*e)^3)/(e^8*(
d + e*x)) + (d^2*(c*d - b*e)^2*(B*d*(7*c*d - 4*b*e) - 3*A*e*(2*c*d - b*e))
*Log[d + e*x])/e^8
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 570 vs. 2(277) = 554.

Time = 0.86 (sec) , antiderivative size = 571, normalized size of antiderivative = 1.99

method	result
norman	$\frac{d\left(3A\,b^{3}d^{2}e^{4}-12A\,b^{2}c\,d^{3}e^{3}+15Ab\,c^{2}d^{4}e^{2}-6A\,c^{3}d^{5}e-4B\,b^{3}d^{3}e^{3}+15B\,b^{2}c\,d^{4}e^{2}-18Bb\,c^{2}d^{5}e+7B\,c^{3}d^{6}\right)}{e^{8}}+\frac{\left(12A\,b^{2}c\,e^{3}-15Ab\,c^{2}d\,e^{2}+6A\right.}{}$
default	$-\frac{\frac{4}{3}B\,c^{3}d^{3}e^{2}x^{3}+2A\,c^{3}d^{3}e^{2}x^{2}-\frac{5}{2}B\,c^{3}d^{4}e\,x^{2}-3B\,b^{3}d^{2}e^{3}x-\frac{3}{5}Bb\,c^{2}e^{5}x^{5}+\frac{1}{2}A\,c^{3}d\,e^{4}x^{4}-\frac{3}{4}B\,b^{2}c\,e^{5}x^{4}-\frac{3}{4}B\,c^{3}d^{2}e^{3}x^{4}+2Ab\,c^{2}}{}$
risch	$-\frac{4d^{3}\ln(ex+d)B\,b^{3}}{e^{5}}+\frac{7d^{6}\ln(ex+d)B\,c^{3}}{e^{8}}-\frac{4B\,c^{3}d^{3}x^{3}}{3e^{5}}-\frac{2A\,c^{3}d^{3}x^{2}}{e^{5}}-\frac{2Ad\,b^{3}x}{e^{3}}+\frac{5A\,c^{3}d^{4}x}{e^{6}}+\frac{3d^{2}\ln(ex+d)A\,b^{3}}{e^{4}}-$
parallelrisch	$\frac{-720A\,b^{2}c\,d^{4}e^{3}+70B\,x^{3}c^{3}d^{4}e^{3}-90A\,x^{2}b^{3}d\,e^{6}+36B\,x^{6}b\,c^{2}e^{7}+180A\ln(ex+d)b^{3}d^{3}e^{4}-360A\ln(ex+d)c^{3}d^{6}e+900Ab\,c^{2}d^{5}e^{2}+}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

output
```
(d*(3*A*b^3*d^2*e^4-12*A*b^2*c*d^3*e^3+15*A*b*c^2*d^4*e^2-6*A*c^3*d^5*e-4*
B*b^3*d^3*e^3+15*B*b^2*c*d^4*e^2-18*B*b*c^2*d^5*e+7*B*c^3*d^6)/e^8+1/12*(1
2*A*b^2*c*e^3-15*A*b*c^2*d*e^2+6*A*c^3*d^2*e+4*B*b^3*e^3-15*B*b^2*c*d*e^2+
18*B*b*c^2*d^2*e-7*B*c^3*d^3)/e^4*x^4+1/6*(3*A*b^3*e^4-12*A*b^2*c*d*e^3+15
*A*b*c^2*d^2*e^2-6*A*c^3*d^3*e-4*B*b^3*d*e^3+15*B*b^2*c*d^2*e^2-18*B*b*c^2
*d^3*e+7*B*c^3*d^4)/e^5*x^3+1/6*B*c^3*x^7/e+1/20*c*(15*A*b*c*e^2-6*A*c^2*d
*e+15*B*b^2*e^2-18*B*b*c*d*e+7*B*c^2*d^2)/e^3*x^5+1/30*c^2*(6*A*c*e+18*B*b
*e-7*B*c*d)/e^2*x^6-1/2*d*(3*A*b^3*e^4-12*A*b^2*c*d*e^3+15*A*b*c^2*d^2*e^2
-6*A*c^3*d^3*e-4*B*b^3*d*e^3+15*B*b^2*c*d^2*e^2-18*B*b*c^2*d^3*e+7*B*c^3*d
^4)/e^6*x^2)/(e*x+d)+d^2/e^8*(3*A*b^3*e^4-12*A*b^2*c*d*e^3+15*A*b*c^2*d^2*
e^2-6*A*c^3*d^3*e-4*B*b^3*d*e^3+15*B*b^2*c*d^2*e^2-18*B*b*c^2*d^3*e+7*B*c^
3*d^4)*ln(e*x+d)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 722 vs. 2(279) = 558.

Time = 0.09 (sec) , antiderivative size = 722, normalized size of antiderivative = 2.52

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^2}\,dx = \text{Too large to display}$$

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

output
```
1/60*(10*B*c^3*e^7*x^7 + 60*B*c^3*d^7 + 60*A*b^3*d^3*e^4 - 60*(3*B*b*c^2 +
 A*c^3)*d^6*e + 180*(B*b^2*c + A*b*c^2)*d^5*e^2 - 60*(B*b^3 + 3*A*b^2*c)*d
^4*e^3 - 2*(7*B*c^3*d*e^6 - 6*(3*B*b*c^2 + A*c^3)*e^7)*x^6 + 3*(7*B*c^3*d^
2*e^5 - 6*(3*B*b*c^2 + A*c^3)*d*e^6 + 15*(B*b^2*c + A*b*c^2)*e^7)*x^5 - 5*
(7*B*c^3*d^3*e^4 - 6*(3*B*b*c^2 + A*c^3)*d^2*e^5 + 15*(B*b^2*c + A*b*c^2)*
d*e^6 - 4*(B*b^3 + 3*A*b^2*c)*e^7)*x^4 + 10*(7*B*c^3*d^4*e^3 + 3*A*b^3*e^7
 - 6*(3*B*b*c^2 + A*c^3)*d^3*e^4 + 15*(B*b^2*c + A*b*c^2)*d^2*e^5 - 4*(B*b
^3 + 3*A*b^2*c)*d*e^6)*x^3 - 30*(7*B*c^3*d^5*e^2 + 3*A*b^3*d*e^6 - 6*(3*B*
b*c^2 + A*c^3)*d^4*e^3 + 15*(B*b^2*c + A*b*c^2)*d^3*e^4 - 4*(B*b^3 + 3*A*b
^2*c)*d^2*e^5)*x^2 - 60*(6*B*c^3*d^6*e + 2*A*b^3*d^2*e^5 - 5*(3*B*b*c^2 +
A*c^3)*d^5*e^2 + 12*(B*b^2*c + A*b*c^2)*d^4*e^3 - 3*(B*b^3 + 3*A*b^2*c)*d^
3*e^4)*x + 60*(7*B*c^3*d^7 + 3*A*b^3*d^3*e^4 - 6*(3*B*b*c^2 + A*c^3)*d^6*e
 + 15*(B*b^2*c + A*b*c^2)*d^5*e^2 - 4*(B*b^3 + 3*A*b^2*c)*d^4*e^3 + (7*B*c
^3*d^6*e + 3*A*b^3*d^2*e^5 - 6*(3*B*b*c^2 + A*c^3)*d^5*e^2 + 15*(B*b^2*c +
 A*b*c^2)*d^4*e^3 - 4*(B*b^3 + 3*A*b^2*c)*d^3*e^4)*x)*log(e*x + d))/(e^9*x
 + d*e^8)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 619 vs. $2(277) = 554$.

Time = 1.38 (sec) , antiderivative size = 619, normalized size of antiderivative = 2.16

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^2}\,dx$$
$$= \frac{Bc^3x^6}{6e^2} - \frac{d^2(be-cd)^2\left(-3Abe^2+6Acde+4Bbde-7Bcd^2\right)\log(d+ex)}{e^8}$$
$$+x^5\left(\frac{Ac^3}{5e^2}+\frac{3Bbc^2}{5e^2}-\frac{2Bc^3d}{5e^3}\right)+x^4\cdot\left(\frac{3Abc^2}{4e^2}-\frac{Ac^3d}{2e^3}+\frac{3Bb^2c}{4e^2}-\frac{3Bbc^2d}{2e^3}+\frac{3Bc^3d^2}{4e^4}\right)$$
$$+x^3\left(\frac{Ab^2c}{e^2}-\frac{2Abc^2d}{e^3}+\frac{Ac^3d^2}{e^4}+\frac{Bb^3}{3e^2}-\frac{2Bb^2cd}{e^3}+\frac{3Bbc^2d^2}{e^4}-\frac{4Bc^3d^3}{3e^5}\right)$$
$$+x^2\left(\frac{Ab^3}{2e^2}-\frac{3Ab^2cd}{e^3}+\frac{9Abc^2d^2}{2e^4}-\frac{2Ac^3d^3}{e^5}-\frac{Bb^3d}{e^3}+\frac{9Bb^2cd^2}{2e^4}-\frac{6Bbc^2d^3}{e^5}+\frac{5Bc^3d^4}{2e^6}\right)$$
$$+x\left(-\frac{2Ab^3d}{e^3}+\frac{9Ab^2cd^2}{e^4}-\frac{12Abc^2d^3}{e^5}+\frac{5Ac^3d^4}{e^6}+\frac{3Bb^3d^2}{e^4}-\frac{12Bb^2cd^3}{e^5}+\frac{15Bbc^2d^4}{e^6}-\frac{6Bc^3d^5}{e^7}\right)$$
$$+\frac{Ab^3d^3e^4-3Ab^2cd^4e^3+3Abc^2d^5e^2-Ac^3d^6e-Bb^3d^4e^3+3Bb^2cd^5e^2-3Bbc^2d^6e+Bc^3d^7}{de^8+e^9x}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**3/(e*x+d)**2,x)
```

output
```
B*c**3*x**6/(6*e**2) - d**2*(b*e - c*d)**2*(-3*A*b*e**2 + 6*A*c*d*e + 4*B*
b*d*e - 7*B*c*d**2)*log(d + e*x)/e**8 + x**5*(A*c**3/(5*e**2) + 3*B*b*c**2
/(5*e**2) - 2*B*c**3*d/(5*e**3)) + x**4*(3*A*b*c**2/(4*e**2) - A*c**3*d/(2
*e**3) + 3*B*b**2*c/(4*e**2) - 3*B*b*c**2*d/(2*e**3) + 3*B*c**3*d**2/(4*e*
*4)) + x**3*(A*b**2*c/e**2 - 2*A*b*c**2*d/e**3 + A*c**3*d**2/e**4 + B*b**3
/(3*e**2) - 2*B*b**2*c*d/e**3 + 3*B*b*c**2*d**2/e**4 - 4*B*c**3*d**3/(3*e*
*5)) + x**2*(A*b**3/(2*e**2) - 3*A*b**2*c*d/e**3 + 9*A*b*c**2*d**2/(2*e**4
) - 2*A*c**3*d**3/e**5 - B*b**3*d/e**3 + 9*B*b**2*c*d**2/(2*e**4) - 6*B*b*
c**2*d**3/e**5 + 5*B*c**3*d**4/(2*e**6)) + x*(-2*A*b**3*d/e**3 + 9*A*b**2*
c*d**2/e**4 - 12*A*b*c**2*d**3/e**5 + 5*A*c**3*d**4/e**6 + 3*B*b**3*d**2/e
**4 - 12*B*b**2*c*d**3/e**5 + 15*B*b*c**2*d**4/e**6 - 6*B*c**3*d**5/e**7)
+ (A*b**3*d**3*e**4 - 3*A*b**2*c*d**4*e**3 + 3*A*b*c**2*d**5*e**2 - A*c**3
*d**6*e - B*b**3*d**4*e**3 + 3*B*b**2*c*d**5*e**2 - 3*B*b*c**2*d**6*e + B*
c**3*d**7)/(d*e**8 + e**9*x)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 541, normalized size of antiderivative = 1.89

$$\int \frac{(A+Bx)(bx+cx^2)^3}{(d+ex)^2}\,dx$$
$$= \frac{Bc^3d^7 + Ab^3d^3e^4 - (3\,Bbc^2 + Ac^3)d^6e + 3\,(Bb^2c + Abc^2)d^5e^2 - (Bb^3 + 3\,Ab^2c)d^4e^3}{e^9x + de^8}$$
$$+ \frac{10\,Bc^3e^5x^6 - 12\,(2\,Bc^3de^4 - (3\,Bbc^2 + Ac^3)e^5)x^5 + 15\,(3\,Bc^3d^2e^3 - 2\,(3\,Bbc^2 + Ac^3)de^4 + 3\,(Bb^2c +}{}$$
$$+ \frac{(7\,Bc^3d^6 + 3\,Ab^3d^2e^4 - 6\,(3\,Bbc^2 + Ac^3)d^5e + 15\,(Bb^2c + Abc^2)d^4e^2 - 4\,(Bb^3 + 3\,Ab^2c)d^3e^3)\log(ex -}{e^8}$$

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

output
```
(B*c^3*d^7 + A*b^3*d^3*e^4 - (3*B*b*c^2 + A*c^3)*d^6*e + 3*(B*b^2*c + A*b*
c^2)*d^5*e^2 - (B*b^3 + 3*A*b^2*c)*d^4*e^3)/(e^9*x + d*e^8) + 1/60*(10*B*c
^3*e^5*x^6 - 12*(2*B*c^3*d*e^4 - (3*B*b*c^2 + A*c^3)*e^5)*x^5 + 15*(3*B*c^
3*d^2*e^3 - 2*(3*B*b*c^2 + A*c^3)*d*e^4 + 3*(B*b^2*c + A*b*c^2)*e^5)*x^4 -
 20*(4*B*c^3*d^3*e^2 - 3*(3*B*b*c^2 + A*c^3)*d^2*e^3 + 6*(B*b^2*c + A*b*c^
2)*d*e^4 - (B*b^3 + 3*A*b^2*c)*e^5)*x^3 + 30*(5*B*c^3*d^4*e + A*b^3*e^5 -
4*(3*B*b*c^2 + A*c^3)*d^3*e^2 + 9*(B*b^2*c + A*b*c^2)*d^2*e^3 - 2*(B*b^3 +
 3*A*b^2*c)*d*e^4)*x^2 - 60*(6*B*c^3*d^5 + 2*A*b^3*d*e^4 - 5*(3*B*b*c^2 +
A*c^3)*d^4*e + 12*(B*b^2*c + A*b*c^2)*d^3*e^2 - 3*(B*b^3 + 3*A*b^2*c)*d^2*
e^3)*x)/e^7 + (7*B*c^3*d^6 + 3*A*b^3*d^2*e^4 - 6*(3*B*b*c^2 + A*c^3)*d^5*e
 + 15*(B*b^2*c + A*b*c^2)*d^4*e^2 - 4*(B*b^3 + 3*A*b^2*c)*d^3*e^3)*log(e*x
 + d)/e^8
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 707 vs. $2(279) = 558$.

Time = 0.28 (sec) , antiderivative size = 707, normalized size of antiderivative = 2.46

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^2}\,dx$$
$$= \frac{\left(10\,Bc^3 - \frac{12\,(7\,Bc^3de-3\,Bbc^2e^2-Ac^3e^2)}{(ex+d)e} + \frac{45\,(7\,Bc^3d^2e^2-6\,Bbc^2de^3-2\,Ac^3de^3+Bb^2ce^4+Abc^2e^4)}{(ex+d)^2e^2} - \frac{20\,(35\,Bc^3d^3e^3-45\,Bbc^2d^2e^4-}{}\right.}{}$$
$$-\frac{(7\,Bc^3d^6-18\,Bbc^2d^5e-6\,Ac^3d^5e+15\,Bb^2cd^4e^2+15\,Abc^2d^4e^2-4\,Bb^3d^3e^3-12\,Ab^2cd^3e^3+3\,Ab^3d^2}{e^8}$$
$$+\frac{\frac{Bc^3d^7e^6}{ex+d} - \frac{3\,Bbc^2d^6e^7}{ex+d} - \frac{Ac^3d^6e^7}{ex+d} + \frac{3\,Bb^2cd^5e^8}{ex+d} + \frac{3\,Abc^2d^5e^8}{ex+d} - \frac{Bb^3d^4e^9}{ex+d} - \frac{3\,Ab^2cd^4e^9}{ex+d} + \frac{Ab^3d^3e^{10}}{ex+d}}{e^{14}}$$

input

```
integrate((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^2,x, algorithm="giac")
```

output

```
1/60*(10*B*c^3 - 12*(7*B*c^3*d*e - 3*B*b*c^2*e^2 - A*c^3*e^2)/((e*x + d)*e
) + 45*(7*B*c^3*d^2*e^2 - 6*B*b*c^2*d*e^3 - 2*A*c^3*d*e^3 + B*b^2*c*e^4 +
A*b*c^2*e^4)/((e*x + d)^2*e^2) - 20*(35*B*c^3*d^3*e^3 - 45*B*b*c^2*d^2*e^4
 - 15*A*c^3*d^2*e^4 + 15*B*b^2*c*d*e^5 + 15*A*b*c^2*d*e^5 - B*b^3*e^6 - 3*
A*b^2*c*e^6)/((e*x + d)^3*e^3) + 30*(35*B*c^3*d^4*e^4 - 60*B*b*c^2*d^3*e^5
 - 20*A*c^3*d^3*e^5 + 30*B*b^2*c*d^2*e^6 + 30*A*b*c^2*d^2*e^6 - 4*B*b^3*d*
e^7 - 12*A*b^2*c*d*e^7 + A*b^3*e^8)/((e*x + d)^4*e^4) - 180*(7*B*c^3*d^5*e
^5 - 15*B*b*c^2*d^4*e^6 - 5*A*c^3*d^4*e^6 + 10*B*b^2*c*d^3*e^7 + 10*A*b*c^
2*d^3*e^7 - 2*B*b^3*d^2*e^8 - 6*A*b^2*c*d^2*e^8 + A*b^3*d*e^9)/((e*x + d)^
5*e^5))*(e*x + d)^6/e^8 - (7*B*c^3*d^6 - 18*B*b*c^2*d^5*e - 6*A*c^3*d^5*e
+ 15*B*b^2*c*d^4*e^2 + 15*A*b*c^2*d^4*e^2 - 4*B*b^3*d^3*e^3 - 12*A*b^2*c*d
^3*e^3 + 3*A*b^3*d^2*e^4)*log(abs(e*x + d)/((e*x + d)^2*abs(e)))/e^8 + (B*
c^3*d^7*e^6/(e*x + d) - 3*B*b*c^2*d^6*e^7/(e*x + d) - A*c^3*d^6*e^7/(e*x +
 d) + 3*B*b^2*c*d^5*e^8/(e*x + d) + 3*A*b*c^2*d^5*e^8/(e*x + d) - B*b^3*d^
4*e^9/(e*x + d) - 3*A*b^2*c*d^4*e^9/(e*x + d) + A*b^3*d^3*e^10/(e*x + d))/
e^14
```

Mupad [B] (verification not implemented)

Time = 10.79 (sec) , antiderivative size = 997, normalized size of antiderivative = 3.47

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^2}\,dx = \text{Too large to display}$$

input
```
int(((b*x + c*x^2)^3*(A + B*x))/(d + e*x)^2,x)
```

output
```
x^3*((B*b^3 + 3*A*b^2*c)/(3*e^2) + (2*d*((2*d*((A*c^3 + 3*B*b*c^2)/e^2 - (
2*B*c^3*d)/e^3))/e - (3*b*c*(A*c + B*b))/e^2 + (B*c^3*d^2)/e^4))/(3*e) - (
d^2*((A*c^3 + 3*B*b*c^2)/e^2 - (2*B*c^3*d)/e^3))/(3*e^2)) + x^2*((A*b^3)/(
2*e^2) - (d*((B*b^3 + 3*A*b^2*c)/e^2 + (2*d*((2*d*((A*c^3 + 3*B*b*c^2)/e^2
 - (2*B*c^3*d)/e^3))/e - (3*b*c*(A*c + B*b))/e^2 + (B*c^3*d^2)/e^4))/e - (
d^2*((A*c^3 + 3*B*b*c^2)/e^2 - (2*B*c^3*d)/e^3))/e^2))/e + (d^2*((2*d*((A*
c^3 + 3*B*b*c^2)/e^2 - (2*B*c^3*d)/e^3))/e - (3*b*c*(A*c + B*b))/e^2 + (B*
c^3*d^2)/e^4))/(2*e^2)) + x^5*((A*c^3 + 3*B*b*c^2)/(5*e^2) - (2*B*c^3*d)/(
5*e^3)) - x*((2*d*((A*b^3)/e^2 - (2*d*((B*b^3 + 3*A*b^2*c)/e^2 + (2*d*((2*
d*((A*c^3 + 3*B*b*c^2)/e^2 - (2*B*c^3*d)/e^3))/e - (3*b*c*(A*c + B*b))/e^2
 + (B*c^3*d^2)/e^4))/e - (d^2*((A*c^3 + 3*B*b*c^2)/e^2 - (2*B*c^3*d)/e^3))
/e^2))/e + (d^2*((2*d*((A*c^3 + 3*B*b*c^2)/e^2 - (2*B*c^3*d)/e^3))/e - (3*
b*c*(A*c + B*b))/e^2 + (B*c^3*d^2)/e^4))/e^2))/e + (d^2*((B*b^3 + 3*A*b^2*
c)/e^2 + (2*d*((2*d*((A*c^3 + 3*B*b*c^2)/e^2 - (2*B*c^3*d)/e^3))/e - (3*b*
c*(A*c + B*b))/e^2 + (B*c^3*d^2)/e^4))/e - (d^2*((A*c^3 + 3*B*b*c^2)/e^2 -
 (2*B*c^3*d)/e^3))/e^2))/e^2) - x^4*((d*((A*c^3 + 3*B*b*c^2)/e^2 - (2*B*c^
3*d)/e^3))/(2*e) - (3*b*c*(A*c + B*b))/(4*e^2) + (B*c^3*d^2)/(4*e^4)) + (l
og(d + e*x)*(7*B*c^3*d^6 - 6*A*c^3*d^5*e + 3*A*b^3*d^2*e^4 - 4*B*b^3*d^3*e
^3 + 15*A*b*c^2*d^4*e^2 - 12*A*b^2*c*d^3*e^3 + 15*B*b^2*c*d^4*e^2 - 18*B*b
*c^2*d^5*e))/e^8 + (B*c^3*d^7 - A*c^3*d^6*e + A*b^3*d^3*e^4 - B*b^3*d^4...
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 865, normalized size of antiderivative = 3.01

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^2,x)
```

output
```
(180*log(d + e*x)*a*b**3*d**3*e**4 + 180*log(d + e*x)*a*b**3*d**2*e**5*x -
 720*log(d + e*x)*a*b**2*c*d**4*e**3 - 720*log(d + e*x)*a*b**2*c*d**3*e**4
*x + 900*log(d + e*x)*a*b*c**2*d**5*e**2 + 900*log(d + e*x)*a*b*c**2*d**4*
e**3*x - 360*log(d + e*x)*a*c**3*d**6*e - 360*log(d + e*x)*a*c**3*d**5*e**
2*x - 240*log(d + e*x)*b**4*d**4*e**3 - 240*log(d + e*x)*b**4*d**3*e**4*x
+ 900*log(d + e*x)*b**3*c*d**5*e**2 + 900*log(d + e*x)*b**3*c*d**4*e**3*x
- 1080*log(d + e*x)*b**2*c**2*d**6*e - 1080*log(d + e*x)*b**2*c**2*d**5*e*
*2*x + 420*log(d + e*x)*b*c**3*d**7 + 420*log(d + e*x)*b*c**3*d**6*e*x - 1
80*a*b**3*d**2*e**5*x - 90*a*b**3*d*e**6*x**2 + 30*a*b**3*e**7*x**3 + 720*
a*b**2*c*d**3*e**4*x + 360*a*b**2*c*d**2*e**5*x**2 - 120*a*b**2*c*d*e**6*x
**3 + 60*a*b**2*c*e**7*x**4 - 900*a*b*c**2*d**4*e**3*x - 450*a*b*c**2*d**3
*e**4*x**2 + 150*a*b*c**2*d**2*e**5*x**3 - 75*a*b*c**2*d*e**6*x**4 + 45*a*
b*c**2*e**7*x**5 + 360*a*c**3*d**5*e**2*x + 180*a*c**3*d**4*e**3*x**2 - 60
*a*c**3*d**3*e**4*x**3 + 30*a*c**3*d**2*e**5*x**4 - 18*a*c**3*d*e**6*x**5
+ 12*a*c**3*e**7*x**6 + 240*b**4*d**3*e**4*x + 120*b**4*d**2*e**5*x**2 - 4
0*b**4*d*e**6*x**3 + 20*b**4*e**7*x**4 - 900*b**3*c*d**4*e**3*x - 450*b**3
*c*d**3*e**4*x**2 + 150*b**3*c*d**2*e**5*x**3 - 75*b**3*c*d*e**6*x**4 + 45
*b**3*c*e**7*x**5 + 1080*b**2*c**2*d**5*e**2*x + 540*b**2*c**2*d**4*e**3*x
**2 - 180*b**2*c**2*d**3*e**4*x**3 + 90*b**2*c**2*d**2*e**5*x**4 - 54*b**2
*c**2*d*e**6*x**5 + 36*b**2*c**2*e**7*x**6 - 420*b*c**3*d**6*e*x - 210*...
```

3.28 $\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 359

$$
\begin{aligned}
\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^3}\,dx
&= -\frac{(cd-be)\left(Ae(10c^2d^2-8bcde+b^2e^2)-3Bd(5c^2d^2-5bcde+b^2e^2)\right)x}{e^7} \\
&\quad+\frac{(cd-be)\left(3Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2)\right)x^2}{2e^6} \\
&\quad+\frac{c(cd-be)(2Bcd-bBe-Ace)x^3}{e^5}-\frac{c^2(3Bcd-3bBe-Ace)x^4}{4e^4}+\frac{Bc^3x^5}{5e^3} \\
&\quad+\frac{d^3(Bd-Ae)(cd-be)^3}{2e^8(d+ex)^2}-\frac{d^2(cd-be)^2(Bd(7cd-4be)-3Ae(2cd-be))}{e^8(d+ex)} \\
&\quad+\frac{3d(cd-be)\left(Ae(5c^2d^2-5bcde+b^2e^2)-Bd(7c^2d^2-8bcde+2b^2e^2)\right)\log(d+ex)}{e^8}
\end{aligned}
$$

output

```
-(-b*e+c*d)*(A*e*(b^2*e^2-8*b*c*d*e+10*c^2*d^2)-3*B*d*(b^2*e^2-5*b*c*d*e+5
*c^2*d^2))*x/e^7+1/2*(-b*e+c*d)*(3*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e
+10*c^2*d^2))*x^2/e^6+c*(-b*e+c*d)*(-A*c*e-B*b*e+2*B*c*d)*x^3/e^5-1/4*c^2*
(-A*c*e-3*B*b*e+3*B*c*d)*x^4/e^4+1/5*B*c^3*x^5/e^3+1/2*d^3*(-A*e+B*d)*(-b*
e+c*d)^3/e^8/(e*x+d)^2-d^2*(-b*e+c*d)^2*(B*d*(-4*b*e+7*c*d)-3*A*e*(-b*e+2*
c*d))/e^8/(e*x+d)+3*d*(-b*e+c*d)*(A*e*(b^2*e^2-5*b*c*d*e+5*c^2*d^2)-B*d*(2
*b^2*e^2-8*b*c*d*e+7*c^2*d^2))*ln(e*x+d)/e^8
```

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 342, normalized size of antiderivative = 0.95

$$\int \frac{(A+Bx)(bx+cx^2)^3}{(d+ex)^3}\,dx$$
$$= \frac{20e(-cd+be)\left(Ae(10c^2d^2-8bcde+b^2e^2)-3Bd(5c^2d^2-5bcde+b^2e^2)\right)x+10e^2(-cd+be)\left(3Ace(-2\right.}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^3)/(d + e*x)^3,x]
```

output
```
(20*e*(-(c*d) + b*e)*(A*e*(10*c^2*d^2 - 8*b*c*d*e + b^2*e^2) - 3*B*d*(5*c^
2*d^2 - 5*b*c*d*e + b^2*e^2))*x + 10*e^2*(-(c*d) + b*e)*(3*A*c*e*(-2*c*d +
 b*e) + B*(10*c^2*d^2 - 8*b*c*d*e + b^2*e^2))*x^2 - 20*c*e^3*(c*d - b*e)*(
-2*B*c*d + b*B*e + A*c*e)*x^3 + 5*c^2*e^4*(-3*B*c*d + 3*b*B*e + A*c*e)*x^4
 + 4*B*c^3*e^5*x^5 + (10*d^3*(B*d - A*e)*(c*d - b*e)^3)/(d + e*x)^2 - (20*
d^2*(c*d - b*e)^2*(B*d*(7*c*d - 4*b*e) + 3*A*e*(-2*c*d + b*e)))/(d + e*x)
- 60*d*(c*d - b*e)*(-(A*e*(5*c^2*d^2 - 5*b*c*d*e + b^2*e^2)) + B*d*(7*c^2*
d^2 - 8*b*c*d*e + 2*b^2*e^2))*Log[d + e*x])/(20*e^8)
```

Rubi [A] (verified)

Time = 1.38 (sec) , antiderivative size = 359, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)(bx+cx^2)^3}{(d+ex)^3}\,dx$$
$$\Big\downarrow \text{1195}$$
$$\int \left(\frac{3d(cd-be)\left(Ae(b^2e^2-5bcde+5c^2d^2)-Bd(2b^2e^2-8bcde+7c^2d^2)\right)}{e^7(d+ex)}+\frac{(cd-be)\left(3Bd(b^2e^2-5bcde+5c\right.}{}\right.$$

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

$$\frac{3d(cd-be)\log(d+ex)\left(Ae\left(b^2e^2-5bcde+5c^2d^2\right)-Bd\left(2b^2e^2-8bcde+7c^2d^2\right)\right)}{e^8}-\frac{x(cd-be)\left(Ae\left(b^2e^2-8bcde+10c^2d^2\right)-3Bd\left(b^2e^2-5bcde+5c^2d^2\right)\right)}{e^7}+\frac{x^2(cd-be)\left(3Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{2e^6}-\frac{c^2x^4(-Ace-3bBe+3Bcd)}{4e^4}+\frac{d^3(Bd-Ae)(cd-be)^3}{2e^8(d+ex)^2}-\frac{d^2(cd-be)^2(Bd(7cd-4be)-3Ae(2cd-be))}{e^8(d+ex)}+\frac{cx^3(cd-be)(-Ace-bBe+2Bcd)}{e^5}+\frac{Bc^3x^5}{5e^3}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^3)/(d + e*x)^3,x]
```

output
```
-(((c*d - b*e)*(A*e*(10*c^2*d^2 - 8*b*c*d*e + b^2*e^2) - 3*B*d*(5*c^2*d^2
- 5*b*c*d*e + b^2*e^2))*x)/e^7) + ((c*d - b*e)*(3*A*c*e*(2*c*d - b*e) - B*
(10*c^2*d^2 - 8*b*c*d*e + b^2*e^2))*x^2)/(2*e^6) + (c*(c*d - b*e)*(2*B*c*d
 - b*B*e - A*c*e)*x^3)/e^5 - (c^2*(3*B*c*d - 3*b*B*e - A*c*e)*x^4)/(4*e^4)
 + (B*c^3*x^5)/(5*e^3) + (d^3*(B*d - A*e)*(c*d - b*e)^3)/(2*e^8*(d + e*x)^
2) - (d^2*(c*d - b*e)^2*(B*d*(7*c*d - 4*b*e) - 3*A*e*(2*c*d - b*e)))/(e^8*
(d + e*x)) + (3*d*(c*d - b*e)*(A*e*(5*c^2*d^2 - 5*b*c*d*e + b^2*e^2) - B*d
*(7*c^2*d^2 - 8*b*c*d*e + 2*b^2*e^2))*Log[d + e*x])/e^8
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 571, normalized size of antiderivative = 1.59

method	result
norman	$\frac{\frac{\left(A b^3 e^4-6 A b^2 c d e^3+10 A b c^2 d^2 e^2-5 A c^3 d^3 e-2 B b^3 d e^3+10 B b^2 c d^2 e^2-15 B b c^2 d^3 e+7 B c^3 d^4\right) x^3}{e^5}-\frac{d^2\left(9 A d b^3 e^4-54 A b^2 c d^2 e^3+90 A b c\right.}{}}{}$
default	$\frac{\frac{1}{5} B c^3 x^5 e^4+\frac{1}{4} A c^3 e^4 x^4+\frac{3}{4} B b c^2 e^4 x^4-\frac{3}{4} B c^3 d e^3 x^4+A b c^2 e^4 x^3-A c^3 d e^3 x^3+B b^2 c e^4 x^3-3 B b c^2 d e^3 x^3+2 B c^3 d^2 e^2 x^3+\frac{3}{2} A}{}$
risch	$\frac{A c^3 x^4}{4 e^3}+\frac{B b^3 x^2}{2 e^3}+\frac{A b^3 x}{e^3}+\frac{3 B b c^2 x^4}{4 e^3}-\frac{3 B c^3 d x^4}{4 e^4}+\frac{A b c^2 x^3}{e^3}-\frac{A c^3 d x^3}{e^4}+\frac{B b^2 c x^3}{e^3}+\frac{2 B c^3 d^2 x^3}{e^5}+\frac{3 A b^2 c x}{2 e^3}$
parallelrisch	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
(1/e^5*(A*b^3*e^4-6*A*b^2*c*d*e^3+10*A*b*c^2*d^2*e^2-5*A*c^3*d^3*e-2*B*b^3
*d*e^3+10*B*b^2*c*d^2*e^2-15*B*b*c^2*d^3*e+7*B*c^3*d^4)*x^3-1/2*d^2*(9*A*b
^3*d*e^4-54*A*b^2*c*d^2*e^3+90*A*b*c^2*d^3*e^2-45*A*c^3*d^4*e-18*B*b^3*d^2
*e^3+90*B*b^2*c*d^3*e^2-135*B*b*c^2*d^4*e+63*B*c^3*d^5)/e^8+1/4*(6*A*b^2*c
*e^3-10*A*b*c^2*d*e^2+5*A*c^3*d^2*e+2*B*b^3*e^3-10*B*b^2*c*d*e^2+15*B*b*c^
2*d^2*e-7*B*c^3*d^3)/e^4*x^4+1/5*B*c^3*x^7/e+1/10*c*(10*A*b*c*e^2-5*A*c^2*
d*e+10*B*b^2*e^2-15*B*b*c*d*e+7*B*c^2*d^2)/e^3*x^5+1/20*c^2*(5*A*c*e+15*B*
b*e-7*B*c*d)/e^2*x^6-2*d*(3*A*b^3*d*e^4-18*A*b^2*c*d^2*e^3+30*A*b*c^2*d^3*
e^2-15*A*c^3*d^4*e-6*B*b^3*d^2*e^3+30*B*b^2*c*d^3*e^2-45*B*b*c^2*d^4*e+21*
B*c^3*d^5)/e^7*x)/(e*x+d)^2-3*d/e^8*(A*b^3*e^4-6*A*b^2*c*d*e^3+10*A*b*c^2*
d^2*e^2-5*A*c^3*d^3*e-2*B*b^3*d*e^3+10*B*b^2*c*d^2*e^2-15*B*b*c^2*d^3*e+7*
B*c^3*d^4)*ln(e*x+d)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 819 vs. 2(351) = 702.

Time = 0.09 (sec) , antiderivative size = 819, normalized size of antiderivative = 2.28

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^3}\,dx = \text{Too large to display}$$

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

output
```
1/20*(4*B*c^3*e^7*x^7 - 130*B*c^3*d^7 - 50*A*b^3*d^3*e^4 + 110*(3*B*b*c^2
+ A*c^3)*d^6*e - 270*(B*b^2*c + A*b*c^2)*d^5*e^2 + 70*(B*b^3 + 3*A*b^2*c)*
d^4*e^3 - (7*B*c^3*d*e^6 - 5*(3*B*b*c^2 + A*c^3)*e^7)*x^6 + 2*(7*B*c^3*d^2
*e^5 - 5*(3*B*b*c^2 + A*c^3)*d*e^6 + 10*(B*b^2*c + A*b*c^2)*e^7)*x^5 - 5*(
7*B*c^3*d^3*e^4 - 5*(3*B*b*c^2 + A*c^3)*d^2*e^5 + 10*(B*b^2*c + A*b*c^2)*d
*e^6 - 2*(B*b^3 + 3*A*b^2*c)*e^7)*x^4 + 20*(7*B*c^3*d^4*e^3 + A*b^3*e^7 -
5*(3*B*b*c^2 + A*c^3)*d^3*e^4 + 10*(B*b^2*c + A*b*c^2)*d^2*e^5 - 2*(B*b^3
+ 3*A*b^2*c)*d*e^6)*x^3 + 10*(50*B*c^3*d^5*e^2 + 4*A*b^3*d*e^6 - 34*(3*B*b
*c^2 + A*c^3)*d^4*e^3 + 63*(B*b^2*c + A*b*c^2)*d^3*e^4 - 11*(B*b^3 + 3*A*b
^2*c)*d^2*e^5)*x^2 + 20*(8*B*c^3*d^6*e - 2*A*b^3*d^2*e^5 - 4*(3*B*b*c^2 +
A*c^3)*d^5*e^2 + 3*(B*b^2*c + A*b*c^2)*d^4*e^3 + (B*b^3 + 3*A*b^2*c)*d^3*e
^4)*x - 60*(7*B*c^3*d^7 + A*b^3*d^3*e^4 - 5*(3*B*b*c^2 + A*c^3)*d^6*e + 10
*(B*b^2*c + A*b*c^2)*d^5*e^2 - 2*(B*b^3 + 3*A*b^2*c)*d^4*e^3 + (7*B*c^3*d^
5*e^2 + A*b^3*d*e^6 - 5*(3*B*b*c^2 + A*c^3)*d^4*e^3 + 10*(B*b^2*c + A*b*c^
2)*d^3*e^4 - 2*(B*b^3 + 3*A*b^2*c)*d^2*e^5)*x^2 + 2*(7*B*c^3*d^6*e + A*b^3
*d^2*e^5 - 5*(3*B*b*c^2 + A*c^3)*d^5*e^2 + 10*(B*b^2*c + A*b*c^2)*d^4*e^3
- 2*(B*b^3 + 3*A*b^2*c)*d^3*e^4)*x)*log(e*x + d))/(e^10*x^2 + 2*d*e^9*x +
d^2*e^8)
```

Sympy [A] (verification not implemented)

Time = 3.75 (sec) , antiderivative size = 660, normalized size of antiderivative = 1.84

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^3}\,dx = \frac{Bc^3x^5}{5e^3} + \frac{3d(be-cd)\left(-Ab^2e^3+5Abcde^2-5Ac^2d^2e+2Bb^2de^2-8Bbcd^2e+7Bc^2d^3\right)\log{(d+ex)}}{e^8} + x^4\left(\frac{Ac^3}{4e^3}+\frac{3Bbc^2}{4e^3}-\frac{3Bc^3d}{4e^4}\right) + x^3\left(\frac{Abc^2}{e^3}-\frac{Ac^3d}{e^4}+\frac{Bb^2c}{e^3}-\frac{3Bbc^2d}{e^4}+\frac{2Bc^3d^2}{e^5}\right) + x^2\cdot\left(\frac{3Ab^2c}{2e^3}-\frac{9Abc^2d}{2e^4}+\frac{3Ac^3d^2}{e^5}+\frac{Bb^3}{2e^3}-\frac{9Bb^2cd}{2e^4}+\frac{9Bbc^2d^2}{e^5}-\frac{5Bc^3d^3}{e^6}\right) + x\left(\frac{Ab^3}{e^3}-\frac{9Ab^2cd}{e^4}+\frac{18Abc^2d^2}{e^5}-\frac{10Ac^3d^3}{e^6}-\frac{3Bb^3d}{e^4}+\frac{18Bb^2cd^2}{e^5}-\frac{30Bbc^2d^3}{e^6}+\frac{15Bc^3d^4}{e^7}\right) + \frac{-5Ab^3d^3e^4+21Ab^2cd^4e^3-27Abc^2d^5e^2+11Ac^3d^6e+7Bb^3d^4e^3-27Bb^2cd^5e^2+33Bbc^2d^6e-13Bc^3 \cdots}{2d^2e^8 \cdots}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**3/(e*x+d)**3,x)
```

output
```
B*c**3*x**5/(5*e**3) + 3*d*(b*e - c*d)*(-A*b**2*e**3 + 5*A*b*c*d*e**2 - 5*
A*c**2*d**2*e + 2*B*b**2*d*e**2 - 8*B*b*c*d**2*e + 7*B*c**2*d**3)*log(d +
e*x)/e**8 + x**4*(A*c**3/(4*e**3) + 3*B*b*c**2/(4*e**3) - 3*B*c**3*d/(4*e*
*4)) + x**3*(A*b*c**2/e**3 - A*c**3*d/e**4 + B*b**2*c/e**3 - 3*B*b*c**2*d/
e**4 + 2*B*c**3*d**2/e**5) + x**2*(3*A*b**2*c/(2*e**3) - 9*A*b*c**2*d/(2*e
**4) + 3*A*c**3*d**2/e**5 + B*b**3/(2*e**3) - 9*B*b**2*c*d/(2*e**4) + 9*B*
b*c**2*d**2/e**5 - 5*B*c**3*d**3/e**6) + x*(A*b**3/e**3 - 9*A*b**2*c*d/e**
4 + 18*A*b*c**2*d**2/e**5 - 10*A*c**3*d**3/e**6 - 3*B*b**3*d/e**4 + 18*B*b
**2*c*d**2/e**5 - 30*B*b*c**2*d**3/e**6 + 15*B*c**3*d**4/e**7) + (-5*A*b**
3*d**3*e**4 + 21*A*b**2*c*d**4*e**3 - 27*A*b*c**2*d**5*e**2 + 11*A*c**3*d*
*6*e + 7*B*b**3*d**4*e**3 - 27*B*b**2*c*d**5*e**2 + 33*B*b*c**2*d**6*e - 1
3*B*c**3*d**7 + x*(-6*A*b**3*d**2*e**5 + 24*A*b**2*c*d**3*e**4 - 30*A*b*c*
*2*d**4*e**3 + 12*A*c**3*d**5*e**2 + 8*B*b**3*d**3*e**4 - 30*B*b**2*c*d**4
*e**3 + 36*B*b*c**2*d**5*e**2 - 14*B*c**3*d**6*e))/(2*d**2*e**8 + 4*d*e**9
*x + 2*e**10*x**2)
```

Maxima [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 550, normalized size of antiderivative = 1.53

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^3}\,dx =$$
$$-\frac{13\,Bc^3d^7+5\,Ab^3d^3e^4-11\,(3\,Bbc^2+Ac^3)d^6e+27\,(Bb^2c+Abc^2)d^5e^2-7\,(Bb^3+3\,Ab^2c)d^4e^3+2\,(7\,B}{2\,(e^{10}x^2+2\,de^9x}$$
$$+\frac{4\,Bc^3e^4x^5-5\,(3\,Bc^3de^3-(3\,Bbc^2+Ac^3)e^4)x^4+20\,(2\,Bc^3d^2e^2-(3\,Bbc^2+Ac^3)de^3+(Bb^2c+Abc^2)}{}$$
$$-\frac{3\,(7\,Bc^3d^5+Ab^3de^4-5\,(3\,Bbc^2+Ac^3)d^4e+10\,(Bb^2c+Abc^2)d^3e^2-2\,(Bb^3+3\,Ab^2c)d^2e^3)\log(ex+}{e^8}$$

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

output
```
-1/2*(13*B*c^3*d^7 + 5*A*b^3*d^3*e^4 - 11*(3*B*b*c^2 + A*c^3)*d^6*e + 27*(
B*b^2*c + A*b*c^2)*d^5*e^2 - 7*(B*b^3 + 3*A*b^2*c)*d^4*e^3 + 2*(7*B*c^3*d^
6*e + 3*A*b^3*d^2*e^5 - 6*(3*B*b*c^2 + A*c^3)*d^5*e^2 + 15*(B*b^2*c + A*b*
c^2)*d^4*e^3 - 4*(B*b^3 + 3*A*b^2*c)*d^3*e^4)*x)/(e^10*x^2 + 2*d*e^9*x + d
^2*e^8) + 1/20*(4*B*c^3*e^4*x^5 - 5*(3*B*c^3*d*e^3 - (3*B*b*c^2 + A*c^3)*e
^4)*x^4 + 20*(2*B*c^3*d^2*e^2 - (3*B*b*c^2 + A*c^3)*d*e^3 + (B*b^2*c + A*b
*c^2)*e^4)*x^3 - 10*(10*B*c^3*d^3*e - 6*(3*B*b*c^2 + A*c^3)*d^2*e^2 + 9*(B
*b^2*c + A*b*c^2)*d*e^3 - (B*b^3 + 3*A*b^2*c)*e^4)*x^2 + 20*(15*B*c^3*d^4
+ A*b^3*e^4 - 10*(3*B*b*c^2 + A*c^3)*d^3*e + 18*(B*b^2*c + A*b*c^2)*d^2*e^
2 - 3*(B*b^3 + 3*A*b^2*c)*d*e^3)*x)/e^7 - 3*(7*B*c^3*d^5 + A*b^3*d*e^4 - 5
*(3*B*b*c^2 + A*c^3)*d^4*e + 10*(B*b^2*c + A*b*c^2)*d^3*e^2 - 2*(B*b^3 + 3
*A*b^2*c)*d^2*e^3)*log(e*x + d)/e^8
```

Giac [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 636, normalized size of antiderivative = 1.77

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^3}\,dx =$$

$$-\frac{3\,(7\,Bc^3d^5-15\,Bbc^2d^4e-5\,Ac^3d^4e+10\,Bb^2cd^3e^2+10\,Abc^2d^3e^2-2\,Bb^3d^2e^3-6\,Ab^2cd^2e^3+Ab^3de^4}{e^8}$$

$$-\frac{13\,Bc^3d^7-33\,Bbc^2d^6e-11\,Ac^3d^6e+27\,Bb^2cd^5e^2+27\,Abc^2d^5e^2-7\,Bb^3d^4e^3-21\,Ab^2cd^4e^3+5\,Ab^3d}{}$$

$$+\frac{4\,Bc^3e^{12}x^5-15\,Bc^3de^{11}x^4+15\,Bbc^2e^{12}x^4+5\,Ac^3e^{12}x^4+40\,Bc^3d^2e^{10}x^3-60\,Bbc^2de^{11}x^3-20\,Ac^3de}{}$$

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

output
```
-3*(7*B*c^3*d^5 - 15*B*b*c^2*d^4*e - 5*A*c^3*d^4*e + 10*B*b^2*c*d^3*e^2 +
10*A*b*c^2*d^3*e^2 - 2*B*b^3*d^2*e^3 - 6*A*b^2*c*d^2*e^3 + A*b^3*d*e^4)*lo
g(abs(e*x + d))/e^8 - 1/2*(13*B*c^3*d^7 - 33*B*b*c^2*d^6*e - 11*A*c^3*d^6*
e + 27*B*b^2*c*d^5*e^2 + 27*A*b*c^2*d^5*e^2 - 7*B*b^3*d^4*e^3 - 21*A*b^2*c
*d^4*e^3 + 5*A*b^3*d^3*e^4 + 2*(7*B*c^3*d^6*e - 18*B*b*c^2*d^5*e^2 - 6*A*c
^3*d^5*e^2 + 15*B*b^2*c*d^4*e^3 + 15*A*b*c^2*d^4*e^3 - 4*B*b^3*d^3*e^4 - 1
2*A*b^2*c*d^3*e^4 + 3*A*b^3*d^2*e^5)*x)/((e*x + d)^2*e^8) + 1/20*(4*B*c^3*
e^12*x^5 - 15*B*c^3*d*e^11*x^4 + 15*B*b*c^2*e^12*x^4 + 5*A*c^3*e^12*x^4 +
40*B*c^3*d^2*e^10*x^3 - 60*B*b*c^2*d*e^11*x^3 - 20*A*c^3*d*e^11*x^3 + 20*B
*b^2*c*e^12*x^3 + 20*A*b*c^2*e^12*x^3 - 100*B*c^3*d^3*e^9*x^2 + 180*B*b*c^
2*d^2*e^10*x^2 + 60*A*c^3*d^2*e^10*x^2 - 90*B*b^2*c*d*e^11*x^2 - 90*A*b*c^
2*d*e^11*x^2 + 10*B*b^3*e^12*x^2 + 30*A*b^2*c*e^12*x^2 + 300*B*c^3*d^4*e^8
*x - 600*B*b*c^2*d^3*e^9*x - 200*A*c^3*d^3*e^9*x + 360*B*b^2*c*d^2*e^10*x
+ 360*A*b*c^2*d^2*e^10*x - 60*B*b^3*d*e^11*x - 180*A*b^2*c*d*e^11*x + 20*A
*b^3*e^12*x)/e^15
```

Mupad [B] (verification not implemented)

Time = 0.19 (sec) , antiderivative size = 828, normalized size of antiderivative = 2.31

$$\int \frac{(A+Bx)\,(bx+cx^2)^3}{(d+ex)^3}\,dx = x\left(\frac{A\,b^3}{e^3} - \frac{3\,d\left(\frac{B\,b^3+3\,A\,c\,b^2}{e^3}+\frac{3\,d\left(\frac{3\,d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^3}-\frac{3\,B\,c^3\,d}{e^4}\right)}{e}-\frac{3\,b\,c\,(A\,c+B\,b)}{e^3}+\frac{3\,B\,c^3\,d^2}{e^5}\right)}{e}-\frac{3\,d^2\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^3}-\frac{3\,B\,c^3\,d}{e^4}\right)}{e^2}-\frac{B\,c^3\,d^3}{e^6}\right)}{e} - \frac{d^3\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^3}-\frac{3\,B\,c^3\,d}{e^4}\right)}{e^3} + \frac{3\,d^2\left(\frac{3\,d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^3}-\frac{3\,B\,c^3\,d}{e^4}\right)}{e}-\frac{3\,b\,c\,(A\,c+B\,b)}{e^3}+\frac{3\,B\,c^3\,d^2}{e^5}\right)}{e^2}\right)$$

$$+ x^4\left(\frac{A\,c^3+3\,B\,b\,c^2}{4\,e^3}-\frac{3\,B\,c^3\,d}{4\,e^4}\right)$$

$$- \frac{x\,(-4\,B\,b^3\,d^3\,e^3+3\,A\,b^3\,d^2\,e^4+15\,B\,b^2\,c\,d^4\,e^2-12\,A\,b^2\,c\,d^3\,e^3-18\,B\,b\,c^2\,d^5\,e+15\,A\,b\,c^2\,d^4\,e^2+7\,B\,c}{d^2\,e^7+2\,d}$$

$$+ x^2\left(\frac{B\,b^3+3\,A\,c\,b^2}{2\,e^3}+\frac{3\,d\left(\frac{3\,d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^3}-\frac{3\,B\,c^3\,d}{e^4}\right)}{e}-\frac{3\,b\,c\,(A\,c+B\,b)}{e^3}+\frac{3\,B\,c^3\,d^2}{e^5}\right)}{2\,e} - \frac{3\,d^2\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^3}-\frac{3\,B\,c^3\,d}{e^4}\right)}{2\,e^2}-\frac{B\,c^3\,d^3}{2\,e^6}\right)$$

$$- x^3\left(\frac{d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^3}-\frac{3\,B\,c^3\,d}{e^4}\right)}{e}-\frac{b\,c\,(A\,c+B\,b)}{e^3}+\frac{B\,c^3\,d^2}{e^5}\right)$$

$$- \frac{\ln(d+e\,x)\,(-6\,B\,b^3\,d^2\,e^3+3\,A\,b^3\,d\,e^4+30\,B\,b^2\,c\,d^3\,e^2-18\,A\,b^2\,c\,d^2\,e^3-45\,B\,b\,c^2\,d^4\,e+30\,A\,b\,c^2\,d^3\,e}{e^8}$$

$$+ \frac{B\,c^3\,x^5}{5\,e^3}$$

input
```
int(((b*x + c*x^2)^3*(A + B*x))/(d + e*x)^3,x)
```

output
```
x*((A*b^3)/e^3 - (3*d*((B*b^3 + 3*A*b^2*c)/e^3 + (3*d*((3*d*((A*c^3 + 3*B*
b*c^2)/e^3 - (3*B*c^3*d)/e^4))/e - (3*b*c*(A*c + B*b))/e^3 + (3*B*c^3*d^2)
/e^5))/e - (3*d^2*((A*c^3 + 3*B*b*c^2)/e^3 - (3*B*c^3*d)/e^4))/e^2 - (B*c^
3*d^3)/e^6))/e - (d^3*((A*c^3 + 3*B*b*c^2)/e^3 - (3*B*c^3*d)/e^4))/e^3 + (
3*d^2*((3*d*((A*c^3 + 3*B*b*c^2)/e^3 - (3*B*c^3*d)/e^4))/e - (3*b*c*(A*c +
 B*b))/e^3 + (3*B*c^3*d^2)/e^5))/e^2) + x^4*((A*c^3 + 3*B*b*c^2)/(4*e^3) -
 (3*B*c^3*d)/(4*e^4)) - (x*(7*B*c^3*d^6 - 6*A*c^3*d^5*e + 3*A*b^3*d^2*e^4
- 4*B*b^3*d^3*e^3 + 15*A*b*c^2*d^4*e^2 - 12*A*b^2*c*d^3*e^3 + 15*B*b^2*c*d
^4*e^2 - 18*B*b*c^2*d^5*e) + (13*B*c^3*d^7 - 11*A*c^3*d^6*e + 5*A*b^3*d^3*
e^4 - 7*B*b^3*d^4*e^3 + 27*A*b*c^2*d^5*e^2 - 21*A*b^2*c*d^4*e^3 + 27*B*b^2
*c*d^5*e^2 - 33*B*b*c^2*d^6*e)/(2*e))/(d^2*e^7 + e^9*x^2 + 2*d*e^8*x) + x^
2*((B*b^3 + 3*A*b^2*c)/(2*e^3) + (3*d*((3*d*((A*c^3 + 3*B*b*c^2)/e^3 - (3*
B*c^3*d)/e^4))/e - (3*b*c*(A*c + B*b))/e^3 + (3*B*c^3*d^2)/e^5))/(2*e) - (
3*d^2*((A*c^3 + 3*B*b*c^2)/e^3 - (3*B*c^3*d)/e^4))/(2*e^2) - (B*c^3*d^3)/(
2*e^6)) - x^3*((d*((A*c^3 + 3*B*b*c^2)/e^3 - (3*B*c^3*d)/e^4))/e - (b*c*(A
*c + B*b))/e^3 + (B*c^3*d^2)/e^5) - (log(d + e*x)*(21*B*c^3*d^5 + 3*A*b^3*
d*e^4 - 15*A*c^3*d^4*e - 6*B*b^3*d^2*e^3 + 30*A*b*c^2*d^3*e^2 - 18*A*b^2*c
*d^2*e^3 + 30*B*b^2*c*d^3*e^2 - 45*B*b*c^2*d^4*e))/e^8 + (B*c^3*x^5)/(5*e^
3)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 1032, normalized size of antiderivative = 2.87

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^3,x)
```

output

```
( - 60*log(d + e*x)*a*b**3*d**3*e**4 - 120*log(d + e*x)*a*b**3*d**2*e**5*x
 - 60*log(d + e*x)*a*b**3*d*e**6*x**2 + 360*log(d + e*x)*a*b**2*c*d**4*e**
3 + 720*log(d + e*x)*a*b**2*c*d**3*e**4*x + 360*log(d + e*x)*a*b**2*c*d**2
*e**5*x**2 - 600*log(d + e*x)*a*b*c**2*d**5*e**2 - 1200*log(d + e*x)*a*b*c
**2*d**4*e**3*x - 600*log(d + e*x)*a*b*c**2*d**3*e**4*x**2 + 300*log(d + e
*x)*a*c**3*d**6*e + 600*log(d + e*x)*a*c**3*d**5*e**2*x + 300*log(d + e*x)
*a*c**3*d**4*e**3*x**2 + 120*log(d + e*x)*b**4*d**4*e**3 + 240*log(d + e*x
)*b**4*d**3*e**4*x + 120*log(d + e*x)*b**4*d**2*e**5*x**2 - 600*log(d + e*
x)*b**3*c*d**5*e**2 - 1200*log(d + e*x)*b**3*c*d**4*e**3*x - 600*log(d + e
*x)*b**3*c*d**3*e**4*x**2 + 900*log(d + e*x)*b**2*c**2*d**6*e + 1800*log(d
 + e*x)*b**2*c**2*d**5*e**2*x + 900*log(d + e*x)*b**2*c**2*d**4*e**3*x**2
- 420*log(d + e*x)*b*c**3*d**7 - 840*log(d + e*x)*b*c**3*d**6*e*x - 420*lo
g(d + e*x)*b*c**3*d**5*e**2*x**2 - 30*a*b**3*d**3*e**4 + 60*a*b**3*d*e**6*
x**2 + 20*a*b**3*e**7*x**3 + 180*a*b**2*c*d**4*e**3 - 360*a*b**2*c*d**2*e*
*5*x**2 - 120*a*b**2*c*d*e**6*x**3 + 30*a*b**2*c*e**7*x**4 - 300*a*b*c**2*
d**5*e**2 + 600*a*b*c**2*d**3*e**4*x**2 + 200*a*b*c**2*d**2*e**5*x**3 - 50
*a*b*c**2*d*e**6*x**4 + 20*a*b*c**2*e**7*x**5 + 150*a*c**3*d**6*e - 300*a*
c**3*d**4*e**3*x**2 - 100*a*c**3*d**3*e**4*x**3 + 25*a*c**3*d**2*e**5*x**4
 - 10*a*c**3*d*e**6*x**5 + 5*a*c**3*e**7*x**6 + 60*b**4*d**4*e**3 - 120*b*
*4*d**2*e**5*x**2 - 40*b**4*d*e**6*x**3 + 10*b**4*e**7*x**4 - 300*b**3*...
```

3.29 $\int \frac{(A+Bx)(bx+cx^2)^3}{(d+ex)^4}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 422

$$
\begin{aligned}
&\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^4}\,dx \\
&= \frac{(Ace(10c^2d^2-12bcde+3b^2e^2)-B(20c^3d^3-30bc^2d^2e+12b^2cde^2-b^3e^3))\,x}{e^7} \\
&\quad - \frac{c(Ace(4cd-3be)-B(10c^2d^2-12bcde+3b^2e^2))\,x^2}{2e^6} - \frac{c^2(4Bcd-3bBe-Ace)x^3}{3e^5} \\
&\quad + \frac{Bc^3x^4}{4e^4} + \frac{d^3(Bd-Ae)(cd-be)^3}{3e^8(d+ex)^3} - \frac{d^2(cd-be)^2(Bd(7cd-4be)-3Ae(2cd-be))}{2e^8(d+ex)^2} \\
&\quad - \frac{3d(cd-be)\left(Ae(5c^2d^2-5bcde+b^2e^2)-Bd(7c^2d^2-8bcde+2b^2e^2)\right)}{e^8(d+ex)} \\
&\quad + \frac{(Bd(35c^3d^3-60bc^2d^2e+30b^2cde^2-4b^3e^3)-Ae(20c^3d^3-30bc^2d^2e+12b^2cde^2-b^3e^3))\log(d+ex)}{e^8}
\end{aligned}
$$

output
```
(A*c*e*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2)-B*(-b^3*e^3+12*b^2*c*d*e^2-30*b*c
^2*d^2*e+20*c^3*d^3))*x/e^7-1/2*c*(A*c*e*(-3*b*e+4*c*d)-B*(3*b^2*e^2-12*b*
c*d*e+10*c^2*d^2))*x^2/e^6-1/3*c^2*(-A*c*e-3*B*b*e+4*B*c*d)*x^3/e^5+1/4*B*
c^3*x^4/e^4+1/3*d^3*(-A*e+B*d)*(-b*e+c*d)^3/e^8/(e*x+d)^3-1/2*d^2*(-b*e+c*
d)^2*(B*d*(-4*b*e+7*c*d)-3*A*e*(-b*e+2*c*d))/e^8/(e*x+d)^2-3*d*(-b*e+c*d)*
(A*e*(b^2*e^2-5*b*c*d*e+5*c^2*d^2)-B*d*(2*b^2*e^2-8*b*c*d*e+7*c^2*d^2))/e^
8/(e*x+d)+(B*d*(-4*b^3*e^3+30*b^2*c*d*e^2-60*b*c^2*d^2*e+35*c^3*d^3)-A*e*(
-b^3*e^3+12*b^2*c*d*e^2-30*b*c^2*d^2*e+20*c^3*d^3))*ln(e*x+d)/e^8
```

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 400, normalized size of antiderivative = 0.95

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^4}\,dx$$
$$= \frac{12e(Ace(10c^2d^2-12bcde+3b^2e^2)+B(-20c^3d^3+30bc^2d^2e-12b^2cde^2+b^3e^3))\,x-6ce^2(Ace(4cd-3b}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^3)/(d + e*x)^4,x]
```

output
```
(12*e*(A*c*e*(10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2) + B*(-20*c^3*d^3 + 30*b
*c^2*d^2*e - 12*b^2*c*d*e^2 + b^3*e^3))*x - 6*c*e^2*(A*c*e*(4*c*d - 3*b*e)
 + B*(-10*c^2*d^2 + 12*b*c*d*e - 3*b^2*e^2))*x^2 + 4*c^2*e^3*(-4*B*c*d + 3
*b*B*e + A*c*e)*x^3 + 3*B*c^3*e^4*x^4 + (4*d^3*(B*d - A*e)*(c*d - b*e)^3)/
(d + e*x)^3 - (6*d^2*(c*d - b*e)^2*(B*d*(7*c*d - 4*b*e) + 3*A*e*(-2*c*d +
b*e)))/(d + e*x)^2 + (36*d*(c*d - b*e)*(-(A*e*(5*c^2*d^2 - 5*b*c*d*e + b^2
*e^2)) + B*d*(7*c^2*d^2 - 8*b*c*d*e + 2*b^2*e^2)))/(d + e*x) + 12*(B*d*(35
*c^3*d^3 - 60*b*c^2*d^2*e + 30*b^2*c*d*e^2 - 4*b^3*e^3) + A*e*(-20*c^3*d^3
 + 30*b*c^2*d^2*e - 12*b^2*c*d*e^2 + b^3*e^3))*Log[d + e*x])/(12*e^8)
```

Rubi [A] (verified)

Time = 1.48 (sec) , antiderivative size = 422, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^4}\,dx$$
$$\Big\downarrow \; 1195$$
$$\int \left(\frac{3d(cd-be)\left(Ae\left(b^2e^2-5bcde+5c^2d^2\right)-Bd\left(2b^2e^2-8bcde+7c^2d^2\right)\right)}{e^7(d+ex)^2}+\frac{cx\left(B\left(3b^2e^2-12bcde+10c^2d^2\right)-\right.}{e^6}\right.$$

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

$$-\frac{3d(cd-be)\left(Ae\left(b^2e^2-5bcde+5c^2d^2\right)-Bd\left(2b^2e^2-8bcde+7c^2d^2\right)\right)}{e^8(d+ex)}-\frac{cx^2\left(Ace(4cd-3be)-B\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{2e^6}+\frac{\log(d+ex)\left(Bd\left(-4b^3e^3+30b^2cde^2-60bc^2d^2e+35c^3d^3\right)-Ae\left(-b^3e^3+12b^2cde^2-30bc^2d^2e+20c^3d^3\right)\right)}{e^8}+\frac{x\left(Ace\left(3b^2e^2-12bcde+10c^2d^2\right)-B\left(-b^3e^3+12b^2cde^2-30bc^2d^2e+20c^3d^3\right)\right)}{e^7}-\frac{c^2x^3(-Ace-3bBe+4Bcd)}{3e^5}+\frac{d^3(Bd-Ae)(cd-be)^3}{3e^8(d+ex)^3}-\frac{d^2(cd-be)^2(Bd(7cd-4be)-3Ae(2cd-be))}{2e^8(d+ex)^2}+\frac{Bc^3x^4}{4e^4}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^3)/(d + e*x)^4,x]
```

output
```
((A*c*e*(10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2) - B*(20*c^3*d^3 - 30*b*c^2*d
^2*e + 12*b^2*c*d*e^2 - b^3*e^3))*x)/e^7 - (c*(A*c*e*(4*c*d - 3*b*e) - B*(
10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2))*x^2)/(2*e^6) - (c^2*(4*B*c*d - 3*b*B
*e - A*c*e)*x^3)/(3*e^5) + (B*c^3*x^4)/(4*e^4) + (d^3*(B*d - A*e)*(c*d - b
*e)^3)/(3*e^8*(d + e*x)^3) - (d^2*(c*d - b*e)^2*(B*d*(7*c*d - 4*b*e) - 3*A
*e*(2*c*d - b*e)))/(2*e^8*(d + e*x)^2) - (3*d*(c*d - b*e)*(A*e*(5*c^2*d^2
- 5*b*c*d*e + b^2*e^2) - B*d*(7*c^2*d^2 - 8*b*c*d*e + 2*b^2*e^2)))/(e^8*(d
 + e*x)) + ((B*d*(35*c^3*d^3 - 60*b*c^2*d^2*e + 30*b^2*c*d*e^2 - 4*b^3*e^3
) - A*e*(20*c^3*d^3 - 30*b*c^2*d^2*e + 12*b^2*c*d*e^2 - b^3*e^3))*Log[d +
e*x])/e^8
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.76 (sec) , antiderivative size = 563, normalized size of antiderivative = 1.33

method	result
norman	$\frac{d^3\left(11A\,b^3e^4-132A\,b^2cd\,e^3+330Ab\,c^2d^2e^2-220A\,c^3d^3e-44B\,b^3d\,e^3+330B\,b^2c\,d^2e^2-660Bb\,c^2d^3e+385B\,c^3d^4\right)}{6e^8}+\frac{\left(12A\,b^2c\,e^3-30Ab\,c^2d\right.}{}$
default	$\frac{\frac{1}{4}B\,c^3x^4e^3+\frac{1}{3}A\,c^3e^3x^3+Bb\,c^2e^3x^3-\frac{4}{3}B\,c^3d\,e^2x^3+\frac{3}{2}Ab\,c^2e^3x^2-2A\,c^3d\,e^2x^2+\frac{3}{2}B\,b^2c\,e^3x^2-6Bb\,c^2d\,e^2x^2+5B\,c^3d^2e\,x^2+3A}{e^7}$
risch	$\frac{Bb\,c^2x^3}{e^4}-\frac{4B\,c^3d\,x^3}{3e^5}+\frac{A\,c^3x^3}{3e^4}+\frac{B\,b^3x}{e^4}+\frac{\ln(ex+d)A\,b^3}{e^4}+\frac{10A\,c^3d^2x}{e^6}-\frac{20B\,c^3d^3x}{e^7}-\frac{20\ln(ex+d)A\,c^3d^3}{e^7}-4\ln$
parallelrisch	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
(1/6*d^3*(11*A*b^3*e^4-132*A*b^2*c*d*e^3+330*A*b*c^2*d^2*e^2-220*A*c^3*d^3
*e-44*B*b^3*d*e^3+330*B*b^2*c*d^2*e^2-660*B*b*c^2*d^3*e+385*B*c^3*d^4)/e^8
+1/4*(12*A*b^2*c*e^3-30*A*b*c^2*d*e^2+20*A*c^3*d^2*e+4*B*b^3*e^3-30*B*b^2*
c*d*e^2+60*B*b*c^2*d^2*e-35*B*c^3*d^3)/e^4*x^4+1/4*B*c^3*x^7/e+1/4*c*(6*A*
b*c*e^2-4*A*c^2*d*e+6*B*b^2*e^2-12*B*b*c*d*e+7*B*c^2*d^2)/e^3*x^5+1/12*c^2
*(4*A*c*e+12*B*b*e-7*B*c*d)/e^2*x^6+3*d*(A*b^3*e^4-12*A*b^2*c*d*e^3+30*A*b
*c^2*d^2*e^2-20*A*c^3*d^3*e-4*B*b^3*d*e^3+30*B*b^2*c*d^2*e^2-60*B*b*c^2*d^
3*e+35*B*c^3*d^4)/e^6*x^2+3/2*d^2*(3*A*b^3*e^4-36*A*b^2*c*d*e^3+90*A*b*c^2
*d^2*e^2-60*A*c^3*d^3*e-12*B*b^3*d*e^3+90*B*b^2*c*d^2*e^2-180*B*b*c^2*d^3*
e+105*B*c^3*d^4)/e^7*x)/(e*x+d)^3+1/e^8*(A*b^3*e^4-12*A*b^2*c*d*e^3+30*A*b
*c^2*d^2*e^2-20*A*c^3*d^3*e-4*B*b^3*d*e^3+30*B*b^2*c*d^2*e^2-60*B*b*c^2*d^
3*e+35*B*c^3*d^4)*ln(e*x+d)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 910 vs. 2(412) = 824.

Time = 0.09 (sec) , antiderivative size = 910, normalized size of antiderivative = 2.16

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^4,x, algorithm="fricas")
```

output
```
1/12*(3*B*c^3*e^7*x^7 + 214*B*c^3*d^7 + 22*A*b^3*d^3*e^4 - 148*(3*B*b*c^2
+ A*c^3)*d^6*e + 282*(B*b^2*c + A*b*c^2)*d^5*e^2 - 52*(B*b^3 + 3*A*b^2*c)*
d^4*e^3 - (7*B*c^3*d*e^6 - 4*(3*B*b*c^2 + A*c^3)*e^7)*x^6 + 3*(7*B*c^3*d^2
*e^5 - 4*(3*B*b*c^2 + A*c^3)*d*e^6 + 6*(B*b^2*c + A*b*c^2)*e^7)*x^5 - 3*(3
5*B*c^3*d^3*e^4 - 20*(3*B*b*c^2 + A*c^3)*d^2*e^5 + 30*(B*b^2*c + A*b*c^2)*
d*e^6 - 4*(B*b^3 + 3*A*b^2*c)*e^7)*x^4 - 2*(278*B*c^3*d^4*e^3 - 146*(3*B*b
*c^2 + A*c^3)*d^3*e^4 + 189*(B*b^2*c + A*b*c^2)*d^2*e^5 - 18*(B*b^3 + 3*A*
b^2*c)*d*e^6)*x^3 - 6*(68*B*c^3*d^5*e^2 - 6*A*b^3*d*e^6 - 26*(3*B*b*c^2 +
A*c^3)*d^4*e^3 + 9*(B*b^2*c + A*b*c^2)*d^3*e^4 + 6*(B*b^3 + 3*A*b^2*c)*d^2
*e^5)*x^2 + 6*(37*B*c^3*d^6*e + 9*A*b^3*d^2*e^5 - 34*(3*B*b*c^2 + A*c^3)*d
^5*e^2 + 81*(B*b^2*c + A*b*c^2)*d^4*e^3 - 18*(B*b^3 + 3*A*b^2*c)*d^3*e^4)*
x + 12*(35*B*c^3*d^7 + A*b^3*d^3*e^4 - 20*(3*B*b*c^2 + A*c^3)*d^6*e + 30*(
B*b^2*c + A*b*c^2)*d^5*e^2 - 4*(B*b^3 + 3*A*b^2*c)*d^4*e^3 + (35*B*c^3*d^4
*e^3 + A*b^3*e^7 - 20*(3*B*b*c^2 + A*c^3)*d^3*e^4 + 30*(B*b^2*c + A*b*c^2)
*d^2*e^5 - 4*(B*b^3 + 3*A*b^2*c)*d*e^6)*x^3 + 3*(35*B*c^3*d^5*e^2 + A*b^3*
d*e^6 - 20*(3*B*b*c^2 + A*c^3)*d^4*e^3 + 30*(B*b^2*c + A*b*c^2)*d^3*e^4 -
4*(B*b^3 + 3*A*b^2*c)*d^2*e^5)*x^2 + 3*(35*B*c^3*d^6*e + A*b^3*d^2*e^5 - 2
0*(3*B*b*c^2 + A*c^3)*d^5*e^2 + 30*(B*b^2*c + A*b*c^2)*d^4*e^3 - 4*(B*b^3
+ 3*A*b^2*c)*d^3*e^4)*x)*log(e*x + d))/(e^11*x^3 + 3*d*e^10*x^2 + 3*d^2*e^
9*x + d^3*e^8)
```

Sympy [A] (verification not implemented)

Time = 12.07 (sec) , antiderivative size = 700, normalized size of antiderivative = 1.66

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^4}\,dx = \frac{Bc^3x^4}{4e^4} + x^3\left(\frac{Ac^3}{3e^4} + \frac{Bbc^2}{e^4} - \frac{4Bc^3d}{3e^5}\right)$$
$$+ x^2\cdot\left(\frac{3Abc^2}{2e^4} - \frac{2Ac^3d}{e^5} + \frac{3Bb^2c}{2e^4} - \frac{6Bbc^2d}{e^5} + \frac{5Bc^3d^2}{e^6}\right)$$
$$+ x\left(\frac{3Ab^2c}{e^4} - \frac{12Abc^2d}{e^5} + \frac{10Ac^3d^2}{e^6} + \frac{Bb^3}{e^4} - \frac{12Bb^2cd}{e^5} + \frac{30Bbc^2d^2}{e^6} - \frac{20Bc^3d^3}{e^7}\right)$$
$$+ \frac{11Ab^3d^3e^4 - 78Ab^2cd^4e^3 + 141Abc^2d^5e^2 - 74Ac^3d^6e - 26Bb^3d^4e^3 + 141Bb^2cd^5e^2 - 222Bbc^2d^6e + 10}{}$$
$$- \frac{\left(-Ab^3e^4 + 12Ab^2cde^3 - 30Abc^2d^2e^2 + 20Ac^3d^3e + 4Bb^3de^3 - 30Bb^2cd^2e^2 + 60Bbc^2d^3e - 35Bc^3d^4\right)\mathrm{lo}}{e^8}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**3/(e*x+d)**4,x)
```

output
```
B*c**3*x**4/(4*e**4) + x**3*(A*c**3/(3*e**4) + B*b*c**2/e**4 - 4*B*c**3*d/
(3*e**5)) + x**2*(3*A*b*c**2/(2*e**4) - 2*A*c**3*d/e**5 + 3*B*b**2*c/(2*e*
*4) - 6*B*b*c**2*d/e**5 + 5*B*c**3*d**2/e**6) + x*(3*A*b**2*c/e**4 - 12*A*
b*c**2*d/e**5 + 10*A*c**3*d**2/e**6 + B*b**3/e**4 - 12*B*b**2*c*d/e**5 + 3
0*B*b*c**2*d**2/e**6 - 20*B*c**3*d**3/e**7) + (11*A*b**3*d**3*e**4 - 78*A*
b**2*c*d**4*e**3 + 141*A*b*c**2*d**5*e**2 - 74*A*c**3*d**6*e - 26*B*b**3*d
**4*e**3 + 141*B*b**2*c*d**5*e**2 - 222*B*b*c**2*d**6*e + 107*B*c**3*d**7
+ x**2*(18*A*b**3*d*e**6 - 108*A*b**2*c*d**2*e**5 + 180*A*b*c**2*d**3*e**4
 - 90*A*c**3*d**4*e**3 - 36*B*b**3*d**2*e**5 + 180*B*b**2*c*d**3*e**4 - 27
0*B*b*c**2*d**4*e**3 + 126*B*c**3*d**5*e**2) + x*(27*A*b**3*d**2*e**5 - 18
0*A*b**2*c*d**3*e**4 + 315*A*b*c**2*d**4*e**3 - 162*A*c**3*d**5*e**2 - 60*
B*b**3*d**3*e**4 + 315*B*b**2*c*d**4*e**3 - 486*B*b*c**2*d**5*e**2 + 231*B
*c**3*d**6*e))/(6*d**3*e**8 + 18*d**2*e**9*x + 18*d*e**10*x**2 + 6*e**11*x
**3) - (-A*b**3*e**4 + 12*A*b**2*c*d*e**3 - 30*A*b*c**2*d**2*e**2 + 20*A*c
**3*d**3*e + 4*B*b**3*d*e**3 - 30*B*b**2*c*d**2*e**2 + 60*B*b*c**2*d**3*e
- 35*B*c**3*d**4)*log(d + e*x)/e**8
```

Maxima [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 561, normalized size of antiderivative = 1.33

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^4}\,dx$$

$$= \frac{107\,Bc^3d^7 + 11\,Ab^3d^3e^4 - 74\,(3\,Bbc^2 + Ac^3)d^6e + 141\,(Bb^2c + Abc^2)d^5e^2 - 26\,(Bb^3 + 3\,Ab^2c)d^4e^3 + 18}{}$$

$$+ \frac{3\,Bc^3e^3x^4 - 4\,(4\,Bc^3de^2 - (3\,Bbc^2 + Ac^3)e^3)x^3 + 6\,(10\,Bc^3d^2e - 4\,(3\,Bbc^2 + Ac^3)de^2 + 3\,(Bb^2c + Ab}{12\,e^7}$$

$$+ \frac{(35\,Bc^3d^4 + Ab^3e^4 - 20\,(3\,Bbc^2 + Ac^3)d^3e + 30\,(Bb^2c + Abc^2)d^2e^2 - 4\,(Bb^3 + 3\,Ab^2c)de^3)\log\left(ex + d\right.}{e^8}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^4,x, algorithm="maxima")
```

output
```
1/6*(107*B*c^3*d^7 + 11*A*b^3*d^3*e^4 - 74*(3*B*b*c^2 + A*c^3)*d^6*e + 141
*(B*b^2*c + A*b*c^2)*d^5*e^2 - 26*(B*b^3 + 3*A*b^2*c)*d^4*e^3 + 18*(7*B*c^
3*d^5*e^2 + A*b^3*d*e^6 - 5*(3*B*b*c^2 + A*c^3)*d^4*e^3 + 10*(B*b^2*c + A*
b*c^2)*d^3*e^4 - 2*(B*b^3 + 3*A*b^2*c)*d^2*e^5)*x^2 + 3*(77*B*c^3*d^6*e +
9*A*b^3*d^2*e^5 - 54*(3*B*b*c^2 + A*c^3)*d^5*e^2 + 105*(B*b^2*c + A*b*c^2)
*d^4*e^3 - 20*(B*b^3 + 3*A*b^2*c)*d^3*e^4)*x)/(e^11*x^3 + 3*d*e^10*x^2 + 3
*d^2*e^9*x + d^3*e^8) + 1/12*(3*B*c^3*e^3*x^4 - 4*(4*B*c^3*d*e^2 - (3*B*b*
c^2 + A*c^3)*e^3)*x^3 + 6*(10*B*c^3*d^2*e - 4*(3*B*b*c^2 + A*c^3)*d*e^2 +
3*(B*b^2*c + A*b*c^2)*e^3)*x^2 - 12*(20*B*c^3*d^3 - 10*(3*B*b*c^2 + A*c^3)
*d^2*e + 12*(B*b^2*c + A*b*c^2)*d*e^2 - (B*b^3 + 3*A*b^2*c)*e^3)*x)/e^7 +
(35*B*c^3*d^4 + A*b^3*e^4 - 20*(3*B*b*c^2 + A*c^3)*d^3*e + 30*(B*b^2*c + A
*b*c^2)*d^2*e^2 - 4*(B*b^3 + 3*A*b^2*c)*d*e^3)*log(e*x + d)/e^8
```

Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 618, normalized size of antiderivative = 1.46

$$\int \frac{(A+Bx)(bx+cx^2)^3}{(d+ex)^4}\,dx$$
$$= \frac{(35\,Bc^3d^4 - 60\,Bbc^2d^3e - 20\,Ac^3d^3e + 30\,Bb^2cd^2e^2 + 30\,Abc^2d^2e^2 - 4\,Bb^3de^3 - 12\,Ab^2cde^3 + Ab^3e^4)\log}{e^8}$$
$$+ \frac{107\,Bc^3d^7 - 222\,Bbc^2d^6e - 74\,Ac^3d^6e + 141\,Bb^2cd^5e^2 + 141\,Abc^2d^5e^2 - 26\,Bb^3d^4e^3 - 78\,Ab^2cd^4e^3 + }{}$$
$$+ \frac{3\,Bc^3e^{12}x^4 - 16\,Bc^3de^{11}x^3 + 12\,Bbc^2e^{12}x^3 + 4\,Ac^3e^{12}x^3 + 60\,Bc^3d^2e^{10}x^2 - 72\,Bbc^2de^{11}x^2 - 24\,Ac^3de}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^4,x, algorithm="giac")
```

output
```
(35*B*c^3*d^4 - 60*B*b*c^2*d^3*e - 20*A*c^3*d^3*e + 30*B*b^2*c*d^2*e^2 + 3
0*A*b*c^2*d^2*e^2 - 4*B*b^3*d*e^3 - 12*A*b^2*c*d*e^3 + A*b^3*e^4)*log(abs(
e*x + d))/e^8 + 1/6*(107*B*c^3*d^7 - 222*B*b*c^2*d^6*e - 74*A*c^3*d^6*e +
141*B*b^2*c*d^5*e^2 + 141*A*b*c^2*d^5*e^2 - 26*B*b^3*d^4*e^3 - 78*A*b^2*c*
d^4*e^3 + 11*A*b^3*d^3*e^4 + 18*(7*B*c^3*d^5*e^2 - 15*B*b*c^2*d^4*e^3 - 5*
A*c^3*d^4*e^3 + 10*B*b^2*c*d^3*e^4 + 10*A*b*c^2*d^3*e^4 - 2*B*b^3*d^2*e^5
- 6*A*b^2*c*d^2*e^5 + A*b^3*d*e^6)*x^2 + 3*(77*B*c^3*d^6*e - 162*B*b*c^2*d
^5*e^2 - 54*A*c^3*d^5*e^2 + 105*B*b^2*c*d^4*e^3 + 105*A*b*c^2*d^4*e^3 - 20
*B*b^3*d^3*e^4 - 60*A*b^2*c*d^3*e^4 + 9*A*b^3*d^2*e^5)*x)/((e*x + d)^3*e^8
) + 1/12*(3*B*c^3*e^12*x^4 - 16*B*c^3*d*e^11*x^3 + 12*B*b*c^2*e^12*x^3 + 4
*A*c^3*e^12*x^3 + 60*B*c^3*d^2*e^10*x^2 - 72*B*b*c^2*d*e^11*x^2 - 24*A*c^3
*d*e^11*x^2 + 18*B*b^2*c*e^12*x^2 + 18*A*b*c^2*e^12*x^2 - 240*B*c^3*d^3*e^
9*x + 360*B*b*c^2*d^2*e^10*x + 120*A*c^3*d^2*e^10*x - 144*B*b^2*c*d*e^11*x
 - 144*A*b*c^2*d*e^11*x + 12*B*b^3*e^12*x + 36*A*b^2*c*e^12*x)/e^16
```

Mupad [B] (verification not implemented)

Time = 11.03 (sec) , antiderivative size = 676, normalized size of antiderivative = 1.60

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^4}\,dx$$
$$= \frac{x\left(-10\,B\,b^3\,d^3\,e^3+\frac{9\,A\,b^3\,d^2\,e^4}{2}+\frac{105\,B\,b^2\,c\,d^4\,e^2}{2}-30\,A\,b^2\,c\,d^3\,e^3-81\,B\,b\,c^2\,d^5\,e+\frac{105\,A\,b\,c^2\,d^4\,e^2}{2}+\frac{77\,B\,c^3\,d^6}{2}-2\cdots\right.}{\cdots}$$
$$+x\left(\frac{B\,b^3+3\,A\,c\,b^2}{e^4}+\frac{4\,d\left(\frac{4\,d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^4}-\frac{4\,B\,c^3\,d}{e^5}\right)}{e}-\frac{3\,b\,c\,(A\,c+B\,b)}{e^4}+\frac{6\,B\,c^3\,d^2}{e^6}\right)}{e}\right.$$
$$\left.-\frac{6\,d^2\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^4}-\frac{4\,B\,c^3\,d}{e^5}\right)}{e^2}-\frac{4\,B\,c^3\,d^3}{e^7}\right)+x^3\left(\frac{A\,c^3+3\,B\,b\,c^2}{3\,e^4}-\frac{4\,B\,c^3\,d}{3\,e^5}\right)$$
$$-x^2\left(\frac{2\,d\left(\frac{A\,c^3+3\,B\,b\,c^2}{e^4}-\frac{4\,B\,c^3\,d}{e^5}\right)}{e}-\frac{3\,b\,c\,(A\,c+B\,b)}{2\,e^4}+\frac{3\,B\,c^3\,d^2}{e^6}\right)$$
$$+\frac{\ln(d+e\,x)\left(-4\,B\,b^3\,d\,e^3+A\,b^3\,e^4+30\,B\,b^2\,c\,d^2\,e^2-12\,A\,b^2\,c\,d\,e^3-60\,B\,b\,c^2\,d^3\,e+30\,A\,b\,c^2\,d^2\,e^2+3\cdots\right.}{e^8}$$
$$+\frac{B\,c^3\,x^4}{4\,e^4}$$

input
```
int(((b*x + c*x^2)^3*(A + B*x))/(d + e*x)^4,x)
```

output
```
(x*((77*B*c^3*d^6)/2 - 27*A*c^3*d^5*e + (9*A*b^3*d^2*e^4)/2 - 10*B*b^3*d^3
*e^3 + (105*A*b*c^2*d^4*e^2)/2 - 30*A*b^2*c*d^3*e^3 + (105*B*b^2*c*d^4*e^2
)/2 - 81*B*b*c^2*d^5*e) + x^2*(3*A*b^3*d*e^5 + 21*B*c^3*d^5*e - 15*A*c^3*d
^4*e^2 - 6*B*b^3*d^2*e^4 + 30*A*b*c^2*d^3*e^3 - 18*A*b^2*c*d^2*e^4 - 45*B*
b*c^2*d^4*e^2 + 30*B*b^2*c*d^3*e^3) + (107*B*c^3*d^7 - 74*A*c^3*d^6*e + 11
*A*b^3*d^3*e^4 - 26*B*b^3*d^4*e^3 + 141*A*b*c^2*d^5*e^2 - 78*A*b^2*c*d^4*e
^3 + 141*B*b^2*c*d^5*e^2 - 222*B*b*c^2*d^6*e)/(6*e))/(d^3*e^7 + e^10*x^3 +
 3*d^2*e^8*x + 3*d*e^9*x^2) + x*((B*b^3 + 3*A*b^2*c)/e^4 + (4*d*((4*d*((A*
c^3 + 3*B*b*c^2)/e^4 - (4*B*c^3*d)/e^5))/e - (3*b*c*(A*c + B*b))/e^4 + (6*
B*c^3*d^2)/e^6))/e - (6*d^2*((A*c^3 + 3*B*b*c^2)/e^4 - (4*B*c^3*d)/e^5))/e
^2 - (4*B*c^3*d^3)/e^7) + x^3*((A*c^3 + 3*B*b*c^2)/(3*e^4) - (4*B*c^3*d)/(
3*e^5)) - x^2*((2*d*((A*c^3 + 3*B*b*c^2)/e^4 - (4*B*c^3*d)/e^5))/e - (3*b*
c*(A*c + B*b))/(2*e^4) + (3*B*c^3*d^2)/e^6) + (log(d + e*x)*(A*b^3*e^4 + 3
5*B*c^3*d^4 - 20*A*c^3*d^3*e - 4*B*b^3*d*e^3 + 30*A*b*c^2*d^2*e^2 + 30*B*b
^2*c*d^2*e^2 - 12*A*b^2*c*d*e^3 - 60*B*b*c^2*d^3*e))/e^8 + (B*c^3*x^4)/(4*
e^4)
```

Reduce [B] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 1191, normalized size of antiderivative = 2.82

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^3}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^3/(e*x+d)^4,x)
```

output
```
(12*log(d + e*x)*a*b**3*d**3*e**4 + 36*log(d + e*x)*a*b**3*d**2*e**5*x + 3
6*log(d + e*x)*a*b**3*d*e**6*x**2 + 12*log(d + e*x)*a*b**3*e**7*x**3 - 144
*log(d + e*x)*a*b**2*c*d**4*e**3 - 432*log(d + e*x)*a*b**2*c*d**3*e**4*x -
 432*log(d + e*x)*a*b**2*c*d**2*e**5*x**2 - 144*log(d + e*x)*a*b**2*c*d*e*
*6*x**3 + 360*log(d + e*x)*a*b*c**2*d**5*e**2 + 1080*log(d + e*x)*a*b*c**2
*d**4*e**3*x + 1080*log(d + e*x)*a*b*c**2*d**3*e**4*x**2 + 360*log(d + e*x
)*a*b*c**2*d**2*e**5*x**3 - 240*log(d + e*x)*a*c**3*d**6*e - 720*log(d + e
*x)*a*c**3*d**5*e**2*x - 720*log(d + e*x)*a*c**3*d**4*e**3*x**2 - 240*log(
d + e*x)*a*c**3*d**3*e**4*x**3 - 48*log(d + e*x)*b**4*d**4*e**3 - 144*log(
d + e*x)*b**4*d**3*e**4*x - 144*log(d + e*x)*b**4*d**2*e**5*x**2 - 48*log(
d + e*x)*b**4*d*e**6*x**3 + 360*log(d + e*x)*b**3*c*d**5*e**2 + 1080*log(d
 + e*x)*b**3*c*d**4*e**3*x + 1080*log(d + e*x)*b**3*c*d**3*e**4*x**2 + 360
*log(d + e*x)*b**3*c*d**2*e**5*x**3 - 720*log(d + e*x)*b**2*c**2*d**6*e -
2160*log(d + e*x)*b**2*c**2*d**5*e**2*x - 2160*log(d + e*x)*b**2*c**2*d**4
*e**3*x**2 - 720*log(d + e*x)*b**2*c**2*d**3*e**4*x**3 + 420*log(d + e*x)*
b*c**3*d**7 + 1260*log(d + e*x)*b*c**3*d**6*e*x + 1260*log(d + e*x)*b*c**3
*d**5*e**2*x**2 + 420*log(d + e*x)*b*c**3*d**4*e**3*x**3 + 10*a*b**3*d**3*
e**4 + 18*a*b**3*d**2*e**5*x - 12*a*b**3*e**7*x**3 - 120*a*b**2*c*d**4*e**
3 - 216*a*b**2*c*d**3*e**4*x + 144*a*b**2*c*d*e**6*x**3 + 36*a*b**2*c*e**7
*x**4 + 300*a*b*c**2*d**5*e**2 + 540*a*b*c**2*d**4*e**3*x - 360*a*b*c**...
```

3.30 $\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 207

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx &= \frac{e(Ace(6c^2d^2-4bcde+b^2e^2)+B(4c^3d^3-6bc^2d^2e+4b^2cde^2-b^3e^3))\,x}{c^4}\\ &\quad+\frac{e^2(Ace(4cd-be)+B(6c^2d^2-4bcde+b^2e^2))\,x^2}{2c^3}+\frac{e^3(4Bcd-bBe+Ace)x^3}{3c^2}\\ &\quad+\frac{Be^4x^4}{4c}+\frac{Ad^4\log(x)}{b}+\frac{(bB-Ac)(cd-be)^4\log(b+cx)}{bc^5}\end{aligned}$$

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

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx$$
$$= \frac{ex(2Ace(6b^2e^2-3bce(8d+ex)+2c^2(18d^2+6dex+e^2x^2))+B(-12b^3e^3+6b^2ce^2(8d+ex)-4bc^2e(18}{12c^4}$$
$$+\frac{Ad^4\log(x)}{b}+\frac{(bB-Ac)(cd-be)^4\log(b+cx)}{bc^5}$$

input
```
Integrate[((A + B*x)*(d + e*x)^4)/(b*x + c*x^2),x]
```

output
```
(e*x*(2*A*c*e*(6*b^2*e^2 - 3*b*c*e*(8*d + e*x) + 2*c^2*(18*d^2 + 6*d*e*x +
 e^2*x^2)) + B*(-12*b^3*e^3 + 6*b^2*c*e^2*(8*d + e*x) - 4*b*c^2*e*(18*d^2
+ 6*d*e*x + e^2*x^2) + c^3*(48*d^3 + 36*d^2*e*x + 16*d*e^2*x^2 + 3*e^3*x^3
))))/(12*c^4) + (A*d^4*Log[x])/b + ((b*B - A*c)*(c*d - b*e)^4*Log[b + c*x]
)/(b*c^5)
```

Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1200, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx$$
$$\Big\downarrow \ 1200$$
$$\int \left(\frac{e^2x\left(Ace(4cd-be)+B\left(b^2e^2-4bcde+6c^2d^2\right)\right)}{c^3}+\frac{e\left(Ace\left(b^2e^2-4bcde+6c^2d^2\right)+B\left(-b^3e^3+4b^2cde^2-6b\right.\right.}{c^4}\right.$$
$$\Big\downarrow \ 2009$$

$$\frac{e^2x^2\left(Ace(4cd-be)+B\left(b^2e^2-4bcde+6c^2d^2\right)\right)}{2c^3}+\frac{ex\left(Ace\left(b^2e^2-4bcde+6c^2d^2\right)+B\left(-b^3e^3+4b^2cde^2-6bc^2d^2e+4c^3d^3\right)\right)}{c^4}+\frac{(bB-Ac)(cd-be)^4\log(b+cx)}{bc^5}+\frac{e^3x^3(Ace-bBe+4Bcd)}{3c^2}+\frac{Ad^4\log(x)}{b}+\frac{Be^4x^4}{4c}$$

input
```
Int[((A + B*x)*(d + e*x)^4)/(b*x + c*x^2),x]
```

output
```
(e*(A*c*e*(6*c^2*d^2 - 4*b*c*d*e + b^2*e^2) + B*(4*c^3*d^3 - 6*b*c^2*d^2*e
 + 4*b^2*c*d*e^2 - b^3*e^3))*x)/c^4 + (e^2*(A*c*e*(4*c*d - b*e) + B*(6*c^2
*d^2 - 4*b*c*d*e + b^2*e^2))*x^2)/(2*c^3) + (e^3*(4*B*c*d - b*B*e + A*c*e)
*x^3)/(3*c^2) + (B*e^4*x^4)/(4*c) + (A*d^4*Log[x])/b + ((b*B - A*c)*(c*d -
 b*e)^4*Log[b + c*x])/(b*c^5)
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

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

Maple [A] (verified)

Time = 0.86 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.49

method	result
norman	$\frac{e\left(A\,b^2c\,e^3-4Ab\,c^2d\,e^2+6A\,c^3d^2e-B\,e^3b^3+4B\,b^2cd\,e^2-6Bb\,c^2d^2e+4B\,c^3d^3\right)x}{c^4}+\frac{B\,e^4x^4}{4c}-\frac{e^2\left(Abc\,e^2-4A\,c^2de-B\,e^2b^2+\right.}{2c^3}$
default	$\frac{e\left(\frac{1}{4}B\,c^3x^4e^3+\frac{1}{3}A\,c^3e^3x^3-\frac{1}{3}Bb\,c^2e^3x^3+\frac{4}{3}B\,c^3d\,e^2x^3-\frac{1}{2}Ab\,c^2e^3x^2+2A\,c^3d\,e^2x^2+\frac{1}{2}B\,b^2c\,e^3x^2-2Bb\,c^2d\,e^2x^2+3B\,c^3d^2e\,x^2\right.}{c^4}$
risch	$\frac{B\,e^4x^4}{4c}-\frac{6e^2Bb\,d^2x}{c^2}-\frac{b^3\ln(cx+b)A\,e^4}{c^4}+\frac{4\ln(cx+b)A\,d^3e}{c}+\frac{b^4\ln(cx+b)B\,e^4}{c^5}-\frac{2e^3Bbd\,x^2}{c^2}-\frac{4e^3Abdx}{c^2}+\frac{4e^3B}{c^3}$
parallelrisch	$\frac{-48B\ln(cx+b)b^2c^3d^3e+48A\ln(cx+b)b^3c^2d\,e^3+16B\,x^3b\,c^4d\,e^3+24A\,x^2b\,c^4d\,e^3-24B\,x^2b^2c^3d\,e^3+36B\,x^2b\,c^4d^2e^2-48Ax\,b^2}{}$

input
```
int((B*x+A)*(e*x+d)^4/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

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

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 331, normalized size of antiderivative = 1.60

$$\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx = \frac{3\,Bbc^4e^4x^4+12\,Ac^5d^4\log{(x)}+4\,(4\,Bbc^4de^3-(Bb^2c^3-Abc^4)e^4)x^3+6\,(6\,Bbc^4d^2e^2-4\,(Bb^2c^3-Abc^4)}{}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
1/12*(3*B*b*c^4*e^4*x^4 + 12*A*c^5*d^4*log(x) + 4*(4*B*b*c^4*d*e^3 - (B*b^
2*c^3 - A*b*c^4)*e^4)*x^3 + 6*(6*B*b*c^4*d^2*e^2 - 4*(B*b^2*c^3 - A*b*c^4)
*d*e^3 + (B*b^3*c^2 - A*b^2*c^3)*e^4)*x^2 + 12*(4*B*b*c^4*d^3*e - 6*(B*b^2
*c^3 - A*b*c^4)*d^2*e^2 + 4*(B*b^3*c^2 - A*b^2*c^3)*d*e^3 - (B*b^4*c - A*b
^3*c^2)*e^4)*x + 12*((B*b*c^4 - A*c^5)*d^4 - 4*(B*b^2*c^3 - A*b*c^4)*d^3*e
 + 6*(B*b^3*c^2 - A*b^2*c^3)*d^2*e^2 - 4*(B*b^4*c - A*b^3*c^2)*d*e^3 + (B*
b^5 - A*b^4*c)*e^4)*log(c*x + b))/(b*c^5)
```

Sympy [A] (verification not implemented)

Time = 4.07 (sec) , antiderivative size = 396, normalized size of antiderivative = 1.91

$$\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx = \frac{Ad^4\log{(x)}}{b} + \frac{Be^4x^4}{4c} + x^3\left(\frac{Ae^4}{3c} - \frac{Bbe^4}{3c^2} + \frac{4Bde^3}{3c}\right) + x^2\left(-\frac{Abe^4}{2c^2} + \frac{2Ade^3}{c} + \frac{Bb^2e^4}{2c^3} - \frac{2Bbde^3}{c^2} + \frac{3Bd^2e^2}{c}\right) + x\left(\frac{Ab^2e^4}{c^3} - \frac{4Abde^3}{c^2} + \frac{6Ad^2e^2}{c} - \frac{Bb^3e^4}{c^4} + \frac{4Bb^2de^3}{c^3} - \frac{6Bbd^2e^2}{c^2} + \frac{4Bd^3e}{c}\right) + \frac{(-Ac+Bb)(be-cd)^4\log\left(x + \frac{-Abc^4d^4 + \frac{b(-Ac+Bb)(be-cd)^4}{c}}{-Ab^4ce^4+4Ab^3c^2de^3-6Ab^2c^3d^2e^2+4Abc^4d^3e-2Ac^5d^4+Bb^5e^4-4Bb^4cde^3+6Bb^3c^2d^2e^2-4B}\right.}{bc^5}$$

input
```
integrate((B*x+A)*(e*x+d)**4/(c*x**2+b*x),x)
```

output
```
A*d**4*log(x)/b + B*e**4*x**4/(4*c) + x**3*(A*e**4/(3*c) - B*b*e**4/(3*c**
2) + 4*B*d*e**3/(3*c)) + x**2*(-A*b*e**4/(2*c**2) + 2*A*d*e**3/c + B*b**2*
e**4/(2*c**3) - 2*B*b*d*e**3/c**2 + 3*B*d**2*e**2/c) + x*(A*b**2*e**4/c**3
 - 4*A*b*d*e**3/c**2 + 6*A*d**2*e**2/c - B*b**3*e**4/c**4 + 4*B*b**2*d*e**
3/c**3 - 6*B*b*d**2*e**2/c**2 + 4*B*d**3*e/c) + (-A*c + B*b)*(b*e - c*d)**
4*log(x + (-A*b*c**4*d**4 + b*(-A*c + B*b)*(b*e - c*d)**4/c)/(-A*b**4*c*e*
*4 + 4*A*b**3*c**2*d*e**3 - 6*A*b**2*c**3*d**2*e**2 + 4*A*b*c**4*d**3*e -
2*A*c**5*d**4 + B*b**5*e**4 - 4*B*b**4*c*d*e**3 + 6*B*b**3*c**2*d**2*e**2
- 4*B*b**2*c**3*d**3*e + B*b*c**4*d**4))/(b*c**5)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 309, normalized size of antiderivative = 1.49

$$\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx = \frac{Ad^4\log{(x)}}{b} + \frac{3\,Bc^3e^4x^4 + 4\,(4\,Bc^3de^3 - (Bbc^2 - Ac^3)e^4)x^3 + 6\,(6\,Bc^3d^2e^2 - 4\,(Bbc^2 - Ac^3)de^3 + (Bb^2c - Abc^2)e^4}{12\,c^4} + \frac{((Bbc^4 - Ac^5)d^4 - 4\,(Bb^2c^3 - Abc^4)d^3e + 6\,(Bb^3c^2 - Ab^2c^3)d^2e^2 - 4\,(Bb^4c - Ab^3c^2)de^3 + (Bb^5 - Ab}{bc^5}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x),x, algorithm="maxima")
```

output
```
A*d^4*log(x)/b + 1/12*(3*B*c^3*e^4*x^4 + 4*(4*B*c^3*d*e^3 - (B*b*c^2 - A*c
^3)*e^4)*x^3 + 6*(6*B*c^3*d^2*e^2 - 4*(B*b*c^2 - A*c^3)*d*e^3 + (B*b^2*c -
 A*b*c^2)*e^4)*x^2 + 12*(4*B*c^3*d^3*e - 6*(B*b*c^2 - A*c^3)*d^2*e^2 + 4*(
B*b^2*c - A*b*c^2)*d*e^3 - (B*b^3 - A*b^2*c)*e^4)*x)/c^4 + ((B*b*c^4 - A*c
^5)*d^4 - 4*(B*b^2*c^3 - A*b*c^4)*d^3*e + 6*(B*b^3*c^2 - A*b^2*c^3)*d^2*e^
2 - 4*(B*b^4*c - A*b^3*c^2)*d*e^3 + (B*b^5 - A*b^4*c)*e^4)*log(c*x + b)/(b
*c^5)
```

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 348, normalized size of antiderivative = 1.68

$$\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx = \frac{Ad^4\log(|x|)}{b} + \frac{3\,Bc^3e^4x^4 + 16\,Bc^3de^3x^3 - 4\,Bbc^2e^4x^3 + 4\,Ac^3e^4x^3 + 36\,Bc^3d^2e^2x^2 - 24\,Bbc^2de^3x^2 + 24\,Ac^3de^3x^2 + \cdots}{\cdots} + \frac{(Bbc^4d^4 - Ac^5d^4 - 4\,Bb^2c^3d^3e + 4\,Abc^4d^3e + 6\,Bb^3c^2d^2e^2 - 6\,Ab^2c^3d^2e^2 - 4\,Bb^4cde^3 + 4\,Ab^3c^2de^3 + \cdots}{bc^5}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x),x, algorithm="giac")
```

output
```
A*d^4*log(abs(x))/b + 1/12*(3*B*c^3*e^4*x^4 + 16*B*c^3*d*e^3*x^3 - 4*B*b*c
^2*e^4*x^3 + 4*A*c^3*e^4*x^3 + 36*B*c^3*d^2*e^2*x^2 - 24*B*b*c^2*d*e^3*x^2
 + 24*A*c^3*d*e^3*x^2 + 6*B*b^2*c*e^4*x^2 - 6*A*b*c^2*e^4*x^2 + 48*B*c^3*d
^3*e*x - 72*B*b*c^2*d^2*e^2*x + 72*A*c^3*d^2*e^2*x + 48*B*b^2*c*d*e^3*x -
48*A*b*c^2*d*e^3*x - 12*B*b^3*e^4*x + 12*A*b^2*c*e^4*x)/c^4 + (B*b*c^4*d^4
 - A*c^5*d^4 - 4*B*b^2*c^3*d^3*e + 4*A*b*c^4*d^3*e + 6*B*b^3*c^2*d^2*e^2 -
 6*A*b^2*c^3*d^2*e^2 - 4*B*b^4*c*d*e^3 + 4*A*b^3*c^2*d*e^3 + B*b^5*e^4 - A
*b^4*c*e^4)*log(abs(c*x + b))/(b*c^5)
```

Mupad [B] (verification not implemented)

Time = 11.21 (sec) , antiderivative size = 322, normalized size of antiderivative = 1.56

$$\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx$$

$$= x\left(\frac{b\left(\frac{b\left(\frac{A\,e^4+4\,B\,d\,e^3}{c}-\frac{B\,b\,e^4}{c^2}\right)}{c}-\frac{2\,d\,e^2\,(2\,A\,e+3\,B\,d)}{c}\right)}{c}+\frac{2\,d^2\,e\,(3\,A\,e+2\,B\,d)}{c}\right)$$

$$-x^2\left(\frac{b\left(\frac{A\,e^4+4\,B\,d\,e^3}{c}-\frac{B\,b\,e^4}{c^2}\right)}{2\,c}-\frac{d\,e^2\,(2\,A\,e+3\,B\,d)}{c}\right)$$

$$+x^3\left(\frac{A\,e^4+4\,B\,d\,e^3}{3\,c}-\frac{B\,b\,e^4}{3\,c^2}\right)-\ln(b+c\,x)\left(\frac{A\,d^4}{b}\right.$$

$$-\frac{c^4\,(B\,b\,d^4+4\,A\,b\,e\,d^3)-c\,(A\,b^4\,e^4+4\,B\,d\,b^4\,e^3)-c^3\,(4\,B\,b^2\,d^3\,e+6\,A\,b^2\,d^2\,e^2)+c^2\,(6\,B\,b^3\,d^2\,e^2+4\,A}{b\,c^5}$$

$$+\frac{A\,d^4\,\ln(x)}{b}+\frac{B\,e^4\,x^4}{4\,c}$$

input

```
int(((A + B*x)*(d + e*x)^4)/(b*x + c*x^2),x)
```

output

```
x*((b*((b*((A*e^4 + 4*B*d*e^3)/c - (B*b*e^4)/c^2))/c - (2*d*e^2*(2*A*e + 3
*B*d))/c))/c + (2*d^2*e*(3*A*e + 2*B*d))/c) - x^2*((b*((A*e^4 + 4*B*d*e^3)
/c - (B*b*e^4)/c^2))/(2*c) - (d*e^2*(2*A*e + 3*B*d))/c) + x^3*((A*e^4 + 4*
B*d*e^3)/(3*c) - (B*b*e^4)/(3*c^2)) - log(b + c*x)*((A*d^4)/b - (c^4*(B*b*
d^4 + 4*A*b*d^3*e) - c*(A*b^4*e^4 + 4*B*b^4*d*e^3) - c^3*(4*B*b^2*d^3*e +
6*A*b^2*d^2*e^2) + c^2*(4*A*b^3*d*e^3 + 6*B*b^3*d^2*e^2) + B*b^5*e^4)/(b*c
^5)) + (A*d^4*log(x))/b + (B*e^4*x^4)/(4*c)
```

Reduce [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 416, normalized size of antiderivative = 2.01

$$\int \frac{(A+Bx)(d+ex)^4}{bx+cx^2}\,dx$$
$$= \frac{12\log(cx+b)\,b^6e^4 - 12\log(cx+b)\,a\,b^4c\,e^4 - 48\log(cx+b)\,b^5cd\,e^3 + 72\log(cx+b)\,b^4c^2d^2e^2 - 48\log(ca}{}$$

input
```
int((B*x+A)*(e*x+d)^4/(c*x^2+b*x),x)
```

output
```
( - 12*log(b + c*x)*a*b**4*c*e**4 + 48*log(b + c*x)*a*b**3*c**2*d*e**3 - 7
2*log(b + c*x)*a*b**2*c**3*d**2*e**2 + 48*log(b + c*x)*a*b*c**4*d**3*e - 1
2*log(b + c*x)*a*c**5*d**4 + 12*log(b + c*x)*b**6*e**4 - 48*log(b + c*x)*b
**5*c*d*e**3 + 72*log(b + c*x)*b**4*c**2*d**2*e**2 - 48*log(b + c*x)*b**3*
c**3*d**3*e + 12*log(b + c*x)*b**2*c**4*d**4 + 12*log(x)*a*c**5*d**4 + 12*
a*b**3*c**2*e**4*x - 48*a*b**2*c**3*d*e**3*x - 6*a*b**2*c**3*e**4*x**2 + 7
2*a*b*c**4*d**2*e**2*x + 24*a*b*c**4*d*e**3*x**2 + 4*a*b*c**4*e**4*x**3 -
12*b**5*c*e**4*x + 48*b**4*c**2*d*e**3*x + 6*b**4*c**2*e**4*x**2 - 72*b**3
*c**3*d**2*e**2*x - 24*b**3*c**3*d*e**3*x**2 - 4*b**3*c**3*e**4*x**3 + 48*
b**2*c**4*d**3*e*x + 36*b**2*c**4*d**2*e**2*x**2 + 16*b**2*c**4*d*e**3*x**
3 + 3*b**2*c**4*e**4*x**4)/(12*b*c**5)
```

3.31 $\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 128

$$\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}\,dx = \frac{e(Ace(3cd-be)+B(3c^2d^2-3bcde+b^2e^2))\,x}{c^3} + \frac{e^2(3Bcd-bBe+Ace)x^2}{2c^2} + \frac{Be^3x^3}{3c} + \frac{Ad^3\log(x)}{b} + \frac{(bB-Ac)(cd-be)^3\log(b+cx)}{bc^4}$$

output
```
e*(A*c*e*(-b*e+3*c*d)+B*(b^2*e^2-3*b*c*d*e+3*c^2*d^2))*x/c^3+1/2*e^2*(A*c*
e-B*b*e+3*B*c*d)*x^2/c^2+1/3*B*e^3*x^3/c+A*d^3*ln(x)/b+(-A*c+B*b)*(-b*e+c*
d)^3*ln(c*x+b)/b/c^4
```

Mathematica [A] (verified)

Time = 0.09 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.92

$$\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}\,dx = \frac{bcex(3Ace(6cd-2be+cex)+B(6b^2e^2-3bce(6d+ex)+c^2(18d^2+9dex+2e^2x^2)))+6Ac^4d^3\log(x)-}{6bc^4}$$

input
```
Integrate[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2),x]
```

output
```
(b*c*e*x*(3*A*c*e*(6*c*d - 2*b*e + c*e*x) + B*(6*b^2*e^2 - 3*b*c*e*(6*d +
e*x) + c^2*(18*d^2 + 9*d*e*x + 2*e^2*x^2))) + 6*A*c^4*d^3*Log[x] - 6*(b*B
- A*c)*(-(c*d) + b*e)^3*Log[b + c*x])/(6*b*c^4)
```

Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1200, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}dx$$

$$\Big\downarrow \text{1200}$$

$$\int \left(\frac{e\left(Ace(3cd-be)+B\left(b^2e^2-3bcde+3c^2d^2\right)\right)}{c^3}-\frac{(bB-Ac)(be-cd)^3}{bc^3(b+cx)}+\frac{e^2x(Ace-bBe+3Bcd)}{c^2}+\frac{Ad^3}{bx}+\right.$$

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

$$\frac{ex\left(Ace(3cd-be)+B\left(b^2e^2-3bcde+3c^2d^2\right)\right)}{c^3}+\frac{(bB-Ac)(cd-be)^3\log(b+cx)}{bc^4}+\frac{e^2x^2(Ace-bBe+3Bcd)}{2c^2}+\frac{Ad^3\log(x)}{b}+\frac{Be^3x^3}{3c}$$

input
```
Int[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2),x]
```

output
```
(e*(A*c*e*(3*c*d - b*e) + B*(3*c^2*d^2 - 3*b*c*d*e + b^2*e^2))*x)/c^3 + (e
^2*(3*B*c*d - b*B*e + A*c*e)*x^2)/(2*c^2) + (B*e^3*x^3)/(3*c) + (A*d^3*Log
[x])/b + ((b*B - A*c)*(c*d - b*e)^3*Log[b + c*x])/(b*c^4)
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

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

Maple [A] (verified)

Time = 0.76 (sec) , antiderivative size = 196, normalized size of antiderivative = 1.53

method	result
norman	$\frac{B e^3 x^3}{3c} - \frac{e\left(Abc e^2-3A c^2 de-B e^2 b^2+3Bbcde-3B c^2 d^2\right)x}{c^3} + \frac{e^2(Ace-Bbe+3Bcd)x^2}{2c^2} + \frac{A d^3 \ln(x)}{b} + (A b^3 e^3 c-3A b^2$
default	$-\frac{e\left(-\frac{1}{3}B c^2 x^3 e^2-\frac{1}{2}A c^2 e^2 x^2+\frac{1}{2}Bbc e^2 x^2-\frac{3}{2}B c^2 de x^2+Abc e^2 x-3A c^2 dex-B e^2 b^2 x+3Bbcdex-3c^2 xB d^2\right)}{c^3} + (A b^3 e^3 c-$
parallelrisch	$2B e^3 x^3 b c^3+3A x^2 b c^3 e^3-3B x^2 b^2 c^2 e^3+9B x^2 b c^3 d e^2+6A d^3 \ln(x)c^4+6A \ln(cx+b)b^3 c e^3-18A \ln(cx+b)b^2 c^2 d e^2+18A \ln($
risch	$\frac{B e^3 x^3}{3c} + \frac{e^3 A x^2}{2c} - \frac{e^3 Bb x^2}{2c^2} + \frac{3e^2 Bd x^2}{2c} - \frac{e^3 Abx}{c^2} + \frac{3e^2 Adx}{c} + \frac{e^3 B b^2 x}{c^3} - \frac{3e^2 Bbdx}{c^2} + \frac{3exB d^2}{c} + \frac{A d^3 \ln(x)}{b}$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
1/3*B*e^3*x^3/c-e*(A*b*c*e^2-3*A*c^2*d*e-B*b^2*e^2+3*B*b*c*d*e-3*B*c^2*d^2
)/c^3*x+1/2*e^2*(A*c*e-B*b*e+3*B*c*d)*x^2/c^2+A*d^3*ln(x)/b+1/c^4*(A*b^3*c
*e^3-3*A*b^2*c^2*d*e^2+3*A*b*c^3*d^2*e-A*c^4*d^3-B*b^4*e^3+3*B*b^3*c*d*e^2
-3*B*b^2*c^2*d^2*e+B*b*c^3*d^3)/b*ln(c*x+b)
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.69

$$\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}\,dx$$
$$= \frac{2\,Bbc^3e^3x^3+6\,Ac^4d^3\log\left(x\right)+3\,(3\,Bbc^3de^2-(Bb^2c^2-Abc^3)e^3)x^2+6\,(3\,Bbc^3d^2e-3\,(Bb^2c^2-Abc^3)d\cdots}{}$$

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

output
```
1/6*(2*B*b*c^3*e^3*x^3 + 6*A*c^4*d^3*log(x) + 3*(3*B*b*c^3*d*e^2 - (B*b^2*
c^2 - A*b*c^3)*e^3)*x^2 + 6*(3*B*b*c^3*d^2*e - 3*(B*b^2*c^2 - A*b*c^3)*d*e
^2 + (B*b^3*c - A*b^2*c^2)*e^3)*x + 6*((B*b*c^3 - A*c^4)*d^3 - 3*(B*b^2*c^
2 - A*b*c^3)*d^2*e + 3*(B*b^3*c - A*b^2*c^2)*d*e^2 - (B*b^4 - A*b^3*c)*e^3
)*log(c*x + b))/(b*c^4)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 264 vs. $2(122) = 244$.

Time = 2.84 (sec) , antiderivative size = 264, normalized size of antiderivative = 2.06

$$\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}\,dx = \frac{Ad^3\log\left(x\right)}{b}+\frac{Be^3x^3}{3c}+x^2\left(\frac{Ae^3}{2c}-\frac{Bbe^3}{2c^2}+\frac{3Bde^2}{2c}\right)$$
$$+x\left(-\frac{Abe^3}{c^2}+\frac{3Ade^2}{c}+\frac{Bb^2e^3}{c^3}-\frac{3Bbde^2}{c^2}+\frac{3Bd^2e}{c}\right)$$
$$-\frac{(-Ac+Bb)\,(be-cd)^3\log\left(x+\frac{Abc^3d^3+\frac{b(-Ac+Bb)(be-cd)^3}{c}}{-Ab^3ce^3+3Ab^2c^2de^2-3Abc^3d^2e+2Ac^4d^3+Bb^4e^3-3Bb^3cde^2+3Bb^2c^2d^2e-Bbc^3d^3}\right)}{bc^4}$$

input
```
integrate((B*x+A)*(e*x+d)**3/(c*x**2+b*x),x)
```

output
```
A*d**3*log(x)/b + B*e**3*x**3/(3*c) + x**2*(A*e**3/(2*c) - B*b*e**3/(2*c**
2) + 3*B*d*e**2/(2*c)) + x*(-A*b*e**3/c**2 + 3*A*d*e**2/c + B*b**2*e**3/c*
*3 - 3*B*b*d*e**2/c**2 + 3*B*d**2*e/c) - (-A*c + B*b)*(b*e - c*d)**3*log(x
 + (A*b*c**3*d**3 + b*(-A*c + B*b)*(b*e - c*d)**3/c)/(-A*b**3*c*e**3 + 3*A
*b**2*c**2*d*e**2 - 3*A*b*c**3*d**2*e + 2*A*c**4*d**3 + B*b**4*e**3 - 3*B*
b**3*c*d*e**2 + 3*B*b**2*c**2*d**2*e - B*b*c**3*d**3))/(b*c**4)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 200, normalized size of antiderivative = 1.56

$$\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}\,dx = \frac{Ad^3\log(x)}{b} + \frac{2\,Bc^2e^3x^3 + 3\,(3\,Bc^2de^2 - (Bbc - Ac^2)e^3)x^2 + 6\,(3\,Bc^2d^2e - 3\,(Bbc - Ac^2)de^2 + (Bb^2 - Abc)e^3)x}{6\,c^3} + \frac{((Bbc^3 - Ac^4)d^3 - 3\,(Bb^2c^2 - Abc^3)d^2e + 3\,(Bb^3c - Ab^2c^2)de^2 - (Bb^4 - Ab^3c)e^3)\log(cx+b)}{bc^4}$$

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

output
```
A*d^3*log(x)/b + 1/6*(2*B*c^2*e^3*x^3 + 3*(3*B*c^2*d*e^2 - (B*b*c - A*c^2)
*e^3)*x^2 + 6*(3*B*c^2*d^2*e - 3*(B*b*c - A*c^2)*d*e^2 + (B*b^2 - A*b*c)*e
^3)*x)/c^3 + ((B*b*c^3 - A*c^4)*d^3 - 3*(B*b^2*c^2 - A*b*c^3)*d^2*e + 3*(B
*b^3*c - A*b^2*c^2)*d*e^2 - (B*b^4 - A*b^3*c)*e^3)*log(c*x + b)/(b*c^4)
```

Giac [A] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.69

$$\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}\,dx = \frac{Ad^3\log(|x|)}{b} + \frac{2\,Bc^2e^3x^3 + 9\,Bc^2de^2x^2 - 3\,Bbce^3x^2 + 3\,Ac^2e^3x^2 + 18\,Bc^2d^2ex - 18\,Bbcde^2x + 18\,Ac^2de^2x + 6\,Bb^2e}{6\,c^3} + \frac{(Bbc^3d^3 - Ac^4d^3 - 3\,Bb^2c^2d^2e + 3\,Abc^3d^2e + 3\,Bb^3cde^2 - 3\,Ab^2c^2de^2 - Bb^4e^3 + Ab^3ce^3)\log(|cx+b|}{bc^4}$$

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

output
```
A*d^3*log(abs(x))/b + 1/6*(2*B*c^2*e^3*x^3 + 9*B*c^2*d*e^2*x^2 - 3*B*b*c*e
^3*x^2 + 3*A*c^2*e^3*x^2 + 18*B*c^2*d^2*e*x - 18*B*b*c*d*e^2*x + 18*A*c^2*
d*e^2*x + 6*B*b^2*e^3*x - 6*A*b*c*e^3*x)/c^3 + (B*b*c^3*d^3 - A*c^4*d^3 -
3*B*b^2*c^2*d^2*e + 3*A*b*c^3*d^2*e + 3*B*b^3*c*d*e^2 - 3*A*b^2*c^2*d*e^2
- B*b^4*e^3 + A*b^3*c*e^3)*log(abs(c*x + b))/(b*c^4)
```

Mupad [B] (verification not implemented)

Time = 10.91 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.62

$$\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}\,dx = x^2\left(\frac{A\,e^3+3\,B\,d\,e^2}{2\,c}-\frac{B\,b\,e^3}{2\,c^2}\right) - x\left(\frac{b\left(\frac{A\,e^3+3\,B\,d\,e^2}{c}-\frac{B\,b\,e^3}{c^2}\right)}{c}-\frac{3\,d\,e\,(A\,e+B\,d)}{c}\right) - \ln(b+c\,x)\,\left(\frac{A\,d^3}{b} - \frac{c^3\,(B\,b\,d^3+3\,A\,b\,e\,d^2)-c^2\,(3\,B\,b^2\,d^2\,e+3\,A\,b^2\,d\,e^2)+c\,(A\,b^3\,e^3+3\,B\,d\,b^3\,e^2)-B\,b^4\,e^3}{b\,c^4}\right) + \frac{A\,d^3\,\ln(x)}{b}+\frac{B\,e^3\,x^3}{3\,c}$$

input
```
int(((A + B*x)*(d + e*x)^3)/(b*x + c*x^2),x)
```

output
```
x^2*((A*e^3 + 3*B*d*e^2)/(2*c) - (B*b*e^3)/(2*c^2)) - x*((b*((A*e^3 + 3*B*
d*e^2)/c - (B*b*e^3)/c^2))/c - (3*d*e*(A*e + B*d))/c) - log(b + c*x)*((A*d
^3)/b - (c^3*(B*b*d^3 + 3*A*b*d^2*e) - c^2*(3*A*b^2*d*e^2 + 3*B*b^2*d^2*e)
 + c*(A*b^3*e^3 + 3*B*b^3*d*e^2) - B*b^4*e^3)/(b*c^4)) + (A*d^3*log(x))/b
+ (B*e^3*x^3)/(3*c)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 269, normalized size of antiderivative = 2.10

$$\int \frac{(A+Bx)(d+ex)^3}{bx+cx^2}\,dx = \frac{6\log(cx+b)\,a\,b^3c\,e^3-18\log(cx+b)\,a\,b^2c^2d\,e^2+18\log(cx+b)\,ab\,c^3d^2e-6\log(cx+b)\,a\,c^4d^3-6\log(c\ldots}{}$$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x),x)
```

output
```
(6*log(b + c*x)*a*b**3*c*e**3 - 18*log(b + c*x)*a*b**2*c**2*d*e**2 + 18*lo
g(b + c*x)*a*b*c**3*d**2*e - 6*log(b + c*x)*a*c**4*d**3 - 6*log(b + c*x)*b
**5*e**3 + 18*log(b + c*x)*b**4*c*d*e**2 - 18*log(b + c*x)*b**3*c**2*d**2*
e + 6*log(b + c*x)*b**2*c**3*d**3 + 6*log(x)*a*c**4*d**3 - 6*a*b**2*c**2*e
**3*x + 18*a*b*c**3*d*e**2*x + 3*a*b*c**3*e**3*x**2 + 6*b**4*c*e**3*x - 18
*b**3*c**2*d*e**2*x - 3*b**3*c**2*e**3*x**2 + 18*b**2*c**3*d**2*e*x + 9*b*
*2*c**3*d*e**2*x**2 + 2*b**2*c**3*e**3*x**3)/(6*b*c**4)
```

3.32 $\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 77

$$\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2}\,dx=\frac{e(2Bcd-bBe+Ace)x}{c^2}+\frac{Be^2x^2}{2c}+\frac{Ad^2\log(x)}{b}+\frac{(bB-Ac)(cd-be)^2\log(b+cx)}{bc^3}$$

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

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 74, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2}\,dx=\frac{bcex(2Ace+B(4cd-2be+cex))+2Ac^3d^2\log(x)+2(bB-Ac)(cd-be)^2\log(b+cx)}{2bc^3}$$

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

output
```
(b*c*e*x*(2*A*c*e + B*(4*c*d - 2*b*e + c*e*x)) + 2*A*c^3*d^2*Log[x] + 2*(b
*B - A*c)*(c*d - b*e)^2*Log[b + c*x])/(2*b*c^3)
```

Rubi [A] (verified)

Time = 0.43 (sec) , antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1200, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2} \, dx$$

$$\Big\downarrow \text{1200}$$

$$\int \left(\frac{(bB-Ac)(be-cd)^2}{bc^2(b+cx)}+\frac{e(Ace-bBe+2Bcd)}{c^2}+\frac{Ad^2}{bx}+\frac{Be^2x}{c}\right)dx$$

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

$$\frac{(bB-Ac)(cd-be)^2\log(b+cx)}{bc^3}+\frac{ex(Ace-bBe+2Bcd)}{c^2}+\frac{Ad^2\log(x)}{b}+\frac{Be^2x^2}{2c}$$

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

output
```
(e*(2*B*c*d - b*B*e + A*c*e)*x)/c^2 + (B*e^2*x^2)/(2*c) + (A*d^2*Log[x])/b
 + ((b*B - A*c)*(c*d - b*e)^2*Log[b + c*x])/(b*c^3)
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

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

Maple [A] (verified)

Time = 0.81 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.44

method	result
default	$\frac{e\left(\frac{1}{2}Bce\,x^2+Acex-Bbex+2Bcdx\right)}{c^2}+\frac{\left(-A\,b^2c\,e^2+2Ab\,c^2de-A\,c^3d^2+b^3B\,e^2-2B\,b^2cde+Bb\,c^2d^2\right)\ln(cx+b)}{b\,c^3}+\frac{A\,d^2\ln(x)}{b}$
norman	$\frac{e(Ace-Bbe+2Bcd)x}{c^2}+\frac{B\,e^2x^2}{2c}+\frac{A\,d^2\ln(x)}{b}-\frac{\left(A\,b^2c\,e^2-2Ab\,c^2de+A\,c^3d^2-b^3B\,e^2+2B\,b^2cde-Bb\,c^2d^2\right)\ln(cx+b)}{b\,c^3}$
risch	$\frac{B\,e^2x^2}{2c}+\frac{e^2Ax}{c}-\frac{e^2Bbx}{c^2}+\frac{2eBdx}{c}+\frac{A\,d^2\ln(-x)}{b}-\frac{b\ln(cx+b)A\,e^2}{c^2}+\frac{2\ln(cx+b)Ade}{c}-\frac{\ln(cx+b)A\,d^2}{b}+\frac{b^2\ln(}{}$
parallelrisch	$\frac{B\,e^2x^2b\,c^2+2A\,d^2\ln(x)c^3-2A\ln(cx+b)b^2c\,e^2+4A\ln(cx+b)b\,c^2de-2A\ln(cx+b)c^3d^2+2Axb\,c^2e^2+2B\ln(cx+b)b^3e^2-4B\ln(}{2b\,c^3}$

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

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

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.62

$$\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2}\,dx = \frac{Bbc^2e^2x^2+2\,Ac^3d^2\log(x)+2\,(2\,Bbc^2de-(Bb^2c-Abc^2)e^2)x+2\,((Bbc^2-Ac^3)d^2-2\,(Bb^2c-Abc^2)d}{2\,bc^3}$$

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

output
```
1/2*(B*b*c^2*e^2*x^2 + 2*A*c^3*d^2*log(x) + 2*(2*B*b*c^2*d*e - (B*b^2*c -
A*b*c^2)*e^2)*x + 2*((B*b*c^2 - A*c^3)*d^2 - 2*(B*b^2*c - A*b*c^2)*d*e + (
B*b^3 - A*b^2*c)*e^2)*log(c*x + b))/(b*c^3)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 163 vs. $2(71) = 142$.

Time = 1.76 (sec) , antiderivative size = 163, normalized size of antiderivative = 2.12

$$\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2}\,dx = \frac{Ad^2\log(x)}{b} + \frac{Be^2x^2}{2c} + x\left(\frac{Ae^2}{c} - \frac{Bbe^2}{c^2} + \frac{2Bde}{c}\right) + \frac{(-Ac+Bb)(be-cd)^2\log\left(x + \frac{-Abc^2d^2 + \frac{b(-Ac+Bb)(be-cd)^2}{c}}{-Ab^2ce^2+2Abc^2de-2Ac^3d^2+Bb^3e^2-2Bb^2cde+Bbc^2d^2}\right)}{bc^3}$$

input
```
integrate((B*x+A)*(e*x+d)**2/(c*x**2+b*x),x)
```

output
```
A*d**2*log(x)/b + B*e**2*x**2/(2*c) + x*(A*e**2/c - B*b*e**2/c**2 + 2*B*d*
e/c) + (-A*c + B*b)*(b*e - c*d)**2*log(x + (-A*b*c**2*d**2 + b*(-A*c + B*b
)*(b*e - c*d)**2/c)/(-A*b**2*c*e**2 + 2*A*b*c**2*d*e - 2*A*c**3*d**2 + B*b
**3*e**2 - 2*B*b**2*c*d*e + B*b*c**2*d**2))/(b*c**3)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 115, normalized size of antiderivative = 1.49

$$\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2}\,dx = \frac{Ad^2\log(x)}{b} + \frac{Bce^2x^2 + 2\,(2\,Bcde - (Bb-Ac)e^2)x}{2\,c^2} + \frac{((Bbc^2 - Ac^3)d^2 - 2\,(Bb^2c - Abc^2)de + (Bb^3 - Ab^2c)e^2)\log(cx+b)}{bc^3}$$

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

output
```
A*d^2*log(x)/b + 1/2*(B*c*e^2*x^2 + 2*(2*B*c*d*e - (B*b - A*c)*e^2)*x)/c^2
 + ((B*b*c^2 - A*c^3)*d^2 - 2*(B*b^2*c - A*b*c^2)*d*e + (B*b^3 - A*b^2*c)*
e^2)*log(c*x + b)/(b*c^3)
```

Giac [A] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 119, normalized size of antiderivative = 1.55

$$\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2}\,dx = \frac{Ad^2\log(|x|)}{b} + \frac{Bce^2x^2+4\,Bcdex-2\,Bbe^2x+2\,Ace^2x}{2\,c^2} + \frac{(Bbc^2d^2-Ac^3d^2-2\,Bb^2cde+2\,Abc^2de+Bb^3e^2-Ab^2ce^2)\log(|cx+b|)}{bc^3}$$

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

output
```
A*d^2*log(abs(x))/b + 1/2*(B*c*e^2*x^2 + 4*B*c*d*e*x - 2*B*b*e^2*x + 2*A*c
*e^2*x)/c^2 + (B*b*c^2*d^2 - A*c^3*d^2 - 2*B*b^2*c*d*e + 2*A*b*c^2*d*e + B
*b^3*e^2 - A*b^2*c*e^2)*log(abs(c*x + b))/(b*c^3)
```

Mupad [B] (verification not implemented)

Time = 0.20 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.58

$$\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2}\,dx = x\left(\frac{A\,e^2+2\,B\,d\,e}{c}-\frac{B\,b\,e^2}{c^2}\right)-\ln(b+c\,x)\left(\frac{A\,d^2}{b}-\frac{c^2\,(B\,b\,d^2+2\,A\,b\,e\,d)-c\,(A\,b^2\,e^2+2\,B\,d\,b^2\,e)+B\,b^3\,e^2}{b\,c^3}\right)+\frac{A\,d^2\,\ln(x)}{b}+\frac{B\,e^2\,x^2}{2\,c}$$

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

output
```
x*((A*e^2 + 2*B*d*e)/c - (B*b*e^2)/c^2) - log(b + c*x)*((A*d^2)/b - (c^2*(
B*b*d^2 + 2*A*b*d*e) - c*(A*b^2*e^2 + 2*B*b^2*d*e) + B*b^3*e^2)/(b*c^3)) +
 (A*d^2*log(x))/b + (B*e^2*x^2)/(2*c)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 156, normalized size of antiderivative = 2.03

$$\int \frac{(A+Bx)(d+ex)^2}{bx+cx^2}\,dx$$
$$= \frac{-2\log(cx+b)\,a\,b^2c\,e^2+4\log(cx+b)\,ab\,c^2de-2\log(cx+b)\,a\,c^3d^2+2\log(cx+b)\,b^4e^2-4\log(cx+b)\,b}{2b\,c^3}$$

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

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

3.33 $\int \frac{(A+Bx)(d+ex)}{bx+cx^2} dx$

Optimal result

Integrand size = 22, antiderivative size = 45

$$\int \frac{(A+Bx)(d+ex)}{bx+cx^2} dx = \frac{Bex}{c} + \frac{Ad\log(x)}{b} + \frac{(bB-Ac)(cd-be)\log(b+cx)}{bc^2}$$

output
```
B*e*x/c+A*d*ln(x)/b+(-A*c+B*b)*(-b*e+c*d)*ln(c*x+b)/b/c^2
```

Mathematica [A] (verified)

Time = 0.03 (sec) , antiderivative size = 46, normalized size of antiderivative = 1.02

$$\int \frac{(A+Bx)(d+ex)}{bx+cx^2} dx = \frac{bBcex + Ac^2d\log(x) - (bB-Ac)(-cd+be)\log(b+cx)}{bc^2}$$

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

output
```
(b*B*c*e*x + A*c^2*d*Log[x] - (b*B - A*c)*(-(c*d) + b*e)*Log[b + c*x])/(b*
c^2)
```

Rubi [A] (verified)

Time = 0.35 (sec) , antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1200, 2009}

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

$$\int \frac{(A+Bx)(d+ex)}{bx+cx^2} \, dx$$
$$\Big\downarrow \ 1200$$
$$\int \left(-\frac{(bB-Ac)(be-cd)}{bc(b+cx)}+\frac{Ad}{bx}+\frac{Be}{c}\right)dx$$
$$\Big\downarrow \ 2009$$
$$\frac{(bB-Ac)(cd-be)\log(b+cx)}{bc^2}+\frac{Ad\log(x)}{b}+\frac{Bex}{c}$$

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

output
```
(B*e*x)/c + (A*d*Log[x])/b + ((b*B - A*c)*(c*d - b*e)*Log[b + c*x])/(b*c^2
)
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

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

Maple [A] (verified)

Time = 0.75 (sec) , antiderivative size = 55, normalized size of antiderivative = 1.22

method	result	size
default	$\frac{Bex}{c}+\frac{(Abce-A\,c^2d-b^2Be+Bbcd)\ln(cx+b)}{c^2b}+\frac{Ad\ln(x)}{b}$	55
norman	$\frac{Bex}{c}+\frac{(Abce-A\,c^2d-b^2Be+Bbcd)\ln(cx+b)}{c^2b}+\frac{Ad\ln(x)}{b}$	55
parallelrisch	$\frac{Ad\ln(x)c^2+A\ln(cx+b)bce-A\ln(cx+b)c^2d-B\ln(cx+b)b^2e+B\ln(cx+b)bcd+Bexbc}{b\,c^2}$	71
risch	$\frac{Bex}{c}+\frac{\ln(-cx-b)Ae}{c}-\frac{\ln(-cx-b)Ad}{b}-\frac{b\ln(-cx-b)Be}{c^2}+\frac{\ln(-cx-b)Bd}{c}+\frac{Ad\ln(x)}{b}$	80

input

```
int((B*x+A)*(e*x+d)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output

```
B*e*x/c+1/c^2*(A*b*c*e-A*c^2*d-B*b^2*e+B*b*c*d)/b*ln(c*x+b)+A*d*ln(x)/b
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.27

$$\int \frac{(A+Bx)(d+ex)}{bx+cx^2}\,dx$$
$$=\frac{Bbcex+Ac^2d\log(x)+((Bbc-Ac^2)d-(Bb^2-Abc)e)\log(cx+b)}{bc^2}$$

input

```
integrate((B*x+A)*(e*x+d)/(c*x^2+b*x),x, algorithm="fricas")
```

output

```
(B*b*c*e*x + A*c^2*d*log(x) + ((B*b*c - A*c^2)*d - (B*b^2 - A*b*c)*e)*log(
c*x + b))/(b*c^2)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 88 vs. $2(39) = 78$.

Time = 0.85 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.96

$$\int \frac{(A+Bx)(d+ex)}{bx+cx^2}\,dx = \frac{Ad\log(x)}{b} + \frac{Bex}{c} - \frac{(-Ac+Bb)(be-cd)\log\left(x+\frac{Abcd+\frac{b(-Ac+Bb)(be-cd)}{c}}{-Abce+2Ac^2d+Bb^2e-Bbcd}\right)}{bc^2}$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x**2+b*x),x)
```

output
```
A*d*log(x)/b + B*e*x/c - (-A*c + B*b)*(b*e - c*d)*log(x + (A*b*c*d + b*(-A
*c + B*b)*(b*e - c*d)/c)/(-A*b*c*e + 2*A*c**2*d + B*b**2*e - B*b*c*d))/(b*
c**2)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 57, normalized size of antiderivative = 1.27

$$\int \frac{(A+Bx)(d+ex)}{bx+cx^2}\,dx = \frac{Bex}{c} + \frac{Ad\log(x)}{b} + \frac{((Bbc-Ac^2)d-(Bb^2-Abc)e)\log(cx+b)}{bc^2}$$

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

output
```
B*e*x/c + A*d*log(x)/b + ((B*b*c - A*c^2)*d - (B*b^2 - A*b*c)*e)*log(c*x +
 b)/(b*c^2)
```

Giac [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 56, normalized size of antiderivative = 1.24

$$\int \frac{(A+Bx)(d+ex)}{bx+cx^2}\,dx = \frac{Bex}{c} + \frac{Ad\log(|x|)}{b} + \frac{(Bbcd - Ac^2d - Bb^2e + Abce)\log(|cx+b|)}{bc^2}$$

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

output
```
B*e*x/c + A*d*log(abs(x))/b + (B*b*c*d - A*c^2*d - B*b^2*e + A*b*c*e)*log(
abs(c*x + b))/(b*c^2)
```

Mupad [B] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 58, normalized size of antiderivative = 1.29

$$\int \frac{(A+Bx)(d+ex)}{bx+cx^2}\,dx = \frac{B\,e\,x}{c} - \ln(b+c\,x)\left(\frac{A\,d}{b} - \frac{c\,(A\,b\,e+B\,b\,d) - B\,b^2\,e}{b\,c^2}\right) + \frac{A\,d\,\ln(x)}{b}$$

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

output
```
(B*e*x)/c - log(b + c*x)*((A*d)/b - (c*(A*b*e + B*b*d) - B*b^2*e)/(b*c^2))
 + (A*d*log(x))/b
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 71, normalized size of antiderivative = 1.58

$$\int \frac{(A+Bx)(d+ex)}{bx+cx^2}\,dx$$
$$= \frac{\log(cx+b)\,abce - \log(cx+b)\,a\,c^2d - \log(cx+b)\,b^3e + \log(cx+b)\,b^2cd + \log(x)\,a\,c^2d + b^2cex}{b\,c^2}$$

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

output
```
(log(b + c*x)*a*b*c*e - log(b + c*x)*a*c**2*d - log(b + c*x)*b**3*e + log(
b + c*x)*b**2*c*d + log(x)*a*c**2*d + b**2*c*e*x)/(b*c**2)
```

3.34 $\int \frac{A+Bx}{(d+ex)(bx+cx^2)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 68

$$\int \frac{A+Bx}{(d+ex)(bx+cx^2)}\,dx=\frac{A\log(x)}{bd}+\frac{(bB-Ac)\log(b+cx)}{b(cd-be)}-\frac{(Bd-Ae)\log(d+ex)}{d(cd-be)}$$

output

```
A*ln(x)/b/d+(-A*c+B*b)*ln(c*x+b)/b/(-b*e+c*d)-(-A*e+B*d)*ln(e*x+d)/d/(-b*e
+c*d)
```

Mathematica [A] (verified)

Time = 0.05 (sec) , antiderivative size = 63, normalized size of antiderivative = 0.93

$$\int \frac{A+Bx}{(d+ex)(bx+cx^2)}\,dx=\frac{A(-cd+be)\log(x)+(-bBd+Acd)\log(b+cx)+b(Bd-Ae)\log(d+ex)}{bd(-cd+be)}$$

input

```
Integrate[(A + B*x)/((d + e*x)*(b*x + c*x^2)),x]
```

output

```
(A*(-(c*d) + b*e)*Log[x] + (-(b*B*d) + A*c*d)*Log[b + c*x] + b*(B*d - A*e)
*Log[d + e*x])/(b*d*(-(c*d) + b*e))
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1200, 2009}

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

$$\int \frac{A+Bx}{(bx+cx^2)(d+ex)}dx$$

$$\Big\downarrow \text{1200}$$

$$\int \left(-\frac{c(bB-Ac)}{b(b+cx)(be-cd)}-\frac{e(Bd-Ae)}{d(d+ex)(cd-be)}+\frac{A}{bdx}\right)dx$$

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

$$\frac{(bB-Ac)\log(b+cx)}{b(cd-be)}-\frac{(Bd-Ae)\log(d+ex)}{d(cd-be)}+\frac{A\log(x)}{bd}$$

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

output
```
(A*Log[x])/(b*d) + ((b*B - A*c)*Log[b + c*x])/(b*(c*d - b*e)) - ((B*d - A*
e)*Log[d + e*x])/(d*(c*d - b*e))
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

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

Maple [A] (verified)

Time = 0.91 (sec) , antiderivative size = 69, normalized size of antiderivative = 1.01

method	result	size
default	$\frac{(Ac-Bb)\ln(cx+b)}{b(be-cd)}-\frac{(Ae-Bd)\ln(ex+d)}{d(be-cd)}+\frac{A\ln(x)}{bd}$	69
norman	$\frac{(Ac-Bb)\ln(cx+b)}{b(be-cd)}-\frac{(Ae-Bd)\ln(ex+d)}{d(be-cd)}+\frac{A\ln(x)}{bd}$	69
parallelrisch	$\frac{A\ln(x)be-A\ln(x)cd+A\ln(cx+b)cd-A\ln(ex+d)be-B\ln(cx+b)bd+B\ln(ex+d)bd}{(be-cd)bd}$	74
risch	$\frac{A\ln(-x)}{bd}+\frac{\ln(cx+b)Ac}{b(be-cd)}-\frac{\ln(cx+b)B}{be-cd}-\frac{\ln(-ex-d)Ae}{d(be-cd)}+\frac{\ln(-ex-d)B}{be-cd}$	102

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

output
```
(A*c-B*b)/b/(b*e-c*d)*ln(c*x+b)-(A*e-B*d)/d/(b*e-c*d)*ln(e*x+d)+A*ln(x)/b/
d
```

Fricas [A] (verification not implemented)

Time = 0.77 (sec) , antiderivative size = 65, normalized size of antiderivative = 0.96

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)}\,dx = \frac{(Bb-Ac)d\log\left(cx+b\right)-(Bbd-Abe)\log\left(ex+d\right)+(Acd-Abe)\log\left(x\right)}{bcd^2-b^2de}$$

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

output
```
((B*b - A*c)*d*log(c*x + b) - (B*b*d - A*b*e)*log(e*x + d) + (A*c*d - A*b*
e)*log(x))/(b*c*d^2 - b^2*d*e)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)(bx+cx^2)}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x**2+b*x),x)
```

output
```
Timed out
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 68, normalized size of antiderivative = 1.00

$$\int \frac{A+Bx}{(d+ex)(bx+cx^2)}\,dx = \frac{(Bb-Ac)\log(cx+b)}{bcd-b^2e} - \frac{(Bd-Ae)\log(ex+d)}{cd^2-bde} + \frac{A\log(x)}{bd}$$

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

output
```
(B*b - A*c)*log(c*x + b)/(b*c*d - b^2*e) - (B*d - A*e)*log(e*x + d)/(c*d^2
 - b*d*e) + A*log(x)/(b*d)
```

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 83, normalized size of antiderivative = 1.22

$$\int \frac{A+Bx}{(d+ex)(bx+cx^2)}\,dx = \frac{(Bbc-Ac^2)\log(|cx+b|)}{bc^2d-b^2ce} - \frac{(Bde-Ae^2)\log(|ex+d|)}{cd^2e-bde^2} + \frac{A\log(|x|)}{bd}$$

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

output
```
(B*b*c - A*c^2)*log(abs(c*x + b))/(b*c^2*d - b^2*c*e) - (B*d*e - A*e^2)*lo
g(abs(e*x + d))/(c*d^2*e - b*d*e^2) + A*log(abs(x))/(b*d)
```

Mupad [B] (verification not implemented)

Time = 11.03 (sec) , antiderivative size = 67, normalized size of antiderivative = 0.99

$$\int \frac{A+Bx}{(d+ex)(bx+cx^2)}\,dx = \frac{\ln(d+e\,x)\,(A\,e-B\,d)}{c\,d^2-b\,d\,e}+\frac{\ln(b+c\,x)\,(A\,c-B\,b)}{b^2\,e-b\,c\,d}+\frac{A\,\ln(x)}{b\,d}$$

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

output
```
(log(d + e*x)*(A*e - B*d))/(c*d^2 - b*d*e) + (log(b + c*x)*(A*c - B*b))/(b
^2*e - b*c*d) + (A*log(x))/(b*d)
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 75, normalized size of antiderivative = 1.10

$$\int \frac{A+Bx}{(d+ex)(bx+cx^2)}\,dx = \frac{\log(cx+b)\,acd-\log(cx+b)\,b^2d-\log(ex+d)\,abe+\log(ex+d)\,b^2d+\log(x)\,abe-\log(x)\,acd}{bd\,(be-cd)}$$

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

output
```
(log(b + c*x)*a*c*d - log(b + c*x)*b**2*d - log(d + e*x)*a*b*e + log(d + e
*x)*b**2*d + log(x)*a*b*e - log(x)*a*c*d)/(b*d*(b*e - c*d))
```

3.35 $\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 110

$$\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)}\,dx = \frac{Bd-Ae}{d(cd-be)(d+ex)} + \frac{A\log(x)}{bd^2} + \frac{c(bB-Ac)\log(b+cx)}{b(cd-be)^2} - \frac{(Bcd^2-Ae(2cd-be))\log(d+ex)}{d^2(cd-be)^2}$$

output
```
(-A*e+B*d)/d/(-b*e+c*d)/(e*x+d)+A*ln(x)/b/d^2+c*(-A*c+B*b)*ln(c*x+b)/b/(-b
*e+c*d)^2-(B*c*d^2-A*e*(-b*e+2*c*d))*ln(e*x+d)/d^2/(-b*e+c*d)^2
```

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.96

$$\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)}\,dx = \frac{A\log(x)+\frac{bd(Bd-Ae)(cd-be)+c(bB-Ac)d^2(d+ex)\log(b+cx)-b\left(Bcd^2+Ae(-2cd+be)\right)(d+ex)\log(d+ex)}{(cd-be)^2(d+ex)}}{bd^2}$$

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

output
```
(A*Log[x] + (b*d*(B*d - A*e)*(c*d - b*e) + c*(b*B - A*c)*d^2*(d + e*x)*Log
[b + c*x] - b*(B*c*d^2 + A*e*(-2*c*d + b*e))*(d + e*x)*Log[d + e*x])/((c*d
 - b*e)^2*(d + e*x)))/(b*d^2)
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1200, 2009}

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

$$\int \frac{A+Bx}{(bx+cx^2)(d+ex)^2}\,dx$$

$$\Big\downarrow \; 1200$$

$$\int \left(\frac{c^2(bB-Ac)}{b(b+cx)(be-cd)^2}+\frac{e\left(Ae(2cd-be)-Bcd^2\right)}{d^2(d+ex)(cd-be)^2}-\frac{e(Bd-Ae)}{d(d+ex)^2(cd-be)}+\frac{A}{bd^2x}\right)dx$$

$$\Big\downarrow \; 2009$$

$$-\frac{\log(d+ex)\left(Bcd^2-Ae(2cd-be)\right)}{d^2(cd-be)^2}+\frac{Bd-Ae}{d(d+ex)(cd-be)}+\frac{c(bB-Ac)\log(b+cx)}{b(cd-be)^2}+\frac{A\log(x)}{bd^2}$$

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

output
```
(B*d - A*e)/(d*(c*d - b*e)*(d + e*x)) + (A*Log[x])/(b*d^2) + (c*(b*B - A*c
)*Log[b + c*x])/(b*(c*d - b*e)^2) - ((B*c*d^2 - A*e*(2*c*d - b*e))*Log[d +
 e*x])/(d^2*(c*d - b*e)^2)
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

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

Maple [A] (verified)

Time = 1.06 (sec) , antiderivative size = 111, normalized size of antiderivative = 1.01

method	result
default	$-\frac{(Ac-Bb)c\ln(cx+b)}{b(be-cd)^2}-\frac{(Ab\,e^2-2Acde+Bc\,d^2)\ln(ex+d)}{d^2(be-cd)^2}+\frac{Ae-Bd}{d(be-cd)(ex+d)}+\frac{A\ln(x)}{b\,d^2}$
norman	$-\frac{(Ae-Bd)ex}{d^2(be-cd)(ex+d)}+\frac{A\ln(x)}{b\,d^2}-\frac{(Ab\,e^2-2Acde+Bc\,d^2)\ln(ex+d)}{d^2(b^2e^2-2bcde+c^2d^2)}-\frac{c(Ac-Bb)\ln(cx+b)}{(b^2e^2-2bcde+c^2d^2)b}$
risch	$\frac{Ae}{d(be-cd)(ex+d)}-\frac{B}{(be-cd)(ex+d)}-\frac{\ln(-ex-d)Ab\,e^2}{d^2(b^2e^2-2bcde+c^2d^2)}+\frac{2\ln(-ex-d)Ace}{d(b^2e^2-2bcde+c^2d^2)}-\frac{\ln(-ex-d)Bc}{b^2e^2-2bcde+c^2d^2}-\frac{c^2}{(b^2e^2-}$
parallelrisch	$\frac{-Abc\,d^2e^2+A\,b^2d\,e^3-2A\ln(x)xbcd\,e^3+2A\ln(ex+d)xbcd\,e^3+B\ln(cx+b)xbc\,d^2e^2-B\ln(ex+d)xbc\,d^2e^2+A\ln(x)x\,b^2e^4-A\ln}{}$

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

output
```
-(A*c-B*b)*c/b/(b*e-c*d)^2*ln(c*x+b)-(A*b*e^2-2*A*c*d*e+B*c*d^2)/d^2/(b*e-
c*d)^2*ln(e*x+d)+(A*e-B*d)/d/(b*e-c*d)/(e*x+d)+A*ln(x)/b/d^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 260 vs. $2(110) = 220$.

Time = 5.52 (sec) , antiderivative size = 260, normalized size of antiderivative = 2.36

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)}\,dx$$
$$= \frac{Bbcd^3 + Ab^2de^2 - (Bb^2 + Abc)d^2e + ((Bbc - Ac^2)d^2ex + (Bbc - Ac^2)d^3)\log(cx+b) - (Bbcd^3 - 2\,Ab}{bc^2d^5 - 2\,b^2cd^4}$$

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

output
```
(B*b*c*d^3 + A*b^2*d*e^2 - (B*b^2 + A*b*c)*d^2*e + ((B*b*c - A*c^2)*d^2*e*
x + (B*b*c - A*c^2)*d^3)*log(c*x + b) - (B*b*c*d^3 - 2*A*b*c*d^2*e + A*b^2
*d*e^2 + (B*b*c*d^2*e - 2*A*b*c*d*e^2 + A*b^2*e^3)*x)*log(e*x + d) + (A*c^
2*d^3 - 2*A*b*c*d^2*e + A*b^2*d*e^2 + (A*c^2*d^2*e - 2*A*b*c*d*e^2 + A*b^2
*e^3)*x)*log(x))/(b*c^2*d^5 - 2*b^2*c*d^4*e + b^3*d^3*e^2 + (b*c^2*d^4*e -
 2*b^2*c*d^3*e^2 + b^3*d^2*e^3)*x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**2/(c*x**2+b*x),x)
```

output
```
Timed out
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 150, normalized size of antiderivative = 1.36

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)}\,dx = \frac{(Bbc-Ac^2)\log(cx+b)}{bc^2d^2-2\,b^2cde+b^3e^2} - \frac{(Bcd^2-2\,Acde+Abe^2)\log(ex+d)}{c^2d^4-2\,bcd^3e+b^2d^2e^2} + \frac{Bd-Ae}{cd^3-bd^2e+(cd^2e-bde^2)x} + \frac{A\log(x)}{bd^2}$$

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

output
```
(B*b*c - A*c^2)*log(c*x + b)/(b*c^2*d^2 - 2*b^2*c*d*e + b^3*e^2) - (B*c*d^
2 - 2*A*c*d*e + A*b*e^2)*log(e*x + d)/(c^2*d^4 - 2*b*c*d^3*e + b^2*d^2*e^2
) + (B*d - A*e)/(c*d^3 - b*d^2*e + (c*d^2*e - b*d*e^2)*x) + A*log(x)/(b*d^
2)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 322 vs. $2(110) = 220$.

Time = 0.27 (sec) , antiderivative size = 322, normalized size of antiderivative = 2.93

$$\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)}\,dx = \frac{(Bcd^2-2\,Acde+Abe^2)\log\left(\left|c-\frac{2\,cd}{ex+d}+\frac{cd^2}{(ex+d)^2}+\frac{be}{ex+d}-\frac{bde}{(ex+d)^2}\right|\right)}{2\,(c^2d^4-2\,bcd^3e+b^2d^2e^2)}+\frac{\frac{Bde^2}{ex+d}-\frac{Ae^3}{ex+d}}{cd^2e^2-bde^3} - \frac{(Bbcd^2e^2-2\,Ac^2d^2e^2+2\,Abcde^3-Ab^2e^4)\log\left(\frac{\left|2\,cde-\frac{2\,cd^2e}{ex+d}-be^2+\frac{2\,bde^2}{ex+d}-e^2|b|\right|}{\left|2\,cde-\frac{2\,cd^2e}{ex+d}-be^2+\frac{2\,bde^2}{ex+d}+e^2|b|\right|}\right)}{2\,(c^2d^4-2\,bcd^3e+b^2d^2e^2)e^2|b|}$$

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

output
```
1/2*(B*c*d^2 - 2*A*c*d*e + A*b*e^2)*log(abs(c - 2*c*d/(e*x + d) + c*d^2/(e
*x + d)^2 + b*e/(e*x + d) - b*d*e/(e*x + d)^2))/(c^2*d^4 - 2*b*c*d^3*e + b
^2*d^2*e^2) + (B*d*e^2/(e*x + d) - A*e^3/(e*x + d))/(c*d^2*e^2 - b*d*e^3)
- 1/2*(B*b*c*d^2*e^2 - 2*A*c^2*d^2*e^2 + 2*A*b*c*d*e^3 - A*b^2*e^4)*log(ab
s(2*c*d*e - 2*c*d^2*e/(e*x + d) - b*e^2 + 2*b*d*e^2/(e*x + d) - e^2*abs(b)
)/abs(2*c*d*e - 2*c*d^2*e/(e*x + d) - b*e^2 + 2*b*d*e^2/(e*x + d) + e^2*ab
s(b)))/((c^2*d^4 - 2*b*c*d^3*e + b^2*d^2*e^2)*e^2*abs(b))
```

Mupad [B] (verification not implemented)

Time = 11.25 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.28

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)}\,dx = \frac{A\,\ln(x)}{b\,d^2} - \frac{\ln(d+e\,x)\,\left(c\,(B\,d^2-2\,A\,d\,e)+A\,b\,e^2\right)}{b^2\,d^2\,e^2-2\,b\,c\,d^3\,e+c^2\,d^4} - \frac{\ln(b+c\,x)\,\left(A\,c^2-B\,b\,c\right)}{b^3\,e^2-2\,b^2\,c\,d\,e+b\,c^2\,d^2} + \frac{A\,e-B\,d}{d\,(b\,e-c\,d)\,(d+e\,x)}$$

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

output
```
(A*log(x))/(b*d^2) - (log(d + e*x)*(c*(B*d^2 - 2*A*d*e) + A*b*e^2))/(c^2*d
^4 + b^2*d^2*e^2 - 2*b*c*d^3*e) - (log(b + c*x)*(A*c^2 - B*b*c))/(b^3*e^2
+ b*c^2*d^2 - 2*b^2*c*d*e) + (A*e - B*d)/(d*(b*e - c*d)*(d + e*x))
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 323, normalized size of antiderivative = 2.94

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)}\,dx = \frac{-\log(cx+b)\,a\,c^2d^3-\log(cx+b)\,a\,c^2d^2ex+\log(cx+b)\,b^2c\,d^3+\log(cx+b)\,b^2c\,d^2ex-\log(ex+d)\,a\,b^2c}{}$$

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

output
```
( - log(b + c*x)*a*c**2*d**3 - log(b + c*x)*a*c**2*d**2*e*x + log(b + c*x)
*b**2*c*d**3 + log(b + c*x)*b**2*c*d**2*e*x - log(d + e*x)*a*b**2*d*e**2 -
 log(d + e*x)*a*b**2*e**3*x + 2*log(d + e*x)*a*b*c*d**2*e + 2*log(d + e*x)
*a*b*c*d*e**2*x - log(d + e*x)*b**2*c*d**3 - log(d + e*x)*b**2*c*d**2*e*x
+ log(x)*a*b**2*d*e**2 + log(x)*a*b**2*e**3*x - 2*log(x)*a*b*c*d**2*e - 2*
log(x)*a*b*c*d*e**2*x + log(x)*a*c**2*d**3 + log(x)*a*c**2*d**2*e*x - a*b*
*2*e**3*x + a*b*c*d*e**2*x + b**3*d*e**2*x - b**2*c*d**2*e*x)/(b*d**2*(b**
2*d*e**2 + b**2*e**3*x - 2*b*c*d**2*e - 2*b*c*d*e**2*x + c**2*d**3 + c**2*
d**2*e*x))
```

3.36 $\int \frac{A+Bx}{(d+ex)^3(bx+cx^2)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 171

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)}\,dx=\frac{Bd-Ae}{2d(cd-be)(d+ex)^2}+\frac{Bcd^2-Ae(2cd-be)}{d^2(cd-be)^2(d+ex)}+\frac{A\log(x)}{bd^3}+\frac{c^2(bB-Ac)\log(b+cx)}{b(cd-be)^3}-\frac{(Bc^2d^3-Ae(3c^2d^2-3bcde+b^2e^2))\log(d+ex)}{d^3(cd-be)^3}$$

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

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 169, normalized size of antiderivative = 0.99

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)}\,dx=\frac{Bd-Ae}{2d(cd-be)(d+ex)^2}+\frac{Bcd^2+Ae(-2cd+be)}{d^2(cd-be)^2(d+ex)}+\frac{A\log(x)}{bd^3}+\frac{c^2(-bB+Ac)\log(b+cx)}{b(-cd+be)^3}-\frac{(Bc^2d^3-Ae(3c^2d^2-3bcde+b^2e^2))\log(d+ex)}{d^3(cd-be)^3}$$

input
```
Integrate[(A + B*x)/((d + e*x)^3*(b*x + c*x^2)),x]
```

output
```
(B*d - A*e)/(2*d*(c*d - b*e)*(d + e*x)^2) + (B*c*d^2 + A*e*(-2*c*d + b*e))
/(d^2*(c*d - b*e)^2*(d + e*x)) + (A*Log[x])/(b*d^3) + (c^2*(-(b*B) + A*c)*
Log[b + c*x])/(b*(-(c*d) + b*e)^3) - ((B*c^2*d^3 - A*e*(3*c^2*d^2 - 3*b*c*
d*e + b^2*e^2))*Log[d + e*x])/(d^3*(c*d - b*e)^3)
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1200, 2009}

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

$$\int \frac{A+Bx}{(bx+cx^2)(d+ex)^3}dx$$

$$\Big\downarrow \text{1200}$$

$$\int \left(\frac{e(Ae(b^2e^2-3bcde+3c^2d^2)-Bc^2d^3)}{d^3(d+ex)(cd-be)^3}-\frac{c^3(bB-Ac)}{b(b+cx)(be-cd)^3}+\frac{e(Ae(2cd-be)-Bcd^2)}{d^2(d+ex)^2(cd-be)^2}-\frac{e(Bd-Ae)}{d(d+ex)^3(cd-\right.$$

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

$$-\frac{\log(d+ex)\left(Bc^2d^3-Ae\left(b^2e^2-3bcde+3c^2d^2\right)\right)}{d^3(cd-be)^3}+\frac{c^2(bB-Ac)\log(b+cx)}{b(cd-be)^3}+\frac{Bcd^2-Ae(2cd-be)}{d^2(d+ex)(cd-be)^2}+\frac{Bd-Ae}{2d(d+ex)^2(cd-be)}+\frac{A\log(x)}{bd^3}$$

input
```
Int[(A + B*x)/((d + e*x)^3*(b*x + c*x^2)),x]
```

output
```
(B*d - A*e)/(2*d*(c*d - b*e)*(d + e*x)^2) + (B*c*d^2 - A*e*(2*c*d - b*e))/
(d^2*(c*d - b*e)^2*(d + e*x)) + (A*Log[x])/(b*d^3) + (c^2*(b*B - A*c)*Log[
b + c*x])/(b*(c*d - b*e)^3) - ((B*c^2*d^3 - A*e*(3*c^2*d^2 - 3*b*c*d*e + b
^2*e^2))*Log[d + e*x])/(d^3*(c*d - b*e)^3)
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

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

Maple [A] (verified)

Time = 1.06 (sec) , antiderivative size = 171, normalized size of antiderivative = 1.00

method	result
default	$\frac{(Ac-Bb)c^2\ln(cx+b)}{b(be-cd)^3}+\frac{Ab\,e^2-2Acde+Bc\,d^2}{d^2(be-cd)^2(ex+d)}-\frac{(A\,b^2e^3-3Abcd\,e^2+3A\,c^2d^2e-B\,c^2d^3)\ln(ex+d)}{d^3(be-cd)^3}+\frac{Ae-Bd}{2d(be-cd)(ex+d)^2}$
norman	$\frac{-\frac{e^2\left(3Ab\,e^2-5Acde-Bbde+3Bc\,d^2\right)x^2}{2d^3\left(b^2e^2-2bcde+c^2d^2\right)}-\frac{\left(2Ab\,e^2-3Acde-Bbde+2Bc\,d^2\right)ex}{d^2\left(b^2e^2-2bcde+c^2d^2\right)}}{(ex+d)^2}+\frac{A\ln(x)}{b\,d^3}+\frac{c^2(Ac-Bb)\ln(cx+b)}{(b^3e^3-3d\,e^2b^2c+3d^2eb\,c^2-d^3c^3)b}-$
risch	$\frac{\frac{e\left(Ab\,e^2-2Acde+Bc\,d^2\right)x}{d^2\left(b^2e^2-2bcde+c^2d^2\right)}+\frac{3Ab\,e^2-5Acde-Bbde+3Bc\,d^2}{2d\left(b^2e^2-2bcde+c^2d^2\right)}}{(ex+d)^2}+\frac{A\ln(-x)}{d^3b}-\frac{\ln(-ex-d)A\,b^2e^3}{d^3(b^3e^3-3d\,e^2b^2c+3d^2eb\,c^2-d^3c^3)}+\frac{3\ln(}{d^2(b^3e^3-3d}$
parallelrisch	$\frac{2B\,b^3d^2e^3x-3A\,b^3e^5x^2-4Ad\,b^3e^4x-4B\,b^2c\,d^2e^3x^2+3Bb\,c^2d^3e^2x^2-5Ab\,c^2d^2e^3x^2+12A\ln(x)xb\,c^2d^3e^2+12A\ln(ex+d)x\,b^2}{}$

input
```
int((B*x+A)/(e*x+d)^3/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

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

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 644 vs. $2(169) = 338$.

Time = 19.74 (sec) , antiderivative size = 644, normalized size of antiderivative = 3.77

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)}\,dx$$
$$= \frac{3\,Bbc^2d^5 - 3\,Ab^3d^2e^3 - (4\,Bb^2c + 5\,Abc^2)d^4e + (Bb^3 + 8\,Ab^2c)d^3e^2 + 2\,(Bbc^2d^4e + 3\,Ab^2cd^2e^3 - Ab^3de^4}{}$$

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

output
```
1/2*(3*B*b*c^2*d^5 - 3*A*b^3*d^2*e^3 - (4*B*b^2*c + 5*A*b*c^2)*d^4*e + (B*
b^3 + 8*A*b^2*c)*d^3*e^2 + 2*(B*b*c^2*d^4*e + 3*A*b^2*c*d^2*e^3 - A*b^3*d*
e^4 - (B*b^2*c + 2*A*b*c^2)*d^3*e^2)*x + 2*((B*b*c^2 - A*c^3)*d^3*e^2*x^2
+ 2*(B*b*c^2 - A*c^3)*d^4*e*x + (B*b*c^2 - A*c^3)*d^5)*log(c*x + b) - 2*(B
*b*c^2*d^5 - 3*A*b*c^2*d^4*e + 3*A*b^2*c*d^3*e^2 - A*b^3*d^2*e^3 + (B*b*c^
2*d^3*e^2 - 3*A*b*c^2*d^2*e^3 + 3*A*b^2*c*d*e^4 - A*b^3*e^5)*x^2 + 2*(B*b*
c^2*d^4*e - 3*A*b*c^2*d^3*e^2 + 3*A*b^2*c*d^2*e^3 - A*b^3*d*e^4)*x)*log(e*
x + d) + 2*(A*c^3*d^5 - 3*A*b*c^2*d^4*e + 3*A*b^2*c*d^3*e^2 - A*b^3*d^2*e^
3 + (A*c^3*d^3*e^2 - 3*A*b*c^2*d^2*e^3 + 3*A*b^2*c*d*e^4 - A*b^3*e^5)*x^2
+ 2*(A*c^3*d^4*e - 3*A*b*c^2*d^3*e^2 + 3*A*b^2*c*d^2*e^3 - A*b^3*d*e^4)*x)
*log(x))/(b*c^3*d^8 - 3*b^2*c^2*d^7*e + 3*b^3*c*d^6*e^2 - b^4*d^5*e^3 + (b
*c^3*d^6*e^2 - 3*b^2*c^2*d^5*e^3 + 3*b^3*c*d^4*e^4 - b^4*d^3*e^5)*x^2 + 2*
(b*c^3*d^7*e - 3*b^2*c^2*d^6*e^2 + 3*b^3*c*d^5*e^3 - b^4*d^4*e^4)*x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**3/(c*x**2+b*x),x)
```

output
```
Timed out
```

Maxima [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 312, normalized size of antiderivative = 1.82

$$\int \frac{A+Bx}{(d+ex)^3(bx+cx^2)}\,dx = \frac{(Bbc^2-Ac^3)\log(cx+b)}{bc^3d^3-3\,b^2c^2d^2e+3\,b^3cde^2-b^4e^3} - \frac{(Bc^2d^3-3\,Ac^2d^2e+3\,Abcde^2-Ab^2e^3)\log(ex+d)}{c^3d^6-3\,bc^2d^5e+3\,b^2cd^4e^2-b^3d^3e^3} + \frac{3\,Bcd^3+3\,Abde^2-(Bb+5\,Ac)d^2e+2\,(Bcd^2e-2\,Acde^2+Abe^3)x}{2\,(c^2d^6-2\,bcd^5e+b^2d^4e^2+(c^2d^4e^2-2\,bcd^3e^3+b^2d^2e^4)x^2+2\,(c^2d^5e-2\,bcd^4e^2+b^2d^3e^3)x)} + \frac{A\log(x)}{bd^3}$$

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

output
```
(B*b*c^2 - A*c^3)*log(c*x + b)/(b*c^3*d^3 - 3*b^2*c^2*d^2*e + 3*b^3*c*d*e^
2 - b^4*e^3) - (B*c^2*d^3 - 3*A*c^2*d^2*e + 3*A*b*c*d*e^2 - A*b^2*e^3)*log
(e*x + d)/(c^3*d^6 - 3*b*c^2*d^5*e + 3*b^2*c*d^4*e^2 - b^3*d^3*e^3) + 1/2*
(3*B*c*d^3 + 3*A*b*d*e^2 - (B*b + 5*A*c)*d^2*e + 2*(B*c*d^2*e - 2*A*c*d*e^
2 + A*b*e^3)*x)/(c^2*d^6 - 2*b*c*d^5*e + b^2*d^4*e^2 + (c^2*d^4*e^2 - 2*b*
c*d^3*e^3 + b^2*d^2*e^4)*x^2 + 2*(c^2*d^5*e - 2*b*c*d^4*e^2 + b^2*d^3*e^3)
*x) + A*log(x)/(b*d^3)
```

Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 314, normalized size of antiderivative = 1.84

$$\int \frac{A+Bx}{(d+ex)^3(bx+cx^2)}\,dx = \frac{(Bbc^3-Ac^4)\log(|cx+b|)}{bc^4d^3-3\,b^2c^3d^2e+3\,b^3c^2de^2-b^4ce^3} - \frac{(Bc^2d^3e-3\,Ac^2d^2e^2+3\,Abcde^3-Ab^2e^4)\log(|ex+d|)}{c^3d^6e-3\,bc^2d^5e^2+3\,b^2cd^4e^3-b^3d^3e^4} + \frac{A\log(|x|)}{bd^3} + \frac{3\,Bc^2d^5-4\,Bbcd^4e-5\,Ac^2d^4e+Bb^2d^3e^2+8\,Abcd^3e^2-3\,Ab^2d^2e^3+2\,(Bc^2d^4e-Bbcd^3e^2-2\,Ac^2d^3}{2\,(cd-be)^3(ex+d)^2d^3}$$

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

output
```
(B*b*c^3 - A*c^4)*log(abs(c*x + b))/(b*c^4*d^3 - 3*b^2*c^3*d^2*e + 3*b^3*c
^2*d*e^2 - b^4*c*e^3) - (B*c^2*d^3*e - 3*A*c^2*d^2*e^2 + 3*A*b*c*d*e^3 - A
*b^2*e^4)*log(abs(e*x + d))/(c^3*d^6*e - 3*b*c^2*d^5*e^2 + 3*b^2*c*d^4*e^3
 - b^3*d^3*e^4) + A*log(abs(x))/(b*d^3) + 1/2*(3*B*c^2*d^5 - 4*B*b*c*d^4*e
 - 5*A*c^2*d^4*e + B*b^2*d^3*e^2 + 8*A*b*c*d^3*e^2 - 3*A*b^2*d^2*e^3 + 2*(
B*c^2*d^4*e - B*b*c*d^3*e^2 - 2*A*c^2*d^3*e^2 + 3*A*b*c*d^2*e^3 - A*b^2*d*
e^4)*x)/((c*d - b*e)^3*(e*x + d)^2*d^3)
```

Mupad [B] (verification not implemented)

Time = 11.76 (sec) , antiderivative size = 284, normalized size of antiderivative = 1.66

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)}\,dx = \frac{\frac{3\,A\,b\,e^2+3\,B\,c\,d^2-5\,A\,c\,d\,e-B\,b\,d\,e}{2\,d\,(b^2\,e^2-2\,b\,c\,d\,e+c^2\,d^2)}+\frac{x\,(B\,c\,d^2\,e-2\,A\,c\,d\,e^2+A\,b\,e^3)}{d^2\,(b^2\,e^2-2\,b\,c\,d\,e+c^2\,d^2)}}{d^2+2\,d\,e\,x+e^2\,x^2} - \frac{\ln(d+e\,x)\,\left(c^2\,(B\,d^3-3\,A\,d^2\,e)-A\,b^2\,e^3+3\,A\,b\,c\,d\,e^2\right)}{-b^3\,d^3\,e^3+3\,b^2\,c\,d^4\,e^2-3\,b\,c^2\,d^5\,e+c^3\,d^6} + \frac{\ln(b+c\,x)\,(A\,c^3-B\,b\,c^2)}{b^4\,e^3-3\,b^3\,c\,d\,e^2+3\,b^2\,c^2\,d^2\,e-b\,c^3\,d^3} + \frac{A\,\ln(x)}{b\,d^3}$$

input
```
int((A + B*x)/((b*x + c*x^2)*(d + e*x)^3),x)
```

output
```
((3*A*b*e^2 + 3*B*c*d^2 - 5*A*c*d*e - B*b*d*e)/(2*d*(b^2*e^2 + c^2*d^2 - 2
*b*c*d*e)) + (x*(A*b*e^3 - 2*A*c*d*e^2 + B*c*d^2*e))/(d^2*(b^2*e^2 + c^2*d
^2 - 2*b*c*d*e)))/(d^2 + e^2*x^2 + 2*d*e*x) - (log(d + e*x)*(c^2*(B*d^3 -
3*A*d^2*e) - A*b^2*e^3 + 3*A*b*c*d*e^2))/(c^3*d^6 - b^3*d^3*e^3 + 3*b^2*c*
d^4*e^2 - 3*b*c^2*d^5*e) + (log(b + c*x)*(A*c^3 - B*b*c^2))/(b^4*e^3 - b*c
^3*d^3 + 3*b^2*c^2*d^2*e - 3*b^3*c*d*e^2) + (A*log(x))/(b*d^3)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 809, normalized size of antiderivative = 4.73

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^3/(c*x^2+b*x),x)
```

output
```
(2*log(b + c*x)*a*c**3*d**5 + 4*log(b + c*x)*a*c**3*d**4*e*x + 2*log(b + c
*x)*a*c**3*d**3*e**2*x**2 - 2*log(b + c*x)*b**2*c**2*d**5 - 4*log(b + c*x)
*b**2*c**2*d**4*e*x - 2*log(b + c*x)*b**2*c**2*d**3*e**2*x**2 - 2*log(d +
e*x)*a*b**3*d**2*e**3 - 4*log(d + e*x)*a*b**3*d*e**4*x - 2*log(d + e*x)*a*
b**3*e**5*x**2 + 6*log(d + e*x)*a*b**2*c*d**3*e**2 + 12*log(d + e*x)*a*b**
2*c*d**2*e**3*x + 6*log(d + e*x)*a*b**2*c*d*e**4*x**2 - 6*log(d + e*x)*a*b
*c**2*d**4*e - 12*log(d + e*x)*a*b*c**2*d**3*e**2*x - 6*log(d + e*x)*a*b*c
**2*d**2*e**3*x**2 + 2*log(d + e*x)*b**2*c**2*d**5 + 4*log(d + e*x)*b**2*c
**2*d**4*e*x + 2*log(d + e*x)*b**2*c**2*d**3*e**2*x**2 + 2*log(x)*a*b**3*d
**2*e**3 + 4*log(x)*a*b**3*d*e**4*x + 2*log(x)*a*b**3*e**5*x**2 - 6*log(x)
*a*b**2*c*d**3*e**2 - 12*log(x)*a*b**2*c*d**2*e**3*x - 6*log(x)*a*b**2*c*d
*e**4*x**2 + 6*log(x)*a*b*c**2*d**4*e + 12*log(x)*a*b*c**2*d**3*e**2*x + 6
*log(x)*a*b*c**2*d**2*e**3*x**2 - 2*log(x)*a*c**3*d**5 - 4*log(x)*a*c**3*d
**4*e*x - 2*log(x)*a*c**3*d**3*e**2*x**2 + 2*a*b**3*d**2*e**3 - a*b**3*e**
5*x**2 - 5*a*b**2*c*d**3*e**2 + 3*a*b**2*c*d*e**4*x**2 + 3*a*b*c**2*d**4*e
 - 2*a*b*c**2*d**2*e**3*x**2 - b**4*d**3*e**2 + 3*b**3*c*d**4*e - b**3*c*d
**2*e**3*x**2 - 2*b**2*c**2*d**5 + b**2*c**2*d**3*e**2*x**2)/(2*b*d**3*(b*
*3*d**2*e**3 + 2*b**3*d*e**4*x + b**3*e**5*x**2 - 3*b**2*c*d**3*e**2 - 6*b
**2*c*d**2*e**3*x - 3*b**2*c*d*e**4*x**2 + 3*b*c**2*d**4*e + 6*b*c**2*d**3
*e**2*x + 3*b*c**2*d**2*e**3*x**2 - c**3*d**5 - 2*c**3*d**4*e*x - c**3*...
```

3.37 $\int \frac{A+Bx}{(d+ex)^4(bx+cx^2)}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 245

$$\int \frac{A+Bx}{(d+ex)^4(bx+cx^2)}\,dx = \frac{Bd-Ae}{3d(cd-be)(d+ex)^3}+\frac{Bcd^2-Ae(2cd-be)}{2d^2(cd-be)^2(d+ex)^2} + \frac{Bc^2d^3-Ae(3c^2d^2-3bcde+b^2e^2)}{d^3(cd-be)^3(d+ex)}+\frac{A\log(x)}{bd^4}+\frac{c^3(bB-Ac)\log(b+cx)}{b(cd-be)^4} - \frac{(Bc^3d^4-Ae(4c^3d^3-6bc^2d^2e+4b^2cde^2-b^3e^3))\log(d+ex)}{d^4(cd-be)^4}$$

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

Mathematica [A] (verified)

Time = 0.38 (sec) , antiderivative size = 241, normalized size of antiderivative = 0.98

$$\int \frac{A+Bx}{(d+ex)^4\,(bx+cx^2)}\,dx$$
$$= \frac{Bd-Ae}{3d(cd-be)(d+ex)^3}+\frac{Bcd^2+Ae(-2cd+be)}{2d^2(cd-be)^2(d+ex)^2}$$
$$+\frac{Bc^2d^3-Ae(3c^2d^2-3bcde+b^2e^2)}{d^3(cd-be)^3(d+ex)}+\frac{A\log(x)}{bd^4}+\frac{c^3(bB-Ac)\log(b+cx)}{b(cd-be)^4}$$
$$-\frac{(Bc^3d^4+Ae(-4c^3d^3+6bc^2d^2e-4b^2cde^2+b^3e^3))\log(d+ex)}{d^4(cd-be)^4}$$

input
```
Integrate[(A + B*x)/((d + e*x)^4*(b*x + c*x^2)),x]
```

output
```
(B*d - A*e)/(3*d*(c*d - b*e)*(d + e*x)^3) + (B*c*d^2 + A*e*(-2*c*d + b*e))
/(2*d^2*(c*d - b*e)^2*(d + e*x)^2) + (B*c^2*d^3 - A*e*(3*c^2*d^2 - 3*b*c*d
*e + b^2*e^2))/(d^3*(c*d - b*e)^3*(d + e*x)) + (A*Log[x])/(b*d^4) + (c^3*(
b*B - A*c)*Log[b + c*x])/(b*(c*d - b*e)^4) - ((B*c^3*d^4 + A*e*(-4*c^3*d^3
 + 6*b*c^2*d^2*e - 4*b^2*c*d*e^2 + b^3*e^3))*Log[d + e*x])/(d^4*(c*d - b*e
)^4)
```

Rubi [A] (verified)

Time = 0.88 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1200, 2009}

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

$$\int \frac{A+Bx}{(bx+cx^2)\,(d+ex)^4}\,dx$$
$$\Big\downarrow \; 1200$$
$$\int \left(\frac{e\left(Ae\left(b^2e^2-3bcde+3c^2d^2\right)-Bc^2d^3\right)}{d^3(d+ex)^2(cd-be)^3}+\frac{e\left(Ae\left(-b^3e^3+4b^2cde^2-6bc^2d^2e+4c^3d^3\right)-Bc^3d^4\right)}{d^4(d+ex)(cd-be)^4}+\frac{c^4(bB}{b(b+cx)(}\right.$$

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

$$\frac{Bc^2d^3 - Ae(b^2e^2 - 3bcde + 3c^2d^2)}{d^3(d+ex)(cd-be)^3} - \frac{\log(d+ex)\left(Bc^3d^4 - Ae(-b^3e^3 + 4b^2cde^2 - 6bc^2d^2e + 4c^3d^3)\right)}{d^4(cd-be)^4} + \frac{c^3(bB-Ac)\log(b+cx)}{b(cd-be)^4} + \frac{Bcd^2 - Ae(2cd-be)}{2d^2(d+ex)^2(cd-be)^2} + \frac{Bd-Ae}{3d(d+ex)^3(cd-be)} + \frac{A\log(x)}{bd^4}$$

input
```
Int[(A + B*x)/((d + e*x)^4*(b*x + c*x^2)),x]
```

output
```
(B*d - A*e)/(3*d*(c*d - b*e)*(d + e*x)^3) + (B*c*d^2 - A*e*(2*c*d - b*e))/
(2*d^2*(c*d - b*e)^2*(d + e*x)^2) + (B*c^2*d^3 - A*e*(3*c^2*d^2 - 3*b*c*d*
e + b^2*e^2))/(d^3*(c*d - b*e)^3*(d + e*x)) + (A*Log[x])/(b*d^4) + (c^3*(b
*B - A*c)*Log[b + c*x])/(b*(c*d - b*e)^4) - ((B*c^3*d^4 - A*e*(4*c^3*d^3 -
 6*b*c^2*d^2*e + 4*b^2*c*d*e^2 - b^3*e^3))*Log[d + e*x])/(d^4*(c*d - b*e)^
4)
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

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

Maple [A] (verified)

Time = 1.11 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.00

method	result
default	$-\frac{(Ac-Bb)c^3\ln(cx+b)}{b(be-cd)^4}+\frac{Ab\,e^2-2Acde+Bc\,d^2}{2d^2(be-cd)^2(ex+d)^2}+\frac{A\,b^2e^3-3Abcd\,e^2+3A\,c^2d^2e-B\,c^2d^3}{d^3(be-cd)^3(ex+d)}-\frac{\left(A\,b^3e^4-4A\,b^2cd\,e^3+6Ab\,c^2\cdots\right.}{d^4\cdots}$
norman	$\frac{-\frac{e^3\left(11A\,b^2e^3-31Abcd\,e^2+26A\,c^2d^2e-2B\,b^2d\,e^2+7Bbc\,d^2e-11B\,c^2d^3\right)x^3}{6d^4\left(b^3e^3-3d\,e^2b^2c+3d^2eb\,c^2-d^3c^3\right)}-\frac{\left(9A\,b^2e^3-25Abcd\,e^2+20A\,c^2d^2e-2B\,b^2d\,e^2+7Bbc\,d^2e-9B\cdots\right.}{2d^3\left(b^3e^3-3d\,e^2b^2c+3d^2eb\,c^2-d^3c^3\right)}\cdots}{(ex+d)^3}$
risch	$\frac{\frac{e^2\left(A\,b^2e^3-3Abcd\,e^2+3A\,c^2d^2e-B\,c^2d^3\right)x^2}{d^3\left(b^3e^3-3d\,e^2b^2c+3d^2eb\,c^2-d^3c^3\right)}+\frac{e\left(5A\,b^2e^3-15Abcd\,e^2+14A\,c^2d^2e+Bbc\,d^2e-5B\,c^2d^3\right)x}{2d^2\left(b^3e^3-3d\,e^2b^2c+3d^2eb\,c^2-d^3c^3\right)}+\frac{11A\,b^2e^3-31Abcd\,e^2+26A\,c^2d^2\cdots}{6d\left(b^3e^3-3d\,e^2b\cdots\right.}}{(ex+d)^3}$
parallelrisch	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^4/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

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

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1133 vs. 2(241) = 482.

Time = 65.35 (sec) , antiderivative size = 1133, normalized size of antiderivative = 4.62

$$\int \frac{A+Bx}{(d+ex)^4\,(bx+cx^2)}\,dx=\text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^4/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
1/6*(11*B*b*c^3*d^7 + 11*A*b^4*d^3*e^4 - 2*(9*B*b^2*c^2 + 13*A*b*c^3)*d^6*
e + 3*(3*B*b^3*c + 19*A*b^2*c^2)*d^5*e^2 - 2*(B*b^4 + 21*A*b^3*c)*d^4*e^3
+ 6*(B*b*c^3*d^5*e^2 + 6*A*b^2*c^2*d^3*e^4 - 4*A*b^3*c*d^2*e^5 + A*b^4*d*e
^6 - (B*b^2*c^2 + 3*A*b*c^3)*d^4*e^3)*x^2 + 3*(5*B*b*c^3*d^6*e - 20*A*b^3*
c*d^3*e^4 + 5*A*b^4*d^2*e^5 - 2*(3*B*b^2*c^2 + 7*A*b*c^3)*d^5*e^2 + (B*b^3
*c + 29*A*b^2*c^2)*d^4*e^3)*x + 6*((B*b*c^3 - A*c^4)*d^4*e^3*x^3 + 3*(B*b*
c^3 - A*c^4)*d^5*e^2*x^2 + 3*(B*b*c^3 - A*c^4)*d^6*e*x + (B*b*c^3 - A*c^4)
*d^7)*log(c*x + b) - 6*(B*b*c^3*d^7 - 4*A*b*c^3*d^6*e + 6*A*b^2*c^2*d^5*e^
2 - 4*A*b^3*c*d^4*e^3 + A*b^4*d^3*e^4 + (B*b*c^3*d^4*e^3 - 4*A*b*c^3*d^3*e
^4 + 6*A*b^2*c^2*d^2*e^5 - 4*A*b^3*c*d*e^6 + A*b^4*e^7)*x^3 + 3*(B*b*c^3*d
^5*e^2 - 4*A*b*c^3*d^4*e^3 + 6*A*b^2*c^2*d^3*e^4 - 4*A*b^3*c*d^2*e^5 + A*b
^4*d*e^6)*x^2 + 3*(B*b*c^3*d^6*e - 4*A*b*c^3*d^5*e^2 + 6*A*b^2*c^2*d^4*e^3
 - 4*A*b^3*c*d^3*e^4 + A*b^4*d^2*e^5)*x)*log(e*x + d) + 6*(A*c^4*d^7 - 4*A
*b*c^3*d^6*e + 6*A*b^2*c^2*d^5*e^2 - 4*A*b^3*c*d^4*e^3 + A*b^4*d^3*e^4 + (
A*c^4*d^4*e^3 - 4*A*b*c^3*d^3*e^4 + 6*A*b^2*c^2*d^2*e^5 - 4*A*b^3*c*d*e^6
+ A*b^4*e^7)*x^3 + 3*(A*c^4*d^5*e^2 - 4*A*b*c^3*d^4*e^3 + 6*A*b^2*c^2*d^3*
e^4 - 4*A*b^3*c*d^2*e^5 + A*b^4*d*e^6)*x^2 + 3*(A*c^4*d^6*e - 4*A*b*c^3*d^
5*e^2 + 6*A*b^2*c^2*d^4*e^3 - 4*A*b^3*c*d^3*e^4 + A*b^4*d^2*e^5)*x)*log(x)
)/(b*c^4*d^11 - 4*b^2*c^3*d^10*e + 6*b^3*c^2*d^9*e^2 - 4*b^4*c*d^8*e^3 + b
^5*d^7*e^4 + (b*c^4*d^8*e^3 - 4*b^2*c^3*d^7*e^4 + 6*b^3*c^2*d^6*e^5 - 4...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^4\,(bx+cx^2)}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**4/(c*x**2+b*x),x)
```

output
```
Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 553 vs. $2(241) = 482$.

Time = 0.06 (sec) , antiderivative size = 553, normalized size of antiderivative = 2.26

$$\int \frac{A+Bx}{(d+ex)^4\,(bx+cx^2)}\,dx = \frac{(Bbc^3 - Ac^4)\log(cx+b)}{bc^4d^4 - 4\,b^2c^3d^3e + 6\,b^3c^2d^2e^2 - 4\,b^4cde^3 + b^5e^4}$$
$$- \frac{(Bc^3d^4 - 4\,Ac^3d^3e + 6\,Abc^2d^2e^2 - 4\,Ab^2cde^3 + Ab^3e^4)\log(ex+d)}{c^4d^8 - 4\,bc^3d^7e + 6\,b^2c^2d^6e^2 - 4\,b^3cd^5e^3 + b^4d^4e^4}$$
$$+ \frac{11\,Bc^2d^5 - 11\,Ab^2d^2e^3 - (7\,Bbc + 26\,Ac^2)d^4e + (2\,Bb^2 + 31\,Abc)d^3e^2 + 6\,(Bc^2d^3e^2 - 3\,Ac^2d^2e^3 + 3\,A}{6\,(c^3d^9 - 3\,bc^2d^8e + 3\,b^2cd^7e^2 - b^3d^6e^3 + (c^3d^6e^3 - 3\,bc^2d^5e^4 + 3\,b^2cd^4e^5 - b^3d^3e^6)x^3 + 3\,(c^3d^7e^2 -}$$
$$+ \frac{A\log(x)}{bd^4}$$

input
```
integrate((B*x+A)/(e*x+d)^4/(c*x^2+b*x),x, algorithm="maxima")
```

output
```
(B*b*c^3 - A*c^4)*log(c*x + b)/(b*c^4*d^4 - 4*b^2*c^3*d^3*e + 6*b^3*c^2*d^
2*e^2 - 4*b^4*c*d*e^3 + b^5*e^4) - (B*c^3*d^4 - 4*A*c^3*d^3*e + 6*A*b*c^2*
d^2*e^2 - 4*A*b^2*c*d*e^3 + A*b^3*e^4)*log(e*x + d)/(c^4*d^8 - 4*b*c^3*d^7
*e + 6*b^2*c^2*d^6*e^2 - 4*b^3*c*d^5*e^3 + b^4*d^4*e^4) + 1/6*(11*B*c^2*d^
5 - 11*A*b^2*d^2*e^3 - (7*B*b*c + 26*A*c^2)*d^4*e + (2*B*b^2 + 31*A*b*c)*d
^3*e^2 + 6*(B*c^2*d^3*e^2 - 3*A*c^2*d^2*e^3 + 3*A*b*c*d*e^4 - A*b^2*e^5)*x
^2 + 3*(5*B*c^2*d^4*e + 15*A*b*c*d^2*e^3 - 5*A*b^2*d*e^4 - (B*b*c + 14*A*c
^2)*d^3*e^2)*x)/(c^3*d^9 - 3*b*c^2*d^8*e + 3*b^2*c*d^7*e^2 - b^3*d^6*e^3 +
 (c^3*d^6*e^3 - 3*b*c^2*d^5*e^4 + 3*b^2*c*d^4*e^5 - b^3*d^3*e^6)*x^3 + 3*(
c^3*d^7*e^2 - 3*b*c^2*d^6*e^3 + 3*b^2*c*d^5*e^4 - b^3*d^4*e^5)*x^2 + 3*(c^
3*d^8*e - 3*b*c^2*d^7*e^2 + 3*b^2*c*d^6*e^3 - b^3*d^5*e^4)*x) + A*log(x)/(
b*d^4)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 494 vs. $2(241) = 482$.

Time = 0.26 (sec) , antiderivative size = 494, normalized size of antiderivative = 2.02

$$\int \frac{A+Bx}{(d+ex)^4(bx+cx^2)}\,dx = \frac{(Bbc^4-Ac^5)\log(|cx+b|)}{bc^5d^4-4\,b^2c^4d^3e+6\,b^3c^3d^2e^2-4\,b^4c^2de^3+b^5ce^4} - \frac{(Bc^3d^4e-4\,Ac^3d^3e^2+6\,Abc^2d^2e^3-4\,Ab^2cde^4+Ab^3e^5)\log(|ex+d|)}{c^4d^8e-4\,bc^3d^7e^2+6\,b^2c^2d^6e^3-4\,b^3cd^5e^4+b^4d^4e^5} + \frac{A\log(|x|)}{bd^4} + \frac{11\,Bc^3d^7-18\,Bbc^2d^6e-26\,Ac^3d^6e+9\,Bb^2cd^5e^2+57\,Abc^2d^5e^2-2\,Bb^3d^4e^3-42\,Ab^2cd^4e^3+11\,Ab^3d}{}$$

input
```
integrate((B*x+A)/(e*x+d)^4/(c*x^2+b*x),x, algorithm="giac")
```

output
```
(B*b*c^4 - A*c^5)*log(abs(c*x + b))/(b*c^5*d^4 - 4*b^2*c^4*d^3*e + 6*b^3*c
^3*d^2*e^2 - 4*b^4*c^2*d*e^3 + b^5*c*e^4) - (B*c^3*d^4*e - 4*A*c^3*d^3*e^2
 + 6*A*b*c^2*d^2*e^3 - 4*A*b^2*c*d*e^4 + A*b^3*e^5)*log(abs(e*x + d))/(c^4
*d^8*e - 4*b*c^3*d^7*e^2 + 6*b^2*c^2*d^6*e^3 - 4*b^3*c*d^5*e^4 + b^4*d^4*e
^5) + A*log(abs(x))/(b*d^4) + 1/6*(11*B*c^3*d^7 - 18*B*b*c^2*d^6*e - 26*A*
c^3*d^6*e + 9*B*b^2*c*d^5*e^2 + 57*A*b*c^2*d^5*e^2 - 2*B*b^3*d^4*e^3 - 42*
A*b^2*c*d^4*e^3 + 11*A*b^3*d^3*e^4 + 6*(B*c^3*d^5*e^2 - B*b*c^2*d^4*e^3 -
3*A*c^3*d^4*e^3 + 6*A*b*c^2*d^3*e^4 - 4*A*b^2*c*d^2*e^5 + A*b^3*d*e^6)*x^2
 + 3*(5*B*c^3*d^6*e - 6*B*b*c^2*d^5*e^2 - 14*A*c^3*d^5*e^2 + B*b^2*c*d^4*e
^3 + 29*A*b*c^2*d^4*e^3 - 20*A*b^2*c*d^3*e^4 + 5*A*b^3*d^2*e^5)*x)/((c*d -
 b*e)^4*(e*x + d)^3*d^4)
```

Mupad [B] (verification not implemented)

Time = 12.01 (sec) , antiderivative size = 471, normalized size of antiderivative = 1.92

$$\int \frac{A+Bx}{(d+ex)^4(bx+cx^2)}\,dx = \frac{\frac{-2\,B\,b^2\,d\,e^2+11\,A\,b^2\,e^3+7\,B\,b\,c\,d^2\,e-31\,A\,b\,c\,d\,e^2-11\,B\,c^2\,d^3+26\,A\,c^2\,d^2\,e}{6\,d\,(b^3\,e^3-3\,b^2\,c\,d\,e^2+3\,b\,c^2\,d^2\,e-c^3\,d^3)} + \frac{x^2\,(A\,b^2\,e^5-3\,A\,b\,c\,d\,e^4-B\,c^2\,d^3\,e^2+3\,A\,c^2\,d^2\,e^3)}{d^3\,(b^3\,e^3-3\,b^2\,c\,d\,e^2+3\,b\,c^2\,d^2\,e-c^3\,d^3)} + \frac{x\,(5\,A\,b^2\,e}{}}{d^3+3\,d^2\,e\,x+3\,d\,e^2\,x^2+e^3\,x^3} - \frac{\ln(b+c\,x)\,(A\,c^4-B\,b\,c^3)}{b^5\,e^4-4\,b^4\,c\,d\,e^3+6\,b^3\,c^2\,d^2\,e^2-4\,b^2\,c^3\,d^3\,e+b\,c^4\,d^4} + \frac{A\,\ln(x)}{b\,d^4} - \frac{\ln(d+e\,x)\,(A\,b^3\,e^4-4\,A\,b^2\,c\,d\,e^3+6\,A\,b\,c^2\,d^2\,e^2+B\,c^3\,d^4-4\,A\,c^3\,d^3\,e)}{d^4\,(b\,e-c\,d)^4}$$

input
```
int((A + B*x)/((b*x + c*x^2)*(d + e*x)^4),x)
```

output
```
((11*A*b^2*e^3 - 11*B*c^2*d^3 + 26*A*c^2*d^2*e - 2*B*b^2*d*e^2 - 31*A*b*c*
d*e^2 + 7*B*b*c*d^2*e)/(6*d*(b^3*e^3 - c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d
*e^2)) + (x^2*(A*b^2*e^5 + 3*A*c^2*d^2*e^3 - B*c^2*d^3*e^2 - 3*A*b*c*d*e^4
))/(d^3*(b^3*e^3 - c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2)) + (x*(5*A*b^2
*e^4 - 5*B*c^2*d^3*e + 14*A*c^2*d^2*e^2 - 15*A*b*c*d*e^3 + B*b*c*d^2*e^2))
/(2*d^2*(b^3*e^3 - c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2)))/(d^3 + e^3*x
^3 + 3*d*e^2*x^2 + 3*d^2*e*x) - (log(b + c*x)*(A*c^4 - B*b*c^3))/(b^5*e^4
+ b*c^4*d^4 - 4*b^2*c^3*d^3*e + 6*b^3*c^2*d^2*e^2 - 4*b^4*c*d*e^3) + (A*lo
g(x))/(b*d^4) - (log(d + e*x)*(A*b^3*e^4 + B*c^3*d^4 - 4*A*c^3*d^3*e + 6*A
*b*c^2*d^2*e^2 - 4*A*b^2*c*d*e^3))/(d^4*(b*e - c*d)^4)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 1444, normalized size of antiderivative = 5.89

$$\int \frac{A+Bx}{(d+ex)^4\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^4/(c*x^2+b*x),x)
```

output

```
( - 6*log(b + c*x)*a*c**4*d**7 - 18*log(b + c*x)*a*c**4*d**6*e*x - 18*log(
b + c*x)*a*c**4*d**5*e**2*x**2 - 6*log(b + c*x)*a*c**4*d**4*e**3*x**3 + 6*
log(b + c*x)*b**2*c**3*d**7 + 18*log(b + c*x)*b**2*c**3*d**6*e*x + 18*log(
b + c*x)*b**2*c**3*d**5*e**2*x**2 + 6*log(b + c*x)*b**2*c**3*d**4*e**3*x**
3 - 6*log(d + e*x)*a*b**4*d**3*e**4 - 18*log(d + e*x)*a*b**4*d**2*e**5*x -
 18*log(d + e*x)*a*b**4*d*e**6*x**2 - 6*log(d + e*x)*a*b**4*e**7*x**3 + 24
*log(d + e*x)*a*b**3*c*d**4*e**3 + 72*log(d + e*x)*a*b**3*c*d**3*e**4*x +
72*log(d + e*x)*a*b**3*c*d**2*e**5*x**2 + 24*log(d + e*x)*a*b**3*c*d*e**6*
x**3 - 36*log(d + e*x)*a*b**2*c**2*d**5*e**2 - 108*log(d + e*x)*a*b**2*c**
2*d**4*e**3*x - 108*log(d + e*x)*a*b**2*c**2*d**3*e**4*x**2 - 36*log(d + e
*x)*a*b**2*c**2*d**2*e**5*x**3 + 24*log(d + e*x)*a*b*c**3*d**6*e + 72*log(
d + e*x)*a*b*c**3*d**5*e**2*x + 72*log(d + e*x)*a*b*c**3*d**4*e**3*x**2 +
24*log(d + e*x)*a*b*c**3*d**3*e**4*x**3 - 6*log(d + e*x)*b**2*c**3*d**7 -
18*log(d + e*x)*b**2*c**3*d**6*e*x - 18*log(d + e*x)*b**2*c**3*d**5*e**2*x
**2 - 6*log(d + e*x)*b**2*c**3*d**4*e**3*x**3 + 6*log(x)*a*b**4*d**3*e**4
+ 18*log(x)*a*b**4*d**2*e**5*x + 18*log(x)*a*b**4*d*e**6*x**2 + 6*log(x)*a
*b**4*e**7*x**3 - 24*log(x)*a*b**3*c*d**4*e**3 - 72*log(x)*a*b**3*c*d**3*e
**4*x - 72*log(x)*a*b**3*c*d**2*e**5*x**2 - 24*log(x)*a*b**3*c*d*e**6*x**3
 + 36*log(x)*a*b**2*c**2*d**5*e**2 + 108*log(x)*a*b**2*c**2*d**4*e**3*x +
108*log(x)*a*b**2*c**2*d**3*e**4*x**2 + 36*log(x)*a*b**2*c**2*d**2*e**5...
```

3.38 $\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 156

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx = -\frac{Ad^4}{b^2x}+\frac{e^3(4Bcd-2bBe+Ace)x}{c^3}+\frac{Be^4x^2}{2c^2} + \frac{(bB-Ac)(cd-be)^4}{b^2c^4(b+cx)}+\frac{d^3(bBd-2Acd+4Abe)\log(x)}{b^3} + \frac{(cd-be)^3\left(2Ac^2d-3b^2Be-bc(Bd-2Ae)\right)\log(b+cx)}{b^3c^4}$$

output
```
-A*d^4/b^2/x+e^3*(A*c*e-2*B*b*e+4*B*c*d)*x/c^3+1/2*B*e^4*x^2/c^2+(-A*c+B*b
)*(-b*e+c*d)^4/b^2/c^4/(c*x+b)+d^3*(4*A*b*e-2*A*c*d+B*b*d)*ln(x)/b^3+(-b*e
+c*d)^3*(2*A*c^2*d-3*b^2*B*e-b*c*(-2*A*e+B*d))*ln(c*x+b)/b^3/c^4
```

Mathematica [A] (verified)

Time = 0.10 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.99

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx$$
$$= -\frac{Ad^4}{b^2x}+\frac{e^3(4Bcd-2bBe+Ace)x}{c^3}+\frac{Be^4x^2}{2c^2}$$
$$+\frac{(bB-Ac)(cd-be)^4}{b^2c^4(b+cx)}+\frac{d^3(bBd-2Acd+4Abe)\log(x)}{b^3}$$
$$+\frac{(-cd+be)^3\left(-2Ac^2d+3b^2Be+bc(Bd-2Ae)\right)\log(b+cx)}{b^3c^4}$$

input
```
Integrate[((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^2,x]
```

output
```
-((A*d^4)/(b^2*x)) + (e^3*(4*B*c*d - 2*b*B*e + A*c*e)*x)/c^3 + (B*e^4*x^2)
/(2*c^2) + ((b*B - A*c)*(c*d - b*e)^4)/(b^2*c^4*(b + c*x)) + (d^3*(b*B*d -
 2*A*c*d + 4*A*b*e)*Log[x])/b^3 + ((-(c*d) + b*e)^3*(-2*A*c^2*d + 3*b^2*B*
e + b*c*(B*d - 2*A*e))*Log[b + c*x])/(b^3*c^4)
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1206, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx$$

$$\Big\downarrow \; 1206$$

$$\int \left(\frac{d^3(4Abe-2Acd+bBd)}{b^3x}-\frac{(bB-Ac)(be-cd)^4}{b^2c^3(b+cx)^2}+\frac{Ad^4}{b^2x^2}+\frac{(cd-be)^3\left(-bc(Bd-2Ae)+2Ac^2d-3b^2Be\right)}{b^3c^3(b+cx)}-\right.$$

$$\Big\downarrow \; 2009$$

$$\frac{d^3\log(x)(4Abe-2Acd+bBd)}{b^3}+\frac{(bB-Ac)(cd-be)^4}{b^2c^4(b+cx)}-\frac{Ad^4}{b^2x}+\frac{(cd-be)^3\log(b+cx)\left(-bc(Bd-2Ae)+2Ac^2d-3b^2Be\right)}{b^3c^4}+\frac{e^3x(Ace-2bBe+4Bcd)}{c^3}+\frac{Be^4x^2}{2c^2}$$

input
```
Int[((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^2,x]
```

output
```
-((A*d^4)/(b^2*x)) + (e^3*(4*B*c*d - 2*b*B*e + A*c*e)*x)/c^3 + (B*e^4*x^2)
/(2*c^2) + ((b*B - A*c)*(c*d - b*e)^4)/(b^2*c^4*(b + c*x)) + (d^3*(b*B*d -
 2*A*c*d + 4*A*b*e)*Log[x])/b^3 + ((c*d - b*e)^3*(2*A*c^2*d - 3*b^2*B*e -
b*c*(B*d - 2*A*e))*Log[b + c*x])/(b^3*c^4)
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 303, normalized size of antiderivative = 1.94

method	result
default	$\frac{e^3\left(\frac{1}{2}Bce\,x^2+Acex-2Bbex+4Bcdx\right)}{c^3}+\frac{(-2A\,b^4e^4c+4A\,b^3c^2d\,e^3-4A\,c^4d^3eb+2A\,c^5d^4+3b^5B\,e^4-8B\,b^4d\,e^3c+6B\,b^3c^2d^2e^2 \cdots}{b^3c^4}$
norman	$\frac{-\frac{A\,d^4}{b}+\frac{B\,e^4x^4}{2c}+\frac{e^3(2Ace-3Bbe+8Bcd)x^3}{2c^2}-\frac{(2A\,b^4e^4c-4A\,b^3c^2d\,e^3+6A\,b^2c^3d^2e^2-4A\,c^4d^3eb+2A\,c^5d^4-3b^5B\,e^4+8B\,b^4d\,e^3c-6B\,b^3 \cdots}{b^2c^4}}{x(cx+b)}$
risch	$\frac{B\,e^4x^2}{2c^2}+\frac{e^4Ax}{c^2}-\frac{2e^4Bbx}{c^3}+\frac{4e^3Bdx}{c^2}+\frac{-\frac{(A\,b^4e^4c-4A\,b^3c^2d\,e^3+6A\,b^2c^3d^2e^2-4A\,c^4d^3eb+2A\,c^5d^4-b^5B\,e^4+4B\,b^4d\,e^3c-6 \cdots}{b^2c}}{c^3x(cx+b)}$
parallelrisch	$\frac{-2A\,b^2c^4d^4+8A\ln(cx+b)x^2b^3c^3d\,e^3-8A\ln(cx+b)x^2b\,c^5d^3e-16B\ln(cx+b)x^2b^4c^2d\,e^3+12B\ln(cx+b)x^2b^3c^3d^2e^2+8A\ln(x) \cdots}{\cdots}$

input
```
int((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
e^3/c^3*(1/2*B*c*e*x^2+A*c*e*x-2*B*b*e*x+4*B*c*d*x)+(-2*A*b^4*c*e^4+4*A*b^
3*c^2*d*e^3-4*A*b*c^4*d^3*e+2*A*c^5*d^4+3*B*b^5*e^4-8*B*b^4*c*d*e^3+6*B*b^
3*c^2*d^2*e^2-B*b*c^4*d^4)/b^3/c^4*ln(c*x+b)-1/c^4*(A*b^4*c*e^4-4*A*b^3*c^
2*d*e^3+6*A*b^2*c^3*d^2*e^2-4*A*b*c^4*d^3*e+A*c^5*d^4-B*b^5*e^4+4*B*b^4*c*
d*e^3-6*B*b^3*c^2*d^2*e^2+4*B*b^2*c^3*d^3*e-B*b*c^4*d^4)/b^2/(c*x+b)-A*d^4
/b^2/x+d^3*(4*A*b*e-2*A*c*d+B*b*d)*ln(x)/b^3
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 517 vs. $2(154) = 308$.

Time = 0.10 (sec) , antiderivative size = 517, normalized size of antiderivative = 3.31

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx$$
$$= \frac{Bb^3c^3e^4x^4 - 2\,Ab^2c^4d^4 + (8\,Bb^3c^3de^3 - (3\,Bb^4c^2 - 2\,Ab^3c^3)e^4)x^3 + 2\,(4\,Bb^4c^2de^3 - (2\,Bb^5c - Ab^4c^2)e^4)}{}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
1/2*(B*b^3*c^3*e^4*x^4 - 2*A*b^2*c^4*d^4 + (8*B*b^3*c^3*d*e^3 - (3*B*b^4*c
^2 - 2*A*b^3*c^3)*e^4)*x^3 + 2*(4*B*b^4*c^2*d*e^3 - (2*B*b^5*c - A*b^4*c^2
)*e^4)*x^2 + 2*((B*b^2*c^4 - 2*A*b*c^5)*d^4 - 4*(B*b^3*c^3 - A*b^2*c^4)*d^
3*e + 6*(B*b^4*c^2 - A*b^3*c^3)*d^2*e^2 - 4*(B*b^5*c - A*b^4*c^2)*d*e^3 +
(B*b^6 - A*b^5*c)*e^4)*x - 2*((4*A*b*c^5*d^3*e - 6*B*b^3*c^3*d^2*e^2 + (B*
b*c^5 - 2*A*c^6)*d^4 + 4*(2*B*b^4*c^2 - A*b^3*c^3)*d*e^3 - (3*B*b^5*c - 2*
A*b^4*c^2)*e^4)*x^2 + (4*A*b^2*c^4*d^3*e - 6*B*b^4*c^2*d^2*e^2 + (B*b^2*c^
4 - 2*A*b*c^5)*d^4 + 4*(2*B*b^5*c - A*b^4*c^2)*d*e^3 - (3*B*b^6 - 2*A*b^5*
c)*e^4)*x)*log(c*x + b) + 2*((4*A*b*c^5*d^3*e + (B*b*c^5 - 2*A*c^6)*d^4)*x
^2 + (4*A*b^2*c^4*d^3*e + (B*b^2*c^4 - 2*A*b*c^5)*d^4)*x)*log(x))/(b^3*c^5
*x^2 + b^4*c^4*x)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 644 vs. $2(156) = 312$.

Time = 8.93 (sec) , antiderivative size = 644, normalized size of antiderivative = 4.13

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx = \frac{Be^4x^2}{2c^2} + x\left(\frac{Ae^4}{c^2} - \frac{2Bbe^4}{c^3} + \frac{4Bde^3}{c^2}\right)$$
$$+ \frac{-Abc^4d^4 + x(-Ab^4ce^4 + 4Ab^3c^2de^3 - 6Ab^2c^3d^2e^2 + 4Abc^4d^3e - 2Ac^5d^4 + Bb^5e^4 - 4Bb^4cde^3 + 6Bb^3c}{b^3c^4x + b^2c^5x^2}$$
$$+ \frac{d^3 \cdot (4Abe - 2Acd + Bbd)\log\left(x + \frac{-4Ab^2c^3d^3e + 2Abc^4d^4 - Bb^2c^3d^4 + bc^3d^3 \cdot (4Abe - 2Acd + Bbd)}{-2Ab^4ce^4 + 4Ab^3c^2de^3 - 8Abc^4d^3e + 4Ac^5d^4 + 3Bb^5e^4 - 8Bb^4cde^3 + 6Bb^3c^2d^2e^2 - 2Bbc^4d^4}\right)}{b^3}$$
$$+ \frac{(be-cd)^3(-2Abce - 2Ac^2d + 3Bb^2e + Bbcd)\log\left(x + \frac{-4Ab^2c^3d^3e + 2Abc^4d^4 - Bb^2c^3d^4 + \frac{b(be-cd)^3(-2Abce-}{}}{-2Ab^4ce^4 + 4Ab^3c^2de^3 - 8Abc^4d^3e + 4Ac^5d^4 + 3Bb^5e^4 - 8Bb^4c}\right.}{b^3c^4}$$

input
```
integrate((B*x+A)*(e*x+d)**4/(c*x**2+b*x)**2,x)
```

output
```
B*e**4*x**2/(2*c**2) + x*(A*e**4/c**2 - 2*B*b*e**4/c**3 + 4*B*d*e**3/c**2)
 + (-A*b*c**4*d**4 + x*(-A*b**4*c*e**4 + 4*A*b**3*c**2*d*e**3 - 6*A*b**2*c
**3*d**2*e**2 + 4*A*b*c**4*d**3*e - 2*A*c**5*d**4 + B*b**5*e**4 - 4*B*b**4
*c*d*e**3 + 6*B*b**3*c**2*d**2*e**2 - 4*B*b**2*c**3*d**3*e + B*b*c**4*d**4
))/(b**3*c**4*x + b**2*c**5*x**2) + d**3*(4*A*b*e - 2*A*c*d + B*b*d)*log(x
 + (-4*A*b**2*c**3*d**3*e + 2*A*b*c**4*d**4 - B*b**2*c**3*d**4 + b*c**3*d*
*3*(4*A*b*e - 2*A*c*d + B*b*d))/(-2*A*b**4*c*e**4 + 4*A*b**3*c**2*d*e**3 -
 8*A*b*c**4*d**3*e + 4*A*c**5*d**4 + 3*B*b**5*e**4 - 8*B*b**4*c*d*e**3 + 6
*B*b**3*c**2*d**2*e**2 - 2*B*b*c**4*d**4))/b**3 + (b*e - c*d)**3*(-2*A*b*c
*e - 2*A*c**2*d + 3*B*b**2*e + B*b*c*d)*log(x + (-4*A*b**2*c**3*d**3*e + 2
*A*b*c**4*d**4 - B*b**2*c**3*d**4 + b*(b*e - c*d)**3*(-2*A*b*c*e - 2*A*c**
2*d + 3*B*b**2*e + B*b*c*d)/c)/(-2*A*b**4*c*e**4 + 4*A*b**3*c**2*d*e**3 -
8*A*b*c**4*d**3*e + 4*A*c**5*d**4 + 3*B*b**5*e**4 - 8*B*b**4*c*d*e**3 + 6*
B*b**3*c**2*d**2*e**2 - 2*B*b*c**4*d**4))/(b**3*c**4)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 310 vs. $2(154) = 308$.

Time = 0.04 (sec) , antiderivative size = 310, normalized size of antiderivative = 1.99

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx = -\frac{Abc^4d^4 - ((Bbc^4 - 2\,Ac^5)d^4 - 4\,(Bb^2c^3 - Abc^4)d^3e + 6\,(Bb^3c^2 - Ab^2c^3)d^2e^2 - 4\,(Bb^4c - Ab^3c^2)de^3 + }{b^2c^5x^2 + b^3c^4x} + \frac{(4\,Abd^3e + (Bb - 2\,Ac)d^4)\log(x)}{b^3} + \frac{Bce^4x^2 + 2\,(4\,Bcde^3 - (2\,Bb - Ac)e^4)x}{2\,c^3} - \frac{(4\,Abc^4d^3e - 6\,Bb^3c^2d^2e^2 + (Bbc^4 - 2\,Ac^5)d^4 + 4\,(2\,Bb^4c - Ab^3c^2)de^3 - (3\,Bb^5 - 2\,Ab^4c)e^4)\log(cx +}{b^3c^4}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^2,x, algorithm="maxima")
```

output
```
-(A*b*c^4*d^4 - ((B*b*c^4 - 2*A*c^5)*d^4 - 4*(B*b^2*c^3 - A*b*c^4)*d^3*e +
 6*(B*b^3*c^2 - A*b^2*c^3)*d^2*e^2 - 4*(B*b^4*c - A*b^3*c^2)*d*e^3 + (B*b^
5 - A*b^4*c)*e^4)*x)/(b^2*c^5*x^2 + b^3*c^4*x) + (4*A*b*d^3*e + (B*b - 2*A
*c)*d^4)*log(x)/b^3 + 1/2*(B*c*e^4*x^2 + 2*(4*B*c*d*e^3 - (2*B*b - A*c)*e^
4)*x)/c^3 - (4*A*b*c^4*d^3*e - 6*B*b^3*c^2*d^2*e^2 + (B*b*c^4 - 2*A*c^5)*d
^4 + 4*(2*B*b^4*c - A*b^3*c^2)*d*e^3 - (3*B*b^5 - 2*A*b^4*c)*e^4)*log(c*x
+ b)/(b^3*c^4)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 326 vs. $2(154) = 308$.

Time = 0.26 (sec) , antiderivative size = 326, normalized size of antiderivative = 2.09

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx = \frac{(Bbd^4 - 2\,Acd^4 + 4\,Abd^3e)\log(|x|)}{b^3} + \frac{Bc^2e^4x^2 + 8\,Bc^2de^3x - 4\,Bbce^4x + 2\,Ac^2e^4x}{2\,c^4} - \frac{(Bbc^4d^4 - 2\,Ac^5d^4 + 4\,Abc^4d^3e - 6\,Bb^3c^2d^2e^2 + 8\,Bb^4cde^3 - 4\,Ab^3c^2de^3 - 3\,Bb^5e^4 + 2\,Ab^4ce^4)\log(|c}{b^3c^4} - \frac{Abc^4d^4 - (Bbc^4d^4 - 2\,Ac^5d^4 - 4\,Bb^2c^3d^3e + 4\,Abc^4d^3e + 6\,Bb^3c^2d^2e^2 - 6\,Ab^2c^3d^2e^2 - 4\,Bb^4cde^3 + 4\,}{(cx+b)b^2c^4x}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
(B*b*d^4 - 2*A*c*d^4 + 4*A*b*d^3*e)*log(abs(x))/b^3 + 1/2*(B*c^2*e^4*x^2 +
 8*B*c^2*d*e^3*x - 4*B*b*c*e^4*x + 2*A*c^2*e^4*x)/c^4 - (B*b*c^4*d^4 - 2*A
*c^5*d^4 + 4*A*b*c^4*d^3*e - 6*B*b^3*c^2*d^2*e^2 + 8*B*b^4*c*d*e^3 - 4*A*b
^3*c^2*d*e^3 - 3*B*b^5*e^4 + 2*A*b^4*c*e^4)*log(abs(c*x + b))/(b^3*c^4) -
(A*b*c^4*d^4 - (B*b*c^4*d^4 - 2*A*c^5*d^4 - 4*B*b^2*c^3*d^3*e + 4*A*b*c^4*
d^3*e + 6*B*b^3*c^2*d^2*e^2 - 6*A*b^2*c^3*d^2*e^2 - 4*B*b^4*c*d*e^3 + 4*A*
b^3*c^2*d*e^3 + B*b^5*e^4 - A*b^4*c*e^4)*x)/((c*x + b)*b^2*c^4*x)
```

Mupad [B] (verification not implemented)

Time = 11.03 (sec) , antiderivative size = 331, normalized size of antiderivative = 2.12

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx$$
$$= \ln(b+c\,x)\left(\frac{c^2\,(6\,B\,b^3\,d^2\,e^2+4\,A\,b^3\,d\,e^3)-c\,(2\,A\,b^4\,e^4+8\,B\,d\,b^4\,e^3)+3\,B\,b^5\,e^4}{b^3\,c^4} - \frac{B\,b\,d^4+4\,A\,b\,e\,d^3}{b^3}+\frac{2\,A\,c\,d^4}{b^3}\right)$$
$$-\frac{\frac{A\,c^3\,d^4}{b}+\frac{x\,(-B\,b^5\,e^4+4\,B\,b^4\,c\,d\,e^3+A\,b^4\,c\,e^4-6\,B\,b^3\,c^2\,d^2\,e^2-4\,A\,b^3\,c^2\,d\,e^3+4\,B\,b^2\,c^3\,d^3\,e+6\,A\,b^2\,c^3\,d^2\,e^2-B\,b\,c^4\,d^4-4\,A\,b\,c^4\,d^3\,e+2\,A\,c^5 \cdots)}{b^2\,c}}{c^4\,x^2+b\,c^3\,x}$$
$$+x\left(\frac{A\,e^4+4\,B\,d\,e^3}{c^2}-\frac{2\,B\,b\,e^4}{c^3}\right)+\frac{\ln(x)\,\left(b\,(B\,d^4+4\,A\,e\,d^3)-2\,A\,c\,d^4\right)}{b^3}+\frac{B\,e^4\,x^2}{2\,c^2}$$

input
```
int(((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^2,x)
```

output
```
log(b + c*x)*((c^2*(4*A*b^3*d*e^3 + 6*B*b^3*d^2*e^2) - c*(2*A*b^4*e^4 + 8*
B*b^4*d*e^3) + 3*B*b^5*e^4)/(b^3*c^4) - (B*b*d^4 + 4*A*b*d^3*e)/b^3 + (2*A
*c*d^4)/b^3) - ((A*c^3*d^4)/b + (x*(2*A*c^5*d^4 - B*b^5*e^4 + A*b^4*c*e^4
- B*b*c^4*d^4 - 4*A*b^3*c^2*d*e^3 + 4*B*b^2*c^3*d^3*e + 6*A*b^2*c^3*d^2*e^
2 - 6*B*b^3*c^2*d^2*e^2 - 4*A*b*c^4*d^3*e + 4*B*b^4*c*d*e^3))/(b^2*c))/(c^
4*x^2 + b*c^3*x) + x*((A*e^4 + 4*B*d*e^3)/c^2 - (2*B*b*e^4)/c^3) + (log(x)
*(b*(B*d^4 + 4*A*d^3*e) - 2*A*c*d^4))/b^3 + (B*e^4*x^2)/(2*c^2)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 633, normalized size of antiderivative = 4.06

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^2}\,dx$$
$$= \frac{b^4c^3e^4x^4 + 6\log(cx+b)\,b^7e^4x - 2a\,b^2c^4d^4 + 4a\,c^6d^4x^2 - 6b^6c\,e^4x^2 - 3b^5c^2e^4x^3 - 2b^2c^5d^4x^2 + 8\log(cx+}{}$$

input
```
int((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^2,x)
```

output
```
( - 4*log(b + c*x)*a*b**5*c*e**4*x + 8*log(b + c*x)*a*b**4*c**2*d*e**3*x -
 4*log(b + c*x)*a*b**4*c**2*e**4*x**2 + 8*log(b + c*x)*a*b**3*c**3*d*e**3*
x**2 - 8*log(b + c*x)*a*b**2*c**4*d**3*e*x + 4*log(b + c*x)*a*b*c**5*d**4*
x - 8*log(b + c*x)*a*b*c**5*d**3*e*x**2 + 4*log(b + c*x)*a*c**6*d**4*x**2
+ 6*log(b + c*x)*b**7*e**4*x - 16*log(b + c*x)*b**6*c*d*e**3*x + 6*log(b +
 c*x)*b**6*c*e**4*x**2 + 12*log(b + c*x)*b**5*c**2*d**2*e**2*x - 16*log(b
+ c*x)*b**5*c**2*d*e**3*x**2 + 12*log(b + c*x)*b**4*c**3*d**2*e**2*x**2 -
2*log(b + c*x)*b**3*c**4*d**4*x - 2*log(b + c*x)*b**2*c**5*d**4*x**2 + 8*l
og(x)*a*b**2*c**4*d**3*e*x - 4*log(x)*a*b*c**5*d**4*x + 8*log(x)*a*b*c**5*
d**3*e*x**2 - 4*log(x)*a*c**6*d**4*x**2 + 2*log(x)*b**3*c**4*d**4*x + 2*lo
g(x)*b**2*c**5*d**4*x**2 + 4*a*b**4*c**2*e**4*x**2 - 8*a*b**3*c**3*d*e**3*
x**2 + 2*a*b**3*c**3*e**4*x**3 - 2*a*b**2*c**4*d**4 + 12*a*b**2*c**4*d**2*
e**2*x**2 - 8*a*b*c**5*d**3*e*x**2 + 4*a*c**6*d**4*x**2 - 6*b**6*c*e**4*x*
*2 + 16*b**5*c**2*d*e**3*x**2 - 3*b**5*c**2*e**4*x**3 - 12*b**4*c**3*d**2*
e**2*x**2 + 8*b**4*c**3*d*e**3*x**3 + b**4*c**3*e**4*x**4 + 8*b**3*c**4*d*
*3*e*x**2 - 2*b**2*c**5*d**4*x**2)/(2*b**3*c**4*x*(b + c*x))
```

3.39 $\int \frac{(A+Bx)(d+ex)^3}{\left(bx+cx^2\right)^2} \, dx$

Optimal result

Integrand size = 24, antiderivative size = 128

$$\int \frac{(A+Bx)(d+ex)^3}{\left(bx+cx^2\right)^2} \, dx = -\frac{Ad^3}{b^2x}+\frac{Be^3x}{c^2}+\frac{(bB-Ac)(cd-be)^3}{b^2c^3(b+cx)} + \frac{d^2(bBd-2Acd+3Abe)\log(x)}{b^3} + \frac{(cd-be)^2\left(2Ac^2d-2b^2Be-bc(Bd-Ae)\right)\log(b+cx)}{b^3c^3}$$

output
```
-A*d^3/b^2/x+B*e^3*x/c^2+(-A*c+B*b)*(-b*e+c*d)^3/b^2/c^3/(c*x+b)+d^2*(3*A*
b*e-2*A*c*d+B*b*d)*ln(x)/b^3+(-b*e+c*d)^2*(2*A*c^2*d-2*b^2*B*e-b*c*(-A*e+B
*d))*ln(c*x+b)/b^3/c^3
```

Mathematica [A] (verified)

Time = 0.08 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00

$$\int \frac{(A+Bx)(d+ex)^3}{\left(bx+cx^2\right)^2} \, dx = -\frac{Ad^3}{b^2x}+\frac{Be^3x}{c^2}-\frac{(bB-Ac)(-cd+be)^3}{b^2c^3(b+cx)} + \frac{d^2(bBd-2Acd+3Abe)\log(x)}{b^3} + \frac{(cd-be)^2\left(-bBcd+2Ac^2d-2b^2Be+Abce\right)\log(b+cx)}{b^3c^3}$$

input
```
Integrate[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^2,x]
```

output
```
-((A*d^3)/(b^2*x)) + (B*e^3*x)/c^2 - ((b*B - A*c)*(-(c*d) + b*e)^3)/(b^2*c
^3*(b + c*x)) + (d^2*(b*B*d - 2*A*c*d + 3*A*b*e)*Log[x])/b^3 + ((c*d - b*e
)^2*(-(b*B*c*d) + 2*A*c^2*d - 2*b^2*B*e + A*b*c*e)*Log[b + c*x])/(b^3*c^3)
```

Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1206, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^2}dx$$

$$\Big\downarrow \textbf{1206}$$

$$\int \left(\frac{d^2(3Abe-2Acd+bBd)}{b^3x}+\frac{(bB-Ac)(be-cd)^3}{b^2c^2(b+cx)^2}+\frac{Ad^3}{b^2x^2}+\frac{(cd-be)^2\left(-bc(Bd-Ae)+2Ac^2d-2b^2Be\right)}{b^3c^2(b+cx)}+\right.$$

$$\Big\downarrow \textbf{2009}$$

$$\frac{d^2\log(x)(3Abe-2Acd+bBd)}{b^3}+\frac{(bB-Ac)(cd-be)^3}{b^2c^3(b+cx)}-\frac{Ad^3}{b^2x}+\frac{(cd-be)^2\log(b+cx)\left(-bc(Bd-Ae)+2Ac^2d-2b^2Be\right)}{b^3c^3}+\frac{Be^3x}{c^2}$$

input
```
Int[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^2,x]
```

output
```
-((A*d^3)/(b^2*x)) + (B*e^3*x)/c^2 + ((b*B - A*c)*(c*d - b*e)^3)/(b^2*c^3*
(b + c*x)) + (d^2*(b*B*d - 2*A*c*d + 3*A*b*e)*Log[x])/b^3 + ((c*d - b*e)^2
*(2*A*c^2*d - 2*b^2*B*e - b*c*(B*d - A*e))*Log[b + c*x])/(b^3*c^3)
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.78 (sec) , antiderivative size = 220, normalized size of antiderivative = 1.72

method	result
default	$\frac{B\,e^{3}x}{c^{2}}+\frac{\left(A\,b^{3}e^{3}c-3Ab\,c^{3}d^{2}e+2A\,c^{4}d^{3}-2b^{4}B\,e^{3}+3B\,b^{3}d\,e^{2}c-Bb\,c^{3}d^{3}\right)\ln\left(cx+b\right)}{c^{3}b^{3}}-\frac{-A\,b^{3}e^{3}c+3A\,b^{2}c^{2}d\,e^{2}-3Ab\,c^{3}d^{2}e+}{}$
norman	$\frac{\frac{B\,e^{3}x^{3}}{c}-\frac{A\,d^{3}}{b}-\frac{\left(A\,b^{3}e^{3}c-3A\,b^{2}c^{2}d\,e^{2}+3Ab\,c^{3}d^{2}e-2A\,c^{4}d^{3}-2b^{4}B\,e^{3}+3B\,b^{3}d\,e^{2}c-3B\,b^{2}d^{2}e\,c^{2}+Bb\,c^{3}d^{3}\right)x^{2}}{b^{3}c^{2}}}{x\left(cx+b\right)}+\frac{\left(A\,b^{3}e^{3}c-3Ab\,c^{3}d\right.}{}$
risch	$\frac{B\,e^{3}x}{c^{2}}+\frac{\frac{\left(A\,b^{3}e^{3}c-3A\,b^{2}c^{2}d\,e^{2}+3Ab\,c^{3}d^{2}e-2A\,c^{4}d^{3}-b^{4}B\,e^{3}+3B\,b^{3}d\,e^{2}c-3B\,b^{2}d^{2}e\,c^{2}+Bb\,c^{3}d^{3}\right)x}{b^{2}c}-\frac{A\,c^{2}d^{3}}{b}}{c^{2}x\left(cx+b\right)}+\frac{\ln\left(-cx-b\right)A\,e^{3}}{c^{2}}$
parallelrisch	$\frac{-A\,b^{2}c^{3}d^{3}+2c^{5}x^{2}A\,d^{3}+2A\ln\left(cx+b\right)x^{2}c^{5}d^{3}-2B\ln\left(cx+b\right)x\,b^{5}e^{3}-3A\ln\left(cx+b\right)x\,b^{2}c^{3}d^{2}e+3B\ln\left(cx+b\right)x\,b^{4}cd\,e^{2}+3A\ln\left(x\right)x^{2}}{}$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
B*e^3/c^2*x+1/c^3*(A*b^3*c*e^3-3*A*b*c^3*d^2*e+2*A*c^4*d^3-2*B*b^4*e^3+3*B
*b^3*c*d*e^2-B*b*c^3*d^3)/b^3*ln(c*x+b)-(-A*b^3*c*e^3+3*A*b^2*c^2*d*e^2-3*
A*b*c^3*d^2*e+A*c^4*d^3+B*b^4*e^3-3*B*b^3*c*d*e^2+3*B*b^2*c^2*d^2*e-B*b*c^
3*d^3)/b^2/c^3/(c*x+b)-A*d^3/b^2/x+d^2*(3*A*b*e-2*A*c*d+B*b*d)*ln(x)/b^3
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 362 vs. $2(128) = 256$.

Time = 0.08 (sec) , antiderivative size = 362, normalized size of antiderivative = 2.83

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^2}\,dx$$
$$= \frac{Bb^3c^2e^3x^3 + Bb^4ce^3x^2 - Ab^2c^3d^3 + ((Bb^2c^3 - 2\,Abc^4)d^3 - 3\,(Bb^3c^2 - Ab^2c^3)d^2e + 3\,(Bb^4c - Ab^3c^2)de^2}{}$$

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

output
```
(B*b^3*c^2*e^3*x^3 + B*b^4*c*e^3*x^2 - A*b^2*c^3*d^3 + ((B*b^2*c^3 - 2*A*b
*c^4)*d^3 - 3*(B*b^3*c^2 - A*b^2*c^3)*d^2*e + 3*(B*b^4*c - A*b^3*c^2)*d*e^
2 - (B*b^5 - A*b^4*c)*e^3)*x - ((3*A*b*c^4*d^2*e - 3*B*b^3*c^2*d*e^2 + (B*
b*c^4 - 2*A*c^5)*d^3 + (2*B*b^4*c - A*b^3*c^2)*e^3)*x^2 + (3*A*b^2*c^3*d^2
*e - 3*B*b^4*c*d*e^2 + (B*b^2*c^3 - 2*A*b*c^4)*d^3 + (2*B*b^5 - A*b^4*c)*e
^3)*x)*log(c*x + b) + ((3*A*b*c^4*d^2*e + (B*b*c^4 - 2*A*c^5)*d^3)*x^2 + (
3*A*b^2*c^3*d^2*e + (B*b^2*c^3 - 2*A*b*c^4)*d^3)*x)*log(x))/(b^3*c^4*x^2 +
 b^4*c^3*x)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 502 vs. $2(124) = 248$.

Time = 5.12 (sec) , antiderivative size = 502, normalized size of antiderivative = 3.92

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^2}\,dx = \frac{Be^3x}{c^2}$$
$$+ \frac{-Abc^3d^3 + x(Ab^3ce^3 - 3Ab^2c^2de^2 + 3Abc^3d^2e - 2Ac^4d^3 - Bb^4e^3 + 3Bb^3cde^2 - 3Bb^2c^2d^2e + Bbc^3d^3)}{b^3c^3x + b^2c^4x^2}$$
$$+ \frac{d^2\cdot(3Abe - 2Acd + Bbd)\log\left(x + \frac{3Ab^2c^2d^2e - 2Abc^3d^3 + Bb^2c^2d^3 - bc^2d^2\cdot(3Abe - 2Acd + Bbd)}{-Ab^3ce^3 + 6Abc^3d^2e - 4Ac^4d^3 + 2Bb^4e^3 - 3Bb^3cde^2 + 2Bbc^3d^3}\right)}{b^3}$$
$$- \frac{(be-cd)^2\,(-Abce - 2Ac^2d + 2Bb^2e + Bbcd)\log\left(x + \frac{3Ab^2c^2d^2e - 2Abc^3d^3 + Bb^2c^2d^3 + \frac{b(be-cd)^2\left(-Abce - 2Ac^2d + 2Bb^2\right.}{c}}{-Ab^3ce^3 + 6Abc^3d^2e - 4Ac^4d^3 + 2Bb^4e^3 - 3Bb^3cde^2 + 2Bbc}\right.}{b^3c^3}$$

input
```
integrate((B*x+A)*(e*x+d)**3/(c*x**2+b*x)**2,x)
```

output
```
B*e**3*x/c**2 + (-A*b*c**3*d**3 + x*(A*b**3*c*e**3 - 3*A*b**2*c**2*d*e**2
+ 3*A*b*c**3*d**2*e - 2*A*c**4*d**3 - B*b**4*e**3 + 3*B*b**3*c*d*e**2 - 3*
B*b**2*c**2*d**2*e + B*b*c**3*d**3))/(b**3*c**3*x + b**2*c**4*x**2) + d**2
*(3*A*b*e - 2*A*c*d + B*b*d)*log(x + (3*A*b**2*c**2*d**2*e - 2*A*b*c**3*d*
*3 + B*b**2*c**2*d**3 - b*c**2*d**2*(3*A*b*e - 2*A*c*d + B*b*d))/(-A*b**3*
c*e**3 + 6*A*b*c**3*d**2*e - 4*A*c**4*d**3 + 2*B*b**4*e**3 - 3*B*b**3*c*d*
e**2 + 2*B*b*c**3*d**3))/b**3 - (b*e - c*d)**2*(-A*b*c*e - 2*A*c**2*d + 2*
B*b**2*e + B*b*c*d)*log(x + (3*A*b**2*c**2*d**2*e - 2*A*b*c**3*d**3 + B*b*
*2*c**2*d**3 + b*(b*e - c*d)**2*(-A*b*c*e - 2*A*c**2*d + 2*B*b**2*e + B*b*
c*d)/c)/(-A*b**3*c*e**3 + 6*A*b*c**3*d**2*e - 4*A*c**4*d**3 + 2*B*b**4*e**
3 - 3*B*b**3*c*d*e**2 + 2*B*b*c**3*d**3))/(b**3*c**3)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 225, normalized size of antiderivative = 1.76

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^2}\,dx = \frac{Be^3x}{c^2} - \frac{Abc^3d^3 - ((Bbc^3-2\,Ac^4)d^3 - 3\,(Bb^2c^2-Abc^3)d^2e + 3\,(Bb^3c-Ab^2c^2)de^2 - (Bb^4-Ab^3c)e^3)x}{b^2c^4x^2+b^3c^3x} + \frac{(3\,Abd^2e + (Bb-2\,Ac)d^3)\log(x)}{b^3} - \frac{(3\,Abc^3d^2e - 3\,Bb^3cde^2 + (Bbc^3-2\,Ac^4)d^3 + (2\,Bb^4-Ab^3c)e^3)\log(cx+b)}{b^3c^3}$$

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

output
```
B*e^3*x/c^2 - (A*b*c^3*d^3 - ((B*b*c^3 - 2*A*c^4)*d^3 - 3*(B*b^2*c^2 - A*b
*c^3)*d^2*e + 3*(B*b^3*c - A*b^2*c^2)*d*e^2 - (B*b^4 - A*b^3*c)*e^3)*x)/(b
^2*c^4*x^2 + b^3*c^3*x) + (3*A*b*d^2*e + (B*b - 2*A*c)*d^3)*log(x)/b^3 - (
3*A*b*c^3*d^2*e - 3*B*b^3*c*d*e^2 + (B*b*c^3 - 2*A*c^4)*d^3 + (2*B*b^4 - A
*b^3*c)*e^3)*log(c*x + b)/(b^3*c^3)
```

Giac [A] (verification not implemented)

Time = 0.20 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.82

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^2}\,dx = \frac{Be^3x}{c^2} + \frac{(Bbd^3 - 2\,Acd^3 + 3\,Abd^2e)\log(|x|)}{b^3} - \frac{(Bbc^3d^3 - 2\,Ac^4d^3 + 3\,Abc^3d^2e - 3\,Bb^3cde^2 + 2\,Bb^4e^3 - Ab^3ce^3)\log(|cx+b|)}{b^3c^3} - \frac{Abc^2d^3 - \frac{(Bbc^3d^3 - 2\,Ac^4d^3 - 3\,Bb^2c^2d^2e + 3\,Abc^3d^2e + 3\,Bb^3cde^2 - 3\,Ab^2c^2de^2 - Bb^4e^3 + Ab^3ce^3)x}{c}}{(cx+b)b^2c^2x}$$

input

```
integrate((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^2,x, algorithm="giac")
```

output

```
B*e^3*x/c^2 + (B*b*d^3 - 2*A*c*d^3 + 3*A*b*d^2*e)*log(abs(x))/b^3 - (B*b*c
^3*d^3 - 2*A*c^4*d^3 + 3*A*b*c^3*d^2*e - 3*B*b^3*c*d*e^2 + 2*B*b^4*e^3 - A
*b^3*c*e^3)*log(abs(c*x + b))/(b^3*c^3) - (A*b*c^2*d^3 - (B*b*c^3*d^3 - 2*
A*c^4*d^3 - 3*B*b^2*c^2*d^2*e + 3*A*b*c^3*d^2*e + 3*B*b^3*c*d*e^2 - 3*A*b^
2*c^2*d*e^2 - B*b^4*e^3 + A*b^3*c*e^3)*x/c)/((c*x + b)*b^2*c^2*x)
```

Mupad [B] (verification not implemented)

Time = 10.88 (sec) , antiderivative size = 212, normalized size of antiderivative = 1.66

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^2}\,dx = \frac{\ln(x)\,\left(b\,(B\,d^3 + 3\,A\,e\,d^2) - 2\,A\,c\,d^3\right)}{b^3} - \frac{\frac{x\,(B\,b^4\,e^3 - 3\,B\,b^3\,c\,d\,e^2 - A\,b^3\,c\,e^3 + 3\,B\,b^2\,c^2\,d^2\,e + 3\,A\,b^2\,c^2\,d\,e^2 - B\,b\,c^3\,d^3 - 3\,A\,b\,c^3\,d^2\,e + 2\,A\,c^4\,d^3)}{b^2\,c} + \frac{A\,c^2\,d^3}{b}}{c^3\,x^2 + b\,c^2\,x} + \frac{B\,e^3\,x}{c^2} + \frac{\ln(b+c\,x)\,\left(b\,e - c\,d\right)^2\,(2\,A\,c^2\,d - 2\,B\,b^2\,e + A\,b\,c\,e - B\,b\,c\,d)}{b^3\,c^3}$$

input

```
int(((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^2,x)
```

output
```
(log(x)*(b*(B*d^3 + 3*A*d^2*e) - 2*A*c*d^3))/b^3 - ((x*(2*A*c^4*d^3 + B*b^
4*e^3 - A*b^3*c*e^3 - B*b*c^3*d^3 + 3*A*b^2*c^2*d*e^2 + 3*B*b^2*c^2*d^2*e
- 3*A*b*c^3*d^2*e - 3*B*b^3*c*d*e^2))/(b^2*c) + (A*c^2*d^3)/b)/(c^3*x^2 +
b*c^2*x) + (B*e^3*x)/c^2 + (log(b + c*x)*(b*e - c*d)^2*(2*A*c^2*d - 2*B*b^
2*e + A*b*c*e - B*b*c*d))/(b^3*c^3)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 463, normalized size of antiderivative = 3.62

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^2}\,dx$$
$$= \frac{-a\,b^2c^3d^3+b^4c^2e^3x^3-b^2c^4d^3x^2-2\log(cx+b)\,b^6e^3x+2a\,c^5d^3x^2+2b^5c\,e^3x^2-a\,b^3c^2e^3x^2+2\log(cx+$$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^2,x)
```

output
```
(log(b + c*x)*a*b**4*c*e**3*x + log(b + c*x)*a*b**3*c**2*e**3*x**2 - 3*log
(b + c*x)*a*b**2*c**3*d**2*e*x + 2*log(b + c*x)*a*b*c**4*d**3*x - 3*log(b
+ c*x)*a*b*c**4*d**2*e*x**2 + 2*log(b + c*x)*a*c**5*d**3*x**2 - 2*log(b +
c*x)*b**6*e**3*x + 3*log(b + c*x)*b**5*c*d*e**2*x - 2*log(b + c*x)*b**5*c*
e**3*x**2 + 3*log(b + c*x)*b**4*c**2*d*e**2*x**2 - log(b + c*x)*b**3*c**3*
d**3*x - log(b + c*x)*b**2*c**4*d**3*x**2 + 3*log(x)*a*b**2*c**3*d**2*e*x
- 2*log(x)*a*b*c**4*d**3*x + 3*log(x)*a*b*c**4*d**2*e*x**2 - 2*log(x)*a*c*
*5*d**3*x**2 + log(x)*b**3*c**3*d**3*x + log(x)*b**2*c**4*d**3*x**2 - a*b*
*3*c**2*e**3*x**2 - a*b**2*c**3*d**3 + 3*a*b**2*c**3*d*e**2*x**2 - 3*a*b*c
**4*d**2*e*x**2 + 2*a*c**5*d**3*x**2 + 2*b**5*c*e**3*x**2 - 3*b**4*c**2*d*
e**2*x**2 + b**4*c**2*e**3*x**3 + 3*b**3*c**3*d**2*e*x**2 - b**2*c**4*d**3
*x**2)/(b**3*c**3*x*(b + c*x))
```

3.40 $\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 108

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2}\,dx = -\frac{Ad^2}{b^2x}+\frac{(bB-Ac)(cd-be)^2}{b^2c^2(b+cx)} + \frac{d(bBd-2Acd+2Abe)\log(x)}{b^3} - \frac{(cd-be)\left(bBcd-2Ac^2d+b^2Be\right)\log(b+cx)}{b^3c^2}$$

output
```
-A*d^2/b^2/x+(-A*c+B*b)*(-b*e+c*d)^2/b^2/c^2/(c*x+b)+d*(2*A*b*e-2*A*c*d+B*
b*d)*ln(x)/b^3-(-b*e+c*d)*(-2*A*c^2*d+B*b^2*e+B*b*c*d)*ln(c*x+b)/b^3/c^2
```

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 101, normalized size of antiderivative = 0.94

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2}\,dx = \frac{-\frac{Abd^2}{x}+\frac{b(bB-Ac)(cd-be)^2}{c^2(b+cx)}+d(bBd-2Acd+2Abe)\log(x)+\frac{(-cd+be)\left(bBcd-2Ac^2d+b^2Be\right)\log(b+cx)}{c^2}}{b^3}$$

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

output
```
(-((A*b*d^2)/x) + (b*(b*B - A*c)*(c*d - b*e)^2)/(c^2*(b + c*x)) + d*(b*B*d
 - 2*A*c*d + 2*A*b*e)*Log[x] + ((-(c*d) + b*e)*(b*B*c*d - 2*A*c^2*d + b^2*
B*e)*Log[b + c*x])/c^2)/b^3
```

Rubi [A] (verified)

Time = 0.51 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1206, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2} \, dx$$

$$\Big\downarrow \ 1206$$

$$\int \left(\frac{d(2Abe-2Acd+bBd)}{b^3x}-\frac{(bB-Ac)(be-cd)^2}{b^2c(b+cx)^2}+\frac{Ad^2}{b^2x^2}+\frac{(be-cd)\left(-2Ac^2d+b^2Be+bBcd\right)}{b^3c(b+cx)}\right)dx$$

$$\Big\downarrow \ 2009$$

$$\frac{d\log(x)(2Abe-2Acd+bBd)}{b^3}+\frac{(bB-Ac)(cd-be)^2}{b^2c^2(b+cx)}-\frac{Ad^2}{b^2x}-\frac{(cd-be)\log(b+cx)\left(-2Ac^2d+b^2Be+bBcd\right)}{b^3c^2}$$

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

output
```
-((A*d^2)/(b^2*x)) + ((b*B - A*c)*(c*d - b*e)^2)/(b^2*c^2*(b + c*x)) + (d*
(b*B*d - 2*A*c*d + 2*A*b*e)*Log[x])/b^3 - ((c*d - b*e)*(b*B*c*d - 2*A*c^2*
d + b^2*B*e)*Log[b + c*x])/(b^3*c^2)
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 156, normalized size of antiderivative = 1.44

method	result
default	$\frac{\left(-2Ab\,c^{2}de+2A\,c^{3}d^{2}+b^{3}B\,e^{2}-Bb\,c^{2}d^{2}\right)\ln\left(cx+b\right)}{b^{3}c^{2}}-\frac{A\,b^{2}c\,e^{2}-2Ab\,c^{2}de+A\,c^{3}d^{2}-b^{3}B\,e^{2}+2B\,b^{2}cde-Bb\,c^{2}d^{2}}{c^{2}b^{2}\left(cx+b\right)}-\frac{A\,d^{2}}{b^{2}x}+$
norman	$\frac{\frac{\left(A\,b^{2}c\,e^{2}-2Ab\,c^{2}de+2A\,c^{3}d^{2}-b^{3}B\,e^{2}+2B\,b^{2}cde-Bb\,c^{2}d^{2}\right)x^{2}}{b^{3}c}-\frac{A\,d^{2}}{b}}{x\left(cx+b\right)}+\frac{d\left(2Abe-2Acd+Bbd\right)\ln\left(x\right)}{b^{3}}-\frac{\left(2Ab\,c^{2}de-2A\,c^{3}d^{2}-b^{3}\right.}{b^{3}}$
risch	$\frac{-\frac{\left(A\,b^{2}c\,e^{2}-2Ab\,c^{2}de+2A\,c^{3}d^{2}-b^{3}B\,e^{2}+2B\,b^{2}cde-Bb\,c^{2}d^{2}\right)x}{b^{2}c^{2}}-\frac{A\,d^{2}}{b}}{x\left(cx+b\right)}-\frac{2\ln\left(cx+b\right)Ade}{b^{2}}+\frac{2c\ln\left(cx+b\right)A\,d^{2}}{b^{3}}+\frac{\ln\left(cx+b\right)B\,e^{2}}{c^{2}}$
parallelrisch	$2A\ln\left(x\right)x^{2}b\,c^{3}de-2A\ln\left(x\right)x^{2}c^{4}d^{2}-2A\ln\left(cx+b\right)x^{2}b\,c^{3}de+2A\ln\left(cx+b\right)x^{2}c^{4}d^{2}+B\ln\left(x\right)x^{2}b\,c^{3}d^{2}+B\ln\left(cx+b\right)x^{2}b^{3}c\,e^{2}-B\ln($

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

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

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 258 vs. $2(108) = 216$.

Time = 0.08 (sec) , antiderivative size = 258, normalized size of antiderivative = 2.39

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2}\,dx = -\frac{Ab^2c^2d^2 - ((Bb^2c^2 - 2\,Abc^3)d^2 - 2\,(Bb^3c - Ab^2c^2)de + (Bb^4 - Ab^3c)e^2)x + ((2\,Abc^3de - Bb^3ce^2 + (}{}$$

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

output
```
-(A*b^2*c^2*d^2 - ((B*b^2*c^2 - 2*A*b*c^3)*d^2 - 2*(B*b^3*c - A*b^2*c^2)*d
*e + (B*b^4 - A*b^3*c)*e^2)*x + ((2*A*b*c^3*d*e - B*b^3*c*e^2 + (B*b*c^3 -
 2*A*c^4)*d^2)*x^2 + (2*A*b^2*c^2*d*e - B*b^4*e^2 + (B*b^2*c^2 - 2*A*b*c^3
)*d^2)*x)*log(c*x + b) - ((2*A*b*c^3*d*e + (B*b*c^3 - 2*A*c^4)*d^2)*x^2 +
(2*A*b^2*c^2*d*e + (B*b^2*c^2 - 2*A*b*c^3)*d^2)*x)*log(x))/(b^3*c^3*x^2 +
b^4*c^2*x)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 367 vs. $2(105) = 210$.

Time = 2.26 (sec) , antiderivative size = 367, normalized size of antiderivative = 3.40

$$\begin{aligned}
&\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2}\,dx \\
&= \frac{-Abc^2d^2 + x(-Ab^2ce^2 + 2Abc^2de - 2Ac^3d^2 + Bb^3e^2 - 2Bb^2cde + Bbc^2d^2)}{b^3c^2x + b^2c^3x^2} \\
&+ \frac{d(2Abe - 2Acd + Bbd)\log\left(x + \frac{-2Ab^2cde + 2Abc^2d^2 - Bb^2cd^2 + bcd(2Abe - 2Acd + Bbd)}{-4Abc^2de + 4Ac^3d^2 + Bb^3e^2 - 2Bbc^2d^2}\right)}{b^3} \\
&+ \frac{(be-cd)\left(-2Ac^2d + Bb^2e + Bbcd\right)\log\left(x + \frac{-2Ab^2cde + 2Abc^2d^2 - Bb^2cd^2 + \frac{b(be-cd)\left(-2Ac^2d + Bb^2e + Bbcd\right)}{c}}{-4Abc^2de + 4Ac^3d^2 + Bb^3e^2 - 2Bbc^2d^2}\right)}{b^3c^2}
\end{aligned}$$

input
```
integrate((B*x+A)*(e*x+d)**2/(c*x**2+b*x)**2,x)
```

output
```
(-A*b*c**2*d**2 + x*(-A*b**2*c*e**2 + 2*A*b*c**2*d*e - 2*A*c**3*d**2 + B*b
**3*e**2 - 2*B*b**2*c*d*e + B*b*c**2*d**2))/(b**3*c**2*x + b**2*c**3*x**2)
 + d*(2*A*b*e - 2*A*c*d + B*b*d)*log(x + (-2*A*b**2*c*d*e + 2*A*b*c**2*d**
2 - B*b**2*c*d**2 + b*c*d*(2*A*b*e - 2*A*c*d + B*b*d))/(-4*A*b*c**2*d*e +
4*A*c**3*d**2 + B*b**3*e**2 - 2*B*b*c**2*d**2))/b**3 + (b*e - c*d)*(-2*A*c
**2*d + B*b**2*e + B*b*c*d)*log(x + (-2*A*b**2*c*d*e + 2*A*b*c**2*d**2 - B
*b**2*c*d**2 + b*(b*e - c*d)*(-2*A*c**2*d + B*b**2*e + B*b*c*d)/c)/(-4*A*b
*c**2*d*e + 4*A*c**3*d**2 + B*b**3*e**2 - 2*B*b*c**2*d**2))/(b**3*c**2)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 165, normalized size of antiderivative = 1.53

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2}\,dx = -\frac{Abc^2d^2 - ((Bbc^2 - 2\,Ac^3)d^2 - 2\,(Bb^2c - Abc^2)de + (Bb^3 - Ab^2c)e^2)x}{b^2c^3x^2 + b^3c^2x} + \frac{(2\,Abde + (Bb - 2\,Ac)d^2)\log(x)}{b^3} - \frac{(2\,Abc^2de - Bb^3e^2 + (Bbc^2 - 2\,Ac^3)d^2)\log(cx+b)}{b^3c^2}$$

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

output
```
-(A*b*c^2*d^2 - ((B*b*c^2 - 2*A*c^3)*d^2 - 2*(B*b^2*c - A*b*c^2)*d*e + (B*
b^3 - A*b^2*c)*e^2)*x)/(b^2*c^3*x^2 + b^3*c^2*x) + (2*A*b*d*e + (B*b - 2*A
*c)*d^2)*log(x)/b^3 - (2*A*b*c^2*d*e - B*b^3*e^2 + (B*b*c^2 - 2*A*c^3)*d^2
)*log(c*x + b)/(b^3*c^2)
```

Giac [A] (verification not implemented)

Time = 0.22 (sec) , antiderivative size = 166, normalized size of antiderivative = 1.54

$$\begin{aligned}&\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2}\,dx\\&=\frac{(Bbd^2-2\,Acd^2+2\,Abde)\log(|x|)}{b^3}\\&\quad-\frac{(Bbc^2d^2-2\,Ac^3d^2+2\,Abc^2de-Bb^3e^2)\log(|cx+b|)}{b^3c^2}\\&\quad-\frac{Abc^2d^2-(Bbc^2d^2-2\,Ac^3d^2-2\,Bb^2cde+2\,Abc^2de+Bb^3e^2-Ab^2ce^2)x}{(cx+b)b^2c^2x}\end{aligned}$$

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

output
```
(B*b*d^2 - 2*A*c*d^2 + 2*A*b*d*e)*log(abs(x))/b^3 - (B*b*c^2*d^2 - 2*A*c^3
*d^2 + 2*A*b*c^2*d*e - B*b^3*e^2)*log(abs(c*x + b))/(b^3*c^2) - (A*b*c^2*d
^2 - (B*b*c^2*d^2 - 2*A*c^3*d^2 - 2*B*b^2*c*d*e + 2*A*b*c^2*d*e + B*b^3*e^
2 - A*b^2*c*e^2)*x)/((c*x + b)*b^2*c^2*x)
```

Mupad [B] (verification not implemented)

Time = 10.80 (sec) , antiderivative size = 154, normalized size of antiderivative = 1.43

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2}\,dx&=\frac{\ln(x)\,\left(b\,(B\,d^2+2\,A\,e\,d)-2\,A\,c\,d^2\right)}{b^3}\\&\quad-\frac{\frac{A\,d^2}{b}+\frac{x\,(-B\,b^3\,e^2+2\,B\,b^2\,c\,d\,e+A\,b^2\,c\,e^2-B\,b\,c^2\,d^2-2\,A\,b\,c^2\,d\,e+2\,A\,c^3\,d^2)}{b^2\,c^2}}{c\,x^2+b\,x}\\&\quad+\frac{\ln(b+c\,x)\,(b\,e-c\,d)\,\left(B\,e\,b^2+B\,d\,b\,c-2\,A\,d\,c^2\right)}{b^3\,c^2}\end{aligned}$$

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

output
```
(log(x)*(b*(B*d^2 + 2*A*d*e) - 2*A*c*d^2))/b^3 - ((A*d^2)/b + (x*(2*A*c^3*
d^2 - B*b^3*e^2 + A*b^2*c*e^2 - B*b*c^2*d^2 - 2*A*b*c^2*d*e + 2*B*b^2*c*d*
e))/(b^2*c^2))/(b*x + c*x^2) + (log(b + c*x)*(b*e - c*d)*(B*b^2*e - 2*A*c^
2*d + B*b*c*d))/(b^3*c^2)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 330, normalized size of antiderivative = 3.06

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^2}\,dx$$
$$= \frac{-2\log(cx+b)\,a\,b^2c^2dex+2\log(cx+b)\,ab\,c^3d^2x-2\log(cx+b)\,ab\,c^3de\,x^2+2\log(cx+b)\,a\,c^4d^2x^2+\log$$

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

output
```
( - 2*log(b + c*x)*a*b**2*c**2*d*e*x + 2*log(b + c*x)*a*b*c**3*d**2*x - 2*
log(b + c*x)*a*b*c**3*d*e*x**2 + 2*log(b + c*x)*a*c**4*d**2*x**2 + log(b +
 c*x)*b**5*e**2*x + log(b + c*x)*b**4*c*e**2*x**2 - log(b + c*x)*b**3*c**2
*d**2*x - log(b + c*x)*b**2*c**3*d**2*x**2 + 2*log(x)*a*b**2*c**2*d*e*x -
2*log(x)*a*b*c**3*d**2*x + 2*log(x)*a*b*c**3*d*e*x**2 - 2*log(x)*a*c**4*d*
*2*x**2 + log(x)*b**3*c**2*d**2*x + log(x)*b**2*c**3*d**2*x**2 - a*b**2*c*
*2*d**2 + a*b**2*c**2*e**2*x**2 - 2*a*b*c**3*d*e*x**2 + 2*a*c**4*d**2*x**2
 - b**4*c*e**2*x**2 + 2*b**3*c**2*d*e*x**2 - b**2*c**3*d**2*x**2)/(b**3*c*
*2*x*(b + c*x))
```

3.41 $\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 86

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx = -\frac{Ad}{b^2x}+\frac{(bB-Ac)(cd-be)}{b^2c(b+cx)}+\frac{(bBd-2Acd+Abe)\log(x)}{b^3} - \frac{(bBd-2Acd+Abe)\log(b+cx)}{b^3}$$

output
```
-A*d/b^2/x+(-A*c+B*b)*(-b*e+c*d)/b^2/c/(c*x+b)+(A*b*e-2*A*c*d+B*b*d)*ln(x)
/b^3-(A*b*e-2*A*c*d+B*b*d)*ln(c*x+b)/b^3
```

Mathematica [A] (verified)

Time = 0.12 (sec) , antiderivative size = 80, normalized size of antiderivative = 0.93

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx = -\frac{\frac{Abd}{x}+\frac{b(bB-Ac)(-cd+be)}{c(b+cx)}-(bBd-2Acd+Abe)\log(x)+(bBd-2Acd+Abe)\log(b+cx)}{b^3}$$

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

output
```
-(((A*b*d)/x + (b*(b*B - A*c)*(-(c*d) + b*e))/(c*(b + c*x)) - (b*B*d - 2*A
*c*d + A*b*e)*Log[x] + (b*B*d - 2*A*c*d + A*b*e)*Log[b + c*x])/b^3)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1206, 2009}

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

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx$$

$$\Big\downarrow \text{1206}$$

$$\int \left(\frac{Abe-2Acd+bBd}{b^3x}-\frac{c(Abe-2Acd+bBd)}{b^3(b+cx)}+\frac{(bB-Ac)(be-cd)}{b^2(b+cx)^2}+\frac{Ad}{b^2x^2}\right)dx$$

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

$$\frac{\log(x)(Abe-2Acd+bBd)}{b^3}-\frac{\log(b+cx)(Abe-2Acd+bBd)}{b^3}+\frac{(bB-Ac)(cd-be)}{b^2c(b+cx)}-\frac{Ad}{b^2x}$$

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

output
```
-((A*d)/(b^2*x)) + ((b*B - A*c)*(c*d - b*e))/(b^2*c*(b + c*x)) + ((b*B*d -
 2*A*c*d + A*b*e)*Log[x])/b^3 - ((b*B*d - 2*A*c*d + A*b*e)*Log[b + c*x])/b
^3
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.71 (sec) , antiderivative size = 97, normalized size of antiderivative = 1.13

method	result
default	$-\frac{-Abce+A\,c^2d+b^2Be-Bbcd}{b^2c(cx+b)}-\frac{(Abe-2Acd+Bbd)\ln(cx+b)}{b^3}+\frac{(Abe-2Acd+Bbd)\ln(x)}{b^3}-\frac{Ad}{b^2x}$
norman	$\frac{-\frac{Ad}{b}-\frac{\left(Abce-2A\,c^2d-b^2Be+Bbcd\right)x^2}{b^3}}{x(cx+b)}+\frac{(Abe-2Acd+Bbd)\ln(x)}{b^3}-\frac{(Abe-2Acd+Bbd)\ln(cx+b)}{b^3}$
risch	$\frac{\frac{\left(Abce-2A\,c^2d-b^2Be+Bbcd\right)x}{b^2c}-\frac{Ad}{b}}{x(cx+b)}+\frac{\ln(-x)Ae}{b^2}-\frac{2\ln(-x)Acd}{b^3}+\frac{\ln(-x)Bd}{b^2}-\frac{\ln(cx+b)Ae}{b^2}+\frac{2\ln(cx+b)Acd}{b^3}-\ln($
parallelrisch	$A\ln(x)x^2b\,c^2e-2A\ln(x)x^2c^3d-A\ln(cx+b)x^2b\,c^2e+2A\ln(cx+b)x^2c^3d+B\ln(x)x^2b\,c^2d-B\ln(cx+b)x^2b\,c^2d+A\ln(x)x\,b^2ce-$

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

output
```
-(-A*b*c*e+A*c^2*d+B*b^2*e-B*b*c*d)/b^2/c/(c*x+b)-(A*b*e-2*A*c*d+B*b*d)*ln
(c*x+b)/b^3+(A*b*e-2*A*c*d+B*b*d)*ln(x)/b^3-A*d/b^2/x
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 184 vs. 2(86) = 172.

Time = 0.07 (sec) , antiderivative size = 184, normalized size of antiderivative = 2.14

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx =$$
$$-\frac{Ab^2cd-((Bb^2c-2\,Abc^2)d-(Bb^3-Ab^2c)e)x+((Abc^2e+(Bbc^2-2\,Ac^3)d)x^2+(Ab^2ce+(Bb^2c-}{b^3c^2x^2+}$$

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

output
```
-(A*b^2*c*d - ((B*b^2*c - 2*A*b*c^2)*d - (B*b^3 - A*b^2*c)*e)*x + ((A*b*c^
2*e + (B*b*c^2 - 2*A*c^3)*d)*x^2 + (A*b^2*c*e + (B*b^2*c - 2*A*b*c^2)*d)*x
)*log(c*x + b) - ((A*b*c^2*e + (B*b*c^2 - 2*A*c^3)*d)*x^2 + (A*b^2*c*e + (
B*b^2*c - 2*A*b*c^2)*d)*x)*log(x))/(b^3*c^2*x^2 + b^4*c*x)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 233 vs. $2(82) = 164$.

Time = 0.76 (sec) , antiderivative size = 233, normalized size of antiderivative = 2.71

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx = \frac{-Abcd + x(Abce - 2Ac^2d - Bb^2e + Bbcd)}{b^3cx + b^2c^2x^2} + \frac{(Abe - 2Acd + Bbd)\log\left(x + \frac{Ab^2e - 2Abcd + Bb^2d - b(Abe - 2Acd + Bbd)}{2Abce - 4Ac^2d + 2Bbcd}\right)}{b^3} - \frac{(Abe - 2Acd + Bbd)\log\left(x + \frac{Ab^2e - 2Abcd + Bb^2d + b(Abe - 2Acd + Bbd)}{2Abce - 4Ac^2d + 2Bbcd}\right)}{b^3}$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x**2+b*x)**2,x)
```

output
```
(-A*b*c*d + x*(A*b*c*e - 2*A*c**2*d - B*b**2*e + B*b*c*d))/(b**3*c*x + b**
2*c**2*x**2) + (A*b*e - 2*A*c*d + B*b*d)*log(x + (A*b**2*e - 2*A*b*c*d + B
*b**2*d - b*(A*b*e - 2*A*c*d + B*b*d))/(2*A*b*c*e - 4*A*c**2*d + 2*B*b*c*d
))/b**3 - (A*b*e - 2*A*c*d + B*b*d)*log(x + (A*b**2*e - 2*A*b*c*d + B*b**2
*d + b*(A*b*e - 2*A*c*d + B*b*d))/(2*A*b*c*e - 4*A*c**2*d + 2*B*b*c*d))/b*
*3
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 106, normalized size of antiderivative = 1.23

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx = -\frac{Abcd-((Bbc-2\,Ac^2)d-(Bb^2-Abc)e)x}{b^2c^2x^2+b^3cx} - \frac{(Abe+(Bb-2\,Ac)d)\log(cx+b)}{b^3} + \frac{(Abe+(Bb-2\,Ac)d)\log(x)}{b^3}$$

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

output
```
-(A*b*c*d - ((B*b*c - 2*A*c^2)*d - (B*b^2 - A*b*c)*e)*x)/(b^2*c^2*x^2 + b^
3*c*x) - (A*b*e + (B*b - 2*A*c)*d)*log(c*x + b)/b^3 + (A*b*e + (B*b - 2*A*
c)*d)*log(x)/b^3
```

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.26

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx = \frac{(Bbd-2\,Acd+Abe)\log(|x|)}{b^3} - \frac{(Bbcd-2\,Ac^2d+Abce)\log(|cx+b|)}{b^3c} + \frac{Bbcdx-2\,Ac^2dx-Bb^2ex+Abcex-Abcd}{(cx^2+bx)b^2c}$$

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

output
```
(B*b*d - 2*A*c*d + A*b*e)*log(abs(x))/b^3 - (B*b*c*d - 2*A*c^2*d + A*b*c*e
)*log(abs(c*x + b))/(b^3*c) + (B*b*c*d*x - 2*A*c^2*d*x - B*b^2*e*x + A*b*c
*e*x - A*b*c*d)/((c*x^2 + b*x)*b^2*c)
```

Mupad [B] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 117, normalized size of antiderivative = 1.36

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx = -\frac{\frac{A\,d}{b}+\frac{x\,\left(2\,A\,c^2\,d+B\,b^2\,e-A\,b\,c\,e-B\,b\,c\,d\right)}{b^2\,c}}{c\,x^2+b\,x} - \frac{2\,\mathrm{atanh}\left(\frac{\left(b\,\left(A\,e+B\,d\right)-2\,A\,c\,d\right)\,\left(b+2\,c\,x\right)}{b\,\left(A\,b\,e-2\,A\,c\,d+B\,b\,d\right)}\right)\,\left(b\,\left(A\,e+B\,d\right)-2\,A\,c\,d\right)}{b^3}$$

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

output
```
- ((A*d)/b + (x*(2*A*c^2*d + B*b^2*e - A*b*c*e - B*b*c*d))/(b^2*c))/(b*x +
 c*x^2) - (2*atanh(((b*(A*e + B*d) - 2*A*c*d)*(b + 2*c*x))/(b*(A*b*e - 2*A
*c*d + B*b*d)))*(b*(A*e + B*d) - 2*A*c*d))/b^3
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 205, normalized size of antiderivative = 2.38

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^2}\,dx = \frac{-\log(cx+b)\,a\,b^2ex+2\log(cx+b)\,abcdx-\log(cx+b)\,abce\,x^2+2\log(cx+b)\,a\,c^2d\,x^2-\log(cx+b)\,b^3d}{}$$

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

output
```
( - log(b + c*x)*a*b**2*e*x + 2*log(b + c*x)*a*b*c*d*x - log(b + c*x)*a*b*
c*e*x**2 + 2*log(b + c*x)*a*c**2*d*x**2 - log(b + c*x)*b**3*d*x - log(b +
c*x)*b**2*c*d*x**2 + log(x)*a*b**2*e*x - 2*log(x)*a*b*c*d*x + log(x)*a*b*c
*e*x**2 - 2*log(x)*a*c**2*d*x**2 + log(x)*b**3*d*x + log(x)*b**2*c*d*x**2
- a*b**2*d - a*b*c*e*x**2 + 2*a*c**2*d*x**2 + b**3*e*x**2 - b**2*c*d*x**2)
/(b**3*x*(b + c*x))
```

3.42 $\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 147

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^2}\,dx = -\frac{A}{b^2dx}+\frac{c(bB-Ac)}{b^2(cd-be)(b+cx)}+\frac{(bBd-2Acd-Abe)\log(x)}{b^3d^2} + \frac{c(2Ac^2d+2b^2Be-bc(Bd+3Ae))\log(b+cx)}{b^3(cd-be)^2} - \frac{e^2(Bd-Ae)\log(d+ex)}{d^2(cd-be)^2}$$

output
```
-A/b^2/d/x+c*(-A*c+B*b)/b^2/(-b*e+c*d)/(c*x+b)+(-A*b*e-2*A*c*d+B*b*d)*ln(x
)/b^3/d^2+c*(2*A*c^2*d+2*b^2*B*e-b*c*(3*A*e+B*d))*ln(c*x+b)/b^3/(-b*e+c*d)
^2-e^2*(-A*e+B*d)*ln(e*x+d)/d^2/(-b*e+c*d)^2
```

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 146, normalized size of antiderivative = 0.99

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^2}\,dx = -\frac{A}{b^2dx}+\frac{c(-bB+Ac)}{b^2(-cd+be)(b+cx)} + \frac{(bBd-2Acd-Abe)\log(x)}{b^3d^2} + \frac{c(2Ac^2d+2b^2Be-bc(Bd+3Ae))\log(b+cx)}{b^3(cd-be)^2} + \frac{e^2(-Bd+Ae)\log(d+ex)}{d^2(cd-be)^2}$$

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

output
```
-(A/(b^2*d*x)) + (c*(-(b*B) + A*c))/(b^2*(-(c*d) + b*e)*(b + c*x)) + ((b*B
*d - 2*A*c*d - A*b*e)*Log[x])/(b^3*d^2) + (c*(2*A*c^2*d + 2*b^2*B*e - b*c*
(B*d + 3*A*e))*Log[b + c*x])/(b^3*(c*d - b*e)^2) + (e^2*(-(B*d) + A*e)*Log
[d + e*x])/(d^2*(c*d - b*e)^2)
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1206, 2009}

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

$$\int \frac{A+Bx}{\left(bx+cx^2\right)^2(d+ex)}\,dx$$

$$\Big\downarrow \text{1206}$$

$$\int \left(\frac{-Abe-2Acd+bBd}{b^3d^2x}+\frac{c^2(bB-Ac)}{b^2(b+cx)^2(be-cd)}+\frac{A}{b^2dx^2}+\frac{c^2\left(-bc(3Ae+Bd)+2Ac^2d+2b^2Be\right)}{b^3(b+cx)(cd-be)^2}-\frac{e^3(B}{d^2(d+e}\right.$$

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

$$\frac{\log(x)(-Abe-2Acd+bBd)}{b^3d^2}+\frac{c(bB-Ac)}{b^2(b+cx)(cd-be)}-\frac{A}{b^2dx}+\frac{c\log(b+cx)\left(-bc(3Ae+Bd)+2Ac^2d+2b^2Be\right)}{b^3(cd-be)^2}-\frac{e^2(Bd-Ae)\log(d+ex)}{d^2(cd-be)^2}$$

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

output
```
-(A/(b^2*d*x)) + (c*(b*B - A*c))/(b^2*(c*d - b*e)*(b + c*x)) + ((b*B*d - 2
*A*c*d - A*b*e)*Log[x])/(b^3*d^2) + (c*(2*A*c^2*d + 2*b^2*B*e - b*c*(B*d +
 3*A*e))*Log[b + c*x])/(b^3*(c*d - b*e)^2) - (e^2*(B*d - A*e)*Log[d + e*x]
)/(d^2*(c*d - b*e)^2)
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.98 (sec) , antiderivative size = 147, normalized size of antiderivative = 1.00

method	result
default	$-\frac{c\left(3Abce-2A\,c^2d-2b^2Be+Bbcd\right)\ln(cx+b)}{b^3(be-cd)^2}+\frac{(Ac-Bb)c}{b^2(be-cd)(cx+b)}+\frac{(Ae-Bd)e^2\ln(ex+d)}{d^2(be-cd)^2}-\frac{A}{b^2dx}+\frac{(-Abe-2Acd+B}{b^3d^2}$
norman	$\frac{\frac{\left(Abce-2A\,c^2d+Bbcd\right)c\,x^2}{d\,b^3(be-cd)}-\frac{A}{bd}}{x(cx+b)}+\frac{e^2(Ae-Bd)\ln(ex+d)}{d^2(b^2e^2-2bcde+c^2d^2)}-\frac{(Abe+2Acd-Bbd)\ln(x)}{b^3d^2}-\frac{c\left(3Abce-2A\,c^2d-2b^2Be+Bbcd\right)\,\mathrm{l}}{(b^2e^2-2bcde+c^2d^2)b^3}$
risch	$\frac{-\frac{c(Abe-2Acd+Bbd)x}{b^2d(be-cd)}-\frac{A}{bd}}{x(cx+b)}-\frac{3c^2\ln(cx+b)Ae}{(b^2e^2-2bcde+c^2d^2)b^2}+\frac{2c^3\ln(cx+b)Ad}{(b^2e^2-2bcde+c^2d^2)b^3}+\frac{2c\ln(cx+b)Be}{(b^2e^2-2bcde+c^2d^2)b}-\frac{c^2\ln(cx+b}{(b^2e^2-2bcde+}$
parallelrisch	$-\frac{A\,b^2c^3d^3-2A\ln(cx+b)x^2c^5d^3+3A\ln(cx+b)x\,b^2c^3d^2e-B\ln(x)x\,b^4cd\,e^2+2B\ln(x)x\,b^3c^2d^2e+B\ln(ex+d)x^2b^3c^2d\,e^2-2B}{}$

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

output
```
-c*(3*A*b*c*e-2*A*c^2*d-2*B*b^2*e+B*b*c*d)/b^3/(b*e-c*d)^2*ln(c*x+b)+(A*c-
B*b)*c/b^2/(b*e-c*d)/(c*x+b)+(A*e-B*d)*e^2/d^2/(b*e-c*d)^2*ln(e*x+d)-A/b^2
/d/x+(-A*b*e-2*A*c*d+B*b*d)*ln(x)/b^3/d^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 450 vs. $2(147) = 294$.

Time = 18.10 (sec) , antiderivative size = 450, normalized size of antiderivative = 3.06

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^2}\,dx = -\frac{Ab^2c^2d^3 - 2\,Ab^3cd^2e + Ab^4de^2 + \left(Ab^3cde^2 - (Bb^2c^2 - 2\,Abc^3)d^3 + (Bb^3c - 3\,Ab^2c^2)d^2e\right)x + (((Bbc^3$$

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

output
```
-(A*b^2*c^2*d^3 - 2*A*b^3*c*d^2*e + A*b^4*d*e^2 + (A*b^3*c*d*e^2 - (B*b^2*
c^2 - 2*A*b*c^3)*d^3 + (B*b^3*c - 3*A*b^2*c^2)*d^2*e)*x + (((B*b*c^3 - 2*A
*c^4)*d^3 - (2*B*b^2*c^2 - 3*A*b*c^3)*d^2*e)*x^2 + ((B*b^2*c^2 - 2*A*b*c^3
)*d^3 - (2*B*b^3*c - 3*A*b^2*c^2)*d^2*e)*x)*log(c*x + b) + ((B*b^3*c*d*e^2
 - A*b^3*c*e^3)*x^2 + (B*b^4*d*e^2 - A*b^4*e^3)*x)*log(e*x + d) - ((B*b^3*
c*d*e^2 - A*b^3*c*e^3 + (B*b*c^3 - 2*A*c^4)*d^3 - (2*B*b^2*c^2 - 3*A*b*c^3
)*d^2*e)*x^2 + (B*b^4*d*e^2 - A*b^4*e^3 + (B*b^2*c^2 - 2*A*b*c^3)*d^3 - (2
*B*b^3*c - 3*A*b^2*c^2)*d^2*e)*x)*log(x))/((b^3*c^3*d^4 - 2*b^4*c^2*d^3*e
+ b^5*c*d^2*e^2)*x^2 + (b^4*c^2*d^4 - 2*b^5*c*d^3*e + b^6*d^2*e^2)*x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [A] (verification not implemented)

Time = 0.05 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.54

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^2}\,dx = -\frac{((Bbc^2-2\,Ac^3)d-(2\,Bb^2c-3\,Abc^2)e)\log\left(cx+b\right)}{b^3c^2d^2-2\,b^4cde+b^5e^2} - \frac{(Bde^2-Ae^3)\log\left(ex+d\right)}{c^2d^4-2\,bcd^3e+b^2d^2e^2} - \frac{Abcd-Ab^2e-(Abce+(Bbc-2\,Ac^2)d)x}{(b^2c^2d^2-b^3cde)x^2+(b^3cd^2-b^4de)x} - \frac{(Abe-(Bb-2\,Ac)d)\log\left(x\right)}{b^3d^2}$$

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

output
```
-((B*b*c^2 - 2*A*c^3)*d - (2*B*b^2*c - 3*A*b*c^2)*e)*log(c*x + b)/(b^3*c^2
*d^2 - 2*b^4*c*d*e + b^5*e^2) - (B*d*e^2 - A*e^3)*log(e*x + d)/(c^2*d^4 -
2*b*c*d^3*e + b^2*d^2*e^2) - (A*b*c*d - A*b^2*e - (A*b*c*e + (B*b*c - 2*A*
c^2)*d)*x)/((b^2*c^2*d^2 - b^3*c*d*e)*x^2 + (b^3*c*d^2 - b^4*d*e)*x) - (A*
b*e - (B*b - 2*A*c)*d)*log(x)/(b^3*d^2)
```

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.80

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^2}\,dx = -\frac{(Bbc^3d-2\,Ac^4d-2\,Bb^2c^2e+3\,Abc^3e)\log\left(|cx+b|\right)}{b^3c^3d^2-2\,b^4c^2de+b^5ce^2} - \frac{(Bde^3-Ae^4)\log\left(|ex+d|\right)}{c^2d^4e-2\,bcd^3e^2+b^2d^2e^3} + \frac{(Bbd-2\,Acd-Abe)\log\left(|x|\right)}{b^3d^2} - \frac{Abc^2d^3-2\,Ab^2cd^2e+Ab^3de^2-(Bbc^2d^3-2\,Ac^3d^3-Bb^2cd^2e+3\,Abc^2d^2e-Ab^2cde^2)x}{(cd-be)^2(cx+b)b^2d^2x}$$

input

```
integrate((B*x+A)/(e*x+d)/(c*x^2+b*x)^2,x, algorithm="giac")
```

output

```
-(B*b*c^3*d - 2*A*c^4*d - 2*B*b^2*c^2*e + 3*A*b*c^3*e)*log(abs(c*x + b))/(
b^3*c^3*d^2 - 2*b^4*c^2*d*e + b^5*c*e^2) - (B*d*e^3 - A*e^4)*log(abs(e*x +
 d))/(c^2*d^4*e - 2*b*c*d^3*e^2 + b^2*d^2*e^3) + (B*b*d - 2*A*c*d - A*b*e)
*log(abs(x))/(b^3*d^2) - (A*b*c^2*d^3 - 2*A*b^2*c*d^2*e + A*b^3*d*e^2 - (B
*b*c^2*d^3 - 2*A*c^3*d^3 - B*b^2*c*d^2*e + 3*A*b*c^2*d^2*e - A*b^2*c*d*e^2
)*x)/((c*d - b*e)^2*(c*x + b)*b^2*d^2*x)
```

Mupad [B] (verification not implemented)

Time = 11.33 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.37

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^2}\,dx = \frac{\ln\left(b+c\,x\right)\,\left(d\,\left(2\,A\,c^3-B\,b\,c^2\right)-3\,A\,b\,c^2\,e+2\,B\,b^2\,c\,e\right)}{b^5\,e^2-2\,b^4\,c\,d\,e+b^3\,c^2\,d^2} - \frac{\frac{A}{b\,d}+\frac{x\,\left(A\,b\,c\,e-2\,A\,c^2\,d+B\,b\,c\,d\right)}{b^2\,d\,\left(b\,e-c\,d\right)}}{c\,x^2+b\,x} + \frac{\ln\left(d+e\,x\right)\,\left(A\,e^3-B\,d\,e^2\right)}{b^2\,d^2\,e^2-2\,b\,c\,d^3\,e+c^2\,d^4} - \frac{\ln\left(x\right)\,\left(b\,\left(A\,e-B\,d\right)+2\,A\,c\,d\right)}{b^3\,d^2}$$

input

```
int((A + B*x)/((b*x + c*x^2)^2*(d + e*x)),x)
```

output
```
(log(b + c*x)*(d*(2*A*c^3 - B*b*c^2) - 3*A*b*c^2*e + 2*B*b^2*c*e))/(b^5*e^
2 + b^3*c^2*d^2 - 2*b^4*c*d*e) - (A/(b*d) + (x*(A*b*c*e - 2*A*c^2*d + B*b*
c*d))/(b^2*d*(b*e - c*d)))/(b*x + c*x^2) + (log(d + e*x)*(A*e^3 - B*d*e^2)
)/(c^2*d^4 + b^2*d^2*e^2 - 2*b*c*d^3*e) - (log(x)*(b*(A*e - B*d) + 2*A*c*d
))/(b^3*d^2)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 553, normalized size of antiderivative = 3.76

$$\int \frac{A+Bx}{(d+ex)\,(bx+cx^2)^2}\,dx$$
$$= \frac{\log(x)\,b^4cd\,e^2x^2+\log(x)\,b^3c^2d^3x+\log(x)\,b^2c^3d^3x^2+a\,b^2c^2d\,e^2x^2+b^3c^2d^2e\,x^2+2\log(cx+b)\,ab\,c^3d^3x+}{}$$

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

output
```
( - 3*log(b + c*x)*a*b**2*c**2*d**2*e*x + 2*log(b + c*x)*a*b*c**3*d**3*x -
 3*log(b + c*x)*a*b*c**3*d**2*e*x**2 + 2*log(b + c*x)*a*c**4*d**3*x**2 + 2
*log(b + c*x)*b**4*c*d**2*e*x - log(b + c*x)*b**3*c**2*d**3*x + 2*log(b +
c*x)*b**3*c**2*d**2*e*x**2 - log(b + c*x)*b**2*c**3*d**3*x**2 + log(d + e*
x)*a*b**4*e**3*x + log(d + e*x)*a*b**3*c*e**3*x**2 - log(d + e*x)*b**5*d*e
**2*x - log(d + e*x)*b**4*c*d*e**2*x**2 - log(x)*a*b**4*e**3*x - log(x)*a*
b**3*c*e**3*x**2 + 3*log(x)*a*b**2*c**2*d**2*e*x - 2*log(x)*a*b*c**3*d**3*
x + 3*log(x)*a*b*c**3*d**2*e*x**2 - 2*log(x)*a*c**4*d**3*x**2 + log(x)*b**
5*d*e**2*x - 2*log(x)*b**4*c*d**2*e*x + log(x)*b**4*c*d*e**2*x**2 + log(x)
*b**3*c**2*d**3*x - 2*log(x)*b**3*c**2*d**2*e*x**2 + log(x)*b**2*c**3*d**3
*x**2 - a*b**4*d*e**2 + 2*a*b**3*c*d**2*e - a*b**2*c**2*d**3 + a*b**2*c**2
*d*e**2*x**2 - 3*a*b*c**3*d**2*e*x**2 + 2*a*c**4*d**3*x**2 + b**3*c**2*d**
2*e*x**2 - b**2*c**3*d**3*x**2)/(b**3*d**2*x*(b**3*e**2 - 2*b**2*c*d*e + b
**2*c*e**2*x + b*c**2*d**2 - 2*b*c**2*d*e*x + c**3*d**2*x))
```

3.43 $\int \frac{A+Bx}{(d+ex)^2 \left(bx+cx^2\right)^2} \, dx$

Optimal result

Integrand size = 24, antiderivative size = 201

$$\int \frac{A+Bx}{(d+ex)^2 \left(bx+cx^2\right)^2} \, dx = -\frac{A}{b^2d^2x}+\frac{c^2(bB-Ac)}{b^2(cd-be)^2(b+cx)}+\frac{e^2(Bd-Ae)}{d^2(cd-be)^2(d+ex)} +\frac{(bBd-2Acd-2Abe)\log(x)}{b^3d^3} +\frac{c^2(2Ac^2d+3b^2Be-bc(Bd+4Ae))\log(b+cx)}{b^3(cd-be)^3} +\frac{e^2(2Ae(2cd-be)-Bd(3cd-be))\log(d+ex)}{d^3(cd-be)^3}$$

output

```
-A/b^2/d^2/x+c^2*(-A*c+B*b)/b^2/(-b*e+c*d)^2/(c*x+b)+e^2*(-A*e+B*d)/d^2/(-
b*e+c*d)^2/(e*x+d)+(-2*A*b*e-2*A*c*d+B*b*d)*ln(x)/b^3/d^3+c^2*(2*A*c^2*d+3
*b^2*B*e-b*c*(4*A*e+B*d))*ln(c*x+b)/b^3/(-b*e+c*d)^3+e^2*(2*A*e*(-b*e+2*c*
d)-B*d*(-b*e+3*c*d))*ln(e*x+d)/d^3/(-b*e+c*d)^3
```

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.00

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^2}\,dx = -\frac{A}{b^2d^2x} + \frac{c^2(bB-Ac)}{b^2(cd-be)^2(b+cx)} + \frac{e^2(Bd-Ae)}{d^2(cd-be)^2(d+ex)} + \frac{(bBd-2Acd-2Abe)\log(x)}{b^3d^3} - \frac{c^2(2Ac^2d+3b^2Be-bc(Bd+4Ae))\log(b+cx)}{b^3(-cd+be)^3} - \frac{e^2(Bd(3cd-be)+2Ae(-2cd+be))\log(d+ex)}{d^3(cd-be)^3}$$

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

output
```
-(A/(b^2*d^2*x)) + (c^2*(b*B - A*c))/(b^2*(c*d - b*e)^2*(b + c*x)) + (e^2*
(B*d - A*e))/(d^2*(c*d - b*e)^2*(d + e*x)) + ((b*B*d - 2*A*c*d - 2*A*b*e)*
Log[x])/(b^3*d^3) - (c^2*(2*A*c^2*d + 3*b^2*B*e - b*c*(B*d + 4*A*e))*Log[b
 + c*x])/(b^3*(-(c*d) + b*e)^3) - (e^2*(B*d*(3*c*d - b*e) + 2*A*e*(-2*c*d
+ b*e))*Log[d + e*x])/(d^3*(c*d - b*e)^3)
```

Rubi [A] (verified)

Time = 0.88 (sec) , antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1206, 2009}

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

$$\int \frac{A+Bx}{(bx+cx^2)^2\,(d+ex)^2}\,dx$$

$$\Big\downarrow \text{1206}$$

$$\int \left(\frac{-2Abe-2Acd+bBd}{b^3d^3x} - \frac{c^3(bB-Ac)}{b^2(b+cx)^2(be-cd)^2} + \frac{A}{b^2d^2x^2} + \frac{c^3\left(-bc(4Ae+Bd)+2Ac^2d+3b^2Be\right)}{b^3(b+cx)(cd-be)^3} + \frac{e^3(2A\right.$$

$\downarrow$ 2009

$$\frac{\log(x)(-2Abe-2Acd+bBd)}{b^3d^3}+\frac{c^2(bB-Ac)}{b^2(b+cx)(cd-be)^2}-\frac{A}{b^2d^2x}+\frac{c^2\log(b+cx)\left(-bc(4Ae+Bd)+2Ac^2d+3b^2Be\right)}{b^3(cd-be)^3}+\frac{e^2\log(d+ex)(2Ae(2cd-be)-Bd(3cd-be))}{d^3(cd-be)^3}+\frac{e^2(Bd-Ae)}{d^2(d+ex)(cd-be)^2}$$

input

```
Int[(A + B*x)/((d + e*x)^2*(b*x + c*x^2)^2),x]
```

output

```
-(A/(b^2*d^2*x)) + (c^2*(b*B - A*c))/(b^2*(c*d - b*e)^2*(b + c*x)) + (e^2*
(B*d - A*e))/(d^2*(c*d - b*e)^2*(d + e*x)) + ((b*B*d - 2*A*c*d - 2*A*b*e)*
Log[x])/(b^3*d^3) + (c^2*(2*A*c^2*d + 3*b^2*B*e - b*c*(B*d + 4*A*e))*Log[b
 + c*x])/(b^3*(c*d - b*e)^3) + (e^2*(2*A*e*(2*c*d - b*e) - B*d*(3*c*d - b*
e))*Log[d + e*x])/(d^3*(c*d - b*e)^3)
```

Defintions of rubi rules used

rule 1206

```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

rule 2009

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

Maple [A] (verified)

Time = 0.98 (sec) , antiderivative size = 203, normalized size of antiderivative = 1.01

method	result
default	$\frac{c^2(4Abce-2Ac^2d-3b^2Be+Bbcd)\ln(cx+b)}{b^3(be-cd)^3}-\frac{(Ac-Bb)c^2}{b^2(be-cd)^2(cx+b)}+\frac{e^2(2Abe^2-4Acde-Bbde+3Bcd^2)\ln(ex+d)}{d^3(be-cd)^3}-$
norman	$\frac{\frac{(2Ab^4e^4-Ab^3cde^3-Abc^3d^3e+2Ac^4d^4-Bb^4de^3-Bbc^3d^4)x^2}{d^3b^3(b^2e^2-2bcde+c^2d^2)}+\frac{(2Ab^3e^3-Ab^2cde^2-Abc^2d^2e+2Ac^3d^3-Bb^3de^2-Bbc^2d^3)cex^3}{d^3b^3(b^2e^2-2bcde+c^2d^2)}-}{(cx+b)x(ex+d)}$
risch	$\frac{-\frac{ce(2Ab^2e^2-2Abcde+2Ac^2d^2-Bb^2de-Bbcd^2)x^2}{b^2d^2(b^2e^2-2bcde+c^2d^2)}-\frac{(2Ab^3e^3-Ab^2cde^2-Abc^2d^2e+2Ac^3d^3-Bb^3de^2-Bbc^2d^3)x}{b^2d^2(b^2e^2-2bcde+c^2d^2)}-\frac{A}{bd}}{(cx+b)x(ex+d)}-$
parallelrisch	Expression too large to display

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

output
```
c^2*(4*A*b*c*e-2*A*c^2*d-3*B*b^2*e+B*b*c*d)/b^3/(b*e-c*d)^3*ln(c*x+b)-(A*c
-B*b)*c^2/b^2/(b*e-c*d)^2/(c*x+b)+e^2*(2*A*b*e^2-4*A*c*d*e-B*b*d*e+3*B*c*d
^2)/d^3/(b*e-c*d)^3*ln(e*x+d)-(A*e-B*d)*e^2/d^2/(b*e-c*d)^2/(e*x+d)-A/b^2/
d^2/x+(-2*A*b*e-2*A*c*d+B*b*d)*ln(x)/b^3/d^3
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1034 vs. 2(201) = 402.

Time = 67.87 (sec) , antiderivative size = 1034, normalized size of antiderivative = 5.14

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

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

output
```
-(A*b^2*c^3*d^5 - 3*A*b^3*c^2*d^4*e + 3*A*b^4*c*d^3*e^2 - A*b^5*d^2*e^3 -
(4*A*b^2*c^3*d^3*e^2 + 2*A*b^4*c*d*e^4 + (B*b^2*c^3 - 2*A*b*c^4)*d^4*e - (
B*b^4*c + 4*A*b^3*c^2)*d^2*e^3)*x^2 - (B*b^4*c*d^3*e^2 + 2*A*b^5*d*e^4 + (
B*b^2*c^3 - 2*A*b*c^4)*d^5 - (B*b^3*c^2 - 3*A*b^2*c^3)*d^4*e - (B*b^5 + 3*
A*b^4*c)*d^2*e^3)*x + (((B*b*c^4 - 2*A*c^5)*d^4*e - (3*B*b^2*c^3 - 4*A*b*c
^4)*d^3*e^2)*x^3 + ((B*b*c^4 - 2*A*c^5)*d^5 - 2*(B*b^2*c^3 - A*b*c^4)*d^4*
e - (3*B*b^3*c^2 - 4*A*b^2*c^3)*d^3*e^2)*x^2 + ((B*b^2*c^3 - 2*A*b*c^4)*d^
5 - (3*B*b^3*c^2 - 4*A*b^2*c^3)*d^4*e)*x)*log(c*x + b) + ((3*B*b^3*c^2*d^2
*e^3 + 2*A*b^4*c*e^5 - (B*b^4*c + 4*A*b^3*c^2)*d*e^4)*x^3 + (3*B*b^3*c^2*d
^3*e^2 + 2*A*b^5*e^5 + 2*(B*b^4*c - 2*A*b^3*c^2)*d^2*e^3 - (B*b^5 + 2*A*b^
4*c)*d*e^4)*x^2 + (3*B*b^4*c*d^3*e^2 + 2*A*b^5*d*e^4 - (B*b^5 + 4*A*b^4*c)
*d^2*e^3)*x)*log(e*x + d) - ((3*B*b^3*c^2*d^2*e^3 + 2*A*b^4*c*e^5 + (B*b*c
^4 - 2*A*c^5)*d^4*e - (3*B*b^2*c^3 - 4*A*b*c^4)*d^3*e^2 - (B*b^4*c + 4*A*b
^3*c^2)*d*e^4)*x^3 + (4*A*b^2*c^3*d^3*e^2 + 2*A*b^5*e^5 + (B*b*c^4 - 2*A*c
^5)*d^5 - 2*(B*b^2*c^3 - A*b*c^4)*d^4*e + 2*(B*b^4*c - 2*A*b^3*c^2)*d^2*e^
3 - (B*b^5 + 2*A*b^4*c)*d*e^4)*x^2 + (3*B*b^4*c*d^3*e^2 + 2*A*b^5*d*e^4 +
(B*b^2*c^3 - 2*A*b*c^4)*d^5 - (3*B*b^3*c^2 - 4*A*b^2*c^3)*d^4*e - (B*b^5 +
 4*A*b^4*c)*d^2*e^3)*x)*log(x))/((b^3*c^4*d^6*e - 3*b^4*c^3*d^5*e^2 + 3*b^
5*c^2*d^4*e^3 - b^6*c*d^3*e^4)*x^3 + (b^3*c^4*d^7 - 2*b^4*c^3*d^6*e + 2*b^
6*c*d^4*e^3 - b^7*d^3*e^4)*x^2 + (b^4*c^3*d^7 - 3*b^5*c^2*d^6*e + 3*b^6...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**2/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 467 vs. $2(201) = 402$.

Time = 0.05 (sec) , antiderivative size = 467, normalized size of antiderivative = 2.32

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^2}\,dx = -\frac{((Bbc^3-2\,Ac^4)d-(3\,Bb^2c^2-4\,Abc^3)e)\log(cx+b)}{b^3c^3d^3-3\,b^4c^2d^2e+3\,b^5cde^2-b^6e^3}$$
$$-\frac{(3\,Bcd^2e^2+2\,Abe^4-(Bb+4\,Ac)de^3)\log(ex+d)}{c^3d^6-3\,bc^2d^5e+3\,b^2cd^4e^2-b^3d^3e^3}$$
$$-\frac{Abc^2d^3-2\,Ab^2cd^2e+Ab^3de^2+(2\,Ab^2ce^3-(Bbc^2-2\,Ac^3)d^2e-(Bb^2c+2\,Abc^2)de^2)x^2-(Abc^2d^2e-}{(b^2c^3d^4e-2\,b^3c^2d^3e^2+b^4cd^2e^3)x^3+(b^2c^3d^5-b^3c^2d^4e-b^4cd^3e^2+b^5d^2e^3)x^2+}$$
$$-\frac{(2\,Abe-(Bb-2\,Ac)d)\log(x)}{b^3d^3}$$

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

output
```
-((B*b*c^3 - 2*A*c^4)*d - (3*B*b^2*c^2 - 4*A*b*c^3)*e)*log(c*x + b)/(b^3*c
^3*d^3 - 3*b^4*c^2*d^2*e + 3*b^5*c*d*e^2 - b^6*e^3) - (3*B*c*d^2*e^2 + 2*A
*b*e^4 - (B*b + 4*A*c)*d*e^3)*log(e*x + d)/(c^3*d^6 - 3*b*c^2*d^5*e + 3*b^
2*c*d^4*e^2 - b^3*d^3*e^3) - (A*b*c^2*d^3 - 2*A*b^2*c*d^2*e + A*b^3*d*e^2
+ (2*A*b^2*c*e^3 - (B*b*c^2 - 2*A*c^3)*d^2*e - (B*b^2*c + 2*A*b*c^2)*d*e^2
)*x^2 - (A*b*c^2*d^2*e - 2*A*b^3*e^3 + (B*b*c^2 - 2*A*c^3)*d^3 + (B*b^3 +
A*b^2*c)*d*e^2)*x)/((b^2*c^3*d^4*e - 2*b^3*c^2*d^3*e^2 + b^4*c*d^2*e^3)*x^
3 + (b^2*c^3*d^5 - b^3*c^2*d^4*e - b^4*c*d^3*e^2 + b^5*d^2*e^3)*x^2 + (b^3
*c^2*d^5 - 2*b^4*c*d^4*e + b^5*d^3*e^2)*x) - (2*A*b*e - (B*b - 2*A*c)*d)*l
og(x)/(b^3*d^3)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 678 vs. $2(201) = 402$.

Time = 0.27 (sec) , antiderivative size = 678, normalized size of antiderivative = 3.37

$$\int \frac{A + Bx}{(d + ex)^2 (bx + cx^2)^2} dx$$
$$= \frac{(3 Bcd^2e^2 - Bbde^3 - 4 Acde^3 + 2 Abe^4) \log \left(\left| c - \frac{2 cd}{ex+d} + \frac{cd^2}{(ex+d)^2} + \frac{be}{ex+d} - \frac{bde}{(ex+d)^2} \right| \right)}{2 (c^3d^6 - 3 bc^2d^5e + 3 b^2cd^4e^2 - b^3d^3e^3)}$$
$$+ \frac{\frac{Bde^6}{ex+d} - \frac{Ae^7}{ex+d}}{c^2d^4e^4 - 2 bcd^3e^5 + b^2d^2e^6}$$
$$+ \frac{(2 Bbc^3d^4e^2 - 4 Ac^4d^4e^2 - 6 Bb^2c^2d^3e^3 + 8 Abc^3d^3e^3 + 3 Bb^3cd^2e^4 - Bb^4de^5 - 4 Ab^3cde^5 + 2 Ab^4e^6) \log}{2 (b^2c^3d^6 - 3 b^3c^2d^5e + 3 b^4cd^4e^2 - b^5d^3e^3)e^2|b|}$$
$$+ \frac{\frac{Bbc^3d^3e - 2 Ac^4d^3e + 3 Abc^3d^2e^2 - 3 Ab^2c^2de^3 + Ab^3ce^4}{cd^2 - bde} - \frac{Bbc^3d^4e^2 - 2 Ac^4d^4e^2 + 4 Abc^3d^3e^3 - 6 Ab^2c^2d^2e^4 + 4 Ab^3cde^5 - Ab^4e^6}{(cd^2 - bde)(ex+d)e}}{(cd - be)^2b^2 \left(c - \frac{2 cd}{ex+d} + \frac{cd^2}{(ex+d)^2} + \frac{be}{ex+d} - \frac{bde}{(ex+d)^2}\right) d^2}$$

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

output
```
1/2*(3*B*c*d^2*e^2 - B*b*d*e^3 - 4*A*c*d*e^3 + 2*A*b*e^4)*log(abs(c - 2*c*
d/(e*x + d) + c*d^2/(e*x + d)^2 + b*e/(e*x + d) - b*d*e/(e*x + d)^2))/(c^3
*d^6 - 3*b*c^2*d^5*e + 3*b^2*c*d^4*e^2 - b^3*d^3*e^3) + (B*d*e^6/(e*x + d)
 - A*e^7/(e*x + d))/(c^2*d^4*e^4 - 2*b*c*d^3*e^5 + b^2*d^2*e^6) + 1/2*(2*B
*b*c^3*d^4*e^2 - 4*A*c^4*d^4*e^2 - 6*B*b^2*c^2*d^3*e^3 + 8*A*b*c^3*d^3*e^3
 + 3*B*b^3*c*d^2*e^4 - B*b^4*d*e^5 - 4*A*b^3*c*d*e^5 + 2*A*b^4*e^6)*log(ab
s(2*c*d*e - 2*c*d^2*e/(e*x + d) - b*e^2 + 2*b*d*e^2/(e*x + d) - e^2*abs(b)
)/abs(2*c*d*e - 2*c*d^2*e/(e*x + d) - b*e^2 + 2*b*d*e^2/(e*x + d) + e^2*ab
s(b)))/((b^2*c^3*d^6 - 3*b^3*c^2*d^5*e + 3*b^4*c*d^4*e^2 - b^5*d^3*e^3)*e^
2*abs(b)) + ((B*b*c^3*d^3*e - 2*A*c^4*d^3*e + 3*A*b*c^3*d^2*e^2 - 3*A*b^2*
c^2*d*e^3 + A*b^3*c*e^4)/(c*d^2 - b*d*e) - (B*b*c^3*d^4*e^2 - 2*A*c^4*d^4*
e^2 + 4*A*b*c^3*d^3*e^3 - 6*A*b^2*c^2*d^2*e^4 + 4*A*b^3*c*d*e^5 - A*b^4*e^
6)/((c*d^2 - b*d*e)*(e*x + d)*e))/((c*d - b*e)^2*b^2*(c - 2*c*d/(e*x + d)
+ c*d^2/(e*x + d)^2 + b*e/(e*x + d) - b*d*e/(e*x + d)^2)*d^2)
```

Mupad [B] (verification not implemented)

Time = 12.03 (sec) , antiderivative size = 410, normalized size of antiderivative = 2.04

$$\int \frac{A+Bx}{(d+ex)^2\left(bx+cx^2\right)^2}\,dx$$
$$= \frac{\frac{x\,\left(B\,b^3\,d\,e^2-2\,A\,b^3\,e^3+A\,b^2\,c\,d\,e^2+B\,b\,c^2\,d^3+A\,b\,c^2\,d^2\,e-2\,A\,c^3\,d^3\right)}{b^2\,d^2\,\left(b^2\,e^2-2\,b\,c\,d\,e+c^2\,d^2\right)}-\frac{A}{b\,d}+\frac{x^2\,\left(B\,b^2\,c\,d\,e^2-2\,A\,b^2\,c\,e^3+B\,b\,c^2\,d^2\,e+2\,A\,b\,c^2\,d\,e^2-2\,A\,c^3\,d^2\,e\cdots\right.}{b^2\,d^2\,\left(b^2\,e^2-2\,b\,c\,d\,e+c^2\,d^2\right)}}{c\,e\,x^3+\left(b\,e+c\,d\right)\,x^2+b\,d\,x}$$
$$-\frac{\ln\left(b+c\,x\right)\,\left(e\,\left(3\,B\,b^2\,c^2-4\,A\,b\,c^3\right)+d\,\left(2\,A\,c^4-B\,b\,c^3\right)\right)}{b^6\,e^3-3\,b^5\,c\,d\,e^2+3\,b^4\,c^2\,d^2\,e-b^3\,c^3\,d^3}$$
$$-\frac{\ln\left(d+e\,x\right)\,\left(c\,\left(3\,B\,d^2\,e^2-4\,A\,d\,e^3\right)+b\,\left(2\,A\,e^4-B\,d\,e^3\right)\right)}{-b^3\,d^3\,e^3+3\,b^2\,c\,d^4\,e^2-3\,b\,c^2\,d^5\,e+c^3\,d^6}$$
$$-\frac{\ln\left(x\right)\,\left(d\,\left(2\,A\,c-B\,b\right)+2\,A\,b\,e\right)}{b^3\,d^3}$$

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

output
```
((x*(B*b*c^2*d^3 - 2*A*c^3*d^3 - 2*A*b^3*e^3 + B*b^3*d*e^2 + A*b*c^2*d^2*e
 + A*b^2*c*d*e^2))/(b^2*d^2*(b^2*e^2 + c^2*d^2 - 2*b*c*d*e)) - A/(b*d) + (
x^2*(2*A*b*c^2*d*e^2 - 2*A*c^3*d^2*e - 2*A*b^2*c*e^3 + B*b*c^2*d^2*e + B*b
^2*c*d*e^2))/(b^2*d^2*(b^2*e^2 + c^2*d^2 - 2*b*c*d*e)))/(x^2*(b*e + c*d) +
 b*d*x + c*e*x^3) - (log(b + c*x)*(e*(3*B*b^2*c^2 - 4*A*b*c^3) + d*(2*A*c^
4 - B*b*c^3)))/(b^6*e^3 - b^3*c^3*d^3 + 3*b^4*c^2*d^2*e - 3*b^5*c*d*e^2) -
 (log(d + e*x)*(c*(3*B*d^2*e^2 - 4*A*d*e^3) + b*(2*A*e^4 - B*d*e^3)))/(c^3
*d^6 - b^3*d^3*e^3 + 3*b^2*c*d^4*e^2 - 3*b*c^2*d^5*e) - (log(x)*(d*(2*A*c
- B*b) + 2*A*b*e))/(b^3*d^3)
```

Reduce [B] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 1745, normalized size of antiderivative = 8.68

$$\int \frac{A+Bx}{(d+ex)^2\left(bx+cx^2\right)^2}\,dx = \text{Too large to display}$$

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

output

```
(4*log(b + c*x)*a*b**3*c**3*d**4*e**2*x + 4*log(b + c*x)*a*b**3*c**3*d**3*
e**3*x**2 + 2*log(b + c*x)*a*b**2*c**4*d**5*e*x + 6*log(b + c*x)*a*b**2*c*
*4*d**4*e**2*x**2 + 4*log(b + c*x)*a*b**2*c**4*d**3*e**3*x**3 - 2*log(b +
c*x)*a*b*c**5*d**6*x + 2*log(b + c*x)*a*b*c**5*d**4*e**2*x**3 - 2*log(b +
c*x)*a*c**6*d**6*x**2 - 2*log(b + c*x)*a*c**6*d**5*e*x**3 - 3*log(b + c*x)
*b**5*c**2*d**4*e**2*x - 3*log(b + c*x)*b**5*c**2*d**3*e**3*x**2 - 2*log(b
 + c*x)*b**4*c**3*d**5*e*x - 5*log(b + c*x)*b**4*c**3*d**4*e**2*x**2 - 3*l
og(b + c*x)*b**4*c**3*d**3*e**3*x**3 + log(b + c*x)*b**3*c**4*d**6*x - log
(b + c*x)*b**3*c**4*d**5*e*x**2 - 2*log(b + c*x)*b**3*c**4*d**4*e**2*x**3
+ log(b + c*x)*b**2*c**5*d**6*x**2 + log(b + c*x)*b**2*c**5*d**5*e*x**3 +
2*log(d + e*x)*a*b**6*d*e**5*x + 2*log(d + e*x)*a*b**6*e**6*x**2 - 2*log(d
 + e*x)*a*b**5*c*d**2*e**4*x + 2*log(d + e*x)*a*b**5*c*e**6*x**3 - 4*log(d
 + e*x)*a*b**4*c**2*d**3*e**3*x - 6*log(d + e*x)*a*b**4*c**2*d**2*e**4*x**
2 - 2*log(d + e*x)*a*b**4*c**2*d*e**5*x**3 - 4*log(d + e*x)*a*b**3*c**3*d*
*3*e**3*x**2 - 4*log(d + e*x)*a*b**3*c**3*d**2*e**4*x**3 - log(d + e*x)*b*
*7*d**2*e**4*x - log(d + e*x)*b**7*d*e**5*x**2 + 2*log(d + e*x)*b**6*c*d**
3*e**3*x + log(d + e*x)*b**6*c*d**2*e**4*x**2 - log(d + e*x)*b**6*c*d*e**5
*x**3 + 3*log(d + e*x)*b**5*c**2*d**4*e**2*x + 5*log(d + e*x)*b**5*c**2*d*
*3*e**3*x**2 + 2*log(d + e*x)*b**5*c**2*d**2*e**4*x**3 + 3*log(d + e*x)*b*
*4*c**3*d**4*e**2*x**2 + 3*log(d + e*x)*b**4*c**3*d**3*e**3*x**3 - 2*lo...
```

3.44 $\int \frac{A+Bx}{(d+ex)^3\left(bx+cx^2\right)^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 283

$$\begin{aligned}\int \frac{A+Bx}{(d+ex)^3\left(bx+cx^2\right)^2}\,dx &= -\frac{A}{b^2d^3x}+\frac{c^3(bB-Ac)}{b^2(cd-be)^3(b+cx)}+\frac{e^2(Bd-Ae)}{2d^2(cd-be)^2(d+ex)^2}\\ &\quad-\frac{e^2(2Ae(2cd-be)-Bd(3cd-be))}{d^3(cd-be)^3(d+ex)}+\frac{(bBd-2Acd-3Abe)\log(x)}{b^3d^4}\\ &\quad+\frac{c^3(2Ac^2d+4b^2Be-bc(Bd+5Ae))\log(b+cx)}{b^3(cd-be)^4}\\ &\quad-\frac{e^2(Bd(6c^2d^2-4bcde+b^2e^2)-Ae(10c^2d^2-10bcde+3b^2e^2))\log(d+ex)}{d^4(cd-be)^4}\end{aligned}$$

output
```
-A/b^2/d^3/x+c^3*(-A*c+B*b)/b^2/(-b*e+c*d)^3/(c*x+b)+1/2*e^2*(-A*e+B*d)/d^
2/(-b*e+c*d)^2/(e*x+d)^2-e^2*(2*A*e*(-b*e+2*c*d)-B*d*(-b*e+3*c*d))/d^3/(-b
*e+c*d)^3/(e*x+d)+(-3*A*b*e-2*A*c*d+B*b*d)*ln(x)/b^3/d^4+c^3*(2*A*c^2*d+4*
b^2*B*e-b*c*(5*A*e+B*d))*ln(c*x+b)/b^3/(-b*e+c*d)^4-e^2*(B*d*(b^2*e^2-4*b*
c*d*e+6*c^2*d^2)-A*e*(3*b^2*e^2-10*b*c*d*e+10*c^2*d^2))*ln(e*x+d)/d^4/(-b*
e+c*d)^4
```

Mathematica [A] (verified)

Time = 0.54 (sec) , antiderivative size = 279, normalized size of antiderivative = 0.99

$$\int \frac{A+Bx}{(d+ex)^3 (bx+cx^2)^2} \, dx = -\frac{A}{b^2 d^3 x} + \frac{c^3(-bB+Ac)}{b^2(-cd+be)^3(b+cx)} + \frac{e^2(Bd-Ae)}{2d^2(cd-be)^2(d+ex)^2} + \frac{e^2(Bd(3cd-be)+2Ae(-2cd+be))}{d^3(cd-be)^3(d+ex)} + \frac{(bBd-2Acd-3Abe)\log(x)}{b^3 d^4} + \frac{c^3(2Ac^2d+4b^2Be-bc(Bd+5Ae))\log(b+cx)}{b^3(cd-be)^4} + \frac{e^2(-Bd(6c^2d^2-4bcde+b^2e^2)+Ae(10c^2d^2-10bcde+3b^2e^2))\log(d+ex)}{d^4(cd-be)^4}$$

input
```
Integrate[(A + B*x)/((d + e*x)^3*(b*x + c*x^2)^2),x]
```

output
```
-(A/(b^2*d^3*x)) + (c^3*(-(b*B) + A*c))/(b^2*(-(c*d) + b*e)^3*(b + c*x)) +
 (e^2*(B*d - A*e))/(2*d^2*(c*d - b*e)^2*(d + e*x)^2) + (e^2*(B*d*(3*c*d -
b*e) + 2*A*e*(-2*c*d + b*e)))/(d^3*(c*d - b*e)^3*(d + e*x)) + ((b*B*d - 2*
A*c*d - 3*A*b*e)*Log[x])/(b^3*d^4) + (c^3*(2*A*c^2*d + 4*b^2*B*e - b*c*(B*
d + 5*A*e))*Log[b + c*x])/(b^3*(c*d - b*e)^4) + (e^2*(-(B*d*(6*c^2*d^2 - 4
*b*c*d*e + b^2*e^2)) + A*e*(10*c^2*d^2 - 10*b*c*d*e + 3*b^2*e^2))*Log[d +
e*x])/(d^4*(c*d - b*e)^4)
```

Rubi [A] (verified)

Time = 1.14 (sec) , antiderivative size = 283, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1206, 2009}

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

$$\int \frac{A+Bx}{(bx+cx^2)^2 (d+ex)^3} \, dx$$

$$\Big\downarrow \; 1206$$

$$\int \left(\frac{-3Abe-2Acd+bBd}{b^3d^4x}+\frac{c^4(bB-Ac)}{b^2(b+cx)^2(be-cd)^3}+\frac{e^3\left(Ae(3b^2e^2-10bcde+10c^2d^2)-Bd(b^2e^2-4bcde+6c\right.}{d^4(d+ex)(cd-be)^4}\right.$$

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

$$\frac{\log(x)(-3Abe-2Acd+bBd)}{b^3d^4}+\frac{c^3(bB-Ac)}{b^2(b+cx)(cd-be)^3}-\frac{e^2\log(d+ex)\left(Bd(b^2e^2-4bcde+6c^2d^2)-Ae(3b^2e^2-10bcde+10c^2d^2)\right)}{d^4(cd-be)^4}-\frac{A}{b^2d^3x}+\frac{c^3\log(b+cx)\left(-bc(5Ae+Bd)+2Ac^2d+4b^2Be\right)}{b^3(cd-be)^4}-\frac{e^2(2Ae(2cd-be)-Bd(3cd-be))}{d^3(d+ex)(cd-be)^3}+\frac{e^2(Bd-Ae)}{2d^2(d+ex)^2(cd-be)^2}$$

input
```
Int[(A + B*x)/((d + e*x)^3*(b*x + c*x^2)^2),x]
```

output
```
-(A/(b^2*d^3*x)) + (c^3*(b*B - A*c))/(b^2*(c*d - b*e)^3*(b + c*x)) + (e^2*
(B*d - A*e))/(2*d^2*(c*d - b*e)^2*(d + e*x)^2) - (e^2*(2*A*e*(2*c*d - b*e)
 - B*d*(3*c*d - b*e)))/(d^3*(c*d - b*e)^3*(d + e*x)) + ((b*B*d - 2*A*c*d -
 3*A*b*e)*Log[x])/(b^3*d^4) + (c^3*(2*A*c^2*d + 4*b^2*B*e - b*c*(B*d + 5*A
*e))*Log[b + c*x])/(b^3*(c*d - b*e)^4) - (e^2*(B*d*(6*c^2*d^2 - 4*b*c*d*e
+ b^2*e^2) - A*e*(10*c^2*d^2 - 10*b*c*d*e + 3*b^2*e^2))*Log[d + e*x])/(d^4
*(c*d - b*e)^4)
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 1.09 (sec) , antiderivative size = 285, normalized size of antiderivative = 1.01

method	result
default	$-\frac{c^{3}\left(5Abce-2A\,c^{2}d-4b^{2}Be+Bbcd\right)\ln\left(cx+b\right)}{b^{3}\left(be-cd\right)^{4}}+\frac{\left(Ac-Bb\right)c^{3}}{b^{2}\left(be-cd\right)^{3}\left(cx+b\right)}-\frac{e^{2}\left(2Ab\,e^{2}-4Acde-Bbde+3Bc\,d^{2}\right)}{d^{3}\left(be-cd\right)^{3}\left(ex+d\right)}+\frac{e^{2}\left(3A\,b^{2}e^{3}\right.}{}$
norman	$\frac{\frac{\left(6A\,b^{5}e^{5}-12A\,b^{4}cd\,e^{4}+4A\,b^{3}c^{2}d^{2}e^{3}+Ab\,c^{4}d^{4}e-2A\,c^{5}d^{5}-2B\,b^{5}d\,e^{4}+4B\,b^{4}c\,d^{2}e^{3}+Bb\,c^{4}d^{5}\right)x^{2}}{d^{3}b^{3}\left(b^{3}e^{3}-3d\,e^{2}b^{2}c+3d^{2}eb\,c^{2}-d^{3}c^{3}\right)}-\frac{A}{bd}+\frac{e\left(9A\,b^{5}e^{5}-7A\,b^{4}cd\,e^{4}-18A\,b^{3}c^{2}\right.}{}}{}$
risch	Expression too large to display
parallelrisch	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^3/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
-c^3*(5*A*b*c*e-2*A*c^2*d-4*B*b^2*e+B*b*c*d)/b^3/(b*e-c*d)^4*ln(c*x+b)+(A*
c-B*b)*c^3/b^2/(b*e-c*d)^3/(c*x+b)-e^2*(2*A*b*e^2-4*A*c*d*e-B*b*d*e+3*B*c*
d^2)/d^3/(b*e-c*d)^3/(e*x+d)+e^2*(3*A*b^2*e^3-10*A*b*c*d*e^2+10*A*c^2*d^2*
e-B*b^2*d*e^2+4*B*b*c*d^2*e-6*B*c^2*d^3)/d^4/(b*e-c*d)^4*ln(e*x+d)-1/2*(A*
e-B*d)*e^2/d^2/(b*e-c*d)^2/(e*x+d)^2-A/b^2/d^3/x+(-3*A*b*e-2*A*c*d+B*b*d)*
ln(x)/b^3/d^4
```

Fricas [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)^2}\,dx=\text{Timed out}$$

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

output
```
Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**3/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 813 vs. $2(279) = 558$.

Time = 0.09 (sec) , antiderivative size = 813, normalized size of antiderivative = 2.87

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

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

output
```
-((B*b*c^4 - 2*A*c^5)*d - (4*B*b^2*c^3 - 5*A*b*c^4)*e)*log(c*x + b)/(b^3*c
^4*d^4 - 4*b^4*c^3*d^3*e + 6*b^5*c^2*d^2*e^2 - 4*b^6*c*d*e^3 + b^7*e^4) -
(6*B*c^2*d^3*e^2 - 3*A*b^2*e^5 - 2*(2*B*b*c + 5*A*c^2)*d^2*e^3 + (B*b^2 +
10*A*b*c)*d*e^4)*log(e*x + d)/(c^4*d^8 - 4*b*c^3*d^7*e + 6*b^2*c^2*d^6*e^2
 - 4*b^3*c*d^5*e^3 + b^4*d^4*e^4) - 1/2*(2*A*b*c^3*d^5 - 6*A*b^2*c^2*d^4*e
 + 6*A*b^3*c*d^3*e^2 - 2*A*b^4*d^2*e^3 - 2*(3*A*b^3*c*e^5 + (B*b*c^3 - 2*A
*c^4)*d^3*e^2 + 3*(B*b^2*c^2 + A*b*c^3)*d^2*e^3 - (B*b^3*c + 7*A*b^2*c^2)*
d*e^4)*x^3 - (6*A*b^4*e^5 + 4*(B*b*c^3 - 2*A*c^4)*d^4*e + (7*B*b^2*c^2 + 1
0*A*b*c^3)*d^3*e^2 + 3*(B*b^3*c - 5*A*b^2*c^2)*d^2*e^3 - (2*B*b^4 + 5*A*b^
3*c)*d*e^4)*x^2 - (2*A*b*c^3*d^4*e + 9*A*b^4*d*e^4 + 2*(B*b*c^3 - 2*A*c^4)
*d^5 + (7*B*b^3*c + 6*A*b^2*c^2)*d^3*e^2 - (3*B*b^4 + 19*A*b^3*c)*d^2*e^3)
*x)/((b^2*c^4*d^6*e^2 - 3*b^3*c^3*d^5*e^3 + 3*b^4*c^2*d^4*e^4 - b^5*c*d^3*
e^5)*x^4 + (2*b^2*c^4*d^7*e - 5*b^3*c^3*d^6*e^2 + 3*b^4*c^2*d^5*e^3 + b^5*
c*d^4*e^4 - b^6*d^3*e^5)*x^3 + (b^2*c^4*d^8 - b^3*c^3*d^7*e - 3*b^4*c^2*d^
6*e^2 + 5*b^5*c*d^5*e^3 - 2*b^6*d^4*e^4)*x^2 + (b^3*c^3*d^8 - 3*b^4*c^2*d^
7*e + 3*b^5*c*d^6*e^2 - b^6*d^5*e^3)*x) - (3*A*b*e - (B*b - 2*A*c)*d)*log(
x)/(b^3*d^4)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 773 vs. $2(279) = 558$.

Time = 0.24 (sec) , antiderivative size = 773, normalized size of antiderivative = 2.73

$$\int \frac{A+Bx}{(d+ex)^3 (bx+cx^2)^2}\,dx = -\frac{(Bbc^5d - 2\,Ac^6d - 4\,Bb^2c^4e + 5\,Abc^5e)\log(|cx+b|)}{b^3c^5d^4 - 4\,b^4c^4d^3e + 6\,b^5c^3d^2e^2 - 4\,b^6c^2de^3 + b^7ce^4}$$
$$-\frac{(6\,Bc^2d^3e^3 - 4\,Bbcd^2e^4 - 10\,Ac^2d^2e^4 + Bb^2de^5 + 10\,Abcde^5 - 3\,Ab^2e^6)\log(|ex+d|)}{c^4d^8e - 4\,bc^3d^7e^2 + 6\,b^2c^2d^6e^3 - 4\,b^3cd^5e^4 + b^4d^4e^5}$$
$$+\frac{(Bbd - 2\,Acd - 3\,Abe)\log(|x|)}{b^3d^4}$$
$$-\frac{2\,Abc^4d^7 - 8\,Ab^2c^3d^6e + 12\,Ab^3c^2d^5e^2 - 8\,Ab^4cd^4e^3 + 2\,Ab^5d^3e^4 - 2\,(Bbc^4d^5e^2 - 2\,Ac^5d^5e^2 + 2\,Bb^2c^3}{}$$

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

output
```
-(B*b*c^5*d - 2*A*c^6*d - 4*B*b^2*c^4*e + 5*A*b*c^5*e)*log(abs(c*x + b))/(
b^3*c^5*d^4 - 4*b^4*c^4*d^3*e + 6*b^5*c^3*d^2*e^2 - 4*b^6*c^2*d*e^3 + b^7*
c*e^4) - (6*B*c^2*d^3*e^3 - 4*B*b*c*d^2*e^4 - 10*A*c^2*d^2*e^4 + B*b^2*d*e
^5 + 10*A*b*c*d*e^5 - 3*A*b^2*e^6)*log(abs(e*x + d))/(c^4*d^8*e - 4*b*c^3*
d^7*e^2 + 6*b^2*c^2*d^6*e^3 - 4*b^3*c*d^5*e^4 + b^4*d^4*e^5) + (B*b*d - 2*
A*c*d - 3*A*b*e)*log(abs(x))/(b^3*d^4) - 1/2*(2*A*b*c^4*d^7 - 8*A*b^2*c^3*
d^6*e + 12*A*b^3*c^2*d^5*e^2 - 8*A*b^4*c*d^4*e^3 + 2*A*b^5*d^3*e^4 - 2*(B*
b*c^4*d^5*e^2 - 2*A*c^5*d^5*e^2 + 2*B*b^2*c^3*d^4*e^3 + 5*A*b*c^4*d^4*e^3
- 4*B*b^3*c^2*d^3*e^4 - 10*A*b^2*c^3*d^3*e^4 + B*b^4*c*d^2*e^5 + 10*A*b^3*
c^2*d^2*e^5 - 3*A*b^4*c*d*e^6)*x^3 - (4*B*b*c^4*d^6*e - 8*A*c^5*d^6*e + 3*
B*b^2*c^3*d^5*e^2 + 18*A*b*c^4*d^5*e^2 - 4*B*b^3*c^2*d^4*e^3 - 25*A*b^2*c^
3*d^4*e^3 - 5*B*b^4*c*d^3*e^4 + 10*A*b^3*c^2*d^3*e^4 + 2*B*b^5*d^2*e^5 + 1
1*A*b^4*c*d^2*e^5 - 6*A*b^5*d*e^6)*x^2 - (2*B*b*c^4*d^7 - 4*A*c^5*d^7 - 2*
B*b^2*c^3*d^6*e + 6*A*b*c^4*d^6*e + 7*B*b^3*c^2*d^5*e^2 + 4*A*b^2*c^3*d^5*
e^2 - 10*B*b^4*c*d^4*e^3 - 25*A*b^3*c^2*d^4*e^3 + 3*B*b^5*d^3*e^4 + 28*A*b
^4*c*d^3*e^4 - 9*A*b^5*d^2*e^5)*x)/((c*d - b*e)^4*(c*x + b)*(e*x + d)^2*b^
2*d^4*x)
```

Mupad [B] (verification not implemented)

Time = 12.69 (sec) , antiderivative size = 726, normalized size of antiderivative = 2.57

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)^2}\,dx$$
$$= \frac{\ln(d+e\,x)\,\left(\left(3\,A\,e^5-B\,d\,e^4\right)\,b^2+\left(4\,B\,d^2\,e^3-10\,A\,d\,e^4\right)\,b\,c+\left(10\,A\,d^2\,e^3-6\,B\,d^3\,e^2\right)\,c^2\right)}{b^4\,d^4\,e^4-4\,b^3\,c\,d^5\,e^3+6\,b^2\,c^2\,d^6\,e^2-4\,b\,c^3\,d^7\,e+c^4\,d^8}$$
$$-\frac{\frac{A}{b\,d}+\frac{x^2\,\left(-2\,B\,b^4\,d\,e^4+6\,A\,b^4\,e^5+3\,B\,b^3\,c\,d^2\,e^3-5\,A\,b^3\,c\,d\,e^4+7\,B\,b^2\,c^2\,d^3\,e^2-15\,A\,b^2\,c^2\,d^2\,e^3+4\,B\,b\,c^3\,d^4\,e+10\,A\,b\,c^3\,d^3\,e^2-8\,A\,c^4\,d^4\,e\right)}{2\,b^2\,d^3\,\left(b^3\,e^3-3\,b^2\,c\,d\,e^2+3\,b\,c^2\,d^2\,e-c^3\,d^3\right)}+}{x^2}$$
$$+\frac{\ln(b+c\,x)\,\left(e\,\left(4\,B\,b^2\,c^3-5\,A\,b\,c^4\right)+d\,\left(2\,A\,c^5-B\,b\,c^4\right)\right)}{b^7\,e^4-4\,b^6\,c\,d\,e^3+6\,b^5\,c^2\,d^2\,e^2-4\,b^4\,c^3\,d^3\,e+b^3\,c^4\,d^4}$$
$$-\frac{\ln(x)\,\left(d\,\left(2\,A\,c-B\,b\right)+3\,A\,b\,e\right)}{b^3\,d^4}$$

input
```
int((A + B*x)/((b*x + c*x^2)^2*(d + e*x)^3),x)
```

output
```
(log(d + e*x)*(b^2*(3*A*e^5 - B*d*e^4) + c^2*(10*A*d^2*e^3 - 6*B*d^3*e^2)
+ b*c*(4*B*d^2*e^3 - 10*A*d*e^4)))/(c^4*d^8 + b^4*d^4*e^4 - 4*b^3*c*d^5*e^
3 + 6*b^2*c^2*d^6*e^2 - 4*b*c^3*d^7*e) - (A/(b*d) + (x^2*(6*A*b^4*e^5 - 8*
A*c^4*d^4*e - 2*B*b^4*d*e^4 + 10*A*b*c^3*d^3*e^2 + 3*B*b^3*c*d^2*e^3 - 15*
A*b^2*c^2*d^2*e^3 + 7*B*b^2*c^2*d^3*e^2 - 5*A*b^3*c*d*e^4 + 4*B*b*c^3*d^4*
e))/(2*b^2*d^3*(b^3*e^3 - c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2)) + (x*(
9*A*b^4*e^4 - 4*A*c^4*d^4 + 2*B*b*c^3*d^4 - 3*B*b^4*d*e^3 + 7*B*b^3*c*d^2*
e^2 + 6*A*b^2*c^2*d^2*e^2 + 2*A*b*c^3*d^3*e - 19*A*b^3*c*d*e^3))/(2*b^2*d^
2*(b^3*e^3 - c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2)) + (c*e^2*x^3*(3*A*b
^3*e^3 - 2*A*c^3*d^3 + B*b*c^2*d^3 - B*b^3*d*e^2 + 3*A*b*c^2*d^2*e - 7*A*b
^2*c*d*e^2 + 3*B*b^2*c*d^2*e))/(b^2*d^3*(b^3*e^3 - c^3*d^3 + 3*b*c^2*d^2*e
 - 3*b^2*c*d*e^2)))/(x^2*(c*d^2 + 2*b*d*e) + x^3*(b*e^2 + 2*c*d*e) + c*e^2
*x^4 + b*d^2*x) + (log(b + c*x)*(e*(4*B*b^2*c^3 - 5*A*b*c^4) + d*(2*A*c^5
- B*b*c^4)))/(b^7*e^4 + b^3*c^4*d^4 - 4*b^4*c^3*d^3*e + 6*b^5*c^2*d^2*e^2
- 4*b^6*c*d*e^3) - (log(x)*(d*(2*A*c - B*b) + 3*A*b*e))/(b^3*d^4)
```

Reduce [B] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 3202, normalized size of antiderivative = 11.31

$$\int \frac{A+Bx}{(d+ex)^3\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^3/(c*x^2+b*x)^2,x)
```

output

```
( - 10*log(b + c*x)*a*b**3*c**4*d**6*e**2*x - 20*log(b + c*x)*a*b**3*c**4*
d**5*e**3*x**2 - 10*log(b + c*x)*a*b**3*c**4*d**4*e**4*x**3 - 16*log(b + c
*x)*a*b**2*c**5*d**7*e*x - 42*log(b + c*x)*a*b**2*c**5*d**6*e**2*x**2 - 36
*log(b + c*x)*a*b**2*c**5*d**5*e**3*x**3 - 10*log(b + c*x)*a*b**2*c**5*d**
4*e**4*x**4 + 8*log(b + c*x)*a*b*c**6*d**8*x - 24*log(b + c*x)*a*b*c**6*d*
*6*e**2*x**3 - 16*log(b + c*x)*a*b*c**6*d**5*e**3*x**4 + 8*log(b + c*x)*a*
c**7*d**8*x**2 + 16*log(b + c*x)*a*c**7*d**7*e*x**3 + 8*log(b + c*x)*a*c**
7*d**6*e**2*x**4 + 8*log(b + c*x)*b**5*c**3*d**6*e**2*x + 16*log(b + c*x)*
b**5*c**3*d**5*e**3*x**2 + 8*log(b + c*x)*b**5*c**3*d**4*e**4*x**3 + 14*lo
g(b + c*x)*b**4*c**4*d**7*e*x + 36*log(b + c*x)*b**4*c**4*d**6*e**2*x**2 +
 30*log(b + c*x)*b**4*c**4*d**5*e**3*x**3 + 8*log(b + c*x)*b**4*c**4*d**4*
e**4*x**4 - 4*log(b + c*x)*b**3*c**5*d**8*x + 6*log(b + c*x)*b**3*c**5*d**
7*e*x**2 + 24*log(b + c*x)*b**3*c**5*d**6*e**2*x**3 + 14*log(b + c*x)*b**3
*c**5*d**5*e**3*x**4 - 4*log(b + c*x)*b**2*c**6*d**8*x**2 - 8*log(b + c*x)
*b**2*c**6*d**7*e*x**3 - 4*log(b + c*x)*b**2*c**6*d**6*e**2*x**4 + 6*log(d
 + e*x)*a*b**7*d**2*e**6*x + 12*log(d + e*x)*a*b**7*d*e**7*x**2 + 6*log(d
+ e*x)*a*b**7*e**8*x**3 - 8*log(d + e*x)*a*b**6*c*d**3*e**5*x - 10*log(d +
 e*x)*a*b**6*c*d**2*e**6*x**2 + 4*log(d + e*x)*a*b**6*c*d*e**7*x**3 + 6*lo
g(d + e*x)*a*b**6*c*e**8*x**4 - 20*log(d + e*x)*a*b**5*c**2*d**4*e**4*x -
48*log(d + e*x)*a*b**5*c**2*d**3*e**5*x**2 - 36*log(d + e*x)*a*b**5*c**...
```

3.45 $\int \frac{(A+Bx)(d+ex)^5}{\left(bx+cx^2\right)^3} \, dx$

Optimal result

Integrand size = 24, antiderivative size = 257

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^5}{\left(bx+cx^2\right)^3} \, dx &= -\frac{Ad^5}{2b^3x^2} - \frac{d^4(bBd-3Acd+5Abe)}{b^4x} + \frac{Be^5x}{c^3} - \frac{(bB-Ac)(cd-be)^5}{2b^3c^4(b+cx)^2} \\ &\quad - \frac{(cd-be)^4\left(2bBcd-3Ac^2d+3b^2Be-2Abce\right)}{b^4c^4(b+cx)} \\ &\quad + \frac{d^3(6Ac^2d^2+5b^2e(Bd+2Ae)-3bcd(Bd+5Ae))\log(x)}{b^5} \\ &\quad - \frac{(cd-be)^3\left(6Ac^3d^2-3b^3Be^2-3bc^2d(Bd-Ae)-b^2ce(4Bd-Ae)\right)\log(b+cx)}{b^5c^4}\end{aligned}$$

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

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 254, normalized size of antiderivative = 0.99

$$\int \frac{(A+Bx)(d+ex)^5}{(bx+cx^2)^3}\,dx$$
$$= -\frac{Ad^5}{2b^3x^2} - \frac{d^4(bBd-3Acd+5Abe)}{b^4x} + \frac{Be^5x}{c^3} + \frac{(bB-Ac)(-cd+be)^5}{2b^3c^4(b+cx)^2}$$
$$+ \frac{(cd-be)^4\left(-2bBcd+3Ac^2d-3b^2Be+2Abce\right)}{b^4c^4(b+cx)}$$
$$+ \frac{d^3(6Ac^2d^2+5b^2e(Bd+2Ae)-3bcd(Bd+5Ae))\log(x)}{b^5}$$
$$- \frac{(cd-be)^3\left(6Ac^3d^2-3b^3Be^2+b^2ce(-4Bd+Ae)+3bc^2d(-Bd+Ae)\right)\log(b+cx)}{b^5c^4}$$

input
```
Integrate[((A + B*x)*(d + e*x)^5)/(b*x + c*x^2)^3,x]
```

output
```
-1/2*(A*d^5)/(b^3*x^2) - (d^4*(b*B*d - 3*A*c*d + 5*A*b*e))/(b^4*x) + (B*e^
5*x)/c^3 + ((b*B - A*c)*(-(c*d) + b*e)^5)/(2*b^3*c^4*(b + c*x)^2) + ((c*d
- b*e)^4*(-2*b*B*c*d + 3*A*c^2*d - 3*b^2*B*e + 2*A*b*c*e))/(b^4*c^4*(b + c
*x)) + (d^3*(6*A*c^2*d^2 + 5*b^2*e*(B*d + 2*A*e) - 3*b*c*d*(B*d + 5*A*e))*
Log[x])/b^5 - ((c*d - b*e)^3*(6*A*c^3*d^2 - 3*b^3*B*e^2 + b^2*c*e*(-4*B*d
+ A*e) + 3*b*c^2*d*(-(B*d) + A*e))*Log[b + c*x])/(b^5*c^4)
```

Rubi [A] (verified)

Time = 1.03 (sec) , antiderivative size = 257, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1206, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^5}{(bx+cx^2)^3}\,dx$$
$$\Big\downarrow \ 1206$$

$$\int \left(\frac{d^4(5Abe-3Acd+bBd)}{b^4x^2}-\frac{(bB-Ac)(be-cd)^5}{b^3c^3(b+cx)^3}+\frac{Ad^5}{b^3x^3}+\frac{d^3\left(5b^2e(2Ae+Bd)-3bcd(5Ae+Bd)+6Ac^2d^2\right)}{b^5x}\right.$$

$\big\downarrow$ 2009

$$-\frac{d^4(5Abe-3Acd+bBd)}{b^4x}-\frac{(bB-Ac)(cd-be)^5}{2b^3c^4(b+cx)^2}-\frac{Ad^5}{2b^3x^2}+\frac{d^3\log(x)\left(5b^2e(2Ae+Bd)-3bcd(5Ae+Bd)+6Ac^2d^2\right)}{b^5}-\frac{(cd-be)^4\left(-2Abce-3Ac^2d+3b^2Be+2bBcd\right)}{b^4c^4(b+cx)}-\frac{(cd-be)^3\log(b+cx)\left(-b^2ce(4Bd-Ae)-3bc^2d(Bd-Ae)+6Ac^3d^2-3b^3Be^2\right)}{b^5c^4}+\frac{Be^5x}{c^3}$$

input
```
Int[((A + B*x)*(d + e*x)^5)/(b*x + c*x^2)^3,x]
```

output
```
-1/2*(A*d^5)/(b^3*x^2) - (d^4*(b*B*d - 3*A*c*d + 5*A*b*e))/(b^4*x) + (B*e^
5*x)/c^3 - ((b*B - A*c)*(c*d - b*e)^5)/(2*b^3*c^4*(b + c*x)^2) - ((c*d - b
*e)^4*(2*b*B*c*d - 3*A*c^2*d + 3*b^2*B*e - 2*A*b*c*e))/(b^4*c^4*(b + c*x))
 + (d^3*(6*A*c^2*d^2 + 5*b^2*e*(B*d + 2*A*e) - 3*b*c*d*(B*d + 5*A*e))*Log[
x])/b^5 - ((c*d - b*e)^3*(6*A*c^3*d^2 - 3*b^3*B*e^2 - 3*b*c^2*d*(B*d - A*e
) - b^2*c*e*(4*B*d - A*e))*Log[b + c*x])/(b^5*c^4)
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.81 (sec) , antiderivative size = 493, normalized size of antiderivative = 1.92

method	result
default	$\frac{B e^5 x}{c^3}+\frac{\left(A b^5 e^5 c-10 A c^4 d^3 e^2 b^2+15 A d^4 c^5 e b-6 A d^5 c^6-3 B b^6 e^5+5 B b^5 d e^4 c-5 B c^4 d^4 e b^2+3 B c^5 d^5 b\right) \ln(c x+b)}{c^4 b^5}-\frac{-2A \cdots}{\cdots}$
norman	$\frac{\frac{B e^5 x^5}{c}+\frac{\left(2 A b^5 e^5 c-5 A d e^4 b^4 c^2+10 A c^4 d^3 e^2 b^2-15 A d^4 c^5 e b+6 A d^5 c^6-6 B b^6 e^5+10 B b^5 d e^4 c-10 B d^2 e^3 b^4 c^2+5 B c^4 d^4 e b^2-3 B c^5 d^5 b\right) x \cdots}{b^4 c^3}}{\cdots}$
risch	$\frac{B e^5 x}{c^3}+\frac{\frac{\left(2 A b^5 e^5 c-5 A d e^4 b^4 c^2+10 A c^4 d^3 e^2 b^2-15 A d^4 c^5 e b+6 A d^5 c^6-3 B b^6 e^5+10 B b^5 d e^4 c-10 B d^2 e^3 b^4 c^2+5 B c^4 d^4 e b^2-3 B c^5 d^5 b \cdots\right)}{b^4}}{\cdots}$
parallelrisch	Expression too large to display

input
```
int((B*x+A)*(e*x+d)^5/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
B*e^5/c^3*x+1/c^4*(A*b^5*c*e^5-10*A*b^2*c^4*d^3*e^2+15*A*b*c^5*d^4*e-6*A*c
^6*d^5-3*B*b^6*e^5+5*B*b^5*c*d*e^4-5*B*b^2*c^4*d^4*e+3*B*b*c^5*d^5)/b^5*ln
(c*x+b)-(-2*A*b^5*c*e^5+5*A*b^4*c^2*d*e^4-10*A*b^2*c^4*d^3*e^2+10*A*b*c^5*
d^4*e-3*A*c^6*d^5+3*B*b^6*e^5-10*B*b^5*c*d*e^4+10*B*b^4*c^2*d^2*e^3-5*B*b^
2*c^4*d^4*e+2*B*b*c^5*d^5)/b^4/c^4/(c*x+b)-1/2/c^4*(A*b^5*c*e^5-5*A*b^4*c^
2*d*e^4+10*A*b^3*c^3*d^2*e^3-10*A*b^2*c^4*d^3*e^2+5*A*b*c^5*d^4*e-A*c^6*d^
5-B*b^6*e^5+5*B*b^5*c*d*e^4-10*B*b^4*c^2*d^2*e^3+10*B*b^3*c^3*d^3*e^2-5*B*
b^2*c^4*d^4*e+B*b*c^5*d^5)/b^3/(c*x+b)^2-1/2*A*d^5/b^3/x^2+d^3*(10*A*b^2*e
^2-15*A*b*c*d*e+6*A*c^2*d^2+5*B*b^2*d*e-3*B*b*c*d^2)/b^5*ln(x)-d^4*(5*A*b*
e-3*A*c*d+B*b*d)/b^4/x
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 889 vs. $2(253) = 506$.

Time = 0.15 (sec) , antiderivative size = 889, normalized size of antiderivative = 3.46

$$\int \frac{(A+Bx)(d+ex)^5}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^5/(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
1/2*(2*B*b^5*c^3*e^5*x^5 + 4*B*b^6*c^2*e^5*x^4 - A*b^4*c^4*d^5 + 2*(10*A*b
^3*c^5*d^3*e^2 - 10*B*b^5*c^3*d^2*e^3 - 3*(B*b^2*c^6 - 2*A*b*c^7)*d^5 + 5*
(B*b^3*c^5 - 3*A*b^2*c^6)*d^4*e + 5*(2*B*b^6*c^2 - A*b^5*c^3)*d*e^4 - 2*(B
*b^7*c - A*b^6*c^2)*e^5)*x^3 - (9*(B*b^3*c^5 - 2*A*b^2*c^6)*d^5 - 15*(B*b^
4*c^4 - 3*A*b^3*c^5)*d^4*e + 10*(B*b^5*c^3 - 3*A*b^4*c^4)*d^3*e^2 + 10*(B*
b^6*c^2 + A*b^5*c^3)*d^2*e^3 - 5*(3*B*b^7*c - A*b^6*c^2)*d*e^4 + (5*B*b^8
- 3*A*b^7*c)*e^5)*x^2 - 2*(5*A*b^4*c^4*d^4*e + (B*b^4*c^4 - 2*A*b^3*c^5)*d
^5)*x - 2*((10*A*b^2*c^6*d^3*e^2 - 5*B*b^5*c^3*d*e^4 - 3*(B*b*c^7 - 2*A*c^
8)*d^5 + 5*(B*b^2*c^6 - 3*A*b*c^7)*d^4*e + (3*B*b^6*c^2 - A*b^5*c^3)*e^5)*
x^4 + 2*(10*A*b^3*c^5*d^3*e^2 - 5*B*b^6*c^2*d*e^4 - 3*(B*b^2*c^6 - 2*A*b*c
^7)*d^5 + 5*(B*b^3*c^5 - 3*A*b^2*c^6)*d^4*e + (3*B*b^7*c - A*b^6*c^2)*e^5)
*x^3 + (10*A*b^4*c^4*d^3*e^2 - 5*B*b^7*c*d*e^4 - 3*(B*b^3*c^5 - 2*A*b^2*c^
6)*d^5 + 5*(B*b^4*c^4 - 3*A*b^3*c^5)*d^4*e + (3*B*b^8 - A*b^7*c)*e^5)*x^2)
*log(c*x + b) + 2*((10*A*b^2*c^6*d^3*e^2 - 3*(B*b*c^7 - 2*A*c^8)*d^5 + 5*(
B*b^2*c^6 - 3*A*b*c^7)*d^4*e)*x^4 + 2*(10*A*b^3*c^5*d^3*e^2 - 3*(B*b^2*c^6
 - 2*A*b*c^7)*d^5 + 5*(B*b^3*c^5 - 3*A*b^2*c^6)*d^4*e)*x^3 + (10*A*b^4*c^4
*d^3*e^2 - 3*(B*b^3*c^5 - 2*A*b^2*c^6)*d^5 + 5*(B*b^4*c^4 - 3*A*b^3*c^5)*d
^4*e)*x^2)*log(x))/(b^5*c^6*x^4 + 2*b^6*c^5*x^3 + b^7*c^4*x^2)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1057 vs. $2(260) = 520$.

Time = 173.40 (sec) , antiderivative size = 1057, normalized size of antiderivative = 4.11

$$\int \frac{(A+Bx)(d+ex)^5}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)**5/(c*x**2+b*x)**3,x)
```

output
```
B*e**5*x/c**3 + (-A*b**3*c**4*d**5 + x**3*(4*A*b**5*c**2*e**5 - 10*A*b**4*
c**3*d*e**4 + 20*A*b**2*c**5*d**3*e**2 - 30*A*b*c**6*d**4*e + 12*A*c**7*d*
*5 - 6*B*b**6*c*e**5 + 20*B*b**5*c**2*d*e**4 - 20*B*b**4*c**3*d**2*e**3 +
10*B*b**2*c**5*d**4*e - 6*B*b*c**6*d**5) + x**2*(3*A*b**6*c*e**5 - 5*A*b**
5*c**2*d*e**4 - 10*A*b**4*c**3*d**2*e**3 + 30*A*b**3*c**4*d**3*e**2 - 45*A
*b**2*c**5*d**4*e + 18*A*b*c**6*d**5 - 5*B*b**7*e**5 + 15*B*b**6*c*d*e**4
- 10*B*b**5*c**2*d**2*e**3 - 10*B*b**4*c**3*d**3*e**2 + 15*B*b**3*c**4*d**
4*e - 9*B*b**2*c**5*d**5) + x*(-10*A*b**3*c**4*d**4*e + 4*A*b**2*c**5*d**5
 - 2*B*b**3*c**4*d**5))/(2*b**6*c**4*x**2 + 4*b**5*c**5*x**3 + 2*b**4*c**6
*x**4) + d**3*(10*A*b**2*e**2 - 15*A*b*c*d*e + 6*A*c**2*d**2 + 5*B*b**2*d*
e - 3*B*b*c*d**2)*log(x + (10*A*b**3*c**3*d**3*e**2 - 15*A*b**2*c**4*d**4*
e + 6*A*b*c**5*d**5 + 5*B*b**3*c**3*d**4*e - 3*B*b**2*c**4*d**5 - b*c**3*d
**3*(10*A*b**2*e**2 - 15*A*b*c*d*e + 6*A*c**2*d**2 + 5*B*b**2*d*e - 3*B*b*
c*d**2))/(-A*b**5*c*e**5 + 20*A*b**2*c**4*d**3*e**2 - 30*A*b*c**5*d**4*e +
 12*A*c**6*d**5 + 3*B*b**6*e**5 - 5*B*b**5*c*d*e**4 + 10*B*b**2*c**4*d**4*
e - 6*B*b*c**5*d**5))/b**5 - (b*e - c*d)**3*(-A*b**2*c*e**2 - 3*A*b*c**2*d
*e - 6*A*c**3*d**2 + 3*B*b**3*e**2 + 4*B*b**2*c*d*e + 3*B*b*c**2*d**2)*log
(x + (10*A*b**3*c**3*d**3*e**2 - 15*A*b**2*c**4*d**4*e + 6*A*b*c**5*d**5 +
 5*B*b**3*c**3*d**4*e - 3*B*b**2*c**4*d**5 + b*(b*e - c*d)**3*(-A*b**2*c*e
**2 - 3*A*b*c**2*d*e - 6*A*c**3*d**2 + 3*B*b**3*e**2 + 4*B*b**2*c*d*e +...
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 513 vs. $2(253) = 506$.

Time = 0.06 (sec) , antiderivative size = 513, normalized size of antiderivative = 2.00

$$\int \frac{(A+Bx)(d+ex)^5}{(bx+cx^2)^3}\,dx = \frac{Be^5x}{c^3} - \frac{Ab^3c^4d^5 - 2\left(10\,Ab^2c^5d^3e^2 - 10\,Bb^4c^3d^2e^3 - 3\,(Bbc^6 - 2\,Ac^7)d^5 + 5\,(Bb^2c^5 - 3\,Abc^6)d^4e + 5\,(2\,Bb^5c^2 \right.}{} + \frac{\left(10\,Ab^2d^3e^2 - 3\,(Bbc - 2\,Ac^2)d^5 + 5\,(Bb^2 - 3\,Abc)d^4e\right)\log(x)}{b^5} - \frac{\left(10\,Ab^2c^4d^3e^2 - 5\,Bb^5cde^4 - 3\,(Bbc^5 - 2\,Ac^6)d^5 + 5\,(Bb^2c^4 - 3\,Abc^5)d^4e + (3\,Bb^6 - Ab^5c)e^5\right)\log(cx}{b^5c^4}$$

input
```
integrate((B*x+A)*(e*x+d)^5/(c*x^2+b*x)^3,x, algorithm="maxima")
```

output
```
B*e^5*x/c^3 - 1/2*(A*b^3*c^4*d^5 - 2*(10*A*b^2*c^5*d^3*e^2 - 10*B*b^4*c^3*
d^2*e^3 - 3*(B*b*c^6 - 2*A*c^7)*d^5 + 5*(B*b^2*c^5 - 3*A*b*c^6)*d^4*e + 5*
(2*B*b^5*c^2 - A*b^4*c^3)*d*e^4 - (3*B*b^6*c - 2*A*b^5*c^2)*e^5)*x^3 + (9*
(B*b^2*c^5 - 2*A*b*c^6)*d^5 - 15*(B*b^3*c^4 - 3*A*b^2*c^5)*d^4*e + 10*(B*b
^4*c^3 - 3*A*b^3*c^4)*d^3*e^2 + 10*(B*b^5*c^2 + A*b^4*c^3)*d^2*e^3 - 5*(3*
B*b^6*c - A*b^5*c^2)*d*e^4 + (5*B*b^7 - 3*A*b^6*c)*e^5)*x^2 + 2*(5*A*b^3*c
^4*d^4*e + (B*b^3*c^4 - 2*A*b^2*c^5)*d^5)*x)/(b^4*c^6*x^4 + 2*b^5*c^5*x^3
+ b^6*c^4*x^2) + (10*A*b^2*d^3*e^2 - 3*(B*b*c - 2*A*c^2)*d^5 + 5*(B*b^2 -
3*A*b*c)*d^4*e)*log(x)/b^5 - (10*A*b^2*c^4*d^3*e^2 - 5*B*b^5*c*d*e^4 - 3*(
B*b*c^5 - 2*A*c^6)*d^5 + 5*(B*b^2*c^4 - 3*A*b*c^5)*d^4*e + (3*B*b^6 - A*b^
5*c)*e^5)*log(c*x + b)/(b^5*c^4)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 522 vs. $2(253) = 506$.

Time = 0.23 (sec) , antiderivative size = 522, normalized size of antiderivative = 2.03

$$\int \frac{(A+Bx)(d+ex)^5}{(bx+cx^2)^3}\,dx$$
$$= \frac{Be^5x}{c^3} - \frac{(3\,Bbcd^5 - 6\,Ac^2d^5 - 5\,Bb^2d^4e + 15\,Abcd^4e - 10\,Ab^2d^3e^2)\log(|x|)}{b^5}$$
$$+ \frac{(3\,Bbc^5d^5 - 6\,Ac^6d^5 - 5\,Bb^2c^4d^4e + 15\,Abc^5d^4e - 10\,Ab^2c^4d^3e^2 + 5\,Bb^5cde^4 - 3\,Bb^6e^5 + Ab^5ce^5)\log(}{b^5c^4}$$
$$- \frac{Ab^3c^4d^5 + 2\,(3\,Bbc^6d^5 - 6\,Ac^7d^5 - 5\,Bb^2c^5d^4e + 15\,Abc^6d^4e - 10\,Ab^2c^5d^3e^2 + 10\,Bb^4c^3d^2e^3 - 10\,Bb^5c}{}$$

input
```
integrate((B*x+A)*(e*x+d)^5/(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
B*e^5*x/c^3 - (3*B*b*c*d^5 - 6*A*c^2*d^5 - 5*B*b^2*d^4*e + 15*A*b*c*d^4*e
- 10*A*b^2*d^3*e^2)*log(abs(x))/b^5 + (3*B*b*c^5*d^5 - 6*A*c^6*d^5 - 5*B*b
^2*c^4*d^4*e + 15*A*b*c^5*d^4*e - 10*A*b^2*c^4*d^3*e^2 + 5*B*b^5*c*d*e^4 -
 3*B*b^6*e^5 + A*b^5*c*e^5)*log(abs(c*x + b))/(b^5*c^4) - 1/2*(A*b^3*c^4*d
^5 + 2*(3*B*b*c^6*d^5 - 6*A*c^7*d^5 - 5*B*b^2*c^5*d^4*e + 15*A*b*c^6*d^4*e
 - 10*A*b^2*c^5*d^3*e^2 + 10*B*b^4*c^3*d^2*e^3 - 10*B*b^5*c^2*d*e^4 + 5*A*
b^4*c^3*d*e^4 + 3*B*b^6*c*e^5 - 2*A*b^5*c^2*e^5)*x^3 + (9*B*b^2*c^5*d^5 -
18*A*b*c^6*d^5 - 15*B*b^3*c^4*d^4*e + 45*A*b^2*c^5*d^4*e + 10*B*b^4*c^3*d^
3*e^2 - 30*A*b^3*c^4*d^3*e^2 + 10*B*b^5*c^2*d^2*e^3 + 10*A*b^4*c^3*d^2*e^3
 - 15*B*b^6*c*d*e^4 + 5*A*b^5*c^2*d*e^4 + 5*B*b^7*e^5 - 3*A*b^6*c*e^5)*x^2
 + 2*(B*b^3*c^4*d^5 - 2*A*b^2*c^5*d^5 + 5*A*b^3*c^4*d^4*e)*x)/((c*x + b)^2
*b^4*c^4*x^2)
```

Mupad [B] (verification not implemented)

Time = 11.07 (sec) , antiderivative size = 498, normalized size of antiderivative = 1.94

$$\int \frac{(A+Bx)(d+ex)^5}{(bx+cx^2)^3}\,dx$$

$$= \frac{\ln(x)\,\left(b^2\,(5\,B\,d^4\,e+10\,A\,d^3\,e^2)-b\,(3\,B\,c\,d^5+15\,A\,c\,e\,d^4)+6\,A\,c^2\,d^5\right)}{b^5}$$

$$- \frac{\frac{x^2\,\left(5\,B\,b^6\,e^5-15\,B\,b^5\,c\,d\,e^4-3\,A\,b^5\,c\,e^5+10\,B\,b^4\,c^2\,d^2\,e^3+5\,A\,b^4\,c^2\,d\,e^4+10\,B\,b^3\,c^3\,d^3\,e^2+10\,A\,b^3\,c^3\,d^2\,e^3-15\,B\,b^2\,c^4\,d^4\,e-30\,A\,b^2\,c^4\,d^3\,e^2+\cdots}{2\,b^3\,c}}{\cdots}$$

$$+ \frac{B\,e^5\,x}{c^3}$$

$$+ \frac{\ln(b+c\,x)\,(b\,e-c\,d)^3\,\left(-3\,B\,b^3\,e^2-4\,B\,b^2\,c\,d\,e+A\,b^2\,c\,e^2-3\,B\,b\,c^2\,d^2+3\,A\,b\,c^2\,d\,e+6\,A\,c^3\,d^2\right)}{b^5\,c^4}$$

input
```
int(((A + B*x)*(d + e*x)^5)/(b*x + c*x^2)^3,x)
```

output
```
(log(x)*(b^2*(10*A*d^3*e^2 + 5*B*d^4*e) - b*(3*B*c*d^5 + 15*A*c*d^4*e) + 6
*A*c^2*d^5))/b^5 - ((x^2*(5*B*b^6*e^5 - 18*A*c^6*d^5 - 3*A*b^5*c*e^5 + 9*B
*b*c^5*d^5 + 5*A*b^4*c^2*d*e^4 - 15*B*b^2*c^4*d^4*e - 30*A*b^2*c^4*d^3*e^2
 + 10*A*b^3*c^3*d^2*e^3 + 10*B*b^3*c^3*d^3*e^2 + 10*B*b^4*c^2*d^2*e^3 + 45
*A*b*c^5*d^4*e - 15*B*b^5*c*d*e^4))/(2*b^3*c) - (x^3*(6*A*c^6*d^5 - 3*B*b^
6*e^5 + 2*A*b^5*c*e^5 - 3*B*b*c^5*d^5 - 5*A*b^4*c^2*d*e^4 + 5*B*b^2*c^4*d^
4*e + 10*A*b^2*c^4*d^3*e^2 - 10*B*b^4*c^2*d^2*e^3 - 15*A*b*c^5*d^4*e + 10*
B*b^5*c*d*e^4))/b^4 + (A*c^3*d^5)/(2*b) + (c^3*d^4*x*(5*A*b*e - 2*A*c*d +
B*b*d))/b^2)/(c^5*x^4 + 2*b*c^4*x^3 + b^2*c^3*x^2) + (B*e^5*x)/c^3 + (log(
b + c*x)*(b*e - c*d)^3*(6*A*c^3*d^2 - 3*B*b^3*e^2 + A*b^2*c*e^2 - 3*B*b*c^
2*d^2 + 3*A*b*c^2*d*e - 4*B*b^2*c*d*e))/(b^5*c^4)
```

Reduce [B] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 1145, normalized size of antiderivative = 4.46

$$\int \frac{(A+Bx)(d+ex)^5}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^5/(c*x^2+b*x)^3,x)
```

output
```
(2*log(b + c*x)*a*b**7*c*e**5*x**2 + 4*log(b + c*x)*a*b**6*c**2*e**5*x**3
+ 2*log(b + c*x)*a*b**5*c**3*e**5*x**4 - 20*log(b + c*x)*a*b**4*c**4*d**3*
e**2*x**2 + 30*log(b + c*x)*a*b**3*c**5*d**4*e*x**2 - 40*log(b + c*x)*a*b*
*3*c**5*d**3*e**2*x**3 - 12*log(b + c*x)*a*b**2*c**6*d**5*x**2 + 60*log(b
+ c*x)*a*b**2*c**6*d**4*e*x**3 - 20*log(b + c*x)*a*b**2*c**6*d**3*e**2*x**
4 - 24*log(b + c*x)*a*b*c**7*d**5*x**3 + 30*log(b + c*x)*a*b*c**7*d**4*e*x
**4 - 12*log(b + c*x)*a*c**8*d**5*x**4 - 6*log(b + c*x)*b**9*e**5*x**2 + 1
0*log(b + c*x)*b**8*c*d*e**4*x**2 - 12*log(b + c*x)*b**8*c*e**5*x**3 + 20*
log(b + c*x)*b**7*c**2*d*e**4*x**3 - 6*log(b + c*x)*b**7*c**2*e**5*x**4 +
10*log(b + c*x)*b**6*c**3*d*e**4*x**4 - 10*log(b + c*x)*b**5*c**4*d**4*e*x
**2 + 6*log(b + c*x)*b**4*c**5*d**5*x**2 - 20*log(b + c*x)*b**4*c**5*d**4*
e*x**3 + 12*log(b + c*x)*b**3*c**6*d**5*x**3 - 10*log(b + c*x)*b**3*c**6*d
**4*e*x**4 + 6*log(b + c*x)*b**2*c**7*d**5*x**4 + 20*log(x)*a*b**4*c**4*d*
*3*e**2*x**2 - 30*log(x)*a*b**3*c**5*d**4*e*x**2 + 40*log(x)*a*b**3*c**5*d
**3*e**2*x**3 + 12*log(x)*a*b**2*c**6*d**5*x**2 - 60*log(x)*a*b**2*c**6*d*
*4*e*x**3 + 20*log(x)*a*b**2*c**6*d**3*e**2*x**4 + 24*log(x)*a*b*c**7*d**5
*x**3 - 30*log(x)*a*b*c**7*d**4*e*x**4 + 12*log(x)*a*c**8*d**5*x**4 + 10*l
og(x)*b**5*c**4*d**4*e*x**2 - 6*log(x)*b**4*c**5*d**5*x**2 + 20*log(x)*b**
4*c**5*d**4*e*x**3 - 12*log(x)*b**3*c**6*d**5*x**3 + 10*log(x)*b**3*c**6*d
**4*e*x**4 - 6*log(x)*b**2*c**7*d**5*x**4 + a*b**7*c*e**5*x**2 - 10*a*b...
```

3.46 $\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3} \, dx$

Optimal result

Integrand size = 24, antiderivative size = 235

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3} \, dx &= -\frac{Ad^4}{2b^3x^2} - \frac{d^3(bBd-3Acd+4Abe)}{b^4x} - \frac{(bB-Ac)(cd-be)^4}{2b^3c^3(b+cx)^2} \\ &\quad - \frac{(cd-be)^3\left(2bBcd-3Ac^2d+2b^2Be-Abce\right)}{b^4c^3(b+cx)} \\ &\quad + \frac{d^2(6Ac^2d^2+2b^2e(2Bd+3Ae)-3bcd(Bd+4Ae))\log(x)}{b^5} \\ &\quad + \frac{(cd-be)^2\left(3bBc^2d^2-6Ac^3d^2+2b^2Bcde+b^3Be^2\right)\log(b+cx)}{b^5c^3}\end{aligned}$$

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

Mathematica [A] (verified)

Time = 0.19 (sec) , antiderivative size = 228, normalized size of antiderivative = 0.97

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3}\,dx = -\frac{\frac{Ab^2d^4}{x^2}+\frac{2bd^3(bBd-3Acd+4Abe)}{x}+\frac{b^2(bB-Ac)(cd-be)^4}{c^3(b+cx)^2}-\frac{2b(-cd+be)^3(-3Ac^2d+2b^2Be+bc(2Bd-Ae))}{c^3(b+cx)}-2d^2(6Ac^2d^2+2b}{2b^5}$$

input
```
Integrate[((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^3,x]
```

output
```
-1/2*((A*b^2*d^4)/x^2 + (2*b*d^3*(b*B*d - 3*A*c*d + 4*A*b*e))/x + (b^2*(b*
B - A*c)*(c*d - b*e)^4)/(c^3*(b + c*x)^2) - (2*b*(-(c*d) + b*e)^3*(-3*A*c^
2*d + 2*b^2*B*e + b*c*(2*B*d - A*e)))/(c^3*(b + c*x)) - 2*d^2*(6*A*c^2*d^2
 + 2*b^2*e*(2*B*d + 3*A*e) - 3*b*c*d*(B*d + 4*A*e))*Log[x] - (2*(c*d - b*e
)^2*(3*b*B*c^2*d^2 - 6*A*c^3*d^2 + 2*b^2*B*c*d*e + b^3*B*e^2)*Log[b + c*x]
)/c^3)/b^5
```

Rubi [A] (verified)

Time = 0.91 (sec) , antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1206, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3}dx$$

$$\Big\downarrow \text{1206}$$

$$\int \left(\frac{d^3(4Abe-3Acd+bBd)}{b^4x^2}+\frac{(bB-Ac)(be-cd)^4}{b^3c^2(b+cx)^3}+\frac{Ad^4}{b^3x^3}+\frac{d^2(2b^2e(3Ae+2Bd)-3bcd(4Ae+Bd)+6Ac^2}{b^5x}\right.$$

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

$$-\frac{d^3(4Abe-3Acd+bBd)}{b^4x}-\frac{(bB-Ac)(cd-be)^4}{2b^3c^3(b+cx)^2}-\frac{Ad^4}{2b^3x^2}+\frac{d^2\log(x)\left(2b^2e(3Ae+2Bd)-3bcd(4Ae+Bd)+6Ac^2d^2\right)}{b^5}-\frac{(cd-be)^3\left(-Abce-3Ac^2d+2b^2Be+2bBcd\right)}{b^4c^3(b+cx)}+\frac{(cd-be)^2\log(b+cx)\left(-6Ac^3d^2+b^3Be^2+2b^2Bcde+3bBc^2d^2\right)}{b^5c^3}$$

input
```
Int[((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^3,x]
```

output
```
-1/2*(A*d^4)/(b^3*x^2) - (d^3*(b*B*d - 3*A*c*d + 4*A*b*e))/(b^4*x) - ((b*B
 - A*c)*(c*d - b*e)^4)/(2*b^3*c^3*(b + c*x)^2) - ((c*d - b*e)^3*(2*b*B*c*d
 - 3*A*c^2*d + 2*b^2*B*e - A*b*c*e))/(b^4*c^3*(b + c*x)) + (d^2*(6*A*c^2*d
^2 + 2*b^2*e*(2*B*d + 3*A*e) - 3*b*c*d*(B*d + 4*A*e))*Log[x])/b^5 + ((c*d
- b*e)^2*(3*b*B*c^2*d^2 - 6*A*c^3*d^2 + 2*b^2*B*c*d*e + b^3*B*e^2)*Log[b +
 c*x])/(b^5*c^3)
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 404, normalized size of antiderivative = 1.72

method	result
default	$-\frac{A\,b^4 e^4 c-6A\,b^2 c^3 d^2 e^2+8A\,c^4 d^3 e b-3A\,c^5 d^4-2b^5 B\,e^4+4B\,b^4 d\,e^3 c-4B\,b^2 c^3 d^3 e+2B\,c^4 d^4 b}{c^3 b^4 (cx+b)}+\frac{(-6A\,b^2 c^3 d^2 e^2+12A\,c^4 d^3 e$
norman	$\frac{-\frac{A\,d^4}{2b}-\frac{d^3(4Abe-2Acd+Bbd)x}{b^2}-\frac{\left(A\,b^4 e^4 c-6A\,b^2 c^3 d^2 e^2+12A\,c^4 d^3 e b-6A\,c^5 d^4-2b^5 B\,e^4+4B\,b^4 d\,e^3 c-4B\,b^2 c^3 d^3 e+3B\,c^4 d^4 b\right)x^3}{b^4 c^2}-(A}{x^2(cx+b)^2}$
risch	$\frac{-\frac{A\,d^4}{2b}-\frac{d^3(4Abe-2Acd+Bbd)x}{b^2}-\frac{\left(A\,b^4 e^4 c-6A\,b^2 c^3 d^2 e^2+12A\,c^4 d^3 e b-6A\,c^5 d^4-2b^5 B\,e^4+4B\,b^4 d\,e^3 c-4B\,b^2 c^3 d^3 e+3B\,c^4 d^4 b\right)x^3}{b^4 c^2}-(A}{x^2(cx+b)^2}$
parallelrisch	$48A\ln(cx+b)x^3 b^2 c^5 d^3 e+12A\ln(x)x^4 b^2 c^5 d^2 e^2-24A\ln(x)x^4 b\,c^6 d^3 e-12A\ln(cx+b)x^4 b^2 c^5 d^2 e^2-24A\ln(cx+b)x^3 b^3 c^4 d^2 e^2-8$

input
```
int((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
-1/c^3*(A*b^4*c*e^4-6*A*b^2*c^3*d^2*e^2+8*A*b*c^4*d^3*e-3*A*c^5*d^4-2*B*b^
5*e^4+4*B*b^4*c*d*e^3-4*B*b^2*c^3*d^3*e+2*B*b*c^4*d^4)/b^4/(c*x+b)+1/b^5*(
-6*A*b^2*c^3*d^2*e^2+12*A*b*c^4*d^3*e-6*A*c^5*d^4+B*b^5*e^4-4*B*b^2*c^3*d^
3*e+3*B*b*c^4*d^4)/c^3*ln(c*x+b)-1/2*(-A*b^4*c*e^4+4*A*b^3*c^2*d*e^3-6*A*b
^2*c^3*d^2*e^2+4*A*b*c^4*d^3*e-A*c^5*d^4+B*b^5*e^4-4*B*b^4*c*d*e^3+6*B*b^3
*c^2*d^2*e^2-4*B*b^2*c^3*d^3*e+B*b*c^4*d^4)/b^3/c^3/(c*x+b)^2-1/2*A*d^4/b^
3/x^2+d^2*(6*A*b^2*e^2-12*A*b*c*d*e+6*A*c^2*d^2+4*B*b^2*d*e-3*B*b*c*d^2)/b
^5*ln(x)-d^3*(4*A*b*e-3*A*c*d+B*b*d)/b^4/x
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 736 vs. 2(231) = 462.

Time = 0.11 (sec) , antiderivative size = 736, normalized size of antiderivative = 3.13

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
-1/2*(A*b^4*c^3*d^4 - 2*(6*A*b^3*c^4*d^2*e^2 - 4*B*b^5*c^2*d*e^3 - 3*(B*b^
2*c^5 - 2*A*b*c^6)*d^4 + 4*(B*b^3*c^4 - 3*A*b^2*c^5)*d^3*e + (2*B*b^6*c -
A*b^5*c^2)*e^4)*x^3 + (9*(B*b^3*c^4 - 2*A*b^2*c^5)*d^4 - 12*(B*b^4*c^3 - 3
*A*b^3*c^4)*d^3*e + 6*(B*b^5*c^2 - 3*A*b^4*c^3)*d^2*e^2 + 4*(B*b^6*c + A*b
^5*c^2)*d*e^3 - (3*B*b^7 - A*b^6*c)*e^4)*x^2 + 2*(4*A*b^4*c^3*d^3*e + (B*b
^4*c^3 - 2*A*b^3*c^4)*d^4)*x + 2*((6*A*b^2*c^5*d^2*e^2 - B*b^5*c^2*e^4 - 3
*(B*b*c^6 - 2*A*c^7)*d^4 + 4*(B*b^2*c^5 - 3*A*b*c^6)*d^3*e)*x^4 + 2*(6*A*b
^3*c^4*d^2*e^2 - B*b^6*c*e^4 - 3*(B*b^2*c^5 - 2*A*b*c^6)*d^4 + 4*(B*b^3*c^
4 - 3*A*b^2*c^5)*d^3*e)*x^3 + (6*A*b^4*c^3*d^2*e^2 - B*b^7*e^4 - 3*(B*b^3*
c^4 - 2*A*b^2*c^5)*d^4 + 4*(B*b^4*c^3 - 3*A*b^3*c^4)*d^3*e)*x^2)*log(c*x +
 b) - 2*((6*A*b^2*c^5*d^2*e^2 - 3*(B*b*c^6 - 2*A*c^7)*d^4 + 4*(B*b^2*c^5 -
 3*A*b*c^6)*d^3*e)*x^4 + 2*(6*A*b^3*c^4*d^2*e^2 - 3*(B*b^2*c^5 - 2*A*b*c^6
)*d^4 + 4*(B*b^3*c^4 - 3*A*b^2*c^5)*d^3*e)*x^3 + (6*A*b^4*c^3*d^2*e^2 - 3*
(B*b^3*c^4 - 2*A*b^2*c^5)*d^4 + 4*(B*b^4*c^3 - 3*A*b^3*c^4)*d^3*e)*x^2)*lo
g(x))/(b^5*c^5*x^4 + 2*b^6*c^4*x^3 + b^7*c^3*x^2)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 881 vs. $2(241) = 482$.

Time = 47.64 (sec) , antiderivative size = 881, normalized size of antiderivative = 3.75

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3}\,dx$$
$$= \frac{-Ab^3c^3d^4 + x^3(-2Ab^4c^2e^4 + 12Ab^2c^4d^2e^2 - 24Abc^5d^3e + 12Ac^6d^4 + 4Bb^5ce^4 - 8Bb^4c^2de^3 + 8Bb^2c^4d^3e \cdots}{\cdots}$$
$$+ \frac{d^2\cdot(6Ab^2e^2 - 12Abcde + 6Ac^2d^2 + 4Bb^2de - 3Bbcd^2)\log\left(x + \frac{-6Ab^3c^2d^2e^2+12Ab^2c^3d^3e-6Abc^4d^4-4Bb^3c^2d^3e \cdots}{-12Ab^2c^3d^2e^2+24Abc^4d^3 \cdots}\right.}{b^5}$$
$$+ \frac{(be-cd)^2\left(-6Ac^3d^2 + Bb^3e^2 + 2Bb^2cde + 3Bbc^2d^2\right)\log\left(x + \frac{-6Ab^3c^2d^2e^2+12Ab^2c^3d^3e-6Abc^4d^4-4Bb^3c^2d^3e+3 \cdots}{-12Ab^2c^3d^2e^2+24Abc^4d^3e-12 \cdots}\right.}{b^5c^3}$$

input
```
integrate((B*x+A)*(e*x+d)**4/(c*x**2+b*x)**3,x)
```

output
```
(-A*b**3*c**3*d**4 + x**3*(-2*A*b**4*c**2*e**4 + 12*A*b**2*c**4*d**2*e**2
- 24*A*b*c**5*d**3*e + 12*A*c**6*d**4 + 4*B*b**5*c*e**4 - 8*B*b**4*c**2*d*
e**3 + 8*B*b**2*c**4*d**3*e - 6*B*b*c**5*d**4) + x**2*(-A*b**5*c*e**4 - 4*
A*b**4*c**2*d*e**3 + 18*A*b**3*c**3*d**2*e**2 - 36*A*b**2*c**4*d**3*e + 18
*A*b*c**5*d**4 + 3*B*b**6*e**4 - 4*B*b**5*c*d*e**3 - 6*B*b**4*c**2*d**2*e*
*2 + 12*B*b**3*c**3*d**3*e - 9*B*b**2*c**4*d**4) + x*(-8*A*b**3*c**3*d**3*
e + 4*A*b**2*c**4*d**4 - 2*B*b**3*c**3*d**4))/(2*b**6*c**3*x**2 + 4*b**5*c
**4*x**3 + 2*b**4*c**5*x**4) + d**2*(6*A*b**2*e**2 - 12*A*b*c*d*e + 6*A*c*
*2*d**2 + 4*B*b**2*d*e - 3*B*b*c*d**2)*log(x + (-6*A*b**3*c**2*d**2*e**2 +
 12*A*b**2*c**3*d**3*e - 6*A*b*c**4*d**4 - 4*B*b**3*c**2*d**3*e + 3*B*b**2
*c**3*d**4 + b*c**2*d**2*(6*A*b**2*e**2 - 12*A*b*c*d*e + 6*A*c**2*d**2 + 4
*B*b**2*d*e - 3*B*b*c*d**2))/(-12*A*b**2*c**3*d**2*e**2 + 24*A*b*c**4*d**3
*e - 12*A*c**5*d**4 + B*b**5*e**4 - 8*B*b**2*c**3*d**3*e + 6*B*b*c**4*d**4
))/b**5 + (b*e - c*d)**2*(-6*A*c**3*d**2 + B*b**3*e**2 + 2*B*b**2*c*d*e +
3*B*b*c**2*d**2)*log(x + (-6*A*b**3*c**2*d**2*e**2 + 12*A*b**2*c**3*d**3*e
 - 6*A*b*c**4*d**4 - 4*B*b**3*c**2*d**3*e + 3*B*b**2*c**3*d**4 + b*(b*e -
c*d)**2*(-6*A*c**3*d**2 + B*b**3*e**2 + 2*B*b**2*c*d*e + 3*B*b*c**2*d**2)/
c)/(-12*A*b**2*c**3*d**2*e**2 + 24*A*b*c**4*d**3*e - 12*A*c**5*d**4 + B*b*
*5*e**4 - 8*B*b**2*c**3*d**3*e + 6*B*b*c**4*d**4))/(b**5*c**3)
```

Maxima [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 430, normalized size of antiderivative = 1.83

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3}\,dx =$$

$$-\frac{Ab^3c^3d^4 - 2\,(6\,Ab^2c^4d^2e^2 - 4\,Bb^4c^2de^3 - 3\,(Bbc^5 - 2\,Ac^6)d^4 + 4\,(Bb^2c^4 - 3\,Abc^5)d^3e + (2\,Bb^5c - Ab}{}$$

$$+\frac{(6\,Ab^2d^2e^2 - 3\,(Bbc - 2\,Ac^2)d^4 + 4\,(Bb^2 - 3\,Abc)d^3e)\log(x)}{b^5}$$

$$-\frac{(6\,Ab^2c^3d^2e^2 - Bb^5e^4 - 3\,(Bbc^4 - 2\,Ac^5)d^4 + 4\,(Bb^2c^3 - 3\,Abc^4)d^3e)\log(cx+b)}{b^5c^3}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^3,x, algorithm="maxima")
```

output
```
-1/2*(A*b^3*c^3*d^4 - 2*(6*A*b^2*c^4*d^2*e^2 - 4*B*b^4*c^2*d*e^3 - 3*(B*b*
c^5 - 2*A*c^6)*d^4 + 4*(B*b^2*c^4 - 3*A*b*c^5)*d^3*e + (2*B*b^5*c - A*b^4*
c^2)*e^4)*x^3 + (9*(B*b^2*c^4 - 2*A*b*c^5)*d^4 - 12*(B*b^3*c^3 - 3*A*b^2*c
^4)*d^3*e + 6*(B*b^4*c^2 - 3*A*b^3*c^3)*d^2*e^2 + 4*(B*b^5*c + A*b^4*c^2)*
d*e^3 - (3*B*b^6 - A*b^5*c)*e^4)*x^2 + 2*(4*A*b^3*c^3*d^3*e + (B*b^3*c^3 -
 2*A*b^2*c^4)*d^4)*x))/(b^4*c^5*x^4 + 2*b^5*c^4*x^3 + b^6*c^3*x^2) + (6*A*b
^2*d^2*e^2 - 3*(B*b*c - 2*A*c^2)*d^4 + 4*(B*b^2 - 3*A*b*c)*d^3*e)*log(x)/b
^5 - (6*A*b^2*c^3*d^2*e^2 - B*b^5*e^4 - 3*(B*b*c^4 - 2*A*c^5)*d^4 + 4*(B*b
^2*c^3 - 3*A*b*c^4)*d^3*e)*log(c*x + b)/(b^5*c^3)
```

Giac [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 432, normalized size of antiderivative = 1.84

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3}\,dx$$
$$= -\frac{(3\,Bbcd^4-6\,Ac^2d^4-4\,Bb^2d^3e+12\,Abcd^3e-6\,Ab^2d^2e^2)\log(|x|)}{b^5}$$
$$+\frac{(3\,Bbc^4d^4-6\,Ac^5d^4-4\,Bb^2c^3d^3e+12\,Abc^4d^3e-6\,Ab^2c^3d^2e^2+Bb^5e^4)\log(|cx+b|)}{b^5c^3}$$
$$-\frac{Ab^3c^3d^4+2\,(3\,Bbc^5d^4-6\,Ac^6d^4-4\,Bb^2c^4d^3e+12\,Abc^5d^3e-6\,Ab^2c^4d^2e^2+4\,Bb^4c^2de^3-2\,Bb^5ce^4+}{}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
-(3*B*b*c*d^4 - 6*A*c^2*d^4 - 4*B*b^2*d^3*e + 12*A*b*c*d^3*e - 6*A*b^2*d^2
*e^2)*log(abs(x))/b^5 + (3*B*b*c^4*d^4 - 6*A*c^5*d^4 - 4*B*b^2*c^3*d^3*e +
 12*A*b*c^4*d^3*e - 6*A*b^2*c^3*d^2*e^2 + B*b^5*e^4)*log(abs(c*x + b))/(b^
5*c^3) - 1/2*(A*b^3*c^3*d^4 + 2*(3*B*b*c^5*d^4 - 6*A*c^6*d^4 - 4*B*b^2*c^4
*d^3*e + 12*A*b*c^5*d^3*e - 6*A*b^2*c^4*d^2*e^2 + 4*B*b^4*c^2*d*e^3 - 2*B*
b^5*c*e^4 + A*b^4*c^2*e^4)*x^3 + (9*B*b^2*c^4*d^4 - 18*A*b*c^5*d^4 - 12*B*
b^3*c^3*d^3*e + 36*A*b^2*c^4*d^3*e + 6*B*b^4*c^2*d^2*e^2 - 18*A*b^3*c^3*d^
2*e^2 + 4*B*b^5*c*d*e^3 + 4*A*b^4*c^2*d*e^3 - 3*B*b^6*e^4 + A*b^5*c*e^4)*x
^2 + 2*(B*b^3*c^3*d^4 - 2*A*b^2*c^4*d^4 + 4*A*b^3*c^3*d^3*e)*x)/((c*x + b)
^2*b^4*c^3*x^2)
```

Mupad [B] (verification not implemented)

Time = 10.97 (sec) , antiderivative size = 403, normalized size of antiderivative = 1.71

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3}\,dx$$
$$= \frac{\ln(x)\,\left(b^2\,\left(4\,B\,d^3\,e+6\,A\,d^2\,e^2\right)-b\,\left(3\,B\,c\,d^4+12\,A\,c\,e\,d^3\right)+6\,A\,c^2\,d^4\right)}{b^5}$$
$$-\frac{\frac{A\,d^4}{2\,b}+\frac{x^2\,\left(-3\,B\,b^5\,e^4+4\,B\,b^4\,c\,d\,e^3+A\,b^4\,c\,e^4+6\,B\,b^3\,c^2\,d^2\,e^2+4\,A\,b^3\,c^2\,d\,e^3-12\,B\,b^2\,c^3\,d^3\,e-18\,A\,b^2\,c^3\,d^2\,e^2+9\,B\,b\,c^4\,d^4+36\,A\,b\,c^4\,d^3\,e-\cdots}{2\,b^3\,c^3}}{b^2\,x^2+\cdots}$$
$$+\frac{\ln(b+c\,x)\,\left(b\,e-c\,d\right)^2\,\left(B\,b^3\,e^2+2\,B\,b^2\,c\,d\,e+3\,B\,b\,c^2\,d^2-6\,A\,c^3\,d^2\right)}{b^5\,c^3}$$

input
```
int(((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^3,x)
```

output
```
(log(x)*(b^2*(6*A*d^2*e^2 + 4*B*d^3*e) - b*(3*B*c*d^4 + 12*A*c*d^3*e) + 6*
A*c^2*d^4))/b^5 - ((A*d^4)/(2*b) + (x^2*(A*b^4*c*e^4 - 3*B*b^5*e^4 - 18*A*
c^5*d^4 + 9*B*b*c^4*d^4 + 4*A*b^3*c^2*d*e^3 - 12*B*b^2*c^3*d^3*e - 18*A*b^
2*c^3*d^2*e^2 + 6*B*b^3*c^2*d^2*e^2 + 36*A*b*c^4*d^3*e + 4*B*b^4*c*d*e^3))
/(2*b^3*c^3) - (x^3*(6*A*c^5*d^4 + 2*B*b^5*e^4 - A*b^4*c*e^4 - 3*B*b*c^4*d
^4 + 4*B*b^2*c^3*d^3*e + 6*A*b^2*c^3*d^2*e^2 - 12*A*b*c^4*d^3*e - 4*B*b^4*
c*d*e^3))/(b^4*c^2) + (d^3*x*(4*A*b*e - 2*A*c*d + B*b*d))/b^2)/(b^2*x^2 +
c^2*x^4 + 2*b*c*x^3) + (log(b + c*x)*(b*e - c*d)^2*(B*b^3*e^2 - 6*A*c^3*d^
2 + 3*B*b*c^2*d^2 + 2*B*b^2*c*d*e))/(b^5*c^3)
```

Reduce [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 947, normalized size of antiderivative = 4.03

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^3,x)
```

output
```
( - 12*log(b + c*x)*a*b**4*c**3*d**2*e**2*x**2 + 24*log(b + c*x)*a*b**3*c*
*4*d**3*e*x**2 - 24*log(b + c*x)*a*b**3*c**4*d**2*e**2*x**3 - 12*log(b + c
*x)*a*b**2*c**5*d**4*x**2 + 48*log(b + c*x)*a*b**2*c**5*d**3*e*x**3 - 12*l
og(b + c*x)*a*b**2*c**5*d**2*e**2*x**4 - 24*log(b + c*x)*a*b*c**6*d**4*x**
3 + 24*log(b + c*x)*a*b*c**6*d**3*e*x**4 - 12*log(b + c*x)*a*c**7*d**4*x**
4 + 2*log(b + c*x)*b**8*e**4*x**2 + 4*log(b + c*x)*b**7*c*e**4*x**3 + 2*lo
g(b + c*x)*b**6*c**2*e**4*x**4 - 8*log(b + c*x)*b**5*c**3*d**3*e*x**2 + 6*
log(b + c*x)*b**4*c**4*d**4*x**2 - 16*log(b + c*x)*b**4*c**4*d**3*e*x**3 +
 12*log(b + c*x)*b**3*c**5*d**4*x**3 - 8*log(b + c*x)*b**3*c**5*d**3*e*x**
4 + 6*log(b + c*x)*b**2*c**6*d**4*x**4 + 12*log(x)*a*b**4*c**3*d**2*e**2*x
**2 - 24*log(x)*a*b**3*c**4*d**3*e*x**2 + 24*log(x)*a*b**3*c**4*d**2*e**2*
x**3 + 12*log(x)*a*b**2*c**5*d**4*x**2 - 48*log(x)*a*b**2*c**5*d**3*e*x**3
 + 12*log(x)*a*b**2*c**5*d**2*e**2*x**4 + 24*log(x)*a*b*c**6*d**4*x**3 - 2
4*log(x)*a*b*c**6*d**3*e*x**4 + 12*log(x)*a*c**7*d**4*x**4 + 8*log(x)*b**5
*c**3*d**3*e*x**2 - 6*log(x)*b**4*c**4*d**4*x**2 + 16*log(x)*b**4*c**4*d**
3*e*x**3 - 12*log(x)*b**3*c**5*d**4*x**3 + 8*log(x)*b**3*c**5*d**3*e*x**4
- 6*log(x)*b**2*c**6*d**4*x**4 - 4*a*b**5*c**2*d*e**3*x**2 - a*b**4*c**3*d
**4 - 8*a*b**4*c**3*d**3*e*x + 12*a*b**4*c**3*d**2*e**2*x**2 + a*b**4*c**3
*e**4*x**4 + 4*a*b**3*c**4*d**4*x - 24*a*b**3*c**4*d**3*e*x**2 + 12*a*b**2
*c**5*d**4*x**2 - 6*a*b**2*c**5*d**2*e**2*x**4 + 12*a*b*c**6*d**3*e*x**...
```

3.47 $\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 185

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx =& -\frac{Ad^3}{2b^3x^2}-\frac{d^2(bBd-3Acd+3Abe)}{b^4x}-\frac{(bB-Ac)(cd-be)^3}{2b^3c^2(b+cx)^2}\\&-\frac{(cd-be)^2\,(2bBcd-3Ac^2d+b^2Be)}{b^4c^2(b+cx)}\\&-\frac{3d(cd-be)(bBd-2Acd+Abe)\log(x)}{b^5}\\&+\frac{3d(cd-be)(bBd-2Acd+Abe)\log(b+cx)}{b^5}\end{aligned}$$

output

```
-1/2*A*d^3/b^3/x^2-d^2*(3*A*b*e-3*A*c*d+B*b*d)/b^4/x-1/2*(-A*c+B*b)*(-b*e+
c*d)^3/b^3/c^2/(c*x+b)^2-(-b*e+c*d)^2*(-3*A*c^2*d+B*b^2*e+2*B*b*c*d)/b^4/c
^2/(c*x+b)-3*d*(-b*e+c*d)*(A*b*e-2*A*c*d+B*b*d)*ln(x)/b^5+3*d*(-b*e+c*d)*(
A*b*e-2*A*c*d+B*b*d)*ln(c*x+b)/b^5
```

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 177, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx = -\frac{\frac{Ab^2d^3}{x^2}+\frac{2bd^2(bBd-3Acd+3Abe)}{x}-\frac{b^2(bB-Ac)(-cd+be)^3}{c^2(b+cx)^2}+\frac{2b(cd-be)^2(2bBcd-3Ac^2d+b^2Be)}{c^2(b+cx)}-6d(-cd+be)(bBd-2A}{2b^5}$$

input
```
Integrate[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^3,x]
```

output
```
-1/2*((A*b^2*d^3)/x^2 + (2*b*d^2*(b*B*d - 3*A*c*d + 3*A*b*e))/x - (b^2*(b*
B - A*c)*(-(c*d) + b*e)^3)/(c^2*(b + c*x)^2) + (2*b*(c*d - b*e)^2*(2*b*B*c
*d - 3*A*c^2*d + b^2*B*e))/(c^2*(b + c*x)) - 6*d*(-(c*d) + b*e)*(b*B*d - 2
*A*c*d + A*b*e)*Log[x] + 6*d*(-(c*d) + b*e)*(b*B*d - 2*A*c*d + A*b*e)*Log[
b + c*x])/b^5
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1206, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx$$

$$\Big\downarrow \text{1206}$$

$$\int \left(\frac{3d(be-cd)(Abe-2Acd+bBd)}{b^5x}-\frac{3cd(be-cd)(Abe-2Acd+bBd)}{b^5(b+cx)}+\frac{d^2(3Abe-3Acd+bBd)}{b^4x^2}-\frac{(bB-A}{b^3c}\right.$$

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

$$-\frac{3d\log(x)(cd-be)(Abe-2Acd+bBd)}{b^5}+\frac{3d(cd-be)\log(b+cx)(Abe-2Acd+bBd)}{b^5}-\frac{d^2(3Abe-3Acd+bBd)}{b^4x}-\frac{(bB-Ac)(cd-be)^3}{2b^3c^2(b+cx)^2}-\frac{Ad^3}{2b^3x^2}-\frac{(cd-be)^2\left(-3Ac^2d+b^2Be+2bBcd\right)}{b^4c^2(b+cx)}$$

input
```
Int[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^3,x]
```

output
```
-1/2*(A*d^3)/(b^3*x^2) - (d^2*(b*B*d - 3*A*c*d + 3*A*b*e))/(b^4*x) - ((b*B
 - A*c)*(c*d - b*e)^3)/(2*b^3*c^2*(b + c*x)^2) - ((c*d - b*e)^2*(2*b*B*c*d
 - 3*A*c^2*d + b^2*B*e))/(b^4*c^2*(b + c*x)) - (3*d*(c*d - b*e)*(b*B*d - 2
*A*c*d + A*b*e)*Log[x])/b^5 + (3*d*(c*d - b*e)*(b*B*d - 2*A*c*d + A*b*e)*L
og[b + c*x])/b^5
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.72

method	result
norman	$\frac{\frac{\left(3A b^2c^2d e^2-9Ab c^3d^2e+6A c^4d^3-b^4B e^3+3B b^2d^2e c^2-3Bb d^3c^3\right)x^3}{b^4c}-\frac{A d^3}{2b}-\frac{d^2(3Abe-2Acd+Bbd)x}{b^2}-\frac{(A b^3e^3c-9A b^2c^2d e^2+27Ab}{}}{x^2(cx+b)^2}$
default	$-\frac{-3A b^2c^2d e^2+6Ab c^3d^2e-3A c^4d^3+b^4B e^3-3B b^2d^2e c^2+2Bb d^3c^3}{b^4c^2(cx+b)}-\frac{A b^3e^3c-3A b^2c^2d e^2+3Ab c^3d^2e-A c^4d^3-b^4B e}{2c^2b^3(cx+b)}$
risch	$\frac{\frac{\left(3A b^2c^2d e^2-9Ab c^3d^2e+6A c^4d^3-b^4B e^3+3B b^2d^2e c^2-3Bb d^3c^3\right)x^3}{b^4c}-\frac{A d^3}{2b}-\frac{d^2(3Abe-2Acd+Bbd)x}{b^2}-\frac{(A b^3e^3c-9A b^2c^2d e^2+27Ab}{}}{x^2(cx+b)^2}$
parallelrisch	$\frac{-2B x^3b^5c e^3-6B x^3b^2c^4d^3-A x^2b^5c e^3+18A x^2b^2c^4d^3-9B x^2b^3c^3d^3+4Ax b^3c^3d^3-2Bx b^4c^2d^3+12A\ln(x)x^4c^6d^3-12A\ln}{}$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
((3*A*b^2*c^2*d*e^2-9*A*b*c^3*d^2*e+6*A*c^4*d^3-B*b^4*e^3+3*B*b^2*c^2*d^2*
e-3*B*b*c^3*d^3)/b^4/c*x^3-1/2*A/b*d^3-d^2*(3*A*b*e-2*A*c*d+B*b*d)/b^2*x-1
/2*(A*b^3*c*e^3-9*A*b^2*c^2*d*e^2+27*A*b*c^3*d^2*e-18*A*c^4*d^3+B*b^4*e^3+
3*B*b^3*c*d*e^2-9*B*b^2*c^2*d^2*e+9*B*b*c^3*d^3)/b^3/c^2*x^2)/x^2/(c*x+b)^
2+3*d*(A*b^2*e^2-3*A*b*c*d*e+2*A*c^2*d^2+B*b^2*d*e-B*b*c*d^2)/b^5*ln(x)-3*
d*(A*b^2*e^2-3*A*b*c*d*e+2*A*c^2*d^2+B*b^2*d*e-B*b*c*d^2)/b^5*ln(c*x+b)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 627 vs. 2(181) = 362.

Time = 0.09 (sec) , antiderivative size = 627, normalized size of antiderivative = 3.39

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx =$$
$$-\frac{Ab^4c^2d^3-2\left(3\,Ab^3c^3de^2-Bb^5ce^3-3\,(Bb^2c^4-2\,Abc^5)d^3+3\,(Bb^3c^3-3\,Ab^2c^4)d^2e\right)x^3+(9\,(Bb^3c^3-}{}$$

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

output
```
-1/2*(A*b^4*c^2*d^3 - 2*(3*A*b^3*c^3*d*e^2 - B*b^5*c*e^3 - 3*(B*b^2*c^4 -
2*A*b*c^5)*d^3 + 3*(B*b^3*c^3 - 3*A*b^2*c^4)*d^2*e)*x^3 + (9*(B*b^3*c^3 -
2*A*b^2*c^4)*d^3 - 9*(B*b^4*c^2 - 3*A*b^3*c^3)*d^2*e + 3*(B*b^5*c - 3*A*b^
4*c^2)*d*e^2 + (B*b^6 + A*b^5*c)*e^3)*x^2 + 2*(3*A*b^4*c^2*d^2*e + (B*b^4*
c^2 - 2*A*b^3*c^3)*d^3)*x + 6*((A*b^2*c^4*d*e^2 - (B*b*c^5 - 2*A*c^6)*d^3
+ (B*b^2*c^4 - 3*A*b*c^5)*d^2*e)*x^4 + 2*(A*b^3*c^3*d*e^2 - (B*b^2*c^4 - 2
*A*b*c^5)*d^3 + (B*b^3*c^3 - 3*A*b^2*c^4)*d^2*e)*x^3 + (A*b^4*c^2*d*e^2 -
(B*b^3*c^3 - 2*A*b^2*c^4)*d^3 + (B*b^4*c^2 - 3*A*b^3*c^3)*d^2*e)*x^2)*log(
c*x + b) - 6*((A*b^2*c^4*d*e^2 - (B*b*c^5 - 2*A*c^6)*d^3 + (B*b^2*c^4 - 3*
A*b*c^5)*d^2*e)*x^4 + 2*(A*b^3*c^3*d*e^2 - (B*b^2*c^4 - 2*A*b*c^5)*d^3 + (
B*b^3*c^3 - 3*A*b^2*c^4)*d^2*e)*x^3 + (A*b^4*c^2*d*e^2 - (B*b^3*c^3 - 2*A*
b^2*c^4)*d^3 + (B*b^4*c^2 - 3*A*b^3*c^3)*d^2*e)*x^2)*log(x))/(b^5*c^4*x^4
+ 2*b^6*c^3*x^3 + b^7*c^2*x^2)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 653 vs. $2(187) = 374$.

Time = 14.47 (sec) , antiderivative size = 653, normalized size of antiderivative = 3.53

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx$$
$$= \frac{-Ab^3c^2d^3 + x^3\cdot(6Ab^2c^3de^2 - 18Abc^4d^2e + 12Ac^5d^3 - 2Bb^4ce^3 + 6Bb^2c^3d^2e - 6Bbc^4d^3) + x^2(-Ab^4ce^3}{2}$$
$$+ \frac{3d(be-cd)\,(Abe-2Acd+Bbd)\log\left(x + \frac{3Ab^3de^2-9Ab^2cd^2e+6Abc^2d^3+3Bb^3d^2e-3Bb^2cd^3-3bd(be-cd)(Abe-2Acd+Bb}{6Ab^2cde^2-18Abc^2d^2e+12Ac^3d^3+6Bb^2cd^2e-6Bbc^2d^3}\right.}{b^5}$$
$$- \frac{3d(be-cd)\,(Abe-2Acd+Bbd)\log\left(x + \frac{3Ab^3de^2-9Ab^2cd^2e+6Abc^2d^3+3Bb^3d^2e-3Bb^2cd^3+3bd(be-cd)(Abe-2Acd+Bb}{6Ab^2cde^2-18Abc^2d^2e+12Ac^3d^3+6Bb^2cd^2e-6Bbc^2d^3}\right.}{b^5}$$

input
```
integrate((B*x+A)*(e*x+d)**3/(c*x**2+b*x)**3,x)
```

output
```
(-A*b**3*c**2*d**3 + x**3*(6*A*b**2*c**3*d*e**2 - 18*A*b*c**4*d**2*e + 12*
A*c**5*d**3 - 2*B*b**4*c*e**3 + 6*B*b**2*c**3*d**2*e - 6*B*b*c**4*d**3) +
x**2*(-A*b**4*c*e**3 + 9*A*b**3*c**2*d*e**2 - 27*A*b**2*c**3*d**2*e + 18*A
*b*c**4*d**3 - B*b**5*e**3 - 3*B*b**4*c*d*e**2 + 9*B*b**3*c**2*d**2*e - 9*
B*b**2*c**3*d**3) + x*(-6*A*b**3*c**2*d**2*e + 4*A*b**2*c**3*d**3 - 2*B*b*
*3*c**2*d**3))/(2*b**6*c**2*x**2 + 4*b**5*c**3*x**3 + 2*b**4*c**4*x**4) +
3*d*(b*e - c*d)*(A*b*e - 2*A*c*d + B*b*d)*log(x + (3*A*b**3*d*e**2 - 9*A*b
**2*c*d**2*e + 6*A*b*c**2*d**3 + 3*B*b**3*d**2*e - 3*B*b**2*c*d**3 - 3*b*d
*(b*e - c*d)*(A*b*e - 2*A*c*d + B*b*d))/(6*A*b**2*c*d*e**2 - 18*A*b*c**2*d
**2*e + 12*A*c**3*d**3 + 6*B*b**2*c*d**2*e - 6*B*b*c**2*d**3))/b**5 - 3*d*
(b*e - c*d)*(A*b*e - 2*A*c*d + B*b*d)*log(x + (3*A*b**3*d*e**2 - 9*A*b**2*
c*d**2*e + 6*A*b*c**2*d**3 + 3*B*b**3*d**2*e - 3*B*b**2*c*d**3 + 3*b*d*(b*
e - c*d)*(A*b*e - 2*A*c*d + B*b*d))/(6*A*b**2*c*d*e**2 - 18*A*b*c**2*d**2*
e + 12*A*c**3*d**3 + 6*B*b**2*c*d**2*e - 6*B*b*c**2*d**3))/b**5
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 347, normalized size of antiderivative = 1.88

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx = -\frac{Ab^3c^2d^3 - 2\,(3\,Ab^2c^3de^2 - Bb^4ce^3 - 3\,(Bbc^4 - 2\,Ac^5)d^3 + 3\,(Bb^2c^3 - 3\,Abc^4)d^2e)x^3 + (9\,(Bb^2c^3 - 2\,A}{2\,(b^4c} - \frac{3\,(Ab^2de^2 - (Bbc - 2\,Ac^2)d^3 + (Bb^2 - 3\,Abc)d^2e)\log(cx+b)}{b^5} + \frac{3\,(Ab^2de^2 - (Bbc - 2\,Ac^2)d^3 + (Bb^2 - 3\,Abc)d^2e)\log(x)}{b^5}$$

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

output
```
-1/2*(A*b^3*c^2*d^3 - 2*(3*A*b^2*c^3*d*e^2 - B*b^4*c*e^3 - 3*(B*b*c^4 - 2*
A*c^5)*d^3 + 3*(B*b^2*c^3 - 3*A*b*c^4)*d^2*e)*x^3 + (9*(B*b^2*c^3 - 2*A*b*
c^4)*d^3 - 9*(B*b^3*c^2 - 3*A*b^2*c^3)*d^2*e + 3*(B*b^4*c - 3*A*b^3*c^2)*d
*e^2 + (B*b^5 + A*b^4*c)*e^3)*x^2 + 2*(3*A*b^3*c^2*d^2*e + (B*b^3*c^2 - 2*
A*b^2*c^3)*d^3)*x)/(b^4*c^4*x^4 + 2*b^5*c^3*x^3 + b^6*c^2*x^2) - 3*(A*b^2*
d*e^2 - (B*b*c - 2*A*c^2)*d^3 + (B*b^2 - 3*A*b*c)*d^2*e)*log(c*x + b)/b^5
+ 3*(A*b^2*d*e^2 - (B*b*c - 2*A*c^2)*d^3 + (B*b^2 - 3*A*b*c)*d^2*e)*log(x)
/b^5
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 390 vs. $2(181) = 362$.

Time = 0.27 (sec) , antiderivative size = 390, normalized size of antiderivative = 2.11

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx$$
$$= -\frac{3\,(Bbcd^3-2\,Ac^2d^3-Bb^2d^2e+3\,Abcd^2e-Ab^2de^2)\log(|x|)}{b^5}$$
$$+\frac{3\,(Bbc^2d^3-2\,Ac^3d^3-Bb^2cd^2e+3\,Abc^2d^2e-Ab^2cde^2)\log(|cx+b|)}{b^5c}$$
$$-\frac{6\,Bbc^4d^3x^3-12\,Ac^5d^3x^3-6\,Bb^2c^3d^2ex^3+18\,Abc^4d^2ex^3-6\,Ab^2c^3de^2x^3+2\,Bb^4ce^3x^3+9\,Bb^2c^3d^3x^2}{}$$

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

output
```
-3*(B*b*c*d^3 - 2*A*c^2*d^3 - B*b^2*d^2*e + 3*A*b*c*d^2*e - A*b^2*d*e^2)*l
og(abs(x))/b^5 + 3*(B*b*c^2*d^3 - 2*A*c^3*d^3 - B*b^2*c*d^2*e + 3*A*b*c^2*
d^2*e - A*b^2*c*d*e^2)*log(abs(c*x + b))/(b^5*c) - 1/2*(6*B*b*c^4*d^3*x^3
- 12*A*c^5*d^3*x^3 - 6*B*b^2*c^3*d^2*e*x^3 + 18*A*b*c^4*d^2*e*x^3 - 6*A*b^
2*c^3*d*e^2*x^3 + 2*B*b^4*c*e^3*x^3 + 9*B*b^2*c^3*d^3*x^2 - 18*A*b*c^4*d^3
*x^2 - 9*B*b^3*c^2*d^2*e*x^2 + 27*A*b^2*c^3*d^2*e*x^2 + 3*B*b^4*c*d*e^2*x^
2 - 9*A*b^3*c^2*d*e^2*x^2 + B*b^5*e^3*x^2 + A*b^4*c*e^3*x^2 + 2*B*b^3*c^2*
d^3*x - 4*A*b^2*c^3*d^3*x + 6*A*b^3*c^2*d^2*e*x + A*b^3*c^2*d^3)/((c*x^2 +
 b*x)^2*b^4*c^2)
```

Mupad [B] (verification not implemented)

Time = 10.99 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.86

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx =$$
$$-\frac{\frac{A\,d^3}{2\,b}-\frac{x^3\,(-B\,b^4\,e^3+3\,B\,b^2\,c^2\,d^2\,e+3\,A\,b^2\,c^2\,d\,e^2-3\,B\,b\,c^3\,d^3-9\,A\,b\,c^3\,d^2\,e+6\,A\,c^4\,d^3)}{b^4\,c}+\frac{x^2\,(B\,b^4\,e^3+3\,B\,b^3\,c\,d\,e^2+A\,b^3\,c\,e^3-9\,B\,b^2\,c^2}{}}{b^2\,x^2+2\,b\,c\,x^3+c^2\,x^4}$$
$$-\frac{6\,d\,\mathrm{atanh}\left(\frac{3\,d\,(b\,e-c\,d)\,(b+2\,c\,x)\,(A\,b\,e-2\,A\,c\,d+B\,b\,d)}{b\,(3\,B\,b^2\,d^2\,e+3\,A\,b^2\,d\,e^2-3\,B\,b\,c\,d^3-9\,A\,b\,c\,d^2\,e+6\,A\,c^2\,d^3)}\right)\,(b\,e-c\,d)\,(A\,b\,e-2\,A\,c\,d+B\,b\,d)}{b^5}$$

input
```
int(((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^3,x)
```

output
```
- ((A*d^3)/(2*b) - (x^3*(6*A*c^4*d^3 - B*b^4*e^3 - 3*B*b*c^3*d^3 + 3*A*b^2
*c^2*d*e^2 + 3*B*b^2*c^2*d^2*e - 9*A*b*c^3*d^2*e))/(b^4*c) + (x^2*(B*b^4*e
^3 - 18*A*c^4*d^3 + A*b^3*c*e^3 + 9*B*b*c^3*d^3 - 9*A*b^2*c^2*d*e^2 - 9*B*
b^2*c^2*d^2*e + 27*A*b*c^3*d^2*e + 3*B*b^3*c*d*e^2))/(2*b^3*c^2) + (d^2*x*
(3*A*b*e - 2*A*c*d + B*b*d))/b^2)/(b^2*x^2 + c^2*x^4 + 2*b*c*x^3) - (6*d*a
tanh((3*d*(b*e - c*d)*(b + 2*c*x)*(A*b*e - 2*A*c*d + B*b*d))/(b*(6*A*c^2*d
^3 - 3*B*b*c*d^3 + 3*A*b^2*d*e^2 + 3*B*b^2*d^2*e - 9*A*b*c*d^2*e)))*(b*e -
 c*d)*(A*b*e - 2*A*c*d + B*b*d))/b^5
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 807, normalized size of antiderivative = 4.36

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^3,x)
```

output
```
( - 6*log(b + c*x)*a*b**4*c*d*e**2*x**2 + 18*log(b + c*x)*a*b**3*c**2*d**2
*e*x**2 - 12*log(b + c*x)*a*b**3*c**2*d*e**2*x**3 - 12*log(b + c*x)*a*b**2
*c**3*d**3*x**2 + 36*log(b + c*x)*a*b**2*c**3*d**2*e*x**3 - 6*log(b + c*x)
*a*b**2*c**3*d*e**2*x**4 - 24*log(b + c*x)*a*b*c**4*d**3*x**3 + 18*log(b +
 c*x)*a*b*c**4*d**2*e*x**4 - 12*log(b + c*x)*a*c**5*d**3*x**4 - 6*log(b +
c*x)*b**5*c*d**2*e*x**2 + 6*log(b + c*x)*b**4*c**2*d**3*x**2 - 12*log(b +
c*x)*b**4*c**2*d**2*e*x**3 + 12*log(b + c*x)*b**3*c**3*d**3*x**3 - 6*log(b
 + c*x)*b**3*c**3*d**2*e*x**4 + 6*log(b + c*x)*b**2*c**4*d**3*x**4 + 6*log
(x)*a*b**4*c*d*e**2*x**2 - 18*log(x)*a*b**3*c**2*d**2*e*x**2 + 12*log(x)*a
*b**3*c**2*d*e**2*x**3 + 12*log(x)*a*b**2*c**3*d**3*x**2 - 36*log(x)*a*b**
2*c**3*d**2*e*x**3 + 6*log(x)*a*b**2*c**3*d*e**2*x**4 + 24*log(x)*a*b*c**4
*d**3*x**3 - 18*log(x)*a*b*c**4*d**2*e*x**4 + 12*log(x)*a*c**5*d**3*x**4 +
 6*log(x)*b**5*c*d**2*e*x**2 - 6*log(x)*b**4*c**2*d**3*x**2 + 12*log(x)*b*
*4*c**2*d**2*e*x**3 - 12*log(x)*b**3*c**3*d**3*x**3 + 6*log(x)*b**3*c**3*d
**2*e*x**4 - 6*log(x)*b**2*c**4*d**3*x**4 - a*b**5*e**3*x**2 - a*b**4*c*d*
*3 - 6*a*b**4*c*d**2*e*x + 6*a*b**4*c*d*e**2*x**2 + 4*a*b**3*c**2*d**3*x -
 18*a*b**3*c**2*d**2*e*x**2 + 12*a*b**2*c**3*d**3*x**2 - 3*a*b**2*c**3*d*e
**2*x**4 + 9*a*b*c**4*d**2*e*x**4 - 6*a*c**5*d**3*x**4 - 3*b**6*d*e**2*x**
2 - 2*b**5*c*d**3*x + 6*b**5*c*d**2*e*x**2 + b**5*c*e**3*x**4 - 6*b**4*c**
2*d**3*x**2 - 3*b**3*c**3*d**2*e*x**4 + 3*b**2*c**4*d**3*x**4)/(2*b**5*...
```

3.48 $\int \frac{(A+Bx)(d+ex)^2}{\left(bx+cx^2\right)^3} \, dx$

Optimal result

Integrand size = 24, antiderivative size = 198

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^3} \, dx = &-\frac{Ad^2}{2b^3x^2} - \frac{d(bBd-3Acd+2Abe)}{b^4x} \\ &- \frac{(bB-Ac)(cd-be)^2}{2b^3c(b+cx)^2} - \frac{(cd-be)(2bBd-3Acd+Abe)}{b^4(b+cx)} \\ &+ \frac{(6Ac^2d^2+b^2e(2Bd+Ae)-3bcd(Bd+2Ae))\log(x)}{b^5} \\ &- \frac{(6Ac^2d^2+b^2e(2Bd+Ae)-3bcd(Bd+2Ae))\log(b+cx)}{b^5}\end{aligned}$$

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

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 190, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^3}\,dx = -\frac{\frac{Ab^2d^2}{x^2}+\frac{2bd(bBd-3Acd+2Abe)}{x}+\frac{b^2(bB-Ac)(cd-be)^2}{c(b+cx)^2}-\frac{2b(-cd+be)(2bBd-3Acd+Abe)}{b+cx}-2(6Ac^2d^2+b^2e(2Bd+Ae)}{2b^5}$$

input
```
Integrate[((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^3,x]
```

output
```
-1/2*((A*b^2*d^2)/x^2 + (2*b*d*(b*B*d - 3*A*c*d + 2*A*b*e))/x + (b^2*(b*B
- A*c)*(c*d - b*e)^2)/(c*(b + c*x)^2) - (2*b*(-(c*d) + b*e)*(2*b*B*d - 3*A
*c*d + A*b*e))/(b + c*x) - 2*(6*A*c^2*d^2 + b^2*e*(2*B*d + A*e) - 3*b*c*d*
(B*d + 2*A*e))*Log[x] + 2*(6*A*c^2*d^2 + b^2*e*(2*B*d + A*e) - 3*b*c*d*(B*
d + 2*A*e))*Log[b + c*x])/b^5
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 198, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1206, 2009}

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

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^3}\,dx$$

$$\Big\downarrow \text{1206}$$

$$\int \left(\frac{d(2Abe-3Acd+bBd)}{b^4x^2}-\frac{c(be-cd)(Abe-3Acd+2bBd)}{b^4(b+cx)^2}+\frac{(bB-Ac)(be-cd)^2}{b^3(b+cx)^3}+\frac{Ad^2}{b^3x^3}+\frac{b^2e(Ae+2Bd}{}\right.$$

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

$$-\frac{d(2Abe-3Acd+bBd)}{b^4x}-\frac{(cd-be)(Abe-3Acd+2bBd)}{b^4(b+cx)}-\frac{(bB-Ac)(cd-be)^2}{2b^3c(b+cx)^2}-\frac{Ad^2}{2b^3x^2}+\frac{\log(x)\left(b^2e(Ae+2Bd)-3bcd(2Ae+Bd)+6Ac^2d^2\right)}{b^5}-\frac{\log(b+cx)\left(b^2e(Ae+2Bd)-3bcd(2Ae+Bd)+6Ac^2d^2\right)}{b^5}$$

input
```
Int[((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^3,x]
```

output
```
-1/2*(A*d^2)/(b^3*x^2) - (d*(b*B*d - 3*A*c*d + 2*A*b*e))/(b^4*x) - ((b*B -
 A*c)*(c*d - b*e)^2)/(2*b^3*c*(b + c*x)^2) - ((c*d - b*e)*(2*b*B*d - 3*A*c
*d + A*b*e))/(b^4*(b + c*x)) + ((6*A*c^2*d^2 + b^2*e*(2*B*d + A*e) - 3*b*c
*d*(B*d + 2*A*e))*Log[x])/b^5 - ((6*A*c^2*d^2 + b^2*e*(2*B*d + A*e) - 3*b*
c*d*(B*d + 2*A*e))*Log[b + c*x])/b^5
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.84 (sec) , antiderivative size = 259, normalized size of antiderivative = 1.31

method	result
default	$-\frac{-A\,b^{2}c\,e^{2}+2Ab\,c^{2}de-A\,c^{3}d^{2}+b^{3}B\,e^{2}-2B\,b^{2}cde+Bb\,c^{2}d^{2}}{2b^{3}c(cx+b)^{2}}-\frac{\left(A\,b^{2}e^{2}-6Abcde+6A\,c^{2}d^{2}+2B\,b^{2}de-3Bbc\,d^{2}\right)\ln(cx+b)}{b^{5}}-$
norman	$\frac{\frac{\left(A\,b^{2}c^{2}e^{2}-6Ab\,c^{3}de+6A\,c^{4}d^{2}+2B\,b^{2}c^{2}de-3Bb\,c^{3}d^{2}\right)x^{3}}{b^{4}c}-\frac{A\,d^{2}}{2b}-\frac{d(2Abe-2Acd+Bbd)x}{b^{2}}+\frac{\left(3A\,b^{2}c^{2}e^{2}-18Ab\,c^{3}de+18A\,c^{4}d^{2}-B\,b^{3}c\,e^{2}-\right.}{2b^{3}c^{2}}}{x^{2}(cx+b)^{2}}$
risch	$\frac{\frac{c\left(A\,b^{2}e^{2}-6Abcde+6A\,c^{2}d^{2}+2B\,b^{2}de-3Bbc\,d^{2}\right)x^{3}}{b^{4}}+\frac{\left(3A\,b^{2}c\,e^{2}-18Ab\,c^{2}de+18A\,c^{3}d^{2}-b^{3}B\,e^{2}+6B\,b^{2}cde-9Bb\,c^{2}d^{2}\right)x^{2}}{2b^{3}c}-\frac{d(2Abe-2Ac}{b^{2}}}{x^{2}(cx+b)^{2}}$
parallelrisch	$\frac{8B\ln(x)x^{3}b^{3}c^{3}de-8B\ln(cx+b)x^{3}b^{3}c^{3}de+12A\ln(cx+b)x^{4}b\,c^{5}de-12A\ln(x)x^{2}b^{3}c^{3}de+12A\ln(cx+b)x^{2}b^{3}c^{3}de+4B\ln(x)x^{2}b}{}$

input
```
int((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

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

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 558 vs. 2(194) = 388.

Time = 0.09 (sec) , antiderivative size = 558, normalized size of antiderivative = 2.82

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^3}\,dx =$$
$$-\frac{Ab^4cd^2-2\left(Ab^3c^2e^2-3\left(Bb^2c^3-2\,Abc^4\right)d^2+2\left(Bb^3c^2-3\,Ab^2c^3\right)de\right)x^3+\left(9\left(Bb^3c^2-2\,Ab^2c^3\right)d^2-6\right.}{}$$

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

output
```
-1/2*(A*b^4*c*d^2 - 2*(A*b^3*c^2*e^2 - 3*(B*b^2*c^3 - 2*A*b*c^4)*d^2 + 2*(
B*b^3*c^2 - 3*A*b^2*c^3)*d*e)*x^3 + (9*(B*b^3*c^2 - 2*A*b^2*c^3)*d^2 - 6*(
B*b^4*c - 3*A*b^3*c^2)*d*e + (B*b^5 - 3*A*b^4*c)*e^2)*x^2 + 2*(2*A*b^4*c*d
*e + (B*b^4*c - 2*A*b^3*c^2)*d^2)*x + 2*((A*b^2*c^3*e^2 - 3*(B*b*c^4 - 2*A
*c^5)*d^2 + 2*(B*b^2*c^3 - 3*A*b*c^4)*d*e)*x^4 + 2*(A*b^3*c^2*e^2 - 3*(B*b
^2*c^3 - 2*A*b*c^4)*d^2 + 2*(B*b^3*c^2 - 3*A*b^2*c^3)*d*e)*x^3 + (A*b^4*c*
e^2 - 3*(B*b^3*c^2 - 2*A*b^2*c^3)*d^2 + 2*(B*b^4*c - 3*A*b^3*c^2)*d*e)*x^2
)*log(c*x + b) - 2*((A*b^2*c^3*e^2 - 3*(B*b*c^4 - 2*A*c^5)*d^2 + 2*(B*b^2*
c^3 - 3*A*b*c^4)*d*e)*x^4 + 2*(A*b^3*c^2*e^2 - 3*(B*b^2*c^3 - 2*A*b*c^4)*d
^2 + 2*(B*b^3*c^2 - 3*A*b^2*c^3)*d*e)*x^3 + (A*b^4*c*e^2 - 3*(B*b^3*c^2 -
2*A*b^2*c^3)*d^2 + 2*(B*b^4*c - 3*A*b^3*c^2)*d*e)*x^2)*log(x))/(b^5*c^3*x^
4 + 2*b^6*c^2*x^3 + b^7*c*x^2)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 660 vs. $2(197) = 394$.

Time = 5.05 (sec) , antiderivative size = 660, normalized size of antiderivative = 3.33

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^3}\,dx$$
$$= \frac{-Ab^3cd^2 + x^3\cdot(2Ab^2c^2e^2 - 12Abc^3de + 12Ac^4d^2 + 4Bb^2c^2de - 6Bbc^3d^2) + x^2\cdot(3Ab^3ce^2 - 18Ab^2c^2de \ldots}{2b^6cx^2 + 4b^5c^2x^3 + 2b^4c \ldots}$$
$$+ \frac{(Ab^2e^2 - 6Abcde + 6Ac^2d^2 + 2Bb^2de - 3Bbcd^2)\log\left(x + \frac{Ab^3e^2 - 6Ab^2cde + 6Abc^2d^2 + 2Bb^3de - 3Bb^2cd^2 - b(Ab^2e^2 - 6 \ldots}{2Ab^2ce^2 - 12Abc^2de + 12Ac^3d^2 + 4Bb^2 \ldots}\right.}{b^5}$$
$$- \frac{(Ab^2e^2 - 6Abcde + 6Ac^2d^2 + 2Bb^2de - 3Bbcd^2)\log\left(x + \frac{Ab^3e^2 - 6Ab^2cde + 6Abc^2d^2 + 2Bb^3de - 3Bb^2cd^2 + b(Ab^2e^2 - 6 \ldots}{2Ab^2ce^2 - 12Abc^2de + 12Ac^3d^2 + 4Bb^2 \ldots}\right.}{b^5}$$

input
```
integrate((B*x+A)*(e*x+d)**2/(c*x**2+b*x)**3,x)
```

output
```
(-A*b**3*c*d**2 + x**3*(2*A*b**2*c**2*e**2 - 12*A*b*c**3*d*e + 12*A*c**4*d
**2 + 4*B*b**2*c**2*d*e - 6*B*b*c**3*d**2) + x**2*(3*A*b**3*c*e**2 - 18*A*
b**2*c**2*d*e + 18*A*b*c**3*d**2 - B*b**4*e**2 + 6*B*b**3*c*d*e - 9*B*b**2
*c**2*d**2) + x*(-4*A*b**3*c*d*e + 4*A*b**2*c**2*d**2 - 2*B*b**3*c*d**2))/
(2*b**6*c*x**2 + 4*b**5*c**2*x**3 + 2*b**4*c**3*x**4) + (A*b**2*e**2 - 6*A
*b*c*d*e + 6*A*c**2*d**2 + 2*B*b**2*d*e - 3*B*b*c*d**2)*log(x + (A*b**3*e*
*2 - 6*A*b**2*c*d*e + 6*A*b*c**2*d**2 + 2*B*b**3*d*e - 3*B*b**2*c*d**2 - b
*(A*b**2*e**2 - 6*A*b*c*d*e + 6*A*c**2*d**2 + 2*B*b**2*d*e - 3*B*b*c*d**2)
)/(2*A*b**2*c*e**2 - 12*A*b*c**2*d*e + 12*A*c**3*d**2 + 4*B*b**2*c*d*e - 6
*B*b*c**2*d**2))/b**5 - (A*b**2*e**2 - 6*A*b*c*d*e + 6*A*c**2*d**2 + 2*B*b
**2*d*e - 3*B*b*c*d**2)*log(x + (A*b**3*e**2 - 6*A*b**2*c*d*e + 6*A*b*c**2
*d**2 + 2*B*b**3*d*e - 3*B*b**2*c*d**2 + b*(A*b**2*e**2 - 6*A*b*c*d*e + 6*
A*c**2*d**2 + 2*B*b**2*d*e - 3*B*b*c*d**2))/(2*A*b**2*c*e**2 - 12*A*b*c**2
*d*e + 12*A*c**3*d**2 + 4*B*b**2*c*d*e - 6*B*b*c**2*d**2))/b**5
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 293, normalized size of antiderivative = 1.48

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^3}\,dx =$$

$$-\frac{Ab^3cd^2 - 2\,(Ab^2c^2e^2 - 3\,(Bbc^3 - 2\,Ac^4)d^2 + 2\,(Bb^2c^2 - 3\,Abc^3)de)x^3 + (9\,(Bb^2c^2 - 2\,Abc^3)d^2 - 6\,(Bb}{2\,(b^4c^3x^4 + 2\,b^5c^2x^3 + b^6cx}$$

$$-\frac{(Ab^2e^2 - 3\,(Bbc - 2\,Ac^2)d^2 + 2\,(Bb^2 - 3\,Abc)de)\log(cx+b)}{b^5}$$

$$+\frac{(Ab^2e^2 - 3\,(Bbc - 2\,Ac^2)d^2 + 2\,(Bb^2 - 3\,Abc)de)\log(x)}{b^5}$$

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

output
```
-1/2*(A*b^3*c*d^2 - 2*(A*b^2*c^2*e^2 - 3*(B*b*c^3 - 2*A*c^4)*d^2 + 2*(B*b^
2*c^2 - 3*A*b*c^3)*d*e)*x^3 + (9*(B*b^2*c^2 - 2*A*b*c^3)*d^2 - 6*(B*b^3*c
- 3*A*b^2*c^2)*d*e + (B*b^4 - 3*A*b^3*c)*e^2)*x^2 + 2*(2*A*b^3*c*d*e + (B*
b^3*c - 2*A*b^2*c^2)*d^2)*x)/(b^4*c^3*x^4 + 2*b^5*c^2*x^3 + b^6*c*x^2) - (
A*b^2*e^2 - 3*(B*b*c - 2*A*c^2)*d^2 + 2*(B*b^2 - 3*A*b*c)*d*e)*log(c*x + b
)/b^5 + (A*b^2*e^2 - 3*(B*b*c - 2*A*c^2)*d^2 + 2*(B*b^2 - 3*A*b*c)*d*e)*lo
g(x)/b^5
```

Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 320, normalized size of antiderivative = 1.62

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^3}\,dx = -\frac{(3\,Bbcd^2-6\,Ac^2d^2-2\,Bb^2de+6\,Abcde-Ab^2e^2)\log(|x|)}{b^5} + \frac{(3\,Bbc^2d^2-6\,Ac^3d^2-2\,Bb^2cde+6\,Abc^2de-Ab^2ce^2)\log(|cx+b|)}{b^5c} - \frac{6\,Bbc^3d^2x^3-12\,Ac^4d^2x^3-4\,Bb^2c^2dex^3+12\,Abc^3dex^3-2\,Ab^2c^2e^2x^3+9\,Bb^2c^2d^2x^2-18\,Abc^3d^2x^2-}{2\,(cx^2+}$$

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

output
```
-(3*B*b*c*d^2 - 6*A*c^2*d^2 - 2*B*b^2*d*e + 6*A*b*c*d*e - A*b^2*e^2)*log(a
bs(x))/b^5 + (3*B*b*c^2*d^2 - 6*A*c^3*d^2 - 2*B*b^2*c*d*e + 6*A*b*c^2*d*e
- A*b^2*c*e^2)*log(abs(c*x + b))/(b^5*c) - 1/2*(6*B*b*c^3*d^2*x^3 - 12*A*c
^4*d^2*x^3 - 4*B*b^2*c^2*d*e*x^3 + 12*A*b*c^3*d*e*x^3 - 2*A*b^2*c^2*e^2*x^
3 + 9*B*b^2*c^2*d^2*x^2 - 18*A*b*c^3*d^2*x^2 - 6*B*b^3*c*d*e*x^2 + 18*A*b^
2*c^2*d*e*x^2 + B*b^4*e^2*x^2 - 3*A*b^3*c*e^2*x^2 + 2*B*b^3*c*d^2*x - 4*A*
b^2*c^2*d^2*x + 4*A*b^3*c*d*e*x + A*b^3*c*d^2)/((c*x^2 + b*x)^2*b^4*c)
```

Mupad [B] (verification not implemented)

Time = 10.85 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.61

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^3}\,dx = -\frac{\frac{A\,d^2}{2\,b}-\frac{c\,x^3\,(2\,B\,b^2\,d\,e+A\,b^2\,e^2-3\,B\,b\,c\,d^2-6\,A\,b\,c\,d\,e+6\,A\,c^2\,d^2)}{b^4}+\frac{d\,x\,(2\,A\,b\,e-2\,A\,c\,d+B\,b\,d)}{b^2}-\frac{x^2\,(-B\,b^3\,e^2+6\,B\,b^2\,c\,d\,e+3\,A\,b^2\,c\,e^2}{2\,b}}{b^2\,x^2+2\,b\,c\,x^3+c^2\,x^4} - \frac{2\,\mathrm{atanh}\left(\frac{(b+2\,c\,x)\,(b^2\,(A\,e^2+2\,B\,d\,e)-b\,(3\,B\,c\,d^2+6\,A\,c\,e\,d)+6\,A\,c^2\,d^2)}{b\,(2\,B\,b^2\,d\,e+A\,b^2\,e^2-3\,B\,b\,c\,d^2-6\,A\,b\,c\,d\,e+6\,A\,c^2\,d^2)}\right)\,(b^2\,(A\,e^2+2\,B\,d\,e)-b\,(3\,B\,c\,d^2+6\,A\,c\,e\,d)-}{b^5}$$

input
```
int(((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^3,x)
```

output
```
- ((A*d^2)/(2*b) - (c*x^3*(A*b^2*e^2 + 6*A*c^2*d^2 - 3*B*b*c*d^2 + 2*B*b^2
*d*e - 6*A*b*c*d*e))/b^4 + (d*x*(2*A*b*e - 2*A*c*d + B*b*d))/b^2 - (x^2*(1
8*A*c^3*d^2 - B*b^3*e^2 + 3*A*b^2*c*e^2 - 9*B*b*c^2*d^2 - 18*A*b*c^2*d*e +
 6*B*b^2*c*d*e))/(2*b^3*c))/(b^2*x^2 + c^2*x^4 + 2*b*c*x^3) - (2*atanh(((b
 + 2*c*x)*(b^2*(A*e^2 + 2*B*d*e) - b*(3*B*c*d^2 + 6*A*c*d*e) + 6*A*c^2*d^2
))/(b*(A*b^2*e^2 + 6*A*c^2*d^2 - 3*B*b*c*d^2 + 2*B*b^2*d*e - 6*A*b*c*d*e))
)*(b^2*(A*e^2 + 2*B*d*e) - b*(3*B*c*d^2 + 6*A*c*d*e) + 6*A*c^2*d^2))/b^5
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 741, normalized size of antiderivative = 3.74

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^3,x)
```

output
```
( - 2*log(b + c*x)*a*b**4*c*e**2*x**2 + 12*log(b + c*x)*a*b**3*c**2*d*e*x*
*2 - 4*log(b + c*x)*a*b**3*c**2*e**2*x**3 - 12*log(b + c*x)*a*b**2*c**3*d*
*2*x**2 + 24*log(b + c*x)*a*b**2*c**3*d*e*x**3 - 2*log(b + c*x)*a*b**2*c**
3*e**2*x**4 - 24*log(b + c*x)*a*b*c**4*d**2*x**3 + 12*log(b + c*x)*a*b*c**
4*d*e*x**4 - 12*log(b + c*x)*a*c**5*d**2*x**4 - 4*log(b + c*x)*b**5*c*d*e*
x**2 + 6*log(b + c*x)*b**4*c**2*d**2*x**2 - 8*log(b + c*x)*b**4*c**2*d*e*x
**3 + 12*log(b + c*x)*b**3*c**3*d**2*x**3 - 4*log(b + c*x)*b**3*c**3*d*e*x
**4 + 6*log(b + c*x)*b**2*c**4*d**2*x**4 + 2*log(x)*a*b**4*c*e**2*x**2 - 1
2*log(x)*a*b**3*c**2*d*e*x**2 + 4*log(x)*a*b**3*c**2*e**2*x**3 + 12*log(x)
*a*b**2*c**3*d**2*x**2 - 24*log(x)*a*b**2*c**3*d*e*x**3 + 2*log(x)*a*b**2*
c**3*e**2*x**4 + 24*log(x)*a*b*c**4*d**2*x**3 - 12*log(x)*a*b*c**4*d*e*x**
4 + 12*log(x)*a*c**5*d**2*x**4 + 4*log(x)*b**5*c*d*e*x**2 - 6*log(x)*b**4*
c**2*d**2*x**2 + 8*log(x)*b**4*c**2*d*e*x**3 - 12*log(x)*b**3*c**3*d**2*x*
*3 + 4*log(x)*b**3*c**3*d*e*x**4 - 6*log(x)*b**2*c**4*d**2*x**4 - a*b**4*c
*d**2 - 4*a*b**4*c*d*e*x + 2*a*b**4*c*e**2*x**2 + 4*a*b**3*c**2*d**2*x - 1
2*a*b**3*c**2*d*e*x**2 + 12*a*b**2*c**3*d**2*x**2 - a*b**2*c**3*e**2*x**4
+ 6*a*b*c**4*d*e*x**4 - 6*a*c**5*d**2*x**4 - b**6*e**2*x**2 - 2*b**5*c*d**
2*x + 4*b**5*c*d*e*x**2 - 6*b**4*c**2*d**2*x**2 - 2*b**3*c**3*d*e*x**4 + 3
*b**2*c**4*d**2*x**4)/(2*b**5*c*x**2*(b**2 + 2*b*c*x + c**2*x**2))
```

3.49 $\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx$

Optimal result

Integrand size = 22, antiderivative size = 168

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx = -\frac{Ad}{2b^3x^2} - \frac{bBd-3Acd+Abe}{b^4x} - \frac{(bB-Ac)(cd-be)}{2b^3(b+cx)^2} + \frac{3Ac^2d+b^2Be-2bc(Bd+Ae)}{b^4(b+cx)} + \frac{(6Ac^2d+b^2Be-3bc(Bd+Ae))\log(x)}{b^5} - \frac{(6Ac^2d+b^2Be-3bc(Bd+Ae))\log(b+cx)}{b^5}$$

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

Mathematica [A] (verified)

Time = 0.16 (sec) , antiderivative size = 162, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx$$
$$= \frac{-\frac{Ab^2d}{x^2}-\frac{2b(bBd-3Acd+Abe)}{x}+\frac{b^2(bB-Ac)(-cd+be)}{(b+cx)^2}+\frac{2b(3Ac^2d+b^2Be-2bc(Bd+Ae))}{b+cx}+2(6Ac^2d+b^2Be-3bc(Bd+A}{2b^5}$$

input
```
Integrate[((A + B*x)*(d + e*x))/(b*x + c*x^2)^3,x]
```

output
```
(-((A*b^2*d)/x^2) - (2*b*(b*B*d - 3*A*c*d + A*b*e))/x + (b^2*(b*B - A*c)*(
-(c*d) + b*e))/(b + c*x)^2 + (2*b*(3*A*c^2*d + b^2*B*e - 2*b*c*(B*d + A*e)
))/(b + c*x) + 2*(6*A*c^2*d + b^2*B*e - 3*b*c*(B*d + A*e))*Log[x] - 2*(6*A
*c^2*d + b^2*B*e - 3*b*c*(B*d + A*e))*Log[b + c*x])/(2*b^5)
```

Rubi [A] (verified)

Time = 0.67 (sec) , antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1206, 2009}

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

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx$$

$$\Big\downarrow \text{1206}$$

$$\int \left(\frac{Abe-3Acd+bBd}{b^4x^2}-\frac{c(bB-Ac)(be-cd)}{b^3(b+cx)^3}+\frac{Ad}{b^3x^3}+\frac{-3bc(Ae+Bd)+6Ac^2d+b^2Be}{b^5x}+\frac{c(3bc(Ae+Bd)-}{b^5(}\right.$$

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

$$-\frac{Abe-3Acd+bBd}{b^4x}-\frac{(bB-Ac)(cd-be)}{2b^3(b+cx)^2}-\frac{Ad}{2b^3x^2}+\frac{\log(x)\left(-3bc(Ae+Bd)+6Ac^2d+b^2Be\right)}{b^5}-\frac{\log(b+cx)\left(-3bc(Ae+Bd)+6Ac^2d+b^2Be\right)}{b^5}+\frac{-2bc(Ae+Bd)+3Ac^2d+b^2Be}{b^4(b+cx)}$$

input
```
Int[((A + B*x)*(d + e*x))/(b*x + c*x^2)^3,x]
```

output
```
-1/2*(A*d)/(b^3*x^2) - (b*B*d - 3*A*c*d + A*b*e)/(b^4*x) - ((b*B - A*c)*(c
*d - b*e))/(2*b^3*(b + c*x)^2) + (3*A*c^2*d + b^2*B*e - 2*b*c*(B*d + A*e))
/(b^4*(b + c*x)) + ((6*A*c^2*d + b^2*B*e - 3*b*c*(B*d + A*e))*Log[x])/b^5
- ((6*A*c^2*d + b^2*B*e - 3*b*c*(B*d + A*e))*Log[b + c*x])/b^5
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 0.77 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.07

method	result
default	$-\frac{2Abce-3Ac^2d-b^2Be+2Bbcd}{b^4(cx+b)}+\frac{\left(3Abce-6Ac^2d-b^2Be+3Bbcd\right)\ln(cx+b)}{b^5}-\frac{Abce-Ac^2d-b^2Be+Bbcd}{2b^3(cx+b)^2}-\frac{Abe-3Ac\cdots}{b^4x\cdots}$
norman	$\frac{-\frac{Ad}{2b}-\frac{(Abe-2Acd+Bbd)x}{b^2}-\frac{\left(3Abc^3e-6Ac^4d-Bb^2c^2e+3Bbc^3d\right)x^3}{b^4c}-\frac{\left(9Abc^3e-18Ac^4d-3Bb^2c^2e+9Bbc^3d\right)x^2}{2b^3c^2}}{x^2(cx+b)^2}+\frac{\left(3Abce-6Ac^2\cdots\right.}{\cdots}$
risch	$\frac{-\frac{c\left(3Abce-6Ac^2d-b^2Be+3Bbcd\right)x^3}{b^4}-\frac{3\left(3Abce-6Ac^2d-b^2Be+3Bbcd\right)x^2}{2b^3}-\frac{(Abe-2Acd+Bbd)x}{b^2}-\frac{Ad}{2b}}{x^2(cx+b)^2}+\frac{3\ln(-cx-b)Ace}{b^4}-\frac{6\ln\cdots}{\cdots}$
parallelrisch	$-\frac{Ab^4c^2d+12A\ln(cx+b)x^4c^6d+6Ax^3b^2c^4e-12Ax^3bc^5d-2Bx^3b^3c^3e+6Bx^3b^2c^4d+9Ax^2b^3c^3e-18Ax^2b^2c^4d-3Bx^2b^4c^2\cdots}{\cdots}$

input
```
int((B*x+A)*(e*x+d)/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

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

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 410 vs. $2(164) = 328$.

Time = 0.11 (sec) , antiderivative size = 410, normalized size of antiderivative = 2.44

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx = -\frac{Ab^4d + 2\left(3\left(Bb^2c^2 - 2\,Abc^3\right)d - \left(Bb^3c - 3\,Ab^2c^2\right)e\right)x^3 + 3\left(3\left(Bb^3c - 2\,Ab^2c^2\right)d - \left(Bb^4 - 3\,Ab^3c\right)e\right)x^2}{}$$

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

output
```
-1/2*(A*b^4*d + 2*(3*(B*b^2*c^2 - 2*A*b*c^3)*d - (B*b^3*c - 3*A*b^2*c^2)*e
)*x^3 + 3*(3*(B*b^3*c - 2*A*b^2*c^2)*d - (B*b^4 - 3*A*b^3*c)*e)*x^2 + 2*(A
*b^4*e + (B*b^4 - 2*A*b^3*c)*d)*x - 2*((3*(B*b*c^3 - 2*A*c^4)*d - (B*b^2*c
^2 - 3*A*b*c^3)*e)*x^4 + 2*(3*(B*b^2*c^2 - 2*A*b*c^3)*d - (B*b^3*c - 3*A*b
^2*c^2)*e)*x^3 + (3*(B*b^3*c - 2*A*b^2*c^2)*d - (B*b^4 - 3*A*b^3*c)*e)*x^2
)*log(c*x + b) + 2*((3*(B*b*c^3 - 2*A*c^4)*d - (B*b^2*c^2 - 3*A*b*c^3)*e)*
x^4 + 2*(3*(B*b^2*c^2 - 2*A*b*c^3)*d - (B*b^3*c - 3*A*b^2*c^2)*e)*x^3 + (3
*(B*b^3*c - 2*A*b^2*c^2)*d - (B*b^4 - 3*A*b^3*c)*e)*x^2)*log(x))/(b^5*c^2*
x^4 + 2*b^6*c*x^3 + b^7*x^2)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 449 vs. $2(167) = 334$.

Time = 1.61 (sec) , antiderivative size = 449, normalized size of antiderivative = 2.67

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx = \frac{-Ab^3d + x^3(-6Abc^2e + 12Ac^3d + 2Bb^2ce - 6Bbc^2d) + x^2(-9Ab^2ce + 18Abc^2d + 3Bb^3e - 9Bb^2cd) + x}{2b^6x^2 + 4b^5cx^3 + 2b^4c^2x^4} + \frac{(-3Abce + 6Ac^2d + Bb^2e - 3Bbcd)\log\left(x + \frac{-3Ab^2ce+6Abc^2d+Bb^3e-3Bb^2cd-b(-3Abce+6Ac^2d+Bb^2e-3Bbcd)}{-6Abc^2e+12Ac^3d+2Bb^2ce-6Bbc^2d}\right)}{b^5} - \frac{(-3Abce + 6Ac^2d + Bb^2e - 3Bbcd)\log\left(x + \frac{-3Ab^2ce+6Abc^2d+Bb^3e-3Bb^2cd+b(-3Abce+6Ac^2d+Bb^2e-3Bbcd)}{-6Abc^2e+12Ac^3d+2Bb^2ce-6Bbc^2d}\right)}{b^5}$$

input

```
integrate((B*x+A)*(e*x+d)/(c*x**2+b*x)**3,x)
```

output

```
(-A*b**3*d + x**3*(-6*A*b*c**2*e + 12*A*c**3*d + 2*B*b**2*c*e - 6*B*b*c**2
*d) + x**2*(-9*A*b**2*c*e + 18*A*b*c**2*d + 3*B*b**3*e - 9*B*b**2*c*d) + x
*(-2*A*b**3*e + 4*A*b**2*c*d - 2*B*b**3*d))/(2*b**6*x**2 + 4*b**5*c*x**3 +
 2*b**4*c**2*x**4) + (-3*A*b*c*e + 6*A*c**2*d + B*b**2*e - 3*B*b*c*d)*log(
x + (-3*A*b**2*c*e + 6*A*b*c**2*d + B*b**3*e - 3*B*b**2*c*d - b*(-3*A*b*c*
e + 6*A*c**2*d + B*b**2*e - 3*B*b*c*d))/(-6*A*b*c**2*e + 12*A*c**3*d + 2*B
*b**2*c*e - 6*B*b*c**2*d))/b**5 - (-3*A*b*c*e + 6*A*c**2*d + B*b**2*e - 3*
B*b*c*d)*log(x + (-3*A*b**2*c*e + 6*A*b*c**2*d + B*b**3*e - 3*B*b**2*c*d +
 b*(-3*A*b*c*e + 6*A*c**2*d + B*b**2*e - 3*B*b*c*d))/(-6*A*b*c**2*e + 12*A
*c**3*d + 2*B*b**2*c*e - 6*B*b*c**2*d))/b**5
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.29

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx = -\frac{Ab^3d+2\,(3\,(Bbc^2-2\,Ac^3)d-(Bb^2c-3\,Abc^2)e)x^3+3\,(3\,(Bb^2c-2\,Abc^2)d-(Bb^3-3\,Ab^2c)e)x^2+2}{2\,(b^4c^2x^4+2\,b^5cx^3+b^6x^2)} + \frac{(3\,(Bbc-2\,Ac^2)d-(Bb^2-3\,Abc)e)\log(cx+b)}{b^5} - \frac{(3\,(Bbc-2\,Ac^2)d-(Bb^2-3\,Abc)e)\log(x)}{b^5}$$

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

output
```
-1/2*(A*b^3*d + 2*(3*(B*b*c^2 - 2*A*c^3)*d - (B*b^2*c - 3*A*b*c^2)*e)*x^3
+ 3*(3*(B*b^2*c - 2*A*b*c^2)*d - (B*b^3 - 3*A*b^2*c)*e)*x^2 + 2*(A*b^3*e +
 (B*b^3 - 2*A*b^2*c)*d)*x)/(b^4*c^2*x^4 + 2*b^5*c*x^3 + b^6*x^2) + (3*(B*b
*c - 2*A*c^2)*d - (B*b^2 - 3*A*b*c)*e)*log(c*x + b)/b^5 - (3*(B*b*c - 2*A*
c^2)*d - (B*b^2 - 3*A*b*c)*e)*log(x)/b^5
```

Giac [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 216, normalized size of antiderivative = 1.29

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx = -\frac{(3\,Bbcd-6\,Ac^2d-Bb^2e+3\,Abce)\log(|x|)}{b^5} + \frac{(3\,Bbc^2d-6\,Ac^3d-Bb^2ce+3\,Abc^2e)\log(|cx+b|)}{b^5c} - \frac{6\,Bbc^2dx^3-12\,Ac^3dx^3-2\,Bb^2cex^3+6\,Abc^2ex^3+9\,Bb^2cdx^2-18\,Abc^2dx^2-3\,Bb^3ex^2+9\,Ab^2cex^2+}{2\,(cx^2+bx)^2b^4}$$

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

output
```
-(3*B*b*c*d - 6*A*c^2*d - B*b^2*e + 3*A*b*c*e)*log(abs(x))/b^5 + (3*B*b*c^
2*d - 6*A*c^3*d - B*b^2*c*e + 3*A*b*c^2*e)*log(abs(c*x + b))/(b^5*c) - 1/2
*(6*B*b*c^2*d*x^3 - 12*A*c^3*d*x^3 - 2*B*b^2*c*e*x^3 + 6*A*b*c^2*e*x^3 + 9
*B*b^2*c*d*x^2 - 18*A*b*c^2*d*x^2 - 3*B*b^3*e*x^2 + 9*A*b^2*c*e*x^2 + 2*B*
b^3*d*x - 4*A*b^2*c*d*x + 2*A*b^3*e*x + A*b^3*d)/((c*x^2 + b*x)^2*b^4)
```

Mupad [B] (verification not implemented)

Time = 10.82 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.33

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx = -\frac{\frac{x\,(A\,b\,e-2\,A\,c\,d+B\,b\,d)}{b^2}-\frac{3\,x^2\,\left(6\,A\,c^2\,d+B\,b^2\,e-3\,A\,b\,c\,e-3\,B\,b\,c\,d\right)}{2\,b^3}+\frac{A\,d}{2\,b}-\frac{c\,x^3\,\left(6\,A\,c^2\,d+B\,b^2\,e-3\,A\,b\,c\,e-3\,B\,b\,c\,d\right)}{b^4}}{b^2\,x^2+2\,b\,c\,x^3+c^2\,x^4} - \frac{2\,\mathrm{atanh}\left(\frac{(b+2\,c\,x)\,\left(6\,A\,c^2\,d-b\,(3\,A\,c\,e+3\,B\,c\,d)+B\,b^2\,e\right)}{b\,\left(6\,A\,c^2\,d+B\,b^2\,e-3\,A\,b\,c\,e-3\,B\,b\,c\,d\right)}\right)\,\left(6\,A\,c^2\,d-b\,(3\,A\,c\,e+3\,B\,c\,d)+B\,b^2\,e\right)}{b^5}$$

input
```
int(((A + B*x)*(d + e*x))/(b*x + c*x^2)^3,x)
```

output
```
- ((x*(A*b*e - 2*A*c*d + B*b*d))/b^2 - (3*x^2*(6*A*c^2*d + B*b^2*e - 3*A*b
*c*e - 3*B*b*c*d))/(2*b^3) + (A*d)/(2*b) - (c*x^3*(6*A*c^2*d + B*b^2*e - 3
*A*b*c*e - 3*B*b*c*d))/b^4)/(b^2*x^2 + c^2*x^4 + 2*b*c*x^3) - (2*atanh(((b
 + 2*c*x)*(6*A*c^2*d - b*(3*A*c*e + 3*B*c*d) + B*b^2*e))/(b*(6*A*c^2*d + B
*b^2*e - 3*A*b*c*e - 3*B*b*c*d)))*(6*A*c^2*d - b*(3*A*c*e + 3*B*c*d) + B*b
^2*e))/b^5
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 510, normalized size of antiderivative = 3.04

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^3}\,dx = \frac{-a\,b^4d-b^3c^2e\,x^4-2\log(cx+b)\,b^5e\,x^2+2\log(x)\,b^5e\,x^2-2a\,b^4ex-6a\,c^4d\,x^4-6b^4cd\,x^2+3b^2c^3d\,x^4-}{}$$

input
```
int((B*x+A)*(e*x+d)/(c*x^2+b*x)^3,x)
```

output
```
(6*log(b + c*x)*a*b**3*c*e*x**2 - 12*log(b + c*x)*a*b**2*c**2*d*x**2 + 12*
log(b + c*x)*a*b**2*c**2*e*x**3 - 24*log(b + c*x)*a*b*c**3*d*x**3 + 6*log(
b + c*x)*a*b*c**3*e*x**4 - 12*log(b + c*x)*a*c**4*d*x**4 - 2*log(b + c*x)*
b**5*e*x**2 + 6*log(b + c*x)*b**4*c*d*x**2 - 4*log(b + c*x)*b**4*c*e*x**3
+ 12*log(b + c*x)*b**3*c**2*d*x**3 - 2*log(b + c*x)*b**3*c**2*e*x**4 + 6*l
og(b + c*x)*b**2*c**3*d*x**4 - 6*log(x)*a*b**3*c*e*x**2 + 12*log(x)*a*b**2
*c**2*d*x**2 - 12*log(x)*a*b**2*c**2*e*x**3 + 24*log(x)*a*b*c**3*d*x**3 -
6*log(x)*a*b*c**3*e*x**4 + 12*log(x)*a*c**4*d*x**4 + 2*log(x)*b**5*e*x**2
- 6*log(x)*b**4*c*d*x**2 + 4*log(x)*b**4*c*e*x**3 - 12*log(x)*b**3*c**2*d*
x**3 + 2*log(x)*b**3*c**2*e*x**4 - 6*log(x)*b**2*c**3*d*x**4 - a*b**4*d -
2*a*b**4*e*x + 4*a*b**3*c*d*x - 6*a*b**3*c*e*x**2 + 12*a*b**2*c**2*d*x**2
+ 3*a*b*c**3*e*x**4 - 6*a*c**4*d*x**4 - 2*b**5*d*x + 2*b**5*e*x**2 - 6*b**
4*c*d*x**2 - b**3*c**2*e*x**4 + 3*b**2*c**3*d*x**4)/(2*b**5*x**2*(b**2 + 2
*b*c*x + c**2*x**2))
```

3.50 $\int \frac{A+Bx}{(d+ex)(bx+cx^2)^3}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 279

$$\begin{aligned}\int \frac{A+Bx}{(d+ex)\,(bx+cx^2)^3}\,dx &= -\frac{A}{2b^3dx^2}-\frac{bBd-3Acd-Abe}{b^4d^2x}-\frac{c^2(bB-Ac)}{2b^3(cd-be)(b+cx)^2}\\ &\quad+\frac{c^2(3Ac^2d+3b^2Be-2bc(Bd+2Ae))}{b^4(cd-be)^2(b+cx)}\\ &\quad+\frac{(6Ac^2d^2-3bcd(Bd-Ae)-b^2e(Bd-Ae))\log(x)}{b^5d^3}\\ &\quad-\frac{c^2(6Ac^3d^2-6b^3Be^2-3bc^2d(Bd+5Ae)+2b^2ce(4Bd+5Ae))\log(b+cx)}{b^5(cd-be)^3}\\ &\quad-\frac{e^4(Bd-Ae)\log(d+ex)}{d^3(cd-be)^3}\end{aligned}$$

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

Mathematica [A] (verified)

Time = 1.30 (sec) , antiderivative size = 276, normalized size of antiderivative = 0.99

$$\begin{aligned}&\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^3}\,dx\\&=-\frac{A}{2b^3dx^2}+\frac{-bBd+3Acd+Abe}{b^4d^2x}+\frac{c^2(bB-Ac)}{2b^3(-cd+be)(b+cx)^2}\\&\quad+\frac{c^2(3Ac^2d+3b^2Be-2bc(Bd+2Ae))}{b^4(cd-be)^2(b+cx)}\\&\quad-\frac{(-6Ac^2d^2+3bcd(Bd-Ae)+b^2e(Bd-Ae))\log(x)}{b^5d^3}\\&\quad+\frac{c^2(6Ac^3d^2-6b^3Be^2-3bc^2d(Bd+5Ae)+2b^2ce(4Bd+5Ae))\log(b+cx)}{b^5(-cd+be)^3}\\&\quad+\frac{e^4(-Bd+Ae)\log(d+ex)}{d^3(cd-be)^3}\end{aligned}$$

input
```
Integrate[(A + B*x)/((d + e*x)*(b*x + c*x^2)^3),x]
```

output
```
-1/2*A/(b^3*d*x^2) + (-(b*B*d) + 3*A*c*d + A*b*e)/(b^4*d^2*x) + (c^2*(b*B
- A*c))/(2*b^3*(-(c*d) + b*e)*(b + c*x)^2) + (c^2*(3*A*c^2*d + 3*b^2*B*e -
 2*b*c*(B*d + 2*A*e)))/(b^4*(c*d - b*e)^2*(b + c*x)) - ((-6*A*c^2*d^2 + 3*
b*c*d*(B*d - A*e) + b^2*e*(B*d - A*e))*Log[x])/(b^5*d^3) + (c^2*(6*A*c^3*d
^2 - 6*b^3*B*e^2 - 3*b*c^2*d*(B*d + 5*A*e) + 2*b^2*c*e*(4*B*d + 5*A*e))*Lo
g[b + c*x])/(b^5*(-(c*d) + b*e)^3) + (e^4*(-(B*d) + A*e)*Log[d + e*x])/(d^
3*(c*d - b*e)^3)
```

Rubi [A] (verified)

Time = 1.15 (sec) , antiderivative size = 279, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1206, 2009}

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

$$\int \frac{A+Bx}{(bx+cx^2)^3 (d+ex)} \, dx$$
$$\Big\downarrow \; 1206$$
$$\int \left(\frac{-Abe-3Acd+bBd}{b^4d^2x^2} - \frac{c^3(bB-Ac)}{b^3(b+cx)^3(be-cd)} + \frac{A}{b^3dx^3} + \frac{b^2(-e)(Bd-Ae)-3bcd(Bd-Ae)+6Ac^2d^2}{b^5d^3x} + \frac{c^3}{-} \right.$$
$$\Big\downarrow \; 2009$$
$$-\frac{-Abe-3Acd+bBd}{b^4d^2x} - \frac{c^2(bB-Ac)}{2b^3(b+cx)^2(cd-be)} - \frac{A}{2b^3dx^2} + \frac{\log(x)\left(b^2(-e)(Bd-Ae)-3bcd(Bd-Ae)+6Ac^2d^2\right)}{b^5d^3} + \frac{c^2\left(-2bc(2Ae+Bd)+3Ac^2d+3b^2Be\right)}{b^4(b+cx)(cd-be)^2} - \frac{c^2\log(b+cx)\left(2b^2ce(5Ae+4Bd)-3bc^2d(5Ae+Bd)+6Ac^3d^2-6b^3Be^2\right)}{b^5(cd-be)^3} - \frac{e^4(Bd-Ae)\log(d+ex)}{d^3(cd-be)^3}$$

input
```
Int[(A + B*x)/((d + e*x)*(b*x + c*x^2)^3),x]
```

output
```
-1/2*A/(b^3*d*x^2) - (b*B*d - 3*A*c*d - A*b*e)/(b^4*d^2*x) - (c^2*(b*B - A
*c))/(2*b^3*(c*d - b*e)*(b + c*x)^2) + (c^2*(3*A*c^2*d + 3*b^2*B*e - 2*b*c
*(B*d + 2*A*e)))/(b^4*(c*d - b*e)^2*(b + c*x)) + ((6*A*c^2*d^2 - 3*b*c*d*(
B*d - A*e) - b^2*e*(B*d - A*e))*Log[x])/(b^5*d^3) - (c^2*(6*A*c^3*d^2 - 6*
b^3*B*e^2 - 3*b*c^2*d*(B*d + 5*A*e) + 2*b^2*c*e*(4*B*d + 5*A*e))*Log[b + c
*x])/(b^5*(c*d - b*e)^3) - (e^4*(B*d - A*e)*Log[d + e*x])/(d^3*(c*d - b*e)
^3)
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 1.00 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.03

method	result
default	$-\frac{c^2(4Abce-3Ac^2d-3b^2Be+2Bbcd)}{b^4(be-cd)^2(cx+b)}+\frac{c^2(10Ab^2ce^2-15Abc^2de+6Ac^3d^2-6b^3Be^2+8Bb^2cde-3Bbc^2d^2)\ln(cx+b)}{b^5(be-cd)^3}-$
norman	$\frac{\frac{(Abe+2Acd-Bbd)x}{b^2d^2}+\frac{(Ab^3c^3e^3+Ab^2c^4de^2-9Abc^5d^2e+6Ac^6d^3-Bb^3c^3de^2+5Bb^2c^4d^2e-3Bbc^5d^3)x^3}{cd^2(b^2e^2-2bcde+c^2d^2)b^4}-\frac{A}{2bd}+\frac{(4Ab^3c^3e^3+3Ab^2c^4}{}}{x^2(cx+b)^2}$
risch	$\frac{\frac{(Ab^3e^3+Ab^2cde^2-9Abc^2d^2e+6Ac^3d^3-Bb^3de^2+5b^2Bcd^2e-3Bbc^2d^3)c^2x^3}{b^4d^2(b^2e^2-2bcde+c^2d^2)}+\frac{c(4Ab^3e^3+3Ab^2cde^2-27Abc^2d^2e+18Ac^3d^3-4Bb^3}{2b^3d^2(b^2e^2-2bcde+c^2d^2}}{x^2(cx+b)^2}$
parallelrisch	Expression too large to display

input
```
int((B*x+A)/(e*x+d)/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
-c^2*(4*A*b*c*e-3*A*c^2*d-3*B*b^2*e+2*B*b*c*d)/b^4/(b*e-c*d)^2/(c*x+b)+c^2
*(10*A*b^2*c*e^2-15*A*b*c^2*d*e+6*A*c^3*d^2-6*B*b^3*e^2+8*B*b^2*c*d*e-3*B*
b*c^2*d^2)/b^5/(b*e-c*d)^3*ln(c*x+b)-1/2*(A*c-B*b)*c^2/b^3/(b*e-c*d)/(c*x+
b)^2-(A*e-B*d)*e^4/(b*e-c*d)^3/d^3*ln(e*x+d)-1/2*A/b^3/d/x^2-(-A*b*e-3*A*c
*d+B*b*d)/b^4/d^2/x+(A*b^2*e^2+3*A*b*c*d*e+6*A*c^2*d^2-B*b^2*d*e-3*B*b*c*d
^2)/b^5/d^3*ln(x)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1161 vs. 2(275) = 550.

Time = 173.86 (sec) , antiderivative size = 1161, normalized size of antiderivative = 4.16

$$\int \frac{A+Bx}{(d+ex)(bx+cx^2)^3}\,dx=\text{Too large to display}$$

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

output
```
-1/2*(A*b^4*c^3*d^5 - 3*A*b^5*c^2*d^4*e + 3*A*b^6*c*d^3*e^2 - A*b^7*d^2*e^
3 - 2*(B*b^5*c^2*d^2*e^3 - A*b^5*c^2*d*e^4 - 3*(B*b^2*c^5 - 2*A*b*c^6)*d^5
 + (8*B*b^3*c^4 - 15*A*b^2*c^5)*d^4*e - 2*(3*B*b^4*c^3 - 5*A*b^3*c^4)*d^3*
e^2)*x^3 + (4*A*b^6*c*d*e^4 + 9*(B*b^3*c^4 - 2*A*b^2*c^5)*d^5 - 3*(8*B*b^4
*c^3 - 15*A*b^3*c^4)*d^4*e + (19*B*b^5*c^2 - 30*A*b^4*c^3)*d^3*e^2 - (4*B*
b^6*c + A*b^5*c^2)*d^2*e^3)*x^2 + 2*(A*b^7*d*e^4 + (B*b^4*c^3 - 2*A*b^3*c^
4)*d^5 - (3*B*b^5*c^2 - 5*A*b^4*c^3)*d^4*e + 3*(B*b^6*c - A*b^5*c^2)*d^3*e
^2 - (B*b^7 + A*b^6*c)*d^2*e^3)*x - 2*((3*(B*b*c^6 - 2*A*c^7)*d^5 - (8*B*b
^2*c^5 - 15*A*b*c^6)*d^4*e + 2*(3*B*b^3*c^4 - 5*A*b^2*c^5)*d^3*e^2)*x^4 +
2*(3*(B*b^2*c^5 - 2*A*b*c^6)*d^5 - (8*B*b^3*c^4 - 15*A*b^2*c^5)*d^4*e + 2*
(3*B*b^4*c^3 - 5*A*b^3*c^4)*d^3*e^2)*x^3 + (3*(B*b^3*c^4 - 2*A*b^2*c^5)*d^
5 - (8*B*b^4*c^3 - 15*A*b^3*c^4)*d^4*e + 2*(3*B*b^5*c^2 - 5*A*b^4*c^3)*d^3
*e^2)*x^2)*log(c*x + b) + 2*((B*b^5*c^2*d*e^4 - A*b^5*c^2*e^5)*x^4 + 2*(B*
b^6*c*d*e^4 - A*b^6*c*e^5)*x^3 + (B*b^7*d*e^4 - A*b^7*e^5)*x^2)*log(e*x +
d) - 2*((B*b^5*c^2*d*e^4 - A*b^5*c^2*e^5 - 3*(B*b*c^6 - 2*A*c^7)*d^5 + (8*
B*b^2*c^5 - 15*A*b*c^6)*d^4*e - 2*(3*B*b^3*c^4 - 5*A*b^2*c^5)*d^3*e^2)*x^4
 + 2*(B*b^6*c*d*e^4 - A*b^6*c*e^5 - 3*(B*b^2*c^5 - 2*A*b*c^6)*d^5 + (8*B*b
^3*c^4 - 15*A*b^2*c^5)*d^4*e - 2*(3*B*b^4*c^3 - 5*A*b^3*c^4)*d^3*e^2)*x^3
+ (B*b^7*d*e^4 - A*b^7*e^5 - 3*(B*b^3*c^4 - 2*A*b^2*c^5)*d^5 + (8*B*b^4*c^
3 - 15*A*b^3*c^4)*d^4*e - 2*(3*B*b^5*c^2 - 5*A*b^4*c^3)*d^3*e^2)*x^2)*l...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A + Bx}{(d + ex)(bx + cx^2)^3} dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x**2+b*x)**3,x)
```

output
```
Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 612 vs. $2(275) = 550$.

Time = 0.07 (sec) , antiderivative size = 612, normalized size of antiderivative = 2.19

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^3}\,dx$$
$$= \frac{\left(3\left(Bbc^4-2\,Ac^5\right)d^2-\left(8\,Bb^2c^3-15\,Abc^4\right)de+2\left(3\,Bb^3c^2-5\,Ab^2c^3\right)e^2\right)\log\left(cx+b\right)}{b^5c^3d^3-3\,b^6c^2d^2e+3\,b^7cde^2-b^8e^3}$$
$$-\frac{\left(Bde^4-Ae^5\right)\log\left(ex+d\right)}{c^3d^6-3\,bc^2d^5e+3\,b^2cd^4e^2-b^3d^3e^3}$$
$$-\frac{Ab^3c^2d^3-2\,Ab^4cd^2e+Ab^5de^2-2\left(Ab^3c^2e^3-3\left(Bbc^4-2\,Ac^5\right)d^3+\left(5\,Bb^2c^3-9\,Abc^4\right)d^2e-\left(Bb^3c^2-\right.\right.}{2\left(\left(b^4c^4d^4-2\,b\right.\right.}$$
$$+\frac{\left(Ab^2e^2-3\left(Bbc-2\,Ac^2\right)d^2-\left(Bb^2-3\,Abc\right)de\right)\log\left(x\right)}{b^5d^3}$$

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

output
```
(3*(B*b*c^4 - 2*A*c^5)*d^2 - (8*B*b^2*c^3 - 15*A*b*c^4)*d*e + 2*(3*B*b^3*c
^2 - 5*A*b^2*c^3)*e^2)*log(c*x + b)/(b^5*c^3*d^3 - 3*b^6*c^2*d^2*e + 3*b^7
*c*d*e^2 - b^8*e^3) - (B*d*e^4 - A*e^5)*log(e*x + d)/(c^3*d^6 - 3*b*c^2*d^
5*e + 3*b^2*c*d^4*e^2 - b^3*d^3*e^3) - 1/2*(A*b^3*c^2*d^3 - 2*A*b^4*c*d^2*
e + A*b^5*d*e^2 - 2*(A*b^3*c^2*e^3 - 3*(B*b*c^4 - 2*A*c^5)*d^3 + (5*B*b^2*
c^3 - 9*A*b*c^4)*d^2*e - (B*b^3*c^2 - A*b^2*c^3)*d*e^2)*x^3 - (4*A*b^4*c*e
^3 - 9*(B*b^2*c^3 - 2*A*b*c^4)*d^3 + 3*(5*B*b^3*c^2 - 9*A*b^2*c^3)*d^2*e -
 (4*B*b^4*c - 3*A*b^3*c^2)*d*e^2)*x^2 + 2*(B*b^5*d*e^2 - A*b^5*e^3 + (B*b^
3*c^2 - 2*A*b^2*c^3)*d^3 - (2*B*b^4*c - 3*A*b^3*c^2)*d^2*e)*x)/((b^4*c^4*d
^4 - 2*b^5*c^3*d^3*e + b^6*c^2*d^2*e^2)*x^4 + 2*(b^5*c^3*d^4 - 2*b^6*c^2*d
^3*e + b^7*c*d^2*e^2)*x^3 + (b^6*c^2*d^4 - 2*b^7*c*d^3*e + b^8*d^2*e^2)*x^
2) + (A*b^2*e^2 - 3*(B*b*c - 2*A*c^2)*d^2 - (B*b^2 - 3*A*b*c)*d*e)*log(x)/
(b^5*d^3)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 660 vs. $2(275) = 550$.

Time = 0.27 (sec) , antiderivative size = 660, normalized size of antiderivative = 2.37

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^3}\,dx = \frac{\left(3\,Bbc^5d^2-6\,Ac^6d^2-8\,Bb^2c^4de+15\,Abc^5de+6\,Bb^3c^3e^2-10\,Ab^2c^4e^2\right)\log\left(|cx+b|\right)}{b^5c^4d^3-3\,b^6c^3d^2e+3\,b^7c^2de^2-b^8ce^3} - \frac{\left(Bde^5-Ae^6\right)\log\left(|ex+d|\right)}{c^3d^6e-3\,bc^2d^5e^2+3\,b^2cd^4e^3-b^3d^3e^4} - \frac{\left(3\,Bbcd^2-6\,Ac^2d^2+Bb^2de-3\,Abcde-Ab^2e^2\right)\log\left(|x|\right)}{b^5d^3} - \frac{Ab^3c^3d^5-3\,Ab^4c^2d^4e+3\,Ab^5cd^3e^2-Ab^6d^2e^3+2\left(3\,Bbc^5d^5-6\,Ac^6d^5-8\,Bb^2c^4d^4e+15\,Abc^5d^4e+6\right.}{}$$

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

output
```
(3*B*b*c^5*d^2 - 6*A*c^6*d^2 - 8*B*b^2*c^4*d*e + 15*A*b*c^5*d*e + 6*B*b^3*
c^3*e^2 - 10*A*b^2*c^4*e^2)*log(abs(c*x + b))/(b^5*c^4*d^3 - 3*b^6*c^3*d^2
*e + 3*b^7*c^2*d*e^2 - b^8*c*e^3) - (B*d*e^5 - A*e^6)*log(abs(e*x + d))/(c
^3*d^6*e - 3*b*c^2*d^5*e^2 + 3*b^2*c*d^4*e^3 - b^3*d^3*e^4) - (3*B*b*c*d^2
 - 6*A*c^2*d^2 + B*b^2*d*e - 3*A*b*c*d*e - A*b^2*e^2)*log(abs(x))/(b^5*d^3
) - 1/2*(A*b^3*c^3*d^5 - 3*A*b^4*c^2*d^4*e + 3*A*b^5*c*d^3*e^2 - A*b^6*d^2
*e^3 + 2*(3*B*b*c^5*d^5 - 6*A*c^6*d^5 - 8*B*b^2*c^4*d^4*e + 15*A*b*c^5*d^4
*e + 6*B*b^3*c^3*d^3*e^2 - 10*A*b^2*c^4*d^3*e^2 - B*b^4*c^2*d^2*e^3 + A*b^
4*c^2*d*e^4)*x^3 + (9*B*b^2*c^4*d^5 - 18*A*b*c^5*d^5 - 24*B*b^3*c^3*d^4*e
+ 45*A*b^2*c^4*d^4*e + 19*B*b^4*c^2*d^3*e^2 - 30*A*b^3*c^3*d^3*e^2 - 4*B*b
^5*c*d^2*e^3 - A*b^4*c^2*d^2*e^3 + 4*A*b^5*c*d*e^4)*x^2 + 2*(B*b^3*c^3*d^5
 - 2*A*b^2*c^4*d^5 - 3*B*b^4*c^2*d^4*e + 5*A*b^3*c^3*d^4*e + 3*B*b^5*c*d^3
*e^2 - 3*A*b^4*c^2*d^3*e^2 - B*b^6*d^2*e^3 - A*b^5*c*d^2*e^3 + A*b^6*d*e^4
)*x)/((c*d - b*e)^3*(c*x + b)^2*b^4*d^3*x^2)
```

Mupad [B] (verification not implemented)

Time = 12.15 (sec) , antiderivative size = 512, normalized size of antiderivative = 1.84

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^3}\,dx$$
$$= \frac{\frac{x\,(A\,b\,e+2\,A\,c\,d-B\,b\,d)}{b^2\,d^2}-\frac{A}{2\,b\,d}+\frac{x^3\,\left(-B\,b^3\,c^2\,d\,e^2+A\,b^3\,c^2\,e^3+5\,B\,b^2\,c^3\,d^2\,e+A\,b^2\,c^3\,d\,e^2-3\,B\,b\,c^4\,d^3-9\,A\,b\,c^4\,d^2\,e+6\,A\,c^5\,d^3\right)}{b^4\,d^2\,\left(b^2\,e^2-2\,b\,c\,d\,e+c^2\,d^2\right)}+\frac{x^2\,(-4\,\ldots}{}}{b^2\,x^2+2\,b\,c\,x^3+c^2\,x^4}$$
$$+\frac{\ln\left(d+e\,x\right)\,\left(A\,e^5-B\,d\,e^4\right)}{-b^3\,d^3\,e^3+3\,b^2\,c\,d^4\,e^2-3\,b\,c^2\,d^5\,e+c^3\,d^6}$$
$$+\frac{\ln\left(b+c\,x\right)\,\left(d^2\,\left(6\,A\,c^5-3\,B\,b\,c^4\right)-d\,\left(15\,A\,b\,c^4\,e-8\,B\,b^2\,c^3\,e\right)+10\,A\,b^2\,c^3\,e^2-6\,B\,b^3\,c^2\,e^2\right)}{b^8\,e^3-3\,b^7\,c\,d\,e^2+3\,b^6\,c^2\,d^2\,e-b^5\,c^3\,d^3}$$
$$+\frac{\ln\left(x\right)\,\left(d^2\,\left(6\,A\,c^2-3\,B\,b\,c\right)-d\,\left(B\,b^2\,e-3\,A\,b\,c\,e\right)+A\,b^2\,e^2\right)}{b^5\,d^3}$$

input
```
int((A + B*x)/((b*x + c*x^2)^3*(d + e*x)),x)
```

output
```
((x*(A*b*e + 2*A*c*d - B*b*d))/(b^2*d^2) - A/(2*b*d) + (x^3*(6*A*c^5*d^3 -
 3*B*b*c^4*d^3 + A*b^3*c^2*e^3 + A*b^2*c^3*d*e^2 + 5*B*b^2*c^3*d^2*e - B*b
^3*c^2*d*e^2 - 9*A*b*c^4*d^2*e))/(b^4*d^2*(b^2*e^2 + c^2*d^2 - 2*b*c*d*e))
 + (x^2*(18*A*c^4*d^3 + 4*A*b^3*c*e^3 - 9*B*b*c^3*d^3 + 3*A*b^2*c^2*d*e^2
+ 15*B*b^2*c^2*d^2*e - 27*A*b*c^3*d^2*e - 4*B*b^3*c*d*e^2))/(2*b^3*d^2*(b^
2*e^2 + c^2*d^2 - 2*b*c*d*e)))/(b^2*x^2 + c^2*x^4 + 2*b*c*x^3) + (log(d +
e*x)*(A*e^5 - B*d*e^4))/(c^3*d^6 - b^3*d^3*e^3 + 3*b^2*c*d^4*e^2 - 3*b*c^2
*d^5*e) + (log(b + c*x)*(d^2*(6*A*c^5 - 3*B*b*c^4) - d*(15*A*b*c^4*e - 8*B
*b^2*c^3*e) + 10*A*b^2*c^3*e^2 - 6*B*b^3*c^2*e^2))/(b^8*e^3 - b^5*c^3*d^3
+ 3*b^6*c^2*d^2*e - 3*b^7*c*d*e^2) + (log(x)*(d^2*(6*A*c^2 - 3*B*b*c) - d*
(B*b^2*e - 3*A*b*c*e) + A*b^2*e^2))/(b^5*d^3)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 1492, normalized size of antiderivative = 5.35

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)/(c*x^2+b*x)^3,x)
```

output

```
(20*log(b + c*x)*a*b**4*c**3*d**3*e**2*x**2 - 30*log(b + c*x)*a*b**3*c**4*
d**4*e*x**2 + 40*log(b + c*x)*a*b**3*c**4*d**3*e**2*x**3 + 12*log(b + c*x)
*a*b**2*c**5*d**5*x**2 - 60*log(b + c*x)*a*b**2*c**5*d**4*e*x**3 + 20*log(
b + c*x)*a*b**2*c**5*d**3*e**2*x**4 + 24*log(b + c*x)*a*b*c**6*d**5*x**3 -
 30*log(b + c*x)*a*b*c**6*d**4*e*x**4 + 12*log(b + c*x)*a*c**7*d**5*x**4 -
 12*log(b + c*x)*b**6*c**2*d**3*e**2*x**2 + 16*log(b + c*x)*b**5*c**3*d**4
*e*x**2 - 24*log(b + c*x)*b**5*c**3*d**3*e**2*x**3 - 6*log(b + c*x)*b**4*c
**4*d**5*x**2 + 32*log(b + c*x)*b**4*c**4*d**4*e*x**3 - 12*log(b + c*x)*b*
*4*c**4*d**3*e**2*x**4 - 12*log(b + c*x)*b**3*c**5*d**5*x**3 + 16*log(b +
c*x)*b**3*c**5*d**4*e*x**4 - 6*log(b + c*x)*b**2*c**6*d**5*x**4 - 2*log(d
+ e*x)*a*b**7*e**5*x**2 - 4*log(d + e*x)*a*b**6*c*e**5*x**3 - 2*log(d + e*
x)*a*b**5*c**2*e**5*x**4 + 2*log(d + e*x)*b**8*d*e**4*x**2 + 4*log(d + e*x
)*b**7*c*d*e**4*x**3 + 2*log(d + e*x)*b**6*c**2*d*e**4*x**4 + 2*log(x)*a*b
**7*e**5*x**2 + 4*log(x)*a*b**6*c*e**5*x**3 + 2*log(x)*a*b**5*c**2*e**5*x*
*4 - 20*log(x)*a*b**4*c**3*d**3*e**2*x**2 + 30*log(x)*a*b**3*c**4*d**4*e*x
**2 - 40*log(x)*a*b**3*c**4*d**3*e**2*x**3 - 12*log(x)*a*b**2*c**5*d**5*x*
*2 + 60*log(x)*a*b**2*c**5*d**4*e*x**3 - 20*log(x)*a*b**2*c**5*d**3*e**2*x
**4 - 24*log(x)*a*b*c**6*d**5*x**3 + 30*log(x)*a*b*c**6*d**4*e*x**4 - 12*l
og(x)*a*c**7*d**5*x**4 - 2*log(x)*b**8*d*e**4*x**2 - 4*log(x)*b**7*c*d*e**
4*x**3 + 12*log(x)*b**6*c**2*d**3*e**2*x**2 - 2*log(x)*b**6*c**2*d*e**4...
```

3.51 $\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)^3}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 331

$$\begin{aligned}\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)^3}\,dx &= -\frac{A}{2b^3d^2x^2}-\frac{bBd-3Acd-2Abe}{b^4d^3x}-\frac{c^3(bB-Ac)}{2b^3(cd-be)^2(b+cx)^2}\\ &\quad-\frac{c^3(2bBcd-3Ac^2d-4b^2Be+5Abce)}{b^4(cd-be)^3(b+cx)}+\frac{e^4(Bd-Ae)}{d^3(cd-be)^3(d+ex)}\\ &\quad+\frac{(6Ac^2d^2-b^2e(2Bd-3Ae)-3bcd(Bd-2Ae))\log(x)}{b^5d^4}\\ &\quad-\frac{c^3(6Ac^3d^2-10b^3Be^2+5b^2ce(2Bd+3Ae)-3bc^2d(Bd+6Ae))\log(b+cx)}{b^5(cd-be)^4}\\ &\quad-\frac{e^4(Bd(5cd-2be)-3Ae(2cd-be))\log(d+ex)}{d^4(cd-be)^4}\end{aligned}$$

output
```
-1/2*A/b^3/d^2/x^2-(-2*A*b*e-3*A*c*d+B*b*d)/b^4/d^3/x-1/2*c^3*(-A*c+B*b)/b
^3/(-b*e+c*d)^2/(c*x+b)^2-c^3*(5*A*b*c*e-3*A*c^2*d-4*B*b^2*e+2*B*b*c*d)/b^
4/(-b*e+c*d)^3/(c*x+b)+e^4*(-A*e+B*d)/d^3/(-b*e+c*d)^3/(e*x+d)+(6*A*c^2*d^
2-b^2*e*(-3*A*e+2*B*d)-3*b*c*d*(-2*A*e+B*d))*ln(x)/b^5/d^4-c^3*(6*A*c^3*d^
2-10*b^3*B*e^2+5*b^2*c*e*(3*A*e+2*B*d)-3*b*c^2*d*(6*A*e+B*d))*ln(c*x+b)/b^
5/(-b*e+c*d)^4-e^4*(B*d*(-2*b*e+5*c*d)-3*A*e*(-b*e+2*c*d))*ln(e*x+d)/d^4/(
-b*e+c*d)^4
```

Mathematica [A] (verified)

Time = 0.70 (sec) , antiderivative size = 328, normalized size of antiderivative = 0.99

$$\int \frac{A+Bx}{(d+ex)^2\left(bx+cx^2\right)^3}\,dx$$
$$= -\frac{A}{2b^3d^2x^2} + \frac{-bBd+3Acd+2Abe}{b^4d^3x} + \frac{c^3(-bB+Ac)}{2b^3(cd-be)^2(b+cx)^2} + \frac{c^3(-3Ac^2d-4b^2Be+bc(2Bd+5Ae))}{b^4(-cd+be)^3(b+cx)} + \frac{e^4(Bd-Ae)}{d^3(cd-be)^3(d+ex)} - \frac{(-6Ac^2d^2+b^2e(2Bd-3Ae)+3bcd(Bd-2Ae))\log(x)}{b^5d^4} + \frac{c^3(-6Ac^3d^2+10b^3Be^2-5b^2ce(2Bd+3Ae)+3bc^2d(Bd+6Ae))\log(b+cx)}{b^5(cd-be)^4} - \frac{e^4(Bd(5cd-2be)+3Ae(-2cd+be))\log(d+ex)}{d^4(cd-be)^4}$$

input
```
Integrate[(A + B*x)/((d + e*x)^2*(b*x + c*x^2)^3),x]
```

output
```
-1/2*A/(b^3*d^2*x^2) + (-(b*B*d) + 3*A*c*d + 2*A*b*e)/(b^4*d^3*x) + (c^3*(
-(b*B) + A*c))/(2*b^3*(c*d - b*e)^2*(b + c*x)^2) + (c^3*(-3*A*c^2*d - 4*b^
2*B*e + b*c*(2*B*d + 5*A*e)))/(b^4*(-(c*d) + b*e)^3*(b + c*x)) + (e^4*(B*d
 - A*e))/(d^3*(c*d - b*e)^3*(d + e*x)) - ((-6*A*c^2*d^2 + b^2*e*(2*B*d - 3
*A*e) + 3*b*c*d*(B*d - 2*A*e))*Log[x])/(b^5*d^4) + (c^3*(-6*A*c^3*d^2 + 10
*b^3*B*e^2 - 5*b^2*c*e*(2*B*d + 3*A*e) + 3*b*c^2*d*(B*d + 6*A*e))*Log[b +
c*x])/(b^5*(c*d - b*e)^4) - (e^4*(B*d*(5*c*d - 2*b*e) + 3*A*e*(-2*c*d + b*
e))*Log[d + e*x])/(d^4*(c*d - b*e)^4)
```

Rubi [A] (verified)

Time = 1.45 (sec) , antiderivative size = 331, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1206, 2009}

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

$$\int \frac{A+Bx}{(bx+cx^2)^3 (d+ex)^2}\,dx$$

$$\Big\downarrow \text{ 1206}$$

$$\int \left(\frac{-2Abe-3Acd+bBd}{b^4d^3x^2}+\frac{c^4(bB-Ac)}{b^3(b+cx)^3(be-cd)^2}+\frac{A}{b^3d^2x^3}+\frac{b^2(-e)(2Bd-3Ae)-3bcd(Bd-2Ae)+6Ac^2d^2}{b^5d^4x}\right.$$

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

$$-\frac{-2Abe-3Acd+bBd}{b^4d^3x}-\frac{c^3(bB-Ac)}{2b^3(b+cx)^2(cd-be)^2}-\frac{A}{2b^3d^2x^2}+\frac{\log(x)\left(b^2(-e)(2Bd-3Ae)-3bcd(Bd-2Ae)+6Ac^2d^2\right)}{b^5d^4}-\frac{c^3\left(5Abce-3Ac^2d-4b^2Be+2bBcd\right)}{b^4(b+cx)(cd-be)^3}-\frac{c^3\log(b+cx)\left(5b^2ce(3Ae+2Bd)-3bc^2d(6Ae+Bd)+6Ac^3d^2-10b^3Be^2\right)}{b^5(cd-be)^4}-\frac{e^4\log(d+ex)(Bd(5cd-2be)-3Ae(2cd-be))}{d^4(cd-be)^4}+\frac{e^4(Bd-Ae)}{d^3(d+ex)(cd-be)^3}$$

input
```
Int[(A + B*x)/((d + e*x)^2*(b*x + c*x^2)^3),x]
```

output
```
-1/2*A/(b^3*d^2*x^2) - (b*B*d - 3*A*c*d - 2*A*b*e)/(b^4*d^3*x) - (c^3*(b*B
 - A*c))/(2*b^3*(c*d - b*e)^2*(b + c*x)^2) - (c^3*(2*b*B*c*d - 3*A*c^2*d -
 4*b^2*B*e + 5*A*b*c*e))/(b^4*(c*d - b*e)^3*(b + c*x)) + (e^4*(B*d - A*e))
/(d^3*(c*d - b*e)^3*(d + e*x)) + ((6*A*c^2*d^2 - b^2*e*(2*B*d - 3*A*e) - 3
*b*c*d*(B*d - 2*A*e))*Log[x])/(b^5*d^4) - (c^3*(6*A*c^3*d^2 - 10*b^3*B*e^2
 + 5*b^2*c*e*(2*B*d + 3*A*e) - 3*b*c^2*d*(B*d + 6*A*e))*Log[b + c*x])/(b^5
*(c*d - b*e)^4) - (e^4*(B*d*(5*c*d - 2*b*e) - 3*A*e*(2*c*d - b*e))*Log[d +
 e*x])/(d^4*(c*d - b*e)^4)
```

Defintions of rubi rules used

rule 1206
```
Int[((d_) + (e_.)*(x_))^(m_.)*((f_) + (g_.)*(x_))^(n_.)*((b_.)*(x_) + (c_.)
*(x_)^2)^(p_), x_Symbol] :> Int[ExpandIntegrand[x^p*(d + e*x)^m*(f + g*x)^n
*(b + c*x)^p, x], x] /; FreeQ[{b, c, d, e, f, g}, x] && ILtQ[p, -1] && Inte
gersQ[m, n]
```

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

Maple [A] (verified)

Time = 1.14 (sec) , antiderivative size = 339, normalized size of antiderivative = 1.02

method	result
default	$\frac{c^3\left(5Abce-3A\,c^2d-4b^2Be+2Bbcd\right)}{b^4(be-cd)^3(cx+b)}-\frac{c^3\left(15A\,b^2c\,e^2-18Ab\,c^2de+6A\,c^3d^2-10b^3B\,e^2+10B\,b^2cde-3Bb\,c^2d^2\right)\ln(cx+b)}{b^5(be-cd)^4}+$
norman	$\frac{-\frac{A}{2bd}+\frac{(3Abe+4Acd-2Bbd)x}{2b^2d^2}-\frac{\left(3A\,b^6e^6-2A\,b^4c^2d^2e^4-6A\,b^3c^3d^3e^3+20Ab\,c^5d^5e-12A\,c^6d^6-2B\,b^6d\,e^5+B\,b^5c\,d^2e^4+4B\,b^3c^3d^4e^2-12}{d^4b^4\left(b^3e^3-3d\,e^2b^2c+3d^2eb\,c^2-d^3c^3\right)}}{}$
risch	Expression too large to display
parallelrisch	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
c^3*(5*A*b*c*e-3*A*c^2*d-4*B*b^2*e+2*B*b*c*d)/b^4/(b*e-c*d)^3/(c*x+b)-c^3*
(15*A*b^2*c*e^2-18*A*b*c^2*d*e+6*A*c^3*d^2-10*B*b^3*e^2+10*B*b^2*c*d*e-3*B
*b*c^2*d^2)/b^5/(b*e-c*d)^4*ln(c*x+b)+1/2*(A*c-B*b)*c^3/b^3/(b*e-c*d)^2/(c
*x+b)^2-e^4*(3*A*b*e^2-6*A*c*d*e-2*B*b*d*e+5*B*c*d^2)/(b*e-c*d)^4/d^4*ln(e
*x+d)+(A*e-B*d)*e^4/(b*e-c*d)^3/d^3/(e*x+d)-1/2*A/b^3/d^2/x^2-(-2*A*b*e-3*
A*c*d+B*b*d)/b^4/d^3/x+(3*A*b^2*e^2+6*A*b*c*d*e+6*A*c^2*d^2-2*B*b^2*d*e-3*
B*b*c*d^2)/b^5/d^4*ln(x)
```

Fricas [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^3}\,dx = \text{Timed out}$$

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

output
```
Timed out
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^3}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**2/(c*x**2+b*x)**3,x)
```

output
```
Timed out
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1043 vs. $2(327) = 654$.

Time = 0.08 (sec) , antiderivative size = 1043, normalized size of antiderivative = 3.15

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^3}\,dx = \text{Too large to display}$$

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

output
```
(3*(B*b*c^5 - 2*A*c^6)*d^2 - 2*(5*B*b^2*c^4 - 9*A*b*c^5)*d*e + 5*(2*B*b^3*
c^3 - 3*A*b^2*c^4)*e^2)*log(c*x + b)/(b^5*c^4*d^4 - 4*b^6*c^3*d^3*e + 6*b^
7*c^2*d^2*e^2 - 4*b^8*c*d*e^3 + b^9*e^4) - (5*B*c*d^2*e^4 + 3*A*b*e^6 - 2*
(B*b + 3*A*c)*d*e^5)*log(e*x + d)/(c^4*d^8 - 4*b*c^3*d^7*e + 6*b^2*c^2*d^6
*e^2 - 4*b^3*c*d^5*e^3 + b^4*d^4*e^4) - 1/2*(A*b^3*c^3*d^5 - 3*A*b^4*c^2*d
^4*e + 3*A*b^5*c*d^3*e^2 - A*b^6*d^2*e^3 + 2*(3*A*b^4*c^2*e^5 + 3*(B*b*c^5
 - 2*A*c^6)*d^4*e - (7*B*b^2*c^4 - 12*A*b*c^5)*d^3*e^2 + 3*(B*b^3*c^3 - A*
b^2*c^4)*d^2*e^3 - (2*B*b^4*c^2 + 3*A*b^3*c^3)*d*e^4)*x^4 + (12*A*b^5*c*e^
5 + 6*(B*b*c^5 - 2*A*c^6)*d^5 - (5*B*b^2*c^4 - 6*A*b*c^5)*d^4*e - 15*(B*b^
3*c^3 - 2*A*b^2*c^4)*d^3*e^2 + 5*(2*B*b^4*c^2 - 3*A*b^3*c^3)*d^2*e^3 - (8*
B*b^5*c + 9*A*b^4*c^2)*d*e^4)*x^3 - (4*B*b^6*d*e^4 - 6*A*b^6*e^5 - 9*(B*b^
2*c^4 - 2*A*b*c^5)*d^5 + (19*B*b^3*c^3 - 32*A*b^2*c^4)*d^4*e - (6*B*b^4*c^
2 - A*b^3*c^3)*d^3*e^2 - (2*B*b^5*c - 13*A*b^4*c^2)*d^2*e^3)*x^2 + (3*A*b^
6*d*e^4 + 2*(B*b^3*c^3 - 2*A*b^2*c^4)*d^5 - 3*(2*B*b^4*c^2 - 3*A*b^3*c^3)*
d^4*e + 3*(2*B*b^5*c - A*b^4*c^2)*d^3*e^2 - (2*B*b^6 + 5*A*b^5*c)*d^2*e^3)
*x)/((b^4*c^5*d^6*e - 3*b^5*c^4*d^5*e^2 + 3*b^6*c^3*d^4*e^3 - b^7*c^2*d^3*
e^4)*x^5 + (b^4*c^5*d^7 - b^5*c^4*d^6*e - 3*b^6*c^3*d^5*e^2 + 5*b^7*c^2*d^
4*e^3 - 2*b^8*c*d^3*e^4)*x^4 + (2*b^5*c^4*d^7 - 5*b^6*c^3*d^6*e + 3*b^7*c^
2*d^5*e^2 + b^8*c*d^4*e^3 - b^9*d^3*e^4)*x^3 + (b^6*c^3*d^7 - 3*b^7*c^2*d^
6*e + 3*b^8*c*d^5*e^2 - b^9*d^4*e^3)*x^2) + (3*A*b^2*e^2 - 3*(B*b*c - 2...
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1350 vs. $2(327) = 654$.

Time = 0.29 (sec) , antiderivative size = 1350, normalized size of antiderivative = 4.08

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^3}\,dx = \text{Too large to display}$$

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

output
```
1/2*(5*B*c*d^2*e^4 - 2*B*b*d*e^5 - 6*A*c*d*e^5 + 3*A*b*e^6)*log(abs(c - 2*
c*d/(e*x + d) + c*d^2/(e*x + d)^2 + b*e/(e*x + d) - b*d*e/(e*x + d)^2))/(c
^4*d^8 - 4*b*c^3*d^7*e + 6*b^2*c^2*d^6*e^2 - 4*b^3*c*d^5*e^3 + b^4*d^4*e^4
) + (B*d*e^10/(e*x + d) - A*e^11/(e*x + d))/(c^3*d^6*e^6 - 3*b*c^2*d^5*e^7
 + 3*b^2*c*d^4*e^8 - b^3*d^3*e^9) - 1/2*(6*B*b*c^5*d^6*e^2 - 12*A*c^6*d^6*
e^2 - 20*B*b^2*c^4*d^5*e^3 + 36*A*b*c^5*d^5*e^3 + 20*B*b^3*c^3*d^4*e^4 - 3
0*A*b^2*c^4*d^4*e^4 - 5*B*b^5*c*d^2*e^6 + 2*B*b^6*d*e^7 + 6*A*b^5*c*d*e^7
- 3*A*b^6*e^8)*log(abs(2*c*d*e - 2*c*d^2*e/(e*x + d) - b*e^2 + 2*b*d*e^2/(
e*x + d) - e^2*abs(b))/abs(2*c*d*e - 2*c*d^2*e/(e*x + d) - b*e^2 + 2*b*d*e
^2/(e*x + d) + e^2*abs(b)))/((b^4*c^4*d^8 - 4*b^5*c^3*d^7*e + 6*b^6*c^2*d^
6*e^2 - 4*b^7*c*d^5*e^3 + b^8*d^4*e^4)*e^2*abs(b)) - 1/2*(6*B*b*c^6*d^5*e
- 12*A*c^7*d^5*e - 17*B*b^2*c^5*d^4*e^2 + 30*A*b*c^6*d^4*e^2 + 12*B*b^3*c^
4*d^3*e^3 - 16*A*b^2*c^5*d^3*e^3 - 8*B*b^4*c^3*d^2*e^4 - 6*A*b^3*c^4*d^2*e
^4 + 2*B*b^5*c^2*d*e^5 + 14*A*b^4*c^3*d*e^5 - 5*A*b^5*c^2*e^6 - 2*(9*B*b*c
^6*d^6*e^2 - 18*A*c^7*d^6*e^2 - 30*B*b^2*c^5*d^5*e^3 + 54*A*b*c^6*d^5*e^3
+ 31*B*b^3*c^4*d^4*e^4 - 47*A*b^2*c^5*d^4*e^4 - 24*B*b^4*c^3*d^3*e^5 + 4*A
*b^3*c^4*d^3*e^5 + 11*B*b^5*c^2*d^2*e^6 + 29*A*b^4*c^3*d^2*e^6 - 2*B*b^6*c
*d*e^7 - 22*A*b^5*c^2*d*e^7 + 5*A*b^6*c*e^8)/((e*x + d)*e) + (18*B*b*c^6*d
^7*e^3 - 36*A*c^7*d^7*e^3 - 69*B*b^2*c^5*d^6*e^4 + 126*A*b*c^6*d^6*e^4 + 9
0*B*b^3*c^4*d^5*e^5 - 144*A*b^2*c^5*d^5*e^5 - 80*B*b^4*c^3*d^4*e^6 + 45...
```

Mupad [B] (verification not implemented)

Time = 12.94 (sec) , antiderivative size = 879, normalized size of antiderivative = 2.66

$$\int \frac{A+Bx}{(d+ex)^2\left(bx+cx^2\right)^3}\,dx$$
$$= \frac{\ln(x)\,\left(b^2\,(3\,A\,e^2-2\,B\,d\,e)-b\,(3\,B\,c\,d^2-6\,A\,c\,d\,e)+6\,A\,c^2\,d^2\right)}{b^5\,d^4}$$
$$-\frac{\ln(b+c\,x)\,\left(d^2\,(6\,A\,c^6-3\,B\,b\,c^5)-d\,(18\,A\,b\,c^5\,e-10\,B\,b^2\,c^4\,e)+15\,A\,b^2\,c^4\,e^2-10\,B\,b^3\,c^3\,e^2\right)}{b^9\,e^4-4\,b^8\,c\,d\,e^3+6\,b^7\,c^2\,d^2\,e^2-4\,b^6\,c^3\,d^3\,e+b^5\,c^4\,d^4}$$
$$-\frac{\ln(d+e\,x)\,\left(c\,(5\,B\,d^2\,e^4-6\,A\,d\,e^5)+b\,(3\,A\,e^6-2\,B\,d\,e^5)\right)}{b^4\,d^4\,e^4-4\,b^3\,c\,d^5\,e^3+6\,b^2\,c^2\,d^6\,e^2-4\,b\,c^3\,d^7\,e+c^4\,d^8}$$
$$-\frac{\frac{A}{2\,b\,d}-\frac{x\,(3\,A\,b\,e+4\,A\,c\,d-2\,B\,b\,d)}{2\,b^2\,d^2}+\frac{x^3\,\left(8\,B\,b^5\,c\,d\,e^4-12\,A\,b^5\,c\,e^5-10\,B\,b^4\,c^2\,d^2\,e^3+9\,A\,b^4\,c^2\,d\,e^4+15\,B\,b^3\,c^3\,d^3\,e^2+15\,A\,b^3\,c^3\,d^2\,e^3+5\,B}{2\,b^4\,d^3\,(b^3\,e^3-3\,b^2\,c\,d\,e^2+3\,b\,c^2\,d^2\,e-c^3}}{}$$

input
```
int((A + B*x)/((b*x + c*x^2)^3*(d + e*x)^2),x)
```

output
```
(log(x)*(b^2*(3*A*e^2 - 2*B*d*e) - b*(3*B*c*d^2 - 6*A*c*d*e) + 6*A*c^2*d^2
))/(b^5*d^4) - (log(b + c*x)*(d^2*(6*A*c^6 - 3*B*b*c^5) - d*(18*A*b*c^5*e
- 10*B*b^2*c^4*e) + 15*A*b^2*c^4*e^2 - 10*B*b^3*c^3*e^2))/(b^9*e^4 + b^5*c
^4*d^4 - 4*b^6*c^3*d^3*e + 6*b^7*c^2*d^2*e^2 - 4*b^8*c*d*e^3) - (log(d + e
*x)*(c*(5*B*d^2*e^4 - 6*A*d*e^5) + b*(3*A*e^6 - 2*B*d*e^5)))/(c^4*d^8 + b^
4*d^4*e^4 - 4*b^3*c*d^5*e^3 + 6*b^2*c^2*d^6*e^2 - 4*b*c^3*d^7*e) - (A/(2*b
*d) - (x*(3*A*b*e + 4*A*c*d - 2*B*b*d))/(2*b^2*d^2) + (x^3*(12*A*c^6*d^5 -
 12*A*b^5*c*e^5 - 6*B*b*c^5*d^5 + 9*A*b^4*c^2*d*e^4 + 5*B*b^2*c^4*d^4*e -
30*A*b^2*c^4*d^3*e^2 + 15*A*b^3*c^3*d^2*e^3 + 15*B*b^3*c^3*d^3*e^2 - 10*B*
b^4*c^2*d^2*e^3 - 6*A*b*c^5*d^4*e + 8*B*b^5*c*d*e^4))/(2*b^4*d^3*(b^3*e^3
- c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2)) - (x^2*(6*A*b^5*e^5 - 18*A*c^5
*d^5 + 9*B*b*c^4*d^5 - 4*B*b^5*d*e^4 - 19*B*b^2*c^3*d^4*e + 2*B*b^4*c*d^2*
e^3 - A*b^2*c^3*d^3*e^2 - 13*A*b^3*c^2*d^2*e^3 + 6*B*b^3*c^2*d^3*e^2 + 32*
A*b*c^4*d^4*e))/(2*b^3*d^3*(b^3*e^3 - c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*
e^2)) + (c^2*e*x^4*(6*A*c^4*d^4 - 3*A*b^4*e^4 - 3*B*b*c^3*d^4 + 2*B*b^4*d*
e^3 + 7*B*b^2*c^2*d^3*e - 3*B*b^3*c*d^2*e^2 + 3*A*b^2*c^2*d^2*e^2 - 12*A*b
*c^3*d^3*e + 3*A*b^3*c*d*e^3))/(b^4*d^3*(b^3*e^3 - c^3*d^3 + 3*b*c^2*d^2*e
 - 3*b^2*c*d*e^2)))/(x^3*(b^2*e + 2*b*c*d) + x^4*(c^2*d + 2*b*c*e) + b^2*d
*x^2 + c^2*e*x^5)
```

Reduce [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 3700, normalized size of antiderivative = 11.18

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^3,x)
```

output
```
( - 60*log(b + c*x)*a*b**5*c**4*d**5*e**3*x**2 - 60*log(b + c*x)*a*b**5*c*
*4*d**4*e**4*x**3 + 42*log(b + c*x)*a*b**4*c**5*d**6*e**2*x**2 - 78*log(b
+ c*x)*a*b**4*c**5*d**5*e**3*x**3 - 120*log(b + c*x)*a*b**4*c**5*d**4*e**4
*x**4 + 12*log(b + c*x)*a*b**3*c**6*d**7*e*x**2 + 96*log(b + c*x)*a*b**3*c
**6*d**6*e**2*x**3 + 24*log(b + c*x)*a*b**3*c**6*d**5*e**3*x**4 - 60*log(b
 + c*x)*a*b**3*c**6*d**4*e**4*x**5 - 12*log(b + c*x)*a*b**2*c**7*d**8*x**2
 + 12*log(b + c*x)*a*b**2*c**7*d**7*e*x**3 + 66*log(b + c*x)*a*b**2*c**7*d
**6*e**2*x**4 + 42*log(b + c*x)*a*b**2*c**7*d**5*e**3*x**5 - 24*log(b + c*
x)*a*b*c**8*d**8*x**3 - 12*log(b + c*x)*a*b*c**8*d**7*e*x**4 + 12*log(b +
c*x)*a*b*c**8*d**6*e**2*x**5 - 12*log(b + c*x)*a*c**9*d**8*x**4 - 12*log(b
 + c*x)*a*c**9*d**7*e*x**5 + 40*log(b + c*x)*b**7*c**3*d**5*e**3*x**2 + 40
*log(b + c*x)*b**7*c**3*d**4*e**4*x**3 - 20*log(b + c*x)*b**6*c**4*d**6*e*
*2*x**2 + 60*log(b + c*x)*b**6*c**4*d**5*e**3*x**3 + 80*log(b + c*x)*b**6*
c**4*d**4*e**4*x**4 - 8*log(b + c*x)*b**5*c**5*d**7*e*x**2 - 48*log(b + c*
x)*b**5*c**5*d**6*e**2*x**3 + 40*log(b + c*x)*b**5*c**5*d**4*e**4*x**5 + 6
*log(b + c*x)*b**4*c**6*d**8*x**2 - 10*log(b + c*x)*b**4*c**6*d**7*e*x**3
- 36*log(b + c*x)*b**4*c**6*d**6*e**2*x**4 - 20*log(b + c*x)*b**4*c**6*d**
5*e**3*x**5 + 12*log(b + c*x)*b**3*c**7*d**8*x**3 + 4*log(b + c*x)*b**3*c*
*7*d**7*e*x**4 - 8*log(b + c*x)*b**3*c**7*d**6*e**2*x**5 + 6*log(b + c*x)*
b**2*c**8*d**8*x**4 + 6*log(b + c*x)*b**2*c**8*d**7*e*x**5 - 12*log(d +...
```

3.52 $\int (A+Bx)(d+ex)^{7/2} \left(bx+cx^2\right) \, dx$

Optimal result

Integrand size = 24, antiderivative size = 126

$$\int (A+Bx)(d+ex)^{7/2} \left(bx+cx^2\right) \, dx = -\frac{2d(Bd-Ae)(cd-be)(d+ex)^{9/2}}{9e^4} + \frac{2(Bd(3cd-2be)-Ae(2cd-be))(d+ex)^{11/2}}{11e^4} - \frac{2(3Bcd-bBe-Ace)(d+ex)^{13/2}}{13e^4} + \frac{2Bc(d+ex)^{15/2}}{15e^4}$$

output
```
-2/9*d*(-A*e+B*d)*(-b*e+c*d)*(e*x+d)^(9/2)/e^4+2/11*(B*d*(-2*b*e+3*c*d)-A*
e*(-b*e+2*c*d))*(e*x+d)^(11/2)/e^4-2/13*(-A*c*e-B*b*e+3*B*c*d)*(e*x+d)^(13
/2)/e^4+2/15*B*c*(e*x+d)^(15/2)/e^4
```

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.90

$$\int (A+Bx)(d+ex)^{7/2} \left(bx+cx^2\right) \, dx = \frac{2(d+ex)^{9/2} \left(5Ae(13be(-2d+9ex)+c(8d^2-36dex+99e^2x^2))+B(5be(8d^2-36dex+99e^2 \right.}{6435e^4}$$

input
```
Integrate[(A + B*x)*(d + e*x)^(7/2)*(b*x + c*x^2),x]
```

output
```
(2*(d + e*x)^(9/2)*(5*A*e*(13*b*e*(-2*d + 9*e*x) + c*(8*d^2 - 36*d*e*x + 9
9*e^2*x^2)) + B*(5*b*e*(8*d^2 - 36*d*e*x + 99*e^2*x^2) + c*(-16*d^3 + 72*d
^2*e*x - 198*d*e^2*x^2 + 429*e^3*x^3))))/(6435*e^4)
```

Rubi [A] (verified)

Time = 0.49 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)(d+ex)^{7/2}\,dx$$

$$\Big\downarrow \; 1195$$

$$\int \left(\frac{(d+ex)^{11/2}(Ace+bBe-3Bcd)}{e^3}+\frac{(d+ex)^{9/2}(Bd(3cd-2be)-Ae(2cd-be))}{e^3}-\frac{d(d+ex)^{7/2}(Bd-Ae)(}{e^3}\right.$$

$$\Big\downarrow \; 2009$$

$$-\frac{2(d+ex)^{13/2}(-Ace-bBe+3Bcd)}{13e^4}+\frac{2(d+ex)^{11/2}(Bd(3cd-2be)-Ae(2cd-be))}{11e^4}-\frac{2d(d+ex)^{9/2}(Bd-Ae)(cd-be)}{9e^4}+\frac{2Bc(d+ex)^{15/2}}{15e^4}$$

input
```
Int[(A + B*x)*(d + e*x)^(7/2)*(b*x + c*x^2),x]
```

output
```
(-2*d*(B*d - A*e)*(c*d - b*e)*(d + e*x)^(9/2))/(9*e^4) + (2*(B*d*(3*c*d -
2*b*e) - A*e*(2*c*d - b*e))*(d + e*x)^(11/2))/(11*e^4) - (2*(3*B*c*d - b*B
*e - A*c*e)*(d + e*x)^(13/2))/(13*e^4) + (2*B*c*(d + e*x)^(15/2))/(15*e^4)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 1.98 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.73

method	result
pseudoelliptic	$-\frac{4(ex+d)^{\frac{9}{2}}\left(-\frac{9\left(\frac{11Bc\,x^2}{15}+\frac{11(Ac+Bb)x}{13}+Ab\right)x\,e^3}{2}+d\left(\frac{99Bc\,x^2}{65}+\frac{18(Ac+Bb)x}{13}+Ab\right)e^2-\frac{4d^2\left(\frac{9}{5}Bcx+Ac+Bb\right)e}{13}+\frac{8Bc\,d^3}{65}\right)}{99e^4}$
default	$\frac{\frac{2Bc(ex+d)^{\frac{15}{2}}}{15}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{13}{2}}}{13}+\frac{2((-Ae+Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{11}{2}}}{11}+\frac{2(-Ae+Bd)d(be-cd)(ex}{9}}{e^4}$
derivativedivides	$\frac{\frac{2Bc(ex+d)^{\frac{15}{2}}}{15}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{13}{2}}}{13}+\frac{2(-(Ae-Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{11}{2}}}{11}-\frac{2(Ae-Bd)d(be-cd)(ex+}{9}}{e^4}$
gosper	$-\frac{2(ex+d)^{\frac{9}{2}}\left(-429Bc\,x^3e^3-495Ac\,e^3x^2-495Bb\,e^3x^2+198Bcd\,e^2x^2-585Axb\,e^3+180Axcd\,e^2+180Bxbd\,e^2-72Bxc\,d\right.}{6435e^4}$
orering	$-\frac{2\left(-429Bc\,x^3e^3-495Ac\,e^3x^2-495Bb\,e^3x^2+198Bcd\,e^2x^2-585Axb\,e^3+180Axcd\,e^2+180Bxbd\,e^2-72Bxc\,d^2e+130A\right.}{6435e^4x(cx+b)}$
trager	$-\frac{2\left(-429B\,e^7c\,x^7-495Ac\,e^7x^6-495Bb\,e^7x^6-1518Bcd\,e^6x^6-585Ab\,e^7x^5-1800Acd\,e^6x^5-1800Bbd\,e^6x^5-1854Bc\,d\right.}{}$
risch	$-\frac{2\left(-429B\,e^7c\,x^7-495Ac\,e^7x^6-495Bb\,e^7x^6-1518Bcd\,e^6x^6-585Ab\,e^7x^5-1800Acd\,e^6x^5-1800Bbd\,e^6x^5-1854Bc\,d\right.}{}$

input
```
int((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
-4/99*(e*x+d)^(9/2)*(-9/2*(11/15*B*c*x^2+11/13*(A*c+B*b)*x+A*b)*x*e^3+d*(9
9/65*B*c*x^2+18/13*(A*c+B*b)*x+A*b)*e^2-4/13*d^2*(9/5*B*c*x+A*c+B*b)*e+8/6
5*B*c*d^3)/e^4
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 271 vs. $2(110) = 220$.

Time = 0.08 (sec) , antiderivative size = 271, normalized size of antiderivative = 2.15

$$\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)\,dx = \frac{2\left(429\,Bce^7x^7 - 16\,Bcd^7 - 130\,Abd^5e^2 + 40\,(Bb+Ac)d^6e + 33\,(46\,Bcde^6 + 15\,(Bb+Ac)e^7)x^6\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x),x, algorithm="fricas")
```

output
```
2/6435*(429*B*c*e^7*x^7 - 16*B*c*d^7 - 130*A*b*d^5*e^2 + 40*(B*b + A*c)*d^
6*e + 33*(46*B*c*d*e^6 + 15*(B*b + A*c)*e^7)*x^6 + 9*(206*B*c*d^2*e^5 + 65
*A*b*e^7 + 200*(B*b + A*c)*d*e^6)*x^5 + 10*(80*B*c*d^3*e^4 + 221*A*b*d*e^6
 + 229*(B*b + A*c)*d^2*e^5)*x^4 + 5*(B*c*d^4*e^3 + 598*A*b*d^2*e^5 + 212*(
B*b + A*c)*d^3*e^4)*x^3 - 3*(2*B*c*d^5*e^2 - 520*A*b*d^3*e^4 - 5*(B*b + A*
c)*d^4*e^3)*x^2 + (8*B*c*d^6*e + 65*A*b*d^4*e^3 - 20*(B*b + A*c)*d^5*e^2)*
x)*sqrt(e*x + d)/e^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 683 vs. $2(129) = 258$.

Time = 0.72 (sec) , antiderivative size = 683, normalized size of antiderivative = 5.42

$$\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)\,dx = \begin{cases} -\frac{4Abd^5\sqrt{d+ex}}{99e^2} + \frac{2Abd^4x\sqrt{d+ex}}{99e} + \frac{16Abd^3x^2\sqrt{d+ex}}{33} + \frac{92Abd^2ex^3\sqrt{d+ex}}{99} + \frac{68Abde^2x^4\sqrt{d+ex}}{99} + \frac{2Abe^3x^5\sqrt{d+ex}}{11} \\ d^{\frac{7}{2}}\left(\frac{Abx^2}{2} + \frac{Acx^3}{3} + \frac{Bbx^3}{3} + \frac{Bcx^4}{4}\right) \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(7/2)*(c*x**2+b*x),x)
```

output
```
Piecewise((-4*A*b*d**5*sqrt(d + e*x)/(99*e**2) + 2*A*b*d**4*x*sqrt(d + e*x
)/(99*e) + 16*A*b*d**3*x**2*sqrt(d + e*x)/33 + 92*A*b*d**2*e*x**3*sqrt(d +
 e*x)/99 + 68*A*b*d*e**2*x**4*sqrt(d + e*x)/99 + 2*A*b*e**3*x**5*sqrt(d +
e*x)/11 + 16*A*c*d**6*sqrt(d + e*x)/(1287*e**3) - 8*A*c*d**5*x*sqrt(d + e*
x)/(1287*e**2) + 2*A*c*d**4*x**2*sqrt(d + e*x)/(429*e) + 424*A*c*d**3*x**3
*sqrt(d + e*x)/1287 + 916*A*c*d**2*e*x**4*sqrt(d + e*x)/1287 + 80*A*c*d*e*
*2*x**5*sqrt(d + e*x)/143 + 2*A*c*e**3*x**6*sqrt(d + e*x)/13 + 16*B*b*d**6
*sqrt(d + e*x)/(1287*e**3) - 8*B*b*d**5*x*sqrt(d + e*x)/(1287*e**2) + 2*B*
b*d**4*x**2*sqrt(d + e*x)/(429*e) + 424*B*b*d**3*x**3*sqrt(d + e*x)/1287 +
 916*B*b*d**2*e*x**4*sqrt(d + e*x)/1287 + 80*B*b*d*e**2*x**5*sqrt(d + e*x)
/143 + 2*B*b*e**3*x**6*sqrt(d + e*x)/13 - 32*B*c*d**7*sqrt(d + e*x)/(6435*
e**4) + 16*B*c*d**6*x*sqrt(d + e*x)/(6435*e**3) - 4*B*c*d**5*x**2*sqrt(d +
 e*x)/(2145*e**2) + 2*B*c*d**4*x**3*sqrt(d + e*x)/(1287*e) + 320*B*c*d**3*
x**4*sqrt(d + e*x)/1287 + 412*B*c*d**2*e*x**5*sqrt(d + e*x)/715 + 92*B*c*d
*e**2*x**6*sqrt(d + e*x)/195 + 2*B*c*e**3*x**7*sqrt(d + e*x)/15, Ne(e, 0))
, (d**(7/2)*(A*b*x**2/2 + A*c*x**3/3 + B*b*x**3/3 + B*c*x**4/4), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.89

$$\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)\,dx=\frac{2\left(429\,(ex+d)^{\frac{15}{2}}Bc-495\,(3\,Bcd-(Bb+Ac)e)(ex+d)^{\frac{13}{2}}+585\,(3\,Bcd^2+Abe^2-2\,(Bb+A\right.}{6435\,e^4}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x),x, algorithm="maxima")
```

output
```
2/6435*(429*(e*x + d)^(15/2)*B*c - 495*(3*B*c*d - (B*b + A*c)*e)*(e*x + d)
^(13/2) + 585*(3*B*c*d^2 + A*b*e^2 - 2*(B*b + A*c)*d*e)*(e*x + d)^(11/2) -
 715*(B*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)*(e*x + d)^(9/2))/e^4
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1304 vs. $2(110) = 220$.

Time = 0.25 (sec) , antiderivative size = 1304, normalized size of antiderivative = 10.35

$$\int (A + Bx)(d + ex)^{7/2} \left(bx + cx^2\right) dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x),x, algorithm="giac")
```

output
```
2/45045*(15015*((e*x + d)^(3/2) - 3*sqrt(e*x + d)*d)*A*b*d^4/e + 3003*(3*(
e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*B*b*d^4/e^2
+ 3003*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*A
*c*d^4/e^2 + 12012*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x
 + d)*d^2)*A*b*d^3/e + 1287*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35
*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*c*d^4/e^3 + 5148*(5*(e*x +
d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d
)*d^3)*B*b*d^3/e^2 + 5148*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(
e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*A*c*d^3/e^2 + 7722*(5*(e*x + d)
^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*
d^3)*A*b*d^2/e + 572*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*
x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*c*d^
3/e^3 + 858*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5
/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*b*d^2/e^2 + 8
58*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 -
 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*A*c*d^2/e^2 + 572*(35*(e
*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x
 + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*A*b*d/e + 390*(63*(e*x + d)^(11/2
) - 385*(e*x + d)^(9/2)*d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x + d)^(5/2)
*d^3 + 1155*(e*x + d)^(3/2)*d^4 - 693*sqrt(e*x + d)*d^5)*B*c*d^2/e^3 + ...
```

Mupad [B] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.88

$$\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)\,dx=\frac{(d+e\,x)^{11/2}\,\left(2\,A\,b\,e^2+6\,B\,c\,d^2-4\,A\,c\,d\,e-4\,B\,b\,d\,e\right)}{11\,e^4}+\frac{(d+e\,x)^{13/2}\,\left(2\,A\,c\,e+2\,B\,b\,e-6\,B\,c\,d\right)}{13\,e^4}+\frac{2\,B\,c\,(d+e\,x)^{15/2}}{15\,e^4}-\frac{2\,d\,\left(A\,e-B\,d\right)\,\left(b\,e-c\,d\right)\,(d+e\,x)^{9/2}}{9\,e^4}$$

input
```
int((b*x + c*x^2)*(A + B*x)*(d + e*x)^(7/2),x)
```

output
```
((d + e*x)^(11/2)*(2*A*b*e^2 + 6*B*c*d^2 - 4*A*c*d*e - 4*B*b*d*e))/(11*e^4
) + ((d + e*x)^(13/2)*(2*A*c*e + 2*B*b*e - 6*B*c*d))/(13*e^4) + (2*B*c*(d
+ e*x)^(15/2))/(15*e^4) - (2*d*(A*e - B*d)*(b*e - c*d)*(d + e*x)^(9/2))/(9
*e^4)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 334, normalized size of antiderivative = 2.65

$$\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)\,dx=\frac{2\sqrt{ex+d}\,(429bc\,e^7x^7+495ac\,e^7x^6+495b^2e^7x^6+1518bcd\,e^6x^6+585ab\,e^7x^5+1800acd\,e^6x^5 -}{}$$

input
```
int((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x),x)
```

output
```
(2*sqrt(d + e*x)*( - 130*a*b*d**5*e**2 + 65*a*b*d**4*e**3*x + 1560*a*b*d**
3*e**4*x**2 + 2990*a*b*d**2*e**5*x**3 + 2210*a*b*d*e**6*x**4 + 585*a*b*e**
7*x**5 + 40*a*c*d**6*e - 20*a*c*d**5*e**2*x + 15*a*c*d**4*e**3*x**2 + 1060
*a*c*d**3*e**4*x**3 + 2290*a*c*d**2*e**5*x**4 + 1800*a*c*d*e**6*x**5 + 495
*a*c*e**7*x**6 + 40*b**2*d**6*e - 20*b**2*d**5*e**2*x + 15*b**2*d**4*e**3*
x**2 + 1060*b**2*d**3*e**4*x**3 + 2290*b**2*d**2*e**5*x**4 + 1800*b**2*d*e
**6*x**5 + 495*b**2*e**7*x**6 - 16*b*c*d**7 + 8*b*c*d**6*e*x - 6*b*c*d**5*
e**2*x**2 + 5*b*c*d**4*e**3*x**3 + 800*b*c*d**3*e**4*x**4 + 1854*b*c*d**2*
e**5*x**5 + 1518*b*c*d*e**6*x**6 + 429*b*c*e**7*x**7))/(6435*e**4)
```

3.53 $\int (A+Bx)(d+ex)^{5/2} \left(bx+cx^2\right) \, dx$

Optimal result

Integrand size = 24, antiderivative size = 126

$$\int (A+Bx)(d+ex)^{5/2} \left(bx+cx^2\right) \, dx = -\frac{2d(Bd-Ae)(cd-be)(d+ex)^{7/2}}{7e^4} + \frac{2(Bd(3cd-2be)-Ae(2cd-be))(d+ex)^{9/2}}{9e^4} - \frac{2(3Bcd-bBe-Ace)(d+ex)^{11/2}}{11e^4} + \frac{2Bc(d+ex)^{13/2}}{13e^4}$$

output
```
-2/7*d*(-A*e+B*d)*(-b*e+c*d)*(e*x+d)^(7/2)/e^4+2/9*(B*d*(-2*b*e+3*c*d)-A*e
*(-b*e+2*c*d))*(e*x+d)^(9/2)/e^4-2/11*(-A*c*e-B*b*e+3*B*c*d)*(e*x+d)^(11/2
)/e^4+2/13*B*c*(e*x+d)^(13/2)/e^4
```

Mathematica [A] (verified)

Time = 0.17 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.90

$$\int (A+Bx)(d+ex)^{5/2} (bx + cx^2) \, dx = \frac{2(d+ex)^{7/2} \left(13Ae\left(11be(-2d+7ex)+c\left(8d^2-28dex+63e^2x^2\right)\right)+B\left(13be\left(8d^2-28dex+63\right.\right.\right.}{9009e^4}$$

input
```
Integrate[(A + B*x)*(d + e*x)^(5/2)*(b*x + c*x^2),x]
```

output
```
(2*(d + e*x)^(7/2)*(13*A*e*(11*b*e*(-2*d + 7*e*x) + c*(8*d^2 - 28*d*e*x +
63*e^2*x^2)) + B*(13*b*e*(8*d^2 - 28*d*e*x + 63*e^2*x^2) + c*(-48*d^3 + 16
8*d^2*e*x - 378*d*e^2*x^2 + 693*e^3*x^3))))/(9009*e^4)
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)(d+ex)^{5/2}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{(d+ex)^{9/2}(Ace+bBe-3Bcd)}{e^3}+\frac{(d+ex)^{7/2}(Bd(3cd-2be)-Ae(2cd-be))}{e^3}-\frac{d(d+ex)^{5/2}(Bd-Ae)(c$$

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

$$-\frac{2(d+ex)^{11/2}(-Ace-bBe+3Bcd)}{11e^4}+\frac{2(d+ex)^{9/2}(Bd(3cd-2be)-Ae(2cd-be))}{9e^4}-\frac{2d(d+ex)^{7/2}(Bd-Ae)(cd-be)}{7e^4}+\frac{2Bc(d+ex)^{13/2}}{13e^4}$$

input
```
Int[(A + B*x)*(d + e*x)^(5/2)*(b*x + c*x^2),x]
```

output
```
(-2*d*(B*d - A*e)*(c*d - b*e)*(d + e*x)^(7/2))/(7*e^4) + (2*(B*d*(3*c*d -
2*b*e) - A*e*(2*c*d - b*e))*(d + e*x)^(9/2))/(9*e^4) - (2*(3*B*c*d - b*B*e
 - A*c*e)*(d + e*x)^(11/2))/(11*e^4) + (2*B*c*(d + e*x)^(13/2))/(13*e^4)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 1.98 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.73

method	result
pseudoelliptic	$-\frac{4\left(-\frac{7\left(\frac{9Bc\,x^{2}}{13}+\frac{9(Ac+Bb)x}{11}+Ab\right)x\,e^{3}}{2}+d\left(\frac{189Bc\,x^{2}}{143}+\frac{14(Ac+Bb)x}{11}+Ab\right)e^{2}-\frac{4d^{2}\left(\frac{21}{13}Bcx+Ac+Bb\right)e}{11}+\frac{24Bc\,d^{3}}{143}\right)(ex+d)}{63e^{4}}$
default	$\frac{\frac{2Bc(ex+d)^{\frac{13}{2}}}{13}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{11}{2}}}{11}+\frac{2((-Ae+Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{9}{2}}}{9}+\frac{2(-Ae+Bd)d(be-cd)(ex+}{7}}{e^{4}}$
derivativedivides	$\frac{\frac{2Bc(ex+d)^{\frac{13}{2}}}{13}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{11}{2}}}{11}+\frac{2(-(Ae-Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{9}{2}}}{9}-\frac{2(Ae-Bd)d(be-cd)(ex+d}{7}}{e^{4}}$
gosper	$-\frac{2(ex+d)^{\frac{7}{2}}\left(-693Bc\,x^{3}e^{3}-819Ac\,e^{3}x^{2}-819Bb\,e^{3}x^{2}+378Bcd\,e^{2}x^{2}-1001Axb\,e^{3}+364Axcd\,e^{2}+364Bxbd\,e^{2}-168Bx\right.}{9009e^{4}}$
orering	$-\frac{2\left(-693Bc\,x^{3}e^{3}-819Ac\,e^{3}x^{2}-819Bb\,e^{3}x^{2}+378Bcd\,e^{2}x^{2}-1001Axb\,e^{3}+364Axcd\,e^{2}+364Bxbd\,e^{2}-168Bxc\,d^{2}e+28\right.}{9009e^{4}x(cx+b)}$
trager	$-\frac{2\left(-693B\,e^{6}c\,x^{6}-819Ac\,e^{6}x^{5}-819Bb\,e^{6}x^{5}-1701Bcd\,e^{5}x^{5}-1001Ab\,e^{6}x^{4}-2093Acd\,e^{5}x^{4}-2093Bbd\,e^{5}x^{4}-1113Bc\right.}{}$
risch	$-\frac{2\left(-693B\,e^{6}c\,x^{6}-819Ac\,e^{6}x^{5}-819Bb\,e^{6}x^{5}-1701Bcd\,e^{5}x^{5}-1001Ab\,e^{6}x^{4}-2093Acd\,e^{5}x^{4}-2093Bbd\,e^{5}x^{4}-1113Bc\right.}{}$

input
```
int((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
-4/63*(-7/2*(9/13*B*c*x^2+9/11*(A*c+B*b)*x+A*b)*x*e^3+d*(189/143*B*c*x^2+1
4/11*(A*c+B*b)*x+A*b)*e^2-4/11*d^2*(21/13*B*c*x+A*c+B*b)*e+24/143*B*c*d^3)
*(e*x+d)^(7/2)/e^4
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 230 vs. $2(110) = 220$.

Time = 0.08 (sec) , antiderivative size = 230, normalized size of antiderivative = 1.83

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)\,dx = \frac{2\left(693\,Bce^6x^6-48\,Bcd^6-286\,Abd^4e^2+104\,(Bb+Ac)d^5e+63\,(27\,Bcde^5+13\,(Bb+Ac)e^6)\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x),x, algorithm="fricas")
```

output
```
2/9009*(693*B*c*e^6*x^6 - 48*B*c*d^6 - 286*A*b*d^4*e^2 + 104*(B*b + A*c)*d
^5*e + 63*(27*B*c*d*e^5 + 13*(B*b + A*c)*e^6)*x^5 + 7*(159*B*c*d^2*e^4 + 1
43*A*b*e^6 + 299*(B*b + A*c)*d*e^5)*x^4 + (15*B*c*d^3*e^3 + 2717*A*b*d*e^5
 + 1469*(B*b + A*c)*d^2*e^4)*x^3 - 3*(6*B*c*d^4*e^2 - 715*A*b*d^2*e^4 - 13
*(B*b + A*c)*d^3*e^3)*x^2 + (24*B*c*d^5*e + 143*A*b*d^3*e^3 - 52*(B*b + A*
c)*d^4*e^2)*x)*sqrt(e*x + d)/e^4
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 581 vs. $2(129) = 258$.

Time = 0.53 (sec) , antiderivative size = 581, normalized size of antiderivative = 4.61

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)\,dx = \begin{cases} -\frac{4Abd^4\sqrt{d+ex}}{63e^2}+\frac{2Abd^3x\sqrt{d+ex}}{63e}+\frac{10Abd^2x^2\sqrt{d+ex}}{21}+\frac{38Abdex^3\sqrt{d+ex}}{63}+\frac{2Abe^2x^4\sqrt{d+ex}}{9}+\frac{16Acd^5\sqrt{d+ex}}{693e^3}-\frac{8}{} \\ d^{\frac{5}{2}}\left(\frac{Abx^2}{2}+\frac{Acx^3}{3}+\frac{Bbx^3}{3}+\frac{Bcx^4}{4}\right) \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(5/2)*(c*x**2+b*x),x)
```

output
```
Piecewise((-4*A*b*d**4*sqrt(d + e*x)/(63*e**2) + 2*A*b*d**3*x*sqrt(d + e*x
)/(63*e) + 10*A*b*d**2*x**2*sqrt(d + e*x)/21 + 38*A*b*d*e*x**3*sqrt(d + e*
x)/63 + 2*A*b*e**2*x**4*sqrt(d + e*x)/9 + 16*A*c*d**5*sqrt(d + e*x)/(693*e
**3) - 8*A*c*d**4*x*sqrt(d + e*x)/(693*e**2) + 2*A*c*d**3*x**2*sqrt(d + e*
x)/(231*e) + 226*A*c*d**2*x**3*sqrt(d + e*x)/693 + 46*A*c*d*e*x**4*sqrt(d
+ e*x)/99 + 2*A*c*e**2*x**5*sqrt(d + e*x)/11 + 16*B*b*d**5*sqrt(d + e*x)/(
693*e**3) - 8*B*b*d**4*x*sqrt(d + e*x)/(693*e**2) + 2*B*b*d**3*x**2*sqrt(d
 + e*x)/(231*e) + 226*B*b*d**2*x**3*sqrt(d + e*x)/693 + 46*B*b*d*e*x**4*sq
rt(d + e*x)/99 + 2*B*b*e**2*x**5*sqrt(d + e*x)/11 - 32*B*c*d**6*sqrt(d + e
*x)/(3003*e**4) + 16*B*c*d**5*x*sqrt(d + e*x)/(3003*e**3) - 4*B*c*d**4*x**
2*sqrt(d + e*x)/(1001*e**2) + 10*B*c*d**3*x**3*sqrt(d + e*x)/(3003*e) + 10
6*B*c*d**2*x**4*sqrt(d + e*x)/429 + 54*B*c*d*e*x**5*sqrt(d + e*x)/143 + 2*
B*c*e**2*x**6*sqrt(d + e*x)/13, Ne(e, 0)), (d**(5/2)*(A*b*x**2/2 + A*c*x**
3/3 + B*b*x**3/3 + B*c*x**4/4), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.89

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)\,dx = \frac{2\left(693\,(ex+d)^{\frac{13}{2}}Bc-819\,(3\,Bcd-(Bb+Ac)e)(ex+d)^{\frac{11}{2}}+1001\,(3\,Bcd^2+Abe^2-2\,(Bb+\right.}{9009\,e^4}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x),x, algorithm="maxima")
```

output
```
2/9009*(693*(e*x + d)^(13/2)*B*c - 819*(3*B*c*d - (B*b + A*c)*e)*(e*x + d)
^(11/2) + 1001*(3*B*c*d^2 + A*b*e^2 - 2*(B*b + A*c)*d*e)*(e*x + d)^(9/2) -
 1287*(B*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)*(e*x + d)^(7/2))/e^4
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 944 vs. $2(110) = 220$.

Time = 0.23 (sec) , antiderivative size = 944, normalized size of antiderivative = 7.49

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x),x, algorithm="giac")
```

output
```
2/45045*(15015*((e*x + d)^(3/2) - 3*sqrt(e*x + d)*d)*A*b*d^3/e + 3003*(3*(
e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*B*b*d^3/e^2
+ 3003*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*A
*c*d^3/e^2 + 9009*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x
+ d)*d^2)*A*b*d^2/e + 1287*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*
(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*c*d^3/e^3 + 3861*(5*(e*x + d
)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)
*d^3)*B*b*d^2/e^2 + 3861*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e
*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*A*c*d^2/e^2 + 3861*(5*(e*x + d)^
(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d
^3)*A*b*d/e + 429*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x +
 d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*c*d^2/e
^3 + 429*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)
*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*b*d/e^2 + 429*(3
5*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*
(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*A*c*d/e^2 + 143*(35*(e*x + d)
^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(
3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*A*b/e + 195*(63*(e*x + d)^(11/2) - 385*(
e*x + d)^(9/2)*d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x + d)^(5/2)*d^3 + 11
55*(e*x + d)^(3/2)*d^4 - 693*sqrt(e*x + d)*d^5)*B*c*d/e^3 + 65*(63*(e*x...
```

Mupad [B] (verification not implemented)

Time = 10.91 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.88

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)\,dx = \frac{(d+e\,x)^{9/2}\,(2\,A\,b\,e^2+6\,B\,c\,d^2-4\,A\,c\,d\,e-4\,B\,b\,d\,e)}{9\,e^4} + \frac{(d+e\,x)^{11/2}\,(2\,A\,c\,e+2\,B\,b\,e-6\,B\,c\,d)}{11\,e^4} + \frac{2\,B\,c\,(d+e\,x)^{13/2}}{13\,e^4} - \frac{2\,d\,(A\,e-B\,d)\,(b\,e-c\,d)\,(d+e\,x)^{7/2}}{7\,e^4}$$

input
```
int((b*x + c*x^2)*(A + B*x)*(d + e*x)^(5/2),x)
```

output
```
((d + e*x)^(9/2)*(2*A*b*e^2 + 6*B*c*d^2 - 4*A*c*d*e - 4*B*b*d*e))/(9*e^4)
+ ((d + e*x)^(11/2)*(2*A*c*e + 2*B*b*e - 6*B*c*d))/(11*e^4) + (2*B*c*(d +
e*x)^(13/2))/(13*e^4) - (2*d*(A*e - B*d)*(b*e - c*d)*(d + e*x)^(7/2))/(7*e
^4)
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 281, normalized size of antiderivative = 2.23

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)\,dx = \frac{2\sqrt{ex+d}\,(693bc\,e^6x^6+819ac\,e^6x^5+819b^2e^6x^5+1701bcd\,e^5x^5+1001ab\,e^6x^4+2093acd\,e^5x^4}{}$$

input
```
int((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x),x)
```

output

```
(2*sqrt(d + e*x)*( - 286*a*b*d**4*e**2 + 143*a*b*d**3*e**3*x + 2145*a*b*d*
*2*e**4*x**2 + 2717*a*b*d*e**5*x**3 + 1001*a*b*e**6*x**4 + 104*a*c*d**5*e
- 52*a*c*d**4*e**2*x + 39*a*c*d**3*e**3*x**2 + 1469*a*c*d**2*e**4*x**3 + 2
093*a*c*d*e**5*x**4 + 819*a*c*e**6*x**5 + 104*b**2*d**5*e - 52*b**2*d**4*e
**2*x + 39*b**2*d**3*e**3*x**2 + 1469*b**2*d**2*e**4*x**3 + 2093*b**2*d*e*
*5*x**4 + 819*b**2*e**6*x**5 - 48*b*c*d**6 + 24*b*c*d**5*e*x - 18*b*c*d**4
*e**2*x**2 + 15*b*c*d**3*e**3*x**3 + 1113*b*c*d**2*e**4*x**4 + 1701*b*c*d*
e**5*x**5 + 693*b*c*e**6*x**6))/(9009*e**4)
```

3.54 $\int (A+Bx)(d+ex)^{3/2} \left(bx+cx^2\right) \, dx$

Optimal result

Integrand size = 24, antiderivative size = 126

$$\int (A+Bx)(d+ex)^{3/2} \left(bx+cx^2\right) \, dx = -\frac{2d(Bd-Ae)(cd-be)(d+ex)^{5/2}}{5e^4} + \frac{2(Bd(3cd-2be)-Ae(2cd-be))(d+ex)^{7/2}}{7e^4} - \frac{2(3Bcd-bBe-Ace)(d+ex)^{9/2}}{9e^4} + \frac{2Bc(d+ex)^{11/2}}{11e^4}$$

output
```
-2/5*d*(-A*e+B*d)*(-b*e+c*d)*(e*x+d)^(5/2)/e^4+2/7*(B*d*(-2*b*e+3*c*d)-A*e
*(-b*e+2*c*d))*(e*x+d)^(7/2)/e^4-2/9*(-A*c*e-B*b*e+3*B*c*d)*(e*x+d)^(9/2)/
e^4+2/11*B*c*(e*x+d)^(11/2)/e^4
```

Mathematica [A] (verified)

Time = 0.15 (sec) , antiderivative size = 114, normalized size of antiderivative = 0.90

$$\int (A+Bx)(d+ex)^{3/2} \left(bx+cx^2\right) \, dx = \frac{2(d+ex)^{5/2} \left(11Ae(9be(-2d+5ex)+c(8d^2-20dex+35e^2x^2))+B(11be(8d^2-20dex+35e\right.}{3465e^4}$$

input
```
Integrate[(A + B*x)*(d + e*x)^(3/2)*(b*x + c*x^2),x]
```

output
```
(2*(d + e*x)^(5/2)*(11*A*e*(9*b*e*(-2*d + 5*e*x) + c*(8*d^2 - 20*d*e*x + 3
5*e^2*x^2)) + B*(11*b*e*(8*d^2 - 20*d*e*x + 35*e^2*x^2) - 3*c*(16*d^3 - 40
*d^2*e*x + 70*d*e^2*x^2 - 105*e^3*x^3))))/(3465*e^4)
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)(d+ex)^{3/2}\,dx$$

$$\Big\downarrow \ 1195$$

$$\int \left(\frac{(d+ex)^{7/2}(Ace+bBe-3Bcd)}{e^3}+\frac{(d+ex)^{5/2}(Bd(3cd-2be)-Ae(2cd-be))}{e^3}-\frac{d(d+ex)^{3/2}(Bd-Ae)(c$$

$$\Big\downarrow \ 2009$$

$$-\frac{2(d+ex)^{9/2}(-Ace-bBe+3Bcd)}{9e^4}+\frac{2(d+ex)^{7/2}(Bd(3cd-2be)-Ae(2cd-be))}{7e^4}-\frac{2d(d+ex)^{5/2}(Bd-Ae)(cd-be)}{5e^4}+\frac{2Bc(d+ex)^{11/2}}{11e^4}$$

input
```
Int[(A + B*x)*(d + e*x)^(3/2)*(b*x + c*x^2),x]
```

output
```
(-2*d*(B*d - A*e)*(c*d - b*e)*(d + e*x)^(5/2))/(5*e^4) + (2*(B*d*(3*c*d -
2*b*e) - A*e*(2*c*d - b*e))*(d + e*x)^(7/2))/(7*e^4) - (2*(3*B*c*d - b*B*e
 - A*c*e)*(d + e*x)^(9/2))/(9*e^4) + (2*B*c*(d + e*x)^(11/2))/(11*e^4)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 1.92 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.73

method	result
pseudoelliptic	$-\frac{4(ex+d)^{\frac{5}{2}}\left(-\frac{5x\left(\frac{7Bc\,x^2}{11}+\frac{7(Ac+Bb)x}{9}+Ab\right)e^3}{2}+d\left(\frac{35Bc\,x^2}{33}+\frac{10(Ac+Bb)x}{9}+Ab\right)e^2-\frac{4d^2\left(\frac{15}{11}Bcx+Ac+Bb\right)e}{9}+\frac{8Bc\,d^3}{33}\right)}{35e^4}$
default	$\frac{\frac{2Bc(ex+d)^{\frac{11}{2}}}{11}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{9}{2}}}{9}+\frac{2((-Ae+Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{7}{2}}}{7}+\frac{2(-Ae+Bd)d(be-cd)(ex+\cdots}{5}\cdots}{e^4}$
derivativedivides	$\frac{\frac{2Bc(ex+d)^{\frac{11}{2}}}{11}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{9}{2}}}{9}+\frac{2(-(Ae-Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{7}{2}}}{7}-\frac{2(Ae-Bd)d(be-cd)(ex+d)\cdots}{5}\cdots}{e^4}$
gosper	$-\frac{2(ex+d)^{\frac{5}{2}}\left(-315Bc\,x^3e^3-385Ac\,e^3x^2-385Bb\,e^3x^2+210Bcd\,e^2x^2-495Axb\,e^3+220Axcd\,e^2+220Bxbd\,e^2-120Bxc\cdots\right.}{3465e^4}$
orering	$-\frac{2\left(-315Bc\,x^3e^3-385Ac\,e^3x^2-385Bb\,e^3x^2+210Bcd\,e^2x^2-495Axb\,e^3+220Axcd\,e^2+220Bxbd\,e^2-120Bxc\,d^2e+198\cdots\right.}{3465e^4x(cx+b)}$
trager	$-\frac{2\left(-315Bc\,e^5x^5-385Ac\,e^5x^4-385Bb\,e^5x^4-420Bcd\,e^4x^4-495Ab\,e^5x^3-550Acd\,e^4x^3-550Bbd\,e^4x^3-15Bc\,d^2e^3x^3\cdots\right.}{\cdots}$
risch	$-\frac{2\left(-315Bc\,e^5x^5-385Ac\,e^5x^4-385Bb\,e^5x^4-420Bcd\,e^4x^4-495Ab\,e^5x^3-550Acd\,e^4x^3-550Bbd\,e^4x^3-15Bc\,d^2e^3x^3\cdots\right.}{\cdots}$

input
```
int((B*x+A)*(e*x+d)^(3/2)*(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
-4/35*(e*x+d)^(5/2)*(-5/2*x*(7/11*B*c*x^2+7/9*(A*c+B*b)*x+A*b)*e^3+d*(35/3
3*B*c*x^2+10/9*(A*c+B*b)*x+A*b)*e^2-4/9*d^2*(15/11*B*c*x+A*c+B*b)*e+8/33*B
*c*d^3)/e^4
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.51

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)\,dx=\frac{2\,(315\,Bce^5x^5-48\,Bcd^5-198\,Abd^3e^2+88\,(Bb+Ac)d^4e+35\,(12\,Bcde^4+11\,(Bb+Ac)e^5)x^4}{}$$

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

output
```
2/3465*(315*B*c*e^5*x^5 - 48*B*c*d^5 - 198*A*b*d^3*e^2 + 88*(B*b + A*c)*d^
4*e + 35*(12*B*c*d*e^4 + 11*(B*b + A*c)*e^5)*x^4 + 5*(3*B*c*d^2*e^3 + 99*A
*b*e^5 + 110*(B*b + A*c)*d*e^4)*x^3 - 3*(6*B*c*d^3*e^2 - 264*A*b*d*e^4 - 1
1*(B*b + A*c)*d^2*e^3)*x^2 + (24*B*c*d^4*e + 99*A*b*d^2*e^3 - 44*(B*b + A*
c)*d^3*e^2)*x)*sqrt(e*x + d)/e^4
```

Sympy [A] (verification not implemented)

Time = 1.25 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.43

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)\,dx=\begin{cases}\frac{2\left(\frac{Bc(d+ex)^{\frac{11}{2}}}{11e^3}+\frac{(d+ex)^{\frac{9}{2}}(Ace+Bbe-3Bcd)}{9e^3}+\frac{(d+ex)^{\frac{7}{2}}\left(Abe^2-2Acde-2Bbde+3Bcd^2\right)}{7e^3}+\frac{(d+ex)^{\frac{5}{2}}\left(-Abde^2+Acd^2e+Bbd^2e-Bcd^3\right)}{5e^3}\right)}{e}\\ d^{\frac{3}{2}}\left(\frac{Abx^2}{2}+\frac{Bcx^4}{4}+\frac{x^3(Ac+Bb)}{3}\right)\end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(3/2)*(c*x**2+b*x),x)
```

output
```
Piecewise((2*(B*c*(d + e*x)**(11/2)/(11*e**3) + (d + e*x)**(9/2)*(A*c*e +
B*b*e - 3*B*c*d)/(9*e**3) + (d + e*x)**(7/2)*(A*b*e**2 - 2*A*c*d*e - 2*B*b
*d*e + 3*B*c*d**2)/(7*e**3) + (d + e*x)**(5/2)*(-A*b*d*e**2 + A*c*d**2*e +
 B*b*d**2*e - B*c*d**3)/(5*e**3))/e, Ne(e, 0)), (d**(3/2)*(A*b*x**2/2 + B*
c*x**4/4 + x**3*(A*c + B*b)/3), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.89

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)\,dx = \frac{2\left(315\,(ex+d)^{\frac{11}{2}}Bc-385\,(3\,Bcd-(Bb+Ac)e)(ex+d)^{\frac{9}{2}}+495\,(3\,Bcd^2+Abe^2-2\,(Bb+A\right.}{3465\,e^4}$$

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

output
```
2/3465*(315*(e*x + d)^(11/2)*B*c - 385*(3*B*c*d - (B*b + A*c)*e)*(e*x + d)
^(9/2) + 495*(3*B*c*d^2 + A*b*e^2 - 2*(B*b + A*c)*d*e)*(e*x + d)^(7/2) - 6
93*(B*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)*(e*x + d)^(5/2))/e^4
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 632 vs. 2(110) = 220.

Time = 0.27 (sec) , antiderivative size = 632, normalized size of antiderivative = 5.02

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)\,dx = \text{Too large to display}$$

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

output
```
2/3465*(1155*((e*x + d)^(3/2) - 3*sqrt(e*x + d)*d)*A*b*d^2/e + 231*(3*(e*x
 + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*B*b*d^2/e^2 + 2
31*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*A*c*d
^2/e^2 + 462*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*
d^2)*A*b*d/e + 99*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)
^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*c*d^2/e^3 + 198*(5*(e*x + d)^(7/2) -
21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*b*
d/e^2 + 198*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)
*d^2 - 35*sqrt(e*x + d)*d^3)*A*c*d/e^2 + 99*(5*(e*x + d)^(7/2) - 21*(e*x +
 d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*A*b/e + 22*(3
5*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*
(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*c*d/e^3 + 11*(35*(e*x + d)^
(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3
/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*b/e^2 + 11*(35*(e*x + d)^(9/2) - 180*(e
*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*
sqrt(e*x + d)*d^4)*A*c/e^2 + 5*(63*(e*x + d)^(11/2) - 385*(e*x + d)^(9/2)*
d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x + d)^(5/2)*d^3 + 1155*(e*x + d)^(3
/2)*d^4 - 693*sqrt(e*x + d)*d^5)*B*c/e^3)/e
```

Mupad [B] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.88

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)\,dx=\frac{(d+e\,x)^{7/2}\,\left(2\,A\,b\,e^2+6\,B\,c\,d^2-4\,A\,c\,d\,e-4\,B\,b\,d\,e\right)}{7\,e^4}+\frac{(d+e\,x)^{9/2}\,\left(2\,A\,c\,e+2\,B\,b\,e-6\,B\,c\,d\right)}{9\,e^4}+\frac{2\,B\,c\,{(d+e\,x)}^{11/2}}{11\,e^4}-\frac{2\,d\,\left(A\,e-B\,d\right)\,\left(b\,e-c\,d\right)\,{(d+e\,x)}^{5/2}}{5\,e^4}$$

input
```
int((b*x + c*x^2)*(A + B*x)*(d + e*x)^(3/2),x)
```

output
```
((d + e*x)^(7/2)*(2*A*b*e^2 + 6*B*c*d^2 - 4*A*c*d*e - 4*B*b*d*e))/(7*e^4)
+ ((d + e*x)^(9/2)*(2*A*c*e + 2*B*b*e - 6*B*c*d))/(9*e^4) + (2*B*c*(d + e*
x)^(11/2))/(11*e^4) - (2*d*(A*e - B*d)*(b*e - c*d)*(d + e*x)^(5/2))/(5*e^4
)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 228, normalized size of antiderivative = 1.81

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)\,dx = \frac{2\sqrt{ex+d}\,(315bc\,e^5x^5+385ac\,e^5x^4+385b^2e^5x^4+420bcd\,e^4x^4+495ab\,e^5x^3+550acd\,e^4x^3+5}{}$$

input
```
int((B*x+A)*(e*x+d)^(3/2)*(c*x^2+b*x),x)
```

output
```
(2*sqrt(d + e*x)*( - 198*a*b*d**3*e**2 + 99*a*b*d**2*e**3*x + 792*a*b*d*e*
*4*x**2 + 495*a*b*e**5*x**3 + 88*a*c*d**4*e - 44*a*c*d**3*e**2*x + 33*a*c*
d**2*e**3*x**2 + 550*a*c*d*e**4*x**3 + 385*a*c*e**5*x**4 + 88*b**2*d**4*e
- 44*b**2*d**3*e**2*x + 33*b**2*d**2*e**3*x**2 + 550*b**2*d*e**4*x**3 + 38
5*b**2*e**5*x**4 - 48*b*c*d**5 + 24*b*c*d**4*e*x - 18*b*c*d**3*e**2*x**2 +
 15*b*c*d**2*e**3*x**3 + 420*b*c*d*e**4*x**4 + 315*b*c*e**5*x**5))/(3465*e
**4)
```

3.55 $\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)\,dx$

Optimal result

Integrand size = 24, antiderivative size = 126

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)\,dx = -\frac{2d(Bd-Ae)(cd-be)(d+ex)^{3/2}}{3e^4} + \frac{2(Bd(3cd-2be)-Ae(2cd-be))(d+ex)^{5/2}}{5e^4} - \frac{2(3Bcd-bBe-Ace)(d+ex)^{7/2}}{7e^4} + \frac{2Bc(d+ex)^{9/2}}{9e^4}$$

output
```
-2/3*d*(-A*e+B*d)*(-b*e+c*d)*(e*x+d)^(3/2)/e^4+2/5*(B*d*(-2*b*e+3*c*d)-A*e
*(-b*e+2*c*d))*(e*x+d)^(5/2)/e^4-2/7*(-A*c*e-B*b*e+3*B*c*d)*(e*x+d)^(7/2)/
e^4+2/9*B*c*(e*x+d)^(9/2)/e^4
```

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.90

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)\,dx$$
$$=\frac{2(d+ex)^{3/2}\,(3Ae(7be(-2d+3ex)+c(8d^2-12dex+15e^2x^2))+B(3be(8d^2-12dex+15e^2x^2)+c(-1}{315e^4}$$

input
```
Integrate[(A + B*x)*Sqrt[d + e*x]*(b*x + c*x^2),x]
```

output
```
(2*(d + e*x)^(3/2)*(3*A*e*(7*b*e*(-2*d + 3*e*x) + c*(8*d^2 - 12*d*e*x + 15
*e^2*x^2)) + B*(3*b*e*(8*d^2 - 12*d*e*x + 15*e^2*x^2) + c*(-16*d^3 + 24*d^
2*e*x - 30*d*e^2*x^2 + 35*e^3*x^3))))/(315*e^4)
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)\sqrt{d+ex}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{(d+ex)^{5/2}(Ace+bBe-3Bcd)}{e^3}+\frac{(d+ex)^{3/2}(Bd(3cd-2be)-Ae(2cd-be))}{e^3}-\frac{d\sqrt{d+ex}(Bd-Ae)(cd-}{e^3}\right.$$

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

$$-\frac{2(d+ex)^{7/2}(-Ace-bBe+3Bcd)}{7e^4}+\frac{2(d+ex)^{5/2}(Bd(3cd-2be)-Ae(2cd-be))}{5e^4}-\frac{2d(d+ex)^{3/2}(Bd-Ae)(cd-be)}{3e^4}+\frac{2Bc(d+ex)^{9/2}}{9e^4}$$

input

```
Int[(A + B*x)*Sqrt[d + e*x]*(b*x + c*x^2),x]
```

output

```
(-2*d*(B*d - A*e)*(c*d - b*e)*(d + e*x)^(3/2))/(3*e^4) + (2*(B*d*(3*c*d -
2*b*e) - A*e*(2*c*d - b*e))*(d + e*x)^(5/2))/(5*e^4) - (2*(3*B*c*d - b*B*e
 - A*c*e)*(d + e*x)^(7/2))/(7*e^4) + (2*B*c*(d + e*x)^(9/2))/(9*e^4)
```

Defintions of rubi rules used

rule 1195

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

rule 2009

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

Maple [A] (verified)

Time = 1.90 (sec) , antiderivative size = 91, normalized size of antiderivative = 0.72

method	result
pseudoelliptic	$-\frac{4(ex+d)^{\frac{3}{2}}\left(-\frac{3x\left(\frac{5Bc\,x^2}{9}+\frac{5(Ac+Bb)x}{7}+Ab\right)e^3}{2}+\left(\frac{5Bc\,x^2}{7}+\frac{6(Ac+Bb)x}{7}+Ab\right)d\,e^2-\frac{4d^2(Bcx+Ac+Bb)e}{7}+\frac{8Bc\,d^3}{21}\right)}{15e^4}$
default	$\frac{\frac{2Bc(ex+d)^{\frac{9}{2}}}{9}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{7}{2}}}{7}+\frac{2((-Ae+Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{5}{2}}}{5}+\frac{2(-Ae+Bd)d(be-cd)(ex+d)}{3}}{e^4}$
derivativedivides	$\frac{\frac{2Bc(ex+d)^{\frac{9}{2}}}{9}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{7}{2}}}{7}+\frac{2(-(Ae-Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{5}{2}}}{5}-\frac{2(Ae-Bd)d(be-cd)(ex+d)^{\frac{3}{2}}}{3}}{e^4}$
gosper	$-\frac{2(ex+d)^{\frac{3}{2}}\left(-35Bc\,x^3e^3-45Ac\,e^3x^2-45Bb\,e^3x^2+30Bcd\,e^2x^2-63Axb\,e^3+36Axcd\,e^2+36Bxbd\,e^2-24Bxc\,d^2e+42A\right)}{315e^4}$
orering	$-\frac{2\left(-35Bc\,x^3e^3-45Ac\,e^3x^2-45Bb\,e^3x^2+30Bcd\,e^2x^2-63Axb\,e^3+36Axcd\,e^2+36Bxbd\,e^2-24Bxc\,d^2e+42Abd\,e^2-24\right)}{315e^4x(cx+b)}$
trager	$-\frac{2\left(-35B\,e^4c\,x^4-45Ac\,e^4x^3-45B\,e^4b\,x^3-5Bcd\,e^3x^3-63Ab\,e^4x^2-9Acd\,e^3x^2-9Bbd\,e^3x^2+6Bc\,d^2e^2x^2-21Abd\,e^3x\right)}{315e^4}$
risch	$-\frac{2\left(-35B\,e^4c\,x^4-45Ac\,e^4x^3-45B\,e^4b\,x^3-5Bcd\,e^3x^3-63Ab\,e^4x^2-9Acd\,e^3x^2-9Bbd\,e^3x^2+6Bc\,d^2e^2x^2-21Abd\,e^3x\right)}{315e^4}$

input
```
int((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
-4/15*(e*x+d)^(3/2)*(-3/2*x*(5/9*B*c*x^2+5/7*(A*c+B*b)*x+A*b)*e^3+(5/7*B*c
*x^2+6/7*(A*c+B*b)*x+A*b)*d*e^2-4/7*d^2*(B*c*x+A*c+B*b)*e+8/21*B*c*d^3)/e^
4
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 148, normalized size of antiderivative = 1.17

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)\,dx = \frac{2\,(35\,Bce^4x^4-16\,Bcd^4-42\,Abd^2e^2+24\,(Bb+Ac)d^3e+5\,(Bcde^3+9\,(Bb+Ac)e^4)x^3-3\,(2\,Bcd^2e^2-}{315\,e^4}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x),x, algorithm="fricas")
```

output
```
2/315*(35*B*c*e^4*x^4 - 16*B*c*d^4 - 42*A*b*d^2*e^2 + 24*(B*b + A*c)*d^3*e
 + 5*(B*c*d*e^3 + 9*(B*b + A*c)*e^4)*x^3 - 3*(2*B*c*d^2*e^2 - 21*A*b*e^4 -
 3*(B*b + A*c)*d*e^3)*x^2 + (8*B*c*d^3*e + 21*A*b*d*e^3 - 12*(B*b + A*c)*d
^2*e^2)*x)*sqrt(e*x + d)/e^4
```

Sympy [A] (verification not implemented)

Time = 1.11 (sec) , antiderivative size = 180, normalized size of antiderivative = 1.43

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)\,dx = \begin{cases} \frac{2\left(\frac{Bc(d+ex)^{\frac{9}{2}}}{9e^3}+\frac{(d+ex)^{\frac{7}{2}}(Ace+Bbe-3Bcd)}{7e^3}+\frac{(d+ex)^{\frac{5}{2}}\left(Abe^2-2Acde-2Bbde+3Bcd^2\right)}{5e^3}+\frac{(d+ex)^{\frac{3}{2}}\left(-Abde^2+Acd^2e+Bbd^2e-Bcd^3\right)}{3e^3}\right)}{e} & \text{for } e\neq 0 \\ \sqrt{d}\left(\frac{Abx^2}{2}+\frac{Bcx^4}{4}+\frac{x^3(Ac+Bb)}{3}\right) & \text{otherwis} \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(1/2)*(c*x**2+b*x),x)
```

output
```
Piecewise((2*(B*c*(d + e*x)**(9/2)/(9*e**3) + (d + e*x)**(7/2)*(A*c*e + B*
b*e - 3*B*c*d)/(7*e**3) + (d + e*x)**(5/2)*(A*b*e**2 - 2*A*c*d*e - 2*B*b*d
*e + 3*B*c*d**2)/(5*e**3) + (d + e*x)**(3/2)*(-A*b*d*e**2 + A*c*d**2*e + B
*b*d**2*e - B*c*d**3)/(3*e**3))/e, Ne(e, 0)), (sqrt(d)*(A*b*x**2/2 + B*c*x
**4/4 + x**3*(A*c + B*b)/3), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.89

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)\,dx = \frac{2\left(35\,(ex+d)^{\frac{9}{2}}Bc-45\,(3\,Bcd-(Bb+Ac)e)(ex+d)^{\frac{7}{2}}+63\,(3\,Bcd^2+Abe^2-2\,(Bb+Ac)de)(ex+d)\right.}{315\,e^4}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x),x, algorithm="maxima")
```

output
```
2/315*(35*(e*x + d)^(9/2)*B*c - 45*(3*B*c*d - (B*b + A*c)*e)*(e*x + d)^(7/
2) + 63*(3*B*c*d^2 + A*b*e^2 - 2*(B*b + A*c)*d*e)*(e*x + d)^(5/2) - 105*(B
*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)*(e*x + d)^(3/2))/e^4
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 367 vs. 2(110) = 220.

Time = 0.27 (sec) , antiderivative size = 367, normalized size of antiderivative = 2.91

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)\,dx = \frac{2\left(\frac{105\left((ex+d)^{\frac{3}{2}}-3\sqrt{ex+d}d\right)Abd}{e}+\frac{21\left(3\,(ex+d)^{\frac{5}{2}}-10\,(ex+d)^{\frac{3}{2}}d+15\sqrt{ex+d}d^2\right)Bbd}{e^2}+\frac{21\left(3\,(ex+d)^{\frac{5}{2}}-10\,(ex+d)^{\frac{3}{2}}d+15\sqrt{ex+d}d^2\right)A}{e^2}\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x),x, algorithm="giac")
```

output
```
2/315*(105*((e*x + d)^(3/2) - 3*sqrt(e*x + d)*d)*A*b*d/e + 21*(3*(e*x + d)
^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*B*b*d/e^2 + 21*(3*(e
*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*A*c*d/e^2 + 2
1*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*A*b/e
+ 9*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 3
5*sqrt(e*x + d)*d^3)*B*c*d/e^3 + 9*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)
*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*b/e^2 + 9*(5*(e*x +
d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d
)*d^3)*A*c/e^2 + (35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x +
d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*c/e^3)/e
```

Mupad [B] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.88

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)\,dx = \frac{(d+e\,x)^{5/2}\,(2\,A\,b\,e^2+6\,B\,c\,d^2-4\,A\,c\,d\,e-4\,B\,b\,d\,e)}{5\,e^4} + \frac{(d+e\,x)^{7/2}\,(2\,A\,c\,e+2\,B\,b\,e-6\,B\,c\,d)}{7\,e^4} + \frac{2\,B\,c\,(d+e\,x)^{9/2}}{9\,e^4} - \frac{2\,d\,(A\,e-B\,d)\,(b\,e-c\,d)\,(d+e\,x)^{3/2}}{3\,e^4}$$

input
```
int((b*x + c*x^2)*(A + B*x)*(d + e*x)^(1/2),x)
```

output
```
((d + e*x)^(5/2)*(2*A*b*e^2 + 6*B*c*d^2 - 4*A*c*d*e - 4*B*b*d*e))/(5*e^4)
+ ((d + e*x)^(7/2)*(2*A*c*e + 2*B*b*e - 6*B*c*d))/(7*e^4) + (2*B*c*(d + e*
x)^(9/2))/(9*e^4) - (2*d*(A*e - B*d)*(b*e - c*d)*(d + e*x)^(3/2))/(3*e^4)
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 175, normalized size of antiderivative = 1.39

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)\,dx$$
$$=\frac{2\sqrt{ex+d}\,(35bc\,e^4x^4+45ac\,e^4x^3+45b^2e^4x^3+5bcd\,e^3x^3+63ab\,e^4x^2+9acd\,e^3x^2+9b^2d\,e^3x^2-6bc\,d^2e^2}{315e^4}$$

input
```
int((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x),x)
```

output
```
(2*sqrt(d + e*x)*( - 42*a*b*d**2*e**2 + 21*a*b*d*e**3*x + 63*a*b*e**4*x**2
 + 24*a*c*d**3*e - 12*a*c*d**2*e**2*x + 9*a*c*d*e**3*x**2 + 45*a*c*e**4*x*
*3 + 24*b**2*d**3*e - 12*b**2*d**2*e**2*x + 9*b**2*d*e**3*x**2 + 45*b**2*e
**4*x**3 - 16*b*c*d**4 + 8*b*c*d**3*e*x - 6*b*c*d**2*e**2*x**2 + 5*b*c*d*e
**3*x**3 + 35*b*c*e**4*x**4))/(315*e**4)
```

3.56 $\int \frac{(A+Bx)(bx+cx^2)}{\sqrt{d+ex}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 124

$$\int \frac{(A+Bx)(bx+cx^2)}{\sqrt{d+ex}}\,dx = -\frac{2d(Bd-Ae)(cd-be)\sqrt{d+ex}}{e^4} + \frac{2(Bd(3cd-2be)-Ae(2cd-be))(d+ex)^{3/2}}{3e^4} - \frac{2(3Bcd-bBe-Ace)(d+ex)^{5/2}}{5e^4} + \frac{2Bc(d+ex)^{7/2}}{7e^4}$$

output
```
-2*d*(-A*e+B*d)*(-b*e+c*d)*(e*x+d)^(1/2)/e^4+2/3*(B*d*(-2*b*e+3*c*d)-A*e*(
-b*e+2*c*d))*(e*x+d)^(3/2)/e^4-2/5*(-A*c*e-B*b*e+3*B*c*d)*(e*x+d)^(5/2)/e^
4+2/7*B*c*(e*x+d)^(7/2)/e^4
```

Mathematica [A] (verified)

Time = 0.13 (sec) , antiderivative size = 113, normalized size of antiderivative = 0.91

$$\int \frac{(A+Bx)(bx+cx^2)}{\sqrt{d+ex}}\,dx = \frac{2\sqrt{d+ex}(7Ae(5be(-2d+ex)+c(8d^2-4dex+3e^2x^2))+B(7be(8d^2-4dex+3e^2x^2)-3c(16d^3-8d^2}{105e^4}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2))/Sqrt[d + e*x],x]
```

output
```
(2*Sqrt[d + e*x]*(7*A*e*(5*b*e*(-2*d + e*x) + c*(8*d^2 - 4*d*e*x + 3*e^2*x
^2)) + B*(7*b*e*(8*d^2 - 4*d*e*x + 3*e^2*x^2) - 3*c*(16*d^3 - 8*d^2*e*x +
6*d*e^2*x^2 - 5*e^3*x^3))))/(105*e^4)
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{\sqrt{d+ex}}dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{(d+ex)^{3/2}(Ace+bBe-3Bcd)}{e^3}+\frac{\sqrt{d+ex}(Bd(3cd-2be)-Ae(2cd-be))}{e^3}-\frac{d(Bd-Ae)(cd-be)}{e^3\sqrt{d+ex}}+\frac{Bc$$

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

$$-\frac{2(d+ex)^{5/2}(-Ace-bBe+3Bcd)}{5e^4}+\frac{2(d+ex)^{3/2}(Bd(3cd-2be)-Ae(2cd-be))}{3e^4}-\frac{2d\sqrt{d+ex}(Bd-Ae)(cd-be)}{e^4}+\frac{2Bc(d+ex)^{7/2}}{7e^4}$$

input
```
Int[((A + B*x)*(b*x + c*x^2))/Sqrt[d + e*x],x]
```

output
```
(-2*d*(B*d - A*e)*(c*d - b*e)*Sqrt[d + e*x])/e^4 + (2*(B*d*(3*c*d - 2*b*e)
 - A*e*(2*c*d - b*e))*(d + e*x)^(3/2))/(3*e^4) - (2*(3*B*c*d - b*B*e - A*c
*e)*(d + e*x)^(5/2))/(5*e^4) + (2*B*c*(d + e*x)^(7/2))/(7*e^4)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 1.93 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.74

method	result
pseudoelliptic	$-\frac{4\left(-\frac{x\left(\frac{3Bc\,x^2}{7}+\frac{3(Ac+Bb)x}{5}+Ab\right)e^3}{2}+\left(\frac{9Bc\,x^2}{35}+\frac{2(Ac+Bb)x}{5}+Ab\right)d\,e^2-\frac{4d^2\left(\frac{3}{7}Bcx+Ac+Bb\right)e}{5}+\frac{24Bc\,d^3}{35}\right)\sqrt{ex+d}}{3e^4}$
default	$\frac{\frac{2Bc(ex+d)^{\frac{7}{2}}}{7}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{5}{2}}}{5}+\frac{2((-Ae+Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{3}{2}}}{3}+2(-Ae+Bd)d(be-cd)\sqrt{ex}}{e^4}$
derivativedivides	$\frac{\frac{2Bc(ex+d)^{\frac{7}{2}}}{7}+\frac{2((Ae-2Bd)c+B(be-cd))(ex+d)^{\frac{5}{2}}}{5}+\frac{2(-(Ae-Bd)dc+(Ae-2Bd)(be-cd))(ex+d)^{\frac{3}{2}}}{3}-2(Ae-Bd)d(be-cd)\sqrt{ex+}}{e^4}$
gosper	$-\frac{2(-15Bc\,x^3e^3-21Ac\,e^3x^2-21Bb\,e^3x^2+18Bcd\,e^2x^2-35Axb\,e^3+28Axcd\,e^2+28Bxbd\,e^2-24Bxc\,d^2e+70Abd\,e^2-56}{105e^4}$
trager	$-\frac{2(-15Bc\,x^3e^3-21Ac\,e^3x^2-21Bb\,e^3x^2+18Bcd\,e^2x^2-35Axb\,e^3+28Axcd\,e^2+28Bxbd\,e^2-24Bxc\,d^2e+70Abd\,e^2-56}{105e^4}$
risch	$-\frac{2(-15Bc\,x^3e^3-21Ac\,e^3x^2-21Bb\,e^3x^2+18Bcd\,e^2x^2-35Axb\,e^3+28Axcd\,e^2+28Bxbd\,e^2-24Bxc\,d^2e+70Abd\,e^2-56}{105e^4}$
orering	$-\frac{2(-15Bc\,x^3e^3-21Ac\,e^3x^2-21Bb\,e^3x^2+18Bcd\,e^2x^2-35Axb\,e^3+28Axcd\,e^2+28Bxbd\,e^2-24Bxc\,d^2e+70Abd\,e^2-56}{105e^4x(cx+b)}$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-4/3*(-1/2*x*(3/7*B*c*x^2+3/5*(A*c+B*b)*x+A*b)*e^3+(9/35*B*c*x^2+2/5*(A*c+
B*b)*x+A*b)*d*e^2-4/5*d^2*(3/7*B*c*x+A*c+B*b)*e+24/35*B*c*d^3)*(e*x+d)^(1/
2)/e^4
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 108, normalized size of antiderivative = 0.87

$$\int \frac{(A+Bx)(bx+cx^2)}{\sqrt{d+ex}}\,dx$$
$$= \frac{2\left(15\,Bce^3x^3 - 48\,Bcd^3 - 70\,Abde^2 + 56\,(Bb+Ac)d^2e - 3\,(6\,Bcde^2 - 7\,(Bb+Ac)e^3)x^2 + (24\,Bcd^2e + \right.}{105\,e^4}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^(1/2),x, algorithm="fricas")
```

output
```
2/105*(15*B*c*e^3*x^3 - 48*B*c*d^3 - 70*A*b*d*e^2 + 56*(B*b + A*c)*d^2*e -
 3*(6*B*c*d*e^2 - 7*(B*b + A*c)*e^3)*x^2 + (24*B*c*d^2*e + 35*A*b*e^3 - 28
*(B*b + A*c)*d*e^2)*x)*sqrt(e*x + d)/e^4
```

Sympy [A] (verification not implemented)

Time = 1.06 (sec) , antiderivative size = 178, normalized size of antiderivative = 1.44

$$\int \frac{(A+Bx)(bx+cx^2)}{\sqrt{d+ex}}\,dx$$
$$= \begin{cases} \frac{2\left(\frac{Bc(d+ex)^{\frac{7}{2}}}{7e^3} + \frac{(d+ex)^{\frac{5}{2}}(Ace+Bbe-3Bcd)}{5e^3} + \frac{(d+ex)^{\frac{3}{2}}\left(Abe^2-2Acde-2Bbde+3Bcd^2\right)}{3e^3} + \frac{\sqrt{d+ex}\left(-Abde^2+Acd^2e+Bbd^2e-Bcd^3\right)}{e^3}\right)}{e} & \text{for } e \neq 0 \\ \frac{\frac{Abx^2}{2} + \frac{Bcx^4}{4} + \frac{x^3(Ac+Bb)}{3}}{\sqrt{d}} & \text{otherwise} \end{cases}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d)**(1/2),x)
```

output
```
Piecewise((2*(B*c*(d + e*x)**(7/2)/(7*e**3) + (d + e*x)**(5/2)*(A*c*e + B*
b*e - 3*B*c*d)/(5*e**3) + (d + e*x)**(3/2)*(A*b*e**2 - 2*A*c*d*e - 2*B*b*d
*e + 3*B*c*d**2)/(3*e**3) + sqrt(d + e*x)*(-A*b*d*e**2 + A*c*d**2*e + B*b*
d**2*e - B*c*d**3)/e**3)/e, Ne(e, 0)), ((A*b*x**2/2 + B*c*x**4/4 + x**3*(A
*c + B*b)/3)/sqrt(d), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 112, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)(bx+cx^2)}{\sqrt{d+ex}}\,dx = \frac{2\left(15\,(ex+d)^{\frac{7}{2}}Bc-21\,(3\,Bcd-(Bb+Ac)e)(ex+d)^{\frac{5}{2}}+35\,(3\,Bcd^2+Abe^2-2\,(Bb+Ac)de)(ex+d)\right.}{105\,e^4}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^(1/2),x, algorithm="maxima")
```

output
```
2/105*(15*(e*x + d)^(7/2)*B*c - 21*(3*B*c*d - (B*b + A*c)*e)*(e*x + d)^(5/
2) + 35*(3*B*c*d^2 + A*b*e^2 - 2*(B*b + A*c)*d*e)*(e*x + d)^(3/2) - 105*(B
*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)*sqrt(e*x + d))/e^4
```

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.29

$$\int \frac{(A+Bx)(bx+cx^2)}{\sqrt{d+ex}}\,dx = \frac{2\left(\frac{35\left((ex+d)^{\frac{3}{2}}-3\sqrt{ex+d}d\right)Ab}{e}+\frac{7\left(3\,(ex+d)^{\frac{5}{2}}-10\,(ex+d)^{\frac{3}{2}}d+15\sqrt{ex+d}d^2\right)Bb}{e^2}+\frac{7\left(3\,(ex+d)^{\frac{5}{2}}-10\,(ex+d)^{\frac{3}{2}}d+15\sqrt{ex+d}d^2\right)Ac}{e^2}+\right.}{105\,e}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^(1/2),x, algorithm="giac")
```

output
```
2/105*(35*((e*x + d)^(3/2) - 3*sqrt(e*x + d)*d)*A*b/e + 7*(3*(e*x + d)^(5/
2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*B*b/e^2 + 7*(3*(e*x + d)
^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d^2)*A*c/e^2 + 3*(5*(e*x
+ d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x +
 d)*d^3)*B*c/e^3)/e
```

Mupad [B] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)(bx+cx^2)}{\sqrt{d+ex}}\,dx = \frac{(d+e\,x)^{3/2}\,(2\,A\,b\,e^2+6\,B\,c\,d^2-4\,A\,c\,d\,e-4\,B\,b\,d\,e)}{3\,e^4} + \frac{(d+e\,x)^{5/2}\,(2\,A\,c\,e+2\,B\,b\,e-6\,B\,c\,d)}{5\,e^4} + \frac{2\,B\,c\,(d+e\,x)^{7/2}}{7\,e^4} - \frac{2\,d\,(A\,e-B\,d)\,(b\,e-c\,d)\,\sqrt{d+e\,x}}{e^4}$$

input
```
int(((b*x + c*x^2)*(A + B*x))/(d + e*x)^(1/2),x)
```

output
```
((d + e*x)^(3/2)*(2*A*b*e^2 + 6*B*c*d^2 - 4*A*c*d*e - 4*B*b*d*e))/(3*e^4)
+ ((d + e*x)^(5/2)*(2*A*c*e + 2*B*b*e - 6*B*c*d))/(5*e^4) + (2*B*c*(d + e*
x)^(7/2))/(7*e^4) - (2*d*(A*e - B*d)*(b*e - c*d)*(d + e*x)^(1/2))/e^4
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 122, normalized size of antiderivative = 0.98

$$\int \frac{(A+Bx)(bx+cx^2)}{\sqrt{d+ex}}\,dx = \frac{2\sqrt{ex+d}\,(15bc\,e^3x^3+21ac\,e^3x^2+21b^2e^3x^2-18bcd\,e^2x^2+35ab\,e^3x-28acd\,e^2x-28b^2d\,e^2x+24bc\,d^2}{105e^4}$$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^(1/2),x)
```

output
```
(2*sqrt(d + e*x)*( - 70*a*b*d*e**2 + 35*a*b*e**3*x + 56*a*c*d**2*e - 28*a*
c*d*e**2*x + 21*a*c*e**3*x**2 + 56*b**2*d**2*e - 28*b**2*d*e**2*x + 21*b**
2*e**3*x**2 - 48*b*c*d**3 + 24*b*c*d**2*e*x - 18*b*c*d*e**2*x**2 + 15*b*c*
e**3*x**3))/(105*e**4)
```

3.57 $\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{3/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 122

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{3/2}}\,dx = \frac{2d(Bd-Ae)(cd-be)}{e^4\sqrt{d+ex}} + \frac{2(Bd(3cd-2be)-Ae(2cd-be))\sqrt{d+ex}}{e^4} - \frac{2(3Bcd-bBe-Ace)(d+ex)^{3/2}}{3e^4} + \frac{2Bc(d+ex)^{5/2}}{5e^4}$$

output
```
2*d*(-A*e+B*d)*(-b*e+c*d)/e^4/(e*x+d)^(1/2)+2*(B*d*(-2*b*e+3*c*d)-A*e*(-b*
e+2*c*d))*(e*x+d)^(1/2)/e^4-2/3*(-A*c*e-B*b*e+3*B*c*d)*(e*x+d)^(3/2)/e^4+2
/5*B*c*(e*x+d)^(5/2)/e^4
```

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{3/2}}\,dx = \frac{2(5Ae(3be(2d+ex)+c(-8d^2-4dex+e^2x^2))+B(5be(-8d^2-4dex+e^2x}{15e^4\sqrt{d+ex}}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2))/(d + e*x)^(3/2),x]
```

output
```
(2*(5*A*e*(3*b*e*(2*d + e*x) + c*(-8*d^2 - 4*d*e*x + e^2*x^2)) + B*(5*b*e*
(-8*d^2 - 4*d*e*x + e^2*x^2) + 3*c*(16*d^3 + 8*d^2*e*x - 2*d*e^2*x^2 + e^3
*x^3))))/(15*e^4*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.44 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{3/2}}\,dx$$

$$\Big\downarrow \; 1195$$

$$\int \left(\frac{\sqrt{d+ex}(Ace+bBe-3Bcd)}{e^3}+\frac{Bd(3cd-2be)-Ae(2cd-be)}{e^3\sqrt{d+ex}}-\frac{d(Bd-Ae)(cd-be)}{e^3(d+ex)^{3/2}}+\frac{Bc(d+ex)^{3/2}}{e^3}\right)$$

$$\Big\downarrow \; 2009$$

$$-\frac{2(d+ex)^{3/2}(-Ace-bBe+3Bcd)}{3e^4}+\frac{2\sqrt{d+ex}(Bd(3cd-2be)-Ae(2cd-be))}{e^4}+\frac{2d(Bd-Ae)(cd-be)}{e^4\sqrt{d+ex}}+\frac{2Bc(d+ex)^{5/2}}{5e^4}$$

input
```
Int[((A + B*x)*(b*x + c*x^2))/(d + e*x)^(3/2),x]
```

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

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.79 (sec) , antiderivative size = 106, normalized size of antiderivative = 0.87

method	result
pseudoelliptic	$\frac{\frac{2\left(3\left(e^{3}x^{3}-2d\,e^{2}x^{2}+8d^{2}ex+16d^{3}\right)c-40\left(-\frac{1}{8}e^{2}x^{2}+\frac{1}{2}dex+d^{2}\right)eb\right)B}{15}+4eA\left(\frac{\left(\frac{1}{2}e^{2}x^{2}-2dex-4d^{2}\right)c}{3}+be\left(\frac{ex}{2}+d\right)\right)}{\sqrt{ex+d}\,e^{4}}$
risch	$\frac{2\left(3e^{2}Bc\,x^{2}+5Ac\,e^{2}x+5e^{2}xBb-9Bcdex+15Ab\,e^{2}-25Acde-25Bbde+33Bc\,d^{2}\right)\sqrt{ex+d}}{15e^{4}}+\frac{2d\left(Ab\,e^{2}-Acde-Bbde+\right.}{e^{4}\sqrt{ex+d}}$
gosper	$\frac{\frac{2}{5}Bc\,x^{3}e^{3}+\frac{2}{3}Ac\,e^{3}x^{2}+\frac{2}{3}Bb\,e^{3}x^{2}-\frac{4}{5}Bcd\,e^{2}x^{2}+2Axb\,e^{3}-\frac{8}{3}Axcd\,e^{2}-\frac{8}{3}Bxbd\,e^{2}+\frac{16}{5}Bxc\,d^{2}e+4Abd\,e^{2}-\frac{16}{3}Ac\,d^{2}e-\frac{16}{3}}{\sqrt{ex+d}\,e^{4}}$
trager	$\frac{\frac{2}{5}Bc\,x^{3}e^{3}+\frac{2}{3}Ac\,e^{3}x^{2}+\frac{2}{3}Bb\,e^{3}x^{2}-\frac{4}{5}Bcd\,e^{2}x^{2}+2Axb\,e^{3}-\frac{8}{3}Axcd\,e^{2}-\frac{8}{3}Bxbd\,e^{2}+\frac{16}{5}Bxc\,d^{2}e+4Abd\,e^{2}-\frac{16}{3}Ac\,d^{2}e-\frac{16}{3}}{\sqrt{ex+d}\,e^{4}}$
orering	$\frac{2\left(3Bc\,x^{3}e^{3}+5Ac\,e^{3}x^{2}+5Bb\,e^{3}x^{2}-6Bcd\,e^{2}x^{2}+15Axb\,e^{3}-20Axcd\,e^{2}-20Bxbd\,e^{2}+24Bxc\,d^{2}e+30Abd\,e^{2}-40Ac\,d^{2}e-\right.}{15e^{4}x(cx+b)\sqrt{ex+d}}$
derivativedivides	$\frac{\frac{2Bc(ex+d)^{\frac{5}{2}}}{5}+\frac{2Ace(ex+d)^{\frac{3}{2}}}{3}+\frac{2Bbe(ex+d)^{\frac{3}{2}}}{3}-2Bcd(ex+d)^{\frac{3}{2}}+2Ab\,e^{2}\sqrt{ex+d}-4Acde\sqrt{ex+d}-4Bbde\sqrt{ex+d}+6Bc\,d^{2}\sqrt{}}{e^{4}}$
default	$\frac{\frac{2Bc(ex+d)^{\frac{5}{2}}}{5}+\frac{2Ace(ex+d)^{\frac{3}{2}}}{3}+\frac{2Bbe(ex+d)^{\frac{3}{2}}}{3}-2Bcd(ex+d)^{\frac{3}{2}}+2Ab\,e^{2}\sqrt{ex+d}-4Acde\sqrt{ex+d}-4Bbde\sqrt{ex+d}+6Bc\,d^{2}\sqrt{}}{e^{4}}$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
2/15*((3*(e^3*x^3-2*d*e^2*x^2+8*d^2*e*x+16*d^3)*c-40*(-1/8*e^2*x^2+1/2*d*e
*x+d^2)*e*b)*B+30*e*A*(1/3*(1/2*e^2*x^2-2*d*e*x-4*d^2)*c+b*e*(1/2*e*x+d)))
/(e*x+d)^(1/2)/e^4
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.97

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^{3/2}}\,dx = \frac{2\,(3\,Bce^3x^3+48\,Bcd^3+30\,Abde^2-40\,(Bb+Ac)d^2e-(6\,Bcde^2-5\,(Bb+}{15\,(e^5x+de^4}$$

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

output
```
2/15*(3*B*c*e^3*x^3 + 48*B*c*d^3 + 30*A*b*d*e^2 - 40*(B*b + A*c)*d^2*e - (
6*B*c*d*e^2 - 5*(B*b + A*c)*e^3)*x^2 + (24*B*c*d^2*e + 15*A*b*e^3 - 20*(B*
b + A*c)*d*e^2)*x)*sqrt(e*x + d)/(e^5*x + d*e^4)
```

Sympy [A] (verification not implemented)

Time = 3.71 (sec) , antiderivative size = 160, normalized size of antiderivative = 1.31

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^{3/2}}\,dx = \begin{cases} \frac{2\left(\frac{Bc(d+ex)^{\frac{5}{2}}}{5e^3}-\frac{d(-Ae+Bd)(be-cd)}{e^3\sqrt{d+ex}}+\frac{(d+ex)^{\frac{3}{2}}(Ace+Bbe-3Bcd)}{3e^3}+\frac{\sqrt{d+ex}\left(Abe^2-2Acde-2Bbde+3Bcd^2\right)}{e^3}\right)}{e} \\ \frac{\frac{Abx^2}{2}+\frac{Bcx^4}{4}+\frac{x^3(Ac+Bb)}{3}}{d^{\frac{3}{2}}} \end{cases}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d)**(3/2),x)
```

output
```
Piecewise((2*(B*c*(d + e*x)**(5/2)/(5*e**3) - d*(-A*e + B*d)*(b*e - c*d)/(
e**3*sqrt(d + e*x)) + (d + e*x)**(3/2)*(A*c*e + B*b*e - 3*B*c*d)/(3*e**3)
+ sqrt(d + e*x)*(A*b*e**2 - 2*A*c*d*e - 2*B*b*d*e + 3*B*c*d**2)/e**3)/e, N
e(e, 0)), ((A*b*x**2/2 + B*c*x**4/4 + x**3*(A*c + B*b)/3)/d**(3/2), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.98

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{3/2}}\,dx = \frac{2\left(\frac{3\,(ex+d)^{\frac{5}{2}}Bc-5\,(3\,Bcd-(Bb+Ac)e)(ex+d)^{\frac{3}{2}}+15\,\left(3\,Bcd^2+Abe^2-2\,(Bb+Ac)de\right)\sqrt{ex+d}}{e^3}+\frac{15\,(Bc}{}\right.}{15\,e}$$

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

output
```
2/15*((3*(e*x + d)^(5/2)*B*c - 5*(3*B*c*d - (B*b + A*c)*e)*(e*x + d)^(3/2)
 + 15*(3*B*c*d^2 + A*b*e^2 - 2*(B*b + A*c)*d*e)*sqrt(e*x + d))/e^3 + 15*(B
*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)/(sqrt(e*x + d)*e^3))/e
```

Giac [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 167, normalized size of antiderivative = 1.37

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{3/2}}\,dx = \frac{2\left(Bcd^3-Bbd^2e-Acd^2e+Abde^2\right)}{\sqrt{ex+d}e^4} + \frac{2\left(3\,(ex+d)^{\frac{5}{2}}Bce^{16}-15\,(ex+d)^{\frac{3}{2}}Bcde^{16}+45\,\sqrt{ex+d}Bcd^2e^{16}+5\,(ex+d)^{\frac{3}{2}}Bbe^{17}+5\,(ex+d)^{\frac{3}{2}}Ace^{17}\right.}{15\,e^{20}}$$

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

output
```
2*(B*c*d^3 - B*b*d^2*e - A*c*d^2*e + A*b*d*e^2)/(sqrt(e*x + d)*e^4) + 2/15
*(3*(e*x + d)^(5/2)*B*c*e^16 - 15*(e*x + d)^(3/2)*B*c*d*e^16 + 45*sqrt(e*x
 + d)*B*c*d^2*e^16 + 5*(e*x + d)^(3/2)*B*b*e^17 + 5*(e*x + d)^(3/2)*A*c*e^
17 - 30*sqrt(e*x + d)*B*b*d*e^17 - 30*sqrt(e*x + d)*A*c*d*e^17 + 15*sqrt(e
*x + d)*A*b*e^18)/e^20
```

Mupad [B] (verification not implemented)

Time = 10.79 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.02

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{3/2}}\,dx=\frac{\sqrt{d+e\,x}\,\left(2\,A\,b\,e^2+6\,B\,c\,d^2-4\,A\,c\,d\,e-4\,B\,b\,d\,e\right)}{e^4}+\frac{{\left(d+e\,x\right)}^{3/2}\,\left(2\,A\,c\,e+2\,B\,b\,e-6\,B\,c\,d\right)}{3\,e^4}+\frac{2\,B\,c\,d^3+2\,A\,b\,d\,e^2-2\,A\,c\,d^2\,e-2\,B\,b\,d^2\,e}{e^4\,\sqrt{d+e\,x}}+\frac{2\,B\,c\,{\left(d+e\,x\right)}^{5/2}}{5\,e^4}$$

input
```
int(((b*x + c*x^2)*(A + B*x))/(d + e*x)^(3/2),x)
```

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

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 124, normalized size of antiderivative = 1.02

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{3/2}}\,dx=\frac{\frac{2}{5}bc\,e^3x^3+\frac{2}{3}ac\,e^3x^2+\frac{2}{3}b^2e^3x^2-\frac{4}{5}bcd\,e^2x^2+2ab\,e^3x-\frac{8}{3}acd\,e^2x-\frac{8}{3}b^2d\,e^2x-}{\sqrt{ex+d}\,e^4}$$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^(3/2),x)
```

output
```
(2*(30*a*b*d*e**2 + 15*a*b*e**3*x - 40*a*c*d**2*e - 20*a*c*d*e**2*x + 5*a*
c*e**3*x**2 - 40*b**2*d**2*e - 20*b**2*d*e**2*x + 5*b**2*e**3*x**2 + 48*b*
c*d**3 + 24*b*c*d**2*e*x - 6*b*c*d*e**2*x**2 + 3*b*c*e**3*x**3))/(15*sqrt(
d + e*x)*e**4)
```

3.58 $\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^{5/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 122

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^{5/2}}\,dx = \frac{2d(Bd-Ae)(cd-be)}{3e^4(d+ex)^{3/2}} - \frac{2(Bd(3cd-2be)-Ae(2cd-be))}{e^4\sqrt{d+ex}} - \frac{2(3Bcd-bBe-Ace)\sqrt{d+ex}}{e^4} + \frac{2Bc(d+ex)^{3/2}}{3e^4}$$

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

Mathematica [A] (verified)

Time = 0.14 (sec) , antiderivative size = 110, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^{5/2}}\,dx = \frac{2(Ae(-be(2d+3ex)+c(8d^2+12dex+3e^2x^2))+B(be(8d^2+12dex+3e^2x}{3e^4(d+ex)^{3/2}}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2))/(d + e*x)^(5/2),x]
```

output
```
(2*(A*e*(-(b*e*(2*d + 3*e*x)) + c*(8*d^2 + 12*d*e*x + 3*e^2*x^2)) + B*(b*e
*(8*d^2 + 12*d*e*x + 3*e^2*x^2) + c*(-16*d^3 - 24*d^2*e*x - 6*d*e^2*x^2 +
e^3*x^3))))/(3*e^4*(d + e*x)^(3/2))
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{5/2}}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{Ace+bBe-3Bcd}{e^3\sqrt{d+ex}}+\frac{Bd(3cd-2be)-Ae(2cd-be)}{e^3(d+ex)^{3/2}}-\frac{d(Bd-Ae)(cd-be)}{e^3(d+ex)^{5/2}}+\frac{Bc\sqrt{d+ex}}{e^3}\right)dx$$

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

$$-\frac{2\sqrt{d+ex}(-Ace-bBe+3Bcd)}{e^4}-\frac{2(Bd(3cd-2be)-Ae(2cd-be))}{e^4\sqrt{d+ex}}+\frac{2d(Bd-Ae)(cd-be)}{3e^4(d+ex)^{3/2}}+\frac{2Bc(d+ex)^{3/2}}{3e^4}$$

input
```
Int[((A + B*x)*(b*x + c*x^2))/(d + e*x)^(5/2),x]
```

output
```
(2*d*(B*d - A*e)*(c*d - b*e))/(3*e^4*(d + e*x)^(3/2)) - (2*(B*d*(3*c*d - 2
*b*e) - A*e*(2*c*d - b*e)))/(e^4*Sqrt[d + e*x]) - (2*(3*B*c*d - b*B*e - A*
c*e)*Sqrt[d + e*x])/e^4 + (2*B*c*(d + e*x)^(3/2))/(3*e^4)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.76 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.79

method	result
pseudoelliptic	$\frac{\frac{2\left(B c\,x^{3}+3(A c+B b)x^{2}-3 A b x\right)e^{3}}{3}-\frac{4\left(3 B c\,x^{2}+6(-A c-B b)x+A b\right)d\,e^{2}}{3}+\frac{16 d^{2}(-3 B c x+A c+B b)e}{3}-\frac{32 B c\,d^{3}}{3}}{(e x+d)^{\frac{3}{2}} e^{4}}$
risch	$\frac{2(B c x e+3 A c e+3 B b e-8 B c d)\sqrt{e x+d}}{3 e^{4}}-\frac{2\left(3 A x b\,e^{3}-6 A x c d\,e^{2}-6 B x b d\,e^{2}+9 B x c\,d^{2} e+2 A b d\,e^{2}-5 A c\,d^{2} e-5 B b\,d^{2} e+8\right.}{3 e^{4}(e x+d)^{\frac{3}{2}}}$
gosper	$-\frac{2\left(-B c\,x^{3} e^{3}-3 A c\,e^{3} x^{2}-3 B b\,e^{3} x^{2}+6 B c d\,e^{2} x^{2}+3 A x b\,e^{3}-12 A x c d\,e^{2}-12 B x b d\,e^{2}+24 B x c\,d^{2} e+2 A b d\,e^{2}-8 A c\,d^{2} e-8\right.}{3(e x+d)^{\frac{3}{2}} e^{4}}$
trager	$-\frac{2\left(-B c\,x^{3} e^{3}-3 A c\,e^{3} x^{2}-3 B b\,e^{3} x^{2}+6 B c d\,e^{2} x^{2}+3 A x b\,e^{3}-12 A x c d\,e^{2}-12 B x b d\,e^{2}+24 B x c\,d^{2} e+2 A b d\,e^{2}-8 A c\,d^{2} e-8\right.}{3(e x+d)^{\frac{3}{2}} e^{4}}$
derivativedivides	$\frac{\frac{2 B c(e x+d)^{\frac{3}{2}}}{3}+2 A c e\sqrt{e x+d}+2 B b e\sqrt{e x+d}-6 B c d\sqrt{e x+d}-\frac{2\left(A b\,e^{2}-2 A c d e-2 B b d e+3 B c\,d^{2}\right)}{\sqrt{e x+d}}+\frac{2 d\left(A b\,e^{2}-A c d e-B b d e+B c\,d^{2}\right.}{3(e x+d)^{\frac{3}{2}}}}{e^{4}}$
default	$\frac{\frac{2 B c(e x+d)^{\frac{3}{2}}}{3}+2 A c e\sqrt{e x+d}+2 B b e\sqrt{e x+d}-6 B c d\sqrt{e x+d}-\frac{2\left(A b\,e^{2}-2 A c d e-2 B b d e+3 B c\,d^{2}\right)}{\sqrt{e x+d}}+\frac{2 d\left(A b\,e^{2}-A c d e-B b d e+B c\,d^{2}\right.}{3(e x+d)^{\frac{3}{2}}}}{e^{4}}$
orering	$-\frac{2\left(-B c\,x^{3} e^{3}-3 A c\,e^{3} x^{2}-3 B b\,e^{3} x^{2}+6 B c d\,e^{2} x^{2}+3 A x b\,e^{3}-12 A x c d\,e^{2}-12 B x b d\,e^{2}+24 B x c\,d^{2} e+2 A b d\,e^{2}-8 A c\,d^{2} e-8\right.}{3 e^{4} x(c x+b)(e x+d)^{\frac{3}{2}}}$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
2/3*((B*c*x^3+3*(A*c+B*b)*x^2-3*A*b*x)*e^3-2*(3*B*c*x^2+6*(-A*c-B*b)*x+A*b
)*d*e^2+8*d^2*(-3*B*c*x+A*c+B*b)*e-16*B*c*d^3)/(e*x+d)^(3/2)/e^4
```

Fricas [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.05

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^{5/2}}\,dx = \frac{2\,(Bce^3x^3-16\,Bcd^3-2\,Abde^2+8\,(Bb+Ac)d^2e-3\,(2\,Bcde^2-(Bb+Ac)e}{3\,(e^6x^2+2\,de^5x+d^2e}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^(5/2),x, algorithm="fricas")
```

output
```
2/3*(B*c*e^3*x^3 - 16*B*c*d^3 - 2*A*b*d*e^2 + 8*(B*b + A*c)*d^2*e - 3*(2*B
*c*d*e^2 - (B*b + A*c)*e^3)*x^2 - 3*(8*B*c*d^2*e + A*b*e^3 - 4*(B*b + A*c)
*d*e^2)*x)*sqrt(e*x + d)/(e^6*x^2 + 2*d*e^5*x + d^2*e^4)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 539 vs. 2(121) = 242.

Time = 0.48 (sec) , antiderivative size = 539, normalized size of antiderivative = 4.42

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^{5/2}}\,dx = \begin{cases} -\frac{4Abde^2}{3de^4\sqrt{d+ex}+3e^5x\sqrt{d+ex}} - \frac{6Abe^3x}{3de^4\sqrt{d+ex}+3e^5x\sqrt{d+ex}} + \frac{16Acd^2e}{3de^4\sqrt{d+ex}+3e^5x\sqrt{d+ex}} + \frac{}{3de^4\sqrt{d}} \\ \frac{\frac{Abx^2}{2}+\frac{Acx^3}{3}+\frac{Bbx^3}{3}+\frac{Bcx^4}{4}}{d^{\frac{5}{2}}} \end{cases}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d)**(5/2),x)
```

output
```
Piecewise((-4*A*b*d*e**2/(3*d*e**4*sqrt(d + e*x) + 3*e**5*x*sqrt(d + e*x))
 - 6*A*b*e**3*x/(3*d*e**4*sqrt(d + e*x) + 3*e**5*x*sqrt(d + e*x)) + 16*A*c
*d**2*e/(3*d*e**4*sqrt(d + e*x) + 3*e**5*x*sqrt(d + e*x)) + 24*A*c*d*e**2*
x/(3*d*e**4*sqrt(d + e*x) + 3*e**5*x*sqrt(d + e*x)) + 6*A*c*e**3*x**2/(3*d
*e**4*sqrt(d + e*x) + 3*e**5*x*sqrt(d + e*x)) + 16*B*b*d**2*e/(3*d*e**4*sq
rt(d + e*x) + 3*e**5*x*sqrt(d + e*x)) + 24*B*b*d*e**2*x/(3*d*e**4*sqrt(d +
 e*x) + 3*e**5*x*sqrt(d + e*x)) + 6*B*b*e**3*x**2/(3*d*e**4*sqrt(d + e*x)
+ 3*e**5*x*sqrt(d + e*x)) - 32*B*c*d**3/(3*d*e**4*sqrt(d + e*x) + 3*e**5*x
*sqrt(d + e*x)) - 48*B*c*d**2*e*x/(3*d*e**4*sqrt(d + e*x) + 3*e**5*x*sqrt(
d + e*x)) - 12*B*c*d*e**2*x**2/(3*d*e**4*sqrt(d + e*x) + 3*e**5*x*sqrt(d +
 e*x)) + 2*B*c*e**3*x**3/(3*d*e**4*sqrt(d + e*x) + 3*e**5*x*sqrt(d + e*x))
, Ne(e, 0)), ((A*b*x**2/2 + A*c*x**3/3 + B*b*x**3/3 + B*c*x**4/4)/d**(5/2)
, True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 116, normalized size of antiderivative = 0.95

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^{5/2}}\,dx = \frac{2\left(\frac{(ex+d)^{\frac{3}{2}}Bc-3\,(3\,Bcd-(Bb+Ac)e)\sqrt{ex+d}}{e^3}+\frac{Bcd^3+Abde^2-(Bb+Ac)d^2e-3\,\left(3\,Bcd^2+Abe^2-2\,(Bb\cdots\right.}{(ex+d)^{\frac{3}{2}}\,e^3}\right.}{3\,e}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^(5/2),x, algorithm="maxima")
```

output
```
2/3*(((e*x + d)^(3/2)*B*c - 3*(3*B*c*d - (B*b + A*c)*e)*sqrt(e*x + d))/e^3
 + (B*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e - 3*(3*B*c*d^2 + A*b*e^2 - 2*(
B*b + A*c)*d*e)*(e*x + d))/((e*x + d)^(3/2)*e^3))/e
```

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 151, normalized size of antiderivative = 1.24

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^{5/2}}\,dx = -\frac{2\,(9\,(ex+d)Bcd^2-Bcd^3-6\,(ex+d)Bbde-6\,(ex+d)Acde+Bbd^2e+Acd^2e+3\,(ex+d)Abe^2-Abde^2)}{3\,(ex+d)^{\frac{3}{2}}e^4} + \frac{2\left((ex+d)^{\frac{3}{2}}Bce^8-9\,\sqrt{ex+d}Bcde^8+3\,\sqrt{ex+d}Bbe^9+3\,\sqrt{ex+d}Ace^9\right)}{3\,e^{12}}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^(5/2),x, algorithm="giac")
```

output
```
-2/3*(9*(e*x + d)*B*c*d^2 - B*c*d^3 - 6*(e*x + d)*B*b*d*e - 6*(e*x + d)*A*
c*d*e + B*b*d^2*e + A*c*d^2*e + 3*(e*x + d)*A*b*e^2 - A*b*d*e^2)/((e*x + d
)^(3/2)*e^4) + 2/3*((e*x + d)^(3/2)*B*c*e^8 - 9*sqrt(e*x + d)*B*c*d*e^8 +
3*sqrt(e*x + d)*B*b*e^9 + 3*sqrt(e*x + d)*A*c*e^9)/e^12
```

Mupad [B] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 137, normalized size of antiderivative = 1.12

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^{5/2}}\,dx = \frac{2\,B\,c\,(d+e\,x)^3+2\,B\,c\,d^3+2\,A\,b\,d\,e^2-2\,A\,c\,d^2\,e-2\,B\,b\,d^2\,e-6\,A\,b\,e^2\,(d+\cdots}{\cdots}$$

input
```
int(((b*x + c*x^2)*(A + B*x))/(d + e*x)^(5/2),x)
```

output
```
(2*B*c*(d + e*x)^3 + 2*B*c*d^3 + 2*A*b*d*e^2 - 2*A*c*d^2*e - 2*B*b*d^2*e -
 6*A*b*e^2*(d + e*x) + 6*A*c*e*(d + e*x)^2 + 6*B*b*e*(d + e*x)^2 - 18*B*c*
d*(d + e*x)^2 - 18*B*c*d^2*(d + e*x) + 12*A*c*d*e*(d + e*x) + 12*B*b*d*e*(
d + e*x))/(3*e^4*(d + e*x)^(3/2))
```

Reduce [B] (verification not implemented)

Time = 0.21 (sec) , antiderivative size = 130, normalized size of antiderivative = 1.07

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^{5/2}}\,dx = \frac{\frac{2}{3}bc\,e^3x^3 + 2ac\,e^3x^2 + 2b^2e^3x^2 - 4bcd\,e^2x^2 - 2ab\,e^3x + 8acd\,e^2x + 8b^2d\,e^2x -}{\sqrt{ex+d}\,e^4\,(ex+d)}$$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^(5/2),x)
```

output
```
(2*( - 2*a*b*d*e**2 - 3*a*b*e**3*x + 8*a*c*d**2*e + 12*a*c*d*e**2*x + 3*a*
c*e**3*x**2 + 8*b**2*d**2*e + 12*b**2*d*e**2*x + 3*b**2*e**3*x**2 - 16*b*c
*d**3 - 24*b*c*d**2*e*x - 6*b*c*d*e**2*x**2 + b*c*e**3*x**3))/(3*sqrt(d +
e*x)*e**4*(d + e*x))
```

3.59 $\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^{7/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 122

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{7/2}}\,dx = \frac{2d(Bd-Ae)(cd-be)}{5e^4(d+ex)^{5/2}} - \frac{2(Bd(3cd-2be)-Ae(2cd-be))}{3e^4(d+ex)^{3/2}} + \frac{2(3Bcd-bBe-Ace)}{e^4\sqrt{d+ex}} + \frac{2Bc\sqrt{d+ex}}{e^4}$$

output
```
2/5*d*(-A*e+B*d)*(-b*e+c*d)/e^4/(e*x+d)^(5/2)-2/3*(B*d*(-2*b*e+3*c*d)-A*e*
(-b*e+2*c*d))/e^4/(e*x+d)^(3/2)+2*(-A*c*e-B*b*e+3*B*c*d)/e^4/(e*x+d)^(1/2)
+2*B*c*(e*x+d)^(1/2)/e^4
```

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.91

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{7/2}}\,dx = -\frac{2(Ae(be(2d+5ex)+c(8d^2+20dex+15e^2x^2))+B(be(8d^2+20dex+15e^2x^2)-3c(16d^3+40d^2ex+30}{15e^4(d+ex)^{5/2}}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2))/(d + e*x)^(7/2),x]
```

output
```
(-2*(A*e*(b*e*(2*d + 5*e*x) + c*(8*d^2 + 20*d*e*x + 15*e^2*x^2)) + B*(b*e*
(8*d^2 + 20*d*e*x + 15*e^2*x^2) - 3*c*(16*d^3 + 40*d^2*e*x + 30*d*e^2*x^2
+ 5*e^3*x^3))))/(15*e^4*(d + e*x)^(5/2))
```

Rubi [A] (verified)

Time = 0.46 (sec) , antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{1195, 2009\}$

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)}{(d+ex)^{7/2}}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{Ace+bBe-3Bcd}{e^3(d+ex)^{3/2}}+\frac{Bd(3cd-2be)-Ae(2cd-be)}{e^3(d+ex)^{5/2}}-\frac{d(Bd-Ae)(cd-be)}{e^3(d+ex)^{7/2}}+\frac{Bc}{e^3\sqrt{d+ex}}\right)dx$$

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

$$\frac{2(-Ace-bBe+3Bcd)}{e^4\sqrt{d+ex}}-\frac{2(Bd(3cd-2be)-Ae(2cd-be))}{3e^4(d+ex)^{3/2}}+\frac{2d(Bd-Ae)(cd-be)}{5e^4(d+ex)^{5/2}}+\frac{2Bc\sqrt{d+ex}}{e^4}$$

input
```
Int[((A + B*x)*(b*x + c*x^2))/(d + e*x)^(7/2),x]
```

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

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 0.83 (sec) , antiderivative size = 95, normalized size of antiderivative = 0.78

method	result
pseudoelliptic	$\frac{-10\left(-3Bc\,x^2+(3Ac+3Bb)x+Ab\right)x\,e^3-4\left(-45Bc\,x^2+(10Ac+10Bb)x+Ab\right)d\,e^2-16d^2(-15Bcx+Ac+Bb)e+96Bc\,d^3}{15(ex+d)^{\frac{5}{2}}e^4}$
derivativedivides	$\frac{2Bc\sqrt{ex+d}+\frac{2d\left(Ab\,e^2-Acde-Bbde+Bc\,d^2\right)}{5(ex+d)^{\frac{5}{2}}}-\frac{2(Ace+Bbe-3Bcd)}{\sqrt{ex+d}}-\frac{2\left(Ab\,e^2-2Acde-2Bbde+3Bc\,d^2\right)}{3(ex+d)^{\frac{3}{2}}}}{e^4}$
default	$\frac{2Bc\sqrt{ex+d}+\frac{2d\left(Ab\,e^2-Acde-Bbde+Bc\,d^2\right)}{5(ex+d)^{\frac{5}{2}}}-\frac{2(Ace+Bbe-3Bcd)}{\sqrt{ex+d}}-\frac{2\left(Ab\,e^2-2Acde-2Bbde+3Bc\,d^2\right)}{3(ex+d)^{\frac{3}{2}}}}{e^4}$
gosper	$-\frac{2(-15Bc\,x^3e^3+15Ac\,e^3x^2+15Bb\,e^3x^2-90Bcd\,e^2x^2+5Axb\,e^3+20Axcd\,e^2+20Bxbd\,e^2-120Bxc\,d^2e+2Abd\,e^2+8A}{15(ex+d)^{\frac{5}{2}}e^4}$
trager	$-\frac{2(-15Bc\,x^3e^3+15Ac\,e^3x^2+15Bb\,e^3x^2-90Bcd\,e^2x^2+5Axb\,e^3+20Axcd\,e^2+20Bxbd\,e^2-120Bxc\,d^2e+2Abd\,e^2+8A}{15(ex+d)^{\frac{5}{2}}e^4}$
orering	$-\frac{2(-15Bc\,x^3e^3+15Ac\,e^3x^2+15Bb\,e^3x^2-90Bcd\,e^2x^2+5Axb\,e^3+20Axcd\,e^2+20Bxbd\,e^2-120Bxc\,d^2e+2Abd\,e^2+8A}{15e^4x(cx+b)(ex+d)^{\frac{5}{2}}}$
risch	$\frac{2Bc\sqrt{ex+d}}{e^4}-\frac{2(15Ac\,e^3x^2+15Bb\,e^3x^2-45Bcd\,e^2x^2+5Axb\,e^3+20Axcd\,e^2+20Bxbd\,e^2-75Bxc\,d^2e+2Abd\,e^2+8Ac}{15e^4\sqrt{ex+d}\,(e^2x^2+2dex+d^2)}$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^(7/2),x,method=_RETURNVERBOSE)
```

output
```
1/15*(-10*(-3*B*c*x^2+(3*A*c+3*B*b)*x+A*b)*x*e^3-4*(-45*B*c*x^2+(10*A*c+10
*B*b)*x+A*b)*d*e^2-16*d^2*(-15*B*c*x+A*c+B*b)*e+96*B*c*d^3)/(e*x+d)^(5/2)/
e^4
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.16

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^{7/2}}\,dx = \frac{2\,(15\,Bce^3x^3+48\,Bcd^3-2\,Abde^2-8\,(Bb+Ac)d^2e+15\,(6\,Bcde^2-(Bb+}{15\,(e^7x^3+3\,de^6x^2+3\,d^2e}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^(7/2),x, algorithm="fricas")
```

output
```
2/15*(15*B*c*e^3*x^3 + 48*B*c*d^3 - 2*A*b*d*e^2 - 8*(B*b + A*c)*d^2*e + 15
*(6*B*c*d*e^2 - (B*b + A*c)*e^3)*x^2 + 5*(24*B*c*d^2*e - A*b*e^3 - 4*(B*b
+ A*c)*d*e^2)*x)*sqrt(e*x + d)/(e^7*x^3 + 3*d*e^6*x^2 + 3*d^2*e^5*x + d^3*
e^4)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 784 vs. 2(122) = 244.

Time = 0.68 (sec) , antiderivative size = 784, normalized size of antiderivative = 6.43

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^{7/2}}\,dx = \begin{cases} -\frac{4Abde^2}{15d^2e^4\sqrt{d+ex}+30de^5x\sqrt{d+ex}+15e^6x^2\sqrt{d+ex}} - \frac{10Abe^3x}{15d^2e^4\sqrt{d+ex}+30de^5x\sqrt{d+ex}+15e^6x^2\sqrt{d+ex}} \\ \frac{\frac{Abx^2}{2}+\frac{Acx^3}{3}+\frac{Bbx^3}{3}+\frac{Bcx^4}{4}}{d^{\frac{7}{2}}} \end{cases}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)/(e*x+d)**(7/2),x)
```

output
```
Piecewise((-4*A*b*d*e**2/(15*d**2*e**4*sqrt(d + e*x) + 30*d*e**5*x*sqrt(d
+ e*x) + 15*e**6*x**2*sqrt(d + e*x)) - 10*A*b*e**3*x/(15*d**2*e**4*sqrt(d
+ e*x) + 30*d*e**5*x*sqrt(d + e*x) + 15*e**6*x**2*sqrt(d + e*x)) - 16*A*c*
d**2*e/(15*d**2*e**4*sqrt(d + e*x) + 30*d*e**5*x*sqrt(d + e*x) + 15*e**6*x
**2*sqrt(d + e*x)) - 40*A*c*d*e**2*x/(15*d**2*e**4*sqrt(d + e*x) + 30*d*e*
*5*x*sqrt(d + e*x) + 15*e**6*x**2*sqrt(d + e*x)) - 30*A*c*e**3*x**2/(15*d*
*2*e**4*sqrt(d + e*x) + 30*d*e**5*x*sqrt(d + e*x) + 15*e**6*x**2*sqrt(d +
e*x)) - 16*B*b*d**2*e/(15*d**2*e**4*sqrt(d + e*x) + 30*d*e**5*x*sqrt(d + e
*x) + 15*e**6*x**2*sqrt(d + e*x)) - 40*B*b*d*e**2*x/(15*d**2*e**4*sqrt(d +
 e*x) + 30*d*e**5*x*sqrt(d + e*x) + 15*e**6*x**2*sqrt(d + e*x)) - 30*B*b*e
**3*x**2/(15*d**2*e**4*sqrt(d + e*x) + 30*d*e**5*x*sqrt(d + e*x) + 15*e**6
*x**2*sqrt(d + e*x)) + 96*B*c*d**3/(15*d**2*e**4*sqrt(d + e*x) + 30*d*e**5
*x*sqrt(d + e*x) + 15*e**6*x**2*sqrt(d + e*x)) + 240*B*c*d**2*e*x/(15*d**2
*e**4*sqrt(d + e*x) + 30*d*e**5*x*sqrt(d + e*x) + 15*e**6*x**2*sqrt(d + e*
x)) + 180*B*c*d*e**2*x**2/(15*d**2*e**4*sqrt(d + e*x) + 30*d*e**5*x*sqrt(d
 + e*x) + 15*e**6*x**2*sqrt(d + e*x)) + 30*B*c*e**3*x**3/(15*d**2*e**4*sqr
t(d + e*x) + 30*d*e**5*x*sqrt(d + e*x) + 15*e**6*x**2*sqrt(d + e*x)), Ne(e
, 0)), ((A*b*x**2/2 + A*c*x**3/3 + B*b*x**3/3 + B*c*x**4/4)/d**(7/2), True
))
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 117, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)\,(bx+cx^2)}{(d+ex)^{7/2}}\,dx = \frac{2\left(\frac{15\,\sqrt{ex+d}Bc}{e^3}+\frac{3\,Bcd^3+3\,Abde^2-3\,(Bb+Ac)d^2e+15\,(3\,Bcd-(Bb+Ac)e)(ex+d)^2-5\,(3\,Bcd^2+Abe}{(ex+d)^{\frac{5}{2}}e^3}\right.}{15\,e}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^(7/2),x, algorithm="maxima")
```

output
```
2/15*(15*sqrt(e*x + d)*B*c/e^3 + (3*B*c*d^3 + 3*A*b*d*e^2 - 3*(B*b + A*c)*
d^2*e + 15*(3*B*c*d - (B*b + A*c)*e)*(e*x + d)^2 - 5*(3*B*c*d^2 + A*b*e^2
- 2*(B*b + A*c)*d*e)*(e*x + d))/((e*x + d)^(5/2)*e^3))/e
```

Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.16

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^{7/2}}\,dx = \frac{2\sqrt{ex+d}Bc}{e^4}$$
$$+\frac{2\left(45\,(ex+d)^2Bcd-15\,(ex+d)Bcd^2+3\,Bcd^3-15\,(ex+d)^2Bbe-15\,(ex+d)^2Ace+10\,(ex+d)Bbd\right.}{15\,(ex+d)^{\frac{5}{2}}e^4}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)/(e*x+d)^(7/2),x, algorithm="giac")
```

output
```
2*sqrt(e*x + d)*B*c/e^4 + 2/15*(45*(e*x + d)^2*B*c*d - 15*(e*x + d)*B*c*d^
2 + 3*B*c*d^3 - 15*(e*x + d)^2*B*b*e - 15*(e*x + d)^2*A*c*e + 10*(e*x + d)
*B*b*d*e + 10*(e*x + d)*A*c*d*e - 3*B*b*d^2*e - 3*A*c*d^2*e - 5*(e*x + d)*
A*b*e^2 + 3*A*b*d*e^2)/((e*x + d)^(5/2)*e^4)
```

Mupad [B] (verification not implemented)

Time = 10.89 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.98

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^{7/2}}\,dx =$$
$$-\frac{2\left(2\,A\,b\,d\,e^2-48\,B\,c\,d^3+8\,A\,c\,d^2\,e+8\,B\,b\,d^2\,e+5\,A\,b\,e^3\,x+15\,A\,c\,e^3\,x^2+15\,B\,b\,e^3\,x^2-15\,B\,c\,e^3\,x^3-\right.}{15\,e^4\,(d+e\,x)^{5/2}}$$

input
```
int(((b*x + c*x^2)*(A + B*x))/(d + e*x)^(7/2),x)
```

output
```
-(2*(2*A*b*d*e^2 - 48*B*c*d^3 + 8*A*c*d^2*e + 8*B*b*d^2*e + 5*A*b*e^3*x +
15*A*c*e^3*x^2 + 15*B*b*e^3*x^2 - 15*B*c*e^3*x^3 - 90*B*c*d*e^2*x^2 + 20*A
*c*d*e^2*x + 20*B*b*d*e^2*x - 120*B*c*d^2*e*x))/(15*e^4*(d + e*x)^(5/2))
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 142, normalized size of antiderivative = 1.16

$$\int \frac{(A+Bx)(bx+cx^2)}{(d+ex)^{7/2}}\,dx = \frac{2bc\,e^3x^3 - 2ac\,e^3x^2 - 2b^2e^3x^2 + 12bcd\,e^2x^2 - \frac{2}{3}ab\,e^3x - \frac{8}{3}acd\,e^2x - \frac{8}{3}b^2d\,e^2x}{\sqrt{ex+d}\,e^4\left(e^2x^2+2dex+\right.}$$

input
```
int((B*x+A)*(c*x^2+b*x)/(e*x+d)^(7/2),x)
```

output
```
(2*( - 2*a*b*d*e**2 - 5*a*b*e**3*x - 8*a*c*d**2*e - 20*a*c*d*e**2*x - 15*a
*c*e**3*x**2 - 8*b**2*d**2*e - 20*b**2*d*e**2*x - 15*b**2*e**3*x**2 + 48*b
*c*d**3 + 120*b*c*d**2*e*x + 90*b*c*d*e**2*x**2 + 15*b*c*e**3*x**3))/(15*s
qrt(d + e*x)*e**4*(d**2 + 2*d*e*x + e**2*x**2))
```

3.60 $\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)^2\,dx$

Optimal result

Integrand size = 26, antiderivative size = 267

$$\begin{aligned}\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)^2\,dx &= -\frac{2d^2(Bd-Ae)(cd-be)^2(d+ex)^{9/2}}{9e^6}\\ &+\frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))(d+ex)^{11/2}}{11e^6}\\ &+\frac{2(Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2))\,(d+ex)^{13/2}}{13e^6}\\ &-\frac{2(2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2))\,(d+ex)^{15/2}}{15e^6}\\ &-\frac{2c(5Bcd-2bBe-Ace)(d+ex)^{17/2}}{17e^6}+\frac{2Bc^2(d+ex)^{19/2}}{19e^6}\end{aligned}$$

output
```
-2/9*d^2*(-A*e+B*d)*(-b*e+c*d)^2*(e*x+d)^(9/2)/e^6+2/11*d*(-b*e+c*d)*(B*d*
(-3*b*e+5*c*d)-2*A*e*(-b*e+2*c*d))*(e*x+d)^(11/2)/e^6+2/13*(A*e*(b^2*e^2-6
*b*c*d*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))*(e*x+d)^(13/2)/
e^6-2/15*(2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))*(e*x+d)^(
15/2)/e^6-2/17*c*(-A*c*e-2*B*b*e+5*B*c*d)*(e*x+d)^(17/2)/e^6+2/19*B*c^2*(e
*x+d)^(19/2)/e^6
```

Mathematica [A] (verified)

Time = 0.38 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.02

$$\int (A+Bx)(d+ex)^{7/2} \left(bx+cx^2\right)^2 \, dx = \frac{2(d+ex)^{9/2} (19Ae(85b^2e^2(8d^2-36dex+99e^2x^2)+34bce(-16d^3+72d^2ex-198de^2x^2+42}{}$$

input
```
Integrate[(A + B*x)*(d + e*x)^(7/2)*(b*x + c*x^2)^2,x]
```

output
```
(2*(d + e*x)^(9/2)*(19*A*e*(85*b^2*e^2*(8*d^2 - 36*d*e*x + 99*e^2*x^2) + 3
4*b*c*e*(-16*d^3 + 72*d^2*e*x - 198*d*e^2*x^2 + 429*e^3*x^3) + c^2*(128*d^
4 - 576*d^3*e*x + 1584*d^2*e^2*x^2 - 3432*d*e^3*x^3 + 6435*e^4*x^4)) + B*(
323*b^2*e^2*(-16*d^3 + 72*d^2*e*x - 198*d*e^2*x^2 + 429*e^3*x^3) + 38*b*c*
e*(128*d^4 - 576*d^3*e*x + 1584*d^2*e^2*x^2 - 3432*d*e^3*x^3 + 6435*e^4*x^
4) - 5*c^2*(256*d^5 - 1152*d^4*e*x + 3168*d^3*e^2*x^2 - 6864*d^2*e^3*x^3 +
 12870*d*e^4*x^4 - 21879*e^5*x^5))))/(2078505*e^6)
```

Rubi [A] (verified)

Time = 0.81 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {1195, 2009}

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

$$\int (A+Bx) \left(bx+cx^2\right)^2 (d+ex)^{7/2} \, dx$$

$$\Big\downarrow \text{ 1195}$$

$$\int \left(\frac{(d+ex)^{13/2} \left(B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)\right)}{e^5}+\frac{(d+ex)^{11/2} \left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bc\right.}{e^5}\right.$$

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

$$-\frac{2(d+ex)^{15/2}\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{15e^6}+\frac{2(d+ex)^{13/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{13e^6}-\frac{2d^2(d+ex)^{9/2}(Bd-Ae)(cd-be)^2}{9e^6}-\frac{2c(d+ex)^{17/2}(-Ace-2bBe+5Bcd)}{17e^6}+\frac{2d(d+ex)^{11/2}(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{11e^6}+\frac{2Bc^2(d+ex)^{19/2}}{19e^6}$$

input
```
Int[(A + B*x)*(d + e*x)^(7/2)*(b*x + c*x^2)^2,x]
```

output
```
(-2*d^2*(B*d - A*e)*(c*d - b*e)^2*(d + e*x)^(9/2))/(9*e^6) + (2*d*(c*d - b
*e)*(B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e))*(d + e*x)^(11/2))/(11*e^6)
 + (2*(A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*
e + 3*b^2*e^2))*(d + e*x)^(13/2))/(13*e^6) - (2*(2*A*c*e*(2*c*d - b*e) - B
*(10*c^2*d^2 - 8*b*c*d*e + b^2*e^2))*(d + e*x)^(15/2))/(15*e^6) - (2*c*(5*
B*c*d - 2*b*B*e - A*c*e)*(d + e*x)^(17/2))/(17*e^6) + (2*B*c^2*(d + e*x)^(
19/2))/(19*e^6)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 2.34 (sec) , antiderivative size = 259, normalized size of antiderivative = 0.97

method	result
pseudoelliptic	$\frac{16(ex+d)^{\frac{9}{2}}\left(\left(\left(\frac{\left(\frac{1287}{8}e^5x^5-\frac{6435}{68}d\,e^4x^4-\frac{396}{17}d^3e^2x^2+\frac{858}{17}d^2e^3x^3-\frac{32}{17}d^5+\frac{144}{17}d^4ex\right)B}{19}+\frac{16e\left(\frac{6435}{128}e^4x^4-\frac{429}{16}d\,e^3x^3+\frac{99}{8}d^2e^2\right.}{85}\right.\right.\right.}{}$
derivativedivides	$\frac{2Bc^2(ex+d)^{\frac{19}{2}}}{19}+\frac{2\left((Ae-3Bd)c^2+2Bc(be-cd)\right)(ex+d)^{\frac{17}{2}}}{17}+\frac{2\left(\left(-2(Ae-Bd)d+B\,d^2\right)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2\right)(ex+}{15}$
default	$\frac{2Bc^2(ex+d)^{\frac{19}{2}}}{19}+\frac{2\left((Ae-3Bd)c^2+2Bc(be-cd)\right)(ex+d)^{\frac{17}{2}}}{17}+\frac{2\left(\left(-2(Ae-Bd)d+B\,d^2\right)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2\right)(ex+}{15}$
gosper	$2(ex+d)^{\frac{9}{2}}\left(109395Bx^5c^2e^5+122265Ax^4c^2e^5+244530Bx^4bce^5-64350Bx^4c^2de^4+277134Ax^3bce^5-65208Ax^3c^2d\right.$
orering	$2(109395Bx^5c^2e^5+122265Ax^4c^2e^5+244530Bx^4bce^5-64350Bx^4c^2de^4+277134Ax^3bce^5-65208Ax^3c^2de^4+13856$
trager	$2(109395Bc^2e^9x^9+122265Ac^2e^9x^8+244530Bbce^9x^8+373230Bc^2de^8x^8+277134Abce^9x^7+423852Ac^2de^8x^7+138$
risch	$2(109395Bc^2e^9x^9+122265Ac^2e^9x^8+244530Bbce^9x^8+373230Bc^2de^8x^8+277134Abce^9x^7+423852Ac^2de^8x^7+138$

input
```
int((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
16/1287*(e*x+d)^(9/2)*((1/19*(1287/8*e^5*x^5-6435/68*d*e^4*x^4-396/17*d^3*
e^2*x^2+858/17*d^2*e^3*x^3-32/17*d^5+144/17*d^4*e*x)*B+16/85*e*(6435/128*e
^4*x^4-429/16*d*e^3*x^3+99/8*d^2*e^2*x^2-9/2*d^3*e*x+d^4)*A)*c^2-4/5*e*(1/
17*(-6435/16*e^4*x^4+429/2*d*e^3*x^3-99*d^2*e^2*x^2+36*d^3*e*x-8*d^4)*B+A*
e*(-429/16*e^3*x^3+99/8*d*e^2*x^2-9/2*d^2*e*x+d^3))*b*c+e^2*b^2*(1/5*(429/
8*e^3*x^3-2*d^3-99/4*d*e^2*x^2+9*d^2*e*x)*B+A*e*(99/8*e^2*x^2+d^2-9/2*d*e*
x)))/e^6
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 562 vs. $2(243) = 486$.

Time = 0.08 (sec) , antiderivative size = 562, normalized size of antiderivative = 2.10

$$\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)^2\,dx = \frac{2\left(109395\,Bc^2e^9x^9-1280\,Bc^2d^9+12920\,Ab^2d^6e^3+2432\,(2\,Bbc+Ac^2)d^8e-5168\,(Bb^2+2\,A\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
2/2078505*(109395*B*c^2*e^9*x^9 - 1280*B*c^2*d^9 + 12920*A*b^2*d^6*e^3 + 2
432*(2*B*b*c + A*c^2)*d^8*e - 5168*(B*b^2 + 2*A*b*c)*d^7*e^2 + 6435*(58*B*
c^2*d*e^8 + 19*(2*B*b*c + A*c^2)*e^9)*x^8 + 429*(1010*B*c^2*d^2*e^7 + 988*
(2*B*b*c + A*c^2)*d*e^8 + 323*(B*b^2 + 2*A*b*c)*e^9)*x^7 + 33*(5240*B*c^2*
d^3*e^6 + 4845*A*b^2*e^9 + 15238*(2*B*b*c + A*c^2)*d^2*e^7 + 14858*(B*b^2
+ 2*A*b*c)*d*e^8)*x^6 + 9*(35*B*c^2*d^4*e^5 + 64600*A*b^2*d*e^8 + 23028*(2
*B*b*c + A*c^2)*d^3*e^6 + 66538*(B*b^2 + 2*A*b*c)*d^2*e^7)*x^5 - 5*(70*B*c
^2*d^5*e^4 - 147934*A*b^2*d^2*e^7 - 133*(2*B*b*c + A*c^2)*d^4*e^5 - 51680*
(B*b^2 + 2*A*b*c)*d^3*e^6)*x^4 + 5*(80*B*c^2*d^6*e^3 + 68476*A*b^2*d^3*e^6
 - 152*(2*B*b*c + A*c^2)*d^5*e^4 + 323*(B*b^2 + 2*A*b*c)*d^4*e^5)*x^3 - 3*
(160*B*c^2*d^7*e^2 - 1615*A*b^2*d^4*e^5 - 304*(2*B*b*c + A*c^2)*d^6*e^3 +
646*(B*b^2 + 2*A*b*c)*d^5*e^4)*x^2 + 4*(160*B*c^2*d^8*e - 1615*A*b^2*d^5*e
^4 - 304*(2*B*b*c + A*c^2)*d^7*e^2 + 646*(B*b^2 + 2*A*b*c)*d^6*e^3)*x)*sqr
t(e*x + d)/e^6
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1352 vs. $2(272) = 544$.

Time = 1.04 (sec) , antiderivative size = 1352, normalized size of antiderivative = 5.06

$$\int (A + Bx)(d + ex)^{7/2} \left(bx + cx^2\right)^2 \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)**(7/2)*(c*x**2+b*x)**2,x)
```

output
```
Piecewise((16*A*b**2*d**6*sqrt(d + e*x)/(1287*e**3) - 8*A*b**2*d**5*x*sqrt
(d + e*x)/(1287*e**2) + 2*A*b**2*d**4*x**2*sqrt(d + e*x)/(429*e) + 424*A*b
**2*d**3*x**3*sqrt(d + e*x)/1287 + 916*A*b**2*d**2*e*x**4*sqrt(d + e*x)/12
87 + 80*A*b**2*d*e**2*x**5*sqrt(d + e*x)/143 + 2*A*b**2*e**3*x**6*sqrt(d +
 e*x)/13 - 64*A*b*c*d**7*sqrt(d + e*x)/(6435*e**4) + 32*A*b*c*d**6*x*sqrt(
d + e*x)/(6435*e**3) - 8*A*b*c*d**5*x**2*sqrt(d + e*x)/(2145*e**2) + 4*A*b
*c*d**4*x**3*sqrt(d + e*x)/(1287*e) + 640*A*b*c*d**3*x**4*sqrt(d + e*x)/12
87 + 824*A*b*c*d**2*e*x**5*sqrt(d + e*x)/715 + 184*A*b*c*d*e**2*x**6*sqrt(
d + e*x)/195 + 4*A*b*c*e**3*x**7*sqrt(d + e*x)/15 + 256*A*c**2*d**8*sqrt(d
 + e*x)/(109395*e**5) - 128*A*c**2*d**7*x*sqrt(d + e*x)/(109395*e**4) + 32
*A*c**2*d**6*x**2*sqrt(d + e*x)/(36465*e**3) - 16*A*c**2*d**5*x**3*sqrt(d
+ e*x)/(21879*e**2) + 14*A*c**2*d**4*x**4*sqrt(d + e*x)/(21879*e) + 2424*A
*c**2*d**3*x**5*sqrt(d + e*x)/12155 + 1604*A*c**2*d**2*e*x**6*sqrt(d + e*x
)/3315 + 104*A*c**2*d*e**2*x**7*sqrt(d + e*x)/255 + 2*A*c**2*e**3*x**8*sqr
t(d + e*x)/17 - 32*B*b**2*d**7*sqrt(d + e*x)/(6435*e**4) + 16*B*b**2*d**6*
x*sqrt(d + e*x)/(6435*e**3) - 4*B*b**2*d**5*x**2*sqrt(d + e*x)/(2145*e**2)
 + 2*B*b**2*d**4*x**3*sqrt(d + e*x)/(1287*e) + 320*B*b**2*d**3*x**4*sqrt(d
 + e*x)/1287 + 412*B*b**2*d**2*e*x**5*sqrt(d + e*x)/715 + 92*B*b**2*d*e**2
*x**6*sqrt(d + e*x)/195 + 2*B*b**2*e**3*x**7*sqrt(d + e*x)/15 + 512*B*b*c*
d**8*sqrt(d + e*x)/(109395*e**5) - 256*B*b*c*d**7*x*sqrt(d + e*x)/(1093...
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.09

$$\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)^2\,dx = \frac{2\left(109395\,(ex+d)^{\frac{19}{2}}Bc^2-122265\,(5\,Bc^2d-(2\,Bbc+Ac^2)e)(ex+d)^{\frac{17}{2}}+138567\,(10\,Bc^2d^2\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x)^2,x, algorithm="maxima")
```

output
```
2/2078505*(109395*(e*x + d)^(19/2)*B*c^2 - 122265*(5*B*c^2*d - (2*B*b*c +
A*c^2)*e)*(e*x + d)^(17/2) + 138567*(10*B*c^2*d^2 - 4*(2*B*b*c + A*c^2)*d*
e + (B*b^2 + 2*A*b*c)*e^2)*(e*x + d)^(15/2) - 159885*(10*B*c^2*d^3 - A*b^2
*e^3 - 6*(2*B*b*c + A*c^2)*d^2*e + 3*(B*b^2 + 2*A*b*c)*d*e^2)*(e*x + d)^(1
3/2) + 188955*(5*B*c^2*d^4 - 2*A*b^2*d*e^3 - 4*(2*B*b*c + A*c^2)*d^3*e + 3
*(B*b^2 + 2*A*b*c)*d^2*e^2)*(e*x + d)^(11/2) - 230945*(B*c^2*d^5 - A*b^2*d
^2*e^3 - (2*B*b*c + A*c^2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2)*(e*x + d)^(9
/2))/e^6
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2546 vs. $2(243) = 486$.

Time = 0.31 (sec) , antiderivative size = 2546, normalized size of antiderivative = 9.54

$$\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)^2\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
2/14549535*(969969*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x
 + d)*d^2)*A*b^2*d^4/e^2 + 415701*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*
d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*b^2*d^4/e^3 + 831402*
(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sq
rt(e*x + d)*d^3)*A*b*c*d^4/e^3 + 1662804*(5*(e*x + d)^(7/2) - 21*(e*x + d)
^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*A*b^2*d^3/e^2 +
92378*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^
2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*b*c*d^4/e^4 + 46189
*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 4
20*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*A*c^2*d^4/e^4 + 184756*(35
*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(
e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*b^2*d^3/e^3 + 369512*(35*(e*
x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x
+ d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*A*b*c*d^3/e^3 + 277134*(35*(e*x +
d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)
^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*A*b^2*d^2/e^2 + 20995*(63*(e*x + d)^(1
1/2) - 385*(e*x + d)^(9/2)*d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x + d)^(5
/2)*d^3 + 1155*(e*x + d)^(3/2)*d^4 - 693*sqrt(e*x + d)*d^5)*B*c^2*d^4/e^5
+ 167960*(63*(e*x + d)^(11/2) - 385*(e*x + d)^(9/2)*d + 990*(e*x + d)^(7/2
)*d^2 - 1386*(e*x + d)^(5/2)*d^3 + 1155*(e*x + d)^(3/2)*d^4 - 693*sqrt(...
```

Mupad [B] (verification not implemented)

Time = 10.96 (sec) , antiderivative size = 254, normalized size of antiderivative = 0.95

$$\int (A+Bx)(d+ex)^{7/2}\left(bx+cx^2\right)^2\,dx=\frac{(d+e\,x)^{17/2}\,\left(2\,A\,c^2\,e-10\,B\,c^2\,d+4\,B\,b\,c\,e\right)}{17\,e^6}$$
$$+\frac{(d+e\,x)^{13/2}\,\left(-6\,B\,b^2\,d\,e^2+2\,A\,b^2\,e^3+24\,B\,b\,c\,d^2\,e-12\,A\,b\,c\,d\,e^2-20\,B\,c^2\,d^3+12\,A\,c^2\,d^2\,e\right)}{13\,e^6}$$
$$+\frac{(d+e\,x)^{15/2}\,\left(2\,B\,b^2\,e^2-16\,B\,b\,c\,d\,e+4\,A\,b\,c\,e^2+20\,B\,c^2\,d^2-8\,A\,c^2\,d\,e\right)}{15\,e^6}$$
$$+\frac{2\,B\,c^2\,(d+e\,x)^{19/2}}{19\,e^6}$$
$$-\frac{2\,d\,(b\,e-c\,d)\,\left(d+e\,x\right)^{11/2}\,\left(2\,A\,b\,e^2+5\,B\,c\,d^2-4\,A\,c\,d\,e-3\,B\,b\,d\,e\right)}{11\,e^6}$$
$$+\frac{2\,d^2\,(A\,e-B\,d)\,\left(b\,e-c\,d\right)^2\,(d+e\,x)^{9/2}}{9\,e^6}$$

input
```
int((b*x + c*x^2)^2*(A + B*x)*(d + e*x)^(7/2),x)
```

output
```
((d + e*x)^(17/2)*(2*A*c^2*e - 10*B*c^2*d + 4*B*b*c*e))/(17*e^6) + ((d + e
*x)^(13/2)*(2*A*b^2*e^3 - 20*B*c^2*d^3 + 12*A*c^2*d^2*e - 6*B*b^2*d*e^2 -
12*A*b*c*d*e^2 + 24*B*b*c*d^2*e))/(13*e^6) + ((d + e*x)^(15/2)*(2*B*b^2*e^
2 + 20*B*c^2*d^2 + 4*A*b*c*e^2 - 8*A*c^2*d*e - 16*B*b*c*d*e))/(15*e^6) + (
2*B*c^2*(d + e*x)^(19/2))/(19*e^6) - (2*d*(b*e - c*d)*(d + e*x)^(11/2)*(2*
A*b*e^2 + 5*B*c*d^2 - 4*A*c*d*e - 3*B*b*d*e))/(11*e^6) + (2*d^2*(A*e - B*d
)*(b*e - c*d)^2*(d + e*x)^(9/2))/(9*e^6)
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 692, normalized size of antiderivative = 2.59

$$\int (A+Bx)(d+ex)^{7/2} \left(bx +cx^2\right)^2 \, dx = \frac{2\sqrt{ex+d}\,(109395b\,c^2e^9x^9+122265a\,c^2e^9x^8+244530b^2c\,e^9x^8+373230b\,c^2d\,e^8x^8+277134ab$$

input
```
int((B*x+A)*(e*x+d)^(7/2)*(c*x^2+b*x)^2,x)
```

output
```
(2*sqrt(d + e*x)*(12920*a*b**2*d**6*e**3 - 6460*a*b**2*d**5*e**4*x + 4845*
a*b**2*d**4*e**5*x**2 + 342380*a*b**2*d**3*e**6*x**3 + 739670*a*b**2*d**2*
e**7*x**4 + 581400*a*b**2*d*e**8*x**5 + 159885*a*b**2*e**9*x**6 - 10336*a*
b*c*d**7*e**2 + 5168*a*b*c*d**6*e**3*x - 3876*a*b*c*d**5*e**4*x**2 + 3230*
a*b*c*d**4*e**5*x**3 + 516800*a*b*c*d**3*e**6*x**4 + 1197684*a*b*c*d**2*e*
*7*x**5 + 980628*a*b*c*d*e**8*x**6 + 277134*a*b*c*e**9*x**7 + 2432*a*c**2*
d**8*e - 1216*a*c**2*d**7*e**2*x + 912*a*c**2*d**6*e**3*x**2 - 760*a*c**2*
d**5*e**4*x**3 + 665*a*c**2*d**4*e**5*x**4 + 207252*a*c**2*d**3*e**6*x**5
+ 502854*a*c**2*d**2*e**7*x**6 + 423852*a*c**2*d*e**8*x**7 + 122265*a*c**2
*e**9*x**8 - 5168*b**3*d**7*e**2 + 2584*b**3*d**6*e**3*x - 1938*b**3*d**5*
e**4*x**2 + 1615*b**3*d**4*e**5*x**3 + 258400*b**3*d**3*e**6*x**4 + 598842
*b**3*d**2*e**7*x**5 + 490314*b**3*d*e**8*x**6 + 138567*b**3*e**9*x**7 + 4
864*b**2*c*d**8*e - 2432*b**2*c*d**7*e**2*x + 1824*b**2*c*d**6*e**3*x**2 -
 1520*b**2*c*d**5*e**4*x**3 + 1330*b**2*c*d**4*e**5*x**4 + 414504*b**2*c*d
**3*e**6*x**5 + 1005708*b**2*c*d**2*e**7*x**6 + 847704*b**2*c*d*e**8*x**7
+ 244530*b**2*c*e**9*x**8 - 1280*b*c**2*d**9 + 640*b*c**2*d**8*e*x - 480*b
*c**2*d**7*e**2*x**2 + 400*b*c**2*d**6*e**3*x**3 - 350*b*c**2*d**5*e**4*x*
*4 + 315*b*c**2*d**4*e**5*x**5 + 172920*b*c**2*d**3*e**6*x**6 + 433290*b*c
**2*d**2*e**7*x**7 + 373230*b*c**2*d*e**8*x**8 + 109395*b*c**2*e**9*x**9))
/(2078505*e**6)
```

3.61 $\int (A+Bx)(d+ex)^{5/2} \left(bx+cx^2\right)^2 \, dx$

Optimal result

Integrand size = 26, antiderivative size = 267

$$\begin{aligned}\int (A+Bx)(d+ex)^{5/2} \left(bx+cx^2\right)^2 \, dx &= -\frac{2d^2(Bd-Ae)(cd-be)^2(d+ex)^{7/2}}{7e^6} \\ &+ \frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))(d+ex)^{9/2}}{9e^6} \\ &+ \frac{2(Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2))\,(d+ex)^{11/2}}{11e^6} \\ &- \frac{2(2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2))\,(d+ex)^{13/2}}{13e^6} \\ &- \frac{2c(5Bcd-2bBe-Ace)(d+ex)^{15/2}}{15e^6} + \frac{2Bc^2(d+ex)^{17/2}}{17e^6}\end{aligned}$$

output
```
-2/7*d^2*(-A*e+B*d)*(-b*e+c*d)^2*(e*x+d)^(7/2)/e^6+2/9*d*(-b*e+c*d)*(B*d*(
-3*b*e+5*c*d)-2*A*e*(-b*e+2*c*d))*(e*x+d)^(9/2)/e^6+2/11*(A*e*(b^2*e^2-6*b
*c*d*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))*(e*x+d)^(11/2)/e^
6-2/13*(2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))*(e*x+d)^(13
/2)/e^6-2/15*c*(-A*c*e-2*B*b*e+5*B*c*d)*(e*x+d)^(15/2)/e^6+2/17*B*c^2*(e*x
+d)^(17/2)/e^6
```

Mathematica [A] (verified)

Time = 0.37 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.02

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)^2\,dx = \frac{2(d+ex)^{7/2}\left(17Ae\left(65b^2e^2\left(8d^2-28dex+63e^2x^2\right)+30bce\left(-16d^3+56d^2ex-126de^2x^2+23\right.\right.\right.}{}$$

input
```
Integrate[(A + B*x)*(d + e*x)^(5/2)*(b*x + c*x^2)^2,x]
```

output
```
(2*(d + e*x)^(7/2)*(17*A*e*(65*b^2*e^2*(8*d^2 - 28*d*e*x + 63*e^2*x^2) + 3
0*b*c*e*(-16*d^3 + 56*d^2*e*x - 126*d*e^2*x^2 + 231*e^3*x^3) + c^2*(128*d^
4 - 448*d^3*e*x + 1008*d^2*e^2*x^2 - 1848*d*e^3*x^3 + 3003*e^4*x^4)) + B*(
255*b^2*e^2*(-16*d^3 + 56*d^2*e*x - 126*d*e^2*x^2 + 231*e^3*x^3) + 34*b*c*
e*(128*d^4 - 448*d^3*e*x + 1008*d^2*e^2*x^2 - 1848*d*e^3*x^3 + 3003*e^4*x^
4) - 5*c^2*(256*d^5 - 896*d^4*e*x + 2016*d^3*e^2*x^2 - 3696*d^2*e^3*x^3 +
6006*d*e^4*x^4 - 9009*e^5*x^5))))/(765765*e^6)
```

Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^2(d+ex)^{5/2}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{(d+ex)^{11/2}\left(B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)\right)}{e^5}+\frac{(d+ex)^{9/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\right.}{e^5}\right.$$

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

$$-\frac{2(d+ex)^{13/2}\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{13e^6}+\frac{2(d+ex)^{11/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{11e^6}-\frac{2d^2(d+ex)^{7/2}(Bd-Ae)(cd-be)^2}{7e^6}-\frac{2c(d+ex)^{15/2}(-Ace-2bBe+5Bcd)}{15e^6}+\frac{2d(d+ex)^{9/2}(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{9e^6}+\frac{2Bc^2(d+ex)^{17/2}}{17e^6}$$

input
```
Int[(A + B*x)*(d + e*x)^(5/2)*(b*x + c*x^2)^2,x]
```

output
```
(-2*d^2*(B*d - A*e)*(c*d - b*e)^2*(d + e*x)^(7/2))/(7*e^6) + (2*d*(c*d - b
*e)*(B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e))*(d + e*x)^(9/2))/(9*e^6) +
 (2*(A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e
+ 3*b^2*e^2))*(d + e*x)^(11/2))/(11*e^6) - (2*(2*A*c*e*(2*c*d - b*e) - B*(
10*c^2*d^2 - 8*b*c*d*e + b^2*e^2))*(d + e*x)^(13/2))/(13*e^6) - (2*c*(5*B*
c*d - 2*b*B*e - A*c*e)*(d + e*x)^(15/2))/(15*e^6) + (2*B*c^2*(d + e*x)^(17
/2))/(17*e^6)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 2.28 (sec) , antiderivative size = 256, normalized size of antiderivative = 0.96

method	result
pseudoelliptic	$\frac{16(ex+d)^{\frac{7}{2}}\left(\left(\left(\left(\frac{693}{136}e^5x^5-\frac{231}{68}de^4x^4-\frac{252}{221}d^3e^2x^2+\frac{462}{221}d^2e^3x^3-\frac{32}{221}d^5+\frac{112}{221}d^4ex\right)B+\frac{16e\left(\frac{3003}{128}e^4x^4-\frac{231}{16}de^3x^3+\frac{63}{8}d^2e\right.}{65}\right.\right.\right.}{}$
derivativedivides	$\frac{2Bc^2(ex+d)^{\frac{17}{2}}}{17}+\frac{2((Ae-3Bd)c^2+2Bc(be-cd))(ex+d)^{\frac{15}{2}}}{15}+\frac{2((-2(Ae-Bd)d+Bd^2)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2)(ex+}{13}$
default	$\frac{2Bc^2(ex+d)^{\frac{17}{2}}}{17}+\frac{2((Ae-3Bd)c^2+2Bc(be-cd))(ex+d)^{\frac{15}{2}}}{15}+\frac{2((-2(Ae-Bd)d+Bd^2)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2)(ex+}{13}$
gosper	$2(ex+d)^{\frac{7}{2}}(45045Bx^5c^2e^5+51051Ax^4c^2e^5+102102Bx^4bce^5-30030Bx^4c^2de^4+117810Ax^3bce^5-31416Ax^3c^2de^4$
orering	$\frac{2(45045Bx^5c^2e^5+51051Ax^4c^2e^5+102102Bx^4bce^5-30030Bx^4c^2de^4+117810Ax^3bce^5-31416Ax^3c^2de^4+58905B}{}$
trager	$\frac{2(45045Bc^2e^8x^8+51051Ac^2e^8x^7+102102Bbce^8x^7+105105Bc^2de^7x^7+117810Abce^8x^6+121737Ac^2de^7x^6+58905}{}$
risch	$\frac{2(45045Bc^2e^8x^8+51051Ac^2e^8x^7+102102Bbce^8x^7+105105Bc^2de^7x^7+117810Abce^8x^6+121737Ac^2de^7x^6+58905}{}$

input
```
int((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
16/693*(e*x+d)^(7/2)*(((693/136*e^5*x^5-231/68*d*e^4*x^4-252/221*d^3*e^2*x
^2+462/221*d^2*e^3*x^3-32/221*d^5+112/221*d^4*e*x)*B+16/65*e*(3003/128*e^4
*x^4-231/16*d*e^3*x^3+63/8*d^2*e^2*x^2-7/2*d^3*e*x+d^4)*A)*c^2-12/13*e*((-
1001/80*e^4*x^4+77/10*d*e^3*x^3-21/5*d^2*e^2*x^2+28/15*d^3*e*x-8/15*d^4)*B
+A*e*(-231/16*e^3*x^3+63/8*d*e^2*x^2-7/2*d^2*e*x+d^3))*b*c+e^2*((693/104*e
^3*x^3-6/13*d^3-189/52*d*e^2*x^2+21/13*d^2*e*x)*B+A*e*(63/8*e^2*x^2-7/2*d*
e*x+d^2))*b^2)/e^6
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 494 vs. $2(243) = 486$.

Time = 0.09 (sec) , antiderivative size = 494, normalized size of antiderivative = 1.85

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)^2\,dx = \frac{2\left(45045\,Bc^2e^8x^8-1280\,Bc^2d^8+8840\,Ab^2d^5e^3+2176\,(2\,Bbc+Ac^2)d^7e-4080\,(Bb^2+2\,Abc\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
2/765765*(45045*B*c^2*e^8*x^8 - 1280*B*c^2*d^8 + 8840*A*b^2*d^5*e^3 + 2176
*(2*B*b*c + A*c^2)*d^7*e - 4080*(B*b^2 + 2*A*b*c)*d^6*e^2 + 3003*(35*B*c^2
*d*e^7 + 17*(2*B*b*c + A*c^2)*e^8)*x^7 + 231*(275*B*c^2*d^2*e^6 + 527*(2*B
*b*c + A*c^2)*d*e^7 + 255*(B*b^2 + 2*A*b*c)*e^8)*x^6 + 63*(5*B*c^2*d^3*e^5
 + 1105*A*b^2*e^8 + 1207*(2*B*b*c + A*c^2)*d^2*e^6 + 2295*(B*b^2 + 2*A*b*c
)*d*e^7)*x^5 - 35*(10*B*c^2*d^4*e^4 - 5083*A*b^2*d*e^7 - 17*(2*B*b*c + A*c
^2)*d^3*e^5 - 2703*(B*b^2 + 2*A*b*c)*d^2*e^6)*x^4 + 5*(80*B*c^2*d^5*e^3 +
24973*A*b^2*d^2*e^6 - 136*(2*B*b*c + A*c^2)*d^4*e^4 + 255*(B*b^2 + 2*A*b*c
)*d^3*e^5)*x^3 - 3*(160*B*c^2*d^6*e^2 - 1105*A*b^2*d^3*e^5 - 272*(2*B*b*c
+ A*c^2)*d^5*e^3 + 510*(B*b^2 + 2*A*b*c)*d^4*e^4)*x^2 + 4*(160*B*c^2*d^7*e
 - 1105*A*b^2*d^4*e^4 - 272*(2*B*b*c + A*c^2)*d^6*e^2 + 510*(B*b^2 + 2*A*b
*c)*d^5*e^3)*x)*sqrt(e*x + d)/e^6
```

Sympy [A] (verification not implemented)

Time = 1.70 (sec) , antiderivative size = 437, normalized size of antiderivative = 1.64

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)^2\,dx=\begin{cases}\frac{2\left(\frac{Bc^2(d+ex)^{\frac{17}{2}}}{17e^5}+\frac{(d+ex)^{\frac{15}{2}}\left(Ac^2e+2Bbce-5Bc^2d\right)}{15e^5}+\frac{(d+ex)^{\frac{13}{2}}\cdot\left(2Abce^2-4Ac^2de+Bb^2e^2-8Bbcde+10Bc^2d^2\right)}{13e^5}+\frac{(d+ex)^{\frac{11}{2}}\left(Ab^2e^3-6\right.}{}\right.}{} \\ d^{\frac{5}{2}}\left(\frac{Ab^2x^3}{3}+\frac{Bc^2x^6}{6}+\frac{x^5\left(Ac^2+2Bbc\right)}{5}+\frac{x^4\cdot\left(2Abc+Bb^2\right)}{4}\right)\end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(5/2)*(c*x**2+b*x)**2,x)
```

output
```
Piecewise((2*(B*c**2*(d + e*x)**(17/2)/(17*e**5) + (d + e*x)**(15/2)*(A*c*
*2*e + 2*B*b*c*e - 5*B*c**2*d)/(15*e**5) + (d + e*x)**(13/2)*(2*A*b*c*e**2
 - 4*A*c**2*d*e + B*b**2*e**2 - 8*B*b*c*d*e + 10*B*c**2*d**2)/(13*e**5) +
(d + e*x)**(11/2)*(A*b**2*e**3 - 6*A*b*c*d*e**2 + 6*A*c**2*d**2*e - 3*B*b*
*2*d*e**2 + 12*B*b*c*d**2*e - 10*B*c**2*d**3)/(11*e**5) + (d + e*x)**(9/2)
*(-2*A*b**2*d*e**3 + 6*A*b*c*d**2*e**2 - 4*A*c**2*d**3*e + 3*B*b**2*d**2*e
**2 - 8*B*b*c*d**3*e + 5*B*c**2*d**4)/(9*e**5) + (d + e*x)**(7/2)*(A*b**2*
d**2*e**3 - 2*A*b*c*d**3*e**2 + A*c**2*d**4*e - B*b**2*d**3*e**2 + 2*B*b*c
*d**4*e - B*c**2*d**5)/(7*e**5))/e, Ne(e, 0)), (d**(5/2)*(A*b**2*x**3/3 +
B*c**2*x**6/6 + x**5*(A*c**2 + 2*B*b*c)/5 + x**4*(2*A*b*c + B*b**2)/4), Tr
ue))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.09

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)^2\,dx=\frac{2\left(45045\,(ex+d)^{\frac{17}{2}}Bc^2-51051\,(5\,Bc^2d-(2\,Bbc+Ac^2)e)(ex+d)^{\frac{15}{2}}+58905\,(10\,Bc^2d^2-4\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x)^2,x, algorithm="maxima")
```

output
```
2/765765*(45045*(e*x + d)^(17/2)*B*c^2 - 51051*(5*B*c^2*d - (2*B*b*c + A*c
^2)*e)*(e*x + d)^(15/2) + 58905*(10*B*c^2*d^2 - 4*(2*B*b*c + A*c^2)*d*e +
(B*b^2 + 2*A*b*c)*e^2)*(e*x + d)^(13/2) - 69615*(10*B*c^2*d^3 - A*b^2*e^3
- 6*(2*B*b*c + A*c^2)*d^2*e + 3*(B*b^2 + 2*A*b*c)*d*e^2)*(e*x + d)^(11/2)
+ 85085*(5*B*c^2*d^4 - 2*A*b^2*d*e^3 - 4*(2*B*b*c + A*c^2)*d^3*e + 3*(B*b^
2 + 2*A*b*c)*d^2*e^2)*(e*x + d)^(9/2) - 109395*(B*c^2*d^5 - A*b^2*d^2*e^3
- (2*B*b*c + A*c^2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2)*(e*x + d)^(7/2))/e^
6
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1888 vs. 2(243) = 486.

Time = 0.27 (sec) , antiderivative size = 1888, normalized size of antiderivative = 7.07

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)^2\,dx=\text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
2/765765*(51051*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x +
d)*d^2)*A*b^2*d^3/e^2 + 21879*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d +
35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*b^2*d^3/e^3 + 43758*(5*(e
*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*
x + d)*d^3)*A*b*c*d^3/e^3 + 65637*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*
d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*A*b^2*d^2/e^2 + 4862*(3
5*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*
(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*b*c*d^3/e^4 + 2431*(35*(e*x
 + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x +
 d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*A*c^2*d^3/e^4 + 7293*(35*(e*x + d)^
(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3
/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*b^2*d^2/e^3 + 14586*(35*(e*x + d)^(9/2)
 - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d
^3 + 315*sqrt(e*x + d)*d^4)*A*b*c*d^2/e^3 + 7293*(35*(e*x + d)^(9/2) - 180
*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 3
15*sqrt(e*x + d)*d^4)*A*b^2*d/e^2 + 1105*(63*(e*x + d)^(11/2) - 385*(e*x +
 d)^(9/2)*d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x + d)^(5/2)*d^3 + 1155*(e
*x + d)^(3/2)*d^4 - 693*sqrt(e*x + d)*d^5)*B*c^2*d^3/e^5 + 6630*(63*(e*x +
 d)^(11/2) - 385*(e*x + d)^(9/2)*d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x +
 d)^(5/2)*d^3 + 1155*(e*x + d)^(3/2)*d^4 - 693*sqrt(e*x + d)*d^5)*B*b*c...
```

Mupad [B] (verification not implemented)

Time = 10.77 (sec) , antiderivative size = 254, normalized size of antiderivative = 0.95

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)^2\,dx=\frac{(d+e\,x)^{15/2}\,\left(2\,A\,c^2\,e-10\,B\,c^2\,d+4\,B\,b\,c\,e\right)}{15\,e^6}$$
$$+\frac{(d+e\,x)^{11/2}\,\left(-6\,B\,b^2\,d\,e^2+2\,A\,b^2\,e^3+24\,B\,b\,c\,d^2\,e-12\,A\,b\,c\,d\,e^2-20\,B\,c^2\,d^3+12\,A\,c^2\,d^2\,e\right)}{11\,e^6}$$
$$+\frac{(d+e\,x)^{13/2}\,\left(2\,B\,b^2\,e^2-16\,B\,b\,c\,d\,e+4\,A\,b\,c\,e^2+20\,B\,c^2\,d^2-8\,A\,c^2\,d\,e\right)}{13\,e^6}$$
$$+\frac{2\,B\,c^2\,(d+e\,x)^{17/2}}{17\,e^6}$$
$$-\frac{2\,d\,(b\,e-c\,d)\,\left(d+e\,x\right)^{9/2}\,\left(2\,A\,b\,e^2+5\,B\,c\,d^2-4\,A\,c\,d\,e-3\,B\,b\,d\,e\right)}{9\,e^6}$$
$$+\frac{2\,d^2\,(A\,e-B\,d)\,\left(b\,e-c\,d\right)^2\,(d+e\,x)^{7/2}}{7\,e^6}$$

input
```
int((b*x + c*x^2)^2*(A + B*x)*(d + e*x)^(5/2),x)
```

output
```
((d + e*x)^(15/2)*(2*A*c^2*e - 10*B*c^2*d + 4*B*b*c*e))/(15*e^6) + ((d + e
*x)^(11/2)*(2*A*b^2*e^3 - 20*B*c^2*d^3 + 12*A*c^2*d^2*e - 6*B*b^2*d*e^2 -
12*A*b*c*d*e^2 + 24*B*b*c*d^2*e))/(11*e^6) + ((d + e*x)^(13/2)*(2*B*b^2*e^
2 + 20*B*c^2*d^2 + 4*A*b*c*e^2 - 8*A*c^2*d*e - 16*B*b*c*d*e))/(13*e^6) + (
2*B*c^2*(d + e*x)^(17/2))/(17*e^6) - (2*d*(b*e - c*d)*(d + e*x)^(9/2)*(2*A
*b*e^2 + 5*B*c*d^2 - 4*A*c*d*e - 3*B*b*d*e))/(9*e^6) + (2*d^2*(A*e - B*d)*
(b*e - c*d)^2*(d + e*x)^(7/2))/(7*e^6)
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 604, normalized size of antiderivative = 2.26

$$\int (A+Bx)(d+ex)^{5/2}\left(bx+cx^2\right)^2\,dx = \frac{2\sqrt{ex+d}\,(45045b\,c^2e^8x^8+51051a\,c^2e^8x^7+102102b^2c\,e^8x^7+105105b\,c^2d\,e^7x^7+117810abc\,e$$

input
```
int((B*x+A)*(e*x+d)^(5/2)*(c*x^2+b*x)^2,x)
```

output

```
(2*sqrt(d + e*x)*(8840*a*b**2*d**5*e**3 - 4420*a*b**2*d**4*e**4*x + 3315*a
*b**2*d**3*e**5*x**2 + 124865*a*b**2*d**2*e**6*x**3 + 177905*a*b**2*d*e**7
*x**4 + 69615*a*b**2*e**8*x**5 - 8160*a*b*c*d**6*e**2 + 4080*a*b*c*d**5*e*
*3*x - 3060*a*b*c*d**4*e**4*x**2 + 2550*a*b*c*d**3*e**5*x**3 + 189210*a*b*
c*d**2*e**6*x**4 + 289170*a*b*c*d*e**7*x**5 + 117810*a*b*c*e**8*x**6 + 217
6*a*c**2*d**7*e - 1088*a*c**2*d**6*e**2*x + 816*a*c**2*d**5*e**3*x**2 - 68
0*a*c**2*d**4*e**4*x**3 + 595*a*c**2*d**3*e**5*x**4 + 76041*a*c**2*d**2*e*
*6*x**5 + 121737*a*c**2*d*e**7*x**6 + 51051*a*c**2*e**8*x**7 - 4080*b**3*d
**6*e**2 + 2040*b**3*d**5*e**3*x - 1530*b**3*d**4*e**4*x**2 + 1275*b**3*d*
*3*e**5*x**3 + 94605*b**3*d**2*e**6*x**4 + 144585*b**3*d*e**7*x**5 + 58905
*b**3*e**8*x**6 + 4352*b**2*c*d**7*e - 2176*b**2*c*d**6*e**2*x + 1632*b**2
*c*d**5*e**3*x**2 - 1360*b**2*c*d**4*e**4*x**3 + 1190*b**2*c*d**3*e**5*x**
4 + 152082*b**2*c*d**2*e**6*x**5 + 243474*b**2*c*d*e**7*x**6 + 102102*b**2
*c*e**8*x**7 - 1280*b*c**2*d**8 + 640*b*c**2*d**7*e*x - 480*b*c**2*d**6*e*
*2*x**2 + 400*b*c**2*d**5*e**3*x**3 - 350*b*c**2*d**4*e**4*x**4 + 315*b*c*
*2*d**3*e**5*x**5 + 63525*b*c**2*d**2*e**6*x**6 + 105105*b*c**2*d*e**7*x**
7 + 45045*b*c**2*e**8*x**8))/(765765*e**6)
```

3.62 $\int (A+Bx)(d+ex)^{3/2} \left(bx+cx^2\right)^2 \, dx$

Optimal result

Integrand size = 26, antiderivative size = 267

$$\int (A+Bx)(d+ex)^{3/2} \left(bx+cx^2\right)^2 \, dx = -\frac{2d^2(Bd-Ae)(cd-be)^2(d+ex)^{5/2}}{5e^6} + \frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))(d+ex)^{7/2}}{7e^6} + \frac{2(Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2))\,(d+ex)^{9/2}}{9e^6} - \frac{2(2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2))\,(d+ex)^{11/2}}{11e^6} - \frac{2c(5Bcd-2bBe-Ace)(d+ex)^{13/2}}{13e^6} + \frac{2Bc^2(d+ex)^{15/2}}{15e^6}$$

output
```
-2/5*d^2*(-A*e+B*d)*(-b*e+c*d)^2*(e*x+d)^(5/2)/e^6+2/7*d*(-b*e+c*d)*(B*d*(
-3*b*e+5*c*d)-2*A*e*(-b*e+2*c*d))*(e*x+d)^(7/2)/e^6+2/9*(A*e*(b^2*e^2-6*b*
c*d*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))*(e*x+d)^(9/2)/e^6-
2/11*(2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))*(e*x+d)^(11/2
)/e^6-2/13*c*(-A*c*e-2*B*b*e+5*B*c*d)*(e*x+d)^(13/2)/e^6+2/15*B*c^2*(e*x+d
)^(15/2)/e^6
```

Mathematica [A] (verified)

Time = 0.33 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.02

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)^2\,dx=\frac{2(d+ex)^{5/2}\left(Ae(143b^2e^2(8d^2-20dex+35e^2x^2)+78bce(-16d^3+40d^2ex-70de^2x^2+105e^3\right.}{}$$

input
```
Integrate[(A + B*x)*(d + e*x)^(3/2)*(b*x + c*x^2)^2,x]
```

output
```
(2*(d + e*x)^(5/2)*(A*e*(143*b^2*e^2*(8*d^2 - 20*d*e*x + 35*e^2*x^2) + 78*
b*c*e*(-16*d^3 + 40*d^2*e*x - 70*d*e^2*x^2 + 105*e^3*x^3) + 3*c^2*(128*d^4
 - 320*d^3*e*x + 560*d^2*e^2*x^2 - 840*d*e^3*x^3 + 1155*e^4*x^4)) + B*(39*
b^2*e^2*(-16*d^3 + 40*d^2*e*x - 70*d*e^2*x^2 + 105*e^3*x^3) + 6*b*c*e*(128
*d^4 - 320*d^3*e*x + 560*d^2*e^2*x^2 - 840*d*e^3*x^3 + 1155*e^4*x^4) + c^2
*(-256*d^5 + 640*d^4*e*x - 1120*d^3*e^2*x^2 + 1680*d^2*e^3*x^3 - 2310*d*e^
4*x^4 + 3003*e^5*x^5))))/(45045*e^6)
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^2(d+ex)^{3/2}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{(d+ex)^{9/2}\left(B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)\right)}{e^5}+\frac{(d+ex)^{7/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd(\right.}{e^5}\right.$$

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

$$-\frac{2(d+ex)^{11/2}\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{11e^6}+\frac{2(d+ex)^{9/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{9e^6}-\frac{2d^2(d+ex)^{5/2}(Bd-Ae)(cd-be)^2}{5e^6}-\frac{2c(d+ex)^{13/2}(-Ace-2bBe+5Bcd)}{13e^6}+\frac{2d(d+ex)^{7/2}(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{7e^6}+\frac{2Bc^2(d+ex)^{15/2}}{15e^6}$$

input
```
Int[(A + B*x)*(d + e*x)^(3/2)*(b*x + c*x^2)^2,x]
```

output
```
(-2*d^2*(B*d - A*e)*(c*d - b*e)^2*(d + e*x)^(5/2))/(5*e^6) + (2*d*(c*d - b
*e)*(B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e))*(d + e*x)^(7/2))/(7*e^6) +
 (2*(A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e
+ 3*b^2*e^2))*(d + e*x)^(9/2))/(9*e^6) - (2*(2*A*c*e*(2*c*d - b*e) - B*(10
*c^2*d^2 - 8*b*c*d*e + b^2*e^2))*(d + e*x)^(11/2))/(11*e^6) - (2*c*(5*B*c*
d - 2*b*B*e - A*c*e)*(d + e*x)^(13/2))/(13*e^6) + (2*B*c^2*(d + e*x)^(15/2
))/(15*e^6)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 2.23 (sec) , antiderivative size = 258, normalized size of antiderivative = 0.97

method	result
pseudoelliptic	$\frac{16(ex+d)^{\frac{5}{2}}\left(\left(\left(\left(\frac{21}{8}e^5x^5-\frac{105}{52}de^4x^4-\frac{140}{143}d^3e^2x^2+\frac{210}{143}d^2e^3x^3-\frac{32}{143}d^5+\frac{80}{143}d^4ex\right)B+\frac{48e\left(\frac{1155}{128}e^4x^4-\frac{105}{16}de^3x^3+\frac{35}{8}d^2e^2\right.}{143}\right.\right.\right.}{}$
derivativedivides	$\frac{2Bc^2(ex+d)^{\frac{15}{2}}}{15}+\frac{2\left((Ae-3Bd)c^2+2Bc(be-cd)\right)(ex+d)^{\frac{13}{2}}}{13}+\frac{2\left(\left(-2(Ae-Bd)d+Bd^2\right)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2\right)(ex+}{11}$
default	$\frac{2Bc^2(ex+d)^{\frac{15}{2}}}{15}+\frac{2\left((Ae-3Bd)c^2+2Bc(be-cd)\right)(ex+d)^{\frac{13}{2}}}{13}+\frac{2\left(\left(-2(Ae-Bd)d+Bd^2\right)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2\right)(ex+}{11}$
gosper	$\frac{2(ex+d)^{\frac{5}{2}}\left(3003Bx^5c^2e^5+3465Ax^4c^2e^5+6930Bx^4bce^5-2310Bx^4c^2de^4+8190Ax^3bce^5-2520Ax^3c^2de^4+4095Bx\right.}{}$
orering	$\frac{2(3003Bx^5c^2e^5+3465Ax^4c^2e^5+6930Bx^4bce^5-2310Bx^4c^2de^4+8190Ax^3bce^5-2520Ax^3c^2de^4+4095Bx^3b^2e^5-5}{}$
trager	$\frac{2(3003Bc^2e^7x^7+3465Ac^2e^7x^6+6930Bbce^7x^6+3696Bc^2de^6x^6+8190Abce^7x^5+4410Ac^2de^6x^5+4095Bb^2e^7x^5+88}{}$
risch	$\frac{2(3003Bc^2e^7x^7+3465Ac^2e^7x^6+6930Bbce^7x^6+3696Bc^2de^6x^6+8190Abce^7x^5+4410Ac^2de^6x^5+4095Bb^2e^7x^5+88}{}$

input
```
int((B*x+A)*(e*x+d)^(3/2)*(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
16/315*(e*x+d)^(5/2)*(((21/8*e^5*x^5-105/52*d*e^4*x^4-140/143*d^3*e^2*x^2+
210/143*d^2*e^3*x^3-32/143*d^5+80/143*d^4*e*x)*B+48/143*e*(1155/128*e^4*x^
4-105/16*d*e^3*x^3+35/8*d^2*e^2*x^2-5/2*d^3*e*x+d^4)*A)*c^2-12/11*e*(1/13*
(-1155/16*e^4*x^4+105/2*d*e^3*x^3-35*d^2*e^2*x^2+20*d^3*e*x-8*d^4)*B+A*e*(
-105/16*e^3*x^3+35/8*d*e^2*x^2-5/2*d^2*e*x+d^3))*b*c+e^2*(3/11*(105/8*e^3*
x^3-2*d^3-35/4*d*e^2*x^2+5*d^2*e*x)*B+A*e*(35/8*e^2*x^2+d^2-5/2*d*e*x))*b^
2)/e^6
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 425, normalized size of antiderivative = 1.59

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)^2\,dx=\frac{2\left(3003\,Bc^2e^7x^7-256\,Bc^2d^7+1144\,Ab^2d^4e^3+384\,(2\,Bbc+Ac^2)d^6e-624\,(Bb^2+2\,Abc)d^5e\right.}{}$$

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

output
```
2/45045*(3003*B*c^2*e^7*x^7 - 256*B*c^2*d^7 + 1144*A*b^2*d^4*e^3 + 384*(2*
B*b*c + A*c^2)*d^6*e - 624*(B*b^2 + 2*A*b*c)*d^5*e^2 + 231*(16*B*c^2*d*e^6
 + 15*(2*B*b*c + A*c^2)*e^7)*x^6 + 63*(B*c^2*d^2*e^5 + 70*(2*B*b*c + A*c^2
)*d*e^6 + 65*(B*b^2 + 2*A*b*c)*e^7)*x^5 - 35*(2*B*c^2*d^3*e^4 - 143*A*b^2*
e^7 - 3*(2*B*b*c + A*c^2)*d^2*e^5 - 156*(B*b^2 + 2*A*b*c)*d*e^6)*x^4 + 5*(
16*B*c^2*d^4*e^3 + 1430*A*b^2*d*e^6 - 24*(2*B*b*c + A*c^2)*d^3*e^4 + 39*(B
*b^2 + 2*A*b*c)*d^2*e^5)*x^3 - 3*(32*B*c^2*d^5*e^2 - 143*A*b^2*d^2*e^5 - 4
8*(2*B*b*c + A*c^2)*d^4*e^3 + 78*(B*b^2 + 2*A*b*c)*d^3*e^4)*x^2 + 4*(32*B*
c^2*d^6*e - 143*A*b^2*d^3*e^4 - 48*(2*B*b*c + A*c^2)*d^5*e^2 + 78*(B*b^2 +
 2*A*b*c)*d^4*e^3)*x)*sqrt(e*x + d)/e^6
```

Sympy [A] (verification not implemented)

Time = 1.60 (sec) , antiderivative size = 437, normalized size of antiderivative = 1.64

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)^2\,dx = \begin{cases} \frac{2\left(\frac{Bc^2(d+ex)^{\frac{15}{2}}}{15e^5}+\frac{(d+ex)^{\frac{13}{2}}\left(Ac^2e+2Bbce-5Bc^2d\right)}{13e^5}+\frac{(d+ex)^{\frac{11}{2}}\cdot\left(2Abce^2-4Ac^2de+Bb^2e^2-8Bbcde+10Bc^2d^2\right)}{11e^5}+\frac{(d+ex)^{\frac{9}{2}}\left(Ab^2e^3-6A\right.}{} \right.}{} \\ d^{\frac{3}{2}}\left(\frac{Ab^2x^3}{3}+\frac{Bc^2x^6}{6}+\frac{x^5\left(Ac^2+2Bbc\right)}{5}+\frac{x^4\cdot\left(2Abc+Bb^2\right)}{4}\right) \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(3/2)*(c*x**2+b*x)**2,x)
```

output
```
Piecewise((2*(B*c**2*(d + e*x)**(15/2)/(15*e**5) + (d + e*x)**(13/2)*(A*c*
*2*e + 2*B*b*c*e - 5*B*c**2*d)/(13*e**5) + (d + e*x)**(11/2)*(2*A*b*c*e**2
 - 4*A*c**2*d*e + B*b**2*e**2 - 8*B*b*c*d*e + 10*B*c**2*d**2)/(11*e**5) +
(d + e*x)**(9/2)*(A*b**2*e**3 - 6*A*b*c*d*e**2 + 6*A*c**2*d**2*e - 3*B*b**
2*d*e**2 + 12*B*b*c*d**2*e - 10*B*c**2*d**3)/(9*e**5) + (d + e*x)**(7/2)*(
-2*A*b**2*d*e**3 + 6*A*b*c*d**2*e**2 - 4*A*c**2*d**3*e + 3*B*b**2*d**2*e**
2 - 8*B*b*c*d**3*e + 5*B*c**2*d**4)/(7*e**5) + (d + e*x)**(5/2)*(A*b**2*d*
*2*e**3 - 2*A*b*c*d**3*e**2 + A*c**2*d**4*e - B*b**2*d**3*e**2 + 2*B*b*c*d
**4*e - B*c**2*d**5)/(5*e**5))/e, Ne(e, 0)), (d**(3/2)*(A*b**2*x**3/3 + B*
c**2*x**6/6 + x**5*(A*c**2 + 2*B*b*c)/5 + x**4*(2*A*b*c + B*b**2)/4), True
))
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.09

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)^2\,dx = \frac{2\left(3003\,(ex+d)^{\frac{15}{2}}Bc^2 - 3465\,(5\,Bc^2d-(2\,Bbc+Ac^2)e)(ex+d)^{\frac{13}{2}} + 4095\,(10\,Bc^2d^2-4\,(2\,B\right.}{}$$

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

output
```
2/45045*(3003*(e*x + d)^(15/2)*B*c^2 - 3465*(5*B*c^2*d - (2*B*b*c + A*c^2)
*e)*(e*x + d)^(13/2) + 4095*(10*B*c^2*d^2 - 4*(2*B*b*c + A*c^2)*d*e + (B*b
^2 + 2*A*b*c)*e^2)*(e*x + d)^(11/2) - 5005*(10*B*c^2*d^3 - A*b^2*e^3 - 6*(
2*B*b*c + A*c^2)*d^2*e + 3*(B*b^2 + 2*A*b*c)*d*e^2)*(e*x + d)^(9/2) + 6435
*(5*B*c^2*d^4 - 2*A*b^2*d*e^3 - 4*(2*B*b*c + A*c^2)*d^3*e + 3*(B*b^2 + 2*A
*b*c)*d^2*e^2)*(e*x + d)^(7/2) - 9009*(B*c^2*d^5 - A*b^2*d^2*e^3 - (2*B*b*
c + A*c^2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2)*(e*x + d)^(5/2))/e^6
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1302 vs. 2(243) = 486.

Time = 0.25 (sec) , antiderivative size = 1302, normalized size of antiderivative = 4.88

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)^2\,dx = \text{Too large to display}$$

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

output
```
2/45045*(3003*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)
*d^2)*A*b^2*d^2/e^2 + 1287*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*
(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*b^2*d^2/e^3 + 2574*(5*(e*x +
 d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x +
d)*d^3)*A*b*c*d^2/e^3 + 2574*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 3
5*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*A*b^2*d/e^2 + 286*(35*(e*x +
 d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d
)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*b*c*d^2/e^4 + 143*(35*(e*x + d)^(9/
2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)
*d^3 + 315*sqrt(e*x + d)*d^4)*A*c^2*d^2/e^4 + 286*(35*(e*x + d)^(9/2) - 18
0*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 +
315*sqrt(e*x + d)*d^4)*B*b^2*d/e^3 + 572*(35*(e*x + d)^(9/2) - 180*(e*x +
d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(
e*x + d)*d^4)*A*b*c*d/e^3 + 143*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*
d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*
d^4)*A*b^2/e^2 + 65*(63*(e*x + d)^(11/2) - 385*(e*x + d)^(9/2)*d + 990*(e*
x + d)^(7/2)*d^2 - 1386*(e*x + d)^(5/2)*d^3 + 1155*(e*x + d)^(3/2)*d^4 - 6
93*sqrt(e*x + d)*d^5)*B*c^2*d^2/e^5 + 260*(63*(e*x + d)^(11/2) - 385*(e*x
+ d)^(9/2)*d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x + d)^(5/2)*d^3 + 1155*(
e*x + d)^(3/2)*d^4 - 693*sqrt(e*x + d)*d^5)*B*b*c*d/e^4 + 130*(63*(e*x ...
```

Mupad [B] (verification not implemented)

Time = 0.06 (sec) , antiderivative size = 254, normalized size of antiderivative = 0.95

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)^2\,dx=\frac{(d+e\,x)^{13/2}\,\left(2\,A\,c^2\,e-10\,B\,c^2\,d+4\,B\,b\,c\,e\right)}{13\,e^6}$$
$$+\frac{(d+e\,x)^{9/2}\,\left(-6\,B\,b^2\,d\,e^2+2\,A\,b^2\,e^3+24\,B\,b\,c\,d^2\,e-12\,A\,b\,c\,d\,e^2-20\,B\,c^2\,d^3+12\,A\,c^2\,d^2\,e\right)}{9\,e^6}$$
$$+\frac{(d+e\,x)^{11/2}\,\left(2\,B\,b^2\,e^2-16\,B\,b\,c\,d\,e+4\,A\,b\,c\,e^2+20\,B\,c^2\,d^2-8\,A\,c^2\,d\,e\right)}{11\,e^6}$$
$$+\frac{2\,B\,c^2\,(d+e\,x)^{15/2}}{15\,e^6}$$
$$-\frac{2\,d\,(b\,e-c\,d)\,\left(d+e\,x\right)^{7/2}\,\left(2\,A\,b\,e^2+5\,B\,c\,d^2-4\,A\,c\,d\,e-3\,B\,b\,d\,e\right)}{7\,e^6}$$
$$+\frac{2\,d^2\,(A\,e-B\,d)\,\left(b\,e-c\,d\right)^2\,(d+e\,x)^{5/2}}{5\,e^6}$$

input
```
int((b*x + c*x^2)^2*(A + B*x)*(d + e*x)^(3/2),x)
```

output
```
((d + e*x)^(13/2)*(2*A*c^2*e - 10*B*c^2*d + 4*B*b*c*e))/(13*e^6) + ((d + e
*x)^(9/2)*(2*A*b^2*e^3 - 20*B*c^2*d^3 + 12*A*c^2*d^2*e - 6*B*b^2*d*e^2 - 1
2*A*b*c*d*e^2 + 24*B*b*c*d^2*e))/(9*e^6) + ((d + e*x)^(11/2)*(2*B*b^2*e^2
+ 20*B*c^2*d^2 + 4*A*b*c*e^2 - 8*A*c^2*d*e - 16*B*b*c*d*e))/(11*e^6) + (2*
B*c^2*(d + e*x)^(15/2))/(15*e^6) - (2*d*(b*e - c*d)*(d + e*x)^(7/2)*(2*A*b
*e^2 + 5*B*c*d^2 - 4*A*c*d*e - 3*B*b*d*e))/(7*e^6) + (2*d^2*(A*e - B*d)*(b
*e - c*d)^2*(d + e*x)^(5/2))/(5*e^6)
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 516, normalized size of antiderivative = 1.93

$$\int (A+Bx)(d+ex)^{3/2}\left(bx+cx^2\right)^2\,dx=\frac{2\sqrt{ex+d}\,(3003b\,c^2e^7x^7+3465a\,c^2e^7x^6+6930b^2c\,e^7x^6+3696b\,c^2d\,e^6x^6+8190abc\,e^7x^5+441$$

input
```
int((B*x+A)*(e*x+d)^(3/2)*(c*x^2+b*x)^2,x)
```

output
```
(2*sqrt(d + e*x)*(1144*a*b**2*d**4*e**3 - 572*a*b**2*d**3*e**4*x + 429*a*b
**2*d**2*e**5*x**2 + 7150*a*b**2*d*e**6*x**3 + 5005*a*b**2*e**7*x**4 - 124
8*a*b*c*d**5*e**2 + 624*a*b*c*d**4*e**3*x - 468*a*b*c*d**3*e**4*x**2 + 390
*a*b*c*d**2*e**5*x**3 + 10920*a*b*c*d*e**6*x**4 + 8190*a*b*c*e**7*x**5 + 3
84*a*c**2*d**6*e - 192*a*c**2*d**5*e**2*x + 144*a*c**2*d**4*e**3*x**2 - 12
0*a*c**2*d**3*e**4*x**3 + 105*a*c**2*d**2*e**5*x**4 + 4410*a*c**2*d*e**6*x
**5 + 3465*a*c**2*e**7*x**6 - 624*b**3*d**5*e**2 + 312*b**3*d**4*e**3*x -
234*b**3*d**3*e**4*x**2 + 195*b**3*d**2*e**5*x**3 + 5460*b**3*d*e**6*x**4
+ 4095*b**3*e**7*x**5 + 768*b**2*c*d**6*e - 384*b**2*c*d**5*e**2*x + 288*b
**2*c*d**4*e**3*x**2 - 240*b**2*c*d**3*e**4*x**3 + 210*b**2*c*d**2*e**5*x*
*4 + 8820*b**2*c*d*e**6*x**5 + 6930*b**2*c*e**7*x**6 - 256*b*c**2*d**7 + 1
28*b*c**2*d**6*e*x - 96*b*c**2*d**5*e**2*x**2 + 80*b*c**2*d**4*e**3*x**3 -
 70*b*c**2*d**3*e**4*x**4 + 63*b*c**2*d**2*e**5*x**5 + 3696*b*c**2*d*e**6*
x**6 + 3003*b*c**2*e**7*x**7))/(45045*e**6)
```

3.63 $\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)^2\,dx$

Optimal result

Integrand size = 26, antiderivative size = 267

$$
\begin{aligned}
&\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)^2\,dx \\
&= -\frac{2d^2(Bd-Ae)(cd-be)^2(d+ex)^{3/2}}{3e^6} \\
&\quad+\frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))(d+ex)^{5/2}}{5e^6} \\
&\quad+\frac{2\left(Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2)\right)(d+ex)^{7/2}}{7e^6} \\
&\quad-\frac{2\left(2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2)\right)(d+ex)^{9/2}}{9e^6} \\
&\quad-\frac{2c(5Bcd-2bBe-Ace)(d+ex)^{11/2}}{11e^6}+\frac{2Bc^2(d+ex)^{13/2}}{13e^6}
\end{aligned}
$$

output

```
-2/3*d^2*(-A*e+B*d)*(-b*e+c*d)^2*(e*x+d)^(3/2)/e^6+2/5*d*(-b*e+c*d)*(B*d*(
-3*b*e+5*c*d)-2*A*e*(-b*e+2*c*d))*(e*x+d)^(5/2)/e^6+2/7*(A*e*(b^2*e^2-6*b*
c*d*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))*(e*x+d)^(7/2)/e^6-
2/9*(2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))*(e*x+d)^(9/2)/
e^6-2/11*c*(-A*c*e-2*B*b*e+5*B*c*d)*(e*x+d)^(11/2)/e^6+2/13*B*c^2*(e*x+d)^
(13/2)/e^6
```

Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.02

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)^2\,dx$$
$$=\frac{2(d+ex)^{3/2}\left(13Ae(33b^2e^2(8d^2-12dex+15e^2x^2)+22bce(-16d^3+24d^2ex-30de^2x^2+35e^3x^3)+c^2(1\right.}{}$$

input
```
Integrate[(A + B*x)*Sqrt[d + e*x]*(b*x + c*x^2)^2,x]
```

output
```
(2*(d + e*x)^(3/2)*(13*A*e*(33*b^2*e^2*(8*d^2 - 12*d*e*x + 15*e^2*x^2) + 2
2*b*c*e*(-16*d^3 + 24*d^2*e*x - 30*d*e^2*x^2 + 35*e^3*x^3) + c^2*(128*d^4
- 192*d^3*e*x + 240*d^2*e^2*x^2 - 280*d*e^3*x^3 + 315*e^4*x^4)) + B*(143*b
^2*e^2*(-16*d^3 + 24*d^2*e*x - 30*d*e^2*x^2 + 35*e^3*x^3) + 26*b*c*e*(128*
d^4 - 192*d^3*e*x + 240*d^2*e^2*x^2 - 280*d*e^3*x^3 + 315*e^4*x^4) - 5*c^2
*(256*d^5 - 384*d^4*e*x + 480*d^3*e^2*x^2 - 560*d^2*e^3*x^3 + 630*d*e^4*x^
4 - 693*e^5*x^5))))/(45045*e^6)
```

Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {1195, 2009}

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

$$\int (A+Bx)\left(bx+cx^2\right)^2\sqrt{d+ex}\,dx$$

$$\Big\downarrow \text{ 1195}$$

$$\int \left(\frac{(d+ex)^{7/2}\left(B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)\right)}{e^5}+\frac{(d+ex)^{5/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd(\right.}{e^5}\right.$$

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

$$-\frac{2(d+ex)^{9/2}\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{9e^6}+\frac{2(d+ex)^{7/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{7e^6}-\frac{2d^2(d+ex)^{3/2}(Bd-Ae)(cd-be)^2}{3e^6}-\frac{2c(d+ex)^{11/2}(-Ace-2bBe+5Bcd)}{11e^6}+\frac{2d(d+ex)^{5/2}(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{5e^6}+\frac{2Bc^2(d+ex)^{13/2}}{13e^6}$$

input
```
Int[(A + B*x)*Sqrt[d + e*x]*(b*x + c*x^2)^2,x]
```

output
```
(-2*d^2*(B*d - A*e)*(c*d - b*e)^2*(d + e*x)^(3/2))/(3*e^6) + (2*d*(c*d - b
*e)*(B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e))*(d + e*x)^(5/2))/(5*e^6) +
 (2*(A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e
+ 3*b^2*e^2))*(d + e*x)^(7/2))/(7*e^6) - (2*(2*A*c*e*(2*c*d - b*e) - B*(10
*c^2*d^2 - 8*b*c*d*e + b^2*e^2))*(d + e*x)^(9/2))/(9*e^6) - (2*c*(5*B*c*d
- 2*b*B*e - A*c*e)*(d + e*x)^(11/2))/(11*e^6) + (2*B*c^2*(d + e*x)^(13/2))
/(13*e^6)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 2.16 (sec) , antiderivative size = 257, normalized size of antiderivative = 0.96

method	result
pseudoelliptic	$\frac{16(ex+d)^{\frac{3}{2}}\left(\left(\frac{5\left(\frac{21}{8}e^5x^5-\frac{105}{44}d\,e^4x^4-\frac{20}{11}d^3e^2x^2+\frac{70}{33}d^2e^3x^3-\frac{32}{33}d^5+\frac{16}{11}d^4ex\right)B}{13}+\frac{16eA\left(\frac{315}{128}e^4x^4-\frac{35}{16}d\,e^3x^3+\frac{15}{8}d^2e^2x^2-\frac{3}{2}\right.}{33}\right.\right.}{}$
derivativedivides	$\frac{2B\,c^2(ex+d)^{\frac{13}{2}}}{13}+\frac{2\left((Ae-3Bd)c^2+2Bc(be-cd)\right)(ex+d)^{\frac{11}{2}}}{11}+\frac{2\left(\left(-2(Ae-Bd)d+B\,d^2\right)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2\right)(ex+}{9}$
default	$\frac{2B\,c^2(ex+d)^{\frac{13}{2}}}{13}+\frac{2\left((Ae-3Bd)c^2+2Bc(be-cd)\right)(ex+d)^{\frac{11}{2}}}{11}+\frac{2\left(\left(-2(Ae-Bd)d+B\,d^2\right)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2\right)(ex+}{9}$
gosper	$\frac{2(ex+d)^{\frac{3}{2}}\left(3465B\,x^5c^2e^5+4095A\,x^4c^2e^5+8190B\,x^4bc\,e^5-3150B\,x^4c^2d\,e^4+10010A\,x^3bc\,e^5-3640A\,x^3c^2d\,e^4+5005B\right.}{}$
orering	$\frac{2\left(3465B\,x^5c^2e^5+4095A\,x^4c^2e^5+8190B\,x^4bc\,e^5-3150B\,x^4c^2d\,e^4+10010A\,x^3bc\,e^5-3640A\,x^3c^2d\,e^4+5005B\,x^3b^2e^5-\right.}{}$
trager	$\frac{2\left(3465B\,c^2e^6x^6+4095A\,c^2e^6x^5+8190Bbc\,e^6x^5+315B\,c^2d\,e^5x^5+10010Abc\,e^6x^4+455A\,c^2d\,e^5x^4+5005B\,b^2e^6x^4+910\right.}{}$
risch	$\frac{2\left(3465B\,c^2e^6x^6+4095A\,c^2e^6x^5+8190Bbc\,e^6x^5+315B\,c^2d\,e^5x^5+10010Abc\,e^6x^4+455A\,c^2d\,e^5x^4+5005B\,b^2e^6x^4+910\right.}{}$

input
```
int((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
16/105*(e*x+d)^(3/2)*((5/13*(21/8*e^5*x^5-105/44*d*e^4*x^4-20/11*d^3*e^2*x
^2+70/33*d^2*e^3*x^3-32/33*d^5+16/11*d^4*e*x)*B+16/33*e*A*(315/128*e^4*x^4
-35/16*d*e^3*x^3+15/8*d^2*e^2*x^2-3/2*d^3*e*x+d^4))*c^2-4/3*e*b*(1/11*(-31
5/16*e^4*x^4+35/2*d*e^3*x^3-15*d^2*e^2*x^2+12*d^3*e*x-8*d^4)*B+A*e*(-35/16
*e^3*x^3+15/8*d*e^2*x^2-3/2*d^2*e*x+d^3))*c+e^2*b^2*((35/24*e^3*x^3-2/3*d^
3-5/4*d*e^2*x^2+d^2*e*x)*B+A*e*(15/8*e^2*x^2-3/2*d*e*x+d^2)))/e^6
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.34

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)^2\,dx = \frac{2\left(3465\,Bc^2e^6x^6-1280\,Bc^2d^6+3432\,Ab^2d^3e^3+1664\,(2\,Bbc+Ac^2)d^5e-2288\,(Bb^2+2\,Abc)d^4e^2+315\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
2/45045*(3465*B*c^2*e^6*x^6 - 1280*B*c^2*d^6 + 3432*A*b^2*d^3*e^3 + 1664*(
2*B*b*c + A*c^2)*d^5*e - 2288*(B*b^2 + 2*A*b*c)*d^4*e^2 + 315*(B*c^2*d*e^5
 + 13*(2*B*b*c + A*c^2)*e^6)*x^5 - 35*(10*B*c^2*d^2*e^4 - 13*(2*B*b*c + A*
c^2)*d*e^5 - 143*(B*b^2 + 2*A*b*c)*e^6)*x^4 + 5*(80*B*c^2*d^3*e^3 + 1287*A
*b^2*e^6 - 104*(2*B*b*c + A*c^2)*d^2*e^4 + 143*(B*b^2 + 2*A*b*c)*d*e^5)*x^
3 - 3*(160*B*c^2*d^4*e^2 - 429*A*b^2*d*e^5 - 208*(2*B*b*c + A*c^2)*d^3*e^3
 + 286*(B*b^2 + 2*A*b*c)*d^2*e^4)*x^2 + 4*(160*B*c^2*d^5*e - 429*A*b^2*d^2
*e^4 - 208*(2*B*b*c + A*c^2)*d^4*e^2 + 286*(B*b^2 + 2*A*b*c)*d^3*e^3)*x)*s
qrt(e*x + d)/e^6
```

Sympy [A] (verification not implemented)

Time = 1.52 (sec) , antiderivative size = 437, normalized size of antiderivative = 1.64

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)^2\,dx$$
$$= \begin{cases} \frac{2\left(\frac{Bc^2(d+ex)^{\frac{13}{2}}}{13e^5}+\frac{(d+ex)^{\frac{11}{2}}\left(Ac^2e+2Bbce-5Bc^2d\right)}{11e^5}+\frac{(d+ex)^{\frac{9}{2}}\cdot\left(2Abce^2-4Ac^2de+Bb^2e^2-8Bbcde+10Bc^2d^2\right)}{9e^5}+\frac{(d+ex)^{\frac{7}{2}}\left(Ab^2e^3-6Abcde^2+6Ac^2d^2e-\cdots\right.}{7e^5}\cdots}{\cdots} \\ \sqrt{d}\left(\frac{Ab^2x^3}{3}+\frac{Bc^2x^6}{6}+\frac{x^5\left(Ac^2+2Bbc\right)}{5}+\frac{x^4\cdot\left(2Abc+Bb^2\right)}{4}\right) \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(1/2)*(c*x**2+b*x)**2,x)
```

output
```
Piecewise((2*(B*c**2*(d + e*x)**(13/2)/(13*e**5) + (d + e*x)**(11/2)*(A*c*
*2*e + 2*B*b*c*e - 5*B*c**2*d)/(11*e**5) + (d + e*x)**(9/2)*(2*A*b*c*e**2
- 4*A*c**2*d*e + B*b**2*e**2 - 8*B*b*c*d*e + 10*B*c**2*d**2)/(9*e**5) + (d
 + e*x)**(7/2)*(A*b**2*e**3 - 6*A*b*c*d*e**2 + 6*A*c**2*d**2*e - 3*B*b**2*
d*e**2 + 12*B*b*c*d**2*e - 10*B*c**2*d**3)/(7*e**5) + (d + e*x)**(5/2)*(-2
*A*b**2*d*e**3 + 6*A*b*c*d**2*e**2 - 4*A*c**2*d**3*e + 3*B*b**2*d**2*e**2
- 8*B*b*c*d**3*e + 5*B*c**2*d**4)/(5*e**5) + (d + e*x)**(3/2)*(A*b**2*d**2
*e**3 - 2*A*b*c*d**3*e**2 + A*c**2*d**4*e - B*b**2*d**3*e**2 + 2*B*b*c*d**
4*e - B*c**2*d**5)/(3*e**5))/e, Ne(e, 0)), (sqrt(d)*(A*b**2*x**3/3 + B*c**
2*x**6/6 + x**5*(A*c**2 + 2*B*b*c)/5 + x**4*(2*A*b*c + B*b**2)/4), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.09

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)^2\,dx$$
$$= \frac{2\left(3465\,(ex+d)^{\frac{13}{2}}Bc^2 - 4095\,(5\,Bc^2d-(2\,Bbc+Ac^2)e)(ex+d)^{\frac{11}{2}} + 5005\,(10\,Bc^2d^2-4\,(2\,Bbc+Ac^2)\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x)^2,x, algorithm="maxima")
```

output
```
2/45045*(3465*(e*x + d)^(13/2)*B*c^2 - 4095*(5*B*c^2*d - (2*B*b*c + A*c^2)
*e)*(e*x + d)^(11/2) + 5005*(10*B*c^2*d^2 - 4*(2*B*b*c + A*c^2)*d*e + (B*b
^2 + 2*A*b*c)*e^2)*(e*x + d)^(9/2) - 6435*(10*B*c^2*d^3 - A*b^2*e^3 - 6*(2
*B*b*c + A*c^2)*d^2*e + 3*(B*b^2 + 2*A*b*c)*d*e^2)*(e*x + d)^(7/2) + 9009*
(5*B*c^2*d^4 - 2*A*b^2*d*e^3 - 4*(2*B*b*c + A*c^2)*d^3*e + 3*(B*b^2 + 2*A*
b*c)*d^2*e^2)*(e*x + d)^(5/2) - 15015*(B*c^2*d^5 - A*b^2*d^2*e^3 - (2*B*b*
c + A*c^2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2)*(e*x + d)^(3/2))/e^6
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 788 vs. 2(243) = 486.

Time = 0.26 (sec) , antiderivative size = 788, normalized size of antiderivative = 2.95

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)^2\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
2/45045*(3003*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)
*d^2)*A*b^2*d/e^2 + 1287*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e
*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*b^2*d/e^3 + 2574*(5*(e*x + d)^
(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d
^3)*A*b*c*d/e^3 + 1287*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x
 + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*A*b^2/e^2 + 286*(35*(e*x + d)^(9/2
) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*
d^3 + 315*sqrt(e*x + d)*d^4)*B*b*c*d/e^4 + 143*(35*(e*x + d)^(9/2) - 180*(
e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315
*sqrt(e*x + d)*d^4)*A*c^2*d/e^4 + 143*(35*(e*x + d)^(9/2) - 180*(e*x + d)^
(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x
 + d)*d^4)*B*b^2/e^3 + 286*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 3
78*(e*x + d)^(5/2)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*
A*b*c/e^3 + 65*(63*(e*x + d)^(11/2) - 385*(e*x + d)^(9/2)*d + 990*(e*x + d
)^(7/2)*d^2 - 1386*(e*x + d)^(5/2)*d^3 + 1155*(e*x + d)^(3/2)*d^4 - 693*sq
rt(e*x + d)*d^5)*B*c^2*d/e^5 + 130*(63*(e*x + d)^(11/2) - 385*(e*x + d)^(9
/2)*d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x + d)^(5/2)*d^3 + 1155*(e*x + d
)^(3/2)*d^4 - 693*sqrt(e*x + d)*d^5)*B*b*c/e^4 + 65*(63*(e*x + d)^(11/2) -
 385*(e*x + d)^(9/2)*d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x + d)^(5/2)*d^
3 + 1155*(e*x + d)^(3/2)*d^4 - 693*sqrt(e*x + d)*d^5)*A*c^2/e^4 + 15*(2...
```

Mupad [B] (verification not implemented)

Time = 10.66 (sec) , antiderivative size = 254, normalized size of antiderivative = 0.95

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)^2\,dx=\frac{(d+e\,x)^{11/2}\,\left(2\,A\,c^2\,e-10\,B\,c^2\,d+4\,B\,b\,c\,e\right)}{11\,e^6}$$
$$+\frac{(d+e\,x)^{7/2}\,\left(-6\,B\,b^2\,d\,e^2+2\,A\,b^2\,e^3+24\,B\,b\,c\,d^2\,e-12\,A\,b\,c\,d\,e^2-20\,B\,c^2\,d^3+12\,A\,c^2\,d^2\,e\right)}{7\,e^6}$$
$$+\frac{(d+e\,x)^{9/2}\,\left(2\,B\,b^2\,e^2-16\,B\,b\,c\,d\,e+4\,A\,b\,c\,e^2+20\,B\,c^2\,d^2-8\,A\,c^2\,d\,e\right)}{9\,e^6}$$
$$+\frac{2\,B\,c^2\,(d+e\,x)^{13/2}}{13\,e^6}$$
$$-\frac{2\,d\,(b\,e-c\,d)\,\left(d+e\,x\right)^{5/2}\,\left(2\,A\,b\,e^2+5\,B\,c\,d^2-4\,A\,c\,d\,e-3\,B\,b\,d\,e\right)}{5\,e^6}$$
$$+\frac{2\,d^2\,\left(A\,e-B\,d\right)\,\left(b\,e-c\,d\right)^2\,(d+e\,x)^{3/2}}{3\,e^6}$$

input
```
int((b*x + c*x^2)^2*(A + B*x)*(d + e*x)^(1/2),x)
```

output
```
((d + e*x)^(11/2)*(2*A*c^2*e - 10*B*c^2*d + 4*B*b*c*e))/(11*e^6) + ((d + e
*x)^(7/2)*(2*A*b^2*e^3 - 20*B*c^2*d^3 + 12*A*c^2*d^2*e - 6*B*b^2*d*e^2 - 1
2*A*b*c*d*e^2 + 24*B*b*c*d^2*e))/(7*e^6) + ((d + e*x)^(9/2)*(2*B*b^2*e^2 +
 20*B*c^2*d^2 + 4*A*b*c*e^2 - 8*A*c^2*d*e - 16*B*b*c*d*e))/(9*e^6) + (2*B*
c^2*(d + e*x)^(13/2))/(13*e^6) - (2*d*(b*e - c*d)*(d + e*x)^(5/2)*(2*A*b*e
^2 + 5*B*c*d^2 - 4*A*c*d*e - 3*B*b*d*e))/(5*e^6) + (2*d^2*(A*e - B*d)*(b*e
 - c*d)^2*(d + e*x)^(3/2))/(3*e^6)
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 428, normalized size of antiderivative = 1.60

$$\int (A+Bx)\sqrt{d+ex}\left(bx+cx^2\right)^2\,dx$$
$$= \frac{2\sqrt{ex+d}\,(3465b\,c^2e^6x^6+4095a\,c^2e^6x^5+8190b^2c\,e^6x^5+315b\,c^2d\,e^5x^5+10010abc\,e^6x^4+455a\,c^2d\,e^5x^4}{}$$

input
```
int((B*x+A)*(e*x+d)^(1/2)*(c*x^2+b*x)^2,x)
```

output
```
(2*sqrt(d + e*x)*(3432*a*b**2*d**3*e**3 - 1716*a*b**2*d**2*e**4*x + 1287*a
*b**2*d*e**5*x**2 + 6435*a*b**2*e**6*x**3 - 4576*a*b*c*d**4*e**2 + 2288*a*
b*c*d**3*e**3*x - 1716*a*b*c*d**2*e**4*x**2 + 1430*a*b*c*d*e**5*x**3 + 100
10*a*b*c*e**6*x**4 + 1664*a*c**2*d**5*e - 832*a*c**2*d**4*e**2*x + 624*a*c
**2*d**3*e**3*x**2 - 520*a*c**2*d**2*e**4*x**3 + 455*a*c**2*d*e**5*x**4 +
4095*a*c**2*e**6*x**5 - 2288*b**3*d**4*e**2 + 1144*b**3*d**3*e**3*x - 858*
b**3*d**2*e**4*x**2 + 715*b**3*d*e**5*x**3 + 5005*b**3*e**6*x**4 + 3328*b*
*2*c*d**5*e - 1664*b**2*c*d**4*e**2*x + 1248*b**2*c*d**3*e**3*x**2 - 1040*
b**2*c*d**2*e**4*x**3 + 910*b**2*c*d*e**5*x**4 + 8190*b**2*c*e**6*x**5 - 1
280*b*c**2*d**6 + 640*b*c**2*d**5*e*x - 480*b*c**2*d**4*e**2*x**2 + 400*b*
c**2*d**3*e**3*x**3 - 350*b*c**2*d**2*e**4*x**4 + 315*b*c**2*d*e**5*x**5 +
 3465*b*c**2*e**6*x**6))/(45045*e**6)
```

3.64 $\int \frac{(A+Bx)(bx+cx^2)^2}{\sqrt{d+ex}} dx$

Optimal result

Integrand size = 26, antiderivative size = 265

$$\begin{aligned}\int \frac{(A+Bx)(bx+cx^2)^2}{\sqrt{d+ex}}\,dx &= -\frac{2d^2(Bd-Ae)(cd-be)^2\sqrt{d+ex}}{e^6}\\ &+\frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))(d+ex)^{3/2}}{3e^6}\\ &+\frac{2(Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2))\,(d+ex)^{5/2}}{5e^6}\\ &-\frac{2(2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2))\,(d+ex)^{7/2}}{7e^6}\\ &-\frac{2c(5Bcd-2bBe-Ace)(d+ex)^{9/2}}{9e^6}+\frac{2Bc^2(d+ex)^{11/2}}{11e^6}\end{aligned}$$

output

```
-2*d^2*(-A*e+B*d)*(-b*e+c*d)^2*(e*x+d)^(1/2)/e^6+2/3*d*(-b*e+c*d)*(B*d*(-3
*b*e+5*c*d)-2*A*e*(-b*e+2*c*d))*(e*x+d)^(3/2)/e^6+2/5*(A*e*(b^2*e^2-6*b*c*
d*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))*(e*x+d)^(5/2)/e^6-2/
7*(2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))*(e*x+d)^(7/2)/e^
6-2/9*c*(-A*c*e-2*B*b*e+5*B*c*d)*(e*x+d)^(9/2)/e^6+2/11*B*c^2*(e*x+d)^(11/
2)/e^6
```

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.03

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{\sqrt{d+ex}}\,dx$$
$$= \frac{2\sqrt{d+ex}(11Ae(21b^2e^2(8d^2-4dex+3e^2x^2)+18bce(-16d^3+8d^2ex-6de^2x^2+5e^3x^3)+c^2(128d^4-6$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/Sqrt[d + e*x],x]
```

output
```
(2*Sqrt[d + e*x]*(11*A*e*(21*b^2*e^2*(8*d^2 - 4*d*e*x + 3*e^2*x^2) + 18*b*
c*e*(-16*d^3 + 8*d^2*e*x - 6*d*e^2*x^2 + 5*e^3*x^3) + c^2*(128*d^4 - 64*d^
3*e*x + 48*d^2*e^2*x^2 - 40*d*e^3*x^3 + 35*e^4*x^4)) + B*(99*b^2*e^2*(-16*
d^3 + 8*d^2*e*x - 6*d*e^2*x^2 + 5*e^3*x^3) + 22*b*c*e*(128*d^4 - 64*d^3*e*
x + 48*d^2*e^2*x^2 - 40*d*e^3*x^3 + 35*e^4*x^4) - 5*c^2*(256*d^5 - 128*d^4
*e*x + 96*d^3*e^2*x^2 - 80*d^2*e^3*x^3 + 70*d*e^4*x^4 - 63*e^5*x^5))))/(34
65*e^6)
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{\sqrt{d+ex}}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{(d+ex)^{5/2}\left(B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)\right)}{e^5}+\frac{(d+ex)^{3/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd(\right.}{e^5}\right.$$

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

$$-\frac{2(d+ex)^{7/2}\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{7e^6}+\frac{2(d+ex)^{5/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{5e^6}-\frac{2d^2\sqrt{d+ex}(Bd-Ae)(cd-be)^2}{e^6}-\frac{2c(d+ex)^{9/2}(-Ace-2bBe+5Bcd)}{9e^6}+\frac{2d(d+ex)^{3/2}(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{3e^6}+\frac{2Bc^2(d+ex)^{11/2}}{11e^6}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^2)/Sqrt[d + e*x],x]
```

output
```
(-2*d^2*(B*d - A*e)*(c*d - b*e)^2*Sqrt[d + e*x])/e^6 + (2*d*(c*d - b*e)*(B
*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e))*(d + e*x)^(3/2))/(3*e^6) + (2*(A
*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e + 3*b^
2*e^2))*(d + e*x)^(5/2))/(5*e^6) - (2*(2*A*c*e*(2*c*d - b*e) - B*(10*c^2*d
^2 - 8*b*c*d*e + b^2*e^2))*(d + e*x)^(7/2))/(7*e^6) - (2*c*(5*B*c*d - 2*b*
B*e - A*c*e)*(d + e*x)^(9/2))/(9*e^6) + (2*B*c^2*(d + e*x)^(11/2))/(11*e^6
)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 2.32 (sec) , antiderivative size = 256, normalized size of antiderivative = 0.97

method	result
pseudoelliptic	$\frac{16\sqrt{ex+d}\left(\left(\left(\left(\frac{15}{88}e^5x^5-\frac{25}{132}d\,e^4x^4-\frac{20}{77}d^3e^2x^2+\frac{50}{231}d^2e^3x^3-\frac{160}{231}d^5+\frac{80}{231}d^4ex\right)B+\frac{16e\left(\frac{35}{128}e^4x^4-\frac{5}{16}d\,e^3x^3+\frac{3}{8}d^2e^2x^2-\frac{1}{2}\right.}{21}\right.\right.\right.}{}$
derivativedivides	$\frac{2B\,c^2(ex+d)^{\frac{11}{2}}}{11}+\frac{2\left((Ae-3Bd)c^2+2Bc(be-cd)\right)(ex+d)^{\frac{9}{2}}}{9}+\frac{2\left(\left(-2(Ae-Bd)d+B\,d^2\right)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2\right)(ex+d}{7}$
default	$\frac{2B\,c^2(ex+d)^{\frac{11}{2}}}{11}+\frac{2\left((Ae-3Bd)c^2+2Bc(be-cd)\right)(ex+d)^{\frac{9}{2}}}{9}+\frac{2\left(\left(-2(Ae-Bd)d+B\,d^2\right)c^2+2(Ae-3Bd)c(be-cd)+B(be-cd)^2\right)(ex+c}{7}$
gosper	$\frac{2(315B\,x^5c^2e^5+385A\,x^4c^2e^5+770B\,x^4bc\,e^5-350B\,x^4c^2d\,e^4+990A\,x^3bc\,e^5-440A\,x^3c^2d\,e^4+495B\,x^3b^2e^5-880B\,x^3b}{}$
trager	$\frac{2(315B\,x^5c^2e^5+385A\,x^4c^2e^5+770B\,x^4bc\,e^5-350B\,x^4c^2d\,e^4+990A\,x^3bc\,e^5-440A\,x^3c^2d\,e^4+495B\,x^3b^2e^5-880B\,x^3b}{}$
risch	$\frac{2(315B\,x^5c^2e^5+385A\,x^4c^2e^5+770B\,x^4bc\,e^5-350B\,x^4c^2d\,e^4+990A\,x^3bc\,e^5-440A\,x^3c^2d\,e^4+495B\,x^3b^2e^5-880B\,x^3b}{}$
orering	$\frac{2(315B\,x^5c^2e^5+385A\,x^4c^2e^5+770B\,x^4bc\,e^5-350B\,x^4c^2d\,e^4+990A\,x^3bc\,e^5-440A\,x^3c^2d\,e^4+495B\,x^3b^2e^5-880B\,x^3b}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
16/15*(e*x+d)^(1/2)*(((15/88*e^5*x^5-25/132*d*e^4*x^4-20/77*d^3*e^2*x^2+50
/231*d^2*e^3*x^3-160/231*d^5+80/231*d^4*e*x)*B+16/21*e*(35/128*e^4*x^4-5/1
6*d*e^3*x^3+3/8*d^2*e^2*x^2-1/2*d^3*e*x+d^4)*A)*c^2-12/7*e*((-35/144*e^4*x
^4+5/18*d*e^3*x^3-1/3*d^2*e^2*x^2+4/9*d^3*e*x-8/9*d^4)*B+A*e*(-5/16*e^3*x^
3+3/8*d*e^2*x^2-1/2*d^2*e*x+d^3))*b*c+e^2*((15/56*e^3*x^3-6/7*d^3-9/28*d*e
^2*x^2+3/7*d^2*e*x)*B+A*e*(3/8*e^2*x^2+d^2-1/2*d*e*x))*b^2)/e^6
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 290, normalized size of antiderivative = 1.09

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{\sqrt{d+ex}}\,dx$$
$$=\frac{2\left(315\,Bc^2e^5x^5-1280\,Bc^2d^5+1848\,Ab^2d^2e^3+1408\left(2\,Bbc+Ac^2\right)d^4e-1584\left(Bb^2+2\,Abc\right)d^3e^2-35\,(\right.}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(1/2),x, algorithm="fricas")
```

output
```
2/3465*(315*B*c^2*e^5*x^5 - 1280*B*c^2*d^5 + 1848*A*b^2*d^2*e^3 + 1408*(2*
B*b*c + A*c^2)*d^4*e - 1584*(B*b^2 + 2*A*b*c)*d^3*e^2 - 35*(10*B*c^2*d*e^4
 - 11*(2*B*b*c + A*c^2)*e^5)*x^4 + 5*(80*B*c^2*d^2*e^3 - 88*(2*B*b*c + A*c
^2)*d*e^4 + 99*(B*b^2 + 2*A*b*c)*e^5)*x^3 - 3*(160*B*c^2*d^3*e^2 - 231*A*b
^2*e^5 - 176*(2*B*b*c + A*c^2)*d^2*e^3 + 198*(B*b^2 + 2*A*b*c)*d*e^4)*x^2
+ 4*(160*B*c^2*d^4*e - 231*A*b^2*d*e^4 - 176*(2*B*b*c + A*c^2)*d^3*e^2 + 1
98*(B*b^2 + 2*A*b*c)*d^2*e^3)*x)*sqrt(e*x + d)/e^6
```

Sympy [A] (verification not implemented)

Time = 1.52 (sec) , antiderivative size = 435, normalized size of antiderivative = 1.64

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{\sqrt{d+ex}}\,dx$$
$$= \begin{cases} \frac{2\left(\frac{Bc^2(d+ex)^{\frac{11}{2}}}{11e^5}+\frac{(d+ex)^{\frac{9}{2}}\left(Ac^2e+2Bbce-5Bc^2d\right)}{9e^5}+\frac{(d+ex)^{\frac{7}{2}}\cdot\left(2Abce^2-4Ac^2de+Bb^2e^2-8Bbcde+10Bc^2d^2\right)}{7e^5}+\frac{(d+ex)^{\frac{5}{2}}\left(Ab^2e^3-6Abcde^2+6Ac^2d^2e-\right.}{5e^5}\right.}{} \\ \frac{\frac{Ab^2x^3}{3}+\frac{Bc^2x^6}{6}+\frac{x^5\left(Ac^2+2Bbc\right)}{5}+\frac{x^4\cdot\left(2Abc+Bb^2\right)}{4}}{\sqrt{d}} \end{cases}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**(1/2),x)
```

output
```
Piecewise((2*(B*c**2*(d + e*x)**(11/2)/(11*e**5) + (d + e*x)**(9/2)*(A*c**
2*e + 2*B*b*c*e - 5*B*c**2*d)/(9*e**5) + (d + e*x)**(7/2)*(2*A*b*c*e**2 -
4*A*c**2*d*e + B*b**2*e**2 - 8*B*b*c*d*e + 10*B*c**2*d**2)/(7*e**5) + (d +
 e*x)**(5/2)*(A*b**2*e**3 - 6*A*b*c*d*e**2 + 6*A*c**2*d**2*e - 3*B*b**2*d*
e**2 + 12*B*b*c*d**2*e - 10*B*c**2*d**3)/(5*e**5) + (d + e*x)**(3/2)*(-2*A
*b**2*d*e**3 + 6*A*b*c*d**2*e**2 - 4*A*c**2*d**3*e + 3*B*b**2*d**2*e**2 -
8*B*b*c*d**3*e + 5*B*c**2*d**4)/(3*e**5) + sqrt(d + e*x)*(A*b**2*d**2*e**3
 - 2*A*b*c*d**3*e**2 + A*c**2*d**4*e - B*b**2*d**3*e**2 + 2*B*b*c*d**4*e -
 B*c**2*d**5)/e**5)/e, Ne(e, 0)), ((A*b**2*x**3/3 + B*c**2*x**6/6 + x**5*(
A*c**2 + 2*B*b*c)/5 + x**4*(2*A*b*c + B*b**2)/4)/sqrt(d), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 291, normalized size of antiderivative = 1.10

$$\int \frac{(A+Bx)(bx+cx^2)^2}{\sqrt{d+ex}}\,dx$$
$$= \frac{2\left(315\,(ex+d)^{\frac{11}{2}}Bc^2 - 385\,(5\,Bc^2d - (2\,Bbc + Ac^2)e)(ex+d)^{\frac{9}{2}} + 495\,(10\,Bc^2d^2 - 4\,(2\,Bbc + Ac^2)de + \right.}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(1/2),x, algorithm="maxima")
```

output
```
2/3465*(315*(e*x + d)^(11/2)*B*c^2 - 385*(5*B*c^2*d - (2*B*b*c + A*c^2)*e)
*(e*x + d)^(9/2) + 495*(10*B*c^2*d^2 - 4*(2*B*b*c + A*c^2)*d*e + (B*b^2 +
2*A*b*c)*e^2)*(e*x + d)^(7/2) - 693*(10*B*c^2*d^3 - A*b^2*e^3 - 6*(2*B*b*c
 + A*c^2)*d^2*e + 3*(B*b^2 + 2*A*b*c)*d*e^2)*(e*x + d)^(5/2) + 1155*(5*B*c
^2*d^4 - 2*A*b^2*d*e^3 - 4*(2*B*b*c + A*c^2)*d^3*e + 3*(B*b^2 + 2*A*b*c)*d
^2*e^2)*(e*x + d)^(3/2) - 3465*(B*c^2*d^5 - A*b^2*d^2*e^3 - (2*B*b*c + A*c
^2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2)*sqrt(e*x + d))/e^6
```

Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 358, normalized size of antiderivative = 1.35

$$\int \frac{(A+Bx)(bx+cx^2)^2}{\sqrt{d+ex}}\,dx$$
$$= \frac{2\left(\frac{231\left(3\,(ex+d)^{\frac{5}{2}}-10\,(ex+d)^{\frac{3}{2}}d+15\,\sqrt{ex+d}d^2\right)Ab^2}{e^2} + \frac{99\left(5\,(ex+d)^{\frac{7}{2}}-21\,(ex+d)^{\frac{5}{2}}d+35\,(ex+d)^{\frac{3}{2}}d^2-35\,\sqrt{ex+d}d^3\right)Bb^2}{e^3} + \frac{198\left(5\,(ex+\right.}{}\right.}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(1/2),x, algorithm="giac")
```

output
```
2/3465*(231*(3*(e*x + d)^(5/2) - 10*(e*x + d)^(3/2)*d + 15*sqrt(e*x + d)*d
^2)*A*b^2/e^2 + 99*(5*(e*x + d)^(7/2) - 21*(e*x + d)^(5/2)*d + 35*(e*x + d
)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*B*b^2/e^3 + 198*(5*(e*x + d)^(7/2) - 2
1*(e*x + d)^(5/2)*d + 35*(e*x + d)^(3/2)*d^2 - 35*sqrt(e*x + d)*d^3)*A*b*c
/e^3 + 22*(35*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2
)*d^2 - 420*(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*B*b*c/e^4 + 11*(3
5*(e*x + d)^(9/2) - 180*(e*x + d)^(7/2)*d + 378*(e*x + d)^(5/2)*d^2 - 420*
(e*x + d)^(3/2)*d^3 + 315*sqrt(e*x + d)*d^4)*A*c^2/e^4 + 5*(63*(e*x + d)^(
11/2) - 385*(e*x + d)^(9/2)*d + 990*(e*x + d)^(7/2)*d^2 - 1386*(e*x + d)^(
5/2)*d^3 + 1155*(e*x + d)^(3/2)*d^4 - 693*sqrt(e*x + d)*d^5)*B*c^2/e^5)/e
```

Mupad [B] (verification not implemented)

Time = 10.72 (sec) , antiderivative size = 254, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{\sqrt{d+ex}}\,dx = \frac{(d+e\,x)^{9/2}\,(2\,A\,c^2\,e-10\,B\,c^2\,d+4\,B\,b\,c\,e)}{9\,e^6} + \frac{(d+e\,x)^{5/2}\,(-6\,B\,b^2\,d\,e^2+2\,A\,b^2\,e^3+24\,B\,b\,c\,d^2\,e-12\,A\,b\,c\,d\,e^2-20\,B\,c^2\,d^3+12\,A\,c^2\,d^2\,e)}{5\,e^6} + \frac{(d+e\,x)^{7/2}\,(2\,B\,b^2\,e^2-16\,B\,b\,c\,d\,e+4\,A\,b\,c\,e^2+20\,B\,c^2\,d^2-8\,A\,c^2\,d\,e)}{7\,e^6} + \frac{2\,B\,c^2\,(d+e\,x)^{11/2}}{11\,e^6} - \frac{2\,d\,(b\,e-c\,d)\,(d+e\,x)^{3/2}\,(2\,A\,b\,e^2+5\,B\,c\,d^2-4\,A\,c\,d\,e-3\,B\,b\,d\,e)}{3\,e^6} + \frac{2\,d^2\,(A\,e-B\,d)\,(b\,e-c\,d)^2\,\sqrt{d+e\,x}}{e^6}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^(1/2),x)
```

output
```
((d + e*x)^(9/2)*(2*A*c^2*e - 10*B*c^2*d + 4*B*b*c*e))/(9*e^6) + ((d + e*x
)^(5/2)*(2*A*b^2*e^3 - 20*B*c^2*d^3 + 12*A*c^2*d^2*e - 6*B*b^2*d*e^2 - 12*
A*b*c*d*e^2 + 24*B*b*c*d^2*e))/(5*e^6) + ((d + e*x)^(7/2)*(2*B*b^2*e^2 + 2
0*B*c^2*d^2 + 4*A*b*c*e^2 - 8*A*c^2*d*e - 16*B*b*c*d*e))/(7*e^6) + (2*B*c^
2*(d + e*x)^(11/2))/(11*e^6) - (2*d*(b*e - c*d)*(d + e*x)^(3/2)*(2*A*b*e^2
 + 5*B*c*d^2 - 4*A*c*d*e - 3*B*b*d*e))/(3*e^6) + (2*d^2*(A*e - B*d)*(b*e -
 c*d)^2*(d + e*x)^(1/2))/e^6
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 340, normalized size of antiderivative = 1.28

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{\sqrt{d+ex}}\,dx$$
$$= \frac{2\sqrt{ex+d}\,(315b\,c^2e^5x^5+385a\,c^2e^5x^4+770b^2c\,e^5x^4-350b\,c^2d\,e^4x^4+990abc\,e^5x^3-440a\,c^2d\,e^4x^3+495$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(1/2),x)
```

output
```
(2*sqrt(d + e*x)*(1848*a*b**2*d**2*e**3 - 924*a*b**2*d*e**4*x + 693*a*b**2
*e**5*x**2 - 3168*a*b*c*d**3*e**2 + 1584*a*b*c*d**2*e**3*x - 1188*a*b*c*d*
e**4*x**2 + 990*a*b*c*e**5*x**3 + 1408*a*c**2*d**4*e - 704*a*c**2*d**3*e**
2*x + 528*a*c**2*d**2*e**3*x**2 - 440*a*c**2*d*e**4*x**3 + 385*a*c**2*e**5
*x**4 - 1584*b**3*d**3*e**2 + 792*b**3*d**2*e**3*x - 594*b**3*d*e**4*x**2
+ 495*b**3*e**5*x**3 + 2816*b**2*c*d**4*e - 1408*b**2*c*d**3*e**2*x + 1056
*b**2*c*d**2*e**3*x**2 - 880*b**2*c*d*e**4*x**3 + 770*b**2*c*e**5*x**4 - 1
280*b*c**2*d**5 + 640*b*c**2*d**4*e*x - 480*b*c**2*d**3*e**2*x**2 + 400*b*
c**2*d**2*e**3*x**3 - 350*b*c**2*d*e**4*x**4 + 315*b*c**2*e**5*x**5))/(346
5*e**6)
```

3.65 $\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{3/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 263

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{3/2}}\,dx = \frac{2d^2(Bd-Ae)(cd-be)^2}{e^6\sqrt{d+ex}} + \frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))\sqrt{d+ex}}{e^6} + \frac{2\left(Ae\left(6c^2d^2-6bcde+b^2e^2\right)-Bd\left(10c^2d^2-12bcde+3b^2e^2\right)\right)(d+ex)^{3/2}}{3e^6} - \frac{2\left(2Ace(2cd-be)-B\left(10c^2d^2-8bcde+b^2e^2\right)\right)(d+ex)^{5/2}}{5e^6} - \frac{2c(5Bcd-2bBe-Ace)(d+ex)^{7/2}}{7e^6} + \frac{2Bc^2(d+ex)^{9/2}}{9e^6}$$

output
```
2*d^2*(-A*e+B*d)*(-b*e+c*d)^2/e^6/(e*x+d)^(1/2)+2*d*(-b*e+c*d)*(B*d*(-3*b*
e+5*c*d)-2*A*e*(-b*e+2*c*d))*(e*x+d)^(1/2)/e^6+2/3*(A*e*(b^2*e^2-6*b*c*d*e
+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))*(e*x+d)^(3/2)/e^6-2/5*(
2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))*(e*x+d)^(5/2)/e^6-2
/7*c*(-A*c*e-2*B*b*e+5*B*c*d)*(e*x+d)^(7/2)/e^6+2/9*B*c^2*(e*x+d)^(9/2)/e^
6
```

Mathematica [A] (verified)

Time = 0.34 (sec) , antiderivative size = 273, normalized size of antiderivative = 1.04

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{3/2}}\,dx = \frac{-6Ae(35b^2e^2(8d^2+4dex-e^2x^2)-42bce(16d^3+8d^2ex-2de^2x^2+e^3x^3)+}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^(3/2),x]
```

output
```
(-6*A*e*(35*b^2*e^2*(8*d^2 + 4*d*e*x - e^2*x^2) - 42*b*c*e*(16*d^3 + 8*d^2
*e*x - 2*d*e^2*x^2 + e^3*x^3) + 3*c^2*(128*d^4 + 64*d^3*e*x - 16*d^2*e^2*x
^2 + 8*d*e^3*x^3 - 5*e^4*x^4)) + 2*B*(63*b^2*e^2*(16*d^3 + 8*d^2*e*x - 2*d
*e^2*x^2 + e^3*x^3) + 18*b*c*e*(-128*d^4 - 64*d^3*e*x + 16*d^2*e^2*x^2 - 8
*d*e^3*x^3 + 5*e^4*x^4) + 5*c^2*(256*d^5 + 128*d^4*e*x - 32*d^3*e^2*x^2 +
16*d^2*e^3*x^3 - 10*d*e^4*x^4 + 7*e^5*x^5)))/(315*e^6*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.71 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{3/2}}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{(d+ex)^{3/2}\left(B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)\right)}{e^5}+\frac{\sqrt{d+ex}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2\right.\right.}{e^5}\right.$$

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

$$-\frac{2(d+ex)^{5/2}\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{5e^6}+\frac{2(d+ex)^{3/2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{3e^6}+\frac{2d^2(Bd-Ae)(cd-be)^2}{e^6\sqrt{d+ex}}-\frac{2c(d+ex)^{7/2}(-Ace-2bBe+5Bcd)}{7e^6}+\frac{2d\sqrt{d+ex}(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{e^6}+\frac{2Bc^2(d+ex)^{9/2}}{9e^6}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^(3/2),x]
```

output
```
(2*d^2*(B*d - A*e)*(c*d - b*e)^2)/(e^6*Sqrt[d + e*x]) + (2*d*(c*d - b*e)*(
B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e))*Sqrt[d + e*x])/e^6 + (2*(A*e*(6
*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2
))*(d + e*x)^(3/2))/(3*e^6) - (2*(2*A*c*e*(2*c*d - b*e) - B*(10*c^2*d^2 -
8*b*c*d*e + b^2*e^2))*(d + e*x)^(5/2))/(5*e^6) - (2*c*(5*B*c*d - 2*b*B*e -
 A*c*e)*(d + e*x)^(7/2))/(7*e^6) + (2*B*c^2*(d + e*x)^(9/2))/(9*e^6)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 1.16 (sec) , antiderivative size = 259, normalized size of antiderivative = 0.98

method	result
pseudoelliptic	$\frac{2\left(5\left(7e^{5}x^{5}-10d\,e^{4}x^{4}+16d^{2}e^{3}x^{3}-32d^{3}e^{2}x^{2}+128d^{4}ex+256d^{5}\right)B-1152\left(-\frac{5}{128}e^{4}x^{4}+\frac{1}{16}d\,e^{3}x^{3}-\frac{1}{8}d^{2}e^{2}x^{2}+\frac{1}{2}d^{3}ex+d^{4}\right)eA\right)c^{2}}{315}+$
risch	$-\frac{2\left(-35e^{4}B\,c^{2}x^{4}-45e^{4}A\,c^{2}x^{3}-90bc\,e^{4}B\,x^{3}+85d\,e^{3}B\,c^{2}x^{3}-126Abc\,e^{4}x^{2}+117d\,e^{3}A\,c^{2}x^{2}-63B\,b^{2}e^{4}x^{2}+234Bbcd\,e^{3}\right.}{}$
gosper	$-\frac{2\left(-35B\,x^{5}c^{2}e^{5}-45A\,x^{4}c^{2}e^{5}-90B\,x^{4}bc\,e^{5}+50B\,x^{4}c^{2}d\,e^{4}-126A\,x^{3}bc\,e^{5}+72A\,x^{3}c^{2}d\,e^{4}-63B\,x^{3}b^{2}e^{5}+144B\,x^{3}bcd\right.}{}$
trager	$-\frac{2\left(-35B\,x^{5}c^{2}e^{5}-45A\,x^{4}c^{2}e^{5}-90B\,x^{4}bc\,e^{5}+50B\,x^{4}c^{2}d\,e^{4}-126A\,x^{3}bc\,e^{5}+72A\,x^{3}c^{2}d\,e^{4}-63B\,x^{3}b^{2}e^{5}+144B\,x^{3}bcd\right.}{}$
orering	$-\frac{2\left(-35B\,x^{5}c^{2}e^{5}-45A\,x^{4}c^{2}e^{5}-90B\,x^{4}bc\,e^{5}+50B\,x^{4}c^{2}d\,e^{4}-126A\,x^{3}bc\,e^{5}+72A\,x^{3}c^{2}d\,e^{4}-63B\,x^{3}b^{2}e^{5}+144B\,x^{3}bcd\right.}{}$
derivativedivides	$\frac{\frac{2B\,c^{2}(ex+d)^{\frac{9}{2}}}{9}+\frac{2A\,c^{2}e(ex+d)^{\frac{7}{2}}}{7}+\frac{4Bbce(ex+d)^{\frac{7}{2}}}{7}-\frac{10B\,c^{2}d(ex+d)^{\frac{7}{2}}}{7}+\frac{4Abc\,e^{2}(ex+d)^{\frac{5}{2}}}{5}-\frac{8A\,c^{2}de(ex+d)^{\frac{5}{2}}}{5}+\frac{2B\,b^{2}e^{2}(ex+d)^{\frac{5}{2}}}{5}}{}$
default	$\frac{\frac{2B\,c^{2}(ex+d)^{\frac{9}{2}}}{9}+\frac{2A\,c^{2}e(ex+d)^{\frac{7}{2}}}{7}+\frac{4Bbce(ex+d)^{\frac{7}{2}}}{7}-\frac{10B\,c^{2}d(ex+d)^{\frac{7}{2}}}{7}+\frac{4Abc\,e^{2}(ex+d)^{\frac{5}{2}}}{5}-\frac{8A\,c^{2}de(ex+d)^{\frac{5}{2}}}{5}+\frac{2B\,b^{2}e^{2}(ex+d)^{\frac{5}{2}}}{5}}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
2/315*((5*(7*e^5*x^5-10*d*e^4*x^4+16*d^2*e^3*x^3-32*d^3*e^2*x^2+128*d^4*e*
x+256*d^5)*B-1152*(-5/128*e^4*x^4+1/16*d*e^3*x^3-1/8*d^2*e^2*x^2+1/2*d^3*e
*x+d^4)*e*A)*c^2+2016*e*(1/7*(5/16*e^4*x^4-1/2*d*e^3*x^3+d^2*e^2*x^2-4*d^3
*e*x-8*d^4)*B+A*e*(1/16*e^3*x^3-1/8*d*e^2*x^2+1/2*d^2*e*x+d^3))*b*c-840*e^
2*(3/5*(-1/8*e^3*x^3+1/4*d*e^2*x^2-d^2*e*x-2*d^3)*B+A*e*(-1/8*e^2*x^2+1/2*
d*e*x+d^2))*b^2)/(e*x+d)^(1/2)/e^6
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 299, normalized size of antiderivative = 1.14

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{3/2}}\,dx = \frac{2\left(35\,Bc^2e^5x^5+1280\,Bc^2d^5-840\,Ab^2d^2e^3-1152\left(2\,Bbc+Ac^2\right)d^4e+1008\right.}{}$$

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

output
```
2/315*(35*B*c^2*e^5*x^5 + 1280*B*c^2*d^5 - 840*A*b^2*d^2*e^3 - 1152*(2*B*b
*c + A*c^2)*d^4*e + 1008*(B*b^2 + 2*A*b*c)*d^3*e^2 - 5*(10*B*c^2*d*e^4 - 9
*(2*B*b*c + A*c^2)*e^5)*x^4 + (80*B*c^2*d^2*e^3 - 72*(2*B*b*c + A*c^2)*d*e
^4 + 63*(B*b^2 + 2*A*b*c)*e^5)*x^3 - (160*B*c^2*d^3*e^2 - 105*A*b^2*e^5 -
144*(2*B*b*c + A*c^2)*d^2*e^3 + 126*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 4*(160*
B*c^2*d^4*e - 105*A*b^2*d*e^4 - 144*(2*B*b*c + A*c^2)*d^3*e^2 + 126*(B*b^2
 + 2*A*b*c)*d^2*e^3)*x)*sqrt(e*x + d)/(e^7*x + d*e^6)
```

Sympy [A] (verification not implemented)

Time = 10.41 (sec) , antiderivative size = 384, normalized size of antiderivative = 1.46

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{3/2}}\,dx = \begin{cases} \frac{2\left(\frac{Bc^2(d+ex)^{\frac{9}{2}}}{9e^5} + \frac{d^2(-Ae+Bd)(be-cd)^2}{e^5\sqrt{d+ex}} + \frac{(d+ex)^{\frac{7}{2}}\left(Ac^2e+2Bbce-5Bc^2d\right)}{7e^5} + \frac{(d+ex)^{\frac{5}{2}}\cdot\left(2Abce^2-4Ac^2de+B\right.}{5e^5}\right.}{} \\ \frac{\frac{Ab^2x^3}{3}+\frac{Bc^2x^6}{6}+\frac{x^5\left(Ac^2+2Bbc\right)}{5}+\frac{x^4\cdot\left(2Abc+Bb^2\right)}{4}}{d^{\frac{3}{2}}} \end{cases}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**(3/2),x)
```

output
```
Piecewise((2*(B*c**2*(d + e*x)**(9/2)/(9*e**5) + d**2*(-A*e + B*d)*(b*e -
c*d)**2/(e**5*sqrt(d + e*x)) + (d + e*x)**(7/2)*(A*c**2*e + 2*B*b*c*e - 5*
B*c**2*d)/(7*e**5) + (d + e*x)**(5/2)*(2*A*b*c*e**2 - 4*A*c**2*d*e + B*b**
2*e**2 - 8*B*b*c*d*e + 10*B*c**2*d**2)/(5*e**5) + (d + e*x)**(3/2)*(A*b**2
*e**3 - 6*A*b*c*d*e**2 + 6*A*c**2*d**2*e - 3*B*b**2*d*e**2 + 12*B*b*c*d**2
*e - 10*B*c**2*d**3)/(3*e**5) + sqrt(d + e*x)*(-2*A*b**2*d*e**3 + 6*A*b*c*
d**2*e**2 - 4*A*c**2*d**3*e + 3*B*b**2*d**2*e**2 - 8*B*b*c*d**3*e + 5*B*c*
*2*d**4)/e**5)/e, Ne(e, 0)), ((A*b**2*x**3/3 + B*c**2*x**6/6 + x**5*(A*c**
2 + 2*B*b*c)/5 + x**4*(2*A*b*c + B*b**2)/4)/d**(3/2), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 299, normalized size of antiderivative = 1.14

$$\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^{3/2}}\,dx = \frac{2\left(\frac{35\,(ex+d)^{\frac{9}{2}}Bc^2-45\,(5\,Bc^2d-(2\,Bbc+Ac^2)e)(ex+d)^{\frac{7}{2}}+63\,(10\,Bc^2d^2-4\,(2\,Bbc+Ac^2)de+(Bb^2+2}{}\right.}{}$$

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

output
```
2/315*((35*(e*x + d)^(9/2)*B*c^2 - 45*(5*B*c^2*d - (2*B*b*c + A*c^2)*e)*(e
*x + d)^(7/2) + 63*(10*B*c^2*d^2 - 4*(2*B*b*c + A*c^2)*d*e + (B*b^2 + 2*A*
b*c)*e^2)*(e*x + d)^(5/2) - 105*(10*B*c^2*d^3 - A*b^2*e^3 - 6*(2*B*b*c + A
*c^2)*d^2*e + 3*(B*b^2 + 2*A*b*c)*d*e^2)*(e*x + d)^(3/2) + 315*(5*B*c^2*d^
4 - 2*A*b^2*d*e^3 - 4*(2*B*b*c + A*c^2)*d^3*e + 3*(B*b^2 + 2*A*b*c)*d^2*e^
2)*sqrt(e*x + d))/e^5 + 315*(B*c^2*d^5 - A*b^2*d^2*e^3 - (2*B*b*c + A*c^2)
*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2)/(sqrt(e*x + d)*e^5))/e
```

Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 443, normalized size of antiderivative = 1.68

$$\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^{3/2}}\,dx = \frac{2\,(Bc^2d^5-2\,Bbcd^4e-Ac^2d^4e+Bb^2d^3e^2+2\,Abcd^3e^2-Ab^2d^2e^3)}{\sqrt{ex+d}e^6}$$
$$+\frac{2\left(35\,(ex+d)^{\frac{9}{2}}Bc^2e^{48}-225\,(ex+d)^{\frac{7}{2}}Bc^2de^{48}+630\,(ex+d)^{\frac{5}{2}}Bc^2d^2e^{48}-1050\,(ex+d)^{\frac{3}{2}}Bc^2d^3e^{48}+15\right.}{}$$

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

output
```
2*(B*c^2*d^5 - 2*B*b*c*d^4*e - A*c^2*d^4*e + B*b^2*d^3*e^2 + 2*A*b*c*d^3*e
^2 - A*b^2*d^2*e^3)/(sqrt(e*x + d)*e^6) + 2/315*(35*(e*x + d)^(9/2)*B*c^2*
e^48 - 225*(e*x + d)^(7/2)*B*c^2*d*e^48 + 630*(e*x + d)^(5/2)*B*c^2*d^2*e^
48 - 1050*(e*x + d)^(3/2)*B*c^2*d^3*e^48 + 1575*sqrt(e*x + d)*B*c^2*d^4*e^
48 + 90*(e*x + d)^(7/2)*B*b*c*e^49 + 45*(e*x + d)^(7/2)*A*c^2*e^49 - 504*(
e*x + d)^(5/2)*B*b*c*d*e^49 - 252*(e*x + d)^(5/2)*A*c^2*d*e^49 + 1260*(e*x
 + d)^(3/2)*B*b*c*d^2*e^49 + 630*(e*x + d)^(3/2)*A*c^2*d^2*e^49 - 2520*sqr
t(e*x + d)*B*b*c*d^3*e^49 - 1260*sqrt(e*x + d)*A*c^2*d^3*e^49 + 63*(e*x +
d)^(5/2)*B*b^2*e^50 + 126*(e*x + d)^(5/2)*A*b*c*e^50 - 315*(e*x + d)^(3/2)
*B*b^2*d*e^50 - 630*(e*x + d)^(3/2)*A*b*c*d*e^50 + 945*sqrt(e*x + d)*B*b^2
*d^2*e^50 + 1890*sqrt(e*x + d)*A*b*c*d^2*e^50 + 105*(e*x + d)^(3/2)*A*b^2*
e^51 - 630*sqrt(e*x + d)*A*b^2*d*e^51)/e^54
```

Mupad [B] (verification not implemented)

Time = 10.73 (sec) , antiderivative size = 296, normalized size of antiderivative = 1.13

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^{3/2}}\,dx = \frac{(d+e\,x)^{7/2}\,(2\,A\,c^2\,e-10\,B\,c^2\,d+4\,B\,b\,c\,e)}{7\,e^6}$$
$$+\frac{(d+e\,x)^{3/2}\,(-6\,B\,b^2\,d\,e^2+2\,A\,b^2\,e^3+24\,B\,b\,c\,d^2\,e-12\,A\,b\,c\,d\,e^2-20\,B\,c^2\,d^3+12\,A\,c^2\,d^2\,e)}{3\,e^6}$$
$$+\frac{(d+e\,x)^{5/2}\,(2\,B\,b^2\,e^2-16\,B\,b\,c\,d\,e+4\,A\,b\,c\,e^2+20\,B\,c^2\,d^2-8\,A\,c^2\,d\,e)}{5\,e^6}$$
$$+\frac{2\,B\,b^2\,d^3\,e^2-2\,A\,b^2\,d^2\,e^3-4\,B\,b\,c\,d^4\,e+4\,A\,b\,c\,d^3\,e^2+2\,B\,c^2\,d^5-2\,A\,c^2\,d^4\,e}{e^6\,\sqrt{d+e\,x}}$$
$$+\frac{2\,B\,c^2\,(d+e\,x)^{9/2}}{9\,e^6}-\frac{2\,d\,(b\,e-c\,d)\,\sqrt{d+e\,x}\,(2\,A\,b\,e^2+5\,B\,c\,d^2-4\,A\,c\,d\,e-3\,B\,b\,d\,e)}{e^6}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^(3/2),x)
```

output
```
((d + e*x)^(7/2)*(2*A*c^2*e - 10*B*c^2*d + 4*B*b*c*e))/(7*e^6) + ((d + e*x
)^(3/2)*(2*A*b^2*e^3 - 20*B*c^2*d^3 + 12*A*c^2*d^2*e - 6*B*b^2*d*e^2 - 12*
A*b*c*d*e^2 + 24*B*b*c*d^2*e))/(3*e^6) + ((d + e*x)^(5/2)*(2*B*b^2*e^2 + 2
0*B*c^2*d^2 + 4*A*b*c*e^2 - 8*A*c^2*d*e - 16*B*b*c*d*e))/(5*e^6) + (2*B*c^
2*d^5 - 2*A*c^2*d^4*e - 2*A*b^2*d^2*e^3 + 2*B*b^2*d^3*e^2 - 4*B*b*c*d^4*e
+ 4*A*b*c*d^3*e^2)/(e^6*(d + e*x)^(1/2)) + (2*B*c^2*(d + e*x)^(9/2))/(9*e^
6) - (2*d*(b*e - c*d)*(d + e*x)^(1/2)*(2*A*b*e^2 + 5*B*c*d^2 - 4*A*c*d*e -
 3*B*b*d*e))/e^6
```

Reduce [B] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 342, normalized size of antiderivative = 1.30

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^{3/2}}\,dx = \frac{\frac{32}{5}abc\,d^2e^3x - \frac{8}{5}abcd\,e^4x^2 + \frac{2}{3}a\,b^2e^5x^2 + \frac{2}{7}a\,c^2e^5x^4 + \frac{16}{5}b^3d^2e^3x - \frac{4}{5}b^3d\,e^4x^2 -$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(3/2),x)
```

output
```
(2*( - 840*a*b**2*d**2*e**3 - 420*a*b**2*d*e**4*x + 105*a*b**2*e**5*x**2 +
 2016*a*b*c*d**3*e**2 + 1008*a*b*c*d**2*e**3*x - 252*a*b*c*d*e**4*x**2 + 1
26*a*b*c*e**5*x**3 - 1152*a*c**2*d**4*e - 576*a*c**2*d**3*e**2*x + 144*a*c
**2*d**2*e**3*x**2 - 72*a*c**2*d*e**4*x**3 + 45*a*c**2*e**5*x**4 + 1008*b*
*3*d**3*e**2 + 504*b**3*d**2*e**3*x - 126*b**3*d*e**4*x**2 + 63*b**3*e**5*
x**3 - 2304*b**2*c*d**4*e - 1152*b**2*c*d**3*e**2*x + 288*b**2*c*d**2*e**3
*x**2 - 144*b**2*c*d*e**4*x**3 + 90*b**2*c*e**5*x**4 + 1280*b*c**2*d**5 +
640*b*c**2*d**4*e*x - 160*b*c**2*d**3*e**2*x**2 + 80*b*c**2*d**2*e**3*x**3
 - 50*b*c**2*d*e**4*x**4 + 35*b*c**2*e**5*x**5))/(315*sqrt(d + e*x)*e**6)
```

3.66 $\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 263

$$\begin{aligned}\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx &= \frac{2d^2(Bd-Ae)(cd-be)^2}{3e^6(d+ex)^{3/2}}\\ &-\frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{e^6\sqrt{d+ex}}\\ &+\frac{2\left(Ae\left(6c^2d^2-6bcde+b^2e^2\right)-Bd\left(10c^2d^2-12bcde+3b^2e^2\right)\right)\sqrt{d+ex}}{e^6}\\ &-\frac{2\left(2Ace(2cd-be)-B\left(10c^2d^2-8bcde+b^2e^2\right)\right)(d+ex)^{3/2}}{3e^6}\\ &-\frac{2c(5Bcd-2bBe-Ace)(d+ex)^{5/2}}{5e^6}+\frac{2Bc^2(d+ex)^{7/2}}{7e^6}\end{aligned}$$

output
```
2/3*d^2*(-A*e+B*d)*(-b*e+c*d)^2/e^6/(e*x+d)^(3/2)-2*d*(-b*e+c*d)*(B*d*(-3*
b*e+5*c*d)-2*A*e*(-b*e+2*c*d))/e^6/(e*x+d)^(1/2)+2*(A*e*(b^2*e^2-6*b*c*d*e
+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))*(e*x+d)^(1/2)/e^6-2/3*(
2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))*(e*x+d)^(3/2)/e^6-2
/5*c*(-A*c*e-2*B*b*e+5*B*c*d)*(e*x+d)^(5/2)/e^6+2/7*B*c^2*(e*x+d)^(7/2)/e^
6
```

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 271, normalized size of antiderivative = 1.03

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx = \frac{2(7Ae(5b^2e^2(8d^2+12dex+3e^2x^2)+10bce(-16d^3-24d^2ex-6de^2x^2+e^3x^3)}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^(5/2),x]
```

output
```
(2*(7*A*e*(5*b^2*e^2*(8*d^2 + 12*d*e*x + 3*e^2*x^2) + 10*b*c*e*(-16*d^3 -
24*d^2*e*x - 6*d*e^2*x^2 + e^3*x^3) + c^2*(128*d^4 + 192*d^3*e*x + 48*d^2*
e^2*x^2 - 8*d*e^3*x^3 + 3*e^4*x^4)) + B*(35*b^2*e^2*(-16*d^3 - 24*d^2*e*x
- 6*d*e^2*x^2 + e^3*x^3) + 14*b*c*e*(128*d^4 + 192*d^3*e*x + 48*d^2*e^2*x^
2 - 8*d*e^3*x^3 + 3*e^4*x^4) - 5*c^2*(256*d^5 + 384*d^4*e*x + 96*d^3*e^2*x
^2 - 16*d^2*e^3*x^3 + 6*d*e^4*x^4 - 3*e^5*x^5))))/(105*e^6*(d + e*x)^(3/2)
)
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{\sqrt{d+ex}\left(B\left(b^2e^2-8bcde+10c^2d^2\right)-2Ace(2cd-be)\right)}{e^5}+\frac{Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde\right.}{e^5\sqrt{d+ex}}\right.$$

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

$$-\frac{2(d+ex)^{3/2}\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{3e^6}+\frac{2\sqrt{d+ex}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{e^6}+\frac{2d^2(Bd-Ae)(cd-be)^2}{3e^6(d+ex)^{3/2}}-\frac{2c(d+ex)^{5/2}(-Ace-2bBe+5Bcd)}{5e^6}-\frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{e^6\sqrt{d+ex}}+\frac{2Bc^2(d+ex)^{7/2}}{7e^6}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^(5/2),x]
```

output
```
(2*d^2*(B*d - A*e)*(c*d - b*e)^2)/(3*e^6*(d + e*x)^(3/2)) - (2*d*(c*d - b*
e)*(B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e)))/(e^6*Sqrt[d + e*x]) + (2*(
A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e + 3*b
^2*e^2))*Sqrt[d + e*x])/e^6 - (2*(2*A*c*e*(2*c*d - b*e) - B*(10*c^2*d^2 -
8*b*c*d*e + b^2*e^2))*(d + e*x)^(3/2))/(3*e^6) - (2*c*(5*B*c*d - 2*b*B*e -
 A*c*e)*(d + e*x)^(5/2))/(5*e^6) + (2*B*c^2*(d + e*x)^(7/2))/(7*e^6)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 1.08 (sec) , antiderivative size = 253, normalized size of antiderivative = 0.96

method	result
pseudoelliptic	$\frac{2\left(5\left(3e^{5}x^{5}-6d\,e^{4}x^{4}+16d^{2}e^{3}x^{3}-96d^{3}e^{2}x^{2}-384d^{4}ex-256d^{5}\right)B+896eA\left(\frac{3}{128}e^{4}x^{4}-\frac{1}{16}d\,e^{3}x^{3}+\frac{3}{8}d^{2}e^{2}x^{2}+\frac{3}{2}d^{3}ex+d^{4}\right)\right)c^{2}}{105}-\frac{64e(}{}$
risch	$\frac{2(15B\,c^{2}e^{3}x^{3}+21A\,c^{2}e^{3}x^{2}+42Bbc\,e^{3}x^{2}-60B\,c^{2}d\,e^{2}x^{2}+70Abc\,e^{3}x-98A\,c^{2}d\,e^{2}x+35B\,b^{2}e^{3}x-196Bbcd\,e^{2}x+185B\,c^{2}}{105e^{6}}$
gosper	$\frac{-\frac{64}{7}B\,x^{2}c^{2}d^{3}e^{2}+8Ax\,b^{2}d\,e^{4}+\frac{128}{5}Ax\,c^{2}d^{3}e^{2}-\frac{64}{3}Abc\,d^{3}e^{2}+\frac{512}{15}Bbc\,d^{4}e-16Bx\,b^{2}d^{2}e^{3}-\frac{256}{7}Bx\,c^{2}d^{4}e+\frac{4}{5}B\,x^{4}bc\,e^{5}-\frac{16}{15}}{}$
trager	$\frac{-\frac{64}{7}B\,x^{2}c^{2}d^{3}e^{2}+8Ax\,b^{2}d\,e^{4}+\frac{128}{5}Ax\,c^{2}d^{3}e^{2}-\frac{64}{3}Abc\,d^{3}e^{2}+\frac{512}{15}Bbc\,d^{4}e-16Bx\,b^{2}d^{2}e^{3}-\frac{256}{7}Bx\,c^{2}d^{4}e+\frac{4}{5}B\,x^{4}bc\,e^{5}-\frac{16}{15}}{}$
orering	$\frac{2(15B\,x^{5}c^{2}e^{5}+21A\,x^{4}c^{2}e^{5}+42B\,x^{4}bc\,e^{5}-30B\,x^{4}c^{2}d\,e^{4}+70A\,x^{3}bc\,e^{5}-56A\,x^{3}c^{2}d\,e^{4}+35B\,x^{3}b^{2}e^{5}-112B\,x^{3}bcd\,e^{4}+80}{}$
derivativedivides	$\frac{\frac{2B\,c^{2}(ex+d)^{\frac{7}{2}}}{7}+\frac{2A\,c^{2}e(ex+d)^{\frac{5}{2}}}{5}+\frac{4Bbce(ex+d)^{\frac{5}{2}}}{5}-2B\,c^{2}d(ex+d)^{\frac{5}{2}}+\frac{4Abc\,e^{2}(ex+d)^{\frac{3}{2}}}{3}-\frac{8A\,c^{2}de(ex+d)^{\frac{3}{2}}}{3}+\frac{2B\,b^{2}e^{2}(ex+d)^{\frac{3}{2}}}{3}}{}$
default	$\frac{\frac{2B\,c^{2}(ex+d)^{\frac{7}{2}}}{7}+\frac{2A\,c^{2}e(ex+d)^{\frac{5}{2}}}{5}+\frac{4Bbce(ex+d)^{\frac{5}{2}}}{5}-2B\,c^{2}d(ex+d)^{\frac{5}{2}}+\frac{4Abc\,e^{2}(ex+d)^{\frac{3}{2}}}{3}-\frac{8A\,c^{2}de(ex+d)^{\frac{3}{2}}}{3}+\frac{2B\,b^{2}e^{2}(ex+d)^{\frac{3}{2}}}{3}}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
2/105*((5*(3*e^5*x^5-6*d*e^4*x^4+16*d^2*e^3*x^3-96*d^3*e^2*x^2-384*d^4*e*x
-256*d^5)*B+896*e*A*(3/128*e^4*x^4-1/16*d*e^3*x^3+3/8*d^2*e^2*x^2+3/2*d^3*
e*x+d^4))*c^2-1120*e*(1/5*(-3/16*e^4*x^4+1/2*d*e^3*x^3-3*d^2*e^2*x^2-12*d^
3*e*x-8*d^4)*B+(1/2*e*x+d)*e*A*(-1/8*e^2*x^2+d*e*x+d^2))*b*c+280*e^2*((1/8
*e^3*x^3-3/4*d*e^2*x^2-3*d^2*e*x-2*d^3)*B+A*e*(3/8*e^2*x^2+3/2*d*e*x+d^2))
*b^2)/(e*x+d)^(3/2)/e^6
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 310, normalized size of antiderivative = 1.18

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx = \frac{2\,(15\,Bc^2e^5x^5 - 1280\,Bc^2d^5 + 280\,Ab^2d^2e^3 + 896\,(2\,Bbc + Ac^2)d^4e - 560\,(B}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(5/2),x, algorithm="fricas")
```

output
```
2/105*(15*B*c^2*e^5*x^5 - 1280*B*c^2*d^5 + 280*A*b^2*d^2*e^3 + 896*(2*B*b*
c + A*c^2)*d^4*e - 560*(B*b^2 + 2*A*b*c)*d^3*e^2 - 3*(10*B*c^2*d*e^4 - 7*(
2*B*b*c + A*c^2)*e^5)*x^4 + (80*B*c^2*d^2*e^3 - 56*(2*B*b*c + A*c^2)*d*e^4
 + 35*(B*b^2 + 2*A*b*c)*e^5)*x^3 - 3*(160*B*c^2*d^3*e^2 - 35*A*b^2*e^5 - 1
12*(2*B*b*c + A*c^2)*d^2*e^3 + 70*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 - 12*(160*B
*c^2*d^4*e - 35*A*b^2*d*e^4 - 112*(2*B*b*c + A*c^2)*d^3*e^2 + 70*(B*b^2 +
2*A*b*c)*d^2*e^3)*x)*sqrt(e*x + d)/(e^8*x^2 + 2*d*e^7*x + d^2*e^6)
```

Sympy [A] (verification not implemented)

Time = 10.78 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.35

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx = \begin{cases} \frac{2\left(\frac{Bc^2(d+ex)^{\frac{7}{2}}}{7e^5} + \frac{d^2(-Ae+Bd)(be-cd)^2}{3e^5(d+ex)^{\frac{3}{2}}} - \frac{d(be-cd)\left(-2Abe^2+4Acde+3Bbde-5Bcd^2\right)}{e^5\sqrt{d+ex}} + \frac{(d+ex)^{\frac{5}{2}}\left(Ac^2e+2B\right.}{5e^5}\right.}{} \\ \frac{\frac{Ab^2x^3}{3} + \frac{Bc^2x^6}{6} + \frac{x^5\left(Ac^2+2Bbc\right)}{5} + \frac{x^4\cdot\left(2Abc+Bb^2\right)}{4}}{d^{\frac{5}{2}}} \end{cases}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**(5/2),x)
```

output
```
Piecewise((2*(B*c**2*(d + e*x)**(7/2)/(7*e**5) + d**2*(-A*e + B*d)*(b*e -
c*d)**2/(3*e**5*(d + e*x)**(3/2)) - d*(b*e - c*d)*(-2*A*b*e**2 + 4*A*c*d*e
 + 3*B*b*d*e - 5*B*c*d**2)/(e**5*sqrt(d + e*x)) + (d + e*x)**(5/2)*(A*c**2
*e + 2*B*b*c*e - 5*B*c**2*d)/(5*e**5) + (d + e*x)**(3/2)*(2*A*b*c*e**2 - 4
*A*c**2*d*e + B*b**2*e**2 - 8*B*b*c*d*e + 10*B*c**2*d**2)/(3*e**5) + sqrt(
d + e*x)*(A*b**2*e**3 - 6*A*b*c*d*e**2 + 6*A*c**2*d**2*e - 3*B*b**2*d*e**2
 + 12*B*b*c*d**2*e - 10*B*c**2*d**3)/e**5)/e, Ne(e, 0)), ((A*b**2*x**3/3 +
 B*c**2*x**6/6 + x**5*(A*c**2 + 2*B*b*c)/5 + x**4*(2*A*b*c + B*b**2)/4)/d*
*(5/2), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 297, normalized size of antiderivative = 1.13

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx = \frac{2\left(\frac{15\,(ex+d)^{\frac{7}{2}}Bc^2-21\,(5\,Bc^2d-(2\,Bbc+Ac^2)e)(ex+d)^{\frac{5}{2}}+35\,(10\,Bc^2d^2-4\,(2\,Bbc+Ac^2)de+(Bb^2+2}{e^5}\right.}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(5/2),x, algorithm="maxima")
```

output
```
2/105*((15*(e*x + d)^(7/2)*B*c^2 - 21*(5*B*c^2*d - (2*B*b*c + A*c^2)*e)*(e
*x + d)^(5/2) + 35*(10*B*c^2*d^2 - 4*(2*B*b*c + A*c^2)*d*e + (B*b^2 + 2*A*
b*c)*e^2)*(e*x + d)^(3/2) - 105*(10*B*c^2*d^3 - A*b^2*e^3 - 6*(2*B*b*c + A
*c^2)*d^2*e + 3*(B*b^2 + 2*A*b*c)*d*e^2)*sqrt(e*x + d))/e^5 + 35*(B*c^2*d^
5 - A*b^2*d^2*e^3 - (2*B*b*c + A*c^2)*d^4*e + (B*b^2 + 2*A*b*c)*d^3*e^2 -
3*(5*B*c^2*d^4 - 2*A*b^2*d*e^3 - 4*(2*B*b*c + A*c^2)*d^3*e + 3*(B*b^2 + 2*
A*b*c)*d^2*e^2)*(e*x + d))/((e*x + d)^(3/2)*e^5))/e
```

Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 424, normalized size of antiderivative = 1.61

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx =$$

$$-\frac{2\left(15\,(ex+d)Bc^2d^4-Bc^2d^5-24\,(ex+d)Bbcd^3e-12\,(ex+d)Ac^2d^3e+2\,Bbcd^4e+Ac^2d^4e+9\,(ex+\cdots\right.}{3\,(ex+d)^{\frac{3}{2}}e^6}$$

$$+\frac{2\left(15\,(ex+d)^{\frac{7}{2}}Bc^2e^{36}-105\,(ex+d)^{\frac{5}{2}}Bc^2de^{36}+350\,(ex+d)^{\frac{3}{2}}Bc^2d^2e^{36}-1050\,\sqrt{ex+d}Bc^2d^3e^{36}+42\,(\cdots\right.}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(5/2),x, algorithm="giac")
```

output
```
-2/3*(15*(e*x + d)*B*c^2*d^4 - B*c^2*d^5 - 24*(e*x + d)*B*b*c*d^3*e - 12*(
e*x + d)*A*c^2*d^3*e + 2*B*b*c*d^4*e + A*c^2*d^4*e + 9*(e*x + d)*B*b^2*d^2
*e^2 + 18*(e*x + d)*A*b*c*d^2*e^2 - B*b^2*d^3*e^2 - 2*A*b*c*d^3*e^2 - 6*(e
*x + d)*A*b^2*d*e^3 + A*b^2*d^2*e^3)/((e*x + d)^(3/2)*e^6) + 2/105*(15*(e*
x + d)^(7/2)*B*c^2*e^36 - 105*(e*x + d)^(5/2)*B*c^2*d*e^36 + 350*(e*x + d)
^(3/2)*B*c^2*d^2*e^36 - 1050*sqrt(e*x + d)*B*c^2*d^3*e^36 + 42*(e*x + d)^(
5/2)*B*b*c*e^37 + 21*(e*x + d)^(5/2)*A*c^2*e^37 - 280*(e*x + d)^(3/2)*B*b*
c*d*e^37 - 140*(e*x + d)^(3/2)*A*c^2*d*e^37 + 1260*sqrt(e*x + d)*B*b*c*d^2
*e^37 + 630*sqrt(e*x + d)*A*c^2*d^2*e^37 + 35*(e*x + d)^(3/2)*B*b^2*e^38 +
 70*(e*x + d)^(3/2)*A*b*c*e^38 - 315*sqrt(e*x + d)*B*b^2*d*e^38 - 630*sqrt
(e*x + d)*A*b*c*d*e^38 + 105*sqrt(e*x + d)*A*b^2*e^39)/e^42
```

Mupad [B] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 316, normalized size of antiderivative = 1.20

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx = \frac{(d+e\,x)^{5/2}\,(2\,A\,c^2\,e-10\,B\,c^2\,d+4\,B\,b\,c\,e)}{5\,e^6}$$
$$-\frac{(d+e\,x)\,\left(6\,B\,b^2\,d^2\,e^2-4\,A\,b^2\,d\,e^3-16\,B\,b\,c\,d^3\,e+12\,A\,b\,c\,d^2\,e^2+10\,B\,c^2\,d^4-8\,A\,c^2\,d^3\,e\right)-\frac{2\,B\,c^2\,d^5}{3}+\cdots}{e^6\,(d+e\,x)^{3/2}}$$
$$+\frac{\sqrt{d+e\,x}\,\left(-6\,B\,b^2\,d\,e^2+2\,A\,b^2\,e^3+24\,B\,b\,c\,d^2\,e-12\,A\,b\,c\,d\,e^2-20\,B\,c^2\,d^3+12\,A\,c^2\,d^2\,e\right)}{e^6}$$
$$+\frac{(d+e\,x)^{3/2}\,\left(2\,B\,b^2\,e^2-16\,B\,b\,c\,d\,e+4\,A\,b\,c\,e^2+20\,B\,c^2\,d^2-8\,A\,c^2\,d\,e\right)}{3\,e^6}$$
$$+\frac{2\,B\,c^2\,(d+e\,x)^{7/2}}{7\,e^6}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^(5/2),x)
```

output
```
((d + e*x)^(5/2)*(2*A*c^2*e - 10*B*c^2*d + 4*B*b*c*e))/(5*e^6) - ((d + e*x
)*(10*B*c^2*d^4 - 4*A*b^2*d*e^3 - 8*A*c^2*d^3*e + 6*B*b^2*d^2*e^2 - 16*B*b
*c*d^3*e + 12*A*b*c*d^2*e^2) - (2*B*c^2*d^5)/3 + (2*A*c^2*d^4*e)/3 + (2*A*
b^2*d^2*e^3)/3 - (2*B*b^2*d^3*e^2)/3 + (4*B*b*c*d^4*e)/3 - (4*A*b*c*d^3*e^
2)/3)/(e^6*(d + e*x)^(3/2)) + ((d + e*x)^(1/2)*(2*A*b^2*e^3 - 20*B*c^2*d^3
 + 12*A*c^2*d^2*e - 6*B*b^2*d*e^2 - 12*A*b*c*d*e^2 + 24*B*b*c*d^2*e))/e^6
+ ((d + e*x)^(3/2)*(2*B*b^2*e^2 + 20*B*c^2*d^2 + 4*A*b*c*e^2 - 8*A*c^2*d*e
 - 16*B*b*c*d*e))/(3*e^6) + (2*B*c^2*(d + e*x)^(7/2))/(7*e^6)
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 349, normalized size of antiderivative = 1.33

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{5/2}}\,dx = \frac{-32abc\,d^2e^3x-8abcd\,e^4x^2+2a\,b^2e^5x^2+\frac{2}{5}a\,c^2e^5x^4-16b^3d^2e^3x-4b^3d\,e^4x^2\cdots}{\cdots}$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(5/2),x)
```

output
```
(2*(280*a*b**2*d**2*e**3 + 420*a*b**2*d*e**4*x + 105*a*b**2*e**5*x**2 - 11
20*a*b*c*d**3*e**2 - 1680*a*b*c*d**2*e**3*x - 420*a*b*c*d*e**4*x**2 + 70*a
*b*c*e**5*x**3 + 896*a*c**2*d**4*e + 1344*a*c**2*d**3*e**2*x + 336*a*c**2*
d**2*e**3*x**2 - 56*a*c**2*d*e**4*x**3 + 21*a*c**2*e**5*x**4 - 560*b**3*d*
*3*e**2 - 840*b**3*d**2*e**3*x - 210*b**3*d*e**4*x**2 + 35*b**3*e**5*x**3
+ 1792*b**2*c*d**4*e + 2688*b**2*c*d**3*e**2*x + 672*b**2*c*d**2*e**3*x**2
 - 112*b**2*c*d*e**4*x**3 + 42*b**2*c*e**5*x**4 - 1280*b*c**2*d**5 - 1920*
b*c**2*d**4*e*x - 480*b*c**2*d**3*e**2*x**2 + 80*b*c**2*d**2*e**3*x**3 - 3
0*b*c**2*d*e**4*x**4 + 15*b*c**2*e**5*x**5))/(105*sqrt(d + e*x)*e**6*(d +
e*x))
```

3.67 $\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^{7/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 263

$$\begin{aligned}\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{7/2}}\,dx &= \frac{2d^2(Bd-Ae)(cd-be)^2}{5e^6(d+ex)^{5/2}} \\ &- \frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{3e^6(d+ex)^{3/2}} \\ &- \frac{2(Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2))}{e^6\sqrt{d+ex}} \\ &- \frac{2(2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2))\sqrt{d+ex}}{e^6} \\ &- \frac{2c(5Bcd-2bBe-Ace)(d+ex)^{3/2}}{3e^6}+\frac{2Bc^2(d+ex)^{5/2}}{5e^6}\end{aligned}$$

output
```
2/5*d^2*(-A*e+B*d)*(-b*e+c*d)^2/e^6/(e*x+d)^(5/2)-2/3*d*(-b*e+c*d)*(B*d*(-
3*b*e+5*c*d)-2*A*e*(-b*e+2*c*d))/e^6/(e*x+d)^(3/2)-2*(A*e*(b^2*e^2-6*b*c*d
*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))/e^6/(e*x+d)^(1/2)-2*(
2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))*(e*x+d)^(1/2)/e^6-2
/3*c*(-A*c*e-2*B*b*e+5*B*c*d)*(e*x+d)^(3/2)/e^6+2/5*B*c^2*(e*x+d)^(5/2)/e^
6
```

Mathematica [A] (verified)

Time = 0.35 (sec) , antiderivative size = 272, normalized size of antiderivative = 1.03

$$\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^{7/2}}\,dx = \frac{2(Ae(-b^2e^2(8d^2+20dex+15e^2x^2)+6bce(16d^3+40d^2ex+30de^2x^2+5e^3x^3)}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^(7/2),x]
```

output
```
(2*(A*e*(-(b^2*e^2*(8*d^2 + 20*d*e*x + 15*e^2*x^2)) + 6*b*c*e*(16*d^3 + 40
*d^2*e*x + 30*d*e^2*x^2 + 5*e^3*x^3) - c^2*(128*d^4 + 320*d^3*e*x + 240*d^
2*e^2*x^2 + 40*d*e^3*x^3 - 5*e^4*x^4)) + B*(3*b^2*e^2*(16*d^3 + 40*d^2*e*x
 + 30*d*e^2*x^2 + 5*e^3*x^3) - 2*b*c*e*(128*d^4 + 320*d^3*e*x + 240*d^2*e^
2*x^2 + 40*d*e^3*x^3 - 5*e^4*x^4) + c^2*(256*d^5 + 640*d^4*e*x + 480*d^3*e
^2*x^2 + 80*d^2*e^3*x^3 - 10*d*e^4*x^4 + 3*e^5*x^5))))/(15*e^6*(d + e*x)^(
5/2))
```

Rubi [A] (verified)

Time = 0.69 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {1195, 2009}

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

$$\int \frac{(A+Bx)(bx+cx^2)^2}{(d+ex)^{7/2}}\,dx$$

$$\Big\downarrow \text{1195}$$

$$\int \left(\frac{B(b^2e^2-8bcde+10c^2d^2)-2Ace(2cd-be)}{e^5\sqrt{d+ex}}+\frac{Ae(b^2e^2-6bcde+6c^2d^2)-Bd(3b^2e^2-12bcde+10c^2d^2)}{e^5(d+ex)^{3/2}}\right.$$

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

$$-\frac{2\sqrt{d+ex}\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{e^6}-\frac{2\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{e^6\sqrt{d+ex}}+\frac{2d^2(Bd-Ae)(cd-be)^2}{5e^6(d+ex)^{5/2}}-\frac{2c(d+ex)^{3/2}(-Ace-2bBe+5Bcd)}{3e^6}-\frac{2d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))}{3e^6(d+ex)^{3/2}}+\frac{2Bc^2(d+ex)^{5/2}}{5e^6}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^2)/(d + e*x)^(7/2),x]
```

output
```
(2*d^2*(B*d - A*e)*(c*d - b*e)^2)/(5*e^6*(d + e*x)^(5/2)) - (2*d*(c*d - b*
e)*(B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e)))/(3*e^6*(d + e*x)^(3/2)) -
(2*(A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 - 12*b*c*d*e +
 3*b^2*e^2)))/(e^6*Sqrt[d + e*x]) - (2*(2*A*c*e*(2*c*d - b*e) - B*(10*c^2*
d^2 - 8*b*c*d*e + b^2*e^2))*Sqrt[d + e*x])/e^6 - (2*c*(5*B*c*d - 2*b*B*e -
 A*c*e)*(d + e*x)^(3/2))/(3*e^6) + (2*B*c^2*(d + e*x)^(5/2))/(5*e^6)
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

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

Maple [A] (verified)

Time = 1.24 (sec) , antiderivative size = 257, normalized size of antiderivative = 0.98

method	result
pseudoelliptic	$\frac{((6e^5x^5-20d\,e^4x^4+160d^2e^3x^3+960d^3e^2x^2+1280d^4ex+512d^5)B-256e(-\frac{5}{128}e^4x^4+\frac{5}{16}d\,e^3x^3+\frac{15}{8}d^2e^2x^2+\frac{5}{2}d^3ex+d}{}$
derivativedivides	$\frac{\frac{2B\,c^2(ex+d)^{\frac{5}{2}}}{5}+\frac{2A\,c^2e(ex+d)^{\frac{3}{2}}}{3}+\frac{4Bbce(ex+d)^{\frac{3}{2}}}{3}-\frac{10B\,c^2d(ex+d)^{\frac{3}{2}}}{3}+4Abc\,e^2\sqrt{ex+d}-8A\,c^2de\sqrt{ex+d}+2B\,b^2e^2\sqrt{ex+d}-}{}$
default	$\frac{\frac{2B\,c^2(ex+d)^{\frac{5}{2}}}{5}+\frac{2A\,c^2e(ex+d)^{\frac{3}{2}}}{3}+\frac{4Bbce(ex+d)^{\frac{3}{2}}}{3}-\frac{10B\,c^2d(ex+d)^{\frac{3}{2}}}{3}+4Abc\,e^2\sqrt{ex+d}-8A\,c^2de\sqrt{ex+d}+2B\,b^2e^2\sqrt{ex+d}-}{}$
gosper	$-\frac{2(-3B\,x^5c^2e^5-5A\,x^4c^2e^5-10B\,x^4bc\,e^5+10B\,x^4c^2d\,e^4-30A\,x^3bc\,e^5+40A\,x^3c^2d\,e^4-15B\,x^3b^2e^5+80B\,x^3bcd\,e^4-8}{}$
trager	$-\frac{2(-3B\,x^5c^2e^5-5A\,x^4c^2e^5-10B\,x^4bc\,e^5+10B\,x^4c^2d\,e^4-30A\,x^3bc\,e^5+40A\,x^3c^2d\,e^4-15B\,x^3b^2e^5+80B\,x^3bcd\,e^4-8}{}$
risch	$\frac{2(3B\,c^2x^2e^2+5A\,c^2e^2x+10Bbc\,e^2x-19B\,c^2dex+30Abc\,e^2-55A\,c^2de+15B\,e^2b^2-110Bbcde+128B\,c^2d^2)\sqrt{ex+d}}{15e^6}-$
orering	$-\frac{2(-3B\,x^5c^2e^5-5A\,x^4c^2e^5-10B\,x^4bc\,e^5+10B\,x^4c^2d\,e^4-30A\,x^3bc\,e^5+40A\,x^3c^2d\,e^4-15B\,x^3b^2e^5+80B\,x^3bcd\,e^4-8}{}$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(7/2),x,method=_RETURNVERBOSE)
```

output
```
1/15*(((6*e^5*x^5-20*d*e^4*x^4+160*d^2*e^3*x^3+960*d^3*e^2*x^2+1280*d^4*e*
x+512*d^5)*B-256*e*(-5/128*e^4*x^4+5/16*d*e^3*x^3+15/8*d^2*e^2*x^2+5/2*d^3
*e*x+d^4)*A)*c^2+192*((5/48*e^4*x^4-5/6*d*e^3*x^3-5*d^2*e^2*x^2-20/3*d^3*e
*x-8/3*d^4)*B+A*e*(5/16*e^3*x^3+15/8*d*e^2*x^2+5/2*d^2*e*x+d^3))*e*b*c-16*
e^2*((-15/8*e^3*x^3-45/4*d*e^2*x^2-15*d^2*e*x-6*d^3)*B+A*e*(15/8*e^2*x^2+5
/2*d*e*x+d^2))*b^2)/(e*x+d)^(5/2)/e^6
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 322, normalized size of antiderivative = 1.22

$$\int \frac{(A+Bx)\,(bx+cx^2)^2}{(d+ex)^{7/2}}\,dx = \frac{2\,(3\,Bc^2e^5x^5+256\,Bc^2d^5-8\,Ab^2d^2e^3-128\,(2\,Bbc+Ac^2)d^4e+48\,(Bb^2+}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(7/2),x, algorithm="fricas")
```

output
```
2/15*(3*B*c^2*e^5*x^5 + 256*B*c^2*d^5 - 8*A*b^2*d^2*e^3 - 128*(2*B*b*c + A
*c^2)*d^4*e + 48*(B*b^2 + 2*A*b*c)*d^3*e^2 - 5*(2*B*c^2*d*e^4 - (2*B*b*c +
 A*c^2)*e^5)*x^4 + 5*(16*B*c^2*d^2*e^3 - 8*(2*B*b*c + A*c^2)*d*e^4 + 3*(B*
b^2 + 2*A*b*c)*e^5)*x^3 + 15*(32*B*c^2*d^3*e^2 - A*b^2*e^5 - 16*(2*B*b*c +
 A*c^2)*d^2*e^3 + 6*(B*b^2 + 2*A*b*c)*d*e^4)*x^2 + 20*(32*B*c^2*d^4*e - A*
b^2*d*e^4 - 16*(2*B*b*c + A*c^2)*d^3*e^2 + 6*(B*b^2 + 2*A*b*c)*d^2*e^3)*x)
*sqrt(e*x + d)/(e^9*x^3 + 3*d*e^8*x^2 + 3*d^2*e^7*x + d^3*e^6)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1833 vs. $2(265) = 530$.

Time = 0.75 (sec) , antiderivative size = 1833, normalized size of antiderivative = 6.97

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{7/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**2/(e*x+d)**(7/2),x)
```

output
```
Piecewise((-16*A*b**2*d**2*e**3/(15*d**2*e**6*sqrt(d + e*x) + 30*d*e**7*x*
sqrt(d + e*x) + 15*e**8*x**2*sqrt(d + e*x)) - 40*A*b**2*d*e**4*x/(15*d**2*
e**6*sqrt(d + e*x) + 30*d*e**7*x*sqrt(d + e*x) + 15*e**8*x**2*sqrt(d + e*x
)) - 30*A*b**2*e**5*x**2/(15*d**2*e**6*sqrt(d + e*x) + 30*d*e**7*x*sqrt(d
+ e*x) + 15*e**8*x**2*sqrt(d + e*x)) + 192*A*b*c*d**3*e**2/(15*d**2*e**6*s
qrt(d + e*x) + 30*d*e**7*x*sqrt(d + e*x) + 15*e**8*x**2*sqrt(d + e*x)) + 4
80*A*b*c*d**2*e**3*x/(15*d**2*e**6*sqrt(d + e*x) + 30*d*e**7*x*sqrt(d + e*
x) + 15*e**8*x**2*sqrt(d + e*x)) + 360*A*b*c*d*e**4*x**2/(15*d**2*e**6*sqr
t(d + e*x) + 30*d*e**7*x*sqrt(d + e*x) + 15*e**8*x**2*sqrt(d + e*x)) + 60*
A*b*c*e**5*x**3/(15*d**2*e**6*sqrt(d + e*x) + 30*d*e**7*x*sqrt(d + e*x) +
15*e**8*x**2*sqrt(d + e*x)) - 256*A*c**2*d**4*e/(15*d**2*e**6*sqrt(d + e*x
) + 30*d*e**7*x*sqrt(d + e*x) + 15*e**8*x**2*sqrt(d + e*x)) - 640*A*c**2*d
**3*e**2*x/(15*d**2*e**6*sqrt(d + e*x) + 30*d*e**7*x*sqrt(d + e*x) + 15*e*
*8*x**2*sqrt(d + e*x)) - 480*A*c**2*d**2*e**3*x**2/(15*d**2*e**6*sqrt(d +
e*x) + 30*d*e**7*x*sqrt(d + e*x) + 15*e**8*x**2*sqrt(d + e*x)) - 80*A*c**2
*d*e**4*x**3/(15*d**2*e**6*sqrt(d + e*x) + 30*d*e**7*x*sqrt(d + e*x) + 15*
e**8*x**2*sqrt(d + e*x)) + 10*A*c**2*e**5*x**4/(15*d**2*e**6*sqrt(d + e*x)
 + 30*d*e**7*x*sqrt(d + e*x) + 15*e**8*x**2*sqrt(d + e*x)) + 96*B*b**2*d**
3*e**2/(15*d**2*e**6*sqrt(d + e*x) + 30*d*e**7*x*sqrt(d + e*x) + 15*e**8*x
**2*sqrt(d + e*x)) + 240*B*b**2*d**2*e**3*x/(15*d**2*e**6*sqrt(d + e*x)...
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 298, normalized size of antiderivative = 1.13

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{7/2}}\,dx = \frac{2\left(\frac{3\,(ex+d)^{\frac{5}{2}}Bc^2-5\,(5\,Bc^2d-(2\,Bbc+Ac^2)e)(ex+d)^{\frac{3}{2}}+15\,(10\,Bc^2d^2-4\,(2\,Bbc+Ac^2)de+(Bb^2+2\,A}{e^5}\right.}{}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(7/2),x, algorithm="maxima")
```

output
```
2/15*((3*(e*x + d)^(5/2)*B*c^2 - 5*(5*B*c^2*d - (2*B*b*c + A*c^2)*e)*(e*x
+ d)^(3/2) + 15*(10*B*c^2*d^2 - 4*(2*B*b*c + A*c^2)*d*e + (B*b^2 + 2*A*b*c
)*e^2)*sqrt(e*x + d))/e^5 + (3*B*c^2*d^5 - 3*A*b^2*d^2*e^3 - 3*(2*B*b*c +
A*c^2)*d^4*e + 3*(B*b^2 + 2*A*b*c)*d^3*e^2 + 15*(10*B*c^2*d^3 - A*b^2*e^3
- 6*(2*B*b*c + A*c^2)*d^2*e + 3*(B*b^2 + 2*A*b*c)*d*e^2)*(e*x + d)^2 - 5*(
5*B*c^2*d^4 - 2*A*b^2*d*e^3 - 4*(2*B*b*c + A*c^2)*d^3*e + 3*(B*b^2 + 2*A*b
*c)*d^2*e^2)*(e*x + d))/((e*x + d)^(5/2)*e^5))/e
```

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 419, normalized size of antiderivative = 1.59

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{7/2}}\,dx = \frac{2\left(150\,(ex+d)^2Bc^2d^3-25\,(ex+d)Bc^2d^4+3\,Bc^2d^5-180\,(ex+d)^2Bbcd^2\right.}{}$$
$$+\frac{2\left(3\,(ex+d)^{\frac{5}{2}}Bc^2e^{24}-25\,(ex+d)^{\frac{3}{2}}Bc^2de^{24}+150\,\sqrt{ex+d}Bc^2d^2e^{24}+10\,(ex+d)^{\frac{3}{2}}Bbce^{25}+5\,(ex+d)\right.}{15\,e^{30}}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(7/2),x, algorithm="giac")
```

output
```
2/15*(150*(e*x + d)^2*B*c^2*d^3 - 25*(e*x + d)*B*c^2*d^4 + 3*B*c^2*d^5 - 1
80*(e*x + d)^2*B*b*c*d^2*e - 90*(e*x + d)^2*A*c^2*d^2*e + 40*(e*x + d)*B*b
*c*d^3*e + 20*(e*x + d)*A*c^2*d^3*e - 6*B*b*c*d^4*e - 3*A*c^2*d^4*e + 45*(
e*x + d)^2*B*b^2*d*e^2 + 90*(e*x + d)^2*A*b*c*d*e^2 - 15*(e*x + d)*B*b^2*d
^2*e^2 - 30*(e*x + d)*A*b*c*d^2*e^2 + 3*B*b^2*d^3*e^2 + 6*A*b*c*d^3*e^2 -
15*(e*x + d)^2*A*b^2*e^3 + 10*(e*x + d)*A*b^2*d*e^3 - 3*A*b^2*d^2*e^3)/((e
*x + d)^(5/2)*e^6) + 2/15*(3*(e*x + d)^(5/2)*B*c^2*e^24 - 25*(e*x + d)^(3/
2)*B*c^2*d*e^24 + 150*sqrt(e*x + d)*B*c^2*d^2*e^24 + 10*(e*x + d)^(3/2)*B*
b*c*e^25 + 5*(e*x + d)^(3/2)*A*c^2*e^25 - 120*sqrt(e*x + d)*B*b*c*d*e^25 -
 60*sqrt(e*x + d)*A*c^2*d*e^25 + 15*sqrt(e*x + d)*B*b^2*e^26 + 30*sqrt(e*x
 + d)*A*b*c*e^26)/e^30
```

Mupad [B] (verification not implemented)

Time = 10.81 (sec) , antiderivative size = 312, normalized size of antiderivative = 1.19

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{7/2}}\,dx = \frac{(d+e\,x)^{3/2}\,\left(2\,A\,c^2\,e-10\,B\,c^2\,d+4\,B\,b\,c\,e\right)}{3\,e^6}$$
$$+\frac{\sqrt{d+e\,x}\,\left(2\,B\,b^2\,e^2-16\,B\,b\,c\,d\,e+4\,A\,b\,c\,e^2+20\,B\,c^2\,d^2-8\,A\,c^2\,d\,e\right)}{e^6}$$
$$-\frac{(d+e\,x)\,\left(2\,B\,b^2\,d^2\,e^2-\frac{4\,A\,b^2\,d\,e^3}{3}-\frac{16\,B\,b\,c\,d^3\,e}{3}+4\,A\,b\,c\,d^2\,e^2+\frac{10\,B\,c^2\,d^4}{3}-\frac{8\,A\,c^2\,d^3\,e}{3}\right)+(d+e\,x)^2\,\left(-6\,B\,b^2\right.}{}$$
$$+\frac{2\,B\,c^2\,(d+e\,x)^{5/2}}{5\,e^6}$$

input
```
int(((b*x + c*x^2)^2*(A + B*x))/(d + e*x)^(7/2),x)
```

output
```
((d + e*x)^(3/2)*(2*A*c^2*e - 10*B*c^2*d + 4*B*b*c*e))/(3*e^6) + ((d + e*x
)^(1/2)*(2*B*b^2*e^2 + 20*B*c^2*d^2 + 4*A*b*c*e^2 - 8*A*c^2*d*e - 16*B*b*c
*d*e))/e^6 - ((d + e*x)*((10*B*c^2*d^4)/3 - (4*A*b^2*d*e^3)/3 - (8*A*c^2*d
^3*e)/3 + 2*B*b^2*d^2*e^2 - (16*B*b*c*d^3*e)/3 + 4*A*b*c*d^2*e^2) + (d + e
*x)^2*(2*A*b^2*e^3 - 20*B*c^2*d^3 + 12*A*c^2*d^2*e - 6*B*b^2*d*e^2 - 12*A*
b*c*d*e^2 + 24*B*b*c*d^2*e) - (2*B*c^2*d^5)/5 + (2*A*c^2*d^4*e)/5 + (2*A*b
^2*d^2*e^3)/5 - (2*B*b^2*d^3*e^2)/5 + (4*B*b*c*d^4*e)/5 - (4*A*b*c*d^3*e^2
)/5)/(e^6*(d + e*x)^(5/2)) + (2*B*c^2*(d + e*x)^(5/2))/(5*e^6)
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 360, normalized size of antiderivative = 1.37

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^2}{(d+ex)^{7/2}}\,dx = \frac{32abc\,d^2e^3x+24abcd\,e^4x^2-2a\,b^2e^5x^2+\frac{2}{3}a\,c^2e^5x^4+16b^3d^2e^3x+12b^3d\,e^4x$$

input
```
int((B*x+A)*(c*x^2+b*x)^2/(e*x+d)^(7/2),x)
```

output
```
(2*( - 8*a*b**2*d**2*e**3 - 20*a*b**2*d*e**4*x - 15*a*b**2*e**5*x**2 + 96*
a*b*c*d**3*e**2 + 240*a*b*c*d**2*e**3*x + 180*a*b*c*d*e**4*x**2 + 30*a*b*c
*e**5*x**3 - 128*a*c**2*d**4*e - 320*a*c**2*d**3*e**2*x - 240*a*c**2*d**2*
e**3*x**2 - 40*a*c**2*d*e**4*x**3 + 5*a*c**2*e**5*x**4 + 48*b**3*d**3*e**2
 + 120*b**3*d**2*e**3*x + 90*b**3*d*e**4*x**2 + 15*b**3*e**5*x**3 - 256*b*
*2*c*d**4*e - 640*b**2*c*d**3*e**2*x - 480*b**2*c*d**2*e**3*x**2 - 80*b**2
*c*d*e**4*x**3 + 10*b**2*c*e**5*x**4 + 256*b*c**2*d**5 + 640*b*c**2*d**4*e
*x + 480*b*c**2*d**3*e**2*x**2 + 80*b*c**2*d**2*e**3*x**3 - 10*b*c**2*d*e*
*4*x**4 + 3*b*c**2*e**5*x**5))/(15*sqrt(d + e*x)*e**6*(d**2 + 2*d*e*x + e*
*2*x**2))
```

3.68 $\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2} \, dx$

Optimal result

Integrand size = 26, antiderivative size = 228

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2} \, dx = \frac{2(B(cd-be)^3+Ace(3c^2d^2-3bcde+b^2e^2))\sqrt{d+ex}}{c^4} + \frac{2(B(cd-be)^2+Ace(2cd-be))(d+ex)^{3/2}}{3c^3} + \frac{2(Bcd-bBe+Ace)(d+ex)^{5/2}}{5c^2} + \frac{2B(d+ex)^{7/2}}{7c} - \frac{2Ad^{7/2}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b} - \frac{2(bB-Ac)(cd-be)^{7/2}\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{bc^{9/2}}$$

output
```
2*(B*(-b*e+c*d)^3+A*c*e*(b^2*e^2-3*b*c*d*e+3*c^2*d^2))*(e*x+d)^(1/2)/c^4+2
/3*(B*(-b*e+c*d)^2+A*c*e*(-b*e+2*c*d))*(e*x+d)^(3/2)/c^3+2/5*(A*c*e-B*b*e+
B*c*d)*(e*x+d)^(5/2)/c^2+2/7*B*(e*x+d)^(7/2)/c-2*A*d^(7/2)*arctanh((e*x+d)
^(1/2)/d^(1/2))/b-2*(-A*c+B*b)*(-b*e+c*d)^(7/2)*arctanh(c^(1/2)*(e*x+d)^(1
/2)/(-b*e+c*d)^(1/2))/b/c^(9/2)
```

Mathematica [A] (verified)

Time = 0.56 (sec) , antiderivative size = 239, normalized size of antiderivative = 1.05

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2}\,dx = \frac{2\sqrt{d+ex}(7Ace(15b^2e^2-5bce(10d+ex)+c^2(58d^2+16dex+3e^2x^2))+B(}{}$$
$$-\frac{2(-bB+Ac)(-cd+be)^{7/2}\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{bc^{9/2}}-\frac{2Ad^{7/2}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(7/2))/(b*x + c*x^2),x]
```

output
```
(2*Sqrt[d + e*x]*(7*A*c*e*(15*b^2*e^2 - 5*b*c*e*(10*d + e*x) + c^2*(58*d^2
 + 16*d*e*x + 3*e^2*x^2)) + B*(-105*b^3*e^3 + 35*b^2*c*e^2*(10*d + e*x) -
7*b*c^2*e*(58*d^2 + 16*d*e*x + 3*e^2*x^2) + c^3*(176*d^3 + 122*d^2*e*x + 6
6*d*e^2*x^2 + 15*e^3*x^3))))/(105*c^4) - (2*(-(b*B) + A*c)*(-(c*d) + b*e)^
(7/2)*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(b*c^(9/2)) - (2
*A*d^(7/2)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/b
```

Rubi [A] (verified)

Time = 1.24 (sec) , antiderivative size = 252, normalized size of antiderivative = 1.11, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {1196, 1196, 1196, 1196, 1197, 25, 1480, 221}

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

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2}\,dx$$

$$\Big\downarrow \; 1196$$

$$\frac{\int \frac{(d+ex)^{5/2}(Acd+(Bcd-bBe+Ace)x)}{cx^2+bx}dx}{c}+\frac{2B(d+ex)^{7/2}}{7c}$$

$$\Big\downarrow \; 1196$$

$$\frac{\frac{\int \frac{(d+ex)^{3/2}\left(Ac^2d^2+\left(B(cd-be)^2+Ace(2cd-be)\right)x\right)}{cx^2+bx}dx}{c}+\frac{2(d+ex)^{5/2}(Ace-bBe+Bcd)}{5c}}{c}+\frac{2B(d+ex)^{7/2}}{7c}$$

$\Big\downarrow$ 1196

$$\frac{\frac{\frac{\int \frac{\sqrt{d+ex}\left(Ac^3d^3+\left(B(cd-be)^3+Ace\left(3c^2d^2-3bced+b^2e^2\right)\right)x\right)}{cx^2+bx}dx}{c}+\frac{2(d+ex)^{3/2}\left(Ace(2cd-be)+B(cd-be)^2\right)}{3c}}{c}+\frac{2(d+ex)^{5/2}(Ace-bBe+Bcd)}{5c}}{c}+\frac{2B(d+ex)^{7/2}}{7c}$$

$\Big\downarrow$ 1196

$$\frac{\frac{\frac{\frac{\int \frac{Ac^4d^4+\left(B(cd-be)^4+Ace\left(4c^3d^3-6bc^2ed^2+4b^2ce^2d-b^3e^3\right)\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{c}+\frac{2\sqrt{d+ex}\left(Ace\left(b^2e^2-3bcde+3c^2d^2\right)+B(cd-be)^3\right)}{c}}{c}+\frac{2(d+ex)^{3/2}\left(Ace(2cd-be)+B(cd-be\cdots\right.}{3c}}{c}}{c}$$

$$\frac{2B(d+ex)^{7/2}}{7c}$$

$\Big\downarrow$ 1197

$$\frac{\frac{\frac{\frac{2\int -\frac{d\left(B(cd-be)^4+Ace\left(3c^3d^3-6bc^2ed^2+4b^2ce^2d-b^3e^3\right)\right)-\left(B(cd-be)^4+Ace\left(4c^3d^3-6bc^2ed^2+4b^2ce^2d-b^3e^3\right)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{c}+\frac{2\sqrt{d+ex}\left(Ace\left(b^2e^2-3bcd\cdots\right.\right.}{c}}{c}}{c}}{c}$$

$$\frac{2B(d+ex)^{7/2}}{7c}$$

$\Big\downarrow$ 25

$$\frac{\frac{\frac{\frac{2\sqrt{d+ex}\left(Ace\left(b^2e^2-3bcde+3c^2d^2\right)+B(cd-be)^3\right)}{c}-\frac{2\int \frac{d\left(B(cd-be)^4+Ace\left(3c^3d^3-6bc^2ed^2+4b^2ce^2d-b^3e^3\right)\right)-\left(B(cd-be)^4+Ace\left(4c^3d^3-6bc^2ed^2+4b^2ce^2d-b\cdots\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{c}}{c}}{c}}{c}$$

$$\frac{2B(d+ex)^{7/2}}{7c}$$

$\Big\downarrow$ 1480

$$\frac{\frac{\frac{\frac{2\left(\frac{(bB-Ac)(cd-be)^4\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{b}+\frac{Ac^5d^4\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{b}\right)}{c}+\frac{2\sqrt{d+ex}\left(Ace\left(b^2e^2-3bcde+3c^2d^2\right)+B(cd-be)^3\right)}{c}}{c}+\frac{2(d+ex)^{3/2}\left(Ace(2\cdots\right.}{\cdots}}{c}}{c}$$

$$\frac{2B(d+ex)^{7/2}}{7c}$$

$\Big\downarrow$ 221

$$\frac{\frac{\frac{2\left(-\frac{(bB-Ac)(cd-be)^{7/2}\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}}-\frac{Ac^4d^{7/2}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b}\right)}{c}+\frac{2\sqrt{d+ex}\left(Ace\left(b^2e^2-3bcde+3c^2d^2\right)+B(cd-be)^3\right)}{c}}{c}+\frac{2(d+ex)^{3/2}\left(Ace(\cdots\right.}{\cdots}}{c}$$

$$\frac{2B(d+ex)^{7/2}}{7c}$$

input
```
Int[((A + B*x)*(d + e*x)^(7/2))/(b*x + c*x^2),x]
```

output
```
(2*B*(d + e*x)^(7/2))/(7*c) + ((2*(B*c*d - b*B*e + A*c*e)*(d + e*x)^(5/2))
/(5*c) + ((2*(B*(c*d - b*e)^2 + A*c*e*(2*c*d - b*e))*(d + e*x)^(3/2))/(3*c
) + ((2*(B*(c*d - b*e)^3 + A*c*e*(3*c^2*d^2 - 3*b*c*d*e + b^2*e^2))*Sqrt[d
 + e*x])/c + (2*(-((A*c^4*d^(7/2)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/b) - ((b
*B - A*c)*(c*d - b*e)^(7/2)*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e
]])/(b*Sqrt[c])))/c)/c)/c)/c
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1196
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[g*((d + e*x)^m/(c*m)), x] + Simp[1/c   Int
[(d + e*x)^(m - 1)*(Simp[c*d*f - a*e*g + (g*c*d - b*e*g + c*e*f)*x, x]/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] &
& GtQ[m, 0]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.49 (sec) , antiderivative size = 224, normalized size of antiderivative = 0.98

method	result
pseudoelliptic	$\frac{-2(be-cd)^4(Ac-Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)+2\left(-A\,d^{\frac{7}{2}}\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)c^4+b\sqrt{ex+d}\left(-B\,e^3b^3+c\,e^2\left(e\left(\frac{Bx}{3}+A\right)+\frac{1}{}\right.\right.\right.}{}$
derivativedivides	$\frac{\frac{2B(ex+d)^{\frac{7}{2}}c^3}{7}+\frac{2A\,c^3e(ex+d)^{\frac{5}{2}}}{5}-\frac{2Bb\,c^2e(ex+d)^{\frac{5}{2}}}{5}+\frac{2B\,c^3d(ex+d)^{\frac{5}{2}}}{5}-\frac{2Ab\,c^2e^2(ex+d)^{\frac{3}{2}}}{3}+\frac{4A\,c^3de(ex+d)^{\frac{3}{2}}}{3}+\frac{2B\,b^2c\,e^2(ex+}{3}}{}$
default	$\frac{\frac{2B(ex+d)^{\frac{7}{2}}c^3}{7}+\frac{2A\,c^3e(ex+d)^{\frac{5}{2}}}{5}-\frac{2Bb\,c^2e(ex+d)^{\frac{5}{2}}}{5}+\frac{2B\,c^3d(ex+d)^{\frac{5}{2}}}{5}-\frac{2Ab\,c^2e^2(ex+d)^{\frac{3}{2}}}{3}+\frac{4A\,c^3de(ex+d)^{\frac{3}{2}}}{3}+\frac{2B\,b^2c\,e^2(ex+}{3}}{}$

input
```
int((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
2*(-(b*e-c*d)^4*(A*c-B*b)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))+(-A*
d^(7/2)*arctanh((e*x+d)^(1/2)/d^(1/2))*c^4+b*(e*x+d)^(1/2)*(-B*e^3*b^3+c*e
^2*(e*(1/3*B*x+A)+10/3*B*d)*b^2-10/3*c^2*(1/10*(3/5*B*x+A)*e^2*x+d*(8/25*B
*x+A)*e+29/25*B*d^2)*e*b+58/15*c^3*(3/58*x^2*(5/7*B*x+A)*e^3+8/29*(33/56*B
*x+A)*d*x*e^2+d^2*(61/203*B*x+A)*e+88/203*B*d^3)))*(c*(b*e-c*d))^(1/2))/(c
*(b*e-c*d))^(1/2)/b/c^4
```

Fricas [A] (verification not implemented)

Time = 8.69 (sec) , antiderivative size = 1468, normalized size of antiderivative = 6.44

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
[1/105*(105*A*c^4*d^(7/2)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + 1
05*((B*b*c^3 - A*c^4)*d^3 - 3*(B*b^2*c^2 - A*b*c^3)*d^2*e + 3*(B*b^3*c - A
*b^2*c^2)*d*e^2 - (B*b^4 - A*b^3*c)*e^3)*sqrt((c*d - b*e)/c)*log((c*e*x +
2*c*d - b*e - 2*sqrt(e*x + d)*c*sqrt((c*d - b*e)/c))/(c*x + b)) + 2*(15*B*
b*c^3*e^3*x^3 + 176*B*b*c^3*d^3 - 406*(B*b^2*c^2 - A*b*c^3)*d^2*e + 350*(B
*b^3*c - A*b^2*c^2)*d*e^2 - 105*(B*b^4 - A*b^3*c)*e^3 + 3*(22*B*b*c^3*d*e^
2 - 7*(B*b^2*c^2 - A*b*c^3)*e^3)*x^2 + (122*B*b*c^3*d^2*e - 112*(B*b^2*c^2
 - A*b*c^3)*d*e^2 + 35*(B*b^3*c - A*b^2*c^2)*e^3)*x)*sqrt(e*x + d))/(b*c^4
), 1/105*(105*A*c^4*d^(7/2)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) -
 210*((B*b*c^3 - A*c^4)*d^3 - 3*(B*b^2*c^2 - A*b*c^3)*d^2*e + 3*(B*b^3*c -
 A*b^2*c^2)*d*e^2 - (B*b^4 - A*b^3*c)*e^3)*sqrt(-(c*d - b*e)/c)*arctan(-sq
rt(e*x + d)*c*sqrt(-(c*d - b*e)/c)/(c*d - b*e)) + 2*(15*B*b*c^3*e^3*x^3 +
176*B*b*c^3*d^3 - 406*(B*b^2*c^2 - A*b*c^3)*d^2*e + 350*(B*b^3*c - A*b^2*c
^2)*d*e^2 - 105*(B*b^4 - A*b^3*c)*e^3 + 3*(22*B*b*c^3*d*e^2 - 7*(B*b^2*c^2
 - A*b*c^3)*e^3)*x^2 + (122*B*b*c^3*d^2*e - 112*(B*b^2*c^2 - A*b*c^3)*d*e^
2 + 35*(B*b^3*c - A*b^2*c^2)*e^3)*x)*sqrt(e*x + d))/(b*c^4), 1/105*(210*A*
c^4*sqrt(-d)*d^3*arctan(sqrt(-d)/sqrt(e*x + d)) + 105*((B*b*c^3 - A*c^4)*d
^3 - 3*(B*b^2*c^2 - A*b*c^3)*d^2*e + 3*(B*b^3*c - A*b^2*c^2)*d*e^2 - (B*b^
4 - A*b^3*c)*e^3)*sqrt((c*d - b*e)/c)*log((c*e*x + 2*c*d - b*e - 2*sqrt(e*
x + d)*c*sqrt((c*d - b*e)/c))/(c*x + b)) + 2*(15*B*b*c^3*e^3*x^3 + 176*...
```

Sympy [A] (verification not implemented)

Time = 10.69 (sec) , antiderivative size = 403, normalized size of antiderivative = 1.77

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2}\,dx = \begin{cases} \frac{2\left(\frac{Ad^4e\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{b\sqrt{-d}}+\frac{Be(d+ex)^{\frac{7}{2}}}{7c}+\frac{(d+ex)^{\frac{5}{2}}\left(Ace^2-Bbe^2+Bcde\right)}{5c^2}+\frac{(d+ex)^{\frac{3}{2}}\left(-Abce^3+2Ac^2de^2+Bb^2e^3\right.}{3c^3}\right.}{} \\ d^{\frac{7}{2}}\left(\frac{B\log\left(bx+cx^2\right)}{2c}+\left(A-\frac{Bb}{2c}\right)\left(-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=0\\ -\frac{\log\left(b-2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b}-\frac{2c}{}\right.\right. \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(7/2)/(c*x**2+b*x),x)
```

output
```
Piecewise((2*(A*d**4*e*atan(sqrt(d + e*x)/sqrt(-d))/(b*sqrt(-d)) + B*e*(d
+ e*x)**(7/2)/(7*c) + (d + e*x)**(5/2)*(A*c*e**2 - B*b*e**2 + B*c*d*e)/(5*
c**2) + (d + e*x)**(3/2)*(-A*b*c*e**3 + 2*A*c**2*d*e**2 + B*b**2*e**3 - 2*
B*b*c*d*e**2 + B*c**2*d**2*e)/(3*c**3) + sqrt(d + e*x)*(A*b**2*c*e**4 - 3*
A*b*c**2*d*e**3 + 3*A*c**3*d**2*e**2 - B*b**3*e**4 + 3*B*b**2*c*d*e**3 - 3
*B*b*c**2*d**2*e**2 + B*c**3*d**3*e)/c**4 + e*(-A*c + B*b)*(b*e - c*d)**4*
atan(sqrt(d + e*x)/sqrt((b*e - c*d)/c))/(b*c**5*sqrt((b*e - c*d)/c)))/e, N
e(e, 0)), (d**(7/2)*(B*log(b*x + c*x**2)/(2*c) + (A - B*b/(2*c))*(-2*c*Pie
cewise(((b/(2*c) + x)/b, Eq(c, 0)), (-log(b - 2*c*(b/(2*c) + x))/(2*c), Tr
ue))/b - 2*c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0)), (log(b + 2*c*(b/(2*c)
+ x))/(2*c), True))/b)), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x),x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 460 vs. $2(198) = 396$.

Time = 0.27 (sec) , antiderivative size = 460, normalized size of antiderivative = 2.02

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2}\,dx = \frac{2\,Ad^4\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b\sqrt{-d}} + \frac{2\,(Bbc^4d^4 - Ac^5d^4 - 4\,Bb^2c^3d^3e + 4\,Abc^4d^3e + 6\,Bb^3c^2d^2e^2 - 6\,Ab^2c^3d^2e^2 - 4\,Bb^4cde^3 + 4\,Ab^3c^2de^3 + B}{\sqrt{-c^2d+bce}bc^4} + \frac{2\left(15\,(ex+d)^{\frac{7}{2}}Bc^6 + 21\,(ex+d)^{\frac{5}{2}}Bc^6d + 35\,(ex+d)^{\frac{3}{2}}Bc^6d^2 + 105\,\sqrt{ex+d}Bc^6d^3 - 21\,(ex+d)^{\frac{5}{2}}Bbc^5e\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x),x, algorithm="giac")
```

output
```
2*A*d^4*arctan(sqrt(e*x + d)/sqrt(-d))/(b*sqrt(-d)) + 2*(B*b*c^4*d^4 - A*c
^5*d^4 - 4*B*b^2*c^3*d^3*e + 4*A*b*c^4*d^3*e + 6*B*b^3*c^2*d^2*e^2 - 6*A*b
^2*c^3*d^2*e^2 - 4*B*b^4*c*d*e^3 + 4*A*b^3*c^2*d*e^3 + B*b^5*e^4 - A*b^4*c
*e^4)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/(sqrt(-c^2*d + b*c*e)*b
*c^4) + 2/105*(15*(e*x + d)^(7/2)*B*c^6 + 21*(e*x + d)^(5/2)*B*c^6*d + 35*
(e*x + d)^(3/2)*B*c^6*d^2 + 105*sqrt(e*x + d)*B*c^6*d^3 - 21*(e*x + d)^(5/
2)*B*b*c^5*e + 21*(e*x + d)^(5/2)*A*c^6*e - 70*(e*x + d)^(3/2)*B*b*c^5*d*e
 + 70*(e*x + d)^(3/2)*A*c^6*d*e - 315*sqrt(e*x + d)*B*b*c^5*d^2*e + 315*sq
rt(e*x + d)*A*c^6*d^2*e + 35*(e*x + d)^(3/2)*B*b^2*c^4*e^2 - 35*(e*x + d)^
(3/2)*A*b*c^5*e^2 + 315*sqrt(e*x + d)*B*b^2*c^4*d*e^2 - 315*sqrt(e*x + d)*
A*b*c^5*d*e^2 - 105*sqrt(e*x + d)*B*b^3*c^3*e^3 + 105*sqrt(e*x + d)*A*b^2*
c^4*e^3)/c^7
```

Mupad [B] (verification not implemented)

Time = 11.60 (sec) , antiderivative size = 6515, normalized size of antiderivative = 28.57

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(7/2))/(b*x + c*x^2),x)
```

output
```
((2*A*e - 2*B*d)/(5*c) - (2*B*(b*e - 2*c*d))/(5*c^2))*(d + e*x)^(5/2) - ((
(c*d^2 - b*d*e)*((2*A*e - 2*B*d)/c - (2*B*(b*e - 2*c*d))/c^2))/c - ((b*e -
 2*c*d)*(((b*e - 2*c*d)*((2*A*e - 2*B*d)/c - (2*B*(b*e - 2*c*d))/c^2))/c +
 (2*B*(c*d^2 - b*d*e))/c^2))/c)*(d + e*x)^(1/2) - (((b*e - 2*c*d)*((2*A*e
- 2*B*d)/c - (2*B*(b*e - 2*c*d))/c^2))/(3*c) + (2*B*(c*d^2 - b*d*e))/(3*c^
2))*(d + e*x)^(3/2) + (2*B*(d + e*x)^(7/2))/(7*c) - (A*atan(((A*((8*(d + e
*x)^(1/2)*(B^2*b^10*e^10 + A^2*b^8*c^2*e^10 + 2*A^2*c^10*d^8*e^2 + 28*A^2*
b^2*c^8*d^6*e^4 - 56*A^2*b^3*c^7*d^5*e^5 + 70*A^2*b^4*c^6*d^4*e^6 - 56*A^2
*b^5*c^5*d^3*e^7 + 28*A^2*b^6*c^4*d^2*e^8 + B^2*b^2*c^8*d^8*e^2 - 8*B^2*b^
3*c^7*d^7*e^3 + 28*B^2*b^4*c^6*d^6*e^4 - 56*B^2*b^5*c^5*d^5*e^5 + 70*B^2*b
^6*c^4*d^4*e^6 - 56*B^2*b^7*c^3*d^3*e^7 + 28*B^2*b^8*c^2*d^2*e^8 - 8*B^2*b
^9*c*d*e^9 - 8*A^2*b*c^9*d^7*e^3 - 8*A^2*b^7*c^3*d*e^9 - 2*A*B*b^9*c*e^10
- 2*A*B*b*c^9*d^8*e^2 + 16*A*B*b^8*c^2*d*e^9 + 16*A*B*b^2*c^8*d^7*e^3 - 56
*A*B*b^3*c^7*d^6*e^4 + 112*A*B*b^4*c^6*d^5*e^5 - 140*A*B*b^5*c^5*d^4*e^6 +
 112*A*B*b^6*c^4*d^3*e^7 - 56*A*B*b^7*c^3*d^2*e^8))/c^7 + (A*(d^7)^(1/2)*(
(8*(B*b^6*c^5*d*e^6 - A*b^5*c^6*d*e^6 + 3*A*b^2*c^9*d^4*e^3 - 6*A*b^3*c^8*
d^3*e^4 + 4*A*b^4*c^7*d^2*e^5 + B*b^2*c^9*d^5*e^2 - 4*B*b^3*c^8*d^4*e^3 +
6*B*b^4*c^7*d^3*e^4 - 4*B*b^5*c^6*d^2*e^5))/c^7 + (8*A*(b^3*c^9*e^3 - 2*b^
2*c^10*d*e^2)*(d^7)^(1/2)*(d + e*x)^(1/2))/(b*c^7)))/b)*(d^7)^(1/2)*1i)/b
+ (A*((8*(d + e*x)^(1/2)*(B^2*b^10*e^10 + A^2*b^8*c^2*e^10 + 2*A^2*c^10...
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 712, normalized size of antiderivative = 3.12

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{bx+cx^2}\,dx = \frac{210\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)a\,c^4d^3 - 210\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)b}{}$$

input
```
int((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x),x)
```

output
```
( - 210*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
 c*d)))*a*b**3*c*e**3 + 630*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)
/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**2*d*e**2 - 630*sqrt(c)*sqrt(b*e - c*
d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**3*d**2*e + 210
*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))
*a*c**4*d**3 + 210*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)
*sqrt(b*e - c*d)))*b**5*e**3 - 630*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d +
e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c*d*e**2 + 630*sqrt(c)*sqrt(b*e -
c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c**2*d**2*e -
210*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d
)))*b**2*c**3*d**3 + 210*sqrt(d + e*x)*a*b**3*c**2*e**3 - 700*sqrt(d + e*x
)*a*b**2*c**3*d*e**2 - 70*sqrt(d + e*x)*a*b**2*c**3*e**3*x + 812*sqrt(d +
e*x)*a*b*c**4*d**2*e + 224*sqrt(d + e*x)*a*b*c**4*d*e**2*x + 42*sqrt(d + e
*x)*a*b*c**4*e**3*x**2 - 210*sqrt(d + e*x)*b**5*c*e**3 + 700*sqrt(d + e*x)
*b**4*c**2*d*e**2 + 70*sqrt(d + e*x)*b**4*c**2*e**3*x - 812*sqrt(d + e*x)*
b**3*c**3*d**2*e - 224*sqrt(d + e*x)*b**3*c**3*d*e**2*x - 42*sqrt(d + e*x)
*b**3*c**3*e**3*x**2 + 352*sqrt(d + e*x)*b**2*c**4*d**3 + 244*sqrt(d + e*x
)*b**2*c**4*d**2*e*x + 132*sqrt(d + e*x)*b**2*c**4*d*e**2*x**2 + 30*sqrt(d
 + e*x)*b**2*c**4*e**3*x**3 + 105*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*c
**5*d**3 - 105*sqrt(d)*log(sqrt(d + e*x) + sqrt(d))*a*c**5*d**3)/(105*b...
```

3.69 $\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 173

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx &= \frac{2(B(cd-be)^2+Ace(2cd-be))\sqrt{d+ex}}{c^3} \\ &+ \frac{2(Bcd-bBe+Ace)(d+ex)^{3/2}}{3c^2} + \frac{2B(d+ex)^{5/2}}{5c} \\ &- \frac{2Ad^{5/2}\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b} - \frac{2(bB-Ac)(cd-be)^{5/2}\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{bc^{7/2}}\end{aligned}$$

output
```
2*(B*(-b*e+c*d)^2+A*c*e*(-b*e+2*c*d))*(e*x+d)^(1/2)/c^3+2/3*(A*c*e-B*b*e+B
*c*d)*(e*x+d)^(3/2)/c^2+2/5*B*(e*x+d)^(5/2)/c-2*A*d^(5/2)*arctanh((e*x+d)^
(1/2)/d^(1/2))/b-2*(-A*c+B*b)*(-b*e+c*d)^(5/2)*arctanh(c^(1/2)*(e*x+d)^(1/
2)/(-b*e+c*d)^(1/2))/b/c^(7/2)
```

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 167, normalized size of antiderivative = 0.97

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx = \frac{2\sqrt{d+ex}(5Ace(7cd-3be+cex)+B(15b^2e^2-5bce(7d+ex)+c^2(23d^2+}{15c^3}$$
$$+\frac{2(-bB+Ac)(-cd+be)^{5/2}\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{bc^{7/2}}-\frac{2Ad^{5/2}\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b}$$

input

```
Integrate[((A + B*x)*(d + e*x)^(5/2))/(b*x + c*x^2),x]
```

output

```
(2*Sqrt[d + e*x]*(5*A*c*e*(7*c*d - 3*b*e + c*e*x) + B*(15*b^2*e^2 - 5*b*c*
e*(7*d + e*x) + c^2*(23*d^2 + 11*d*e*x + 3*e^2*x^2))))/(15*c^3) + (2*(-(b*
B) + A*c)*(-(c*d) + b*e)^(5/2)*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d)
+ b*e]])/(b*c^(7/2)) - (2*A*d^(5/2)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/b
```

Rubi [A] (verified)

Time = 0.97 (sec) , antiderivative size = 192, normalized size of antiderivative = 1.11, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {1196, 1196, 1196, 1197, 25, 1480, 221}

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

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx$$

$$\Big\downarrow \text{1196}$$

$$\frac{\int \frac{(d+ex)^{3/2}(Acd+(Bcd-bBe+Ace)x)}{cx^2+bx}dx}{c}+\frac{2B(d+ex)^{5/2}}{5c}$$

$$\Big\downarrow \text{1196}$$

$$\frac{\frac{\int \frac{\sqrt{d+ex}\left(Ac^2d^2+\left(B(cd-be)^2+Ace(2cd-be)\right)x\right)}{cx^2+bx}dx}{c}+\frac{2(d+ex)^{3/2}(Ace-bBe+Bcd)}{3c}}{c}+\frac{2B(d+ex)^{5/2}}{5c}$$

$$\Big\downarrow \text{1196}$$

$$\frac{\frac{\frac{\int \frac{Ac^3d^3+\left(B(cd-be)^3+Ace\left(3c^2d^2-3bced+b^2e^2\right)\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{c}+\frac{2\sqrt{d+ex}\left(Ace(2cd-be)+B(cd-be)^2\right)}{c}}{c}+\frac{2(d+ex)^{3/2}(Ace-bBe+Bcd)}{3c}}{c}+\frac{2B(d+ex)^{5/2}}{5c}$$

$\Big\downarrow$ 1197

$$\frac{\frac{\frac{2\int -\frac{d(cd-be)\left(B(cd-be)^2+Ace(2cd-be)\right)-\left(B(cd-be)^3+Ace\left(3c^2d^2-3bced+b^2e^2\right)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{c}+\frac{2\sqrt{d+ex}\left(Ace(2cd-be)+B(cd-be)^2\right)}{c}}{c}+2(d+ex)^{3/2}(\cdots}{c}+\frac{2B(d+ex)^{5/2}}{5c}$$

$\Big\downarrow$ 25

$$\frac{\frac{\frac{2\sqrt{d+ex}\left(Ace(2cd-be)+B(cd-be)^2\right)}{c}-\frac{2\int \frac{d(cd-be)\left(B(cd-be)^2+Ace(2cd-be)\right)-\left(B(cd-be)^3+Ace\left(3c^2d^2-3bced+b^2e^2\right)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{c}}{c}+2(d+ex)^{3/2}(A\cdots}{c}+\frac{2B(d+ex)^{5/2}}{5c}$$

$\Big\downarrow$ 1480

$$\frac{\frac{\frac{2\left(\frac{(bB-Ac)(cd-be)^3\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{b}+\frac{Ac^4d^3\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{b}\right)}{c}+\frac{2\sqrt{d+ex}\left(Ace(2cd-be)+B(cd-be)^2\right)}{c}}{c}+\frac{2(d+ex)^{3/2}(Ace-bBe+Bc\cdots}{3c}}{c}+\frac{2B(d+ex)^{5/2}}{5c}$$

$\Big\downarrow$ 221

$$\frac{\frac{\frac{2\left(-\frac{(bB-Ac)(cd-be)^{5/2}\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}}-\frac{Ac^3d^{5/2}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b}\right)}{c}+\frac{2\sqrt{d+ex}\left(Ace(2cd-be)+B(cd-be)^2\right)}{c}}{c}+\frac{2(d+ex)^{3/2}(Ace-bBe+B\cdots}{3c}}{c}+\frac{2B(d+ex)^{5/2}}{5c}$$

input
```
Int[((A + B*x)*(d + e*x)^(5/2))/(b*x + c*x^2),x]
```

output
```
(2*B*(d + e*x)^(5/2))/(5*c) + ((2*(B*c*d - b*B*e + A*c*e)*(d + e*x)^(3/2))
/(3*c) + ((2*(B*(c*d - b*e)^2 + A*c*e*(2*c*d - b*e))*Sqrt[d + e*x])/c + (2
*(-((A*c^3*d^(5/2)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/b) - ((b*B - A*c)*(c*d
- b*e)^(5/2)*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c])
))/c)/c)/c
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1196
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[g*((d + e*x)^m/(c*m)), x] + Simp[1/c   Int
[(d + e*x)^(m - 1)*(Simp[c*d*f - a*e*g + (g*c*d - b*e*g + c*e*f)*x, x]/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] &
& GtQ[m, 0]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.38 (sec) , antiderivative size = 167, normalized size of antiderivative = 0.97

method	result
pseudoelliptic	$-\frac{2\left(-(be-cd)^3(Ac-Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)+\sqrt{c(be-cd)}\left(A\,d^{\frac{5}{2}}\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)c^3+\left(-B\,e^2b^2+c\left(e\left(\frac{Bx}{3}+A\right)+\right.\right.\right.\right.}{\sqrt{c(be-cd)}\,c^3b}$
derivativedivides	$-\frac{2\left(-\frac{B\,c^2(ex+d)^{\frac{5}{2}}}{5}-\frac{A\,c^2e(ex+d)^{\frac{3}{2}}}{3}+\frac{Bbce(ex+d)^{\frac{3}{2}}}{3}-\frac{B\,c^2d(ex+d)^{\frac{3}{2}}}{3}+Abc\,e^2\sqrt{ex+d}-2A\,c^2de\sqrt{ex+d}-B\,b^2e^2\sqrt{ex+d}+\right.}{c^3}$
default	$-\frac{2\left(-\frac{B\,c^2(ex+d)^{\frac{5}{2}}}{5}-\frac{A\,c^2e(ex+d)^{\frac{3}{2}}}{3}+\frac{Bbce(ex+d)^{\frac{3}{2}}}{3}-\frac{B\,c^2d(ex+d)^{\frac{3}{2}}}{3}+Abc\,e^2\sqrt{ex+d}-2A\,c^2de\sqrt{ex+d}-B\,b^2e^2\sqrt{ex+d}+\right.}{c^3}$

input
```
int((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
-2/(c*(b*e-c*d))^(1/2)*(-(b*e-c*d)^3*(A*c-B*b)*arctan(c*(e*x+d)^(1/2)/(c*(
b*e-c*d))^(1/2))+(c*(b*e-c*d))^(1/2)*(A*d^(5/2)*arctanh((e*x+d)^(1/2)/d^(1
/2))*c^3+(-B*e^2*b^2+c*(e*(1/3*B*x+A)+7/3*B*d)*e*b-7/3*c^2*(23/35*B*d^2+e*
(11/35*B*x+A)*d+1/7*(3/5*B*x+A)*e^2*x))*b*(e*x+d)^(1/2)))/c^3/b
```

Fricas [A] (verification not implemented)

Time = 2.13 (sec) , antiderivative size = 1000, normalized size of antiderivative = 5.78

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
[1/15*(15*A*c^3*d^(5/2)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - 15*
((B*b*c^2 - A*c^3)*d^2 - 2*(B*b^2*c - A*b*c^2)*d*e + (B*b^3 - A*b^2*c)*e^2
)*sqrt((c*d - b*e)/c)*log((c*e*x + 2*c*d - b*e + 2*sqrt(e*x + d)*c*sqrt((c
*d - b*e)/c))/(c*x + b)) + 2*(3*B*b*c^2*e^2*x^2 + 23*B*b*c^2*d^2 - 35*(B*b
^2*c - A*b*c^2)*d*e + 15*(B*b^3 - A*b^2*c)*e^2 + (11*B*b*c^2*d*e - 5*(B*b^
2*c - A*b*c^2)*e^2)*x)*sqrt(e*x + d))/(b*c^3), 1/15*(15*A*c^3*d^(5/2)*log(
(e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - 30*((B*b*c^2 - A*c^3)*d^2 - 2*(
B*b^2*c - A*b*c^2)*d*e + (B*b^3 - A*b^2*c)*e^2)*sqrt(-(c*d - b*e)/c)*arcta
n(-sqrt(e*x + d)*c*sqrt(-(c*d - b*e)/c)/(c*d - b*e)) + 2*(3*B*b*c^2*e^2*x^
2 + 23*B*b*c^2*d^2 - 35*(B*b^2*c - A*b*c^2)*d*e + 15*(B*b^3 - A*b^2*c)*e^2
 + (11*B*b*c^2*d*e - 5*(B*b^2*c - A*b*c^2)*e^2)*x)*sqrt(e*x + d))/(b*c^3),
 1/15*(30*A*c^3*sqrt(-d)*d^2*arctan(sqrt(-d)/sqrt(e*x + d)) - 15*((B*b*c^2
 - A*c^3)*d^2 - 2*(B*b^2*c - A*b*c^2)*d*e + (B*b^3 - A*b^2*c)*e^2)*sqrt((c
*d - b*e)/c)*log((c*e*x + 2*c*d - b*e + 2*sqrt(e*x + d)*c*sqrt((c*d - b*e)
/c))/(c*x + b)) + 2*(3*B*b*c^2*e^2*x^2 + 23*B*b*c^2*d^2 - 35*(B*b^2*c - A*
b*c^2)*d*e + 15*(B*b^3 - A*b^2*c)*e^2 + (11*B*b*c^2*d*e - 5*(B*b^2*c - A*b
*c^2)*e^2)*x)*sqrt(e*x + d))/(b*c^3), 2/15*(15*A*c^3*sqrt(-d)*d^2*arctan(s
qrt(-d)/sqrt(e*x + d)) - 15*((B*b*c^2 - A*c^3)*d^2 - 2*(B*b^2*c - A*b*c^2)
*d*e + (B*b^3 - A*b^2*c)*e^2)*sqrt(-(c*d - b*e)/c)*arctan(-sqrt(e*x + d)*c
*sqrt(-(c*d - b*e)/c)/(c*d - b*e)) + (3*B*b*c^2*e^2*x^2 + 23*B*b*c^2*d^...
```

Sympy [A] (verification not implemented)

Time = 10.01 (sec) , antiderivative size = 303, normalized size of antiderivative = 1.75

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx = \begin{cases} \frac{2\left(\frac{Ad^3e\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{b\sqrt{-d}} + \frac{Be(d+ex)^{\frac{5}{2}}}{5c} + \frac{(d+ex)^{\frac{3}{2}}\left(Ace^2-Bbe^2+Bcde\right)}{3c^2} + \frac{\sqrt{d+ex}\left(-Abce^3+2Ac^2de^2+Bb^2e^3-\cdots\right.}{c^3}\cdots\right.}{e} \\ d^{\frac{5}{2}}\left(\frac{B\log\left(bx+cx^2\right)}{2c} + \left(A-\frac{Bb}{2c}\right)\left(-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=0\\ -\frac{\log\left(b-2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b} - \frac{2c\cdots}{\cdots}\cdots\right.\right. \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(5/2)/(c*x**2+b*x),x)
```

output
```
Piecewise((2*(A*d**3*e*atan(sqrt(d + e*x)/sqrt(-d))/(b*sqrt(-d)) + B*e*(d
+ e*x)**(5/2)/(5*c) + (d + e*x)**(3/2)*(A*c*e**2 - B*b*e**2 + B*c*d*e)/(3*
c**2) + sqrt(d + e*x)*(-A*b*c*e**3 + 2*A*c**2*d*e**2 + B*b**2*e**3 - 2*B*b
*c*d*e**2 + B*c**2*d**2*e)/c**3 - e*(-A*c + B*b)*(b*e - c*d)**3*atan(sqrt(
d + e*x)/sqrt((b*e - c*d)/c))/(b*c**4*sqrt((b*e - c*d)/c)))/e, Ne(e, 0)),
(d**(5/2)*(B*log(b*x + c*x**2)/(2*c) + (A - B*b/(2*c))*(-2*c*Piecewise(((b
/(2*c) + x)/b, Eq(c, 0)), (-log(b - 2*c*(b/(2*c) + x))/(2*c), True))/b - 2
*c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0)), (log(b + 2*c*(b/(2*c) + x))/(2*c
), True))/b)), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x),x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 303 vs. $2(147) = 294$.

Time = 0.27 (sec) , antiderivative size = 303, normalized size of antiderivative = 1.75

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx = \frac{2\,Ad^3\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b\sqrt{-d}} + \frac{2\,(Bbc^3d^3 - Ac^4d^3 - 3\,Bb^2c^2d^2e + 3\,Abc^3d^2e + 3\,Bb^3cde^2 - 3\,Ab^2c^2de^2 - Bb^4e^3 + Ab^3ce^3)\arctan\left(\frac{\sqrt{ex-}}{\sqrt{-c^2d}}\right.}{\sqrt{-c^2d+bce}bc^3} + \frac{2\left(3\,(ex+d)^{\frac{5}{2}}Bc^4 + 5\,(ex+d)^{\frac{3}{2}}Bc^4d + 15\,\sqrt{ex+d}Bc^4d^2 - 5\,(ex+d)^{\frac{3}{2}}Bbc^3e + 5\,(ex+d)^{\frac{3}{2}}Ac^4e - 30\,\sqrt{}\right.}{15\,c^5}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x),x, algorithm="giac")
```

output
```
2*A*d^3*arctan(sqrt(e*x + d)/sqrt(-d))/(b*sqrt(-d)) + 2*(B*b*c^3*d^3 - A*c
^4*d^3 - 3*B*b^2*c^2*d^2*e + 3*A*b*c^3*d^2*e + 3*B*b^3*c*d*e^2 - 3*A*b^2*c
^2*d*e^2 - B*b^4*e^3 + A*b^3*c*e^3)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b
*c*e))/(sqrt(-c^2*d + b*c*e)*b*c^3) + 2/15*(3*(e*x + d)^(5/2)*B*c^4 + 5*(e
*x + d)^(3/2)*B*c^4*d + 15*sqrt(e*x + d)*B*c^4*d^2 - 5*(e*x + d)^(3/2)*B*b
*c^3*e + 5*(e*x + d)^(3/2)*A*c^4*e - 30*sqrt(e*x + d)*B*b*c^3*d*e + 30*sqr
t(e*x + d)*A*c^4*d*e + 15*sqrt(e*x + d)*B*b^2*c^2*e^2 - 15*sqrt(e*x + d)*A
*b*c^3*e^2)/c^5
```

Mupad [B] (verification not implemented)

Time = 11.23 (sec) , antiderivative size = 5138, normalized size of antiderivative = 29.70

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(5/2))/(b*x + c*x^2),x)
```

output
```
((2*A*e - 2*B*d)/(3*c) - (2*B*(b*e - 2*c*d))/(3*c^2))*(d + e*x)^(3/2) - ((
(b*e - 2*c*d)*((2*A*e - 2*B*d)/c - (2*B*(b*e - 2*c*d))/c^2))/c + (2*B*(c*d
^2 - b*d*e))/c^2)*(d + e*x)^(1/2) + (2*B*(d + e*x)^(5/2))/(5*c) - (A*atan(
((A*((8*(d + e*x)^(1/2)*(B^2*b^8*e^8 + A^2*b^6*c^2*e^8 + 2*A^2*c^8*d^6*e^2
 + 15*A^2*b^2*c^6*d^4*e^4 - 20*A^2*b^3*c^5*d^3*e^5 + 15*A^2*b^4*c^4*d^2*e^
6 + B^2*b^2*c^6*d^6*e^2 - 6*B^2*b^3*c^5*d^5*e^3 + 15*B^2*b^4*c^4*d^4*e^4 -
 20*B^2*b^5*c^3*d^3*e^5 + 15*B^2*b^6*c^2*d^2*e^6 - 6*B^2*b^7*c*d*e^7 - 6*A
^2*b*c^7*d^5*e^3 - 6*A^2*b^5*c^3*d*e^7 - 2*A*B*b^7*c*e^8 - 2*A*B*b*c^7*d^6
*e^2 + 12*A*B*b^6*c^2*d*e^7 + 12*A*B*b^2*c^6*d^5*e^3 - 30*A*B*b^3*c^5*d^4*
e^4 + 40*A*B*b^4*c^4*d^3*e^5 - 30*A*B*b^5*c^3*d^2*e^6))/c^5 + (A*((8*(A*b^
4*c^5*d*e^5 - B*b^5*c^4*d*e^5 + 2*A*b^2*c^7*d^3*e^3 - 3*A*b^3*c^6*d^2*e^4
+ B*b^2*c^7*d^4*e^2 - 3*B*b^3*c^6*d^3*e^3 + 3*B*b^4*c^5*d^2*e^4))/c^5 + (8
*A*(b^3*c^7*e^3 - 2*b^2*c^8*d*e^2)*(d^5)^(1/2)*(d + e*x)^(1/2))/(b*c^5))*(
d^5)^(1/2))/b)*(d^5)^(1/2)*1i)/b + (A*((8*(d + e*x)^(1/2)*(B^2*b^8*e^8 + A
^2*b^6*c^2*e^8 + 2*A^2*c^8*d^6*e^2 + 15*A^2*b^2*c^6*d^4*e^4 - 20*A^2*b^3*c
^5*d^3*e^5 + 15*A^2*b^4*c^4*d^2*e^6 + B^2*b^2*c^6*d^6*e^2 - 6*B^2*b^3*c^5*
d^5*e^3 + 15*B^2*b^4*c^4*d^4*e^4 - 20*B^2*b^5*c^3*d^3*e^5 + 15*B^2*b^6*c^2
*d^2*e^6 - 6*B^2*b^7*c*d*e^7 - 6*A^2*b*c^7*d^5*e^3 - 6*A^2*b^5*c^3*d*e^7 -
 2*A*B*b^7*c*e^8 - 2*A*B*b*c^7*d^6*e^2 + 12*A*B*b^6*c^2*d*e^7 + 12*A*B*b^2
*c^6*d^5*e^3 - 30*A*B*b^3*c^5*d^4*e^4 + 40*A*B*b^4*c^4*d^3*e^5 - 30*A*B...
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 471, normalized size of antiderivative = 2.72

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{bx+cx^2}\,dx = \frac{30\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)a\,b^2c\,e^2-60\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)a}{}$$

input
```
int((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x),x)
```

output
```
(30*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d
)))*a*b**2*c*e**2 - 60*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqr
t(c)*sqrt(b*e - c*d)))*a*b*c**2*d*e + 30*sqrt(c)*sqrt(b*e - c*d)*atan((sqr
t(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**3*d**2 - 30*sqrt(c)*sqrt(b*e
 - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*e**2 + 60*s
qrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b
**3*c*d*e - 30*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqr
t(b*e - c*d)))*b**2*c**2*d**2 - 30*sqrt(d + e*x)*a*b**2*c**2*e**2 + 70*sqr
t(d + e*x)*a*b*c**3*d*e + 10*sqrt(d + e*x)*a*b*c**3*e**2*x + 30*sqrt(d + e
*x)*b**4*c*e**2 - 70*sqrt(d + e*x)*b**3*c**2*d*e - 10*sqrt(d + e*x)*b**3*c
**2*e**2*x + 46*sqrt(d + e*x)*b**2*c**3*d**2 + 22*sqrt(d + e*x)*b**2*c**3*
d*e*x + 6*sqrt(d + e*x)*b**2*c**3*e**2*x**2 + 15*sqrt(d)*log(sqrt(d + e*x)
 - sqrt(d))*a*c**4*d**2 - 15*sqrt(d)*log(sqrt(d + e*x) + sqrt(d))*a*c**4*d
**2)/(15*b*c**4)
```

3.70 $\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2} dx$

Optimal result

Integrand size = 26, antiderivative size = 131

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2} dx = \frac{2(Bcd-bBe+Ace)\sqrt{d+ex}}{c^2} + \frac{2B(d+ex)^{3/2}}{3c} - \frac{2Ad^{3/2}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b} - \frac{2(bB-Ac)(cd-be)^{3/2}\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{bc^{5/2}}$$

output
```
2*(A*c*e-B*b*e+B*c*d)*(e*x+d)^(1/2)/c^2+2/3*B*(e*x+d)^(3/2)/c-2*A*d^(3/2)*
arctanh((e*x+d)^(1/2)/d^(1/2))/b-2*(-A*c+B*b)*(-b*e+c*d)^(3/2)*arctanh(c^(
1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b/c^(5/2)
```

Mathematica [A] (verified)

Time = 0.29 (sec) , antiderivative size = 123, normalized size of antiderivative = 0.94

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2} dx = \frac{2\sqrt{d+ex}(3Ace+B(4cd-3be+cex))}{3c^2} - \frac{2(-bB+Ac)(-cd+be)^{3/2}\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{bc^{5/2}} - \frac{2Ad^{3/2}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(3/2))/(b*x + c*x^2),x]
```

output
```
(2*Sqrt[d + e*x]*(3*A*c*e + B*(4*c*d - 3*b*e + c*e*x)))/(3*c^2) - (2*(-(b*
B) + A*c)*(-(c*d) + b*e)^(3/2)*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d)
+ b*e]])/(b*c^(5/2)) - (2*A*d^(3/2)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/b
```

Rubi [A] (verified)

Time = 0.75 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.11, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {1196, 1196, 1197, 25, 1480, 221}

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

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2}\,dx$$

$$\Big\downarrow \text{ 1196}$$

$$\frac{\int \frac{\sqrt{d+ex}(Acd+(Bcd-bBe+Ace)x)}{cx^2+bx}dx}{c}+\frac{2B(d+ex)^{3/2}}{3c}$$

$$\Big\downarrow \text{ 1196}$$

$$\frac{\frac{\int \frac{Ac^2d^2+\left(B(cd-be)^2+Ace(2cd-be)\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{c}+\frac{2\sqrt{d+ex}(Ace-bBe+Bcd)}{c}}{c}+\frac{2B(d+ex)^{3/2}}{3c}$$

$$\Big\downarrow \text{ 1197}$$

$$\frac{\frac{2\int -\frac{d(cd-be)(Bcd-bBe+Ace)-\left(B(cd-be)^2+Ace(2cd-be)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{c}+\frac{2\sqrt{d+ex}(Ace-bBe+Bcd)}{c}}{c}+\frac{2B(d+ex)^{3/2}}{3c}$$

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

$$\frac{\frac{2\sqrt{d+ex}(Ace-bBe+Bcd)}{c}-\frac{2\int \frac{d(cd-be)(Bcd-bBe+Ace)-\left(B(cd-be)^2+Ace(2cd-be)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{c}}{c}+\frac{2B(d+ex)^{3/2}}{3c}$$

$$\Big\downarrow \text{ 1480}$$

$$\frac{\frac{2\left(\frac{(bB-Ac)(cd-be)^2\int\frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{b}+\frac{Ac^3d^2\int\frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{b}\right)}{c}+\frac{2\sqrt{d+ex}(Ace-bBe+Bcd)}{c}}{c}+\frac{2B(d+ex)^{3/2}}{3c}$$

$$\Big\downarrow \ 221$$

$$\frac{\frac{2\left(-\frac{(bB-Ac)(cd-be)^{3/2}\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}}-\frac{Ac^2d^{3/2}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b}\right)}{c}+\frac{2\sqrt{d+ex}(Ace-bBe+Bcd)}{c}}{c}+\frac{2B(d+ex)^{3/2}}{3c}$$

input
```
Int[((A + B*x)*(d + e*x)^(3/2))/(b*x + c*x^2),x]
```

output
```
(2*B*(d + e*x)^(3/2))/(3*c) + ((2*(B*c*d - b*B*e + A*c*e)*Sqrt[d + e*x])/c
 + (2*(-((A*c^2*d^(3/2)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/b) - ((b*B - A*c)*
(c*d - b*e)^(3/2)*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*Sqr
t[c])))/c)/c
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1196
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[g*((d + e*x)^m/(c*m)), x] + Simp[1/c   Int
[(d + e*x)^(m - 1)*(Simp[c*d*f - a*e*g + (g*c*d - b*e*g + c*e*f)*x, x]/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] &
& GtQ[m, 0]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.41 (sec) , antiderivative size = 129, normalized size of antiderivative = 0.98

method	result
pseudoelliptic	$\frac{-2(be-cd)^2(Ac-Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)+2\sqrt{c(be-cd)}\left(-A\,d^{\frac{3}{2}}\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)c^2+\left(\left(\frac{4Bd}{3}+e\left(\frac{Bx}{3}+A\right)\right)c-Bbe\right)\right.}{b\,c^2\sqrt{c(be-cd)}}$
derivativedivides	$\frac{\frac{2Bc(ex+d)^{\frac{3}{2}}}{3}+2Ace\sqrt{ex+d}-2Bbe\sqrt{ex+d}+2Bcd\sqrt{ex+d}}{c^2}-\frac{2A\,d^{\frac{3}{2}}\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b}+\frac{2(-A\,b^2c\,e^2+2Ab\,c^2de-A\,c}{}$
default	$\frac{\frac{2Bc(ex+d)^{\frac{3}{2}}}{3}+2Ace\sqrt{ex+d}-2Bbe\sqrt{ex+d}+2Bcd\sqrt{ex+d}}{c^2}-\frac{2A\,d^{\frac{3}{2}}\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b}+\frac{2(-A\,b^2c\,e^2+2Ab\,c^2de-A\,c}{}$

input
```
int((B*x+A)*(e*x+d)^(3/2)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
2*(-(b*e-c*d)^2*(A*c-B*b)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))+(c*(
b*e-c*d))^(1/2)*(-A*d^(3/2)*arctanh((e*x+d)^(1/2)/d^(1/2))*c^2+((4/3*B*d+e
*(1/3*B*x+A))*c-B*b*e)*b*(e*x+d)^(1/2)))/(c*(b*e-c*d))^(1/2)/b/c^2
```

Fricas [A] (verification not implemented)

Time = 0.43 (sec) , antiderivative size = 640, normalized size of antiderivative = 4.89

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2}\,dx = \left[\frac{3\,Ac^2d^{\frac{3}{2}}\log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)+3\left((Bbc-Ac^2)d-(Bb^2-Abc)e\right)\sqrt{\frac{cd-be}{c}}\right.$$

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

output
```
[1/3*(3*A*c^2*d^(3/2)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + 3*((B
*b*c - A*c^2)*d - (B*b^2 - A*b*c)*e)*sqrt((c*d - b*e)/c)*log((c*e*x + 2*c*
d - b*e - 2*sqrt(e*x + d)*c*sqrt((c*d - b*e)/c))/(c*x + b)) + 2*(B*b*c*e*x
 + 4*B*b*c*d - 3*(B*b^2 - A*b*c)*e)*sqrt(e*x + d))/(b*c^2), 1/3*(3*A*c^2*d
^(3/2)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - 6*((B*b*c - A*c^2)*d
 - (B*b^2 - A*b*c)*e)*sqrt(-(c*d - b*e)/c)*arctan(-sqrt(e*x + d)*c*sqrt(-(
c*d - b*e)/c)/(c*d - b*e)) + 2*(B*b*c*e*x + 4*B*b*c*d - 3*(B*b^2 - A*b*c)*
e)*sqrt(e*x + d))/(b*c^2), 1/3*(6*A*c^2*sqrt(-d)*d*arctan(sqrt(-d)/sqrt(e*
x + d)) + 3*((B*b*c - A*c^2)*d - (B*b^2 - A*b*c)*e)*sqrt((c*d - b*e)/c)*lo
g((c*e*x + 2*c*d - b*e - 2*sqrt(e*x + d)*c*sqrt((c*d - b*e)/c))/(c*x + b))
 + 2*(B*b*c*e*x + 4*B*b*c*d - 3*(B*b^2 - A*b*c)*e)*sqrt(e*x + d))/(b*c^2),
 2/3*(3*A*c^2*sqrt(-d)*d*arctan(sqrt(-d)/sqrt(e*x + d)) - 3*((B*b*c - A*c^
2)*d - (B*b^2 - A*b*c)*e)*sqrt(-(c*d - b*e)/c)*arctan(-sqrt(e*x + d)*c*sqr
t(-(c*d - b*e)/c)/(c*d - b*e)) + (B*b*c*e*x + 4*B*b*c*d - 3*(B*b^2 - A*b*c
)*e)*sqrt(e*x + d))/(b*c^2)]
```

Sympy [A] (verification not implemented)

Time = 11.70 (sec) , antiderivative size = 236, normalized size of antiderivative = 1.80

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2}\,dx = \begin{cases} \frac{2\left(\frac{Ad^2e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{b\sqrt{-d}} + \frac{Be(d+ex)^{\frac{3}{2}}}{3c} + \frac{\sqrt{d+ex}\left(Ace^2-Bbe^2+Bcde\right)}{c^2} + \frac{e(-Ac+Bb)(be-cd)^2\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{\frac{be-cd}{c}}}\right)}{bc^3\sqrt{\frac{be-cd}{c}}}\right.}{e} \\ d^{\frac{3}{2}}\left(\frac{B\log\left(bx+cx^2\right)}{2c} + \left(A-\frac{Bb}{2c}\right)\left(-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=0\\ -\frac{\log\left(b-2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b} - \frac{2c}{\ }\right.\right.\end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(3/2)/(c*x**2+b*x),x)
```

output
```
Piecewise((2*(A*d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/(b*sqrt(-d)) + B*e*(d
+ e*x)**(3/2)/(3*c) + sqrt(d + e*x)*(A*c*e**2 - B*b*e**2 + B*c*d*e)/c**2 +
 e*(-A*c + B*b)*(b*e - c*d)**2*atan(sqrt(d + e*x)/sqrt((b*e - c*d)/c))/(b*
c**3*sqrt((b*e - c*d)/c)))/e, Ne(e, 0)), (d**(3/2)*(B*log(b*x + c*x**2)/(2
*c) + (A - B*b/(2*c))*(-2*c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0)), (-log(b
 - 2*c*(b/(2*c) + x))/(2*c), True))/b - 2*c*Piecewise(((b/(2*c) + x)/b, Eq
(c, 0)), (log(b + 2*c*(b/(2*c) + x))/(2*c), True))/b)), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2}\,dx = \text{Exception raised: ValueError}$$

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

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

Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 187, normalized size of antiderivative = 1.43

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2}\,dx = \frac{2\,Ad^2\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b\sqrt{-d}} + \frac{2\,(Bbc^2d^2 - Ac^3d^2 - 2\,Bb^2cde + 2\,Abc^2de + Bb^3e^2 - Ab^2ce^2)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{\sqrt{-c^2d+bce}bc^2} + \frac{2\left((ex+d)^{\frac{3}{2}}Bc^2 + 3\sqrt{ex+d}Bc^2d - 3\sqrt{ex+d}Bbce + 3\sqrt{ex+d}Ac^2e\right)}{3\,c^3}$$

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

output
```
2*A*d^2*arctan(sqrt(e*x + d)/sqrt(-d))/(b*sqrt(-d)) + 2*(B*b*c^2*d^2 - A*c
^3*d^2 - 2*B*b^2*c*d*e + 2*A*b*c^2*d*e + B*b^3*e^2 - A*b^2*c*e^2)*arctan(s
qrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/(sqrt(-c^2*d + b*c*e)*b*c^2) + 2/3*((
e*x + d)^(3/2)*B*c^2 + 3*sqrt(e*x + d)*B*c^2*d - 3*sqrt(e*x + d)*B*b*c*e +
 3*sqrt(e*x + d)*A*c^2*e)/c^3
```

Mupad [B] (verification not implemented)

Time = 0.60 (sec) , antiderivative size = 3810, normalized size of antiderivative = 29.08

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(3/2))/(b*x + c*x^2),x)
```

output
```
((2*A*e - 2*B*d)/c - (2*B*(b*e - 2*c*d))/c^2)*(d + e*x)^(1/2) + (2*B*(d +
e*x)^(3/2))/(3*c) - (A*atan(((A*((8*(d + e*x)^(1/2)*(B^2*b^6*e^6 + A^2*b^4
*c^2*e^6 + 2*A^2*c^6*d^4*e^2 + 6*A^2*b^2*c^4*d^2*e^4 + B^2*b^2*c^4*d^4*e^2
 - 4*B^2*b^3*c^3*d^3*e^3 + 6*B^2*b^4*c^2*d^2*e^4 - 4*B^2*b^5*c*d*e^5 - 4*A
^2*b*c^5*d^3*e^3 - 4*A^2*b^3*c^3*d*e^5 - 2*A*B*b^5*c*e^6 - 2*A*B*b*c^5*d^4
*e^2 + 8*A*B*b^4*c^2*d*e^5 + 8*A*B*b^2*c^4*d^3*e^3 - 12*A*B*b^3*c^3*d^2*e^
4))/c^3 + (A*((8*(B*b^4*c^3*d*e^4 - A*b^3*c^4*d*e^4 + A*b^2*c^5*d^2*e^3 +
B*b^2*c^5*d^3*e^2 - 2*B*b^3*c^4*d^2*e^3))/c^3 + (8*A*(b^3*c^5*e^3 - 2*b^2*
c^6*d*e^2)*(d^3)^(1/2)*(d + e*x)^(1/2))/(b*c^3))*(d^3)^(1/2))/b)*(d^3)^(1/
2)*1i)/b + (A*((8*(d + e*x)^(1/2)*(B^2*b^6*e^6 + A^2*b^4*c^2*e^6 + 2*A^2*c
^6*d^4*e^2 + 6*A^2*b^2*c^4*d^2*e^4 + B^2*b^2*c^4*d^4*e^2 - 4*B^2*b^3*c^3*d
^3*e^3 + 6*B^2*b^4*c^2*d^2*e^4 - 4*B^2*b^5*c*d*e^5 - 4*A^2*b*c^5*d^3*e^3 -
 4*A^2*b^3*c^3*d*e^5 - 2*A*B*b^5*c*e^6 - 2*A*B*b*c^5*d^4*e^2 + 8*A*B*b^4*c
^2*d*e^5 + 8*A*B*b^2*c^4*d^3*e^3 - 12*A*B*b^3*c^3*d^2*e^4))/c^3 - (A*((8*(
B*b^4*c^3*d*e^4 - A*b^3*c^4*d*e^4 + A*b^2*c^5*d^2*e^3 + B*b^2*c^5*d^3*e^2
- 2*B*b^3*c^4*d^2*e^3))/c^3 - (8*A*(b^3*c^5*e^3 - 2*b^2*c^6*d*e^2)*(d^3)^(
1/2)*(d + e*x)^(1/2))/(b*c^3))*(d^3)^(1/2))/b)*(d^3)^(1/2)*1i)/b)/((16*(2*
A^3*c^5*d^5*e^3 + 4*A^3*b^2*c^3*d^3*e^5 - A^3*b^3*c^2*d^2*e^6 - A*B^2*b^5*
d^2*e^6 + A^2*B*c^5*d^6*e^2 - 5*A^3*b*c^4*d^4*e^4 + 4*A*B^2*b^2*c^3*d^5*e^
3 - 6*A*B^2*b^3*c^2*d^4*e^4 + 11*A^2*B*b^2*c^3*d^4*e^4 - 8*A^2*B*b^3*c^...
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 273, normalized size of antiderivative = 2.08

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{bx+cx^2}\,dx = \frac{-6\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)abce+6\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)a\,c^2d$$

input
```
int((B*x+A)*(e*x+d)^(3/2)/(c*x^2+b*x),x)
```

output
```
( - 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c
*d)))*a*b*c*e + 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*
sqrt(b*e - c*d)))*a*c**2*d + 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)
*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*e - 6*sqrt(c)*sqrt(b*e - c*d)*atan((sq
rt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*c*d + 6*sqrt(d + e*x)*a*b*c
**2*e - 6*sqrt(d + e*x)*b**3*c*e + 8*sqrt(d + e*x)*b**2*c**2*d + 2*sqrt(d
+ e*x)*b**2*c**2*e*x + 3*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*c**3*d - 3
*sqrt(d)*log(sqrt(d + e*x) + sqrt(d))*a*c**3*d)/(3*b*c**3)
```

3.71 $\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 101

$$\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}\,dx = \frac{2B\sqrt{d+ex}}{c} - \frac{2A\sqrt{d}\,\mathrm{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b} - \frac{2(bB-Ac)\sqrt{cd-be}\,\mathrm{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{bc^{3/2}}$$

output
```
2*B*(e*x+d)^(1/2)/c-2*A*d^(1/2)*arctanh((e*x+d)^(1/2)/d^(1/2))/b-2*(-A*c+B
*b)*(-b*e+c*d)^(1/2)*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b/c^(
3/2)
```

Mathematica [A] (verified)

Time = 0.36 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.00

$$\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}\,dx = \frac{2B\sqrt{d+ex}}{c} + \frac{2(-bB+Ac)\sqrt{-cd+be}\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{bc^{3/2}} - \frac{2A\sqrt{d}\,\mathrm{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b}$$

input
```
Integrate[((A + B*x)*Sqrt[d + e*x])/(b*x + c*x^2),x]
```

output
```
(2*B*Sqrt[d + e*x])/c + (2*(-(b*B) + A*c)*Sqrt[-(c*d) + b*e]*ArcTan[(Sqrt[
c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(b*c^(3/2)) - (2*A*Sqrt[d]*ArcTanh[
Sqrt[d + e*x]/Sqrt[d]])/b
```

Rubi [A] (verified)

Time = 0.58 (sec) , antiderivative size = 108, normalized size of antiderivative = 1.07, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {1196, 1197, 25, 1480, 221}

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

$$\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}dx$$

$$\Big\downarrow \text{1196}$$

$$\frac{\int \frac{Acd+(Bcd-bBe+Ace)x}{\sqrt{d+ex}(cx^2+bx)}dx}{c}+\frac{2B\sqrt{d+ex}}{c}$$

$$\Big\downarrow \text{1197}$$

$$\frac{2\int -\frac{Bd(cd-be)-(Bcd-bBe+Ace)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{c}+\frac{2B\sqrt{d+ex}}{c}$$

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

$$\frac{2B\sqrt{d+ex}}{c}-\frac{2\int \frac{Bd(cd-be)-(Bcd-bBe+Ace)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{c}$$

$$\Big\downarrow \text{1480}$$

$$\frac{2\left(\frac{(bB-Ac)(cd-be)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{b}+\frac{Ac^2d\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{b}\right)}{c}+\frac{2B\sqrt{d+ex}}{c}$$

$$\Big\downarrow \text{221}$$

$$\frac{2\left(-\frac{(bB-Ac)\sqrt{cd-be}\,\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}}-\frac{Ac\sqrt{d}\,\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b}\right)}{c}+\frac{2B\sqrt{d+ex}}{c}$$

input
```
Int[((A + B*x)*Sqrt[d + e*x])/(b*x + c*x^2),x]
```

output
```
(2*B*Sqrt[d + e*x])/c + (2*(-((A*c*Sqrt[d]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])
/b) - ((b*B - A*c)*Sqrt[c*d - b*e]*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*
d - b*e]])/(b*Sqrt[c])))/c
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1196
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[g*((d + e*x)^m/(c*m)), x] + Simp[1/c   Int
[(d + e*x)^(m - 1)*(Simp[c*d*f - a*e*g + (g*c*d - b*e*g + c*e*f)*x, x]/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] &
& GtQ[m, 0]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.46 (sec) , antiderivative size = 103, normalized size of antiderivative = 1.02

method	result	size
derivativedivides	$\frac{2B\sqrt{ex+d}}{c}-\frac{2A\sqrt{d}\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b}+\frac{2\left(Abce-A\,c^{2}d-b^{2}Be+Bbcd\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{cb\sqrt{c(be-cd)}}$	103
default	$\frac{2B\sqrt{ex+d}}{c}-\frac{2A\sqrt{d}\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b}+\frac{2\left(Abce-A\,c^{2}d-b^{2}Be+Bbcd\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{cb\sqrt{c(be-cd)}}$	103
pseudoelliptic	$-\frac{2\left(-(be-cd)(Ac-Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)+\left(A\sqrt{d}\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)c-B\sqrt{ex+d}\,b\right)\sqrt{c(be-cd)}\right)}{\sqrt{c(be-cd)}\,bc}$	105

input
```
int((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
2*B*(e*x+d)^(1/2)/c-2*A*d^(1/2)*arctanh((e*x+d)^(1/2)/d^(1/2))/b+2/c*(A*b*
c*e-A*c^2*d-B*b^2*e+B*b*c*d)/b/(c*(b*e-c*d))^(1/2)*arctan(c*(e*x+d)^(1/2)/
(c*(b*e-c*d))^(1/2))
```

Fricas [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 444, normalized size of antiderivative = 4.40

$$\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}\,dx$$
$$=\left[\frac{Ac\sqrt{d}\log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)+2\sqrt{ex+d}Bb-(Bb-Ac)\sqrt{\frac{cd-be}{c}}\log\left(\frac{cex+2\,cd-be+2\sqrt{ex+d}c\sqrt{\frac{cd-be}{c}}}{cx+b}\right)}{bc},\ \frac{Ac\cdots}{\cdots}\right.$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
[(A*c*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + 2*sqrt(e*x +
d)*B*b - (B*b - A*c)*sqrt((c*d - b*e)/c)*log((c*e*x + 2*c*d - b*e + 2*sqrt
(e*x + d)*c*sqrt((c*d - b*e)/c))/(c*x + b)))/(b*c), (A*c*sqrt(d)*log((e*x
- 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + 2*sqrt(e*x + d)*B*b - 2*(B*b - A*c)*
sqrt(-(c*d - b*e)/c)*arctan(-sqrt(e*x + d)*c*sqrt(-(c*d - b*e)/c)/(c*d - b
*e)))/(b*c), (2*A*c*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x + d)) + 2*sqrt(e*x +
 d)*B*b - (B*b - A*c)*sqrt((c*d - b*e)/c)*log((c*e*x + 2*c*d - b*e + 2*sqr
t(e*x + d)*c*sqrt((c*d - b*e)/c))/(c*x + b)))/(b*c), 2*(A*c*sqrt(-d)*arcta
n(sqrt(-d)/sqrt(e*x + d)) + sqrt(e*x + d)*B*b - (B*b - A*c)*sqrt(-(c*d - b
*e)/c)*arctan(-sqrt(e*x + d)*c*sqrt(-(c*d - b*e)/c)/(c*d - b*e)))/(b*c)]
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 197 vs. $2(90) = 180$.

Time = 8.99 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.95

$$\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}\,dx = \begin{cases} \frac{2\left(\frac{Ade\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{b\sqrt{-d}}+\frac{Be\sqrt{d+ex}}{c}-\frac{e(-Ac+Bb)(be-cd)\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{\frac{be-cd}{c}}}\right)}{bc^2\sqrt{\frac{be-cd}{c}}}\right)}{e} \\ \sqrt{d}\left(\frac{B\log\left(bx+cx^2\right)}{2c}+\left(A-\frac{Bb}{2c}\right)\left(-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=0\\ -\frac{\log\left(b-2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b}-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=\\ \frac{\log\left(b+2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherw}\end{cases}\right)}{b}\right.\right.\end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**(1/2)/(c*x**2+b*x),x)
```

output
```
Piecewise((2*(A*d*e*atan(sqrt(d + e*x)/sqrt(-d))/(b*sqrt(-d)) + B*e*sqrt(d
 + e*x)/c - e*(-A*c + B*b)*(b*e - c*d)*atan(sqrt(d + e*x)/sqrt((b*e - c*d)
/c))/(b*c**2*sqrt((b*e - c*d)/c)))/e, Ne(e, 0)), (sqrt(d)*(B*log(b*x + c*x
**2)/(2*c) + (A - B*b/(2*c))*(-2*c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0)),
(-log(b - 2*c*(b/(2*c) + x))/(2*c), True))/b - 2*c*Piecewise(((b/(2*c) + x
)/b, Eq(c, 0)), (log(b + 2*c*(b/(2*c) + x))/(2*c), True))/b)), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x),x, algorithm="maxima")
```

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

Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 109, normalized size of antiderivative = 1.08

$$\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}\,dx = \frac{2\,Ad\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b\sqrt{-d}} + \frac{2\,\sqrt{ex+d}B}{c} + \frac{2\,(Bbcd - Ac^2d - Bb^2e + Abce)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{\sqrt{-c^2d+bce}bc}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x),x, algorithm="giac")
```

output
```
2*A*d*arctan(sqrt(e*x + d)/sqrt(-d))/(b*sqrt(-d)) + 2*sqrt(e*x + d)*B/c +
2*(B*b*c*d - A*c^2*d - B*b^2*e + A*b*c*e)*arctan(sqrt(e*x + d)*c/sqrt(-c^2
*d + b*c*e))/(sqrt(-c^2*d + b*c*e)*b*c)
```

Mupad [B] (verification not implemented)

Time = 11.30 (sec) , antiderivative size = 2368, normalized size of antiderivative = 23.45

$$\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(1/2))/(b*x + c*x^2),x)
```

output
```
(2*B*(d + e*x)^(1/2))/c - (A*d^(1/2)*atan(((A*d^(1/2)*((8*(d + e*x)^(1/2)*
(B^2*b^4*e^4 + A^2*b^2*c^2*e^4 + 2*A^2*c^4*d^2*e^2 + B^2*b^2*c^2*d^2*e^2 -
 2*A^2*b*c^3*d*e^3 - 2*B^2*b^3*c*d*e^3 - 2*A*B*b^3*c*e^4 - 2*A*B*b*c^3*d^2
*e^2 + 4*A*B*b^2*c^2*d*e^3))/c + (A*d^(1/2)*((8*(B*b^3*c^2*d*e^3 - B*b^2*c
^3*d^2*e^2))/c + (8*A*d^(1/2)*(b^3*c^3*e^3 - 2*b^2*c^4*d*e^2)*(d + e*x)^(1
/2))/(b*c)))/b)*1i)/b + (A*d^(1/2)*((8*(d + e*x)^(1/2)*(B^2*b^4*e^4 + A^2*
b^2*c^2*e^4 + 2*A^2*c^4*d^2*e^2 + B^2*b^2*c^2*d^2*e^2 - 2*A^2*b*c^3*d*e^3
- 2*B^2*b^3*c*d*e^3 - 2*A*B*b^3*c*e^4 - 2*A*B*b*c^3*d^2*e^2 + 4*A*B*b^2*c^
2*d*e^3))/c - (A*d^(1/2)*((8*(B*b^3*c^2*d*e^3 - B*b^2*c^3*d^2*e^2))/c - (8
*A*d^(1/2)*(b^3*c^3*e^3 - 2*b^2*c^4*d*e^2)*(d + e*x)^(1/2))/(b*c)))/b)*1i)
/b)/((16*(A^3*c^3*d^2*e^3 - A*B^2*b^3*d*e^4 - A^3*b*c^2*d*e^4 + A^2*B*c^3*
d^3*e^2 + 2*A^2*B*b^2*c*d*e^4 - A*B^2*b*c^2*d^3*e^2 + 2*A*B^2*b^2*c*d^2*e^
3 - 3*A^2*B*b*c^2*d^2*e^3))/c - (A*d^(1/2)*((8*(d + e*x)^(1/2)*(B^2*b^4*e^
4 + A^2*b^2*c^2*e^4 + 2*A^2*c^4*d^2*e^2 + B^2*b^2*c^2*d^2*e^2 - 2*A^2*b*c^
3*d*e^3 - 2*B^2*b^3*c*d*e^3 - 2*A*B*b^3*c*e^4 - 2*A*B*b*c^3*d^2*e^2 + 4*A*
B*b^2*c^2*d*e^3))/c + (A*d^(1/2)*((8*(B*b^3*c^2*d*e^3 - B*b^2*c^3*d^2*e^2)
)/c + (8*A*d^(1/2)*(b^3*c^3*e^3 - 2*b^2*c^4*d*e^2)*(d + e*x)^(1/2))/(b*c))
)/b))/b + (A*d^(1/2)*((8*(d + e*x)^(1/2)*(B^2*b^4*e^4 + A^2*b^2*c^2*e^4 +
2*A^2*c^4*d^2*e^2 + B^2*b^2*c^2*d^2*e^2 - 2*A^2*b*c^3*d*e^3 - 2*B^2*b^3*c*
d*e^3 - 2*A*B*b^3*c*e^4 - 2*A*B*b*c^3*d^2*e^2 + 4*A*B*b^2*c^2*d*e^3))/c...
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.35

$$\int \frac{(A+Bx)\sqrt{d+ex}}{bx+cx^2}\,dx = \frac{2\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)ac-2\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)b^2+2\sqrt{ex+d}\,b^2c+\sqrt{d}\log\left(\sqrt{ex+\right.}{b\,c^2}$$

input
```
int((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x),x)
```

output
```
(2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)
))*a*c - 2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*
e - c*d)))*b**2 + 2*sqrt(d + e*x)*b**2*c + sqrt(d)*log(sqrt(d + e*x) - sqr
t(d))*a*c**2 - sqrt(d)*log(sqrt(d + e*x) + sqrt(d))*a*c**2)/(b*c**2)
```

3.72 $\int \frac{A+Bx}{\sqrt{d+ex}(bx+cx^2)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 86

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)}\,dx=-\frac{2A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b\sqrt{d}}-\frac{2(bB-Ac)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}\sqrt{cd-be}}$$

output
```
-2*A*arctanh((e*x+d)^(1/2)/d^(1/2))/b/d^(1/2)-2*(-A*c+B*b)*arctanh(c^(1/2)
*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b/c^(1/2)/(-b*e+c*d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.32 (sec) , antiderivative size = 84, normalized size of antiderivative = 0.98

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)}\,dx=\frac{2\left(\frac{(bB-Ac)\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{\sqrt{c}\sqrt{-cd+be}}-\frac{A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}}\right)}{b}$$

input
```
Integrate[(A + B*x)/(Sqrt[d + e*x]*(b*x + c*x^2)),x]
```

output
```
(2*(((b*B - A*c)*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(Sqrt
[c]*Sqrt[-(c*d) + b*e]) - (A*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/Sqrt[d]))/b
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 88, normalized size of antiderivative = 1.02, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {1197, 25, 1480, 221}

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

$$\int \frac{A+Bx}{(bx+cx^2)\sqrt{d+ex}}dx$$

$$\Big\downarrow \text{1197}$$

$$2\int -\frac{Bd-Ae-B(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}$$

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

$$-2\int \frac{Bd-Ae-B(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}$$

$$\Big\downarrow \text{1480}$$

$$2\left(\frac{(bB-Ac)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{b}+\frac{Ac\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{b}\right)$$

$$\Big\downarrow \text{221}$$

$$2\left(-\frac{(bB-Ac)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}\sqrt{cd-be}}-\frac{A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b\sqrt{d}}\right)$$

input
```
Int[(A + B*x)/(Sqrt[d + e*x]*(b*x + c*x^2)),x]
```

output
```
2*(-((A*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d])) - ((b*B - A*c)*ArcTan
h[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c]*Sqrt[c*d - b*e]))
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.30 (sec) , antiderivative size = 69, normalized size of antiderivative = 0.80

method	result	size
pseudoelliptic	$\frac{-\frac{2(Ac-Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{\sqrt{c(be-cd)}}-\frac{2A\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{\sqrt{d}}}{b}$	69
derivativedivides	$\frac{2(-Ac+Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{b\sqrt{c(be-cd)}}-\frac{2A\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\sqrt{d}}$	70
default	$\frac{2(-Ac+Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{b\sqrt{c(be-cd)}}-\frac{2A\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\sqrt{d}}$	70

input
```
int((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
2/b*(-(A*c-B*b)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))/(c*(b*e-c*d))^
(1/2)-A*arctanh((e*x+d)^(1/2)/d^(1/2))/d^(1/2))
```

Fricas [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 483, normalized size of antiderivative = 5.62

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)}\,dx$$
$$= \left[-\frac{\sqrt{c^2d-bce}(Bb-Ac)d\log\left(\frac{cex+2\,cd-be+2\,\sqrt{c^2d-bce}\sqrt{ex+d}}{cx+b}\right)-(Ac^2d-Abce)\sqrt{d}\log\left(\frac{ex-2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)}{bc^2d^2-b^2cde},\right.$$
$$-\frac{\sqrt{c^2d-bce}(Bb-Ac)d\log\left(\frac{cex+2\,cd-be+2\,\sqrt{c^2d-bce}\sqrt{ex+d}}{cx+b}\right)-2\,(Ac^2d-Abce)\sqrt{-d}\arctan\left(\frac{\sqrt{-d}}{\sqrt{ex+d}}\right)}{bc^2d^2-b^2cde},$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
[-(sqrt(c^2*d - b*c*e)*(B*b - A*c)*d*log((c*e*x + 2*c*d - b*e + 2*sqrt(c^2
*d - b*c*e)*sqrt(e*x + d))/(c*x + b)) - (A*c^2*d - A*b*c*e)*sqrt(d)*log((e
*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x))/(b*c^2*d^2 - b^2*c*d*e), (2*sqrt(-
c^2*d + b*c*e)*(B*b - A*c)*d*arctan(sqrt(-c^2*d + b*c*e)*sqrt(e*x + d)/(c*
e*x + c*d)) + (A*c^2*d - A*b*c*e)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(
d) + 2*d)/x))/(b*c^2*d^2 - b^2*c*d*e), -(sqrt(c^2*d - b*c*e)*(B*b - A*c)*d
*log((c*e*x + 2*c*d - b*e + 2*sqrt(c^2*d - b*c*e)*sqrt(e*x + d))/(c*x + b)
) - 2*(A*c^2*d - A*b*c*e)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x + d)))/(b*c^2*
d^2 - b^2*c*d*e), 2*(sqrt(-c^2*d + b*c*e)*(B*b - A*c)*d*arctan(sqrt(-c^2*d
 + b*c*e)*sqrt(e*x + d)/(c*e*x + c*d)) + (A*c^2*d - A*b*c*e)*sqrt(-d)*arct
an(sqrt(-d)/sqrt(e*x + d)))/(b*c^2*d^2 - b^2*c*d*e)]
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 172 vs. 2(78) = 156.

Time = 11.14 (sec) , antiderivative size = 172, normalized size of antiderivative = 2.00

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)}\,dx = \begin{cases} \frac{2\left(\frac{Ae\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{b\sqrt{-d}}+\frac{e(-Ac+Bb)\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{\frac{be-cd}{c}}}\right)}{bc\sqrt{\frac{be-cd}{c}}}\right)}{e} & \text{for } e \neq \\ \frac{\frac{B\log\left(bx+cx^2\right)}{2c}+\left(A-\frac{Bb}{2c}\right)\left(-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=0\\ -\frac{\log\left(b-2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b}-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=0\\ \frac{\log\left(b+2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b}\right)}{\sqrt{d}} & \text{otherw} \end{cases}$$

input
```
integrate((B*x+A)/(e*x+d)**(1/2)/(c*x**2+b*x),x)
```

output
```
Piecewise((2*(A*e*atan(sqrt(d + e*x)/sqrt(-d))/(b*sqrt(-d)) + e*(-A*c + B*
b)*atan(sqrt(d + e*x)/sqrt((b*e - c*d)/c))/(b*c*sqrt((b*e - c*d)/c)))/e, N
e(e, 0)), ((B*log(b*x + c*x**2)/(2*c) + (A - B*b/(2*c))*(-2*c*Piecewise(((
b/(2*c) + x)/b, Eq(c, 0)), (-log(b - 2*c*(b/(2*c) + x))/(2*c), True))/b -
2*c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0)), (log(b + 2*c*(b/(2*c) + x))/(2*
c), True))/b))/sqrt(d), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x),x, algorithm="maxima")
```

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

Giac [A] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 75, normalized size of antiderivative = 0.87

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)}\,dx = \frac{2\,(Bb-Ac)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{\sqrt{-c^2d+bce}b} + \frac{2\,A\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b\sqrt{-d}}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x),x, algorithm="giac")
```

output
```
2*(B*b - A*c)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/(sqrt(-c^2*d +
b*c*e)*b) + 2*A*arctan(sqrt(e*x + d)/sqrt(-d))/(b*sqrt(-d))
```

Mupad [B] (verification not implemented)

Time = 0.44 (sec) , antiderivative size = 1130, normalized size of antiderivative = 13.14

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)*(d + e*x)^(1/2)),x)
```

output
```
- (2*A*atanh((16*A^3*c^2*e^3*(d + e*x)^(1/2))/(d^(3/2)*((16*A^3*c^2*e^3)/d
 - 32*A^2*B*c^2*e^2 + 16*A*B^2*b*c*e^2)) - (32*A^2*B*c^2*e^2*(d + e*x)^(1/
2))/(d^(1/2)*((16*A^3*c^2*e^3)/d - 32*A^2*B*c^2*e^2 + 16*A*B^2*b*c*e^2)) +
 (16*A*B^2*b*c*e^2*(d + e*x)^(1/2))/(d^(1/2)*((16*A^3*c^2*e^3)/d - 32*A^2*
B*c^2*e^2 + 16*A*B^2*b*c*e^2))))/(b*d^(1/2)) - (atan(((((d + e*x)^(1/2)*(1
6*A^2*c^3*e^2 + 8*B^2*b^2*c*e^2 - 16*A*B*b*c^2*e^2) + ((A*c - B*b)*(-c*(b*
e - c*d))^(1/2)*(8*B*b^2*c^2*d*e^2 - 8*A*b^2*c^2*e^3 + ((8*b^3*c^2*e^3 - 1
6*b^2*c^3*d*e^2)*(A*c - B*b)*(-c*(b*e - c*d))^(1/2)*(d + e*x)^(1/2))/(b*c^
2*d - b^2*c*e)))/(b*c^2*d - b^2*c*e))*(A*c - B*b)*(-c*(b*e - c*d))^(1/2)*1
i)/(b*c^2*d - b^2*c*e) + (((d + e*x)^(1/2)*(16*A^2*c^3*e^2 + 8*B^2*b^2*c*e
^2 - 16*A*B*b*c^2*e^2) + ((A*c - B*b)*(-c*(b*e - c*d))^(1/2)*(8*A*b^2*c^2*
e^3 - 8*B*b^2*c^2*d*e^2 + ((8*b^3*c^2*e^3 - 16*b^2*c^3*d*e^2)*(A*c - B*b)*
(-c*(b*e - c*d))^(1/2)*(d + e*x)^(1/2))/(b*c^2*d - b^2*c*e)))/(b*c^2*d - b
^2*c*e))*(A*c - B*b)*(-c*(b*e - c*d))^(1/2)*1i)/(b*c^2*d - b^2*c*e))/((((d
 + e*x)^(1/2)*(16*A^2*c^3*e^2 + 8*B^2*b^2*c*e^2 - 16*A*B*b*c^2*e^2) + ((A*
c - B*b)*(-c*(b*e - c*d))^(1/2)*(8*B*b^2*c^2*d*e^2 - 8*A*b^2*c^2*e^3 + ((8
*b^3*c^2*e^3 - 16*b^2*c^3*d*e^2)*(A*c - B*b)*(-c*(b*e - c*d))^(1/2)*(d + e
*x)^(1/2))/(b*c^2*d - b^2*c*e)))/(b*c^2*d - b^2*c*e))*(A*c - B*b)*(-c*(b*e
 - c*d))^(1/2))/(b*c^2*d - b^2*c*e) - (((d + e*x)^(1/2)*(16*A^2*c^3*e^2 +
8*B^2*b^2*c*e^2 - 16*A*B*b*c^2*e^2) + ((A*c - B*b)*(-c*(b*e - c*d))^(1/...
```

Reduce [B] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 178, normalized size of antiderivative = 2.07

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)}\,dx$$

$$= \frac{-2\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)acd+2\sqrt{c}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)b^2d+\sqrt{d}\log\left(\sqrt{ex+d}-\sqrt{d}\right)ab \ldots}{bcd\,(be-\ldots}$$

input
```
int((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x),x)
```

output
```
( - 2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c
*d)))*a*c*d + 2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sq
rt(b*e - c*d)))*b**2*d + sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*b*c*e - sq
rt(d)*log(sqrt(d + e*x) - sqrt(d))*a*c**2*d - sqrt(d)*log(sqrt(d + e*x) +
sqrt(d))*a*b*c*e + sqrt(d)*log(sqrt(d + e*x) + sqrt(d))*a*c**2*d)/(b*c*d*(
b*e - c*d))
```

3.73 $\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 118

$$\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)}\,dx = \frac{2(Bd-Ae)}{d(cd-be)\sqrt{d+ex}} - \frac{2A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{bd^{3/2}} - \frac{2\sqrt{c}(bB-Ac)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b(cd-be)^{3/2}}$$

output
```
2*(-A*e+B*d)/d/(-b*e+c*d)/(e*x+d)^(1/2)-2*A*arctanh((e*x+d)^(1/2)/d^(1/2))
/b/d^(3/2)-2*c^(1/2)*(-A*c+B*b)*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(
1/2))/b/(-b*e+c*d)^(3/2)
```

Mathematica [A] (verified)

Time = 0.58 (sec) , antiderivative size = 118, normalized size of antiderivative = 1.00

$$\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)}\,dx = \frac{2(Bd-Ae)}{d(cd-be)\sqrt{d+ex}} + \frac{2\sqrt{c}(-bB+Ac)\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{b(-cd+be)^{3/2}} - \frac{2A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{bd^{3/2}}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(3/2)*(b*x + c*x^2)),x]
```

output
```
(2*(B*d - A*e))/(d*(c*d - b*e)*Sqrt[d + e*x]) + (2*Sqrt[c]*(-(b*B) + A*c)*
ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(b*(-(c*d) + b*e)^(3/2
)) - (2*A*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*d^(3/2))
```

Rubi [A] (verified)

Time = 0.75 (sec) , antiderivative size = 143, normalized size of antiderivative = 1.21, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {1198, 1197, 25, 1480, 221}

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

$$\int \frac{A+Bx}{(bx+cx^2)(d+ex)^{3/2}}dx$$

$$\Big\downarrow \ 1198$$

$$\frac{\int \frac{A(cd-be)+c(Bd-Ae)x}{\sqrt{d+ex}(cx^2+bx)}dx}{d(cd-be)}+\frac{2(Bd-Ae)}{d\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \ 1197$$

$$\frac{2\int -\frac{Bcd^2-Ae(2cd-be)-c(Bd-Ae)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}+\frac{2(Bd-Ae)}{d\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \ 25$$

$$\frac{2(Bd-Ae)}{d\sqrt{d+ex}(cd-be)}-\frac{2\int \frac{Bcd^2-Ae(2cd-be)-c(Bd-Ae)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}$$

$$\Big\downarrow \ 1480$$

$$\frac{2\left(\frac{cd(bB-Ac)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{b}+\frac{Ac(cd-be)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{b}\right)}{d(cd-be)}+\frac{2(Bd-Ae)}{d\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \ 221$$

$$\frac{2\left(-\frac{\sqrt{c}d(bB-Ac)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{cd-be}}-\frac{A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)}{b\sqrt{d}}\right)}{d(cd-be)}+\frac{2(Bd-Ae)}{d\sqrt{d+ex}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^(3/2)*(b*x + c*x^2)),x]
```

output
```
(2*(B*d - A*e))/(d*(c*d - b*e)*Sqrt[d + e*x]) + (2*(-((A*(c*d - b*e)*ArcTa
nh[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d])) - (Sqrt[c]*(b*B - A*c)*d*ArcTanh[(
Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c*d - b*e])))/(d*(c*d - b
*e))
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1198
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[(e*f - d*g)*((d + e*x)^(m + 1)/((m + 1)*(c
*d^2 - b*d*e + a*e^2))), x] + Simp[1/(c*d^2 - b*d*e + a*e^2)   Int[(d + e*x
)^(m + 1)*(Simp[c*d*f - f*b*e + a*e*g - c*(e*f - d*g)*x, x]/(a + b*x + c*x^
2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] && LtQ[m, -1
]
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.32 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.94

method	result	size
derivativedivides	$-\frac{2(-Ae+Bd)}{d(be-cd)\sqrt{ex+d}}-\frac{2A\ \operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\,d^{\frac{3}{2}}}+\frac{2(Ac-Bb)c\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{(be-cd)b\sqrt{c(be-cd)}}$	111
default	$-\frac{2(-Ae+Bd)}{d(be-cd)\sqrt{ex+d}}-\frac{2A\ \operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\,d^{\frac{3}{2}}}+\frac{2(Ac-Bb)c\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{(be-cd)b\sqrt{c(be-cd)}}$	111
pseudoelliptic	$\frac{2Ae-2Bd}{d(be-cd)\sqrt{ex+d}}-\frac{2A\ \operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\,d^{\frac{3}{2}}}+\frac{2(Ac-Bb)c\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{(be-cd)b\sqrt{c(be-cd)}}$	111

input
```
int((B*x+A)/(e*x+d)^(3/2)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
-2*(-A*e+B*d)/d/(b*e-c*d)/(e*x+d)^(1/2)-2*A*arctanh((e*x+d)^(1/2)/d^(1/2))
/b/d^(3/2)+2/(b*e-c*d)*(A*c-B*b)*c/b/(c*(b*e-c*d))^(1/2)*arctan(c*(e*x+d)^
(1/2)/(c*(b*e-c*d))^(1/2))
```

Fricas [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 787, normalized size of antiderivative = 6.67

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx+cx^2\right)}\,dx = \text{Too large to display}$$

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

output
```
[(((B*b - A*c)*d^2*e*x + (B*b - A*c)*d^3)*sqrt(c/(c*d - b*e))*log((c*e*x +
 2*c*d - b*e - 2*(c*d - b*e)*sqrt(e*x + d)*sqrt(c/(c*d - b*e)))/(c*x + b))
 + (A*c*d^2 - A*b*d*e + (A*c*d*e - A*b*e^2)*x)*sqrt(d)*log((e*x - 2*sqrt(e
*x + d)*sqrt(d) + 2*d)/x) + 2*(B*b*d^2 - A*b*d*e)*sqrt(e*x + d))/(b*c*d^4
- b^2*d^3*e + (b*c*d^3*e - b^2*d^2*e^2)*x), (2*((B*b - A*c)*d^2*e*x + (B*b
 - A*c)*d^3)*sqrt(-c/(c*d - b*e))*arctan(sqrt(e*x + d)*sqrt(-c/(c*d - b*e)
)) + (A*c*d^2 - A*b*d*e + (A*c*d*e - A*b*e^2)*x)*sqrt(d)*log((e*x - 2*sqrt
(e*x + d)*sqrt(d) + 2*d)/x) + 2*(B*b*d^2 - A*b*d*e)*sqrt(e*x + d))/(b*c*d^
4 - b^2*d^3*e + (b*c*d^3*e - b^2*d^2*e^2)*x), (2*(A*c*d^2 - A*b*d*e + (A*c
*d*e - A*b*e^2)*x)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x + d)) + ((B*b - A*c)*
d^2*e*x + (B*b - A*c)*d^3)*sqrt(c/(c*d - b*e))*log((c*e*x + 2*c*d - b*e -
2*(c*d - b*e)*sqrt(e*x + d)*sqrt(c/(c*d - b*e)))/(c*x + b)) + 2*(B*b*d^2 -
 A*b*d*e)*sqrt(e*x + d))/(b*c*d^4 - b^2*d^3*e + (b*c*d^3*e - b^2*d^2*e^2)*
x), 2*(((B*b - A*c)*d^2*e*x + (B*b - A*c)*d^3)*sqrt(-c/(c*d - b*e))*arctan
(sqrt(e*x + d)*sqrt(-c/(c*d - b*e))) + (A*c*d^2 - A*b*d*e + (A*c*d*e - A*b
*e^2)*x)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x + d)) + (B*b*d^2 - A*b*d*e)*sqr
t(e*x + d))/(b*c*d^4 - b^2*d^3*e + (b*c*d^3*e - b^2*d^2*e^2)*x)]
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 206 vs. $2(102) = 204$.

Time = 13.27 (sec) , antiderivative size = 206, normalized size of antiderivative = 1.75

$$\int \frac{A+Bx}{(d+ex)^{3/2}\,(bx+cx^2)}\,dx = \begin{cases} \frac{2\left(\frac{Ae\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{bd\sqrt{-d}} - \frac{e(-Ae+Bd)}{d\sqrt{d+ex}(be-cd)} - \frac{e(-Ac+Bb)\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{\frac{be-cd}{c}}}\right)}{b\sqrt{\frac{be-cd}{c}}(be-cd)}\right)}{e} \\ \frac{\frac{B\log\left(bx+cx^2\right)}{2c} + \left(A-\frac{Bb}{2c}\right)\left(-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=0\\ -\frac{\log\left(b-2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b} - \frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} \\ \frac{\log\left(b+2c\left(\frac{b}{2c}+\cdots\right.\right.}{2c}\end{cases}\right.}{\cdots}\right.}{d^{\frac{3}{2}}} \end{cases}$$

input
```
integrate((B*x+A)/(e*x+d)**(3/2)/(c*x**2+b*x),x)
```

output
```
Piecewise((2*(A*e*atan(sqrt(d + e*x)/sqrt(-d))/(b*d*sqrt(-d)) - e*(-A*e +
B*d)/(d*sqrt(d + e*x)*(b*e - c*d)) - e*(-A*c + B*b)*atan(sqrt(d + e*x)/sqr
t((b*e - c*d)/c))/(b*sqrt((b*e - c*d)/c)*(b*e - c*d)))/e, Ne(e, 0)), ((B*l
og(b*x + c*x**2)/(2*c) + (A - B*b/(2*c))*(-2*c*Piecewise(((b/(2*c) + x)/b,
 Eq(c, 0)), (-log(b - 2*c*(b/(2*c) + x))/(2*c), True))/b - 2*c*Piecewise((
(b/(2*c) + x)/b, Eq(c, 0)), (log(b + 2*c*(b/(2*c) + x))/(2*c), True))/b))/
d**(3/2), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^{3/2}\,(bx+cx^2)}\,dx = \text{Exception raised: ValueError}$$

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

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

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 121, normalized size of antiderivative = 1.03

$$\int \frac{A+Bx}{(d+ex)^{3/2}\,(bx+cx^2)}\,dx = \frac{2\,(Bbc-Ac^2)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{(bcd-b^2e)\sqrt{-c^2d+bce}} + \frac{2\,(Bd-Ae)}{(cd^2-bde)\sqrt{ex+d}} + \frac{2\,A\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b\sqrt{-d}d}$$

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

output
```
2*(B*b*c - A*c^2)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/((b*c*d - b
^2*e)*sqrt(-c^2*d + b*c*e)) + 2*(B*d - A*e)/((c*d^2 - b*d*e)*sqrt(e*x + d)
) + 2*A*arctan(sqrt(e*x + d)/sqrt(-d))/(b*sqrt(-d)*d)
```

Mupad [B] (verification not implemented)

Time = 12.50 (sec) , antiderivative size = 3674, normalized size of antiderivative = 31.14

$$\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)*(d + e*x)^(3/2)),x)
```

output
```
(atan((((A*c - B*b)*(-c*(b*e - c*d)^3)^(1/2)*((d + e*x)^(1/2)*(16*A^2*c^8*
d^8*e^2 + 104*A^2*b^2*c^6*d^6*e^4 - 88*A^2*b^3*c^5*d^5*e^5 + 40*A^2*b^4*c^
4*d^4*e^6 - 8*A^2*b^5*c^3*d^3*e^7 + 8*B^2*b^2*c^6*d^8*e^2 - 24*B^2*b^3*c^5
*d^7*e^3 + 24*B^2*b^4*c^4*d^6*e^4 - 8*B^2*b^5*c^3*d^5*e^5 - 64*A^2*b*c^7*d
^7*e^3 - 16*A*B*b*c^7*d^8*e^2 + 48*A*B*b^2*c^6*d^7*e^3 - 48*A*B*b^3*c^5*d^
6*e^4 + 16*A*B*b^4*c^4*d^5*e^5) - ((A*c - B*b)*(-c*(b*e - c*d)^3)^(1/2)*((
(A*c - B*b)*(-c*(b*e - c*d)^3)^(1/2)*(d + e*x)^(1/2)*(16*b^2*c^8*d^11*e^2
- 88*b^3*c^7*d^10*e^3 + 200*b^4*c^6*d^9*e^4 - 240*b^5*c^5*d^8*e^5 + 160*b^
6*c^4*d^7*e^6 - 56*b^7*c^3*d^6*e^7 + 8*b^8*c^2*d^5*e^8))/(b^4*e^3 - b*c^3*
d^3 + 3*b^2*c^2*d^2*e - 3*b^3*c*d*e^2) - 16*A*b^2*c^7*d^9*e^3 + 72*A*b^3*c
^6*d^8*e^4 - 128*A*b^4*c^5*d^7*e^5 + 112*A*b^5*c^4*d^6*e^6 - 48*A*b^6*c^3*
d^5*e^7 + 8*A*b^7*c^2*d^4*e^8 + 8*B*b^2*c^7*d^10*e^2 - 32*B*b^3*c^6*d^9*e^
3 + 48*B*b^4*c^5*d^8*e^4 - 32*B*b^5*c^4*d^7*e^5 + 8*B*b^6*c^3*d^6*e^6))/(b
^4*e^3 - b*c^3*d^3 + 3*b^2*c^2*d^2*e - 3*b^3*c*d*e^2))*1i)/(b^4*e^3 - b*c^
3*d^3 + 3*b^2*c^2*d^2*e - 3*b^3*c*d*e^2) + ((A*c - B*b)*(-c*(b*e - c*d)^3)
^(1/2)*((d + e*x)^(1/2)*(16*A^2*c^8*d^8*e^2 + 104*A^2*b^2*c^6*d^6*e^4 - 88
*A^2*b^3*c^5*d^5*e^5 + 40*A^2*b^4*c^4*d^4*e^6 - 8*A^2*b^5*c^3*d^3*e^7 + 8*
B^2*b^2*c^6*d^8*e^2 - 24*B^2*b^3*c^5*d^7*e^3 + 24*B^2*b^4*c^4*d^6*e^4 - 8*
B^2*b^5*c^3*d^5*e^5 - 64*A^2*b*c^7*d^7*e^3 - 16*A*B*b*c^7*d^8*e^2 + 48*A*B
*b^2*c^6*d^7*e^3 - 48*A*B*b^3*c^5*d^6*e^4 + 16*A*B*b^4*c^4*d^5*e^5) - (...
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 335, normalized size of antiderivative = 2.84

$$\int \frac{A+Bx}{(d+ex)^{3/2}\,(bx+cx^2)}\,dx = \frac{2\sqrt{c}\,\sqrt{ex+d}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{ex+d}\,c}{\sqrt{c}\,\sqrt{be-cd}}\right)ac\,d^2 - 2\sqrt{c}\,\sqrt{ex+d}\,\sqrt{be-cd}\,atan$$

input
```
int((B*x+A)/(e*x+d)^(3/2)/(c*x^2+b*x),x)
```

output
```
(2*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*s
qrt(b*e - c*d)))*a*c*d**2 - 2*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((
sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*d**2 + sqrt(d)*sqrt(d + e
*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**2*e**2 - 2*sqrt(d)*sqrt(d + e*x)*log
(sqrt(d + e*x) - sqrt(d))*a*b*c*d*e + sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e
*x) - sqrt(d))*a*c**2*d**2 - sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) + sqr
t(d))*a*b**2*e**2 + 2*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) + sqrt(d))*a
*b*c*d*e - sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) + sqrt(d))*a*c**2*d**2
+ 2*a*b**2*d*e**2 - 2*a*b*c*d**2*e - 2*b**3*d**2*e + 2*b**2*c*d**3)/(sqrt(
d + e*x)*b*d**2*(b**2*e**2 - 2*b*c*d*e + c**2*d**2))
```

3.74 $\int \frac{A+Bx}{(d+ex)^{5/2}(bx+cx^2)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 164

$$\int \frac{A+Bx}{(d+ex)^{5/2}(bx+cx^2)}\,dx = \frac{2(Bd-Ae)}{3d(cd-be)(d+ex)^{3/2}} + \frac{2(Bcd^2-Ae(2cd-be))}{d^2(cd-be)^2\sqrt{d+ex}} - \frac{2A\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{bd^{5/2}} - \frac{2c^{3/2}(bB-Ac)\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b(cd-be)^{5/2}}$$

output
```
2/3*(-A*e+B*d)/d/(-b*e+c*d)/(e*x+d)^(3/2)+2*(B*c*d^2-A*e*(-b*e+2*c*d))/d^2
/(-b*e+c*d)^2/(e*x+d)^(1/2)-2*A*arctanh((e*x+d)^(1/2)/d^(1/2))/b/d^(5/2)-2
*c^(3/2)*(-A*c+B*b)*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b/(-b*
e+c*d)^(5/2)
```

Mathematica [A] (verified)

Time = 0.72 (sec) , antiderivative size = 159, normalized size of antiderivative = 0.97

$$\int \frac{A+Bx}{(d+ex)^{5/2}(bx+cx^2)}\,dx = \frac{2(Bd^2(4cd-be+3cex)+Ae(be(4d+3ex)-cd(7d+6ex)))}{3d^2(cd-be)^2(d+ex)^{3/2}} - \frac{2c^{3/2}(-bB+Ac)\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{b(-cd+be)^{5/2}} - \frac{2A\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{bd^{5/2}}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(5/2)*(b*x + c*x^2)),x]
```

output
```
(2*(B*d^2*(4*c*d - b*e + 3*c*e*x) + A*e*(b*e*(4*d + 3*e*x) - c*d*(7*d + 6*
e*x))))/(3*d^2*(c*d - b*e)^2*(d + e*x)^(3/2)) - (2*c^(3/2)*(-(b*B) + A*c)*
ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(b*(-(c*d) + b*e)^(5/2
)) - (2*A*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*d^(5/2))
```

Rubi [A] (verified)

Time = 0.88 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.27, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {1198, 1198, 1197, 25, 1480, 221}

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

$$\int \frac{A+Bx}{(bx+cx^2)(d+ex)^{5/2}}dx$$

$$\Big\downarrow \ 1198$$

$$\frac{\int \frac{A(cd-be)+c(Bd-Ae)x}{(d+ex)^{3/2}(cx^2+bx)}dx}{d(cd-be)}+\frac{2(Bd-Ae)}{3d(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \ 1198$$

$$\frac{\frac{\int \frac{A(cd-be)^2+c\left(Bcd^2-Ae(2cd-be)\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{d(cd-be)}+\frac{2\left(Bcd^2-Ae(2cd-be)\right)}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2(Bd-Ae)}{3d(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \ 1197$$

$$\frac{\frac{2\int -\frac{Bc^2d^3-Ae\left(3c^2d^2-3bced+b^2e^2\right)-c\left(Bcd^2-Ae(2cd-be)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}+\frac{2\left(Bcd^2-Ae(2cd-be)\right)}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2(Bd-Ae)}{3d(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \ 25$$

$$\frac{\frac{2(Bcd^2-Ae(2cd-be))}{d\sqrt{d+ex}(cd-be)}-\frac{2\int \frac{Bc^2d^3-Ae\left(3c^2d^2-3bced+b^2e^2\right)-c\left(Bcd^2-Ae(2cd-be)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}}{d(cd-be)}+\frac{2(Bd-Ae)}{3d(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \text{1480}$$

$$\frac{\frac{2\left(\frac{c^2d^2(bB-Ac)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{b}+\frac{Ac(cd-be)^2\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{b}\right)}{d(cd-be)}+\frac{2(Bcd^2-Ae(2cd-be))}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2(Bd-Ae)}{3d(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \text{221}$$

$$\frac{\frac{2\left(-\frac{c^{3/2}d^2(bB-Ac)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{cd-be}}-\frac{A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)^2}{b\sqrt{d}}\right)}{d(cd-be)}+\frac{2(Bcd^2-Ae(2cd-be))}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2(Bd-Ae)}{3d(d+ex)^{3/2}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^(5/2)*(b*x + c*x^2)),x]
```

output
```
(2*(B*d - A*e))/(3*d*(c*d - b*e)*(d + e*x)^(3/2)) + ((2*(B*c*d^2 - A*e*(2*
c*d - b*e)))/(d*(c*d - b*e)*Sqrt[d + e*x]) + (2*(-((A*(c*d - b*e)^2*ArcTan
h[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d])) - (c^(3/2)*(b*B - A*c)*d^2*ArcTanh[
(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c*d - b*e])))/(d*(c*d -
b*e)))/(d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1198
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[(e*f - d*g)*((d + e*x)^(m + 1)/((m + 1)*(c
*d^2 - b*d*e + a*e^2))), x] + Simp[1/(c*d^2 - b*d*e + a*e^2)   Int[(d + e*x
)^(m + 1)*(Simp[c*d*f - f*b*e + a*e*g - c*(e*f - d*g)*x, x]/(a + b*x + c*x^
2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] && LtQ[m, -1
]
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.28 (sec) , antiderivative size = 155, normalized size of antiderivative = 0.95

method	result
pseudoelliptic	$\frac{\frac{2Ae}{3}-\frac{2Bd}{3}}{d(be-cd)(ex+d)^{\frac{3}{2}}}+\frac{2Ab\,e^2-4Acde+2Bc\,d^2}{\sqrt{ex+d}\,d^2(be-cd)^2}-\frac{2c^2(Ac-Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{(be-cd)^2b\sqrt{c(be-cd)}}-\frac{2A\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\,d^{\frac{5}{2}}}$
derivativedivides	$-\frac{2(-Ae+Bd)}{3d(be-cd)(ex+d)^{\frac{3}{2}}}-\frac{2(-Ab\,e^2+2Acde-Bc\,d^2)}{d^2(be-cd)^2\sqrt{ex+d}}-\frac{2c^2(Ac-Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{(be-cd)^2b\sqrt{c(be-cd)}}-\frac{2A\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\,d^{\frac{5}{2}}}$
default	$-\frac{2(-Ae+Bd)}{3d(be-cd)(ex+d)^{\frac{3}{2}}}-\frac{2(-Ab\,e^2+2Acde-Bc\,d^2)}{d^2(be-cd)^2\sqrt{ex+d}}-\frac{2c^2(Ac-Bb)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{(be-cd)^2b\sqrt{c(be-cd)}}-\frac{2A\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\,d^{\frac{5}{2}}}$

input
```
int((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
2/3*(A*e-B*d)/d/(b*e-c*d)/(e*x+d)^(3/2)+(2*A*b*e^2-4*A*c*d*e+2*B*c*d^2)/(e
*x+d)^(1/2)/d^2/(b*e-c*d)^2-2/(b*e-c*d)^2*c^2*(A*c-B*b)/b/(c*(b*e-c*d))^(1
/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))-2*A*arctanh((e*x+d)^(1/2)/
d^(1/2))/b/d^(5/2)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 397 vs. $2(142) = 284$.

Time = 0.91 (sec) , antiderivative size = 1664, normalized size of antiderivative = 10.15

$$\int \frac{A + Bx}{(d + ex)^{5/2} (bx + cx^2)} dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
[-1/3*(3*((B*b*c - A*c^2)*d^3*e^2*x^2 + 2*(B*b*c - A*c^2)*d^4*e*x + (B*b*c
 - A*c^2)*d^5)*sqrt(c/(c*d - b*e))*log((c*e*x + 2*c*d - b*e + 2*(c*d - b*e
)*sqrt(e*x + d)*sqrt(c/(c*d - b*e)))/(c*x + b)) - 3*(A*c^2*d^4 - 2*A*b*c*d
^3*e + A*b^2*d^2*e^2 + (A*c^2*d^2*e^2 - 2*A*b*c*d*e^3 + A*b^2*e^4)*x^2 + 2
*(A*c^2*d^3*e - 2*A*b*c*d^2*e^2 + A*b^2*d*e^3)*x)*sqrt(d)*log((e*x - 2*sqr
t(e*x + d)*sqrt(d) + 2*d)/x) - 2*(4*B*b*c*d^4 + 4*A*b^2*d^2*e^2 - (B*b^2 +
 7*A*b*c)*d^3*e + 3*(B*b*c*d^3*e - 2*A*b*c*d^2*e^2 + A*b^2*d*e^3)*x)*sqrt(
e*x + d))/(b*c^2*d^7 - 2*b^2*c*d^6*e + b^3*d^5*e^2 + (b*c^2*d^5*e^2 - 2*b^
2*c*d^4*e^3 + b^3*d^3*e^4)*x^2 + 2*(b*c^2*d^6*e - 2*b^2*c*d^5*e^2 + b^3*d^
4*e^3)*x), 1/3*(6*((B*b*c - A*c^2)*d^3*e^2*x^2 + 2*(B*b*c - A*c^2)*d^4*e*x
 + (B*b*c - A*c^2)*d^5)*sqrt(-c/(c*d - b*e))*arctan(sqrt(e*x + d)*sqrt(-c/
(c*d - b*e))) + 3*(A*c^2*d^4 - 2*A*b*c*d^3*e + A*b^2*d^2*e^2 + (A*c^2*d^2*
e^2 - 2*A*b*c*d*e^3 + A*b^2*e^4)*x^2 + 2*(A*c^2*d^3*e - 2*A*b*c*d^2*e^2 +
A*b^2*d*e^3)*x)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + 2*(
4*B*b*c*d^4 + 4*A*b^2*d^2*e^2 - (B*b^2 + 7*A*b*c)*d^3*e + 3*(B*b*c*d^3*e -
 2*A*b*c*d^2*e^2 + A*b^2*d*e^3)*x)*sqrt(e*x + d))/(b*c^2*d^7 - 2*b^2*c*d^6
*e + b^3*d^5*e^2 + (b*c^2*d^5*e^2 - 2*b^2*c*d^4*e^3 + b^3*d^3*e^4)*x^2 + 2
*(b*c^2*d^6*e - 2*b^2*c*d^5*e^2 + b^3*d^4*e^3)*x), 1/3*(6*(A*c^2*d^4 - 2*A
*b*c*d^3*e + A*b^2*d^2*e^2 + (A*c^2*d^2*e^2 - 2*A*b*c*d*e^3 + A*b^2*e^4)*x
^2 + 2*(A*c^2*d^3*e - 2*A*b*c*d^2*e^2 + A*b^2*d*e^3)*x)*sqrt(-d)*arctan...
```

Sympy [A] (verification not implemented)

Time = 10.89 (sec) , antiderivative size = 258, normalized size of antiderivative = 1.57

$$\int \frac{A+Bx}{(d+ex)^{5/2}\,(bx+cx^2)}\,dx = \begin{cases} \frac{2\left(\frac{Ae\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{bd^2\sqrt{-d}} - \frac{e(-Ae+Bd)}{3d(d+ex)^{\frac{3}{2}}(be-cd)} + \frac{e\left(Abe^2-2Acde+Bcd^2\right)}{d^2\sqrt{d+ex}(be-cd)^2} + \frac{ce(-Ac+Bb)\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{\frac{be-cd}{c}}}\right)}{b\sqrt{\frac{be-cd}{c}}(be-cd)^2}\right)}{e} \\ \frac{\frac{B\log\left(bx+cx^2\right)}{2c} + \left(A-\frac{Bb}{2c}\right)\left(-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=0\\ -\frac{\log\left(b-2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b} - \frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} \\ \frac{\log\left(b+2c\left(\frac{b}{2c}+\right.\right.}{2c}\end{cases}\right)}{}\right)}{d^{\frac{5}{2}}} \end{cases}$$

input
```
integrate((B*x+A)/(e*x+d)**(5/2)/(c*x**2+b*x),x)
```

output
```
Piecewise((2*(A*e*atan(sqrt(d + e*x)/sqrt(-d))/(b*d**2*sqrt(-d)) - e*(-A*e
 + B*d)/(3*d*(d + e*x)**(3/2)*(b*e - c*d)) + e*(A*b*e**2 - 2*A*c*d*e + B*c
*d**2)/(d**2*sqrt(d + e*x)*(b*e - c*d)**2) + c*e*(-A*c + B*b)*atan(sqrt(d
+ e*x)/sqrt((b*e - c*d)/c))/(b*sqrt((b*e - c*d)/c)*(b*e - c*d)**2))/e, Ne(
e, 0)), ((B*log(b*x + c*x**2)/(2*c) + (A - B*b/(2*c))*(-2*c*Piecewise(((b/
(2*c) + x)/b, Eq(c, 0)), (-log(b - 2*c*(b/(2*c) + x))/(2*c), True))/b - 2*
c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0)), (log(b + 2*c*(b/(2*c) + x))/(2*c)
, True))/b))/d**(5/2), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^{5/2}\,(bx+cx^2)}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x),x, algorithm="maxima")
```

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

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 208, normalized size of antiderivative = 1.27

$$\int \frac{A+Bx}{(d+ex)^{5/2}\,(bx+cx^2)}\,dx = \frac{2\,(Bbc^2-Ac^3)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{(bc^2d^2-2\,b^2cde+b^3e^2)\sqrt{-c^2d+bce}} + \frac{2\,(3\,(ex+d)Bcd^2+Bcd^3-6\,(ex+d)Acde-Bbd^2e-Acd^2e+3\,(ex+d)Abe^2+Abde^2)}{3\,(c^2d^4-2\,bcd^3e+b^2d^2e^2)(ex+d)^{\frac{3}{2}}} + \frac{2\,A\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b\sqrt{-d}d^2}$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x),x, algorithm="giac")
```

output
```
2*(B*b*c^2 - A*c^3)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/((b*c^2*d
^2 - 2*b^2*c*d*e + b^3*e^2)*sqrt(-c^2*d + b*c*e)) + 2/3*(3*(e*x + d)*B*c*d
^2 + B*c*d^3 - 6*(e*x + d)*A*c*d*e - B*b*d^2*e - A*c*d^2*e + 3*(e*x + d)*A
*b*e^2 + A*b*d*e^2)/((c^2*d^4 - 2*b*c*d^3*e + b^2*d^2*e^2)*(e*x + d)^(3/2)
) + 2*A*arctan(sqrt(e*x + d)/sqrt(-d))/(b*sqrt(-d)*d^2)
```

Mupad [B] (verification not implemented)

Time = 12.95 (sec) , antiderivative size = 6340, normalized size of antiderivative = 38.66

$$\int \frac{A+Bx}{(d+ex)^{5/2}\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)*(d + e*x)^(5/2)),x)
```

output
```
(atan((((-c^3*(b*e - c*d)^5)^(1/2)*(A*c - B*b)*((d + e*x)^(1/2)*(16*A^2*c^
13*d^16*e^2 + 480*A^2*b^2*c^11*d^14*e^4 - 1120*A^2*b^3*c^10*d^13*e^5 + 180
0*A^2*b^4*c^9*d^12*e^6 - 2064*A^2*b^5*c^8*d^11*e^7 + 1688*A^2*b^6*c^7*d^10
*e^8 - 960*A^2*b^7*c^6*d^9*e^9 + 360*A^2*b^8*c^5*d^8*e^10 - 80*A^2*b^9*c^4
*d^7*e^11 + 8*A^2*b^10*c^3*d^6*e^12 + 8*B^2*b^2*c^11*d^16*e^2 - 48*B^2*b^3
*c^10*d^15*e^3 + 120*B^2*b^4*c^9*d^14*e^4 - 160*B^2*b^5*c^8*d^13*e^5 + 120
*B^2*b^6*c^7*d^12*e^6 - 48*B^2*b^7*c^6*d^11*e^7 + 8*B^2*b^8*c^5*d^10*e^8 -
 128*A^2*b*c^12*d^15*e^3 - 16*A*B*b*c^12*d^16*e^2 + 96*A*B*b^2*c^11*d^15*e
^3 - 240*A*B*b^3*c^10*d^14*e^4 + 320*A*B*b^4*c^9*d^13*e^5 - 240*A*B*b^5*c^
8*d^12*e^6 + 96*A*B*b^6*c^7*d^11*e^7 - 16*A*B*b^7*c^6*d^10*e^8) - ((-c^3*(
b*e - c*d)^5)^(1/2)*(A*c - B*b)*(((-c^3*(b*e - c*d)^5)^(1/2)*(A*c - B*b)*(
d + e*x)^(1/2)*(16*b^2*c^13*d^21*e^2 - 168*b^3*c^12*d^20*e^3 + 800*b^4*c^1
1*d^19*e^4 - 2280*b^5*c^10*d^18*e^5 + 4320*b^6*c^9*d^17*e^6 - 5712*b^7*c^8
*d^16*e^7 + 5376*b^8*c^7*d^15*e^8 - 3600*b^9*c^6*d^14*e^9 + 1680*b^10*c^5*
d^13*e^10 - 520*b^11*c^4*d^12*e^11 + 96*b^12*c^3*d^11*e^12 - 8*b^13*c^2*d^
10*e^13))/(b^6*e^5 - b*c^5*d^5 + 5*b^2*c^4*d^4*e - 10*b^3*c^3*d^3*e^2 + 10
*b^4*c^2*d^2*e^3 - 5*b^5*c*d*e^4) - 24*A*b^2*c^12*d^18*e^3 + 216*A*b^3*c^1
1*d^17*e^4 - 872*A*b^4*c^10*d^16*e^5 + 2080*A*b^5*c^9*d^15*e^6 - 3248*A*b^
6*c^8*d^14*e^7 + 3472*A*b^7*c^7*d^13*e^8 - 2576*A*b^8*c^6*d^12*e^9 + 1312*
A*b^9*c^5*d^11*e^10 - 440*A*b^10*c^4*d^10*e^11 + 88*A*b^11*c^3*d^9*e^12...
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 921, normalized size of antiderivative = 5.62

$$\int \frac{A+Bx}{(d+ex)^{5/2}\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x),x)
```

output
```
( - 6*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c
)*sqrt(b*e - c*d)))*a*c**2*d**4 - 6*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*
atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**2*d**3*e*x + 6*sqrt
(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e
 - c*d)))*b**2*c*d**4 + 6*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt
(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*c*d**3*e*x + 3*sqrt(d)*sqrt(d
 + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**3*d*e**3 + 3*sqrt(d)*sqrt(d + e*
x)*log(sqrt(d + e*x) - sqrt(d))*a*b**3*e**4*x - 9*sqrt(d)*sqrt(d + e*x)*lo
g(sqrt(d + e*x) - sqrt(d))*a*b**2*c*d**2*e**2 - 9*sqrt(d)*sqrt(d + e*x)*lo
g(sqrt(d + e*x) - sqrt(d))*a*b**2*c*d*e**3*x + 9*sqrt(d)*sqrt(d + e*x)*log
(sqrt(d + e*x) - sqrt(d))*a*b*c**2*d**3*e + 9*sqrt(d)*sqrt(d + e*x)*log(sq
rt(d + e*x) - sqrt(d))*a*b*c**2*d**2*e**2*x - 3*sqrt(d)*sqrt(d + e*x)*log(
sqrt(d + e*x) - sqrt(d))*a*c**3*d**4 - 3*sqrt(d)*sqrt(d + e*x)*log(sqrt(d
+ e*x) - sqrt(d))*a*c**3*d**3*e*x - 3*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e
*x) + sqrt(d))*a*b**3*d*e**3 - 3*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) +
 sqrt(d))*a*b**3*e**4*x + 9*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) + sqrt
(d))*a*b**2*c*d**2*e**2 + 9*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) + sqrt
(d))*a*b**2*c*d*e**3*x - 9*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) + sqrt(
d))*a*b*c**2*d**3*e - 9*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) + sqrt(d))
*a*b*c**2*d**2*e**2*x + 3*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) + sqr...
```

3.75 $\int \frac{A+Bx}{(d+ex)^{7/2}(bx+cx^2)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 225

$$\begin{aligned}\int \frac{A+Bx}{(d+ex)^{7/2}\,(bx+cx^2)}\,dx &= \frac{2(Bd-Ae)}{5d(cd-be)(d+ex)^{5/2}} \\ &+ \frac{2(Bcd^2-Ae(2cd-be))}{3d^2(cd-be)^2(d+ex)^{3/2}} + \frac{2(Bc^2d^3-Ae(3c^2d^2-3bcde+b^2e^2))}{d^3(cd-be)^3\sqrt{d+ex}} \\ &- \frac{2A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{bd^{7/2}} - \frac{2c^{5/2}(bB-Ac)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b(cd-be)^{7/2}}\end{aligned}$$

output

```
2/5*(-A*e+B*d)/d/(-b*e+c*d)/(e*x+d)^(5/2)+2/3*(B*c*d^2-A*e*(-b*e+2*c*d))/d
^2/(-b*e+c*d)^2/(e*x+d)^(3/2)+2*(B*c^2*d^3-A*e*(b^2*e^2-3*b*c*d*e+3*c^2*d^
2))/d^3/(-b*e+c*d)^3/(e*x+d)^(1/2)-2*A*arctanh((e*x+d)^(1/2)/d^(1/2))/b/d^
(7/2)-2*c^(5/2)*(-A*c+B*b)*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))
/b/(-b*e+c*d)^(7/2)
```

Mathematica [A] (verified)

Time = 1.07 (sec) , antiderivative size = 246, normalized size of antiderivative = 1.09

$$\int \frac{A+Bx}{(d+ex)^{7/2}(bx+cx^2)}\,dx = \frac{2Bd^3(3b^2e^2-bce(11d+5ex)+c^2(23d^2+35dex+15e^2x^2))-2Ae(-3bcde}{15d^3} + \frac{2c^{5/2}(-bB+Ac)\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{b(-cd+be)^{7/2}} - \frac{2A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{bd^{7/2}}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(7/2)*(b*x + c*x^2)),x]
```

output
```
(2*B*d^3*(3*b^2*e^2 - b*c*e*(11*d + 5*e*x) + c^2*(23*d^2 + 35*d*e*x + 15*e
^2*x^2)) - 2*A*e*(-3*b*c*d*e*(22*d^2 + 35*d*e*x + 15*e^2*x^2) + b^2*e^2*(2
3*d^2 + 35*d*e*x + 15*e^2*x^2) + c^2*d^2*(58*d^2 + 100*d*e*x + 45*e^2*x^2)
))/(15*d^3*(c*d - b*e)^3*(d + e*x)^(5/2)) + (2*c^(5/2)*(-(b*B) + A*c)*ArcT
an[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(b*(-(c*d) + b*e)^(7/2)) -
 (2*A*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*d^(7/2))
```

Rubi [A] (verified)

Time = 1.15 (sec) , antiderivative size = 284, normalized size of antiderivative = 1.26, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {1198, 1198, 1198, 1197, 25, 1480, 221}

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

$$\int \frac{A+Bx}{(bx+cx^2)(d+ex)^{7/2}}\,dx$$

$$\Big\downarrow \ 1198$$

$$\frac{\int \frac{A(cd-be)+c(Bd-Ae)x}{(d+ex)^{5/2}(cx^2+bx)}dx}{d(cd-be)} + \frac{2(Bd-Ae)}{5d(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \ 1198$$

$$\frac{\frac{\int \frac{A(cd-be)^2+c\left(Bcd^2-Ae(2cd-be)\right)x}{(d+ex)^{3/2}\left(cx^2+bx\right)}dx}{d(cd-be)}+\frac{2\left(Bcd^2-Ae(2cd-be)\right)}{3d(d+ex)^{3/2}(cd-be)}}{d(cd-be)}+\frac{2(Bd-Ae)}{5d(d+ex)^{5/2}(cd-be)}$$

$\Big\downarrow$ 1198

$$\frac{\frac{\frac{\int \frac{A(cd-be)^3+c\left(Bc^2d^3-Ae\left(3c^2d^2-3bced+b^2e^2\right)\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{d(cd-be)}+\frac{2\left(Bc^2d^3-Ae\left(b^2e^2-3bcde+3c^2d^2\right)\right)}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2\left(Bcd^2-Ae(2cd-be)\right)}{3d(d+ex)^{3/2}(cd-be)}}{d(cd-be)}+$$
$$\frac{2(Bd-Ae)}{5d(d+ex)^{5/2}(cd-be)}$$

$\Big\downarrow$ 1197

$$\frac{\frac{\frac{2\int -\frac{Bc^3d^4-Ae\left(4c^3d^3-6bc^2ed^2+4b^2ce^2d-b^3e^3\right)-c\left(Bc^2d^3-Ae\left(3c^2d^2-3bced+b^2e^2\right)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}+\frac{2\left(Bc^2d^3-Ae\left(b^2e^2-3bcde+3c^2d^2\right)\right)}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2(Bcd^2-\cdots}{3d(d+e\cdots}}{d(cd-be)}$$
$$\frac{2(Bd-Ae)}{5d(d+ex)^{5/2}(cd-be)}$$

$\Big\downarrow$ 25

$$\frac{\frac{\frac{2\left(Bc^2d^3-Ae\left(b^2e^2-3bcde+3c^2d^2\right)\right)}{d\sqrt{d+ex}(cd-be)}-\frac{2\int \frac{Bc^3d^4-Ae\left(4c^3d^3-6bc^2ed^2+4b^2ce^2d-b^3e^3\right)-c\left(Bc^2d^3-Ae\left(3c^2d^2-3bced+b^2e^2\right)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}}{d(cd-be)}+\frac{2(Bcd^2-\cdots}{3d(d+ex\cdots}}{d(cd-be)}$$
$$\frac{2(Bd-Ae)}{5d(d+ex)^{5/2}(cd-be)}$$

$\Big\downarrow$ 1480

$$\frac{\frac{\frac{2\left(\frac{c^3d^3(bB-Ac)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{b}+\frac{Ac(cd-be)^3\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{b}\right)}{d(cd-be)}+\frac{2\left(Bc^2d^3-Ae\left(b^2e^2-3bcde+3c^2d^2\right)\right)}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2\left(Bcd^2-Ae(2cd-be)\right)}{3d(d+ex)^{3/2}(cd-be)}}{d(cd-be)}+$$
$$\frac{2(Bd-Ae)}{5d(d+ex)^{5/2}(cd-be)}$$

$\Big\downarrow$ 221

$$\frac{\frac{\frac{2\left(-\frac{c^{5/2}d^3(bB-Ac)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{cd-be}}-\frac{A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)^3}{b\sqrt{d}}\right)}{d(cd-be)}+\frac{2\left(Bc^2d^3-Ae\left(b^2e^2-3bcde+3c^2d^2\right)\right)}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2(Bcd^2-Ae(2cd-be))}{3d(d+ex)^{3/2}(cd-be)}}{d(cd-be)}+\frac{2(Bd-Ae)}{5d(d+ex)^{5/2}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^(7/2)*(b*x + c*x^2)),x]
```

output
```
(2*(B*d - A*e))/(5*d*(c*d - b*e)*(d + e*x)^(5/2)) + ((2*(B*c*d^2 - A*e*(2*
c*d - b*e)))/(3*d*(c*d - b*e)*(d + e*x)^(3/2)) + ((2*(B*c^2*d^3 - A*e*(3*c
^2*d^2 - 3*b*c*d*e + b^2*e^2)))/(d*(c*d - b*e)*Sqrt[d + e*x]) + (2*(-((A*(
c*d - b*e)^3*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d])) - (c^(5/2)*(b*B
- A*c)*d^3*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c*d -
 b*e])))/(d*(c*d - b*e)))/(d*(c*d - b*e)))/(d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1198
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[(e*f - d*g)*((d + e*x)^(m + 1)/((m + 1)*(c
*d^2 - b*d*e + a*e^2))), x] + Simp[1/(c*d^2 - b*d*e + a*e^2)   Int[(d + e*x
)^(m + 1)*(Simp[c*d*f - f*b*e + a*e*g - c*(e*f - d*g)*x, x]/(a + b*x + c*x^
2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] && LtQ[m, -1
]
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.31 (sec) , antiderivative size = 213, normalized size of antiderivative = 0.95

method	result
pseudoelliptic	$-\frac{2A\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\,d^{\frac{7}{2}}}+\frac{\frac{2Ae}{5}-\frac{2Bd}{5}}{d(be-cd)(ex+d)^{\frac{5}{2}}}+\frac{\frac{2}{3}Ab\,e^{2}-\frac{4}{3}Acde+\frac{2}{3}Bc\,d^{2}}{d^{2}(be-cd)^{2}(ex+d)^{\frac{3}{2}}}+\frac{2A\,b^{2}e^{3}-6Abcd\,e^{2}+6A\,c^{2}d^{2}e-2B\,c}{\sqrt{ex+d}\,d^{3}(be-cd)^{3}}$
derivativedivides	$-\frac{2A\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\,d^{\frac{7}{2}}}-\frac{2(-Ae+Bd)}{5d(be-cd)(ex+d)^{\frac{5}{2}}}-\frac{2(-Ab\,e^{2}+2Acde-Bc\,d^{2})}{3d^{2}(be-cd)^{2}(ex+d)^{\frac{3}{2}}}-\frac{2(-A\,b^{2}e^{3}+3Abcd\,e^{2}-3A\,c^{2}d^{2}e+}{d^{3}(be-cd)^{3}\sqrt{ex+d}}$
default	$-\frac{2A\,\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{b\,d^{\frac{7}{2}}}-\frac{2(-Ae+Bd)}{5d(be-cd)(ex+d)^{\frac{5}{2}}}-\frac{2(-Ab\,e^{2}+2Acde-Bc\,d^{2})}{3d^{2}(be-cd)^{2}(ex+d)^{\frac{3}{2}}}-\frac{2(-A\,b^{2}e^{3}+3Abcd\,e^{2}-3A\,c^{2}d^{2}e+}{d^{3}(be-cd)^{3}\sqrt{ex+d}}$

input
```
int((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
-2*A*arctanh((e*x+d)^(1/2)/d^(1/2))/b/d^(7/2)+2/5*(A*e-B*d)/d/(b*e-c*d)/(e
*x+d)^(5/2)+2/3*(A*b*e^2-2*A*c*d*e+B*c*d^2)/d^2/(b*e-c*d)^2/(e*x+d)^(3/2)+
(2*A*b^2*e^3-6*A*b*c*d*e^2+6*A*c^2*d^2*e-2*B*c^2*d^3)/(e*x+d)^(1/2)/d^3/(b
*e-c*d)^3+2/(b*e-c*d)^3*c^3*(A*c-B*b)/b/(c*(b*e-c*d))^(1/2)*arctan(c*(e*x+
d)^(1/2)/(c*(b*e-c*d))^(1/2))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 740 vs. $2(199) = 398$.

Time = 4.63 (sec) , antiderivative size = 3036, normalized size of antiderivative = 13.49

$$\int \frac{A+Bx}{(d+ex)^{7/2}\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [A] (verification not implemented)

Time = 11.64 (sec) , antiderivative size = 326, normalized size of antiderivative = 1.45

$$\int \frac{A+Bx}{(d+ex)^{7/2}\,(bx+cx^2)}\,dx = \begin{cases} \frac{2\left(\frac{Ae\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{bd^3\sqrt{-d}} - \frac{e(-Ae+Bd)}{5d(d+ex)^{\frac{5}{2}}(be-cd)} + \frac{e\left(Abe^2-2Acde+Bcd^2\right)}{3d^2(d+ex)^{\frac{3}{2}}(be-cd)^2} + \frac{e\left(Ab^2e^3-3Abcde^2+3Ac^2d^2e-Bc^2d^3 \cdots\right.}{d^3\sqrt{d+ex}(be-cd)^3} \cdots\right.}{e} \\ \frac{\frac{B\log\left(bx+cx^2\right)}{2c} + \left(A-\frac{Bb}{2c}\right)\left(-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for}\ c=0\\ -\frac{\log\left(b-2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b} - \frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} \\ \frac{\log\left(b+2c\left(\frac{b}{2c}+\cdots\right.\right.}{2c}\end{cases}\right.}{\cdots}\cdots\right.}{d^{\frac{7}{2}}} \end{cases}$$

input
```
integrate((B*x+A)/(e*x+d)**(7/2)/(c*x**2+b*x),x)
```

output
```
Piecewise((2*(A*e*atan(sqrt(d + e*x)/sqrt(-d))/(b*d**3*sqrt(-d)) - e*(-A*e
 + B*d)/(5*d*(d + e*x)**(5/2)*(b*e - c*d)) + e*(A*b*e**2 - 2*A*c*d*e + B*c
*d**2)/(3*d**2*(d + e*x)**(3/2)*(b*e - c*d)**2) + e*(A*b**2*e**3 - 3*A*b*c
*d*e**2 + 3*A*c**2*d**2*e - B*c**2*d**3)/(d**3*sqrt(d + e*x)*(b*e - c*d)**
3) - c**2*e*(-A*c + B*b)*atan(sqrt(d + e*x)/sqrt((b*e - c*d)/c))/(b*sqrt((
b*e - c*d)/c)*(b*e - c*d)**3))/e, Ne(e, 0)), ((B*log(b*x + c*x**2)/(2*c) +
 (A - B*b/(2*c))*(-2*c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0)), (-log(b - 2*
c*(b/(2*c) + x))/(2*c), True))/b - 2*c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0
)), (log(b + 2*c*(b/(2*c) + x))/(2*c), True))/b))/d**(7/2), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^{7/2}(bx+cx^2)}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x),x, algorithm="maxima")
```

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

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 376, normalized size of antiderivative = 1.67

$$\int \frac{A+Bx}{(d+ex)^{7/2}(bx+cx^2)}\,dx = \frac{2\,(Bbc^3-Ac^4)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{(bc^3d^3-3\,b^2c^2d^2e+3\,b^3cde^2-b^4e^3)\sqrt{-c^2d+bce}}$$
$$+\frac{2\left(15\,(ex+d)^2Bc^2d^3+5\,(ex+d)Bc^2d^4+3\,Bc^2d^5-45\,(ex+d)^2Ac^2d^2e-5\,(ex+d)Bbcd^3e-10\,(ex+\right.}{}$$
$$+\frac{2\,A\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b\sqrt{-d}d^3}$$

input
```
integrate((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x),x, algorithm="giac")
```

output
```
2*(B*b*c^3 - A*c^4)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/((b*c^3*d
^3 - 3*b^2*c^2*d^2*e + 3*b^3*c*d*e^2 - b^4*e^3)*sqrt(-c^2*d + b*c*e)) + 2/
15*(15*(e*x + d)^2*B*c^2*d^3 + 5*(e*x + d)*B*c^2*d^4 + 3*B*c^2*d^5 - 45*(e
*x + d)^2*A*c^2*d^2*e - 5*(e*x + d)*B*b*c*d^3*e - 10*(e*x + d)*A*c^2*d^3*e
 - 6*B*b*c*d^4*e - 3*A*c^2*d^4*e + 45*(e*x + d)^2*A*b*c*d*e^2 + 15*(e*x +
d)*A*b*c*d^2*e^2 + 3*B*b^2*d^3*e^2 + 6*A*b*c*d^3*e^2 - 15*(e*x + d)^2*A*b^
2*e^3 - 5*(e*x + d)*A*b^2*d*e^3 - 3*A*b^2*d^2*e^3)/((c^3*d^6 - 3*b*c^2*d^5
*e + 3*b^2*c*d^4*e^2 - b^3*d^3*e^3)*(e*x + d)^(5/2)) + 2*A*arctan(sqrt(e*x
 + d)/sqrt(-d))/(b*sqrt(-d)*d^3)
```

Mupad [B] (verification not implemented)

Time = 13.77 (sec) , antiderivative size = 13404, normalized size of antiderivative = 59.57

$$\int \frac{A+Bx}{(d+ex)^{7/2}(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)*(d + e*x)^(7/2)),x)
```

output
```
- ((2*(A*e - B*d))/(5*(c*d^2 - b*d*e)) + (2*(d + e*x)^2*(A*b^2*e^3 - B*c^2
*d^3 + 3*A*c^2*d^2*e - 3*A*b*c*d*e^2))/(c*d^2 - b*d*e)^3 - (2*(d + e*x)*(A
*b*e^2 + B*c*d^2 - 2*A*c*d*e))/(3*(c*d^2 - b*d*e)^2))/(d + e*x)^(5/2) - (a
tan((((-c^5*(b*e - c*d)^7)^(1/2)*(A*c - B*b)*((d + e*x)^(1/2)*(16*A^2*c^18
*d^24*e^2 + 1128*A^2*b^2*c^16*d^22*e^4 - 4312*A^2*b^3*c^15*d^21*e^5 + 1192
8*A^2*b^4*c^14*d^20*e^6 - 25032*A^2*b^5*c^13*d^19*e^7 + 40712*A^2*b^6*c^12
*d^18*e^8 - 51768*A^2*b^7*c^11*d^17*e^9 + 51552*A^2*b^8*c^10*d^16*e^10 - 4
0048*A^2*b^9*c^9*d^15*e^11 + 24024*A^2*b^10*c^8*d^14*e^12 - 10920*A^2*b^11
*c^7*d^13*e^13 + 3640*A^2*b^12*c^6*d^12*e^14 - 840*A^2*b^13*c^5*d^11*e^15
+ 120*A^2*b^14*c^4*d^10*e^16 - 8*A^2*b^15*c^3*d^9*e^17 + 8*B^2*b^2*c^16*d^
24*e^2 - 72*B^2*b^3*c^15*d^23*e^3 + 288*B^2*b^4*c^14*d^22*e^4 - 672*B^2*b^
5*c^13*d^21*e^5 + 1008*B^2*b^6*c^12*d^20*e^6 - 1008*B^2*b^7*c^11*d^19*e^7
+ 672*B^2*b^8*c^10*d^18*e^8 - 288*B^2*b^9*c^9*d^17*e^9 + 72*B^2*b^10*c^8*d
^16*e^10 - 8*B^2*b^11*c^7*d^15*e^11 - 192*A^2*b*c^17*d^23*e^3 - 16*A*B*b*c
^17*d^24*e^2 + 144*A*B*b^2*c^16*d^23*e^3 - 576*A*B*b^3*c^15*d^22*e^4 + 134
4*A*B*b^4*c^14*d^21*e^5 - 2016*A*B*b^5*c^13*d^20*e^6 + 2016*A*B*b^6*c^12*d
^19*e^7 - 1344*A*B*b^7*c^11*d^18*e^8 + 576*A*B*b^8*c^10*d^17*e^9 - 144*A*B
*b^9*c^9*d^16*e^10 + 16*A*B*b^10*c^8*d^15*e^11) - ((-c^5*(b*e - c*d)^7)^(1
/2)*(A*c - B*b)*(((-c^5*(b*e - c*d)^7)^(1/2)*(A*c - B*b)*(d + e*x)^(1/2)*(
16*b^2*c^18*d^31*e^2 - 248*b^3*c^17*d^30*e^3 + 1800*b^4*c^16*d^29*e^4 -...
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 1788, normalized size of antiderivative = 7.95

$$\int \frac{A+Bx}{(d+ex)^{7/2}\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x),x)
```

output
```
(30*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*
sqrt(b*e - c*d)))*a*c**3*d**6 + 60*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*a
tan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**3*d**5*e*x + 30*sqrt
(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e
 - c*d)))*a*c**3*d**4*e**2*x**2 - 30*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)
*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*c**2*d**6 - 60*sqr
t(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*
e - c*d)))*b**2*c**2*d**5*e*x - 30*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*a
tan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*c**2*d**4*e**2*x**2
+ 15*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**4*d**2*e**4 +
 30*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**4*d*e**5*x + 1
5*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**4*e**6*x**2 - 60
*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**3*c*d**3*e**3 - 1
20*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**3*c*d**2*e**4*x
 - 60*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**3*c*d*e**5*x
**2 + 90*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**2*c**2*d*
*4*e**2 + 180*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**2*c*
*2*d**3*e**3*x + 90*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b
**2*c**2*d**2*e**4*x**2 - 60*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqr
t(d))*a*b*c**3*d**5*e - 120*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - s...
```

3.76 $\int \frac{A+Bx}{(d+ex)^{9/2}(bx+cx^2)}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 301

$$\begin{aligned}\int \frac{A+Bx}{(d+ex)^{9/2}\,(bx+cx^2)}\,dx &= \frac{2(Bd-Ae)}{7d(cd-be)(d+ex)^{7/2}} \\ &+ \frac{2(Bcd^2-Ae(2cd-be))}{5d^2(cd-be)^2(d+ex)^{5/2}} + \frac{2(Bc^2d^3-Ae(3c^2d^2-3bcde+b^2e^2))}{3d^3(cd-be)^3(d+ex)^{3/2}} \\ &+ \frac{2(Bc^3d^4-Ae(4c^3d^3-6bc^2d^2e+4b^2cde^2-b^3e^3))}{d^4(cd-be)^4\sqrt{d+ex}} \\ &- \frac{2A\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{bd^{9/2}} - \frac{2c^{7/2}(bB-Ac)\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b(cd-be)^{9/2}}\end{aligned}$$

output

```
2/7*(-A*e+B*d)/d/(-b*e+c*d)/(e*x+d)^(7/2)+2/5*(B*c*d^2-A*e*(-b*e+2*c*d))/d
^2/(-b*e+c*d)^2/(e*x+d)^(5/2)+2/3*(B*c^2*d^3-A*e*(b^2*e^2-3*b*c*d*e+3*c^2*
d^2))/d^3/(-b*e+c*d)^3/(e*x+d)^(3/2)+2*(B*c^3*d^4-A*e*(-b^3*e^3+4*b^2*c*d*
e^2-6*b*c^2*d^2*e+4*c^3*d^3))/d^4/(-b*e+c*d)^4/(e*x+d)^(1/2)-2*A*arctanh((
e*x+d)^(1/2)/d^(1/2))/b/d^(9/2)-2*c^(7/2)*(-A*c+B*b)*arctanh(c^(1/2)*(e*x+
d)^(1/2)/(-b*e+c*d)^(1/2))/b/(-b*e+c*d)^(9/2)
```

Mathematica [A] (verified)

Time = 1.56 (sec) , antiderivative size = 363, normalized size of antiderivative = 1.21

$$\int \frac{A+Bx}{(d+ex)^{9/2}\,(bx+cx^2)}\,dx = \frac{2(Bd^4(-15b^3e^3+3b^2ce^2(22d+7ex)-bc^2e(122d^2+112dex+35e^2x^2)+c^3}{}$$
$$-\frac{2c^{7/2}(-bB+Ac)\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{b(-cd+be)^{9/2}}-\frac{2A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{bd^{9/2}}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(9/2)*(b*x + c*x^2)),x]
```

output
```
(2*(B*d^4*(-15*b^3*e^3 + 3*b^2*c*e^2*(22*d + 7*e*x) - b*c^2*e*(122*d^2 + 1
12*d*e*x + 35*e^2*x^2) + c^3*(176*d^3 + 406*d^2*e*x + 350*d*e^2*x^2 + 105*
e^3*x^3)) + A*e*(15*b*c^2*d^2*e*(66*d^3 + 161*d^2*e*x + 140*d*e^2*x^2 + 42
*e^3*x^3) + b^3*e^3*(176*d^3 + 406*d^2*e*x + 350*d*e^2*x^2 + 105*e^3*x^3)
- 3*c^3*d^3*(194*d^3 + 504*d^2*e*x + 455*d*e^2*x^2 + 140*e^3*x^3) - b^2*c*
d*e^2*(689*d^3 + 1624*d^2*e*x + 1400*d*e^2*x^2 + 420*e^3*x^3))))/(105*d^4*
(c*d - b*e)^4*(d + e*x)^(7/2)) - (2*c^(7/2)*(-(b*B) + A*c)*ArcTan[(Sqrt[c]
*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(b*(-(c*d) + b*e)^(9/2)) - (2*A*ArcTa
nh[Sqrt[d + e*x]/Sqrt[d]])/(b*d^(9/2))
```

Rubi [A] (verified)

Time = 1.41 (sec) , antiderivative size = 375, normalized size of antiderivative = 1.25, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {1198, 1198, 1198, 1198, 1197, 25, 1480, 221}

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

$$\int \frac{A+Bx}{(bx+cx^2)\,(d+ex)^{9/2}}\,dx$$
$$\Big\downarrow \ 1198$$
$$\frac{\int \frac{A(cd-be)+c(Bd-Ae)x}{(d+ex)^{7/2}(cx^2+bx)}dx}{d(cd-be)}+\frac{2(Bd-Ae)}{7d(d+ex)^{7/2}(cd-be)}$$

$\Big\downarrow$ 1198

$$\frac{\frac{\int \frac{A(cd-be)^2+c\left(Bcd^2-Ae(2cd-be)\right)x}{(d+ex)^{5/2}\left(cx^2+bx\right)}dx}{d(cd-be)}+\frac{2\left(Bcd^2-Ae(2cd-be)\right)}{5d(d+ex)^{5/2}(cd-be)}}{d(cd-be)}+\frac{2(Bd-Ae)}{7d(d+ex)^{7/2}(cd-be)}$$

$\Big\downarrow$ 1198

$$\frac{\frac{\frac{\int \frac{A(cd-be)^3+c\left(Bc^2d^3-Ae\left(3c^2d^2-3bced+b^2e^2\right)\right)x}{(d+ex)^{3/2}\left(cx^2+bx\right)}dx}{d(cd-be)}+\frac{2\left(Bc^2d^3-Ae\left(b^2e^2-3bcde+3c^2d^2\right)\right)}{3d(d+ex)^{3/2}(cd-be)}}{d(cd-be)}+\frac{2\left(Bcd^2-Ae(2cd-be)\right)}{5d(d+ex)^{5/2}(cd-be)}}{d(cd-be)}+\frac{2(Bd-Ae)}{7d(d+ex)^{7/2}(cd-be)}$$

$\Big\downarrow$ 1198

$$\frac{\frac{\frac{\frac{\int \frac{A(cd-be)^4+c\left(Bc^3d^4-Ae\left(4c^3d^3-6bc^2ed^2+4b^2ce^2d-b^3e^3\right)\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{d(cd-be)}+\frac{2\left(Bc^3d^4-Ae\left(-b^3e^3+4b^2cde^2-6bc^2d^2e+4c^3d^3\right)\right)}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2\left(Bc^2d^3-Ae\left(b^2e^2-3bcde+3c^2d^2 \cdots\right.\right.}{3d(d+ex)^{3/2}(cd-be)}}{d(cd-be)} \cdots}{d(cd-be)} \cdots$$

$$\frac{2(Bd-Ae)}{7d(d+ex)^{7/2}(cd-be)}$$

$\Big\downarrow$ 1197

$$\frac{\frac{\frac{\frac{2\int -\frac{Bc^4d^5-Ae\left(5c^4d^4-10bc^3ed^3+10b^2c^2e^2d^2-5b^3ce^3d+b^4e^4\right)-c\left(Bc^3d^4-Ae\left(4c^3d^3-6bc^2ed^2+4b^2ce^2d-b^3e^3\right)\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}+\frac{2\left(Bc^3d^4-Ae\left(-b^3e^3+4 \cdots\right.\right.}{d\sqrt{d+e \cdots}}}{d(cd-be)} \cdots}{d(cd-be)} \cdots}{d(cd-be)} \cdots$$

$$\frac{2(Bd-Ae)}{7d(d+ex)^{7/2}(cd-be)}$$

$\Big\downarrow$ 25

$$\frac{\frac{\frac{\frac{2\left(Bc^3d^4-Ae\left(-b^3e^3+4b^2cde^2-6bc^2d^2e+4c^3d^3\right)\right)}{d\sqrt{d+ex}(cd-be)}-\frac{2\int \frac{Bc^4d^5-Ae\left(5c^4d^4-10bc^3ed^3+10b^2c^2e^2d^2-5b^3ce^3d+b^4e^4\right)-c\left(Bc^3d^4-Ae\left(4c^3d^3-6bc^2ed^2+4b^2ce^2 \cdots\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{d(cd-be)} \cdots}{d(cd-be)} \cdots}{d(cd-be)} \cdots}{d(cd-be)} \cdots$$

$$\frac{2(Bd-Ae)}{7d(d+ex)^{7/2}(cd-be)}$$

$\Big\downarrow$ 1480

$$\frac{\frac{\frac{2\left(\frac{c^4d^4(bB-Ac)\int \frac{1}{\frac{-cd+be+c(d+ex)}{b}}d\sqrt{d+ex}}{d(cd-be)}+\frac{Ac(cd-be)^4\int \frac{1}{\frac{c(d+ex)-cd}{b}}d\sqrt{d+ex}}{d(cd-be)}\right)}{d(cd-be)}+\frac{2\left(Bc^3d^4-Ae\left(-b^3e^3+4b^2cde^2-6bc^2d^2e+4c^3d^3\right)\right)}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2\left(Bc^2d^3-Ae\left(b^2\right.\right.}{3d(d+ex}}{d(cd-be)}$$

$$\frac{2(Bd-Ae)}{7d(d+ex)^{7/2}(cd-be)}$$

$$\Big\downarrow \; 221$$

$$\frac{\frac{\frac{2\left(-\frac{c^{7/2}d^4(bB-Ac)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{cd-be}}-\frac{A\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)^4}{b\sqrt{d}}\right)}{d(cd-be)}+\frac{2\left(Bc^3d^4-Ae\left(-b^3e^3+4b^2cde^2-6bc^2d^2e+4c^3d^3\right)\right)}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}+\frac{2\left(Bc^2d^3-Ae\left(b^2e\right.\right.}{3d(d+ex)^3}}{d(cd-be)}$$

$$\frac{2(Bd-Ae)}{7d(d+ex)^{7/2}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^(9/2)*(b*x + c*x^2)),x]
```

output
```
(2*(B*d - A*e))/(7*d*(c*d - b*e)*(d + e*x)^(7/2)) + ((2*(B*c*d^2 - A*e*(2*
c*d - b*e)))/(5*d*(c*d - b*e)*(d + e*x)^(5/2)) + ((2*(B*c^2*d^3 - A*e*(3*c
^2*d^2 - 3*b*c*d*e + b^2*e^2)))/(3*d*(c*d - b*e)*(d + e*x)^(3/2)) + ((2*(B
*c^3*d^4 - A*e*(4*c^3*d^3 - 6*b*c^2*d^2*e + 4*b^2*c*d*e^2 - b^3*e^3)))/(d*
(c*d - b*e)*Sqrt[d + e*x]) + (2*(-((A*(c*d - b*e)^4*ArcTanh[Sqrt[d + e*x]/
Sqrt[d]])/(b*Sqrt[d])) - (c^(7/2)*(b*B - A*c)*d^4*ArcTanh[(Sqrt[c]*Sqrt[d
+ e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c*d - b*e])))/(d*(c*d - b*e)))/(d*(c*d -
 b*e)))/(d*(c*d - b*e)))/(d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1198
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[(e*f - d*g)*((d + e*x)^(m + 1)/((m + 1)*(c
*d^2 - b*d*e + a*e^2))), x] + Simp[1/(c*d^2 - b*d*e + a*e^2)   Int[(d + e*x
)^(m + 1)*(Simp[c*d*f - f*b*e + a*e*g - c*(e*f - d*g)*x, x]/(a + b*x + c*x^
2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] && LtQ[m, -1
]
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.74 (sec) , antiderivative size = 285, normalized size of antiderivative = 0.95

method	result
pseudoelliptic	$\frac{\frac{2Ae}{7}-\frac{2Bd}{7}}{d(be-cd)(ex+d)^{\frac{7}{2}}}+\frac{\frac{2}{5}Ab\,e^{2}-\frac{4}{5}Acde+\frac{2}{5}Bc\,d^{2}}{d^{2}(be-cd)^{2}(ex+d)^{\frac{5}{2}}}+\frac{\frac{2}{3}A\,b^{2}e^{3}-2Abcd\,e^{2}+2A\,c^{2}d^{2}e-\frac{2}{3}B\,c^{2}d^{3}}{d^{3}(be-cd)^{3}(ex+d)^{\frac{3}{2}}}+\frac{2(e^{4}b^{3}-4b^{2}cd\,e^{3}+6}{\sqrt{ex}}$
derivativedivides	$-\frac{2(-Ae+Bd)}{7d(be-cd)(ex+d)^{\frac{7}{2}}}-\frac{2(-Ab\,e^{2}+2Acde-Bc\,d^{2})}{5d^{2}(be-cd)^{2}(ex+d)^{\frac{5}{2}}}-\frac{2(-A\,b^{2}e^{3}+3Abcd\,e^{2}-3A\,c^{2}d^{2}e+B\,c^{2}d^{3})}{3d^{3}(be-cd)^{3}(ex+d)^{\frac{3}{2}}}-\frac{2(-A\,b^{3}e^{4}+}{}$
default	$-\frac{2(-Ae+Bd)}{7d(be-cd)(ex+d)^{\frac{7}{2}}}-\frac{2(-Ab\,e^{2}+2Acde-Bc\,d^{2})}{5d^{2}(be-cd)^{2}(ex+d)^{\frac{5}{2}}}-\frac{2(-A\,b^{2}e^{3}+3Abcd\,e^{2}-3A\,c^{2}d^{2}e+B\,c^{2}d^{3})}{3d^{3}(be-cd)^{3}(ex+d)^{\frac{3}{2}}}-\frac{2(-A\,b^{3}e^{4}+}{}$

input
```
int((B*x+A)/(e*x+d)^(9/2)/(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
2/7*(A*e-B*d)/d/(b*e-c*d)/(e*x+d)^(7/2)+2/5*(A*b*e^2-2*A*c*d*e+B*c*d^2)/d^
2/(b*e-c*d)^2/(e*x+d)^(5/2)+2/3*(A*b^2*e^3-3*A*b*c*d*e^2+3*A*c^2*d^2*e-B*c
^2*d^3)/d^3/(b*e-c*d)^3/(e*x+d)^(3/2)+2*((b^3*e^4-4*b^2*c*d*e^3+6*b*c^2*d^
2*e^2-4*c^3*d^3*e)*A+B*c^3*d^4)/(e*x+d)^(1/2)/d^4/(b*e-c*d)^4-2*A*arctanh(
(e*x+d)^(1/2)/d^(1/2))/b/d^(9/2)-2/(b*e-c*d)^4*c^4*(A*c-B*b)/b/(c*(b*e-c*d
))^(1/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1159 vs. $2(271) = 542$.

Time = 12.78 (sec) , antiderivative size = 4712, normalized size of antiderivative = 15.65

$$\int \frac{A+Bx}{(d+ex)^{9/2}\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(9/2)/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [A] (verification not implemented)

Time = 11.99 (sec) , antiderivative size = 410, normalized size of antiderivative = 1.36

$$\int \frac{A+Bx}{(d+ex)^{9/2}\,(bx+cx^2)}\,dx = \begin{cases} \frac{2\left(\frac{Ae\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{bd^4\sqrt{-d}} - \frac{e(-Ae+Bd)}{7d(d+ex)^{\frac{7}{2}}(be-cd)} + \frac{e\left(Abe^2-2Acde+Bcd^2\right)}{5d^2(d+ex)^{\frac{5}{2}}(be-cd)^2} + \frac{e\left(Ab^2e^3-3Abcde^2+3Ac^2d^2e-Bc^2d^3\right.}{3d^3(d+ex)^{\frac{3}{2}}(be-cd)^3}\right.}{e} \\ \frac{\frac{B\log\left(bx+cx^2\right)}{2c} + \left(A-\frac{Bb}{2c}\right)\left(-\frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} & \text{for } c=0\\ -\frac{\log\left(b-2c\left(\frac{b}{2c}+x\right)\right)}{2c} & \text{otherwise}\end{cases}\right)}{b} - \frac{2c\left(\begin{cases}\frac{\frac{b}{2c}+x}{b} \\ \frac{\log\left(b+2c\left(\frac{b}{2c}+\right.\right.}{2c}\end{cases}\right.}{}\right.}{d^{\frac{9}{2}}} \end{cases}$$

input
```
integrate((B*x+A)/(e*x+d)**(9/2)/(c*x**2+b*x),x)
```

output
```
Piecewise((2*(A*e*atan(sqrt(d + e*x)/sqrt(-d))/(b*d**4*sqrt(-d)) - e*(-A*e
 + B*d)/(7*d*(d + e*x)**(7/2)*(b*e - c*d)) + e*(A*b*e**2 - 2*A*c*d*e + B*c
*d**2)/(5*d**2*(d + e*x)**(5/2)*(b*e - c*d)**2) + e*(A*b**2*e**3 - 3*A*b*c
*d*e**2 + 3*A*c**2*d**2*e - B*c**2*d**3)/(3*d**3*(d + e*x)**(3/2)*(b*e - c
*d)**3) + e*(A*b**3*e**4 - 4*A*b**2*c*d*e**3 + 6*A*b*c**2*d**2*e**2 - 4*A*
c**3*d**3*e + B*c**3*d**4)/(d**4*sqrt(d + e*x)*(b*e - c*d)**4) + c**3*e*(-
A*c + B*b)*atan(sqrt(d + e*x)/sqrt((b*e - c*d)/c))/(b*sqrt((b*e - c*d)/c)*
(b*e - c*d)**4))/e, Ne(e, 0)), ((B*log(b*x + c*x**2)/(2*c) + (A - B*b/(2*c
))*(-2*c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0)), (-log(b - 2*c*(b/(2*c) + x
))/(2*c), True))/b - 2*c*Piecewise(((b/(2*c) + x)/b, Eq(c, 0)), (log(b + 2
*c*(b/(2*c) + x))/(2*c), True))/b))/d**(9/2), True))
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^{9/2}(bx+cx^2)}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^(9/2)/(c*x^2+b*x),x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 604 vs. $2(271) = 542$.

Time = 0.27 (sec) , antiderivative size = 604, normalized size of antiderivative = 2.01

$$\int \frac{A+Bx}{(d+ex)^{9/2}(bx+cx^2)}\,dx = \frac{2\,(Bbc^4 - Ac^5)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{(bc^4d^4 - 4\,b^2c^3d^3e + 6\,b^3c^2d^2e^2 - 4\,b^4cde^3 + b^5e^4)\sqrt{-c^2d+bce}}$$
$$+ \frac{2\left(105\,(ex+d)^3Bc^3d^4 + 35\,(ex+d)^2Bc^3d^5 + 21\,(ex+d)Bc^3d^6 + 15\,Bc^3d^7 - 420\,(ex+d)^3Ac^3d^3e - 35\,\right.}{}$$
$$+ \frac{2\,A\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b\sqrt{-d}d^4}$$

input
```
integrate((B*x+A)/(e*x+d)^(9/2)/(c*x^2+b*x),x, algorithm="giac")
```

output
```
2*(B*b*c^4 - A*c^5)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/((b*c^4*d
^4 - 4*b^2*c^3*d^3*e + 6*b^3*c^2*d^2*e^2 - 4*b^4*c*d*e^3 + b^5*e^4)*sqrt(-
c^2*d + b*c*e)) + 2/105*(105*(e*x + d)^3*B*c^3*d^4 + 35*(e*x + d)^2*B*c^3*
d^5 + 21*(e*x + d)*B*c^3*d^6 + 15*B*c^3*d^7 - 420*(e*x + d)^3*A*c^3*d^3*e
- 35*(e*x + d)^2*B*b*c^2*d^4*e - 105*(e*x + d)^2*A*c^3*d^4*e - 42*(e*x + d
)*B*b*c^2*d^5*e - 42*(e*x + d)*A*c^3*d^5*e - 45*B*b*c^2*d^6*e - 15*A*c^3*d
^6*e + 630*(e*x + d)^3*A*b*c^2*d^2*e^2 + 210*(e*x + d)^2*A*b*c^2*d^3*e^2 +
 21*(e*x + d)*B*b^2*c*d^4*e^2 + 105*(e*x + d)*A*b*c^2*d^4*e^2 + 45*B*b^2*c
*d^5*e^2 + 45*A*b*c^2*d^5*e^2 - 420*(e*x + d)^3*A*b^2*c*d*e^3 - 140*(e*x +
 d)^2*A*b^2*c*d^2*e^3 - 84*(e*x + d)*A*b^2*c*d^3*e^3 - 15*B*b^3*d^4*e^3 -
45*A*b^2*c*d^4*e^3 + 105*(e*x + d)^3*A*b^3*e^4 + 35*(e*x + d)^2*A*b^3*d*e^
4 + 21*(e*x + d)*A*b^3*d^2*e^4 + 15*A*b^3*d^3*e^4)/((c^4*d^8 - 4*b*c^3*d^7
*e + 6*b^2*c^2*d^6*e^2 - 4*b^3*c*d^5*e^3 + b^4*d^4*e^4)*(e*x + d)^(7/2)) +
 2*A*arctan(sqrt(e*x + d)/sqrt(-d))/(b*sqrt(-d)*d^4)
```

Mupad [B] (verification not implemented)

Time = 15.21 (sec) , antiderivative size = 11601, normalized size of antiderivative = 38.54

$$\int \frac{A+Bx}{(d+ex)^{9/2}\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)*(d + e*x)^(9/2)),x)
```

output
```
(A*atan((B^2*b^2*c^19*d^41*(d + e*x)^(1/2)*1i + A^2*b^21*d^20*e^21*(d + e*
x)^(1/2)*1i - A^2*b^20*c*d^21*e^20*(d + e*x)^(1/2)*21i - B^2*b^3*c^18*d^40
*e*(d + e*x)^(1/2)*12i - A*B*b*c^20*d^41*(d + e*x)^(1/2)*2i - A^2*b^2*c^19
*d^39*e^2*(d + e*x)^(1/2)*144i + A^2*b^3*c^18*d^38*e^3*(d + e*x)^(1/2)*111
0i - A^2*b^4*c^17*d^37*e^4*(d + e*x)^(1/2)*5490i + A^2*b^5*c^16*d^36*e^5*(
d + e*x)^(1/2)*19557i - A^2*b^6*c^15*d^35*e^6*(d + e*x)^(1/2)*53340i + A^2
*b^7*c^14*d^34*e^7*(d + e*x)^(1/2)*115488i - A^2*b^8*c^13*d^33*e^8*(d + e*
x)^(1/2)*202995i + A^2*b^9*c^12*d^32*e^9*(d + e*x)^(1/2)*293710i - A^2*b^1
0*c^11*d^31*e^10*(d + e*x)^(1/2)*352650i + A^2*b^11*c^10*d^30*e^11*(d + e*
x)^(1/2)*352704i - A^2*b^12*c^9*d^29*e^12*(d + e*x)^(1/2)*293929i + A^2*b^
13*c^8*d^28*e^13*(d + e*x)^(1/2)*203490i - A^2*b^14*c^7*d^27*e^14*(d + e*x
)^(1/2)*116280i + A^2*b^15*c^6*d^26*e^15*(d + e*x)^(1/2)*54264i - A^2*b^16
*c^5*d^25*e^16*(d + e*x)^(1/2)*20349i + A^2*b^17*c^4*d^24*e^17*(d + e*x)^(
1/2)*5985i - A^2*b^18*c^3*d^23*e^18*(d + e*x)^(1/2)*1330i + A^2*b^19*c^2*d
^22*e^19*(d + e*x)^(1/2)*210i + B^2*b^4*c^17*d^39*e^2*(d + e*x)^(1/2)*66i
- B^2*b^5*c^16*d^38*e^3*(d + e*x)^(1/2)*220i + B^2*b^6*c^15*d^37*e^4*(d +
e*x)^(1/2)*495i - B^2*b^7*c^14*d^36*e^5*(d + e*x)^(1/2)*792i + B^2*b^8*c^1
3*d^35*e^6*(d + e*x)^(1/2)*924i - B^2*b^9*c^12*d^34*e^7*(d + e*x)^(1/2)*79
2i + B^2*b^10*c^11*d^33*e^8*(d + e*x)^(1/2)*495i - B^2*b^11*c^10*d^32*e^9*
(d + e*x)^(1/2)*220i + B^2*b^12*c^9*d^31*e^10*(d + e*x)^(1/2)*66i - B^2...
```

Reduce [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 2890, normalized size of antiderivative = 9.60

$$\int \frac{A+Bx}{(d+ex)^{9/2}\,(bx+cx^2)}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(9/2)/(c*x^2+b*x),x)
```

output

```
( - 210*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt
(c)*sqrt(b*e - c*d)))*a*c**4*d**8 - 630*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c
*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**4*d**7*e*x - 63
0*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sq
rt(b*e - c*d)))*a*c**4*d**6*e**2*x**2 - 210*sqrt(c)*sqrt(d + e*x)*sqrt(b*e
 - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**4*d**5*e**3
*x**3 + 210*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(
sqrt(c)*sqrt(b*e - c*d)))*b**2*c**3*d**8 + 630*sqrt(c)*sqrt(d + e*x)*sqrt(
b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*c**3*d**
7*e*x + 630*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(
sqrt(c)*sqrt(b*e - c*d)))*b**2*c**3*d**6*e**2*x**2 + 210*sqrt(c)*sqrt(d +
e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**
2*c**3*d**5*e**3*x**3 + 105*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt
(d))*a*b**5*d**3*e**5 + 315*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt
(d))*a*b**5*d**2*e**6*x + 315*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sq
rt(d))*a*b**5*d*e**7*x**2 + 105*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) -
sqrt(d))*a*b**5*e**8*x**3 - 525*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) -
sqrt(d))*a*b**4*c*d**4*e**4 - 1575*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x)
 - sqrt(d))*a*b**4*c*d**3*e**5*x - 1575*sqrt(d)*sqrt(d + e*x)*log(sqrt(d +
 e*x) - sqrt(d))*a*b**4*c*d**2*e**6*x**2 - 525*sqrt(d)*sqrt(d + e*x)*lo...
```

3.77 $\int \frac{(A+Bx)(d+ex)^{9/2}}{\left(bx+cx^2\right)^2} \, dx$

Optimal result

Integrand size = 26, antiderivative size = 389

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{\left(bx+cx^2\right)^2} \, dx = \frac{e(2Ac^4d^3 + 7b^4Be^3 - bc^3d^2(Bd+3Ae) - b^3ce^2(19Bd+5Ae) + b^2c^2de(15B}{b^2c^4}$$
$$+ \frac{e(6Ac^3d^2 - 7b^3Be^2 - 3bc^2d(Bd+2Ae) + b^2ce(12Bd+5Ae))\,(d+ex)^{3/2}}{3b^2c^3}$$
$$+ \frac{e(10Ac^2d + 7b^2Be - 5bc(Bd+Ae))\,(d+ex)^{5/2}}{5b^2c^2} + \frac{(bB-2Ac)(cd-be)(d+ex)^{7/2}}{b^2c(b+cx)}$$
$$- \frac{A(d+ex)^{9/2}}{bx(b+cx)} - \frac{d^{7/2}(2bBd - 4Acd + 9Abe)\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b^3}$$
$$- \frac{(cd-be)^{7/2}\,(4Ac^2d - 7b^2Be - bc(2Bd-5Ae))\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b^3c^{9/2}}$$

output
```
e*(2*A*c^4*d^3+7*b^4*B*e^3-b*c^3*d^2*(3*A*e+B*d)-b^3*c*e^2*(5*A*e+19*B*d)+
b^2*c^2*d*e*(11*A*e+15*B*d))*(e*x+d)^(1/2)/b^2/c^4+1/3*e*(6*A*c^3*d^2-7*b^
3*B*e^2-3*b*c^2*d*(2*A*e+B*d)+b^2*c*e*(5*A*e+12*B*d))*(e*x+d)^(3/2)/b^2/c^
3+1/5*e*(10*A*c^2*d+7*b^2*B*e-5*b*c*(A*e+B*d))*(e*x+d)^(5/2)/b^2/c^2+(-2*A
*c+B*b)*(-b*e+c*d)*(e*x+d)^(7/2)/b^2/c/(c*x+b)-A*(e*x+d)^(9/2)/b/x/(c*x+b)
-d^(7/2)*(9*A*b*e-4*A*c*d+2*B*b*d)*arctanh((e*x+d)^(1/2)/d^(1/2))/b^3-(-b*
e+c*d)^(7/2)*(4*A*c^2*d-7*b^2*B*e-b*c*(-5*A*e+2*B*d))*arctanh(c^(1/2)*(e*x
+d)^(1/2)/(-b*e+c*d)^(1/2))/b^3/c^(9/2)
```

Mathematica [A] (verified)

Time = 1.67 (sec) , antiderivative size = 336, normalized size of antiderivative = 0.86

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^2}\,dx = \frac{\frac{b\sqrt{d+ex}\left(-5Ac\left(6c^4d^4x+15b^4e^4x+3bc^3d^3(d-4ex)+2b^3ce^3x(-19d+5ex)-2b^2c^2e^2x\left(-9d^2+13dex+e^2x^2\right.\right.\right.}{}}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(9/2))/(b*x + c*x^2)^2,x]
```

output
```
((b*Sqrt[d + e*x]*(-5*A*c*(6*c^4*d^4*x + 15*b^4*e^4*x + 3*b*c^3*d^3*(d - 4
*e*x) + 2*b^3*c*e^3*x*(-19*d + 5*e*x) - 2*b^2*c^2*e^2*x*(-9*d^2 + 13*d*e*x
 + e^2*x^2)) + b*B*x*(15*c^4*d^4 + 105*b^4*e^4 + 10*b^3*c*e^3*(-32*d + 7*e
*x) - 2*b^2*c^2*e^2*(-153*d^2 + 109*d*e*x + 7*e^2*x^2) + 6*b*c^3*e*(-10*d^
3 + 36*d^2*e*x + 7*d*e^2*x^2 + e^3*x^3))))/(c^4*x*(b + c*x)) + (15*(-(c*d)
 + b*e)^(7/2)*(-2*b*B*c*d + 4*A*c^2*d - 7*b^2*B*e + 5*A*b*c*e)*ArcTan[(Sqr
t[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/c^(9/2) - 15*d^(7/2)*(2*b*B*d - 4
*A*c*d + 9*A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(15*b^3)
```

Rubi [A] (verified)

Time = 2.11 (sec) , antiderivative size = 413, normalized size of antiderivative = 1.06, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.385$, Rules used = {1233, 27, 1196, 1196, 1196, 1197, 25, 27, 1480, 221}

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

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^2}\,dx$$

$$\Big\downarrow \; 1233$$

$$\frac{\int \frac{(d+ex)^{5/2}\left(cd(2bBd-4Acd+9Abe)+e\left(7Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x\right)}{2(cx^2+bx)}dx}{b^2c} - \frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\,(bx+cx^2)}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{(d+ex)^{5/2}\left(cd(2bBd-4Acd+9Abe)+e\left(7Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x\right)}{cx^2+bx}dx}{2b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1196

$$\frac{\frac{\int \frac{(d+ex)^{3/2}\left(c^2(2bBd-4Acd+9Abe)d^2+e\left(-7Be^2b^3+ce(12Bd+5Ae)b^2-3c^2d(Bd+2Ae)b+6Ac^3d^2\right)x\right)}{cx^2+bx}dx}{c}+\frac{2e(d+ex)^{5/2}\left(-5bc(Ae+Bd)+10Ac^2d+7b^2\cdots\right.}{5c}}{2b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1196

$$\frac{\frac{\frac{\int \frac{\sqrt{d+ex}\left(c^3(2bBd-4Acd+9Abe)d^3+e\left(7Be^3b^4-ce^2(19Bd+5Ae)b^3+c^2de(15Bd+11Ae)b^2-c^3d^2(Bd+3Ae)b+2Ac^4d^3\right)x\right)}{cx^2+bx}dx}{c}+\frac{2e(d+ex)^{3/2}\left(b^2ce(5Ae+12Bd)-\cdots\right.}{\cdots}}{c}\cdots}{2b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1196

$$\frac{\frac{\frac{\int \frac{c^4d^4(2bBd-4Acd+9Abe)-e\left(7Be^4b^5-ce^3(26Bd+5Ae)b^4+2c^2de^2(17Bd+8Ae)b^3-2c^3d^2e(8Bd+7Ae)b^2-c^4d^3(Bd+4Ae)b+2Ac^5d^4\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{c}+\frac{2e\sqrt{d+ex}\left(-b^3ce^2\cdots\right.}{\cdots}}{c}\cdots}{c}\cdots-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1197

$$\frac{\frac{\frac{2\int -\frac{e\left(d(cd-be)\left(7Be^3b^4-ce^2(19Bd+5Ae)b^3+c^2de(15Bd+11Ae)b^2-c^3d^2(Bd+3Ae)b+2Ac^4d^3\right)+\left(7Be^4b^5-ce^3(26Bd+5Ae)b^4+2c^2de^2(17Bd+8Ae)b^3-2c^3d^2\cdots\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}\cdots}{c}\cdots}{c}\cdots}{\cdots}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 25

$$\frac{2e\sqrt{d+ex}\left(-b^3ce^2(5Ae+19Bd)+b^2c^2de(11Ae+15Bd)-bc^3d^2(3Ae+Bd)+2Ac^4d^3+7b^4Be^3\right)}{c} - \frac{2\int \frac{e\left(d(cd-be)\left(7Be^3b^4-ce^2(19Bd+5Ae)b^3+c^2de(15Bd+11Ae)b\right.\right.}{}}{c}$$

$$\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 27

$$\frac{2e\sqrt{d+ex}\left(-b^3ce^2(5Ae+19Bd)+b^2c^2de(11Ae+15Bd)-bc^3d^2(3Ae+Bd)+2Ac^4d^3+7b^4Be^3\right)}{c} - \frac{2e\int \frac{d(cd-be)\left(7Be^3b^4-ce^2(19Bd+5Ae)b^3+c^2de(15Bd+11Ae)b^2\right.}{}}{c}$$

$$\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1480

$$\frac{2e\sqrt{d+ex}\left(-b^3ce^2(5Ae+19Bd)+b^2c^2de(11Ae+15Bd)-bc^3d^2(3Ae+Bd)+2Ac^4d^3+7b^4Be^3\right)}{c} - \frac{2e\left(-\frac{(cd-be)^4\left(-bc(2Bd-5Ae)+4Ac^2d-7b^2Be\right)\int \frac{1}{-cd+be+c(d-}}{be}\right.}{c}$$

$$\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 221

$$\frac{2e\sqrt{d+ex}\left(-b^3ce^2(5Ae+19Bd)+b^2c^2de(11Ae+15Bd)-bc^3d^2(3Ae+Bd)+2Ac^4d^3+7b^4Be^3\right)}{c} - \frac{2e\left(\frac{(cd-be)^{7/2}\left(-bc(2Bd-5Ae)+4Ac^2d-7b^2Be\right)\operatorname{arctanh}\left(\frac{\sqrt{c}}{\sqrt{}}\right.}{b\sqrt{ce}}\right.}{c}$$

$$\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

input

```
Int[((A + B*x)*(d + e*x)^(9/2))/(b*x + c*x^2)^2,x]
```

output
```
-(((d + e*x)^(7/2)*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/
(b^2*c*(b*x + c*x^2))) + ((2*e*(10*A*c^2*d + 7*b^2*B*e - 5*b*c*(B*d + A*e)
)*(d + e*x)^(5/2))/(5*c) + ((2*e*(6*A*c^3*d^2 - 7*b^3*B*e^2 - 3*b*c^2*d*(B
*d + 2*A*e) + b^2*c*e*(12*B*d + 5*A*e))*(d + e*x)^(3/2))/(3*c) + ((2*e*(2*
A*c^4*d^3 + 7*b^4*B*e^3 - b*c^3*d^2*(B*d + 3*A*e) - b^3*c*e^2*(19*B*d + 5*
A*e) + b^2*c^2*d*e*(15*B*d + 11*A*e))*Sqrt[d + e*x])/c - (2*e*((c^4*d^(7/2
)*(2*b*B*d - 4*A*c*d + 9*A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*e) + ((
c*d - b*e)^(7/2)*(4*A*c^2*d - 7*b^2*B*e - b*c*(2*B*d - 5*A*e))*ArcTanh[(Sq
rt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c]*e)))/c)/c)/c)/(2*b^2*c)
```

Defintions of rubi rules used

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

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1196
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[g*((d + e*x)^m/(c*m)), x] + Simp[1/c   Int
[(d + e*x)^(m - 1)*(Simp[c*d*f - a*e*g + (g*c*d - b*e*g + c*e*f)*x, x]/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] &
& GtQ[m, 0]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.41 (sec) , antiderivative size = 333, normalized size of antiderivative = 0.86

method	result
pseudoelliptic	$\frac{4\left(A\,c^{2}d+\frac{5\left(Ae-\frac{2Bd}{5}\right)bc}{4}-\frac{7b^{2}Be}{4}\right)\sqrt{d}\,x(cx+b)(-be+cd)^{4}\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)-\sqrt{c(be-cd)}\left(9c^{4}d^{4}x(cx+b)\left(-\frac{4Acd}{9}\right.\right.}{}$
derivativedivides	$2e^{2}\left(-\frac{-\frac{B\,c^{2}(ex+d)^{\frac{5}{2}}}{5}-\frac{A\,c^{2}e(ex+d)^{\frac{3}{2}}}{3}+\frac{2Bbce(ex+d)^{\frac{3}{2}}}{3}-B\,c^{2}d(ex+d)^{\frac{3}{2}}+2Abc\,e^{2}\sqrt{ex+d}-4A\,c^{2}de\sqrt{ex+d}-3B\,b^{2}e^{2}}{c^{4}}\right.$
default	$2e^{2}\left(-\frac{-\frac{B\,c^{2}(ex+d)^{\frac{5}{2}}}{5}-\frac{A\,c^{2}e(ex+d)^{\frac{3}{2}}}{3}+\frac{2Bbce(ex+d)^{\frac{3}{2}}}{3}-B\,c^{2}d(ex+d)^{\frac{3}{2}}+2Abc\,e^{2}\sqrt{ex+d}-4A\,c^{2}de\sqrt{ex+d}-3B\,b^{2}e^{2}}{c^{4}}\right.$
risch	$-\frac{d^{4}A\sqrt{ex+d}}{b^{2}x}+\frac{e\left(\frac{2e\,b^{2}\left(\frac{B\,c^{2}(ex+d)^{\frac{5}{2}}}{5}+\frac{A\,c^{2}e(ex+d)^{\frac{3}{2}}}{3}-\frac{2Bbce(ex+d)^{\frac{3}{2}}}{3}+B\,c^{2}d(ex+d)^{\frac{3}{2}}-2Abc\,e^{2}\sqrt{ex+d}+4A\,c^{2}de\sqrt{ex+d}\right.}{c^{4}}\right.}{}$

input
```
int((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
4/d^(1/2)*((A*c^2*d+5/4*(A*e-2/5*B*d)*b*c-7/4*b^2*B*e)*d^(1/2)*x*(c*x+b)*(
-b*e+c*d)^4*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))-1/4*(c*(b*e-c*d))^
(1/2)*(9*c^4*d^4*x*(c*x+b)*(-4/9*A*c*d+b*(A*e+2/9*B*d))*arctanh((e*x+d)^(1
/2)/d^(1/2))+d^(1/2)*b*(2*A*c^5*d^4*x+d^3*b*(d*(-B*x+A)-4*A*e*x)*c^4+6*e*x
*(2/3*B*d^3+e*(-12/5*B*x+A)*d^2-13/9*(21/65*B*x+A)*e^2*x*d-1/9*e^3*(3/5*B*
x+A)*x^2)*b^2*c^3-38/3*e^2*x*(153/95*B*d^2+e*(-109/95*B*x+A)*d-5/19*e^2*(7
/25*B*x+A)*x)*b^3*c^2+5*(64/15*B*d+e*(-14/15*B*x+A))*e^3*x*b^4*c-7*B*b^5*e
^4*x)*(e*x+d)^(1/2)))/(c*(b*e-c*d))^(1/2)/c^4/b^3/x/(c*x+b)
```

Fricas [A] (verification not implemented)

Time = 138.32 (sec) , antiderivative size = 2706, normalized size of antiderivative = 6.96

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
[1/30*(15*((2*(B*b*c^5 - 2*A*c^6)*d^4 + (B*b^2*c^4 + 7*A*b*c^5)*d^3*e - 3*
(5*B*b^3*c^3 - A*b^2*c^4)*d^2*e^2 + (19*B*b^4*c^2 - 11*A*b^3*c^3)*d*e^3 -
(7*B*b^5*c - 5*A*b^4*c^2)*e^4)*x^2 + (2*(B*b^2*c^4 - 2*A*b*c^5)*d^4 + (B*b
^3*c^3 + 7*A*b^2*c^4)*d^3*e - 3*(5*B*b^4*c^2 - A*b^3*c^3)*d^2*e^2 + (19*B*
b^5*c - 11*A*b^4*c^2)*d*e^3 - (7*B*b^6 - 5*A*b^5*c)*e^4)*x)*sqrt((c*d - b*
e)/c)*log((c*e*x + 2*c*d - b*e + 2*sqrt(e*x + d)*c*sqrt((c*d - b*e)/c))/(c
*x + b)) + 15*((9*A*b*c^5*d^3*e + 2*(B*b*c^5 - 2*A*c^6)*d^4)*x^2 + (9*A*b^
2*c^4*d^3*e + 2*(B*b^2*c^4 - 2*A*b*c^5)*d^4)*x)*sqrt(d)*log((e*x - 2*sqrt(
e*x + d)*sqrt(d) + 2*d)/x) + 2*(6*B*b^3*c^3*e^4*x^4 - 15*A*b^2*c^4*d^4 + 2
*(21*B*b^3*c^3*d*e^3 - (7*B*b^4*c^2 - 5*A*b^3*c^3)*e^4)*x^3 + 2*(108*B*b^3
*c^3*d^2*e^2 - (109*B*b^4*c^2 - 65*A*b^3*c^3)*d*e^3 + 5*(7*B*b^5*c - 5*A*b
^4*c^2)*e^4)*x^2 + (15*(B*b^2*c^4 - 2*A*b*c^5)*d^4 - 60*(B*b^3*c^3 - A*b^2
*c^4)*d^3*e + 18*(17*B*b^4*c^2 - 5*A*b^3*c^3)*d^2*e^2 - 10*(32*B*b^5*c - 1
9*A*b^4*c^2)*d*e^3 + 15*(7*B*b^6 - 5*A*b^5*c)*e^4)*x)*sqrt(e*x + d))/(b^3*
c^5*x^2 + b^4*c^4*x), 1/30*(30*((2*(B*b*c^5 - 2*A*c^6)*d^4 + (B*b^2*c^4 +
7*A*b*c^5)*d^3*e - 3*(5*B*b^3*c^3 - A*b^2*c^4)*d^2*e^2 + (19*B*b^4*c^2 - 1
1*A*b^3*c^3)*d*e^3 - (7*B*b^5*c - 5*A*b^4*c^2)*e^4)*x^2 + (2*(B*b^2*c^4 -
2*A*b*c^5)*d^4 + (B*b^3*c^3 + 7*A*b^2*c^4)*d^3*e - 3*(5*B*b^4*c^2 - A*b^3*
c^3)*d^2*e^2 + (19*B*b^5*c - 11*A*b^4*c^2)*d*e^3 - (7*B*b^6 - 5*A*b^5*c)*e
^4)*x)*sqrt(-(c*d - b*e)/c)*arctan(-sqrt(e*x + d)*c*sqrt(-(c*d - b*e)/c...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(9/2)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^2,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 834 vs. 2(359) = 718.

Time = 0.27 (sec) , antiderivative size = 834, normalized size of antiderivative = 2.14

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
(2*B*b*d^5 - 4*A*c*d^5 + 9*A*b*d^4*e)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^3*
sqrt(-d)) - (2*B*b*c^5*d^5 - 4*A*c^6*d^5 - B*b^2*c^4*d^4*e + 11*A*b*c^5*d^
4*e - 16*B*b^3*c^3*d^3*e^2 - 4*A*b^2*c^4*d^3*e^2 + 34*B*b^4*c^2*d^2*e^3 -
14*A*b^3*c^3*d^2*e^3 - 26*B*b^5*c*d*e^4 + 16*A*b^4*c^2*d*e^4 + 7*B*b^6*e^5
 - 5*A*b^5*c*e^5)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/(sqrt(-c^2*
d + b*c*e)*b^3*c^4) + ((e*x + d)^(3/2)*B*b*c^4*d^4*e - 2*(e*x + d)^(3/2)*A
*c^5*d^4*e - sqrt(e*x + d)*B*b*c^4*d^5*e + 2*sqrt(e*x + d)*A*c^5*d^5*e - 4
*(e*x + d)^(3/2)*B*b^2*c^3*d^3*e^2 + 4*(e*x + d)^(3/2)*A*b*c^4*d^3*e^2 + 4
*sqrt(e*x + d)*B*b^2*c^3*d^4*e^2 - 5*sqrt(e*x + d)*A*b*c^4*d^4*e^2 + 6*(e*
x + d)^(3/2)*B*b^3*c^2*d^2*e^3 - 6*(e*x + d)^(3/2)*A*b^2*c^3*d^2*e^3 - 6*s
qrt(e*x + d)*B*b^3*c^2*d^3*e^3 + 6*sqrt(e*x + d)*A*b^2*c^3*d^3*e^3 - 4*(e*
x + d)^(3/2)*B*b^4*c*d*e^4 + 4*(e*x + d)^(3/2)*A*b^3*c^2*d*e^4 + 4*sqrt(e*
x + d)*B*b^4*c*d^2*e^4 - 4*sqrt(e*x + d)*A*b^3*c^2*d^2*e^4 + (e*x + d)^(3/
2)*B*b^5*e^5 - (e*x + d)^(3/2)*A*b^4*c*e^5 - sqrt(e*x + d)*B*b^5*d*e^5 + s
qrt(e*x + d)*A*b^4*c*d*e^5)/(((e*x + d)^2*c - 2*(e*x + d)*c*d + c*d^2 + (e
*x + d)*b*e - b*d*e)*b^2*c^4) + 2/15*(3*(e*x + d)^(5/2)*B*c^8*e^2 + 15*(e*
x + d)^(3/2)*B*c^8*d*e^2 + 90*sqrt(e*x + d)*B*c^8*d^2*e^2 - 10*(e*x + d)^(
3/2)*B*b*c^7*e^3 + 5*(e*x + d)^(3/2)*A*c^8*e^3 - 120*sqrt(e*x + d)*B*b*c^7
*d*e^3 + 60*sqrt(e*x + d)*A*c^8*d*e^3 + 45*sqrt(e*x + d)*B*b^2*c^6*e^4 - 3
0*sqrt(e*x + d)*A*b*c^7*e^4)/c^10
```

Mupad [B] (verification not implemented)

Time = 16.90 (sec) , antiderivative size = 12636, normalized size of antiderivative = 32.48

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(9/2))/(b*x + c*x^2)^2,x)
```

output
```
atan(((((20*A*b^10*c^6*d*e^7 - 28*B*b^11*c^5*d*e^7 + 8*A*b^6*c^10*d^5*e^3
- 20*A*b^7*c^9*d^4*e^4 + 56*A*b^8*c^8*d^3*e^5 - 64*A*b^9*c^7*d^2*e^6 - 4*B
*b^7*c^9*d^5*e^3 + 64*B*b^8*c^8*d^4*e^4 - 136*B*b^9*c^7*d^3*e^5 + 104*B*b^
10*c^6*d^2*e^6)/(b^6*c^7) - (2*(4*b^7*c^9*e^3 - 8*b^6*c^10*d*e^2)*(d + e*x
)^(1/2)*((16*A^2*c^11*d^9 - 49*B^2*b^11*e^9 - 25*A^2*b^9*c^2*e^9 + 4*B^2*b
^2*c^9*d^9 + 81*A^2*b^2*c^9*d^7*e^2 + 105*A^2*b^3*c^8*d^6*e^3 - 315*A^2*b^
4*c^7*d^5*e^4 + 189*A^2*b^5*c^6*d^4*e^5 + 147*A^2*b^6*c^5*d^3*e^6 - 261*A^
2*b^7*c^4*d^2*e^7 - 63*B^2*b^4*c^7*d^7*e^2 + 105*B^2*b^5*c^6*d^6*e^3 + 189
*B^2*b^6*c^5*d^5*e^4 - 819*B^2*b^7*c^4*d^4*e^5 + 1155*B^2*b^8*c^3*d^3*e^6
- 837*B^2*b^9*c^2*d^2*e^7 - 72*A^2*b*c^10*d^8*e + 315*B^2*b^10*c*d*e^8 + 1
35*A^2*b^8*c^3*d*e^8 - 16*A*B*b*c^10*d^9 + 70*A*B*b^10*c*e^9 + 36*A*B*b^2*
c^9*d^8*e - 414*A*B*b^9*c^2*d*e^8 + 126*A*B*b^3*c^8*d^7*e^2 - 546*A*B*b^4*
c^7*d^6*e^3 + 630*A*B*b^5*c^6*d^5*e^4 + 126*A*B*b^6*c^5*d^4*e^5 - 966*A*B*
b^7*c^4*d^3*e^6 + 954*A*B*b^8*c^3*d^2*e^7)/(4*b^6*c^9))^(1/2))/(b^4*c^7))*
((16*A^2*c^11*d^9 - 49*B^2*b^11*e^9 - 25*A^2*b^9*c^2*e^9 + 4*B^2*b^2*c^9*d
^9 + 81*A^2*b^2*c^9*d^7*e^2 + 105*A^2*b^3*c^8*d^6*e^3 - 315*A^2*b^4*c^7*d^
5*e^4 + 189*A^2*b^5*c^6*d^4*e^5 + 147*A^2*b^6*c^5*d^3*e^6 - 261*A^2*b^7*c^
4*d^2*e^7 - 63*B^2*b^4*c^7*d^7*e^2 + 105*B^2*b^5*c^6*d^6*e^3 + 189*B^2*b^6
*c^5*d^5*e^4 - 819*B^2*b^7*c^4*d^4*e^5 + 1155*B^2*b^8*c^3*d^3*e^6 - 837*B^
2*b^9*c^2*d^2*e^7 - 72*A^2*b*c^10*d^8*e + 315*B^2*b^10*c*d*e^8 + 135*A^...
```

Reduce [B] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 1701, normalized size of antiderivative = 4.37

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^2,x)
```

output

```
(150*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*
d)))*a*b**5*c*e**4*x - 330*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/
(sqrt(c)*sqrt(b*e - c*d)))*a*b**4*c**2*d*e**3*x + 150*sqrt(c)*sqrt(b*e - c
*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**4*c**2*e**4*x**
2 + 90*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
c*d)))*a*b**3*c**3*d**2*e**2*x - 330*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d
+ e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**3*d*e**3*x**2 + 210*sqrt(c)
*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*
c**4*d**3*e*x + 90*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)
*sqrt(b*e - c*d)))*a*b**2*c**4*d**2*e**2*x**2 - 120*sqrt(c)*sqrt(b*e - c*d
)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**5*d**4*x + 210*
sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*
a*b*c**5*d**3*e*x**2 - 120*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/
(sqrt(c)*sqrt(b*e - c*d)))*a*c**6*d**4*x**2 - 210*sqrt(c)*sqrt(b*e - c*d)*
atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**7*e**4*x + 570*sqrt(c
)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**6*c
*d*e**3*x - 210*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sq
rt(b*e - c*d)))*b**6*c*e**4*x**2 - 450*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(
d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**5*c**2*d**2*e**2*x + 570*sqrt(c)
*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**5...
```

3.78 $\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 295

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^2}\,dx = \frac{e(2Ac^3d^2-5b^3Be^2-bc^2d(Bd+2Ae)+b^2ce(8Bd+3Ae))\sqrt{d+ex}}{b^2c^3} + \frac{e(6Ac^2d+5b^2Be-3bc(Bd+Ae))\,(d+ex)^{3/2}}{3b^2c^2} + \frac{(bB-2Ac)(cd-be)(d+ex)^{5/2}}{b^2c(b+cx)} - \frac{A(d+ex)^{7/2}}{bx(b+cx)} - \frac{d^{5/2}(2bBd-4Acd+7Abe)\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b^3} + \frac{(cd-be)^{5/2}\,(2bBcd-4Ac^2d+5b^2Be-3Abce)\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b^3c^{7/2}}$$

output
```
e*(2*A*c^3*d^2-5*b^3*B*e^2-b*c^2*d*(2*A*e+B*d)+b^2*c*e*(3*A*e+8*B*d))*(e*x
+d)^(1/2)/b^2/c^3+1/3*e*(6*A*c^2*d+5*b^2*B*e-3*b*c*(A*e+B*d))*(e*x+d)^(3/2
)/b^2/c^2+(-2*A*c+B*b)*(-b*e+c*d)*(e*x+d)^(5/2)/b^2/c/(c*x+b)-A*(e*x+d)^(7
/2)/b/x/(c*x+b)-d^(5/2)*(7*A*b*e-4*A*c*d+2*B*b*d)*arctanh((e*x+d)^(1/2)/d^
(1/2))/b^3+(-b*e+c*d)^(5/2)*(-3*A*b*c*e-4*A*c^2*d+5*B*b^2*e+2*B*b*c*d)*arc
tanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b^3/c^(7/2)
```

Mathematica [A] (verified)

Time = 1.37 (sec) , antiderivative size = 262, normalized size of antiderivative = 0.89

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^2}\,dx = \frac{\frac{b\sqrt{d+ex}\left(-3Ac\left(2c^3d^3x-3b^3e^3x+bc^2d^2(d-3ex)+b^2ce^2x(3d-2ex)\right)+bBx\left(3c^3d^3-15b^3e^3+b^2ce^2(29d-10\right.\right.}{c^3x(b+cx)}}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(7/2))/(b*x + c*x^2)^2,x]
```

output
```
((b*Sqrt[d + e*x]*(-3*A*c*(2*c^3*d^3*x - 3*b^3*e^3*x + b*c^2*d^2*(d - 3*e*
x) + b^2*c*e^2*x*(3*d - 2*e*x)) + b*B*x*(3*c^3*d^3 - 15*b^3*e^3 + b^2*c*e^
2*(29*d - 10*e*x) + b*c^2*e*(-9*d^2 + 20*d*e*x + 2*e^2*x^2))))/(c^3*x*(b +
 c*x)) - (3*(-(c*d) + b*e)^(5/2)*(-2*b*B*c*d + 4*A*c^2*d - 5*b^2*B*e + 3*A
*b*c*e)*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/c^(7/2) - 3*d^
(5/2)*(2*b*B*d - 4*A*c*d + 7*A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*b^3
)
```

Rubi [A] (verified)

Time = 1.60 (sec) , antiderivative size = 319, normalized size of antiderivative = 1.08, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.346$, Rules used = {1233, 27, 1196, 1196, 1197, 25, 27, 1480, 221}

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

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^2}\,dx$$

$$\Big\downarrow \; 1233$$

$$\frac{\int \frac{(d+ex)^{3/2}\left(cd(2bBd-4Acd+7Abe)+e\left(5Beb^2-3c(Bd+Ae)b+6Ac^2d\right)x\right)}{2(cx^2+bx)}dx}{b^2c} - \frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\,(bx+cx^2)}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{(d+ex)^{3/2}(cd(2bBd-4Acd+7Abe)+e(5Beb^2-3c(Bd+Ae)b+6Ac^2d)x)}{cx^2+bx}dx}{2b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\big\downarrow$ 1196

$$\frac{\frac{\int \frac{\sqrt{d+ex}\left(c^2(2bBd-4Acd+7Abe)d^2+e\left(-5Be^2b^3+ce(8Bd+3Ae)b^2-c^2d(Bd+2Ae)b+2Ac^3d^2\right)x\right)}{cx^2+bx}dx}{c}+\frac{2e(d+ex)^{3/2}(-3bc(Ae+Bd)+6Ac^2d+5b^2Be)}{3c}}{2b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\big\downarrow$ 1196

$$\frac{\frac{\frac{\int \frac{c^3d^3(2bBd-4Acd+7Abe)-e\left(-5Be^3b^4+ce^2(13Bd+3Ae)b^3-c^2de(9Bd+5Ae)b^2-c^3d^2(Bd+3Ae)b+2Ac^4d^3\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{c}+\frac{2e\sqrt{d+ex}\left(b^2ce(3Ae+8Bd)-bc^2d(2Ae+Bd)}{c}}{c}}{2b^2c}$$

$$\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\big\downarrow$ 1197

$$\frac{\frac{\frac{2\int -\frac{e\left(d(cd-be)\left(-5Be^2b^3+ce(8Bd+3Ae)b^2-c^2d(Bd+2Ae)b+2Ac^3d^2\right)+\left(-5Be^3b^4+ce^2(13Bd+3Ae)b^3-c^2de(9Bd+5Ae)b^2-c^3d^2(Bd+3Ae)b+2Ac^4d^3\right)(d+ex}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{c}}{c}}{2b^2c}$$

$$\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\big\downarrow$ 25

$$\frac{\frac{\frac{2e\sqrt{d+ex}\left(b^2ce(3Ae+8Bd)-bc^2d(2Ae+Bd)+2Ac^3d^2-5b^3Be^2\right)}{c}-\frac{2\int \frac{e\left(d(cd-be)\left(-5Be^2b^3+ce(8Bd+3Ae)b^2-c^2d(Bd+2Ae)b+2Ac^3d^2\right)+\left(-5Be^3b^4+ce^2(13B\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d}}{c}}{c}}{2b^2c}$$

$$\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\big\downarrow$ 27

$$\frac{\frac{\frac{2e\sqrt{d+ex}\left(b^2ce(3Ae+8Bd)-bc^2d(2Ae+Bd)+2Ac^3d^2-5b^3Be^2\right)}{c}-\frac{2e\int\frac{d(cd-be)\left(-5Be^2b^3+ce(8Bd+3Ae)b^2-c^2d(Bd+2Ae)b+2Ac^3d^2\right)+\left(-5Be^3b^4+ce^2(13Bd\cdots\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(\cdots}}{c}}{c}}{2b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$$\Big\downarrow \text{1480}$$

$$\frac{\frac{\frac{2e\sqrt{d+ex}\left(b^2ce(3Ae+8Bd)-bc^2d(2Ae+Bd)+2Ac^3d^2-5b^3Be^2\right)}{c}-\frac{2e\left(-\frac{(cd-be)^3\left(-bc(2Bd-3Ae)+4Ac^2d-5b^2Be\right)\int\frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{be}-\frac{c^4d^3(7Abe-\cdots}{\cdots}\right.}{c}}{c}}{2b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$$\Big\downarrow \text{221}$$

$$\frac{\frac{\frac{2e\sqrt{d+ex}\left(b^2ce(3Ae+8Bd)-bc^2d(2Ae+Bd)+2Ac^3d^2-5b^3Be^2\right)}{c}-\frac{2e\left(\frac{(cd-be)^{5/2}\left(-bc(2Bd-3Ae)+4Ac^2d-5b^2Be\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}e}+\frac{c^3d^{5/2}\text{arctan}\cdots}{\cdots}\right.}{c}}{c}}{2b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

input
```
Int[((A + B*x)*(d + e*x)^(7/2))/(b*x + c*x^2)^2,x]
```

output
```
-(((d + e*x)^(5/2)*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/
(b^2*c*(b*x + c*x^2))) + ((2*e*(6*A*c^2*d + 5*b^2*B*e - 3*b*c*(B*d + A*e))
*(d + e*x)^(3/2))/(3*c) + ((2*e*(2*A*c^3*d^2 - 5*b^3*B*e^2 - b*c^2*d*(B*d
+ 2*A*e) + b^2*c*e*(8*B*d + 3*A*e))*Sqrt[d + e*x])/c - (2*e*((c^3*d^(5/2)*
(2*b*B*d - 4*A*c*d + 7*A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*e) + ((c*
d - b*e)^(5/2)*(4*A*c^2*d - 5*b^2*B*e - b*c*(2*B*d - 3*A*e))*ArcTanh[(Sqrt
[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c]*e)))/c)/c)/(2*b^2*c)
```

Defintions of rubi rules used

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

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1196
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[g*((d + e*x)^m/(c*m)), x] + Simp[1/c   Int
[(d + e*x)^(m - 1)*(Simp[c*d*f - a*e*g + (g*c*d - b*e*g + c*e*f)*x, x]/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] &
& GtQ[m, 0]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.35 (sec) , antiderivative size = 275, normalized size of antiderivative = 0.93

method	result
pseudoelliptic	$\frac{4\sqrt{d}\,(-be+cd)^3\left(A\,c^2d+\frac{3b\left(Ae-\frac{2Bd}{3}\right)c}{4}-\frac{5b^2Be}{4}\right)x(cx+b)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)-\sqrt{c(be-cd)}\left(7c^3d^3\left(-\frac{4Acd}{7}+b\left(Ae+\cdots\right.\right.\right.}{\cdots}$
derivativedivides	$2e^2\left(\frac{\frac{Bc(ex+d)^{\frac{3}{2}}}{3}+Ace\sqrt{ex+d}-2Bbe\sqrt{ex+d}+3Bcd\sqrt{ex+d}}{c^3}-\frac{\left(-\frac{1}{2}A\,b^4c\,e^4+\frac{3}{2}A\,b^3c^2d\,e^3-\frac{3}{2}A\,b^2c^3d^2e^2+\frac{1}{2}Ab\,c^4d^3e+\cdots\right.}{(ex+d)\cdots}\right.$
default	$2e^2\left(\frac{\frac{Bc(ex+d)^{\frac{3}{2}}}{3}+Ace\sqrt{ex+d}-2Bbe\sqrt{ex+d}+3Bcd\sqrt{ex+d}}{c^3}-\frac{\left(-\frac{1}{2}A\,b^4c\,e^4+\frac{3}{2}A\,b^3c^2d\,e^3-\frac{3}{2}A\,b^2c^3d^2e^2+\frac{1}{2}Ab\,c^4d^3e+\cdots\right.}{(ex+d)\cdots}\right.$
risch	$-\frac{d^3A\sqrt{ex+d}}{b^2x}+\frac{e\left(\frac{2e\,b^2\left(\frac{Bc(ex+d)^{\frac{3}{2}}}{3}+Ace\sqrt{ex+d}-2Bbe\sqrt{ex+d}+3Bcd\sqrt{ex+d}\right)}{c^3}-\frac{d^{\frac{5}{2}}(7Abe-4Acd+2Bbd)\,\mathrm{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)\cdots}{eb}\cdots\right.}{\cdots}$

input
```
int((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
4*(d^(1/2)*(-b*e+c*d)^3*(A*c^2*d+3/4*b*(A*e-2/3*B*d)*c-5/4*b^2*B*e)*x*(c*x
+b)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))-1/4*(c*(b*e-c*d))^(1/2)*(7
*c^3*d^3*(-4/7*A*c*d+b*(A*e+2/7*B*d))*x*(c*x+b)*arctanh((e*x+d)^(1/2)/d^(1
/2))+d^(1/2)*(2*A*c^4*d^3*x+(d*(-B*x+A)-3*A*e*x)*d^2*b*c^3+3*(B*d^2+e*(-20
/9*B*x+A)*d-2/3*e^2*x*(1/3*B*x+A))*e*x*b^2*c^2-3*e^2*x*b^3*(29/9*B*d+e*(-1
0/9*B*x+A))*c+5*B*b^4*e^3*x)*b*(e*x+d)^(1/2)))/d^(1/2)/(c*(b*e-c*d))^(1/2)
/c^3/b^3/x/(c*x+b)
```

Fricas [A] (verification not implemented)

Time = 36.30 (sec) , antiderivative size = 2098, normalized size of antiderivative = 7.11

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
[-1/6*(3*((2*(B*b*c^4 - 2*A*c^5)*d^3 + (B*b^2*c^3 + 5*A*b*c^4)*d^2*e - 2*(
4*B*b^3*c^2 - A*b^2*c^3)*d*e^2 + (5*B*b^4*c - 3*A*b^3*c^2)*e^3)*x^2 + (2*(
B*b^2*c^3 - 2*A*b*c^4)*d^3 + (B*b^3*c^2 + 5*A*b^2*c^3)*d^2*e - 2*(4*B*b^4*
c - A*b^3*c^2)*d*e^2 + (5*B*b^5 - 3*A*b^4*c)*e^3)*x)*sqrt((c*d - b*e)/c)*l
og((c*e*x + 2*c*d - b*e - 2*sqrt(e*x + d)*c*sqrt((c*d - b*e)/c))/(c*x + b)
) - 3*((7*A*b*c^4*d^2*e + 2*(B*b*c^4 - 2*A*c^5)*d^3)*x^2 + (7*A*b^2*c^3*d^
2*e + 2*(B*b^2*c^3 - 2*A*b*c^4)*d^3)*x)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)
*sqrt(d) + 2*d)/x) - 2*(2*B*b^3*c^2*e^3*x^3 - 3*A*b^2*c^3*d^3 + 2*(10*B*b^
3*c^2*d*e^2 - (5*B*b^4*c - 3*A*b^3*c^2)*e^3)*x^2 + (3*(B*b^2*c^3 - 2*A*b*c
^4)*d^3 - 9*(B*b^3*c^2 - A*b^2*c^3)*d^2*e + (29*B*b^4*c - 9*A*b^3*c^2)*d*e
^2 - 3*(5*B*b^5 - 3*A*b^4*c)*e^3)*x)*sqrt(e*x + d))/(b^3*c^4*x^2 + b^4*c^3
*x), 1/6*(6*((2*(B*b*c^4 - 2*A*c^5)*d^3 + (B*b^2*c^3 + 5*A*b*c^4)*d^2*e -
2*(4*B*b^3*c^2 - A*b^2*c^3)*d*e^2 + (5*B*b^4*c - 3*A*b^3*c^2)*e^3)*x^2 + (
2*(B*b^2*c^3 - 2*A*b*c^4)*d^3 + (B*b^3*c^2 + 5*A*b^2*c^3)*d^2*e - 2*(4*B*b
^4*c - A*b^3*c^2)*d*e^2 + (5*B*b^5 - 3*A*b^4*c)*e^3)*x)*sqrt(-(c*d - b*e)/
c)*arctan(-sqrt(e*x + d)*c*sqrt(-(c*d - b*e)/c)/(c*d - b*e)) + 3*((7*A*b*c
^4*d^2*e + 2*(B*b*c^4 - 2*A*c^5)*d^3)*x^2 + (7*A*b^2*c^3*d^2*e + 2*(B*b^2*
c^3 - 2*A*b*c^4)*d^3)*x)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)
/x) + 2*(2*B*b^3*c^2*e^3*x^3 - 3*A*b^2*c^3*d^3 + 2*(10*B*b^3*c^2*d*e^2 - (
5*B*b^4*c - 3*A*b^3*c^2)*e^3)*x^2 + (3*(B*b^2*c^3 - 2*A*b*c^4)*d^3 - 9*...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(7/2)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^2,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 625 vs. $2(269) = 538$.

Time = 0.31 (sec) , antiderivative size = 625, normalized size of antiderivative = 2.12

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^2}\,dx = \frac{(2\,Bbd^4 - 4\,Acd^4 + 7\,Abd^3e)\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b^3\sqrt{-d}}$$
$$- \frac{(2\,Bbc^4d^4 - 4\,Ac^5d^4 - Bb^2c^3d^3e + 9\,Abc^4d^3e - 9\,Bb^3c^2d^2e^2 - 3\,Ab^2c^3d^2e^2 + 13\,Bb^4cde^3 - 5\,Ab^3c^2de^3 -}{\sqrt{-c^2d+bce}b^3c^3}$$
$$+ \frac{2\left((ex+d)^{\frac{3}{2}}Bc^4e^2 + 9\,\sqrt{ex+d}Bc^4de^2 - 6\,\sqrt{ex+d}Bbc^3e^3 + 3\,\sqrt{ex+d}Ac^4e^3\right)}{3\,c^6}$$
$$+ \frac{(ex+d)^{\frac{3}{2}}Bbc^3d^3e - 2\,(ex+d)^{\frac{3}{2}}Ac^4d^3e - \sqrt{ex+d}Bbc^3d^4e + 2\,\sqrt{ex+d}Ac^4d^4e - 3\,(ex+d)^{\frac{3}{2}}Bb^2c^2d^2e^2 -}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
(2*B*b*d^4 - 4*A*c*d^4 + 7*A*b*d^3*e)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^3*
sqrt(-d)) - (2*B*b*c^4*d^4 - 4*A*c^5*d^4 - B*b^2*c^3*d^3*e + 9*A*b*c^4*d^3
*e - 9*B*b^3*c^2*d^2*e^2 - 3*A*b^2*c^3*d^2*e^2 + 13*B*b^4*c*d*e^3 - 5*A*b^
3*c^2*d*e^3 - 5*B*b^5*e^4 + 3*A*b^4*c*e^4)*arctan(sqrt(e*x + d)*c/sqrt(-c^
2*d + b*c*e))/(sqrt(-c^2*d + b*c*e)*b^3*c^3) + 2/3*((e*x + d)^(3/2)*B*c^4*
e^2 + 9*sqrt(e*x + d)*B*c^4*d*e^2 - 6*sqrt(e*x + d)*B*b*c^3*e^3 + 3*sqrt(e
*x + d)*A*c^4*e^3)/c^6 + ((e*x + d)^(3/2)*B*b*c^3*d^3*e - 2*(e*x + d)^(3/2
)*A*c^4*d^3*e - sqrt(e*x + d)*B*b*c^3*d^4*e + 2*sqrt(e*x + d)*A*c^4*d^4*e
- 3*(e*x + d)^(3/2)*B*b^2*c^2*d^2*e^2 + 3*(e*x + d)^(3/2)*A*b*c^3*d^2*e^2
+ 3*sqrt(e*x + d)*B*b^2*c^2*d^3*e^2 - 4*sqrt(e*x + d)*A*b*c^3*d^3*e^2 + 3*
(e*x + d)^(3/2)*B*b^3*c*d*e^3 - 3*(e*x + d)^(3/2)*A*b^2*c^2*d*e^3 - 3*sqrt
(e*x + d)*B*b^3*c*d^2*e^3 + 3*sqrt(e*x + d)*A*b^2*c^2*d^2*e^3 - (e*x + d)^
(3/2)*B*b^4*e^4 + (e*x + d)^(3/2)*A*b^3*c*e^4 + sqrt(e*x + d)*B*b^4*d*e^4
- sqrt(e*x + d)*A*b^3*c*d*e^4)/(((e*x + d)^2*c - 2*(e*x + d)*c*d + c*d^2 +
 (e*x + d)*b*e - b*d*e)*b^2*c^3)
```

Mupad [B] (verification not implemented)

Time = 13.22 (sec) , antiderivative size = 7328, normalized size of antiderivative = 24.84

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{\left(bx+cx^2\right)^2}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(7/2))/(b*x + c*x^2)^2,x)
```

output
```
(((d + e*x)^(3/2)*(B*b^4*e^4 - A*b^3*c*e^4 + 2*A*c^4*d^3*e - 3*A*b*c^3*d^2
*e^2 + 3*A*b^2*c^2*d*e^3 + 3*B*b^2*c^2*d^2*e^2 - B*b*c^3*d^3*e - 3*B*b^3*c
*d*e^3))/b^2 - ((d + e*x)^(1/2)*(2*A*c^4*d^4*e + B*b^4*d*e^4 - 4*A*b*c^3*d
^3*e^2 - 3*B*b^3*c*d^2*e^3 + 3*A*b^2*c^2*d^2*e^3 + 3*B*b^2*c^2*d^3*e^2 - A
*b^3*c*d*e^4 - B*b*c^3*d^4*e))/b^2)/((2*c^4*d - b*c^3*e)*(d + e*x) - c^4*(
d + e*x)^2 - c^4*d^2 + b*c^3*d*e) + ((2*A*e^3 - 2*B*d*e^2)/c^2 + (2*B*e^2*
(4*c^2*d - 2*b*c*e))/c^4)*(d + e*x)^(1/2) + (atan((((((12*A*b^9*c^5*d*e^6
 - 20*B*b^10*c^4*d*e^6 - 8*A*b^6*c^8*d^4*e^3 + 16*A*b^7*c^7*d^3*e^4 - 20*A
*b^8*c^6*d^2*e^5 + 4*B*b^7*c^7*d^4*e^3 - 36*B*b^8*c^6*d^3*e^4 + 52*B*b^9*c
^5*d^2*e^5)/(b^6*c^5) + ((4*b^7*c^7*e^3 - 8*b^6*c^8*d*e^2)*(d^5)^(1/2)*(d
+ e*x)^(1/2)*(7*A*b*e - 4*A*c*d + 2*B*b*d))/(b^7*c^5))*(d^5)^(1/2)*(7*A*b*
e - 4*A*c*d + 2*B*b*d))/(2*b^3) + (2*(d + e*x)^(1/2)*(25*B^2*b^10*e^10 + 9
*A^2*b^8*c^2*e^10 + 32*A^2*c^10*d^8*e^2 + 154*A^2*b^2*c^8*d^6*e^4 - 14*A^2
*b^3*c^7*d^5*e^5 - 105*A^2*b^4*c^6*d^4*e^6 + 84*A^2*b^5*c^5*d^3*e^7 + 7*A^
2*b^6*c^4*d^2*e^8 + 8*B^2*b^2*c^8*d^8*e^2 - 4*B^2*b^3*c^7*d^7*e^3 - 35*B^2
*b^4*c^6*d^6*e^4 + 70*B^2*b^5*c^5*d^5*e^5 + 35*B^2*b^6*c^4*d^4*e^6 - 224*B
^2*b^7*c^3*d^3*e^7 + 259*B^2*b^8*c^2*d^2*e^8 - 130*B^2*b^9*c*d*e^9 - 128*A
^2*b*c^9*d^7*e^3 - 30*A^2*b^7*c^3*d*e^9 - 30*A*B*b^9*c*e^10 - 32*A*B*b*c^9
*d^8*e^2 + 128*A*B*b^8*c^2*d*e^9 + 72*A*B*b^2*c^8*d^7*e^3 + 42*A*B*b^3*c^7
*d^6*e^4 - 280*A*B*b^4*c^6*d^5*e^5 + 350*A*B*b^5*c^5*d^4*e^6 - 84*A*B*b...
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 1345, normalized size of antiderivative = 4.56

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^2,x)
```

output

```
( - 18*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
c*d)))*a*b**4*c*e**3*x + 12*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)
/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**2*d*e**2*x - 18*sqrt(c)*sqrt(b*e - c
*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**2*e**3*x**
2 + 30*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
c*d)))*a*b**2*c**3*d**2*e*x + 12*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*
x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**3*d*e**2*x**2 - 24*sqrt(c)*sqrt
(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**4*d**
3*x + 30*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e
- c*d)))*a*b*c**4*d**2*e*x**2 - 24*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d +
e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**5*d**3*x**2 + 30*sqrt(c)*sqrt(b*e
- c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**6*e**3*x - 48*
sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*
b**5*c*d*e**2*x + 30*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(
c)*sqrt(b*e - c*d)))*b**5*c*e**3*x**2 + 6*sqrt(c)*sqrt(b*e - c*d)*atan((sq
rt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c**2*d**2*e*x - 48*sqrt(c)*
sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c**
2*d*e**2*x**2 + 12*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)
*sqrt(b*e - c*d)))*b**3*c**3*d**3*x + 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt
(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c**3*d**2*e*x**2 + 12*sqrt...
```

3.79 $\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2} dx$

Optimal result

Integrand size = 26, antiderivative size = 228

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2} dx = \frac{e(2Ac^2d+3b^2Be-bc(Bd+Ae))\sqrt{d+ex}}{b^2c^2} + \frac{(bB-2Ac)(cd-be)(d+ex)^{3/2}}{b^2c(b+cx)} - \frac{A(d+ex)^{5/2}}{bx(b+cx)} - \frac{d^{3/2}(2bBd-4Acd+5Abe)\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b^3} - \frac{(cd-be)^{3/2}\left(4Ac^2d-3b^2Be-bc(2Bd-Ae)\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b^3c^{5/2}}$$

output
```
e*(2*A*c^2*d+3*b^2*B*e-b*c*(A*e+B*d))*(e*x+d)^(1/2)/b^2/c^2+(-2*A*c+B*b)*(
-b*e+c*d)*(e*x+d)^(3/2)/b^2/c/(c*x+b)-A*(e*x+d)^(5/2)/b/x/(c*x+b)-d^(3/2)*
(5*A*b*e-4*A*c*d+2*B*b*d)*arctanh((e*x+d)^(1/2)/d^(1/2))/b^3-(-b*e+c*d)^(3
/2)*(4*A*c^2*d-3*b^2*B*e-b*c*(-A*e+2*B*d))*arctanh(c^(1/2)*(e*x+d)^(1/2)/(
-b*e+c*d)^(1/2))/b^3/c^(5/2)
```

Mathematica [A] (verified)

Time = 1.50 (sec) , antiderivative size = 205, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2}\,dx = \frac{\frac{b\sqrt{d+ex}\left(-Ac\left(2c^2d^2x+b^2e^2x+bcd(d-2ex)\right)+bBx\left(c^2d^2+3b^2e^2+2bce(-d+ex)\right)\right)}{c^2x(b+cx)}+\frac{(-cd+be)^{3/2}(-2b\cdots}{\cdots}}{\cdots}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(5/2))/(b*x + c*x^2)^2,x]
```

output
```
((b*Sqrt[d + e*x]*(-(A*c*(2*c^2*d^2*x + b^2*e^2*x + b*c*d*(d - 2*e*x))) +
b*B*x*(c^2*d^2 + 3*b^2*e^2 + 2*b*c*e*(-d + e*x))))/(c^2*x*(b + c*x)) + ((-
(c*d) + b*e)^(3/2)*(-2*b*B*c*d + 4*A*c^2*d - 3*b^2*B*e + A*b*c*e)*ArcTan[(
Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/c^(5/2) - d^(3/2)*(2*b*B*d - 4
*A*c*d + 5*A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/b^3
```

Rubi [A] (verified)

Time = 1.16 (sec) , antiderivative size = 248, normalized size of antiderivative = 1.09, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {1233, 27, 1196, 1197, 25, 27, 1480, 221}

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

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2}\,dx$$

$$\Big\downarrow \ 1233$$

$$\frac{\int \frac{\sqrt{d+ex}\left(cd(2bBd-4Acd+5Abe)+e\left(3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{2(cx^2+bx)}dx}{b^2c}-\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$$\Big\downarrow \ 27$$

$$\frac{\int \frac{\sqrt{d+ex}\left(cd(2bBd-4Acd+5Abe)+e\left(3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{cx^2+bx}dx}{2b^2c}-\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1196

$$\frac{\frac{\int \frac{c^2d^2(2bBd-4Acd+5Abe)-e\left(3Be^2b^3-ce(4Bd+Ae)b^2-c^2d(Bd+2Ae)b+2Ac^3d^2\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{c}+\frac{2e\sqrt{d+ex}\left(-bc(Ae+Bd)+2Ac^2d+3b^2Be\right)}{c}}{2b^2c}-\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1197

$$\frac{\frac{2\int -\frac{e\left(d(cd-be)\left(3Beb^2-c(Bd+Ae)b+2Ac^2d\right)+\left(3Be^2b^3-ce(4Bd+Ae)b^2-c^2d(Bd+2Ae)b+2Ac^3d^2\right)(d+ex)\right)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{c}+\frac{2e\sqrt{d+ex}\left(-bc(Ae+Bd)+2Ac^2\right)}{c}}{2b^2c}-\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 25

$$\frac{\frac{2e\sqrt{d+ex}\left(-bc(Ae+Bd)+2Ac^2d+3b^2Be\right)}{c}-\frac{2\int \frac{e\left(d(cd-be)\left(3Beb^2-c(Bd+Ae)b+2Ac^2d\right)+\left(3Be^2b^3-ce(4Bd+Ae)b^2-c^2d(Bd+2Ae)b+2Ac^3d^2\right)(d+ex)\right)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{c}}{2b^2c}-\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 27

$$\frac{\frac{2e\sqrt{d+ex}\left(-bc(Ae+Bd)+2Ac^2d+3b^2Be\right)}{c}-\frac{2e\int \frac{d(cd-be)\left(3Beb^2-c(Bd+Ae)b+2Ac^2d\right)+\left(3Be^2b^3-ce(4Bd+Ae)b^2-c^2d(Bd+2Ae)b+2Ac^3d^2\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d}{c}}{2b^2c}-\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1480

$$\frac{\frac{2e\sqrt{d+ex}\left(-bc(Ae+Bd)+2Ac^2d+3b^2Be\right)}{c}-\frac{2e\left(-\frac{(cd-be)^2\left(-bc(2Bd-Ae)+4Ac^2d-3b^2Be\right)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{be}-\frac{c^3d^2(5Abe-4Acd+2bBd)\int}{be}\right)}{c}}{2b^2c}-\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$$\Big\downarrow \; 221$$

$$\frac{\frac{2e\sqrt{d+ex}(-bc(Ae+Bd)+2Ac^2d+3b^2Be)}{c}-\frac{2e\left(\frac{(cd-be)^{3/2}\left(-bc(2Bd-Ae)+4Ac^2d-3b^2Be\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}e}+\frac{c^2d^{3/2}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(5 \ldots}{be}\right.}{c}}{2b^2c}$$

$$\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

input
```
Int[((A + B*x)*(d + e*x)^(5/2))/(b*x + c*x^2)^2,x]
```

output
```
-(((d + e*x)^(3/2)*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/
(b^2*c*(b*x + c*x^2))) + ((2*e*(2*A*c^2*d + 3*b^2*B*e - b*c*(B*d + A*e))*S
qrt[d + e*x])/c - (2*e*((c^2*d^(3/2)*(2*b*B*d - 4*A*c*d + 5*A*b*e)*ArcTanh
[Sqrt[d + e*x]/Sqrt[d]])/(b*e) + ((c*d - b*e)^(3/2)*(4*A*c^2*d - 3*b^2*B*e
 - b*c*(2*B*d - A*e))*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b
*Sqrt[c]*e)))/c)/(2*b^2*c)
```

Defintions of rubi rules used

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

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1196
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[g*((d + e*x)^m/(c*m)), x] + Simp[1/c   Int
[(d + e*x)^(m - 1)*(Simp[c*d*f - a*e*g + (g*c*d - b*e*g + c*e*f)*x, x]/(a +
 b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] &
& GtQ[m, 0]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.36 (sec) , antiderivative size = 233, normalized size of antiderivative = 1.02

method	result
pseudoelliptic	$\frac{4(-be+cd)^2\sqrt{d}\,x(cx+b)\left(A c^2 d+\frac{b(Ae-2Bd)c}{4}-\frac{3b^2Be}{4}\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)-\left(5c^2d^2\left(-\frac{4Acd}{5}+b\left(Ae+\frac{2Bd}{5}\right)\right)x(cx+b)\right.}{c^2b^3x\sqrt{d}\,(c}$
derivativedivides	$2e^2\left(\frac{B\sqrt{ex+d}}{c^2}+\frac{\frac{\left(-\frac{1}{2}A b^3 c e^3+A b^2c^2d e^2-\frac{1}{2}A b c^3d^2e+\frac{1}{2}b^4Be^3-B b^3cd e^2+\frac{1}{2}B b^2d^2e c^2\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{\left(A b^3c e^3+2A b^2c^2d\right.}{}}{b^3e^2c^2}\right.$
default	$2e^2\left(\frac{B\sqrt{ex+d}}{c^2}+\frac{\frac{\left(-\frac{1}{2}A b^3 c e^3+A b^2c^2d e^2-\frac{1}{2}A b c^3d^2e+\frac{1}{2}b^4Be^3-B b^3cd e^2+\frac{1}{2}B b^2d^2e c^2\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{\left(A b^3c e^3+2A b^2c^2d\right.}{}}{b^3e^2c^2}\right.$
risch	$-\frac{d^2A\sqrt{ex+d}}{b^2x}+\frac{e\left(\frac{2b^2Be\sqrt{ex+d}}{c^2}-\frac{d^{\frac{3}{2}}(5Abe-4Acd+2Bbd)\,\text{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{eb}+\frac{2\left(-\frac{1}{2}A b^3ce^3+A b^2c^2de^2-\frac{1}{2}A b c^3d^2e+\frac{1}{2}\right.}{(ex+d)c+}\right.}{}$

input
```
int((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
4/d^(1/2)/(c*(b*e-c*d))^(1/2)*((-b*e+c*d)^2*d^(1/2)*x*(c*x+b)*(A*c^2*d+1/4
*b*(A*e-2*B*d)*c-3/4*b^2*B*e)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))-
1/4*(5*c^2*d^2*(-4/5*A*c*d+b*(A*e+2/5*B*d))*x*(c*x+b)*arctanh((e*x+d)^(1/2
)/d^(1/2))+d^(1/2)*(2*A*c^3*d^2*x+d*(d*(-B*x+A)-2*A*e*x)*b*c^2+e*x*b^2*(2*
B*d+e*(-2*B*x+A))*c-3*B*b^3*e^2*x)*b*(e*x+d)^(1/2))*(c*(b*e-c*d))^(1/2))/c
^2/b^3/x/(c*x+b)
```

Fricas [A] (verification not implemented)

Time = 5.87 (sec) , antiderivative size = 1583, normalized size of antiderivative = 6.94

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
[1/2*(((2*(B*b*c^3 - 2*A*c^4)*d^2 + (B*b^2*c^2 + 3*A*b*c^3)*d*e - (3*B*b^3
*c - A*b^2*c^2)*e^2)*x^2 + (2*(B*b^2*c^2 - 2*A*b*c^3)*d^2 + (B*b^3*c + 3*A
*b^2*c^2)*d*e - (3*B*b^4 - A*b^3*c)*e^2)*x)*sqrt((c*d - b*e)/c)*log((c*e*x
 + 2*c*d - b*e + 2*sqrt(e*x + d)*c*sqrt((c*d - b*e)/c))/(c*x + b)) + ((5*A
*b*c^3*d*e + 2*(B*b*c^3 - 2*A*c^4)*d^2)*x^2 + (5*A*b^2*c^2*d*e + 2*(B*b^2*
c^2 - 2*A*b*c^3)*d^2)*x)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)
/x) + 2*(2*B*b^3*c*e^2*x^2 - A*b^2*c^2*d^2 + ((B*b^2*c^2 - 2*A*b*c^3)*d^2
- 2*(B*b^3*c - A*b^2*c^2)*d*e + (3*B*b^4 - A*b^3*c)*e^2)*x)*sqrt(e*x + d))
/(b^3*c^3*x^2 + b^4*c^2*x), 1/2*(2*((2*(B*b*c^3 - 2*A*c^4)*d^2 + (B*b^2*c^
2 + 3*A*b*c^3)*d*e - (3*B*b^3*c - A*b^2*c^2)*e^2)*x^2 + (2*(B*b^2*c^2 - 2*
A*b*c^3)*d^2 + (B*b^3*c + 3*A*b^2*c^2)*d*e - (3*B*b^4 - A*b^3*c)*e^2)*x)*s
qrt(-(c*d - b*e)/c)*arctan(-sqrt(e*x + d)*c*sqrt(-(c*d - b*e)/c)/(c*d - b*
e)) + ((5*A*b*c^3*d*e + 2*(B*b*c^3 - 2*A*c^4)*d^2)*x^2 + (5*A*b^2*c^2*d*e
+ 2*(B*b^2*c^2 - 2*A*b*c^3)*d^2)*x)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqr
t(d) + 2*d)/x) + 2*(2*B*b^3*c*e^2*x^2 - A*b^2*c^2*d^2 + ((B*b^2*c^2 - 2*A*
b*c^3)*d^2 - 2*(B*b^3*c - A*b^2*c^2)*d*e + (3*B*b^4 - A*b^3*c)*e^2)*x)*sqr
t(e*x + d))/(b^3*c^3*x^2 + b^4*c^2*x), 1/2*(2*((5*A*b*c^3*d*e + 2*(B*b*c^3
 - 2*A*c^4)*d^2)*x^2 + (5*A*b^2*c^2*d*e + 2*(B*b^2*c^2 - 2*A*b*c^3)*d^2)*x
)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x + d)) + ((2*(B*b*c^3 - 2*A*c^4)*d^2 +
(B*b^2*c^2 + 3*A*b*c^3)*d*e - (3*B*b^3*c - A*b^2*c^2)*e^2)*x^2 + (2*(B*...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(5/2)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^2,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 452 vs. $2(206) = 412$.

Time = 0.28 (sec) , antiderivative size = 452, normalized size of antiderivative = 1.98

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2}\,dx = \frac{2\sqrt{ex+d}Be^2}{c^2}$$
$$+\frac{(2\,Bbd^3-4\,Acd^3+5\,Abd^2e)\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b^3\sqrt{-d}}$$
$$-\frac{(2\,Bbc^3d^3-4\,Ac^4d^3-Bb^2c^2d^2e+7\,Abc^3d^2e-4\,Bb^3cde^2-2\,Ab^2c^2de^2+3\,Bb^4e^3-Ab^3ce^3)\arctan\left(\frac{\sqrt{}}{\sqrt{-}}\right.}{\sqrt{-c^2d+bce}b^3c^2}$$
$$+\frac{(ex+d)^{\frac{3}{2}}Bbc^2d^2e-2\,(ex+d)^{\frac{3}{2}}Ac^3d^2e-\sqrt{ex+d}Bbc^2d^3e+2\,\sqrt{ex+d}Ac^3d^3e-2\,(ex+d)^{\frac{3}{2}}Bb^2cde^2+}{((ex+d)^2c}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
2*sqrt(e*x + d)*B*e^2/c^2 + (2*B*b*d^3 - 4*A*c*d^3 + 5*A*b*d^2*e)*arctan(s
qrt(e*x + d)/sqrt(-d))/(b^3*sqrt(-d)) - (2*B*b*c^3*d^3 - 4*A*c^4*d^3 - B*b
^2*c^2*d^2*e + 7*A*b*c^3*d^2*e - 4*B*b^3*c*d*e^2 - 2*A*b^2*c^2*d*e^2 + 3*B
*b^4*e^3 - A*b^3*c*e^3)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/(sqrt
(-c^2*d + b*c*e)*b^3*c^2) + ((e*x + d)^(3/2)*B*b*c^2*d^2*e - 2*(e*x + d)^(
3/2)*A*c^3*d^2*e - sqrt(e*x + d)*B*b*c^2*d^3*e + 2*sqrt(e*x + d)*A*c^3*d^3
*e - 2*(e*x + d)^(3/2)*B*b^2*c*d*e^2 + 2*(e*x + d)^(3/2)*A*b*c^2*d*e^2 + 2
*sqrt(e*x + d)*B*b^2*c*d^2*e^2 - 3*sqrt(e*x + d)*A*b*c^2*d^2*e^2 + (e*x +
d)^(3/2)*B*b^3*e^3 - (e*x + d)^(3/2)*A*b^2*c*e^3 - sqrt(e*x + d)*B*b^3*d*e
^3 + sqrt(e*x + d)*A*b^2*c*d*e^3)/(((e*x + d)^2*c - 2*(e*x + d)*c*d + c*d^
2 + (e*x + d)*b*e - b*d*e)*b^2*c^2)
```

Mupad [B] (verification not implemented)

Time = 12.33 (sec) , antiderivative size = 5878, normalized size of antiderivative = 25.78

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(5/2))/(b*x + c*x^2)^2,x)
```

output
```
(atan(((((2*(d + e*x)^(1/2)*(9*B^2*b^8*e^8 + A^2*b^6*c^2*e^8 + 32*A^2*c^8*
d^6*e^2 + 90*A^2*b^2*c^6*d^4*e^4 - 20*A^2*b^3*c^5*d^3*e^5 - 10*A^2*b^4*c^4
*d^2*e^6 + 8*B^2*b^2*c^6*d^6*e^2 - 4*B^2*b^3*c^5*d^5*e^3 - 15*B^2*b^4*c^4*
d^4*e^4 + 20*B^2*b^5*c^3*d^3*e^5 + 10*B^2*b^6*c^2*d^2*e^6 - 24*B^2*b^7*c*d
*e^7 - 96*A^2*b*c^7*d^5*e^3 + 4*A^2*b^5*c^3*d*e^7 - 6*A*B*b^7*c*e^8 - 32*A
*B*b*c^7*d^6*e^2 - 4*A*B*b^6*c^2*d*e^7 + 56*A*B*b^2*c^6*d^5*e^3 + 10*A*B*b
^3*c^5*d^4*e^4 - 80*A*B*b^4*c^4*d^3*e^5 + 60*A*B*b^5*c^3*d^2*e^6))/(b^4*c^
3) + ((d^3)^(1/2)*((4*A*b^8*c^4*d*e^5 - 12*B*b^9*c^3*d*e^5 + 8*A*b^6*c^6*d
^3*e^3 - 12*A*b^7*c^5*d^2*e^4 - 4*B*b^7*c^5*d^3*e^3 + 16*B*b^8*c^4*d^2*e^4
)/(b^6*c^3) + ((4*b^7*c^5*e^3 - 8*b^6*c^6*d*e^2)*(d^3)^(1/2)*(d + e*x)^(1/
2)*(5*A*b*e - 4*A*c*d + 2*B*b*d))/(b^7*c^3))*(5*A*b*e - 4*A*c*d + 2*B*b*d)
)/(2*b^3))*(d^3)^(1/2)*(5*A*b*e - 4*A*c*d + 2*B*b*d)*1i)/(2*b^3) + (((2*(d
 + e*x)^(1/2)*(9*B^2*b^8*e^8 + A^2*b^6*c^2*e^8 + 32*A^2*c^8*d^6*e^2 + 90*A
^2*b^2*c^6*d^4*e^4 - 20*A^2*b^3*c^5*d^3*e^5 - 10*A^2*b^4*c^4*d^2*e^6 + 8*B
^2*b^2*c^6*d^6*e^2 - 4*B^2*b^3*c^5*d^5*e^3 - 15*B^2*b^4*c^4*d^4*e^4 + 20*B
^2*b^5*c^3*d^3*e^5 + 10*B^2*b^6*c^2*d^2*e^6 - 24*B^2*b^7*c*d*e^7 - 96*A^2*
b*c^7*d^5*e^3 + 4*A^2*b^5*c^3*d*e^7 - 6*A*B*b^7*c*e^8 - 32*A*B*b*c^7*d^6*e
^2 - 4*A*B*b^6*c^2*d*e^7 + 56*A*B*b^2*c^6*d^5*e^3 + 10*A*B*b^3*c^5*d^4*e^4
 - 80*A*B*b^4*c^4*d^3*e^5 + 60*A*B*b^5*c^3*d^2*e^6))/(b^4*c^3) - ((d^3)^(1
/2)*((4*A*b^8*c^4*d*e^5 - 12*B*b^9*c^3*d*e^5 + 8*A*b^6*c^6*d^3*e^3 - 12...
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 1026, normalized size of antiderivative = 4.50

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^2,x)
```

output

```
(2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)
))*a*b**3*c*e**2*x + 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqr
t(c)*sqrt(b*e - c*d)))*a*b**2*c**2*d*e*x + 2*sqrt(c)*sqrt(b*e - c*d)*atan(
(sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**2*e**2*x**2 - 8*sqr
t(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b
*c**3*d**2*x + 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*s
qrt(b*e - c*d)))*a*b*c**3*d*e*x**2 - 8*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(
d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**4*d**2*x**2 - 6*sqrt(c)*sqrt(b
*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**5*e**2*x +
2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d))
)*b**4*c*d*e*x - 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)
*sqrt(b*e - c*d)))*b**4*c*e**2*x**2 + 4*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt
(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c**2*d**2*x + 2*sqrt(c)*sqrt(
b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c**2*d*e
*x**2 + 4*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e
 - c*d)))*b**2*c**3*d**2*x**2 - 2*sqrt(d + e*x)*a*b**3*c**2*e**2*x - 2*sqr
t(d + e*x)*a*b**2*c**3*d**2 + 4*sqrt(d + e*x)*a*b**2*c**3*d*e*x - 4*sqrt(d
 + e*x)*a*b*c**4*d**2*x + 6*sqrt(d + e*x)*b**5*c*e**2*x - 4*sqrt(d + e*x)*
b**4*c**2*d*e*x + 4*sqrt(d + e*x)*b**4*c**2*e**2*x**2 + 2*sqrt(d + e*x)*b*
*3*c**3*d**2*x + 5*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*b**2*c**3*d*e...
```

3.80 $\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 184

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx = \frac{(bB-2Ac)(cd-be)\sqrt{d+ex}}{b^2c(b+cx)} - \frac{A(d+ex)^{3/2}}{bx(b+cx)} - \frac{\sqrt{d}(2bBd-4Acd+3Abe)\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b^3} - \frac{\sqrt{cd-be}\left(4Ac^2d-b^2Be-bc(2Bd+Ae)\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b^3c^{3/2}}$$

output
```
(-2*A*c+B*b)*(-b*e+c*d)*(e*x+d)^(1/2)/b^2/c/(c*x+b)-A*(e*x+d)^(3/2)/b/x/(c
*x+b)-d^(1/2)*(3*A*b*e-4*A*c*d+2*B*b*d)*arctanh((e*x+d)^(1/2)/d^(1/2))/b^3
-(-b*e+c*d)^(1/2)*(4*A*c^2*d-b^2*B*e-b*c*(A*e+2*B*d))*arctanh(c^(1/2)*(e*x
+d)^(1/2)/(-b*e+c*d)^(1/2))/b^3/c^(3/2)
```

Mathematica [A] (verified)

Time = 1.12 (sec) , antiderivative size = 172, normalized size of antiderivative = 0.93

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx = \frac{\frac{b\sqrt{d+ex}(bB(cd-be)x+Ac(-bd-2cdx+bex))}{cx(b+cx)} - \frac{\sqrt{-cd+be}(4Ac^2d-b^2Be-bc(2Bd+Ae))\arctan\left(\frac{\sqrt{c}\sqrt{d+}}{\sqrt{-cd+}}\right.}{c^{3/2}}}{b^3}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(3/2))/(b*x + c*x^2)^2,x]
```

output
```
((b*Sqrt[d + e*x]*(b*B*(c*d - b*e)*x + A*c*(-(b*d) - 2*c*d*x + b*e*x)))/(c
*x*(b + c*x)) - (Sqrt[-(c*d) + b*e]*(4*A*c^2*d - b^2*B*e - b*c*(2*B*d + A*
e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/c^(3/2) - Sqrt[d]*
(2*b*B*d - 4*A*c*d + 3*A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/b^3
```

Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 197, normalized size of antiderivative = 1.07, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {1233, 27, 1197, 27, 1480, 221}

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

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx$$

$$\Big\downarrow \text{1233}$$

$$\frac{\int \frac{cd(2bBd-4Acd+3Abe)-e\left(-Beb^2-c(Bd+Ae)b+2Ac^2d\right)x}{2\sqrt{d+ex}(cx^2+bx)}dx}{b^2c} - \frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\,(bx+cx^2)}$$

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

$$\frac{\int \frac{cd(2bBd-4Acd+3Abe)-e\left(-Beb^2-c(Bd+Ae)b+2Ac^2d\right)x}{\sqrt{d+ex}(cx^2+bx)}dx}{2b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1197

$$\frac{\int \frac{e\left((bB-2Ac)d(cd-be)-\left(-Beb^2-c(Bd+Ae)b+2Ac^2d\right)(d+ex)\right)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 27

$$\frac{e\int \frac{(bB-2Ac)d(cd-be)-\left(-Beb^2-c(Bd+Ae)b+2Ac^2d\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 1480

$$\frac{e\left(\frac{(cd-be)\left(-bc(Ae+2Bd)+4Ac^2d+b^2(-B)e\right)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{be}+\frac{c^2d(3Abe-4Acd+2bBd)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}\right)}{b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

$\Big\downarrow$ 221

$$\frac{e\left(-\frac{\sqrt{cd-be}\left(-bc(Ae+2Bd)+4Ac^2d+b^2(-B)e\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}e}-\frac{c\sqrt{d}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(3Abe-4Acd+2bBd)}{be}\right)}{b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\left(bx+cx^2\right)}$$

input

```
Int[((A + B*x)*(d + e*x)^(3/2))/(b*x + c*x^2)^2,x]
```

output
```
-((Sqrt[d + e*x]*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/(b
^2*c*(b*x + c*x^2))) + (e*(-((c*Sqrt[d]*(2*b*B*d - 4*A*c*d + 3*A*b*e)*ArcT
anh[Sqrt[d + e*x]/Sqrt[d]])/(b*e)) - (Sqrt[c*d - b*e]*(4*A*c^2*d - b^2*B*e
 - b*c*(2*B*d + A*e))*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b
*Sqrt[c]*e)))/(b^2*c)
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.24 (sec) , antiderivative size = 183, normalized size of antiderivative = 0.99

method	result
derivativedivides	$2e^2 (-\frac{d (\frac{Ab\sqrt{ex+d}}{2x} + \frac{(3Abe-4Acd+2Bbd)\operatorname{arctanh}(\frac{\sqrt{ex+d}}{\sqrt{d}})}{2\sqrt{d}})}{e^2b^3} + \frac{(be-cd) (\frac{be(Ac-Bb)\sqrt{ex+d}}{2c((ex+d)c+be-cd)} + \frac{(Aceb-4A c^2d+b^2Be \cdots}{2 \cdots}}{b^3e^2} \cdots$
default	$2e^2 (-\frac{d (\frac{Ab\sqrt{ex+d}}{2x} + \frac{(3Abe-4Acd+2Bbd)\operatorname{arctanh}(\frac{\sqrt{ex+d}}{\sqrt{d}})}{2\sqrt{d}})}{e^2b^3} + \frac{(be-cd) (\frac{be(Ac-Bb)\sqrt{ex+d}}{2c((ex+d)c+be-cd)} + \frac{(Aceb-4A c^2d+b^2Be \cdots}{2 \cdots}}{b^3e^2} \cdots$
pseudoelliptic	$\frac{4(-be+cd)(A c^2d-\frac{bc(Ae+2Bd)}{4}-\frac{b^2Be}{4})x\sqrt{d}\,(cx+b)\arctan(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}})-(3cd(-\frac{4Acd}{3}+b(Ae+\frac{2Bd}{3}))x(cx+b)\operatorname{arct} \cdots}{b^3x\sqrt{d}\,(cx+b)c\sqrt{c(be-cd)}}$
risch	$-\frac{dA\sqrt{ex+d}}{b^2x}-\frac{e(\frac{\sqrt{d}\,(3Abe-4Acd+2Bbd)\operatorname{arctanh}(\frac{\sqrt{ex+d}}{\sqrt{d}})}{be}+\frac{-\frac{be(Aceb-A c^2d-b^2Be+Bbcd)\sqrt{ex+d}}{c((ex+d)c+be-cd)}-\frac{(A b^2e^2c-5Ab c^2d \cdots}{\cdots}}{\cdots} \cdots)}{b^2}$

input
```
int((B*x+A)*(e*x+d)^(3/2)/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
2*e^2*(-d/e^2/b^3*(1/2*A*b*(e*x+d)^(1/2)/x+1/2*(3*A*b*e-4*A*c*d+2*B*b*d)/d
^(1/2)*arctanh((e*x+d)^(1/2)/d^(1/2)))+(b*e-c*d)/b^3/e^2*(1/2*b*e*(A*c-B*b
)/c*(e*x+d)^(1/2)/((e*x+d)*c+b*e-c*d)+1/2*(A*b*c*e-4*A*c^2*d+B*b^2*e+2*B*b
*c*d)/c/(c*(b*e-c*d))^(1/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))))
```

Fricas [A] (verification not implemented)

Time = 0.52 (sec) , antiderivative size = 1140, normalized size of antiderivative = 6.20

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

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

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

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(3/2)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx = \text{Exception raised: ValueError}$$

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

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

Giac [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 316, normalized size of antiderivative = 1.72

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx = \frac{(2\,Bbd^2-4\,Acd^2+3\,Abde)\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b^3\sqrt{-d}}$$
$$-\frac{(2\,Bbc^2d^2-4\,Ac^3d^2-Bb^2cde+5\,Abc^2de-Bb^3e^2-Ab^2ce^2)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{\sqrt{-c^2d+bce}b^3c}$$
$$+\frac{(ex+d)^{\frac{3}{2}}Bbcde-2\,(ex+d)^{\frac{3}{2}}Ac^2de-\sqrt{ex+d}Bbcd^2e+2\,\sqrt{ex+d}Ac^2d^2e-(ex+d)^{\frac{3}{2}}Bb^2e^2+(ex+d}{((ex+d)^2c-2\,(ex+d)cd+cd^2+(ex+d)be-bde)b^2c}$$

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

output
```
(2*B*b*d^2 - 4*A*c*d^2 + 3*A*b*d*e)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^3*sq
rt(-d)) - (2*B*b*c^2*d^2 - 4*A*c^3*d^2 - B*b^2*c*d*e + 5*A*b*c^2*d*e - B*b
^3*e^2 - A*b^2*c*e^2)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/(sqrt(-
c^2*d + b*c*e)*b^3*c) + ((e*x + d)^(3/2)*B*b*c*d*e - 2*(e*x + d)^(3/2)*A*c
^2*d*e - sqrt(e*x + d)*B*b*c*d^2*e + 2*sqrt(e*x + d)*A*c^2*d^2*e - (e*x +
d)^(3/2)*B*b^2*e^2 + (e*x + d)^(3/2)*A*b*c*e^2 + sqrt(e*x + d)*B*b^2*d*e^2
 - 2*sqrt(e*x + d)*A*b*c*d*e^2)/(((e*x + d)^2*c - 2*(e*x + d)*c*d + c*d^2
+ (e*x + d)*b*e - b*d*e)*b^2*c)
```

Mupad [B] (verification not implemented)

Time = 11.75 (sec) , antiderivative size = 4391, normalized size of antiderivative = 23.86

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(3/2))/(b*x + c*x^2)^2,x)
```

output

```
(d^(1/2)*atan(((d^(1/2)*((2*(d + e*x)^(1/2)*(B^2*b^6*e^6 + A^2*b^4*c^2*e^6
 + 32*A^2*c^6*d^4*e^2 + 42*A^2*b^2*c^4*d^2*e^4 + 8*B^2*b^2*c^4*d^4*e^2 - 4
*B^2*b^3*c^3*d^3*e^3 - 3*B^2*b^4*c^2*d^2*e^4 + 2*B^2*b^5*c*d*e^5 - 64*A^2*
b*c^5*d^3*e^3 - 10*A^2*b^3*c^3*d*e^5 + 2*A*B*b^5*c*e^6 - 32*A*B*b*c^5*d^4*
e^2 - 8*A*B*b^4*c^2*d*e^5 + 40*A*B*b^2*c^4*d^3*e^3 - 6*A*B*b^3*c^3*d^2*e^4
))/(b^4*c) + (d^(1/2)*((8*A*b^7*c^3*d*e^4 - 4*B*b^8*c^2*d*e^4 - 8*A*b^6*c^
4*d^2*e^3 + 4*B*b^7*c^3*d^2*e^3)/(b^6*c) + (d^(1/2)*(4*b^7*c^3*e^3 - 8*b^6
*c^4*d*e^2)*(d + e*x)^(1/2)*(3*A*b*e - 4*A*c*d + 2*B*b*d))/(b^7*c))*(3*A*b
*e - 4*A*c*d + 2*B*b*d))/(2*b^3))*(3*A*b*e - 4*A*c*d + 2*B*b*d)*1i)/(2*b^3
) + (d^(1/2)*((2*(d + e*x)^(1/2)*(B^2*b^6*e^6 + A^2*b^4*c^2*e^6 + 32*A^2*c
^6*d^4*e^2 + 42*A^2*b^2*c^4*d^2*e^4 + 8*B^2*b^2*c^4*d^4*e^2 - 4*B^2*b^3*c^
3*d^3*e^3 - 3*B^2*b^4*c^2*d^2*e^4 + 2*B^2*b^5*c*d*e^5 - 64*A^2*b*c^5*d^3*e
^3 - 10*A^2*b^3*c^3*d*e^5 + 2*A*B*b^5*c*e^6 - 32*A*B*b*c^5*d^4*e^2 - 8*A*B
*b^4*c^2*d*e^5 + 40*A*B*b^2*c^4*d^3*e^3 - 6*A*B*b^3*c^3*d^2*e^4))/(b^4*c)
- (d^(1/2)*((8*A*b^7*c^3*d*e^4 - 4*B*b^8*c^2*d*e^4 - 8*A*b^6*c^4*d^2*e^3 +
 4*B*b^7*c^3*d^2*e^3)/(b^6*c) - (d^(1/2)*(4*b^7*c^3*e^3 - 8*b^6*c^4*d*e^2)
*(d + e*x)^(1/2)*(3*A*b*e - 4*A*c*d + 2*B*b*d))/(b^7*c))*(3*A*b*e - 4*A*c*
d + 2*B*b*d))/(2*b^3))*(3*A*b*e - 4*A*c*d + 2*B*b*d)*1i)/(2*b^3))/((2*(32*
A^3*c^6*d^5*e^3 + 2*B^3*b^6*d^2*e^6 + 70*A^3*b^2*c^4*d^3*e^5 - 25*A^3*b^3*
c^3*d^2*e^6 - 4*B^3*b^3*c^3*d^5*e^3 - 2*B^3*b^4*c^2*d^4*e^4 + 3*A*B^2*b...
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 735, normalized size of antiderivative = 3.99

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input

```
int((B*x+A)*(e*x+d)^(3/2)/(c*x^2+b*x)^2,x)
```

output
```
(2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)
))*a*b**2*c*e*x - 8*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c
)*sqrt(b*e - c*d)))*a*b*c**2*d*x + 2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d
+ e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**2*e*x**2 - 8*sqrt(c)*sqrt(b*e
- c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**3*d*x**2 + 2
*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))
*b**4*e*x + 4*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt
(b*e - c*d)))*b**3*c*d*x + 2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c
)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c*e*x**2 + 4*sqrt(c)*sqrt(b*e - c*d)*ata
n((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*c**2*d*x**2 - 2*sqrt(d
 + e*x)*a*b**2*c**2*d + 2*sqrt(d + e*x)*a*b**2*c**2*e*x - 4*sqrt(d + e*x)*
a*b*c**3*d*x - 2*sqrt(d + e*x)*b**4*c*e*x + 2*sqrt(d + e*x)*b**3*c**2*d*x
+ 3*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*b**2*c**2*e*x - 4*sqrt(d)*log(s
qrt(d + e*x) - sqrt(d))*a*b*c**3*d*x + 3*sqrt(d)*log(sqrt(d + e*x) - sqrt(
d))*a*b*c**3*e*x**2 - 4*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*c**4*d*x**2
 + 2*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*b**3*c**2*d*x + 2*sqrt(d)*log(sq
rt(d + e*x) - sqrt(d))*b**2*c**3*d*x**2 - 3*sqrt(d)*log(sqrt(d + e*x) + sq
rt(d))*a*b**2*c**2*e*x + 4*sqrt(d)*log(sqrt(d + e*x) + sqrt(d))*a*b*c**3*d
*x - 3*sqrt(d)*log(sqrt(d + e*x) + sqrt(d))*a*b*c**3*e*x**2 + 4*sqrt(d)*lo
g(sqrt(d + e*x) + sqrt(d))*a*c**4*d*x**2 - 2*sqrt(d)*log(sqrt(d + e*x) ...
```

3.81 $\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2} dx$

Optimal result

Integrand size = 26, antiderivative size = 171

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2} dx = \frac{(bB-2Ac)\sqrt{d+ex}}{b^2(b+cx)} - \frac{A\sqrt{d+ex}}{bx(b+cx)} - \frac{(2bBd-4Acd+Abe)\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b^3\sqrt{d}} + \frac{(2bBcd-4Ac^2d-b^2Be+3Abce)\,\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b^3\sqrt{c}\sqrt{cd-be}}$$

output
```
(-2*A*c+B*b)*(e*x+d)^(1/2)/b^2/(c*x+b)-A*(e*x+d)^(1/2)/b/x/(c*x+b)-(A*b*e-
4*A*c*d+2*B*b*d)*arctanh((e*x+d)^(1/2)/d^(1/2))/b^3/d^(1/2)+(3*A*b*c*e-4*A
*c^2*d-B*b^2*e+2*B*b*c*d)*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/
b^3/c^(1/2)/(-b*e+c*d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.98 (sec) , antiderivative size = 151, normalized size of antiderivative = 0.88

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2}\,dx$$
$$=\frac{\frac{b\sqrt{d+ex}(bBx-A(b+2cx))}{x(b+cx)}+\frac{(4Ac^2d+b^2Be-bc(2Bd+3Ae))\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{\sqrt{c}\sqrt{-cd+be}}-\frac{(2bBd-4Acd+Abe)\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}}}{b^3}$$

input
```
Integrate[((A + B*x)*Sqrt[d + e*x])/(b*x + c*x^2)^2,x]
```

output
```
((b*Sqrt[d + e*x]*(b*B*x - A*(b + 2*c*x)))/(x*(b + c*x)) + ((4*A*c^2*d + b
^2*B*e - b*c*(2*B*d + 3*A*e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) +
 b*e]])/(Sqrt[c]*Sqrt[-(c*d) + b*e]) - ((2*b*B*d - 4*A*c*d + A*b*e)*ArcTan
h[Sqrt[d + e*x]/Sqrt[d]])/Sqrt[d])/b^3
```

Rubi [A] (verified)

Time = 0.70 (sec) , antiderivative size = 170, normalized size of antiderivative = 0.99, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {1234, 27, 25, 1197, 27, 1480, 221}

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

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2}\,dx$$
$$\Big\downarrow \text{1234}$$
$$-\frac{\int \frac{4Acd-b(2Bd+Ae)-(bB-2Ac)ex}{2\sqrt{d+ex}(cx^2+bx)}dx}{b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{b^2(bx+cx^2)}$$
$$\Big\downarrow \text{27}$$
$$-\frac{\int -\frac{2bBd-4Acd+Abe+(bB-2Ac)ex}{\sqrt{d+ex}(cx^2+bx)}dx}{2b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{b^2(bx+cx^2)}$$

$$\Big\downarrow \ 25$$

$$\frac{\int \frac{2bBd-4Acd+Abe+(bB-2Ac)ex}{\sqrt{d+ex}(cx^2+bx)}dx}{2b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{b^2\left(bx+cx^2\right)}$$

$$\Big\downarrow \ 1197$$

$$\frac{\int \frac{e(bBd-2Acd+Abe+(bB-2Ac)(d+ex))}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{b^2\left(bx+cx^2\right)}$$

$$\Big\downarrow \ 27$$

$$\frac{e\int \frac{bBd-2Acd+Abe+(bB-2Ac)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{b^2\left(bx+cx^2\right)}$$

$$\Big\downarrow \ 1480$$

$$\frac{e\left(\frac{c(Abe-4Acd+2bBd)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}-\frac{(3Abce-4Ac^2d+b^2(-B)e+2bBcd)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{be}\right)}{b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{b^2\left(bx+cx^2\right)}$$

$$\Big\downarrow \ 221$$

$$\frac{e\left(\frac{(3Abce-4Ac^2d+b^2(-B)e+2bBcd)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}e\sqrt{cd-be}}-\frac{\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(Abe-4Acd+2bBd)}{b\sqrt{d}e}\right)}{b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{b^2\left(bx+cx^2\right)}$$

input
```
Int[((A + B*x)*Sqrt[d + e*x])/(b*x + c*x^2)^2,x]
```

output
```
-(((A*b - (b*B - 2*A*c)*x)*Sqrt[d + e*x])/(b^2*(b*x + c*x^2))) + (e*(-(((2
*b*B*d - 4*A*c*d + A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d]*e)) +
 ((2*b*B*c*d - 4*A*c^2*d - b^2*B*e + 3*A*b*c*e)*ArcTanh[(Sqrt[c]*Sqrt[d +
e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c]*e*Sqrt[c*d - b*e])))/b^2
```

Defintions of rubi rules used

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

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1234
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^m*(a + b*x + c*x^2)^(p + 1)*(
(f*b - 2*a*g + (2*c*f - b*g)*x)/((p + 1)*(b^2 - 4*a*c))), x] + Simp[1/((p +
 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 1)*(a + b*x + c*x^2)^(p + 1)*Simp[g
*(2*a*e*m + b*d*(2*p + 3)) - f*(b*e*m + 2*c*d*(2*p + 3)) - e*(2*c*f - b*g)*
(m + 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1
] && GtQ[m, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.25 (sec) , antiderivative size = 166, normalized size of antiderivative = 0.97

method	result
pseudoelliptic	$-\frac{-4\left(A c^2 d-\frac{3b\left(Ae+\frac{2Bd}{3}\right)c}{4}+\frac{b^2 Be}{4}\right)\sqrt{d}\,x(cx+b)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)+\sqrt{c(be-cd)}\left(x(-4Acd+b(Ae+2Bd))(cx+b)\right.}{\sqrt{d}\sqrt{c(be-cd)}\,x\,b^3(cx+b)}$
derivativedivides	$2e^2\left(-\frac{\frac{\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{\left(3Aceb-4Ac^2d-b^2Be+2Bbcd\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2\sqrt{c(be-cd)}}}{b^3e^2}+\frac{-\frac{Ab\sqrt{ex+d}}{2x}-\frac{(Abe-4Acd+2B}{}}{b^3e^2}\right.$
default	$2e^2\left(-\frac{\frac{\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{\left(3Aceb-4Ac^2d-b^2Be+2Bbcd\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2\sqrt{c(be-cd)}}}{b^3e^2}+\frac{-\frac{Ab\sqrt{ex+d}}{2x}-\frac{(Abe-4Acd+2B}{}}{b^3e^2}\right.$
risch	$-\frac{A\sqrt{ex+d}}{b^2x}-\frac{e\left(-\frac{(-Abe+4Acd-2Bbd)\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{be\sqrt{d}}+\frac{\frac{2\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{\left(3Aceb-4Ac^2d-b^2Be+2Bbcd\right)\mathrm{ar}}{\sqrt{c(be-cd)}}}{be}\right.}{b^2}$

input
```
int((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
-(-4*(A*c^2*d-3/4*b*(A*e+2/3*B*d)*c+1/4*b^2*B*e)*d^(1/2)*x*(c*x+b)*arctan(
c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))+(c*(b*e-c*d))^(1/2)*(x*(-4*A*c*d+b*(A
*e+2*B*d))*(c*x+b)*arctanh((e*x+d)^(1/2)/d^(1/2))+(2*A*c*x+b*(-B*x+A))*d^(
1/2)*b*(e*x+d)^(1/2)))/d^(1/2)/(c*(b*e-c*d))^(1/2)/x/b^3/(c*x+b)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 380 vs. 2(151) = 302.

Time = 0.31 (sec) , antiderivative size = 1568, normalized size of antiderivative = 9.17

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
[1/2*(sqrt(c^2*d - b*c*e)*((2*(B*b*c^2 - 2*A*c^3)*d^2 - (B*b^2*c - 3*A*b*c
^2)*d*e)*x^2 + (2*(B*b^2*c - 2*A*b*c^2)*d^2 - (B*b^3 - 3*A*b^2*c)*d*e)*x)*
log((c*e*x + 2*c*d - b*e + 2*sqrt(c^2*d - b*c*e)*sqrt(e*x + d))/(c*x + b))
 - ((A*b^2*c^2*e^2 - 2*(B*b*c^3 - 2*A*c^4)*d^2 + (2*B*b^2*c^2 - 5*A*b*c^3)
*d*e)*x^2 + (A*b^3*c*e^2 - 2*(B*b^2*c^2 - 2*A*b*c^3)*d^2 + (2*B*b^3*c - 5*
A*b^2*c^2)*d*e)*x)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) -
2*(A*b^2*c^2*d^2 - A*b^3*c*d*e - ((B*b^2*c^2 - 2*A*b*c^3)*d^2 - (B*b^3*c -
 2*A*b^2*c^2)*d*e)*x)*sqrt(e*x + d))/((b^3*c^3*d^2 - b^4*c^2*d*e)*x^2 + (b
^4*c^2*d^2 - b^5*c*d*e)*x), -1/2*(2*sqrt(-c^2*d + b*c*e)*((2*(B*b*c^2 - 2*
A*c^3)*d^2 - (B*b^2*c - 3*A*b*c^2)*d*e)*x^2 + (2*(B*b^2*c - 2*A*b*c^2)*d^2
 - (B*b^3 - 3*A*b^2*c)*d*e)*x)*arctan(sqrt(-c^2*d + b*c*e)*sqrt(e*x + d)/(
c*e*x + c*d)) + ((A*b^2*c^2*e^2 - 2*(B*b*c^3 - 2*A*c^4)*d^2 + (2*B*b^2*c^2
 - 5*A*b*c^3)*d*e)*x^2 + (A*b^3*c*e^2 - 2*(B*b^2*c^2 - 2*A*b*c^3)*d^2 + (2
*B*b^3*c - 5*A*b^2*c^2)*d*e)*x)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d)
 + 2*d)/x) + 2*(A*b^2*c^2*d^2 - A*b^3*c*d*e - ((B*b^2*c^2 - 2*A*b*c^3)*d^2
 - (B*b^3*c - 2*A*b^2*c^2)*d*e)*x)*sqrt(e*x + d))/((b^3*c^3*d^2 - b^4*c^2*
d*e)*x^2 + (b^4*c^2*d^2 - b^5*c*d*e)*x), -1/2*(2*((A*b^2*c^2*e^2 - 2*(B*b*
c^3 - 2*A*c^4)*d^2 + (2*B*b^2*c^2 - 5*A*b*c^3)*d*e)*x^2 + (A*b^3*c*e^2 - 2
*(B*b^2*c^2 - 2*A*b*c^3)*d^2 + (2*B*b^3*c - 5*A*b^2*c^2)*d*e)*x)*sqrt(-d)*
arctan(sqrt(-d)/sqrt(e*x + d)) - sqrt(c^2*d - b*c*e)*((2*(B*b*c^2 - 2*A...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(1/2)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^2,x, algorithm="maxima")
```

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

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.25

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2}\,dx = -\frac{(2\,Bbcd-4\,Ac^2d-Bb^2e+3\,Abce)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{\sqrt{-c^2d+bce}b^3} + \frac{(2\,Bbd-4\,Acd+Abe)\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b^3\sqrt{-d}} + \frac{(ex+d)^{\frac{3}{2}}Bbe-2\,(ex+d)^{\frac{3}{2}}Ace-\sqrt{ex+d}Bbde+2\,\sqrt{ex+d}Acde-\sqrt{ex+d}Abe^2}{\left((ex+d)^2c-2\,(ex+d)cd+cd^2+(ex+d)be-bde\right)b^2}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
-(2*B*b*c*d - 4*A*c^2*d - B*b^2*e + 3*A*b*c*e)*arctan(sqrt(e*x + d)*c/sqrt
(-c^2*d + b*c*e))/(sqrt(-c^2*d + b*c*e)*b^3) + (2*B*b*d - 4*A*c*d + A*b*e)
*arctan(sqrt(e*x + d)/sqrt(-d))/(b^3*sqrt(-d)) + ((e*x + d)^(3/2)*B*b*e -
2*(e*x + d)^(3/2)*A*c*e - sqrt(e*x + d)*B*b*d*e + 2*sqrt(e*x + d)*A*c*d*e
- sqrt(e*x + d)*A*b*e^2)/(((e*x + d)^2*c - 2*(e*x + d)*c*d + c*d^2 + (e*x
+ d)*b*e - b*d*e)*b^2)
```

Mupad [B] (verification not implemented)

Time = 11.70 (sec) , antiderivative size = 2558, normalized size of antiderivative = 14.96

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(1/2))/(b*x + c*x^2)^2,x)
```

output
```
(atan((((-c*(b*e - c*d))^(1/2)*((2*(d + e*x)^(1/2)*(10*A^2*b^2*c^3*e^4 + 3
2*A^2*c^5*d^2*e^2 + B^2*b^4*c*e^4 + 8*B^2*b^2*c^3*d^2*e^2 - 6*A*B*b^3*c^2*
e^4 - 32*A^2*b*c^4*d*e^3 - 4*B^2*b^3*c^2*d*e^3 - 32*A*B*b*c^4*d^2*e^2 + 24
*A*B*b^2*c^3*d*e^3))/b^4 + (((4*A*b^7*c^2*e^4 - 8*A*b^6*c^3*d*e^3 + 4*B*b^
7*c^2*d*e^3)/b^6 + ((4*b^7*c^2*e^3 - 8*b^6*c^3*d*e^2)*(-c*(b*e - c*d))^(1/
2)*(d + e*x)^(1/2)*(4*A*c^2*d + B*b^2*e - 3*A*b*c*e - 2*B*b*c*d))/(b^4*(b^
3*c^2*d - b^4*c*e)))*(-c*(b*e - c*d))^(1/2)*(4*A*c^2*d + B*b^2*e - 3*A*b*c
*e - 2*B*b*c*d))/(2*(b^3*c^2*d - b^4*c*e)))*(4*A*c^2*d + B*b^2*e - 3*A*b*c
*e - 2*B*b*c*d)*1i)/(2*(b^3*c^2*d - b^4*c*e)) + ((-c*(b*e - c*d))^(1/2)*((
2*(d + e*x)^(1/2)*(10*A^2*b^2*c^3*e^4 + 32*A^2*c^5*d^2*e^2 + B^2*b^4*c*e^4
 + 8*B^2*b^2*c^3*d^2*e^2 - 6*A*B*b^3*c^2*e^4 - 32*A^2*b*c^4*d*e^3 - 4*B^2*
b^3*c^2*d*e^3 - 32*A*B*b*c^4*d^2*e^2 + 24*A*B*b^2*c^3*d*e^3))/b^4 - (((4*A
*b^7*c^2*e^4 - 8*A*b^6*c^3*d*e^3 + 4*B*b^7*c^2*d*e^3)/b^6 - ((4*b^7*c^2*e^
3 - 8*b^6*c^3*d*e^2)*(-c*(b*e - c*d))^(1/2)*(d + e*x)^(1/2)*(4*A*c^2*d + B
*b^2*e - 3*A*b*c*e - 2*B*b*c*d))/(b^4*(b^3*c^2*d - b^4*c*e)))*(-c*(b*e - c
*d))^(1/2)*(4*A*c^2*d + B*b^2*e - 3*A*b*c*e - 2*B*b*c*d))/(2*(b^3*c^2*d -
b^4*c*e)))*(4*A*c^2*d + B*b^2*e - 3*A*b*c*e - 2*B*b*c*d)*1i)/(2*(b^3*c^2*d
 - b^4*c*e)))/((2*(6*A^3*b^2*c^3*e^5 + 32*A^3*c^5*d^2*e^3 - 4*B^3*b^3*c^2*
d^2*e^3 + A*B^2*b^4*c*e^5 - 32*A^3*b*c^4*d*e^4 + 2*B^3*b^4*c*d*e^4 - 5*A^2
*B*b^3*c^2*e^5 + 24*A*B^2*b^2*c^3*d^2*e^3 - 16*A*B^2*b^3*c^2*d*e^4 - 48...
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 1009, normalized size of antiderivative = 5.90

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^2,x)
```

output
```
( - 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c
*d)))*a*b**2*c*d*e*x + 8*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(s
qrt(c)*sqrt(b*e - c*d)))*a*b*c**2*d**2*x - 6*sqrt(c)*sqrt(b*e - c*d)*atan(
(sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**2*d*e*x**2 + 8*sqrt(c)
*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**3*
d**2*x**2 + 2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt
(b*e - c*d)))*b**4*d*e*x - 4*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c
)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c*d**2*x + 2*sqrt(c)*sqrt(b*e - c*d)*ata
n((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c*d*e*x**2 - 4*sqrt(c)
*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*c*
*2*d**2*x**2 - 2*sqrt(d + e*x)*a*b**3*c*d*e + 2*sqrt(d + e*x)*a*b**2*c**2*
d**2 - 4*sqrt(d + e*x)*a*b**2*c**2*d*e*x + 4*sqrt(d + e*x)*a*b*c**3*d**2*x
 + 2*sqrt(d + e*x)*b**4*c*d*e*x - 2*sqrt(d + e*x)*b**3*c**2*d**2*x + sqrt(
d)*log(sqrt(d + e*x) - sqrt(d))*a*b**3*c*e**2*x - 5*sqrt(d)*log(sqrt(d + e
*x) - sqrt(d))*a*b**2*c**2*d*e*x + sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*
b**2*c**2*e**2*x**2 + 4*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*b*c**3*d**2
*x - 5*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*b*c**3*d*e*x**2 + 4*sqrt(d)*
log(sqrt(d + e*x) - sqrt(d))*a*c**4*d**2*x**2 + 2*sqrt(d)*log(sqrt(d + e*x
) - sqrt(d))*b**4*c*d*e*x - 2*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*b**3*c*
*2*d**2*x + 2*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*b**3*c**2*d*e*x**2 -...
```

3.82 $\int \frac{A+Bx}{\sqrt{d+ex}(bx+cx^2)^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 195

$$\begin{aligned}\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^2}\,dx &= \frac{c(bBd-2Acd+Abe)\sqrt{d+ex}}{b^2d(cd-be)(b+cx)}-\frac{A\sqrt{d+ex}}{bdx(b+cx)} \\ &\quad-\frac{(2bBd-4Acd-Abe)\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b^3d^{3/2}} \\ &\quad+\frac{\sqrt{c}(2bBcd-4Ac^2d-3b^2Be+5Abce)\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b^3(cd-be)^{3/2}}\end{aligned}$$

output
```
c*(A*b*e-2*A*c*d+B*b*d)*(e*x+d)^(1/2)/b^2/d/(-b*e+c*d)/(c*x+b)-A*(e*x+d)^(
1/2)/b/d/x/(c*x+b)-(-A*b*e-4*A*c*d+2*B*b*d)*arctanh((e*x+d)^(1/2)/d^(1/2))
/b^3/d^(3/2)+c^(1/2)*(5*A*b*c*e-4*A*c^2*d-3*B*b^2*e+2*B*b*c*d)*arctanh(c^(
1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b^3/(-b*e+c*d)^(3/2)
```

Mathematica [A] (verified)

Time = 1.78 (sec) , antiderivative size = 183, normalized size of antiderivative = 0.94

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^2}\,dx$$
$$= \frac{\frac{b\sqrt{d+ex}(bBcdx+A(-bcd+b^2e-2c^2dx+bcex))}{d(cd-be)x(b+cx)} - \frac{\sqrt{c}(4Ac^2d+3b^2Be-bc(2Bd+5Ae))\arctan\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{-cd+be}}\right)}{(-cd+be)^{3/2}} + \frac{(-2bBd+4Acd+Abe)\text{arctanh}}{d^{3/2}}}{b^3}$$

input
```
Integrate[(A + B*x)/(Sqrt[d + e*x]*(b*x + c*x^2)^2),x]
```

output
```
((b*Sqrt[d + e*x]*(b*B*c*d*x + A*(-(b*c*d) + b^2*e - 2*c^2*d*x + b*c*e*x))
)/(d*(c*d - b*e)*x*(b + c*x)) - (Sqrt[c]*(4*A*c^2*d + 3*b^2*B*e - b*c*(2*B
*d + 5*A*e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(-(c*d) +
 b*e)^(3/2) + ((-2*b*B*d + 4*A*c*d + A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]
)/d^(3/2))/b^3
```

Rubi [A] (verified)

Time = 0.89 (sec) , antiderivative size = 223, normalized size of antiderivative = 1.14, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.269$, Rules used = {1235, 27, 1197, 25, 27, 1480, 221}

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

$$\int \frac{A+Bx}{(bx+cx^2)^2\sqrt{d+ex}}\,dx$$

$$\Big\downarrow \text{ 1235}$$

$$-\frac{\int -\frac{(cd-be)(2bBd-4Acd-Abe)+ce(bBd-2Acd+Abe)x}{2\sqrt{d+ex}(cx^2+bx)}dx}{b^2d(cd-be)} - \frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\,(bx+cx^2)\,(cd-be)}$$

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

$$\frac{\int \frac{(cd-be)(2bBd-4Acd-Abe)+ce(bBd-2Acd+Abe)x}{\sqrt{d+ex}(cx^2+bx)}dx}{2b^2d(cd-be)} - \frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\left(bx+cx^2\right)(cd-be)}$$

$$\Big\downarrow \; 1197$$

$$\frac{\int -\frac{e\left(e(2Bd-Ae)b^2-cd(Bd+2Ae)b+2Ac^2d^2-c(bBd-2Acd+Abe)(d+ex)\right)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2d(cd-be)} - \frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\left(bx+cx^2\right)(cd-be)}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int \frac{e\left(e(2Bd-Ae)b^2-cd(Bd+2Ae)b+2Ac^2d^2-c(bBd-2Acd+Abe)(d+ex)\right)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2d(cd-be)} - \frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\left(bx+cx^2\right)(cd-be)}$$

$$\Big\downarrow \; 27$$

$$-\frac{e\int \frac{e(2Bd-Ae)b^2-cd(Bd+2Ae)b+2Ac^2d^2-c(bBd-2Acd+Abe)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2d(cd-be)} - \frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\left(bx+cx^2\right)(cd-be)}$$

$$\Big\downarrow \; 1480$$

$$-\frac{e\left(\frac{cd(5Abce-4Ac^2d-3b^2Be+2bBcd)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{be} - \frac{c(cd-be)(-Abe-4Acd+2bBd)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}\right)}{b^2d(cd-be)} - \frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\left(bx+cx^2\right)(cd-be)}$$

$$\Big\downarrow \; 221$$

$$-\frac{e\left(\frac{\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)(-Abe-4Acd+2bBd)}{b\sqrt{d}e} - \frac{\sqrt{c}d(5Abce-4Ac^2d-3b^2Be+2bBcd)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{be\sqrt{cd-be}}\right)}{b^2d(cd-be)} - \frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\left(bx+cx^2\right)(cd-be)}$$

input
```
Int[(A + B*x)/(Sqrt[d + e*x]*(b*x + c*x^2)^2),x]
```

output
```
-((Sqrt[d + e*x]*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x))/(b^2*d
*(c*d - b*e)*(b*x + c*x^2))) - (e*(((c*d - b*e)*(2*b*B*d - 4*A*c*d - A*b*e
)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d]*e) - (Sqrt[c]*d*(2*b*B*c*d -
4*A*c^2*d - 3*b^2*B*e + 5*A*b*c*e)*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*
d - b*e]])/(b*e*Sqrt[c*d - b*e])))/(b^2*d*(c*d - b*e))
```

Defintions of rubi rules used

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

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.22 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.98

method	result
derivativedivides	$2e^2\left(\frac{c\left(\frac{(Ac-Bb)be\sqrt{ex+d}}{2(be-cd)((ex+d)c+be-cd)}+\frac{(5Aceb-4A\,c^2d-3b^2Be+2Bbcd)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2(be-cd)\sqrt{c(be-cd)}}\right)}{b^3e^2}+\frac{-\frac{Ab\sqrt{ex+d}}{2dx}+\frac{(Abe+4Acd}{}}{e^2}\right.$
default	$2e^2\left(\frac{c\left(\frac{(Ac-Bb)be\sqrt{ex+d}}{2(be-cd)((ex+d)c+be-cd)}+\frac{(5Aceb-4A\,c^2d-3b^2Be+2Bbcd)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2(be-cd)\sqrt{c(be-cd)}}\right)}{b^3e^2}+\frac{-\frac{Ab\sqrt{ex+d}}{2dx}+\frac{(Abe+4Acd}{}}{e^2}\right.$
risch	$-\frac{A\sqrt{ex+d}}{d\,b^2x}-\frac{e\left(-\frac{(Abe+4Acd-2Bbd)\,\mathrm{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{be\sqrt{d}}-\frac{2cd\left(\frac{(Ac-Bb)be\sqrt{ex+d}}{2(be-cd)((ex+d)c+be-cd)}+\frac{(5Aceb-4A\,c^2d-3b^2Be+2Bbc}{2(be-cd)\sqrt{c(}}\right.}{be}\right.}{b^2d}$
pseudoelliptic	$-\frac{4\left(cx(cx+b)\left(A\,c^2d-\frac{5b\left(Ae+\frac{2Bd}{5}\right)c}{4}+\frac{3b^2Be}{4}\right)d^{\frac{5}{2}}\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)-\frac{\sqrt{c(be-cd)}\left(d(4Acd+b(Ae-2Bd))x(cx+b)(be-\right.}{}\right.}{\sqrt{c(be-cd)}\,d^{\frac{5}{2}}\,x\,b^3(be-cd)(cx+b)}$

input
```
int((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
2*e^2*(c/b^3/e^2*(1/2*(A*c-B*b)*b*e/(b*e-c*d)*(e*x+d)^(1/2)/((e*x+d)*c+b*e
-c*d)+1/2*(5*A*b*c*e-4*A*c^2*d-3*B*b^2*e+2*B*b*c*d)/(b*e-c*d)/(c*(b*e-c*d)
)^(1/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2)))+1/e^2/b^3*(-1/2*A*b/d
*(e*x+d)^(1/2)/x+1/2*(A*b*e+4*A*c*d-2*B*b*d)/d^(3/2)*arctanh((e*x+d)^(1/2)
/d^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 355 vs. $2(175) = 350$.

Time = 1.37 (sec) , antiderivative size = 1496, normalized size of antiderivative = 7.67

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
[-1/2*(((2*(B*b*c^2 - 2*A*c^3)*d^3 - (3*B*b^2*c - 5*A*b*c^2)*d^2*e)*x^2 +
(2*(B*b^2*c - 2*A*b*c^2)*d^3 - (3*B*b^3 - 5*A*b^2*c)*d^2*e)*x)*sqrt(c/(c*d
 - b*e))*log((c*e*x + 2*c*d - b*e - 2*(c*d - b*e)*sqrt(e*x + d)*sqrt(c/(c*
d - b*e)))/(c*x + b)) + ((A*b^2*c*e^2 + 2*(B*b*c^2 - 2*A*c^3)*d^2 - (2*B*b
^2*c - 3*A*b*c^2)*d*e)*x^2 + (A*b^3*e^2 + 2*(B*b^2*c - 2*A*b*c^2)*d^2 - (2
*B*b^3 - 3*A*b^2*c)*d*e)*x)*sqrt(d)*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2
*d)/x) + 2*(A*b^2*c*d^2 - A*b^3*d*e - (A*b^2*c*d*e + (B*b^2*c - 2*A*b*c^2)
*d^2)*x)*sqrt(e*x + d))/((b^3*c^2*d^3 - b^4*c*d^2*e)*x^2 + (b^4*c*d^3 - b^
5*d^2*e)*x), -1/2*(2*((2*(B*b*c^2 - 2*A*c^3)*d^3 - (3*B*b^2*c - 5*A*b*c^2)
*d^2*e)*x^2 + (2*(B*b^2*c - 2*A*b*c^2)*d^3 - (3*B*b^3 - 5*A*b^2*c)*d^2*e)*
x)*sqrt(-c/(c*d - b*e))*arctan(sqrt(e*x + d)*sqrt(-c/(c*d - b*e))) + ((A*b
^2*c*e^2 + 2*(B*b*c^2 - 2*A*c^3)*d^2 - (2*B*b^2*c - 3*A*b*c^2)*d*e)*x^2 +
(A*b^3*e^2 + 2*(B*b^2*c - 2*A*b*c^2)*d^2 - (2*B*b^3 - 3*A*b^2*c)*d*e)*x)*s
qrt(d)*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + 2*(A*b^2*c*d^2 - A*b
^3*d*e - (A*b^2*c*d*e + (B*b^2*c - 2*A*b*c^2)*d^2)*x)*sqrt(e*x + d))/((b^3
*c^2*d^3 - b^4*c*d^2*e)*x^2 + (b^4*c*d^3 - b^5*d^2*e)*x), 1/2*(2*((A*b^2*c
*e^2 + 2*(B*b*c^2 - 2*A*c^3)*d^2 - (2*B*b^2*c - 3*A*b*c^2)*d*e)*x^2 + (A*b
^3*e^2 + 2*(B*b^2*c - 2*A*b*c^2)*d^2 - (2*B*b^3 - 3*A*b^2*c)*d*e)*x)*sqrt(
-d)*arctan(sqrt(-d)/sqrt(e*x + d)) - ((2*(B*b*c^2 - 2*A*c^3)*d^3 - (3*B*b^
2*c - 5*A*b*c^2)*d^2*e)*x^2 + (2*(B*b^2*c - 2*A*b*c^2)*d^3 - (3*B*b^3 -...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**(1/2)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^2,x, algorithm="maxima")
```

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

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 293, normalized size of antiderivative = 1.50

$$\begin{aligned}\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^2}\,dx &= -\frac{(2\,Bbc^2d-4\,Ac^3d-3\,Bb^2ce+5\,Abc^2e)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{(b^3cd-b^4e)\sqrt{-c^2d+bce}} \\ &\quad + \frac{(ex+d)^{\frac{3}{2}}Bbcde-2\,(ex+d)^{\frac{3}{2}}Ac^2de-\sqrt{ex+d}Bbcd^2e+2\,\sqrt{ex+d}Ac^2d^2e+(ex+d)^{\frac{3}{2}}Abce^2-2\,\sqrt{e}}{(b^2cd^2-b^3de)\left((ex+d)^2c-2\,(ex+d)cd+cd^2+(ex+d)be-bde\right)} \\ &\quad + \frac{(2\,Bbd-4\,Acd-Abe)\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b^3\sqrt{-d}d}\end{aligned}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
-(2*B*b*c^2*d - 4*A*c^3*d - 3*B*b^2*c*e + 5*A*b*c^2*e)*arctan(sqrt(e*x + d
)*c/sqrt(-c^2*d + b*c*e))/((b^3*c*d - b^4*e)*sqrt(-c^2*d + b*c*e)) + ((e*x
 + d)^(3/2)*B*b*c*d*e - 2*(e*x + d)^(3/2)*A*c^2*d*e - sqrt(e*x + d)*B*b*c*
d^2*e + 2*sqrt(e*x + d)*A*c^2*d^2*e + (e*x + d)^(3/2)*A*b*c*e^2 - 2*sqrt(e
*x + d)*A*b*c*d*e^2 + sqrt(e*x + d)*A*b^2*e^3)/((b^2*c*d^2 - b^3*d*e)*((e*
x + d)^2*c - 2*(e*x + d)*c*d + c*d^2 + (e*x + d)*b*e - b*d*e)) + (2*B*b*d
- 4*A*c*d - A*b*e)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^3*sqrt(-d)*d)
```

Mupad [B] (verification not implemented)

Time = 13.54 (sec) , antiderivative size = 5828, normalized size of antiderivative = 29.89

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)^2*(d + e*x)^(1/2)),x)
```

output
```
(((d + e*x)^(1/2)*(A*b^2*e^3 + 2*A*c^2*d^2*e - 2*A*b*c*d*e^2 - B*b*c*d^2*e
))/(b^2*(c*d^2 - b*d*e)) + (c*(d + e*x)^(3/2)*(A*b*e^2 - 2*A*c*d*e + B*b*d
*e))/(b^2*(c*d^2 - b*d*e)))/((b*e - 2*c*d)*(d + e*x) + c*(d + e*x)^2 + c*d
^2 - b*d*e) + (atan(((((2*(d + e*x)^(1/2)*(A^2*b^4*c^3*e^6 + 32*A^2*c^7*d^
4*e^2 + 26*A^2*b^2*c^5*d^2*e^4 + 8*B^2*b^2*c^5*d^4*e^2 - 20*B^2*b^3*c^4*d^
3*e^3 + 13*B^2*b^4*c^3*d^2*e^4 - 64*A^2*b*c^6*d^3*e^3 + 6*A^2*b^3*c^4*d*e^
5 - 32*A*B*b*c^6*d^4*e^2 - 4*A*B*b^4*c^3*d*e^5 + 72*A*B*b^2*c^5*d^3*e^3 -
38*A*B*b^3*c^4*d^2*e^4))/(b^4*c^2*d^4 + b^6*d^2*e^2 - 2*b^5*c*d^3*e) - (((
4*A*b^9*c^2*d*e^6 + 8*A*b^6*c^5*d^4*e^3 - 16*A*b^7*c^4*d^3*e^4 + 4*A*b^8*c
^3*d^2*e^5 - 4*B*b^7*c^4*d^4*e^3 + 12*B*b^8*c^3*d^3*e^4 - 8*B*b^9*c^2*d^2*
e^5)/(b^6*c^2*d^4 + b^8*d^2*e^2 - 2*b^7*c*d^3*e) + ((-c*(b*e - c*d)^3)^(1/
2)*(d + e*x)^(1/2)*(8*b^6*c^5*d^5*e^2 - 20*b^7*c^4*d^4*e^3 + 16*b^8*c^3*d^
3*e^4 - 4*b^9*c^2*d^2*e^5)*(4*A*c^2*d + 3*B*b^2*e - 5*A*b*c*e - 2*B*b*c*d)
)/((b^4*c^2*d^4 + b^6*d^2*e^2 - 2*b^5*c*d^3*e)*(b^6*e^3 - b^3*c^3*d^3 + 3*
b^4*c^2*d^2*e - 3*b^5*c*d*e^2)))*(-c*(b*e - c*d)^3)^(1/2)*(4*A*c^2*d + 3*B
*b^2*e - 5*A*b*c*e - 2*B*b*c*d))/(2*(b^6*e^3 - b^3*c^3*d^3 + 3*b^4*c^2*d^2
*e - 3*b^5*c*d*e^2)))*(-c*(b*e - c*d)^3)^(1/2)*(4*A*c^2*d + 3*B*b^2*e - 5*
A*b*c*e - 2*B*b*c*d)*1i)/(2*(b^6*e^3 - b^3*c^3*d^3 + 3*b^4*c^2*d^2*e - 3*b
^5*c*d*e^2)) + (((2*(d + e*x)^(1/2)*(A^2*b^4*c^3*e^6 + 32*A^2*c^7*d^4*e^2
+ 26*A^2*b^2*c^5*d^2*e^4 + 8*B^2*b^2*c^5*d^4*e^2 - 20*B^2*b^3*c^4*d^3*e...
```

Reduce [B] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 1297, normalized size of antiderivative = 6.65

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^2,x)
```

output
```
(10*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d
)))*a*b**2*c*d**2*e*x - 8*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(
sqrt(c)*sqrt(b*e - c*d)))*a*b*c**2*d**3*x + 10*sqrt(c)*sqrt(b*e - c*d)*ata
n((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**2*d**2*e*x**2 - 8*sq
rt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*
c**3*d**3*x**2 - 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)
*sqrt(b*e - c*d)))*b**4*d**2*e*x + 4*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d
+ e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c*d**3*x - 6*sqrt(c)*sqrt(b*e -
c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c*d**2*e*x**2
+ 4*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d
)))*b**2*c**2*d**3*x**2 - 2*sqrt(d + e*x)*a*b**4*d*e**2 + 4*sqrt(d + e*x)*
a*b**3*c*d**2*e - 2*sqrt(d + e*x)*a*b**3*c*d*e**2*x - 2*sqrt(d + e*x)*a*b*
*2*c**2*d**3 + 6*sqrt(d + e*x)*a*b**2*c**2*d**2*e*x - 4*sqrt(d + e*x)*a*b*
c**3*d**3*x - 2*sqrt(d + e*x)*b**4*c*d**2*e*x + 2*sqrt(d + e*x)*b**3*c**2*
d**3*x - sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*b**4*e**3*x - 2*sqrt(d)*lo
g(sqrt(d + e*x) - sqrt(d))*a*b**3*c*d*e**2*x - sqrt(d)*log(sqrt(d + e*x) -
 sqrt(d))*a*b**3*c*e**3*x**2 + 7*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*b*
*2*c**2*d**2*e*x - 2*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*b**2*c**2*d*e*
*2*x**2 - 4*sqrt(d)*log(sqrt(d + e*x) - sqrt(d))*a*b*c**3*d**3*x + 7*sqrt(
d)*log(sqrt(d + e*x) - sqrt(d))*a*b*c**3*d**2*e*x**2 - 4*sqrt(d)*log(sq...
```

3.83 $\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 263

$$\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)^2}\,dx = -\frac{e(2Ac^2d^2-b^2e(2Bd-3Ae)-bcd(Bd+2Ae))}{b^2d^2(cd-be)^2\sqrt{d+ex}} + \frac{c(bBd-2Acd+Abe)}{b^2d(cd-be)(b+cx)\sqrt{d+ex}} - \frac{A}{bdx(b+cx)\sqrt{d+ex}} - \frac{(2bBd-4Acd-3Abe)\,\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b^3d^{5/2}} - \frac{c^{3/2}(4Ac^2d+5b^2Be-bc(2Bd+7Ae))\,\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b^3(cd-be)^{5/2}}$$

output

```
-e*(2*A*c^2*d^2-b^2*e*(-3*A*e+2*B*d)-b*c*d*(2*A*e+B*d))/b^2/d^2/(-b*e+c*d)
^2/(e*x+d)^(1/2)+c*(A*b*e-2*A*c*d+B*b*d)/b^2/d/(-b*e+c*d)/(c*x+b)/(e*x+d)^
(1/2)-A/b/d/x/(c*x+b)/(e*x+d)^(1/2)-(-3*A*b*e-4*A*c*d+2*B*b*d)*arctanh((e*
x+d)^(1/2)/d^(1/2))/b^3/d^(5/2)-c^(3/2)*(4*A*c^2*d+5*b^2*B*e-b*c*(7*A*e+2*
B*d))*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b^3/(-b*e+c*d)^(5/2)
```

Mathematica [A] (verified)

Time = 1.74 (sec) , antiderivative size = 263, normalized size of antiderivative = 1.00

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx+cx^2\right)^2}\,dx = \frac{\frac{b\left(bBdx\left(2b^2e^2+2bce^2x+c^2d(d+ex)\right)-A\left(2c^3d^2x(d+ex)+b^3e^2(d+3ex)+bc^2d\left(d^2-dex-2e^2x^2\right)+b^2ce(\cdots\right.\right.}{d^2(cd-be)^2x(b+cx)\sqrt{d+ex}}}{\cdots}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(3/2)*(b*x + c*x^2)^2),x]
```

output
```
((b*(b*B*d*x*(2*b^2*e^2 + 2*b*c*e^2*x + c^2*d*(d + e*x)) - A*(2*c^3*d^2*x*
(d + e*x) + b^3*e^2*(d + 3*e*x) + b*c^2*d*(d^2 - d*e*x - 2*e^2*x^2) + b^2*
c*e*(-2*d^2 - d*e*x + 3*e^2*x^2))))/(d^2*(c*d - b*e)^2*x*(b + c*x)*Sqrt[d
+ e*x]) + (c^(3/2)*(4*A*c^2*d + 5*b^2*B*e - b*c*(2*B*d + 7*A*e))*ArcTan[(S
qrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(-(c*d) + b*e)^(5/2) + ((-2*b*B
*d + 4*A*c*d + 3*A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(5/2))/b^3
```

Rubi [A] (verified)

Time = 1.36 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.17, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {1235, 27, 1198, 1197, 25, 27, 1480, 221}

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

$$\int \frac{A+Bx}{\left(bx+cx^2\right)^2(d+ex)^{3/2}}dx$$

$$\Big\downarrow \text{1235}$$

$$-\frac{\int -\frac{(cd-be)(2bBd-4Acd-3Abe)+3ce(bBd-2Acd+Abe)x}{2(d+ex)^{3/2}\left(cx^2+bx\right)}dx}{b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)\sqrt{d+ex}(cd-be)}$$

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

$$\frac{\int \frac{(cd-be)(2bBd-4Acd-3Abe)+3ce(bBd-2Acd+Abe)x}{(d+ex)^{3/2}\left(cx^2+bx\right)}dx}{2b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 1198$$

$$\frac{\frac{\int \frac{(cd-be)^2(2bBd-4Acd-3Abe)-ce\left(-e(2Bd-3Ae)b^2-cd(Bd+2Ae)b+2Ac^2d^2\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{d(cd-be)}-\frac{2e(b^2(-e)(2Bd-3Ae)-bcd(2Ae+Bd)+2Ac^2d^2)}{d\sqrt{d+ex}(cd-be)}}{2b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 1197$$

$$\frac{\frac{2\int -\frac{e\left(-e^2(2Bd-3Ae)b^3+cde(6Bd-5Ae)b^2-c^2d^2(Bd+3Ae)b+2Ac^3d^3+c\left(-e(2Bd-3Ae)b^2-cd(Bd+2Ae)b+2Ac^2d^2\right)(d+ex)\right)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}-\frac{2e(b^2(-e)(2Bd}{}}{2b^2d(cd-be)}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 25$$

$$\frac{-\frac{2\int \frac{e\left(-e^2(2Bd-3Ae)b^3+cde(6Bd-5Ae)b^2-c^2d^2(Bd+3Ae)b+2Ac^3d^3+c\left(-e(2Bd-3Ae)b^2-cd(Bd+2Ae)b+2Ac^2d^2\right)(d+ex)\right)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}-\frac{2e(b^2(-e)(2Bd}{}}{2b^2d(cd-be)}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 27$$

$$\frac{-\frac{2e\int \frac{-e^2(2Bd-3Ae)b^3+cde(6Bd-5Ae)b^2-c^2d^2(Bd+3Ae)b+2Ac^3d^3+c\left(-e(2Bd-3Ae)b^2-cd(Bd+2Ae)b+2Ac^2d^2\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{d(cd-be)}-\frac{2e(b^2(-e)(2Bd-}{d}}{2b^2d(cd-be)}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 1480$$

$$\frac{-\frac{2e\left(\frac{c^2d^2\left(7Abce-4Ac^2d-5b^2Be+2bBcd\right)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{be}-\frac{c(cd-be)^2(-3Abe-4Acd+2bBd)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}\right)}{d(cd-be)}-\frac{2e(b^2(-e)(2Bd-3}{d\sqrt{}}}{2b^2d(cd-be)}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 221$$

$$-\frac{\frac{2e\left(\frac{\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)^2(-3Abe-4Acd+2bBd)}{b\sqrt{d}e}-\frac{c^{3/2}d^2\left(7Abce-4Ac^2d-5b^2Be+2bBcd\right)\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{be\sqrt{cd-be}}\right)}{d(cd-be)}-\frac{2e(b^2(-e)(2Bd-3Ae}{d\sqrt{d-}}}{2b^2d(cd-be)}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)\sqrt{d+ex}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^(3/2)*(b*x + c*x^2)^2),x]
```

output
```
-((A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x)/(b^2*d*(c*d - b*e)*Sqr
t[d + e*x]*(b*x + c*x^2))) + ((-2*e*(2*A*c^2*d^2 - b^2*e*(2*B*d - 3*A*e) -
 b*c*d*(B*d + 2*A*e)))/(d*(c*d - b*e)*Sqrt[d + e*x]) - (2*e*(((c*d - b*e)^
2*(2*b*B*d - 4*A*c*d - 3*A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d]
*e) - (c^(3/2)*d^2*(2*b*B*c*d - 4*A*c^2*d - 5*b^2*B*e + 7*A*b*c*e)*ArcTanh
[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*e*Sqrt[c*d - b*e])))/(d*(c*d
 - b*e)))/(2*b^2*d*(c*d - b*e))
```

Defintions of rubi rules used

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

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1198
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[(e*f - d*g)*((d + e*x)^(m + 1)/((m + 1)*(c
*d^2 - b*d*e + a*e^2))), x] + Simp[1/(c*d^2 - b*d*e + a*e^2)   Int[(d + e*x
)^(m + 1)*(Simp[c*d*f - f*b*e + a*e*g - c*(e*f - d*g)*x, x]/(a + b*x + c*x^
2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] && LtQ[m, -1
]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.25 (sec) , antiderivative size = 219, normalized size of antiderivative = 0.83

method	result
derivativedivides	$2e^2\left(\frac{-\frac{Ab\sqrt{ex+d}}{2x}+\frac{(3Abe+4Acd-2Bbd)\,\mathrm{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{2\sqrt{d}}}{b^3d^2e^2}-\frac{Ae-Bd}{d^2(be-cd)^2\sqrt{ex+d}}-\frac{c^2\left(\frac{\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{(7\cdots}{\cdots}\right.}{\cdots}\right.$
default	$2e^2\left(\frac{-\frac{Ab\sqrt{ex+d}}{2x}+\frac{(3Abe+4Acd-2Bbd)\,\mathrm{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{2\sqrt{d}}}{b^3d^2e^2}-\frac{Ae-Bd}{d^2(be-cd)^2\sqrt{ex+d}}-\frac{c^2\left(\frac{\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{(7\cdots}{\cdots}\right.}{\cdots}\right.$
risch	$-\frac{A\sqrt{ex+d}}{d^2b^2x}-\frac{e\left(-\frac{(3Abe+4Acd-2Bbd)\,\mathrm{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{be\sqrt{d}}+\frac{2c^2d^2\left(\frac{\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{(7Aceb-4Ac^2d-5b^2Be+2B\cdots}{2\sqrt{c(b\cdots}}\right.}{(be-cd)^2be}\right.}{b^2d^2}\cdots$
pseudoelliptic	$-\frac{-4c^2\left(Ac^2d-\frac{7b\left(Ae+\frac{2Bd}{7}\right)c}{4}+\frac{5b^2Be}{4}\right)x(cx+b)d^{\frac{5}{2}}\sqrt{ex+d}\,\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)+\left(-3\left(\frac{4Acd}{3}+b\left(Ae-\frac{2Bd}{3}\right)\right)x(cx+\cdots\right.}{\cdots}$

input
```
int((B*x+A)/(e*x+d)^(3/2)/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
2*e^2*(1/b^3/d^2/e^2*(-1/2*A*b*(e*x+d)^(1/2)/x+1/2*(3*A*b*e+4*A*c*d-2*B*b*
d)/d^(1/2)*arctanh((e*x+d)^(1/2)/d^(1/2)))-(A*e-B*d)/d^2/(b*e-c*d)^2/(e*x+
d)^(1/2)-c^2/(b*e-c*d)^2/e^2/b^3*((1/2*A*c*e*b-1/2*b^2*B*e)*(e*x+d)^(1/2)/
((e*x+d)*c+b*e-c*d)+1/2*(7*A*b*c*e-4*A*c^2*d-5*B*b^2*e+2*B*b*c*d)/(c*(b*e-
c*d))^(1/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 779 vs. $2(241) = 482$.

Time = 9.05 (sec) , antiderivative size = 3196, normalized size of antiderivative = 12.15

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx+cx^2\right)^2}\,dx = \text{Too large to display}$$

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

output
```
Too large to include
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{3/2}\,(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**(3/2)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^{3/2}\,(bx+cx^2)^2}\,dx = \text{Exception raised: ValueError}$$

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

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

Giac [A] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 482, normalized size of antiderivative = 1.83

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx+cx^2\right)^2}\,dx =$$

$$-\frac{\left(2\,Bbc^3d-4\,Ac^4d-5\,Bb^2c^2e+7\,Abc^3e\right)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{\left(b^3c^2d^2-2\,b^4cde+b^5e^2\right)\sqrt{-c^2d+bce}}$$

$$+\frac{(ex+d)^2Bbc^2d^2e-2\,(ex+d)^2Ac^3d^2e-(ex+d)Bbc^2d^3e+2\,(ex+d)Ac^3d^3e+2\,(ex+d)^2Bb^2cde^2+2}{(b^2c^2d^4}$$

$$+\frac{\left(2\,Bbd-4\,Acd-3\,Abe\right)\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b^3\sqrt{-d}d^2}$$

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

output
```
-(2*B*b*c^3*d - 4*A*c^4*d - 5*B*b^2*c^2*e + 7*A*b*c^3*e)*arctan(sqrt(e*x +
 d)*c/sqrt(-c^2*d + b*c*e))/((b^3*c^2*d^2 - 2*b^4*c*d*e + b^5*e^2)*sqrt(-c
^2*d + b*c*e)) + ((e*x + d)^2*B*b*c^2*d^2*e - 2*(e*x + d)^2*A*c^3*d^2*e -
(e*x + d)*B*b*c^2*d^3*e + 2*(e*x + d)*A*c^3*d^3*e + 2*(e*x + d)^2*B*b^2*c*
d*e^2 + 2*(e*x + d)^2*A*b*c^2*d*e^2 - 4*(e*x + d)*B*b^2*c*d^2*e^2 - 3*(e*x
 + d)*A*b*c^2*d^2*e^2 + 2*B*b^2*c*d^3*e^2 - 3*(e*x + d)^2*A*b^2*c*e^3 + 2*
(e*x + d)*B*b^3*d*e^3 + 7*(e*x + d)*A*b^2*c*d*e^3 - 2*B*b^3*d^2*e^3 - 2*A*
b^2*c*d^2*e^3 - 3*(e*x + d)*A*b^3*e^4 + 2*A*b^3*d*e^4)/((b^2*c^2*d^4 - 2*b
^3*c*d^3*e + b^4*d^2*e^2)*((e*x + d)^(5/2)*c - 2*(e*x + d)^(3/2)*c*d + sqr
t(e*x + d)*c*d^2 + (e*x + d)^(3/2)*b*e - sqrt(e*x + d)*b*d*e)) + (2*B*b*d
- 4*A*c*d - 3*A*b*e)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^3*sqrt(-d)*d^2)
```

Mupad [B] (verification not implemented)

Time = 15.04 (sec) , antiderivative size = 8946, normalized size of antiderivative = 34.02

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx+cx^2\right)^2}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)^2*(d + e*x)^(3/2)),x)
```

output
```
(atan(((((d + e*x)^(1/2)*(64*A^2*b^6*c^15*d^18*e^2 - 576*A^2*b^7*c^14*d^17
*e^3 + 2228*A^2*b^8*c^13*d^16*e^4 - 4768*A^2*b^9*c^12*d^15*e^5 + 5960*A^2*
b^10*c^11*d^14*e^6 - 3976*A^2*b^11*c^10*d^13*e^7 + 578*A^2*b^12*c^9*d^12*e
^8 + 1004*A^2*b^13*c^8*d^11*e^9 - 442*A^2*b^14*c^7*d^10*e^10 - 320*A^2*b^1
5*c^6*d^9*e^11 + 362*A^2*b^16*c^5*d^8*e^12 - 132*A^2*b^17*c^4*d^7*e^13 + 1
8*A^2*b^18*c^3*d^6*e^14 + 16*B^2*b^8*c^13*d^18*e^2 - 168*B^2*b^9*c^12*d^17
*e^3 + 770*B^2*b^10*c^11*d^16*e^4 - 2020*B^2*b^11*c^10*d^15*e^5 + 3350*B^2
*b^12*c^9*d^14*e^6 - 3664*B^2*b^13*c^8*d^13*e^7 + 2678*B^2*b^14*c^7*d^12*e
^8 - 1300*B^2*b^15*c^6*d^11*e^9 + 410*B^2*b^16*c^5*d^10*e^10 - 80*B^2*b^17
*c^4*d^9*e^11 + 8*B^2*b^18*c^3*d^8*e^12 - 64*A*B*b^7*c^14*d^18*e^2 + 624*A
*B*b^8*c^13*d^17*e^3 - 2636*A*B*b^9*c^12*d^16*e^4 + 6280*A*B*b^10*c^11*d^1
5*e^5 - 9140*A*B*b^11*c^10*d^14*e^6 + 8056*A*B*b^12*c^9*d^13*e^7 - 3620*A*
B*b^13*c^8*d^12*e^8 - 224*A*B*b^14*c^7*d^11*e^9 + 1300*A*B*b^15*c^6*d^10*e
^10 - 760*A*B*b^16*c^5*d^9*e^11 + 208*A*B*b^17*c^4*d^8*e^12 - 24*A*B*b^18*
c^3*d^7*e^13) - ((-c^3*(b*e - c*d)^5)^(1/2)*(4*A*c^2*d + 5*B*b^2*e - 7*A*b
*c*e - 2*B*b*c*d)*(((-c^3*(b*e - c*d)^5)^(1/2)*(d + e*x)^(1/2)*(4*A*c^2*d
+ 5*B*b^2*e - 7*A*b*c*e - 2*B*b*c*d)*(16*b^12*c^13*d^21*e^2 - 168*b^13*c^1
2*d^20*e^3 + 800*b^14*c^11*d^19*e^4 - 2280*b^15*c^10*d^18*e^5 + 4320*b^16*
c^9*d^17*e^6 - 5712*b^17*c^8*d^16*e^7 + 5376*b^18*c^7*d^15*e^8 - 3600*b^19
*c^6*d^14*e^9 + 1680*b^20*c^5*d^13*e^10 - 520*b^21*c^4*d^12*e^11 + 96*b...
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 1965, normalized size of antiderivative = 7.47

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx+cx^2\right)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(3/2)/(c*x^2+b*x)^2,x)
```

output

```
( - 14*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(
c)*sqrt(b*e - c*d)))*a*b**2*c**2*d**3*e*x + 8*sqrt(c)*sqrt(d + e*x)*sqrt(b
*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**3*d**4*
x - 14*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(
c)*sqrt(b*e - c*d)))*a*b*c**3*d**3*e*x**2 + 8*sqrt(c)*sqrt(d + e*x)*sqrt(b
*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**4*d**4*x*
*2 + 10*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt
(c)*sqrt(b*e - c*d)))*b**4*c*d**3*e*x - 4*sqrt(c)*sqrt(d + e*x)*sqrt(b*e -
 c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c**2*d**4*x +
 10*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*
sqrt(b*e - c*d)))*b**3*c**2*d**3*e*x**2 - 4*sqrt(c)*sqrt(d + e*x)*sqrt(b*e
 - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*c**3*d**4*x
**2 - 3*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**5*e**4*x +
 5*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**4*c*d*e**3*x -
3*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**4*c*e**4*x**2 +
3*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**3*c**2*d**2*e**2
*x + 5*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**3*c**2*d*e*
*3*x**2 - 9*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**2*c**3
*d**3*e*x + 3*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d))*a*b**2*c*
*3*d**2*e**2*x**2 + 4*sqrt(d)*sqrt(d + e*x)*log(sqrt(d + e*x) - sqrt(d)...
```

3.84 $\int \frac{A+Bx}{(d+ex)^{5/2}(bx+cx^2)^2} dx$

Optimal result

Integrand size = 26, antiderivative size = 351

$$\int \frac{A+Bx}{(d+ex)^{5/2}\left(bx+cx^2\right)^2} dx = -\frac{e(6Ac^2d^2-b^2e(2Bd-5Ae)-3bcd(Bd+2Ae))}{3b^2d^2(cd-be)^2(d+ex)^{3/2}} + \frac{c(bBd-2Acd+Abe)}{b^2d(cd-be)(b+cx)(d+ex)^{3/2}} - \frac{A}{bdx(b+cx)(d+ex)^{3/2}} - \frac{e(2Ac^3d^3-b^2cde(6Bd-11Ae)+b^3e^2(2Bd-5Ae)-bc^2d^2(Bd+3Ae))}{b^2d^3(cd-be)^3\sqrt{d+ex}} - \frac{(2bBd-4Acd-5Abe)\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b^3d^{7/2}} + \frac{c^{5/2}(2bBcd-4Ac^2d-7b^2Be+9Abce)\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b^3(cd-be)^{7/2}}$$

output
```
-1/3*e*(6*A*c^2*d^2-b^2*e*(-5*A*e+2*B*d)-3*b*c*d*(2*A*e+B*d))/b^2/d^2/(-b*
e+c*d)^2/(e*x+d)^(3/2)+c*(A*b*e-2*A*c*d+B*b*d)/b^2/d/(-b*e+c*d)/(c*x+b)/(e
*x+d)^(3/2)-A/b/d/x/(c*x+b)/(e*x+d)^(3/2)-e*(2*A*c^3*d^3-b^2*c*d*e*(-11*A*
e+6*B*d)+b^3*e^2*(-5*A*e+2*B*d)-b*c^2*d^2*(3*A*e+B*d))/b^2/d^3/(-b*e+c*d)^
3/(e*x+d)^(1/2)-(-5*A*b*e-4*A*c*d+2*B*b*d)*arctanh((e*x+d)^(1/2)/d^(1/2))/
b^3/d^(7/2)+c^(5/2)*(9*A*b*c*e-4*A*c^2*d-7*B*b^2*e+2*B*b*c*d)*arctanh(c^(1
/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b^3/(-b*e+c*d)^(7/2)
```

Mathematica [A] (verified)

Time = 2.63 (sec) , antiderivative size = 385, normalized size of antiderivative = 1.10

$$\int \frac{A+Bx}{(d+ex)^{5/2}\,(bx+cx^2)^2}\,dx = \frac{b\big(bBdx\big(3c^3d^2(d+ex)^2-2b^3e^3(4d+3ex)+2bc^2de^2x(10d+9ex)+2b^2ce^2\big(10d^2+5dex-3e^2x^2\big)\big)+A\big(-6c^4}{}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(5/2)*(b*x + c*x^2)^2),x]
```

output
```
((b*(b*B*d*x*(3*c^3*d^2*(d + e*x)^2 - 2*b^3*e^3*(4*d + 3*e*x) + 2*b*c^2*d*
e^2*x*(10*d + 9*e*x) + 2*b^2*c*e^2*(10*d^2 + 5*d*e*x - 3*e^2*x^2)) + A*(-6
*c^4*d^3*x*(d + e*x)^2 - 3*b*c^3*d^2*(d - 3*e*x)*(d + e*x)^2 + b^4*e^3*(3*
d^2 + 20*d*e*x + 15*e^2*x^2) + b^2*c^2*d*e*(9*d^3 + 9*d^2*e*x - 35*d*e^2*x
^2 - 33*e^3*x^3) + b^3*c*e^2*(-9*d^3 - 41*d^2*e*x - 13*d*e^2*x^2 + 15*e^3*
x^3))))/(d^3*(c*d - b*e)^3*x*(b + c*x)*(d + e*x)^(3/2)) - (3*c^(5/2)*(4*A*
c^2*d + 7*b^2*B*e - b*c*(2*B*d + 9*A*e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sq
rt[-(c*d) + b*e]])/(-(c*d) + b*e)^(7/2) + (3*(-2*b*B*d + 4*A*c*d + 5*A*b*e
)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(7/2))/(3*b^3)
```

Rubi [A] (verified)

Time = 1.89 (sec) , antiderivative size = 410, normalized size of antiderivative = 1.17, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.346$, Rules used = {1235, 27, 1198, 1198, 1197, 25, 27, 1480, 221}

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

$$\int \frac{A+Bx}{\left(bx+cx^2\right)^2 (d+ex)^{5/2}}\,dx$$

$$\Big\downarrow \; 1235$$

$$-\frac{\int -\frac{(cd-be)(2bBd-4Acd-5Abe)+5ce(bBd-2Acd+Abe)x}{2(d+ex)^{5/2}(cx^2+bx)}dx}{b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{(cd-be)(2bBd-4Acd-5Abe)+5ce(bBd-2Acd+Abe)x}{(d+ex)^{5/2}(cx^2+bx)}dx}{2b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 1198$$

$$\frac{\frac{\int \frac{(cd-be)^2(2bBd-4Acd-5Abe)-ce\left(-e(2Bd-5Ae)b^2-3cd(Bd+2Ae)b+6Ac^2d^2\right)x}{(d+ex)^{3/2}\left(cx^2+bx\right)}dx}{d(cd-be)}-\frac{2e(b^2(-e)(2Bd-5Ae)-3bcd(2Ae+Bd)+6Ac^2d^2)}{3d(d+ex)^{3/2}(cd-be)}}{2b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 1198$$

$$\frac{\frac{\frac{\int \frac{(cd-be)^3(2bBd-4Acd-5Abe)-ce\left(e^2(2Bd-5Ae)b^3-cde(6Bd-11Ae)b^2-c^2d^2(Bd+3Ae)b+2Ac^3d^3\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{d(cd-be)}-\frac{2e\left(b^3e^2(2Bd-5Ae)-b^2cde(6Bd-11Ae)-bc^2d^2(3A\cdots\right.}{d\sqrt{d+ex}(cd-be)}}{d(cd-be)}\cdots}{2b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 1197$$

$$\frac{\frac{\frac{2\int -\frac{e\left(e^3(2Bd-5Ae)b^4-8cde^2(Bd-2Ae)b^3+2c^2d^2e(6Bd-7Ae)b^2-c^3d^3(Bd+4Ae)b+2Ac^4d^4+c\left(e^2(2Bd-5Ae)b^3-cde(6Bd-11Ae)b^2-c^2d^2(Bd+3Ae)b+2Ac^3\cdots\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}\cdots}{d(cd-be)}\cdots}{d(cd-be)}\cdots}{2b^2d(cd-\cdots}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 25$$

$$-\frac{2\int \frac{e\left(e^3(2Bd-5Ae)b^4-8cde^2(Bd-2Ae)b^3+2c^2d^2e(6Bd-7Ae)b^2-c^3d^3(Bd+4Ae)b+2Ac^4d^4+c\left(e^2(2Bd-5Ae)b^3-cde(6Bd-11Ae)b^2-c^2d^2(Bd+3Ae)b+2Ac^3\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{d(cd-be)}$$

$$d(cd-be)$$

$$2b^2d(cd-$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{3/2}(cd-be)}$$

$\downarrow$ 27

$$-\frac{2e\int \frac{e^3(2Bd-5Ae)b^4-8cde^2(Bd-2Ae)b^3+2c^2d^2e(6Bd-7Ae)b^2-c^3d^3(Bd+4Ae)b+2Ac^4d^4+c\left(e^2(2Bd-5Ae)b^3-cde(6Bd-11Ae)b^2-c^2d^2(Bd+3Ae)b+2Ac^3d\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{d(cd-be)}$$

$$d(cd-be)$$

$$2b^2d(cd-$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{3/2}(cd-be)}$$

$\downarrow$ 1480

$$-\frac{2e\left(\frac{c^3d^3\left(9Abce-4Ac^2d-7b^2Be+2bBcd\right)\int \frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{be}-\frac{c(cd-be)^3(-5Abe-4Acd+2bBd)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}\right)}{d(cd-be)}-\frac{2e\left(b^3e^2(2Bd-5Ae)-b^2\right.}{}$$

$$d(cd-be)$$

$$2b^2d(cd-be)$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{3/2}(cd-be)}$$

$\downarrow$ 221

$$-\frac{2e\left(\frac{\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)^3(-5Abe-4Acd+2bBd)}{b\sqrt{d}e}-\frac{c^{5/2}d^3\left(9Abce-4Ac^2d-7b^2Be+2bBcd\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{be\sqrt{cd-be}}\right)}{d(cd-be)}-\frac{2e\left(b^3e^2(2Bd-5Ae)-b^2cde\right.}{}$$

$$d(cd-be)$$

$$2b^2d(cd-be)$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{3/2}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^(5/2)*(b*x + c*x^2)^2),x]
```

output
```
-((A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x)/(b^2*d*(c*d - b*e)*(d
+ e*x)^(3/2)*(b*x + c*x^2))) + ((-2*e*(6*A*c^2*d^2 - b^2*e*(2*B*d - 5*A*e)
 - 3*b*c*d*(B*d + 2*A*e)))/(3*d*(c*d - b*e)*(d + e*x)^(3/2)) + ((-2*e*(2*A
*c^3*d^3 - b^2*c*d*e*(6*B*d - 11*A*e) + b^3*e^2*(2*B*d - 5*A*e) - b*c^2*d^
2*(B*d + 3*A*e)))/(d*(c*d - b*e)*Sqrt[d + e*x]) - (2*e*(((c*d - b*e)^3*(2*
b*B*d - 4*A*c*d - 5*A*b*e)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d]*e) -
 (c^(5/2)*d^3*(2*b*B*c*d - 4*A*c^2*d - 7*b^2*B*e + 9*A*b*c*e)*ArcTanh[(Sqr
t[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*e*Sqrt[c*d - b*e])))/(d*(c*d - b*
e)))/(d*(c*d - b*e)))/(2*b^2*d*(c*d - b*e))
```

Defintions of rubi rules used

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

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1198
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[(e*f - d*g)*((d + e*x)^(m + 1)/((m + 1)*(c
*d^2 - b*d*e + a*e^2))), x] + Simp[1/(c*d^2 - b*d*e + a*e^2)   Int[(d + e*x
)^(m + 1)*(Simp[c*d*f - f*b*e + a*e*g - c*(e*f - d*g)*x, x]/(a + b*x + c*x^
2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] && LtQ[m, -1
]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.68 (sec) , antiderivative size = 267, normalized size of antiderivative = 0.76

method	result
derivativedivides	$2e^2\left(\frac{c^3\left(\frac{\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{\left(9Aceb-4A\,c^2d-7b^2Be+2Bbcd\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2\sqrt{c(be-cd)}}\right)}{(be-cd)^3e^2b^3}+\frac{-\frac{Ab\sqrt{ex+d}}{2x}+\frac{(5Abe+4Ac}{}}{b^3}\right.$
default	$2e^2\left(\frac{c^3\left(\frac{\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{\left(9Aceb-4A\,c^2d-7b^2Be+2Bbcd\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2\sqrt{c(be-cd)}}\right)}{(be-cd)^3e^2b^3}+\frac{-\frac{Ab\sqrt{ex+d}}{2x}+\frac{(5Abe+4Ac}{}}{b^3}\right.$
risch	$-\frac{A\sqrt{ex+d}}{d^3b^2x}-\frac{e\left(-\frac{(5Abe+4Acd-2Bbd)\,\mathrm{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{be\sqrt{d}}-\frac{2d^3c^3\left(\frac{\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{\left(9Aceb-4A\,c^2d-7b^2Be+2B\right.}{2\sqrt{c(b}}\right.}{(be-cd)^3be}\right.}{b^2d^3}$
pseudoelliptic	$\frac{(ex+d)^{\frac{3}{2}}(cx+b)\left(9Aceb-4A\,c^2d-7b^2Be+2Bbcd\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)c^3d^{\frac{7}{2}}x+\left((5Abe+4Acd-2Bbd)x(cx+b)(ex+d)\right.}{}$

input
```
int((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
2*e^2*(c^3/(b*e-c*d)^3/e^2/b^3*((1/2*A*c*e*b-1/2*b^2*B*e)*(e*x+d)^(1/2)/((
e*x+d)*c+b*e-c*d)+1/2*(9*A*b*c*e-4*A*c^2*d-7*B*b^2*e+2*B*b*c*d)/(c*(b*e-c*
d))^(1/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2)))+1/b^3/e^2/d^3*(-1/2
*A*b*(e*x+d)^(1/2)/x+1/2*(5*A*b*e+4*A*c*d-2*B*b*d)/d^(1/2)*arctanh((e*x+d)
^(1/2)/d^(1/2)))-1/3*(A*e-B*d)/d^2/(b*e-c*d)^2/(e*x+d)^(3/2)-(2*A*b*e^2-4*
A*c*d*e-B*b*d*e+3*B*c*d^2)/d^3/(b*e-c*d)^3/(e*x+d)^(1/2))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1386 vs. $2(325) = 650$.

Time = 25.46 (sec) , antiderivative size = 5620, normalized size of antiderivative = 16.01

$$\int \frac{A+Bx}{(d+ex)^{5/2}\left(bx+cx^2\right)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{5/2}(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**(5/2)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^{5/2}(bx+cx^2)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x)^2,x, algorithm="maxima")
```

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

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 589, normalized size of antiderivative = 1.68

$$\int \frac{A+Bx}{(d+ex)^{5/2}\left(bx+cx^2\right)^2}\,dx =$$

$$-\frac{(2\,Bbc^4d-4\,Ac^5d-7\,Bb^2c^3e+9\,Abc^4e)\arctan\left(\frac{\sqrt{ex+d}c}{\sqrt{-c^2d+bce}}\right)}{(b^3c^3d^3-3\,b^4c^2d^2e+3\,b^5cde^2-b^6e^3)\sqrt{-c^2d+bce}}$$
$$+\frac{(ex+d)^{\frac{3}{2}}Bbc^3d^3e-2\,(ex+d)^{\frac{3}{2}}Ac^4d^3e-\sqrt{ex+d}Bbc^3d^4e+2\,\sqrt{ex+d}Ac^4d^4e+3\,(ex+d)^{\frac{3}{2}}Abc^3d^2e^2-}{(b^2c^3d^6-3\,b^3c^2d^5e+3\,b^4cd^4e^2-b^5d^3}$$
$$+\frac{2\,(9\,(ex+d)Bcd^2e^2+Bcd^3e^2-3\,(ex+d)Bbde^3-12\,(ex+d)Acde^3-Bbd^2e^3-Acd^2e^3+6\,(ex+d)Ab}{3\,(c^3d^6-3\,bc^2d^5e+3\,b^2cd^4e^2-b^3d^3e^3)(ex+d)^{\frac{3}{2}}}$$
$$+\frac{(2\,Bbd-4\,Acd-5\,Abe)\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{b^3\sqrt{-d}d^3}$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
-(2*B*b*c^4*d - 4*A*c^5*d - 7*B*b^2*c^3*e + 9*A*b*c^4*e)*arctan(sqrt(e*x +
 d)*c/sqrt(-c^2*d + b*c*e))/((b^3*c^3*d^3 - 3*b^4*c^2*d^2*e + 3*b^5*c*d*e^
2 - b^6*e^3)*sqrt(-c^2*d + b*c*e)) + ((e*x + d)^(3/2)*B*b*c^3*d^3*e - 2*(e
*x + d)^(3/2)*A*c^4*d^3*e - sqrt(e*x + d)*B*b*c^3*d^4*e + 2*sqrt(e*x + d)*
A*c^4*d^4*e + 3*(e*x + d)^(3/2)*A*b*c^3*d^2*e^2 - 4*sqrt(e*x + d)*A*b*c^3*
d^3*e^2 - 3*(e*x + d)^(3/2)*A*b^2*c^2*d*e^3 + 6*sqrt(e*x + d)*A*b^2*c^2*d^
2*e^3 + (e*x + d)^(3/2)*A*b^3*c*e^4 - 4*sqrt(e*x + d)*A*b^3*c*d*e^4 + sqrt
(e*x + d)*A*b^4*e^5)/((b^2*c^3*d^6 - 3*b^3*c^2*d^5*e + 3*b^4*c*d^4*e^2 - b
^5*d^3*e^3)*((e*x + d)^2*c - 2*(e*x + d)*c*d + c*d^2 + (e*x + d)*b*e - b*d
*e)) + 2/3*(9*(e*x + d)*B*c*d^2*e^2 + B*c*d^3*e^2 - 3*(e*x + d)*B*b*d*e^3
- 12*(e*x + d)*A*c*d*e^3 - B*b*d^2*e^3 - A*c*d^2*e^3 + 6*(e*x + d)*A*b*e^4
 + A*b*d*e^4)/((c^3*d^6 - 3*b*c^2*d^5*e + 3*b^2*c*d^4*e^2 - b^3*d^3*e^3)*(
e*x + d)^(3/2)) + (2*B*b*d - 4*A*c*d - 5*A*b*e)*arctan(sqrt(e*x + d)/sqrt(
-d))/(b^3*sqrt(-d)*d^3)
```

Mupad [B] (verification not implemented)

Time = 15.37 (sec) , antiderivative size = 18450, normalized size of antiderivative = 52.56

$$\int \frac{A+Bx}{(d+ex)^{5/2}\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)^2*(d + e*x)^(5/2)),x)
```

output
```
atan((A^2*c^13*d^12*(-(16*A^2*c^9*d^2 + 81*A^2*b^2*c^7*e^2 + 4*B^2*b^2*c^7
*d^2 + 49*B^2*b^4*c^5*e^2 - 126*A*B*b^3*c^6*e^2 - 28*B^2*b^3*c^6*d*e - 16*
A*B*b*c^8*d^2 - 72*A^2*b*c^8*d*e + 92*A*B*b^2*c^7*d*e)/(b^13*e^7 - b^6*c^7
*d^7 + 7*b^7*c^6*d^6*e - 21*b^8*c^5*d^5*e^2 + 35*b^9*c^4*d^4*e^3 - 35*b^10
*c^3*d^3*e^4 + 21*b^11*c^2*d^2*e^5 - 7*b^12*c*d*e^6))^(1/2)*(d + e*x)^(1/2
)*32i - b^6*c^11*d^17*(-(16*A^2*c^9*d^2 + 81*A^2*b^2*c^7*e^2 + 4*B^2*b^2*c
^7*d^2 + 49*B^2*b^4*c^5*e^2 - 126*A*B*b^3*c^6*e^2 - 28*B^2*b^3*c^6*d*e - 1
6*A*B*b*c^8*d^2 - 72*A^2*b*c^8*d*e + 92*A*B*b^2*c^7*d*e)/(b^13*e^7 - b^6*c
^7*d^7 + 7*b^7*c^6*d^6*e - 21*b^8*c^5*d^5*e^2 + 35*b^9*c^4*d^4*e^3 - 35*b^
10*c^3*d^3*e^4 + 21*b^11*c^2*d^2*e^5 - 7*b^12*c*d*e^6))^(3/2)*(d + e*x)^(1
/2)*2i + b^17*d^6*e^11*(-(16*A^2*c^9*d^2 + 81*A^2*b^2*c^7*e^2 + 4*B^2*b^2*
c^7*d^2 + 49*B^2*b^4*c^5*e^2 - 126*A*B*b^3*c^6*e^2 - 28*B^2*b^3*c^6*d*e -
16*A*B*b*c^8*d^2 - 72*A^2*b*c^8*d*e + 92*A*B*b^2*c^7*d*e)/(b^13*e^7 - b^6*
c^7*d^7 + 7*b^7*c^6*d^6*e - 21*b^8*c^5*d^5*e^2 + 35*b^9*c^4*d^4*e^3 - 35*b
^10*c^3*d^3*e^4 + 21*b^11*c^2*d^2*e^5 - 7*b^12*c*d*e^6))^(3/2)*(d + e*x)^(
1/2)*1i + B^2*b^2*c^11*d^12*(-(16*A^2*c^9*d^2 + 81*A^2*b^2*c^7*e^2 + 4*B^2
*b^2*c^7*d^2 + 49*B^2*b^4*c^5*e^2 - 126*A*B*b^3*c^6*e^2 - 28*B^2*b^3*c^6*d
*e - 16*A*B*b*c^8*d^2 - 72*A^2*b*c^8*d*e + 92*A*B*b^2*c^7*d*e)/(b^13*e^7 -
 b^6*c^7*d^7 + 7*b^7*c^6*d^6*e - 21*b^8*c^5*d^5*e^2 + 35*b^9*c^4*d^4*e^3 -
 35*b^10*c^3*d^3*e^4 + 21*b^11*c^2*d^2*e^5 - 7*b^12*c*d*e^6))^(1/2)*(d ...
```

Reduce [B] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 3890, normalized size of antiderivative = 11.08

$$\int \frac{A+Bx}{(d+ex)^{5/2}\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(5/2)/(c*x^2+b*x)^2,x)
```

output

```
(54*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*
sqrt(b*e - c*d)))*a*b**2*c**3*d**5*e*x + 54*sqrt(c)*sqrt(d + e*x)*sqrt(b*e
 - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**3*d**4
*e**2*x**2 - 24*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*
c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**4*d**6*x + 30*sqrt(c)*sqrt(d + e*x)*s
qrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**4*
d**5*e*x**2 + 54*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)
*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**4*d**4*e**2*x**3 - 24*sqrt(c)*sqrt(d
 + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*
a*c**5*d**6*x**2 - 24*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d +
 e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**5*d**5*e*x**3 - 42*sqrt(c)*sqrt(d
 + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*
b**4*c**2*d**5*e*x - 42*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d
 + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c**2*d**4*e**2*x**2 + 12*sqrt(c
)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
 c*d)))*b**3*c**3*d**6*x - 30*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((
sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**3*c**3*d**5*e*x**2 - 42*sqr
t(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*
e - c*d)))*b**3*c**3*d**4*e**2*x**3 + 12*sqrt(c)*sqrt(d + e*x)*sqrt(b*e -
c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**2*c**4*d**6*x...
```

3.85 $\int \frac{A+Bx}{(d+ex)^{7/2}(bx+cx^2)^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 466

$$\int \frac{A+Bx}{(d+ex)^{7/2}(bx+cx^2)^2}\,dx = -\frac{e(10Ac^2d^2-b^2e(2Bd-7Ae)-5bcd(Bd+2Ae))}{5b^2d^2(cd-be)^2(d+ex)^{5/2}}$$
$$+\frac{c(bBd-2Acd+Abe)}{b^2d(cd-be)(b+cx)(d+ex)^{5/2}}-\frac{A}{bdx(b+cx)(d+ex)^{5/2}}$$
$$-\frac{e(6Ac^3d^3-b^2cde(6Bd-17Ae)+b^3e^2(2Bd-7Ae)-3bc^2d^2(Bd+3Ae))}{3b^2d^3(cd-be)^3(d+ex)^{3/2}}$$
$$-\frac{e(2Ac^4d^4-2b^2c^2d^2e(6Bd-13Ae)-b^4e^3(2Bd-7Ae)+8b^3cde^2(Bd-3Ae)-bc^3d^3(Bd+4Ae))}{b^2d^4(cd-be)^4\sqrt{d+ex}}$$
$$-\frac{(2bBd-4Acd-7Abe)\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{b^3d^{9/2}}$$
$$-\frac{c^{7/2}(4Ac^2d+9b^2Be-bc(2Bd+11Ae))\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b^3(cd-be)^{9/2}}$$

output
```
-1/5*e*(10*A*c^2*d^2-b^2*e*(-7*A*e+2*B*d)-5*b*c*d*(2*A*e+B*d))/b^2/d^2/(-b
*e+c*d)^2/(e*x+d)^(5/2)+c*(A*b*e-2*A*c*d+B*b*d)/b^2/d/(-b*e+c*d)/(c*x+b)/(
e*x+d)^(5/2)-A/b/d/x/(c*x+b)/(e*x+d)^(5/2)-1/3*e*(6*A*c^3*d^3-b^2*c*d*e*(-
17*A*e+6*B*d)+b^3*e^2*(-7*A*e+2*B*d)-3*b*c^2*d^2*(3*A*e+B*d))/b^2/d^3/(-b*
e+c*d)^3/(e*x+d)^(3/2)-e*(2*A*c^4*d^4-2*b^2*c^2*d^2*e*(-13*A*e+6*B*d)-b^4*
e^3*(-7*A*e+2*B*d)+8*b^3*c*d*e^2*(-3*A*e+B*d)-b*c^3*d^3*(4*A*e+B*d))/b^2/d
^4/(-b*e+c*d)^4/(e*x+d)^(1/2)-(-7*A*b*e-4*A*c*d+2*B*b*d)*arctanh((e*x+d)^(
1/2)/d^(1/2))/b^3/d^(9/2)-c^(7/2)*(4*A*c^2*d+9*b^2*B*e-b*c*(11*A*e+2*B*d))
*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b^3/(-b*e+c*d)^(9/2)
```

Mathematica [A] (verified)

Time = 3.62 (sec) , antiderivative size = 553, normalized size of antiderivative = 1.19

$$\int \frac{A+Bx}{(d+ex)^{7/2}\left(bx+cx^2\right)^2}\,dx = \frac{b\left(bBdx\left(15c^4d^3(d+ex)^3+2b^4e^4\left(23d^2+35dex+15e^2x^2\right)+6bc^3d^2e^2x\left(36d^2+65dex+30e^2x^2\right)+2b^2c^2de^2\right.\right.}{}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(7/2)*(b*x + c*x^2)^2),x]
```

output
```
((b*(b*B*d*x*(15*c^4*d^3*(d + e*x)^3 + 2*b^4*e^4*(23*d^2 + 35*d*e*x + 15*e
^2*x^2) + 6*b*c^3*d^2*e^2*x*(36*d^2 + 65*d*e*x + 30*e^2*x^2) + 2*b^2*c^2*d
*e^2*(108*d^3 + 109*d^2*e*x - 50*d*e^2*x^2 - 60*e^3*x^3) - 2*b^3*c*e^3*(86
*d^3 + 117*d^2*e*x + 25*d*e^2*x^2 - 15*e^3*x^3)) - A*(30*c^5*d^4*x*(d + e*
x)^3 + 15*b*c^4*d^3*(d - 4*e*x)*(d + e*x)^3 + b^5*e^4*(15*d^3 + 161*d^2*e*
x + 245*d*e^2*x^2 + 105*e^3*x^3) + 2*b^3*c^2*d*e^2*(45*d^4 + 278*d^3*e*x +
 179*d^2*e^2*x^2 - 225*d*e^3*x^3 - 180*e^4*x^4) - b^4*c*e^3*(60*d^4 + 537*
d^3*e*x + 679*d^2*e^2*x^2 + 115*d*e^3*x^3 - 105*e^4*x^4) + 2*b^2*c^3*d^2*e
*(-30*d^4 - 45*d^3*e*x + 218*d^2*e^2*x^2 + 425*d*e^3*x^3 + 195*e^4*x^4))))
/(d^4*(c*d - b*e)^4*x*(b + c*x)*(d + e*x)^(5/2)) + (15*c^(7/2)*(4*A*c^2*d
+ 9*b^2*B*e - b*c*(2*B*d + 11*A*e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(
c*d) + b*e]])/(-(c*d) + b*e)^(9/2) + (15*(-2*b*B*d + 4*A*c*d + 7*A*b*e)*Ar
cTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(9/2))/(15*b^3)
```

Rubi [A] (verified)

Time = 2.44 (sec) , antiderivative size = 535, normalized size of antiderivative = 1.15, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {1235, 27, 1198, 1198, 1198, 1197, 25, 27, 1480, 221}

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

$$\int \frac{A+Bx}{(bx+cx^2)^2 (d+ex)^{7/2}} \, dx$$

$$\Big\downarrow \; 1235$$

$$-\frac{\int -\frac{(cd-be)(2bBd-4Acd-7Abe)+7ce(bBd-2Acd+Abe)x}{2(d+ex)^{7/2}(cx^2+bx)}dx}{b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\,(bx+cx^2)\,(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{(cd-be)(2bBd-4Acd-7Abe)+7ce(bBd-2Acd+Abe)x}{(d+ex)^{7/2}(cx^2+bx)}dx}{2b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\,(bx+cx^2)\,(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \; 1198$$

$$\frac{\frac{\int \frac{(cd-be)^2(2bBd-4Acd-7Abe)-ce\left(-e(2Bd-7Ae)b^2-5cd(Bd+2Ae)b+10Ac^2d^2\right)x}{(d+ex)^{5/2}\left(cx^2+bx\right)}dx}{d(cd-be)}-\frac{2e\left(b^2(-e)(2Bd-7Ae)-5bcd(2Ae+Bd)+10Ac^2d^2\right)}{5d(d+ex)^{5/2}(cd-be)}}{2b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\,(bx+cx^2)\,(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \; 1198$$

$$\frac{\frac{\frac{\int \frac{(cd-be)^3(2bBd-4Acd-7Abe)-ce\left(e^2(2Bd-7Ae)b^3-cde(6Bd-17Ae)b^2-3c^2d^2(Bd+3Ae)b+6Ac^3d^3\right)x}{(d+ex)^{3/2}\left(cx^2+bx\right)}dx}{d(cd-be)}-\frac{2e\big(b^3e^2(2Bd-7Ae)-b^2cde(6Bd-17Ae)-3bc^2d^2(}{3d(d+ex)^{3/2}(cd-be)}}{d(cd-be)}}{2b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\,(bx+cx^2)\,(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \; 1198$$

$$\frac{\frac{\frac{\int \frac{(cd-be)^4(2bBd-4Acd-7Abe)-ce\left(-e^3(2Bd-7Ae)b^4+8cde^2(Bd-3Ae)b^3-2c^2d^2e(6Bd-13Ae)b^2-c^3d^3(Bd+4Ae)b+2Ac^4d^4\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{d(cd-be)}-\frac{2e\left(b^4\left(-e^3\right)(2Bd-7Ae)-\right.}{}}{d(cd-be)}}{d(cd-be)}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \; 1197$$

$$\frac{\frac{2\int -\frac{e\left(-e^4(2Bd-7Ae)b^5+cde^3(10Bd-31Ae)b^4-10c^2d^2e^2(2Bd-5Ae)b^3+10c^3d^3e(2Bd-3Ae)b^2-c^4d^4(Bd+5Ae)b+2Ac^5d^5+c\left(-e^3(2Bd-7Ae)b^4+8cde^2(Bd-\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{d(cd-be)}}{}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \; 25$$

$$-\frac{2\int \frac{e\left(-e^4(2Bd-7Ae)b^5+cde^3(10Bd-31Ae)b^4-10c^2d^2e^2(2Bd-5Ae)b^3+10c^3d^3e(2Bd-3Ae)b^2-c^4d^4(Bd+5Ae)b+2Ac^5d^5+c\left(-e^3(2Bd-7Ae)b^4+8cde^2(Bd-\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{d(cd-be)}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \; 27$$

$$-\frac{2e\int \frac{-e^4(2Bd-7Ae)b^5+cde^3(10Bd-31Ae)b^4-10c^2d^2e^2(2Bd-5Ae)b^3+10c^3d^3e(2Bd-3Ae)b^2-c^4d^4(Bd+5Ae)b+2Ac^5d^5+c\left(-e^3(2Bd-7Ae)b^4+8cde^2(Bd-3\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{d(cd-be)}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \; 1480$$

$$-\frac{\frac{-\frac{2e\left(\frac{c^4d^4\left(11Abce-4Ac^2d-9b^2Be+2bBcd\right)\int\frac{1}{-cd+be+c(d+ex)}d\sqrt{d+ex}}{be}-\frac{c(cd-be)^4(-7Abe-4Acd+2bBd)\int\frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}\right)}{d(cd-be)}-\frac{2e\left(b^4\left(-e^3\right)(2Bd-7A\cdots}{\cdots}}{d(cd-be)}\cdots}{d(cd-be)}\cdots$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{5/2}(cd-be)}$$

$$\Big\downarrow \; 221$$

$$-\frac{\frac{-\frac{2e\left(\frac{\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)^4(-7Abe-4Acd+2bBd)}{b\sqrt{d}e}-\frac{c^{7/2}d^4\left(11Abce-4Ac^2d-9b^2Be+2bBcd\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{be\sqrt{cd-be}}\right)}{d(cd-be)}-\frac{2e\left(b^4\left(-e^3\right)(2Bd-7Ae)+\cdots}{\cdots}}{d(cd-be)}\cdots}{d(cd-be)}\cdots$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{b^2d\left(bx+cx^2\right)(d+ex)^{5/2}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^(7/2)*(b*x + c*x^2)^2),x]
```

output
```
-((A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x)/(b^2*d*(c*d - b*e)*(d
+ e*x)^(5/2)*(b*x + c*x^2))) + ((-2*e*(10*A*c^2*d^2 - b^2*e*(2*B*d - 7*A*e
) - 5*b*c*d*(B*d + 2*A*e)))/(5*d*(c*d - b*e)*(d + e*x)^(5/2)) + ((-2*e*(6*
A*c^3*d^3 - b^2*c*d*e*(6*B*d - 17*A*e) + b^3*e^2*(2*B*d - 7*A*e) - 3*b*c^2
*d^2*(B*d + 3*A*e)))/(3*d*(c*d - b*e)*(d + e*x)^(3/2)) + ((-2*e*(2*A*c^4*d
^4 - 2*b^2*c^2*d^2*e*(6*B*d - 13*A*e) - b^4*e^3*(2*B*d - 7*A*e) + 8*b^3*c*
d*e^2*(B*d - 3*A*e) - b*c^3*d^3*(B*d + 4*A*e)))/(d*(c*d - b*e)*Sqrt[d + e*
x]) - (2*e*(((c*d - b*e)^4*(2*b*B*d - 4*A*c*d - 7*A*b*e)*ArcTanh[Sqrt[d +
e*x]/Sqrt[d]])/(b*Sqrt[d]*e) - (c^(7/2)*d^4*(2*b*B*c*d - 4*A*c^2*d - 9*b^2
*B*e + 11*A*b*c*e)*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*e*
Sqrt[c*d - b*e])))/(d*(c*d - b*e)))/(d*(c*d - b*e)))/(d*(c*d - b*e)))/(2*b
^2*d*(c*d - b*e))
```

Defintions of rubi rules used

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

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1198
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[(e*f - d*g)*((d + e*x)^(m + 1)/((m + 1)*(c
*d^2 - b*d*e + a*e^2))), x] + Simp[1/(c*d^2 - b*d*e + a*e^2)   Int[(d + e*x
)^(m + 1)*(Simp[c*d*f - f*b*e + a*e*g - c*(e*f - d*g)*x, x]/(a + b*x + c*x^
2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] && LtQ[m, -1
]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.69 (sec) , antiderivative size = 347, normalized size of antiderivative = 0.74

method	result
derivativedivides	$2e^2\left(-\frac{Ae-Bd}{5d^2(be-cd)^2(ex+d)^{\frac{5}{2}}}-\frac{2Ab\,e^2-4Acde-Bbde+3Bc\,d^2}{3d^3(be-cd)^3(ex+d)^{\frac{3}{2}}}-\frac{3A\,b^2e^3-10Abcd\,e^2+10A\,c^2d^2e-B\,b^2d\,e^2+4}{d^4(be-cd)^4\sqrt{ex+d}}\right.$
default	$2e^2\left(-\frac{Ae-Bd}{5d^2(be-cd)^2(ex+d)^{\frac{5}{2}}}-\frac{2Ab\,e^2-4Acde-Bbde+3Bc\,d^2}{3d^3(be-cd)^3(ex+d)^{\frac{3}{2}}}-\frac{3A\,b^2e^3-10Abcd\,e^2+10A\,c^2d^2e-B\,b^2d\,e^2+4}{d^4(be-cd)^4\sqrt{ex+d}}\right.$
risch	$-\frac{A\sqrt{ex+d}}{d^4b^2x}-\frac{e\left(-\frac{(7Abe+4Acd-2Bbd)\,\mathrm{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{be\sqrt{d}}+\frac{2d^4c^4\left(\frac{\left(\frac{1}{2}Aceb-\frac{1}{2}b^2Be\right)\sqrt{ex+d}}{(ex+d)c+be-cd}+\frac{\left(11Aceb-4A\,c^2d-9b^2Be+2\right.}{2\sqrt{c(b}}\right.}{(be-cd)^4be}\right.}{}$
pseudoelliptic	$e^2\left(\frac{-\frac{Ab\sqrt{ex+d}}{x}+\frac{(7Abe+4Acd-2Bbd)\,\mathrm{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{\sqrt{d}}}{b^3d^4e^2}-\frac{\sqrt{ex+d}\,A\,c^5}{e^2(cx+b)b^2(be-cd)^4}+\frac{\sqrt{ex+d}\,B\,c^4}{e^2(cx+b)b(be-cd)^4}-\frac{11\,\mathrm{arcta}}{\sqrt{c(be}}\right.$

input
```
int((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
2*e^2*(-1/5*(A*e-B*d)/d^2/(b*e-c*d)^2/(e*x+d)^(5/2)-1/3*(2*A*b*e^2-4*A*c*d
*e-B*b*d*e+3*B*c*d^2)/d^3/(b*e-c*d)^3/(e*x+d)^(3/2)-(3*A*b^2*e^3-10*A*b*c*
d*e^2+10*A*c^2*d^2*e-B*b^2*d*e^2+4*B*b*c*d^2*e-6*B*c^2*d^3)/d^4/(b*e-c*d)^
4/(e*x+d)^(1/2)+1/b^3/e^2/d^4*(-1/2*A*b*(e*x+d)^(1/2)/x+1/2*(7*A*b*e+4*A*c
*d-2*B*b*d)/d^(1/2)*arctanh((e*x+d)^(1/2)/d^(1/2)))-c^4/(b*e-c*d)^4/e^2/b^
3*((1/2*A*c*e*b-1/2*b^2*B*e)*(e*x+d)^(1/2)/((e*x+d)*c+b*e-c*d)+1/2*(11*A*b
*c*e-4*A*c^2*d-9*B*b^2*e+2*B*b*c*d)/(c*(b*e-c*d))^(1/2)*arctan(c*(e*x+d)^(
1/2)/(c*(b*e-c*d))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2104 vs. $2(436) = 872$.

Time = 68.45 (sec) , antiderivative size = 8492, normalized size of antiderivative = 18.22

$$\int \frac{A+Bx}{(d+ex)^{7/2}\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{7/2}\,(bx+cx^2)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**(7/2)/(c*x**2+b*x)**2,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^{7/2}\left(bx+cx^2\right)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x)^2,x, algorithm="maxima")
```

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

Giac [A] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 858, normalized size of antiderivative = 1.84

$$\int \frac{A+Bx}{(d+ex)^{7/2}\left(bx+cx^2\right)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
-(2*B*b*c^5*d - 4*A*c^6*d - 9*B*b^2*c^4*e + 11*A*b*c^5*e)*arctan(sqrt(e*x
+ d)*c/sqrt(-c^2*d + b*c*e))/((b^3*c^4*d^4 - 4*b^4*c^3*d^3*e + 6*b^5*c^2*d
^2*e^2 - 4*b^6*c*d*e^3 + b^7*e^4)*sqrt(-c^2*d + b*c*e)) + ((e*x + d)^(3/2)
*B*b*c^4*d^4*e - 2*(e*x + d)^(3/2)*A*c^5*d^4*e - sqrt(e*x + d)*B*b*c^4*d^5
*e + 2*sqrt(e*x + d)*A*c^5*d^5*e + 4*(e*x + d)^(3/2)*A*b*c^4*d^3*e^2 - 5*s
qrt(e*x + d)*A*b*c^4*d^4*e^2 - 6*(e*x + d)^(3/2)*A*b^2*c^3*d^2*e^3 + 10*sq
rt(e*x + d)*A*b^2*c^3*d^3*e^3 + 4*(e*x + d)^(3/2)*A*b^3*c^2*d*e^4 - 10*sqr
t(e*x + d)*A*b^3*c^2*d^2*e^4 - (e*x + d)^(3/2)*A*b^4*c*e^5 + 5*sqrt(e*x +
d)*A*b^4*c*d*e^5 - sqrt(e*x + d)*A*b^5*e^6)/((b^2*c^4*d^8 - 4*b^3*c^3*d^7*
e + 6*b^4*c^2*d^6*e^2 - 4*b^5*c*d^5*e^3 + b^6*d^4*e^4)*((e*x + d)^2*c - 2*
(e*x + d)*c*d + c*d^2 + (e*x + d)*b*e - b*d*e)) + 2/15*(90*(e*x + d)^2*B*c
^2*d^3*e^2 + 15*(e*x + d)*B*c^2*d^4*e^2 + 3*B*c^2*d^5*e^2 - 60*(e*x + d)^2
*B*b*c*d^2*e^3 - 150*(e*x + d)^2*A*c^2*d^2*e^3 - 20*(e*x + d)*B*b*c*d^3*e^
3 - 20*(e*x + d)*A*c^2*d^3*e^3 - 6*B*b*c*d^4*e^3 - 3*A*c^2*d^4*e^3 + 15*(e
*x + d)^2*B*b^2*d*e^4 + 150*(e*x + d)^2*A*b*c*d*e^4 + 5*(e*x + d)*B*b^2*d^
2*e^4 + 30*(e*x + d)*A*b*c*d^2*e^4 + 3*B*b^2*d^3*e^4 + 6*A*b*c*d^3*e^4 - 4
5*(e*x + d)^2*A*b^2*e^5 - 10*(e*x + d)*A*b^2*d*e^5 - 3*A*b^2*d^2*e^5)/((c^
4*d^8 - 4*b*c^3*d^7*e + 6*b^2*c^2*d^6*e^2 - 4*b^3*c*d^5*e^3 + b^4*d^4*e^4)
*(e*x + d)^(5/2)) + (2*B*b*d - 4*A*c*d - 7*A*b*e)*arctan(sqrt(e*x + d)/sqr
t(-d))/(b^3*sqrt(-d)*d^4)
```

Mupad [B] (verification not implemented)

Time = 16.39 (sec) , antiderivative size = 20597, normalized size of antiderivative = 44.20

$$\int \frac{A+Bx}{(d+ex)^{7/2}\left(bx+cx^2\right)^2}\,dx=\text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)^2*(d + e*x)^(7/2)),x)
```

output
```
log((((49*A^2*b^2*e^2 + 16*A^2*c^2*d^2 + 4*B^2*b^2*d^2 - 16*A*B*b*c*d^2 -
28*A*B*b^2*d*e + 56*A^2*b*c*d*e)/(4*b^6*d^9))^(1/2)*((d + e*x)^(1/2)*((49*
A^2*b^2*e^2 + 16*A^2*c^2*d^2 + 4*B^2*b^2*d^2 - 16*A*B*b*c*d^2 - 28*A*B*b^2
*d*e + 56*A^2*b*c*d*e)/(4*b^6*d^9))^(1/2)*(16*b^12*c^23*d^41*e^2 - 328*b^1
3*c^22*d^40*e^3 + 3200*b^14*c^21*d^39*e^4 - 19760*b^15*c^20*d^38*e^5 + 866
40*b^16*c^19*d^37*e^6 - 286824*b^17*c^18*d^36*e^7 + 744192*b^18*c^17*d^35*
e^8 - 1550400*b^19*c^16*d^34*e^9 + 2635680*b^20*c^15*d^33*e^10 - 3695120*b
^21*c^14*d^32*e^11 + 4299776*b^22*c^13*d^31*e^12 - 4165408*b^23*c^12*d^30*
e^13 + 3359200*b^24*c^11*d^29*e^14 - 2248080*b^25*c^10*d^28*e^15 + 1240320
*b^26*c^9*d^27*e^16 - 558144*b^27*c^8*d^26*e^17 + 201552*b^28*c^7*d^25*e^1
8 - 57000*b^29*c^6*d^24*e^19 + 12160*b^30*c^5*d^23*e^20 - 1840*b^31*c^4*d^
22*e^21 + 176*b^32*c^3*d^21*e^22 - 8*b^33*c^2*d^20*e^23) - 8*A*b^10*c^23*d
^37*e^3 + 148*A*b^11*c^22*d^36*e^4 - 1160*A*b^12*c^21*d^35*e^5 + 4760*A*b^
13*c^20*d^34*e^6 - 8036*A*b^14*c^19*d^33*e^7 - 21868*A*b^15*c^18*d^32*e^8
+ 194304*A*b^16*c^17*d^31*e^9 - 709280*A*b^17*c^16*d^30*e^10 + 1744160*A*b
^18*c^15*d^29*e^11 - 3218072*A*b^19*c^14*d^28*e^12 + 4654832*A*b^20*c^13*d
^27*e^13 - 5394480*A*b^21*c^12*d^26*e^14 + 5063240*A*b^22*c^11*d^25*e^15 -
 3863800*A*b^23*c^10*d^24*e^16 + 2393152*A*b^24*c^9*d^23*e^17 - 1194528*A*
b^25*c^8*d^22*e^18 + 474056*A*b^26*c^7*d^21*e^19 - 146300*A*b^27*c^6*d^20*
e^20 + 33880*A*b^28*c^5*d^19*e^21 - 5544*A*b^29*c^4*d^18*e^22 + 572*A*b...
```

Reduce [B] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 6046, normalized size of antiderivative = 12.97

$$\int \frac{A+Bx}{(d+ex)^{7/2}\,(bx+cx^2)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(7/2)/(c*x^2+b*x)^2,x)
```

output

```
( - 330*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt
(c)*sqrt(b*e - c*d)))*a*b**2*c**4*d**7*e*x - 660*sqrt(c)*sqrt(d + e*x)*sqr
t(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**4
*d**6*e**2*x**2 - 330*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d +
 e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**4*d**5*e**3*x**3 + 120*sqrt(
c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e
- c*d)))*a*b*c**5*d**8*x - 90*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((
sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**5*d**7*e*x**2 - 540*sqr
t(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*
e - c*d)))*a*b*c**5*d**6*e**2*x**3 - 330*sqrt(c)*sqrt(d + e*x)*sqrt(b*e -
c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**5*d**5*e**3*
x**4 + 120*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(s
qrt(c)*sqrt(b*e - c*d)))*a*c**6*d**8*x**2 + 240*sqrt(c)*sqrt(d + e*x)*sqrt
(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**6*d**7*
e*x**3 + 120*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/
(sqrt(c)*sqrt(b*e - c*d)))*a*c**6*d**6*e**2*x**4 + 270*sqrt(c)*sqrt(d + e*
x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*
c**3*d**7*e*x + 540*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e
*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c**3*d**6*e**2*x**2 + 270*sqrt(c)*s
qrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -...
```

3.86 $\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 474

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3}\,dx = -\frac{3e(8Ac^4d^3-5b^4Be^3+b^3ce^2(2Bd+Ae)+b^2c^2de(3Bd+2Ae)-4bc^3d^2(Bd+3Ae))\sqrt{d+ex}}{4b^4c^3}$$
$$+\frac{(cd-be)\left(24Ac^3d^2+5b^3Be^2+b^2ce(3Bd-Ae)-12bc^2d(Bd+2Ae)\right)(d+ex)^{3/2}}{4b^4c^2(b+cx)}$$
$$-\frac{(cd-be)\left(6bBcd-12Ac^2d-2b^2Be+13Abce\right)(d+ex)^{5/2}}{4b^3c(b+cx)^2}$$
$$-\frac{(4bBd-8Acd+9Abe)(d+ex)^{7/2}}{4b^2x(b+cx)^2}-\frac{A(d+ex)^{9/2}}{2bx^2(b+cx)^2}$$
$$-\frac{3d^{5/2}(16Ac^2d^2+3b^2e(4Bd+7Ae)-4bcd(2Bd+9Ae))\,\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4b^5}$$
$$+\frac{3(cd-be)^{5/2}\left(16Ac^3d^2-5b^3Be^2-4bc^2d(2Bd-Ae)-b^2ce(8Bd-Ae)\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{4b^5c^{7/2}}$$

output
```
-3/4*e*(8*A*c^4*d^3-5*b^4*B*e^3+b^3*c*e^2*(A*e+2*B*d)+b^2*c^2*d*e*(2*A*e+3
*B*d)-4*b*c^3*d^2*(3*A*e+B*d))*(e*x+d)^(1/2)/b^4/c^3+1/4*(-b*e+c*d)*(24*A*
c^3*d^2+5*b^3*B*e^2+b^2*c*e*(-A*e+3*B*d)-12*b*c^2*d*(2*A*e+B*d))*(e*x+d)^(
3/2)/b^4/c^2/(c*x+b)-1/4*(-b*e+c*d)*(13*A*b*c*e-12*A*c^2*d-2*B*b^2*e+6*B*b
*c*d)*(e*x+d)^(5/2)/b^3/c/(c*x+b)^2-1/4*(9*A*b*e-8*A*c*d+4*B*b*d)*(e*x+d)^
(7/2)/b^2/x/(c*x+b)^2-1/2*A*(e*x+d)^(9/2)/b/x^2/(c*x+b)^2-3/4*d^(5/2)*(16*
A*c^2*d^2+3*b^2*e*(7*A*e+4*B*d)-4*b*c*d*(9*A*e+2*B*d))*arctanh((e*x+d)^(1/
2)/d^(1/2))/b^5+3/4*(-b*e+c*d)^(5/2)*(16*A*c^3*d^2-5*b^3*B*e^2-4*b*c^2*d*(
-A*e+2*B*d)-b^2*c*e*(-A*e+8*B*d))*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)
^(1/2))/b^5/c^(7/2)
```

Mathematica [A] (verified)

Time = 2.87 (sec) , antiderivative size = 441, normalized size of antiderivative = 0.93

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3}\,dx = -\frac{b\sqrt{d+ex}\left(bBx\left(-15b^5e^4x+12c^5d^4x^2+b^4ce^3x(11d-25ex)+3bc^4d^3x(6d-5ex)+b^3c^2e^2x\left(9d^2+19dex-8e\right.\right.\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(9/2))/(b*x + c*x^2)^3,x]
```

output
```
(-((b*Sqrt[d + e*x]*(b*B*x*(-15*b^5*e^4*x + 12*c^5*d^4*x^2 + b^4*c*e^3*x*(
11*d - 25*e*x) + 3*b*c^4*d^3*x*(6*d - 5*e*x) + b^3*c^2*e^2*x*(9*d^2 + 19*d
*e*x - 8*e^2*x^2) + b^2*c^3*d^2*(4*d^2 - 23*d*e*x - 3*e^2*x^2)) + A*c*(3*b
^5*e^4*x^2 - 24*c^5*d^4*x^3 + 5*b^4*c*e^3*x^2*(d + e*x) + 12*b*c^4*d^3*x^2
*(-3*d + 4*e*x) + b^2*c^3*d^2*x*(-8*d^2 + 73*d*e*x - 21*e^2*x^2) + b^3*c^2
*d*(2*d^3 + 17*d^2*e*x - 33*d*e^2*x^2 - 3*e^3*x^3))))/(c^3*x^2*(b + c*x)^2
)) + (3*(-(c*d) + b*e)^(5/2)*(16*A*c^3*d^2 - 5*b^3*B*e^2 + b^2*c*e*(-8*B*d
 + A*e) + 4*b*c^2*d*(-2*B*d + A*e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(
c*d) + b*e]])/c^(7/2) + 3*d^(5/2)*(-16*A*c^2*d^2 - 3*b^2*e*(4*B*d + 7*A*e)
 + 4*b*c*d*(2*B*d + 9*A*e))*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(4*b^5)
```

Rubi [F]

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

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3}\,dx$$

$$\Big\downarrow \text{ 1233}$$

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{2(cx^2+bx)^2}dx}{2b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

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

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

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

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

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

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

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

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

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

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$-\frac{\int -\frac{(d+ex)^{5/2}(d(-2Beb^2+6Bcdb+13Aceb-12Ac^2d)+e(5Beb^2-c(Bd+Ae)b+2Ac^2d)x)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{5/2}(d(2Beb^2-c(6Bd+13Ae)b+12Ac^2d)-e(5Beb^2-c(Bd+Ae)b+2Ac^2d)x)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{5/2}(d(-2Beb^2+6Bcdb+13Aceb-12Ac^2d)+e(5Beb^2-c(Bd+Ae)b+2Ac^2d)x)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{5/2}(d(2Beb^2-c(6Bd+13Ae)b+12Ac^2d)-e(5Beb^2-c(Bd+Ae)b+2Ac^2d)x)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{5/2}(d(-2Beb^2+6Bcdb+13Aceb-12Ac^2d)+e(5Beb^2-c(Bd+Ae)b+2Ac^2d)x)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{5/2}(d(2Beb^2-c(6Bd+13Ae)b+12Ac^2d)-e(5Beb^2-c(Bd+Ae)b+2Ac^2d)x)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(2Beb^2-c(6Bd+13Ae)b+12Ac^2d\right)-e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{5/2}\left(d\left(-2Beb^2+6Bcdb+13Aceb-12Ac^2d\right)+e\left(5Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{7/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

input
```
Int[((A + B*x)*(d + e*x)^(9/2))/(b*x + c*x^2)^3,x]
```

output
```
$Aborted
```

Defintions of rubi rules used

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

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

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

Maple [A] (verified)

Time = 1.52 (sec) , antiderivative size = 452, normalized size of antiderivative = 0.95

method	result
pseudoelliptic	$-\frac{-\frac{3x^2(cx+b)^2(be-cd)^3\left(Ab^2e^2c+4Abc^2de+16Ac^3d^2-5b^3Be^2-8Bb^2cde-8Bbc^2d^2\right)\sqrt{d}\,\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2}+\sqrt{c(be-cd)}}{}$
risch	$-\frac{d^3\sqrt{ex+d}\,(17Abex-12cxAd+4Bbdx+2Abd)}{4b^4x^2}+\frac{e\left(\frac{8b^4Be^3\sqrt{ex+d}}{c^3}-\frac{3d^{\frac{5}{2}}\left(21Ab^2e^2-36Abcde+16Ac^2d^2+12Bb^2de-8B\right.}{be}\right.}{}$
derivativedivides	$2e^4\left(\frac{B\sqrt{ex+d}}{c^3}-\frac{d^3\left(\frac{\left(\frac{17}{8}Ab^2e^2-\frac{3}{2}Abcde+\frac{1}{2}Bb^2de\right)(ex+d)^{\frac{3}{2}}+\left(-\frac{15}{8}Ab^2de^2+\frac{3}{2}Abcd^2e-\frac{1}{2}Bb^2d^2e\right)\sqrt{ex+d}}{e^2x^2}+\frac{3\left(21Ab^2\right.}{}\right.}{e^4b^5}\right.$
default	$2e^4\left(\frac{B\sqrt{ex+d}}{c^3}-\frac{d^3\left(\frac{\left(\frac{17}{8}Ab^2e^2-\frac{3}{2}Abcde+\frac{1}{2}Bb^2de\right)(ex+d)^{\frac{3}{2}}+\left(-\frac{15}{8}Ab^2de^2+\frac{3}{2}Abcd^2e-\frac{1}{2}Bb^2d^2e\right)\sqrt{ex+d}}{e^2x^2}+\frac{3\left(21Ab^2\right.}{}\right.}{e^4b^5}\right.$

input
```
int((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
-1/2/d^(1/2)/(c*(b*e-c*d))^(1/2)*(-3/2*x^2*(c*x+b)^2*(b*e-c*d)^3*(A*b^2*c*
e^2+4*A*b*c^2*d*e+16*A*c^3*d^2-5*B*b^3*e^2-8*B*b^2*c*d*e-8*B*b*c^2*d^2)*d^
(1/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))+(c*(b*e-c*d))^(1/2)*(3/2
*c^3*d^3*x^2*(c*x+b)^2*(21*A*b^2*e^2-36*A*b*c*d*e+16*A*c^2*d^2+12*B*b^2*d*
e-8*B*b*c*d^2)*arctanh((e*x+d)^(1/2)/d^(1/2))+b*(e*x+d)^(1/2)*d^(1/2)*(-12
*A*c^6*d^4*x^3-18*d^3*((-1/3*B*x+A)*d-4/3*A*e*x)*x^2*b*c^5-4*d^2*((-9/4*B*
x+A)*d^2-73/8*e*(-15/73*B*x+A)*x*d+21/8*A*e^2*x^2)*x*b^2*c^4+((2*B*x+A)*d^
3+17/2*e*x*(-23/17*B*x+A)*d^2-33/2*(1/11*B*x+A)*e^2*x^2*d-3/2*A*e^3*x^3)*d
*b^3*c^3+5/2*e^2*(9/5*B*d^2+e*(19/5*B*x+A)*d+e^2*x*(-8/5*B*x+A))*x^2*b^4*c
^2+3/2*e^3*(11/3*B*d+e*(-25/3*B*x+A))*x^2*b^5*c-15/2*B*b^6*e^4*x^2)))/(c*x
+b)^2/b^5/c^3/x^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 987 vs. $2(434) = 868$.

Time = 71.04 (sec) , antiderivative size = 3983, normalized size of antiderivative = 8.40

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(9/2)/(c*x**2+b*x)**3,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^3,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1225 vs. $2(434) = 868$.

Time = 0.29 (sec) , antiderivative size = 1225, normalized size of antiderivative = 2.58

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
2*sqrt(e*x + d)*B*e^4/c^3 - 3/4*(8*B*b*c*d^5 - 16*A*c^2*d^5 - 12*B*b^2*d^4
*e + 36*A*b*c*d^4*e - 21*A*b^2*d^3*e^2)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^
5*sqrt(-d)) + 3/4*(8*B*b*c^5*d^5 - 16*A*c^6*d^5 - 16*B*b^2*c^4*d^4*e + 44*
A*b*c^5*d^4*e + 5*B*b^3*c^3*d^3*e^2 - 37*A*b^2*c^4*d^3*e^2 + B*b^4*c^2*d^2
*e^3 + 7*A*b^3*c^3*d^2*e^3 + 7*B*b^5*c*d*e^4 + A*b^4*c^2*d*e^4 - 5*B*b^6*e
^5 + A*b^5*c*e^5)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/(sqrt(-c^2*
d + b*c*e)*b^5*c^3) - 1/4*(12*(e*x + d)^(7/2)*B*b*c^5*d^4*e - 24*(e*x + d)
^(7/2)*A*c^6*d^4*e - 36*(e*x + d)^(5/2)*B*b*c^5*d^5*e + 72*(e*x + d)^(5/2)
*A*c^6*d^5*e + 36*(e*x + d)^(3/2)*B*b*c^5*d^6*e - 72*(e*x + d)^(3/2)*A*c^6
*d^6*e - 12*sqrt(e*x + d)*B*b*c^5*d^7*e + 24*sqrt(e*x + d)*A*c^6*d^7*e - 1
5*(e*x + d)^(7/2)*B*b^2*c^4*d^3*e^2 + 48*(e*x + d)^(7/2)*A*b*c^5*d^3*e^2 +
 63*(e*x + d)^(5/2)*B*b^2*c^4*d^4*e^2 - 180*(e*x + d)^(5/2)*A*b*c^5*d^4*e^
2 - 81*(e*x + d)^(3/2)*B*b^2*c^4*d^5*e^2 + 216*(e*x + d)^(3/2)*A*b*c^5*d^5
*e^2 + 33*sqrt(e*x + d)*B*b^2*c^4*d^6*e^2 - 84*sqrt(e*x + d)*A*b*c^5*d^6*e
^2 - 3*(e*x + d)^(7/2)*B*b^3*c^3*d^2*e^3 - 21*(e*x + d)^(7/2)*A*b^2*c^4*d^
2*e^3 - 14*(e*x + d)^(5/2)*B*b^3*c^3*d^3*e^3 + 136*(e*x + d)^(5/2)*A*b^2*c
^4*d^3*e^3 + 41*(e*x + d)^(3/2)*B*b^3*c^3*d^4*e^3 - 217*(e*x + d)^(3/2)*A*
b^2*c^4*d^4*e^3 - 24*sqrt(e*x + d)*B*b^3*c^3*d^5*e^3 + 102*sqrt(e*x + d)*A
*b^2*c^4*d^5*e^3 + 19*(e*x + d)^(7/2)*B*b^4*c^2*d*e^4 - 3*(e*x + d)^(7/2)*
A*b^3*c^3*d*e^4 - 48*(e*x + d)^(5/2)*B*b^4*c^2*d^2*e^4 - 24*(e*x + d)^(...
```

Mupad [B] (verification not implemented)

Time = 14.97 (sec) , antiderivative size = 16542, normalized size of antiderivative = 34.90

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3} dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(9/2))/(b*x + c*x^2)^3,x)
```

output
```
atan(((((3*(64*A*b^14*c^5*d*e^7 - 320*B*b^15*c^4*d*e^7 - 512*A*b^10*c^9*d^
5*e^3 + 1280*A*b^11*c^8*d^4*e^4 - 896*A*b^12*c^7*d^3*e^5 + 64*A*b^13*c^6*d
^2*e^6 + 256*B*b^11*c^8*d^5*e^3 - 448*B*b^12*c^7*d^4*e^4 + 64*B*b^13*c^6*d
^3*e^5 + 448*B*b^14*c^5*d^2*e^6))/(64*b^12*c^5) - ((64*b^11*c^7*e^3 - 128*
b^10*c^8*d*e^2)*(d + e*x)^(1/2)*((9*(256*A^2*c^11*d^9 - 25*B^2*b^11*e^9 -
A^2*b^9*c^2*e^9 + 64*B^2*b^2*c^9*d^9 + 1968*A^2*b^2*c^9*d^7*e^2 - 1512*A^2
*b^3*c^8*d^6*e^3 + 441*A^2*b^4*c^7*d^5*e^4 - 21*A^2*b^5*c^6*d^4*e^5 + 42*A
^2*b^6*c^5*d^3*e^6 - 18*A^2*b^7*c^4*d^2*e^7 + 144*B^2*b^4*c^7*d^7*e^2 + 10
5*B^2*b^6*c^5*d^5*e^4 - 189*B^2*b^7*c^4*d^4*e^5 + 42*B^2*b^8*c^3*d^3*e^6 +
 6*B^2*b^9*c^2*d^2*e^7 - 1152*A^2*b*c^10*d^8*e + 45*B^2*b^10*c*d*e^8 - 3*A
^2*b^8*c^3*d*e^8 - 192*B^2*b^3*c^8*d^8*e - 256*A*B*b*c^10*d^9 + 10*A*B*b^1
0*c*e^9 + 960*A*B*b^2*c^9*d^8*e + 6*A*B*b^9*c^2*d*e^8 - 1200*A*B*b^3*c^8*d
^7*e^2 + 504*A*B*b^4*c^7*d^6*e^3 - 210*A*B*b^5*c^6*d^5*e^4 + 546*A*B*b^6*c
^5*d^4*e^5 - 420*A*B*b^7*c^4*d^3*e^6 + 60*A*B*b^8*c^3*d^2*e^7))/(64*b^10*c
^7))^(1/2))/(8*b^8*c^5))*((9*(256*A^2*c^11*d^9 - 25*B^2*b^11*e^9 - A^2*b^9
*c^2*e^9 + 64*B^2*b^2*c^9*d^9 + 1968*A^2*b^2*c^9*d^7*e^2 - 1512*A^2*b^3*c^
8*d^6*e^3 + 441*A^2*b^4*c^7*d^5*e^4 - 21*A^2*b^5*c^6*d^4*e^5 + 42*A^2*b^6*
c^5*d^3*e^6 - 18*A^2*b^7*c^4*d^2*e^7 + 144*B^2*b^4*c^7*d^7*e^2 + 105*B^2*b
^6*c^5*d^5*e^4 - 189*B^2*b^7*c^4*d^4*e^5 + 42*B^2*b^8*c^3*d^3*e^6 + 6*B^2*
b^9*c^2*d^2*e^7 - 1152*A^2*b*c^10*d^8*e + 45*B^2*b^10*c*d*e^8 - 3*A^2*b...
```

Reduce [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 2894, normalized size of antiderivative = 6.11

$$\int \frac{(A+Bx)(d+ex)^{9/2}}{(bx+cx^2)^3} dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(9/2)/(c*x^2+b*x)^3,x)
```

output
```
(6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)
))*a*b**6*c*e**4*x**2 + 12*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/
(sqrt(c)*sqrt(b*e - c*d)))*a*b**5*c**2*d*e**3*x**2 + 12*sqrt(c)*sqrt(b*e -
 c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**5*c**2*e**4*x
**3 + 54*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e
- c*d)))*a*b**4*c**3*d**2*e**2*x**2 + 24*sqrt(c)*sqrt(b*e - c*d)*atan((sqr
t(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**4*c**3*d*e**3*x**3 + 6*sqrt(
c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**
4*c**3*e**4*x**4 - 168*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqr
t(c)*sqrt(b*e - c*d)))*a*b**3*c**4*d**3*e*x**2 + 108*sqrt(c)*sqrt(b*e - c*
d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**4*d**2*e**2
*x**3 + 12*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*
e - c*d)))*a*b**3*c**4*d*e**3*x**4 + 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt
(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**5*d**4*x**2 - 336*sqrt(c
)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2
*c**5*d**3*e*x**3 + 54*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqr
t(c)*sqrt(b*e - c*d)))*a*b**2*c**5*d**2*e**2*x**4 + 192*sqrt(c)*sqrt(b*e -
 c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**6*d**4*x**3
 - 168*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
c*d)))*a*b*c**6*d**3*e*x**4 + 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d +...
```

3.87 $\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3} dx$

Optimal result

Integrand size = 26, antiderivative size = 381

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3} dx = \frac{(cd-be)\left(24Ac^3d^2+3b^3Be^2+b^2ce(5Bd+Ae)-12bc^2d(Bd+2Ae)\right)\sqrt{d+}}{4b^4c^2(b+cx)}$$
$$-\frac{(cd-be)\left(6bBcd-12Ac^2d-2b^2Be+11Abce\right)(d+ex)^{3/2}}{4b^3c(b+cx)^2}$$
$$-\frac{(4bBd-8Acd+7Abe)(d+ex)^{5/2}}{4b^2x(b+cx)^2}-\frac{A(d+ex)^{7/2}}{2bx^2(b+cx)^2}$$
$$-\frac{d^{3/2}(48Ac^2d^2+7b^2e(4Bd+5Ae)-12bcd(2Bd+7Ae))\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4b^5}$$
$$+\frac{(cd-be)^{3/2}\left(48Ac^3d^2-3b^3Be^2-12bc^2d(2Bd+Ae)-b^2ce(8Bd+Ae)\right)\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{4b^5c^{5/2}}$$

output
```
1/4*(-b*e+c*d)*(24*A*c^3*d^2+3*b^3*B*e^2+b^2*c*e*(A*e+5*B*d)-12*b*c^2*d*(2
*A*e+B*d))*(e*x+d)^(1/2)/b^4/c^2/(c*x+b)-1/4*(-b*e+c*d)*(11*A*b*c*e-12*A*c
^2*d-2*B*b^2*e+6*B*b*c*d)*(e*x+d)^(3/2)/b^3/c/(c*x+b)^2-1/4*(7*A*b*e-8*A*c
*d+4*B*b*d)*(e*x+d)^(5/2)/b^2/x/(c*x+b)^2-1/2*A*(e*x+d)^(7/2)/b/x^2/(c*x+b
)^2-1/4*d^(3/2)*(48*A*c^2*d^2+7*b^2*e*(5*A*e+4*B*d)-12*b*c*d*(7*A*e+2*B*d)
)*arctanh((e*x+d)^(1/2)/d^(1/2))/b^5+1/4*(-b*e+c*d)^(3/2)*(48*A*c^3*d^2-3*
b^3*B*e^2-12*b*c^2*d*(A*e+2*B*d)-b^2*c*e*(A*e+8*B*d))*arctanh(c^(1/2)*(e*x
+d)^(1/2)/(-b*e+c*d)^(1/2))/b^5/c^(5/2)
```

Mathematica [A] (verified)

Time = 3.73 (sec) , antiderivative size = 382, normalized size of antiderivative = 1.00

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3}\,dx =$$

$$-\frac{\frac{b\sqrt{d+ex}\left(bBx\left(3b^4e^3x+12c^4d^3x^2+bc^3d^2x(18d-11ex)+b^3ce^2x(4d+5ex)+b^2c^2d\left(4d^2-17dex-2e^2x^2\right)\right)+Ac\left(b^4e^3x^2-24c^4d^3x^3-36bc^3d^2x^2(d-e\right.\right.}{c^2x^2(b+cx)^2}}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(7/2))/(b*x + c*x^2)^3,x]
```

output
```
-1/4*((b*Sqrt[d + e*x]*(b*B*x*(3*b^4*e^3*x + 12*c^4*d^3*x^2 + b*c^3*d^2*x*
(18*d - 11*e*x) + b^3*c*e^2*x*(4*d + 5*e*x) + b^2*c^2*d*(4*d^2 - 17*d*e*x
- 2*e^2*x^2)) + A*c*(b^4*e^3*x^2 - 24*c^4*d^3*x^3 - 36*b*c^3*d^2*x^2*(d -
e*x) + b^2*c^2*d*x*(-8*d^2 + 55*d*e*x - 10*e^2*x^2) + b^3*c*(2*d^3 + 13*d^
2*e*x - 16*d*e^2*x^2 - e^3*x^3))))/(c^2*x^2*(b + c*x)^2) + ((-(c*d) + b*e)
^(3/2)*(48*A*c^3*d^2 - 3*b^3*B*e^2 - 12*b*c^2*d*(2*B*d + A*e) - b^2*c*e*(8
*B*d + A*e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/c^(5/2) -
 d^(3/2)*(-48*A*c^2*d^2 - 7*b^2*e*(4*B*d + 5*A*e) + 12*b*c*d*(2*B*d + 7*A*
e))*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/b^5
```

Rubi [F]

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

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3}\,dx$$

$$\Big\downarrow \; 1233$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{2\left(cx^2+bx\right)^2}dx}{2b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 27$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

$$\Big\downarrow \ 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

$$\Big\downarrow \ 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

$$\Big\downarrow \ 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\,(bx+cx^2)^2}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(2Beb^2-c(6Bd+11Ae)b+12Ac^2d\right)+e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{(d+ex)^{3/2}\left(d\left(-2Beb^2+6Bcdb+11Aceb-12Ac^2d\right)-e\left(-3Beb^2-c(Bd+Ae)b+2Ac^2d\right)x\right)}{(cx^2+bx)^2}dx}{4b^2c}-\frac{(d+ex)^{5/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

input

```
Int[((A + B*x)*(d + e*x)^(7/2))/(b*x + c*x^2)^3,x]
```

output

```
$Aborted
```

Defintions of rubi rules used

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

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

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

Maple [A] (verified)

Time = 1.37 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.05

method	result
derivativedivides	$2e^4\left(-\frac{d^2\left(\frac{\left(\frac{13}{8}A\,b^2e^2-\frac{3}{2}Abcde+\frac{1}{2}B\,b^2de\right)(ex+d)^{\frac{3}{2}}+\left(-\frac{11}{8}A\,b^2d\,e^2+\frac{3}{2}Abc\,d^2e-\frac{1}{2}B\,b^2d^2e\right)\sqrt{ex+d}}{e^2x^2}+\frac{\left(35A\,b^2e^2-84Abcde+\right.}{}\right.}{b^5e^4}\right.$
default	$2e^4\left(-\frac{d^2\left(\frac{\left(\frac{13}{8}A\,b^2e^2-\frac{3}{2}Abcde+\frac{1}{2}B\,b^2de\right)(ex+d)^{\frac{3}{2}}+\left(-\frac{11}{8}A\,b^2d\,e^2+\frac{3}{2}Abc\,d^2e-\frac{1}{2}B\,b^2d^2e\right)\sqrt{ex+d}}{e^2x^2}+\frac{\left(35A\,b^2e^2-84Abcde+\right.}{}\right.}{b^5e^4}\right.$
pseudoelliptic	$-\frac{-\frac{\sqrt{d}\,x^2(be-cd)^2(cx+b)^2\left(A\,b^2e^2c+12Ab\,c^2de-48A\,c^3d^2+3b^3B\,e^2+8B\,b^2cde+24Bb\,c^2d^2\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2}+\left(\frac{c^2\left(35A\,b^2\right.}{}\right.}{}$
risch	$-\frac{d^2\sqrt{ex+d}\,(13Abex-12cxAd+4Bbdx+2Abd)}{4b^4x^2}-\frac{e\left(\frac{d^{\frac{3}{2}}\left(35A\,b^2e^2-84Abcde+48A\,c^2d^2+28B\,b^2de-24Bbc\,d^2\right)\operatorname{arctanh}\left(\frac{\sqrt{}}{}\right.}{eb}\right.}{}$

input

```
int((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output

```
2*e^4*(-d^2/b^5/e^4*(((13/8*A*b^2*e^2-3/2*A*b*c*d*e+1/2*B*b^2*d*e)*(e*x+d)
^(3/2)+(-11/8*A*b^2*d*e^2+3/2*A*b*c*d^2*e-1/2*B*b^2*d^2*e)*(e*x+d)^(1/2))/
e^2/x^2+1/8*(35*A*b^2*e^2-84*A*b*c*d*e+48*A*c^2*d^2+28*B*b^2*d*e-24*B*b*c*
d^2)/d^(1/2)*arctanh((e*x+d)^(1/2)/d^(1/2)))+(b*e-c*d)^2/e^4/b^5*((1/8*b*e
*(A*b*c*e+12*A*c^2*d-5*B*b^2*e-8*B*b*c*d)/c*(e*x+d)^(3/2)-1/8*b/c^2*e*(A*b
^2*c*e^2-13*A*b*c^2*d*e+12*A*c^3*d^2+3*B*b^3*e^2+5*B*b^2*c*d*e-8*B*b*c^2*d
^2)*(e*x+d)^(1/2))/((e*x+d)*c+b*e-c*d)^2+1/8*(A*b^2*c*e^2+12*A*b*c^2*d*e-4
8*A*c^3*d^2+3*B*b^3*e^2+8*B*b^2*c*d*e+24*B*b*c^2*d^2)/c^2/(c*(b*e-c*d))^(1
/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 833 vs. $2(345) = 690$.

Time = 16.29 (sec) , antiderivative size = 3372, normalized size of antiderivative = 8.85

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(7/2)/(c*x**2+b*x)**3,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^3,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1025 vs. $2(345) = 690$.

Time = 0.28 (sec) , antiderivative size = 1025, normalized size of antiderivative = 2.69

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
-1/4*(24*B*b*c*d^4 - 48*A*c^2*d^4 - 28*B*b^2*d^3*e + 84*A*b*c*d^3*e - 35*A
*b^2*d^2*e^2)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^5*sqrt(-d)) + 1/4*(24*B*b*
c^4*d^4 - 48*A*c^5*d^4 - 40*B*b^2*c^3*d^3*e + 108*A*b*c^4*d^3*e + 11*B*b^3
*c^2*d^2*e^2 - 71*A*b^2*c^3*d^2*e^2 + 2*B*b^4*c*d*e^3 + 10*A*b^3*c^2*d*e^3
 + 3*B*b^5*e^4 + A*b^4*c*e^4)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))
/(sqrt(-c^2*d + b*c*e)*b^5*c^2) - 1/4*(12*(e*x + d)^(7/2)*B*b*c^4*d^3*e -
24*(e*x + d)^(7/2)*A*c^5*d^3*e - 36*(e*x + d)^(5/2)*B*b*c^4*d^4*e + 72*(e*
x + d)^(5/2)*A*c^5*d^4*e + 36*(e*x + d)^(3/2)*B*b*c^4*d^5*e - 72*(e*x + d)
^(3/2)*A*c^5*d^5*e - 12*sqrt(e*x + d)*B*b*c^4*d^6*e + 24*sqrt(e*x + d)*A*c
^5*d^6*e - 11*(e*x + d)^(7/2)*B*b^2*c^3*d^2*e^2 + 36*(e*x + d)^(7/2)*A*b*c
^4*d^2*e^2 + 51*(e*x + d)^(5/2)*B*b^2*c^3*d^3*e^2 - 144*(e*x + d)^(5/2)*A*
b*c^4*d^3*e^2 - 69*(e*x + d)^(3/2)*B*b^2*c^3*d^4*e^2 + 180*(e*x + d)^(3/2)
*A*b*c^4*d^4*e^2 + 29*sqrt(e*x + d)*B*b^2*c^3*d^5*e^2 - 72*sqrt(e*x + d)*A
*b*c^4*d^5*e^2 - 2*(e*x + d)^(7/2)*B*b^3*c^2*d*e^3 - 10*(e*x + d)^(7/2)*A*
b^2*c^3*d*e^3 - 11*(e*x + d)^(5/2)*B*b^3*c^2*d^2*e^3 + 85*(e*x + d)^(5/2)*
A*b^2*c^3*d^2*e^3 + 32*(e*x + d)^(3/2)*B*b^3*c^2*d^3*e^3 - 148*(e*x + d)^(
3/2)*A*b^2*c^3*d^3*e^3 - 19*sqrt(e*x + d)*B*b^3*c^2*d^4*e^3 + 73*sqrt(e*x
+ d)*A*b^2*c^3*d^4*e^3 + 5*(e*x + d)^(7/2)*B*b^4*c*e^4 - (e*x + d)^(7/2)*A
*b^3*c^2*e^4 - 11*(e*x + d)^(5/2)*B*b^4*c*d*e^4 - 13*(e*x + d)^(5/2)*A*b^3
*c^2*d*e^4 + 7*(e*x + d)^(3/2)*B*b^4*c*d^2*e^4 + 42*(e*x + d)^(3/2)*A*b...
```

Mupad [B] (verification not implemented)

Time = 16.58 (sec) , antiderivative size = 11072, normalized size of antiderivative = 29.06

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(7/2))/(b*x + c*x^2)^3,x)
```

output
```
atan(((((64*A*b^13*c^4*d*e^6 + 192*B*b^14*c^3*d*e^6 - 1536*A*b^10*c^7*d^4*
e^3 + 3072*A*b^11*c^6*d^3*e^4 - 1600*A*b^12*c^5*d^2*e^5 + 768*B*b^11*c^6*d
^4*e^3 - 1088*B*b^12*c^5*d^3*e^4 + 128*B*b^13*c^4*d^2*e^5)/(64*b^12*c^3) -
 ((64*b^11*c^5*e^3 - 128*b^10*c^6*d*e^2)*(d + e*x)^(1/2)*(-(9*B^2*b^9*e^7
- 2304*A^2*c^9*d^7 + A^2*b^7*c^2*e^7 - 576*B^2*b^2*c^7*d^7 - 10416*A^2*b^2
*c^7*d^5*e^2 + 5880*A^2*b^3*c^6*d^4*e^3 - 1225*A^2*b^4*c^5*d^3*e^4 - 21*A^
2*b^5*c^4*d^2*e^5 - 784*B^2*b^4*c^5*d^5*e^2 - 105*B^2*b^6*c^3*d^3*e^4 + 91
*B^2*b^7*c^2*d^2*e^5 + 8064*A^2*b*c^8*d^6*e + 21*B^2*b^8*c*d*e^6 + 21*A^2*
b^6*c^3*d*e^6 + 1344*B^2*b^3*c^6*d^6*e + 2304*A*B*b*c^8*d^7 + 6*A*B*b^8*c*
e^7 - 6720*A*B*b^2*c^7*d^6*e + 70*A*B*b^7*c^2*d*e^6 + 6384*A*B*b^3*c^6*d^5
*e^2 - 1960*A*B*b^4*c^5*d^4*e^3 + 210*A*B*b^5*c^4*d^3*e^4 - 294*A*B*b^6*c^
3*d^2*e^5)/(64*b^10*c^5))^(1/2))/(8*b^8*c^3))*(-(9*B^2*b^9*e^7 - 2304*A^2*
c^9*d^7 + A^2*b^7*c^2*e^7 - 576*B^2*b^2*c^7*d^7 - 10416*A^2*b^2*c^7*d^5*e^
2 + 5880*A^2*b^3*c^6*d^4*e^3 - 1225*A^2*b^4*c^5*d^3*e^4 - 21*A^2*b^5*c^4*d
^2*e^5 - 784*B^2*b^4*c^5*d^5*e^2 - 105*B^2*b^6*c^3*d^3*e^4 + 91*B^2*b^7*c^
2*d^2*e^5 + 8064*A^2*b*c^8*d^6*e + 21*B^2*b^8*c*d*e^6 + 21*A^2*b^6*c^3*d*e
^6 + 1344*B^2*b^3*c^6*d^6*e + 2304*A*B*b*c^8*d^7 + 6*A*B*b^8*c*e^7 - 6720*
A*B*b^2*c^7*d^6*e + 70*A*B*b^7*c^2*d*e^6 + 6384*A*B*b^3*c^6*d^5*e^2 - 1960
*A*B*b^4*c^5*d^4*e^3 + 210*A*B*b^5*c^4*d^3*e^4 - 294*A*B*b^6*c^3*d^2*e^5)/
(64*b^10*c^5))^(1/2) - ((d + e*x)^(1/2)*(9*B^2*b^10*e^10 + A^2*b^8*c^2*...
```

Reduce [B] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 2453, normalized size of antiderivative = 6.44

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(7/2)/(c*x^2+b*x)^3,x)
```

output
```
(2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)
))*a*b**5*c*e**3*x**2 + 22*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/
(sqrt(c)*sqrt(b*e - c*d)))*a*b**4*c**2*d*e**2*x**2 + 4*sqrt(c)*sqrt(b*e -
c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**4*c**2*e**3*x*
*3 - 120*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e
- c*d)))*a*b**3*c**3*d**2*e*x**2 + 44*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d
 + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**3*d*e**2*x**3 + 2*sqrt(c)*
sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c
**3*e**3*x**4 + 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)
*sqrt(b*e - c*d)))*a*b**2*c**4*d**3*x**2 - 240*sqrt(c)*sqrt(b*e - c*d)*ata
n((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**4*d**2*e*x**3 + 2
2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d))
)*a*b**2*c**4*d*e**2*x**4 + 192*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x
)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**5*d**3*x**3 - 120*sqrt(c)*sqrt(b*e
- c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**5*d**2*e*x
**4 + 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e
- c*d)))*a*c**6*d**3*x**4 + 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*
c)/(sqrt(c)*sqrt(b*e - c*d)))*b**7*e**3*x**2 + 10*sqrt(c)*sqrt(b*e - c*d)*
atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**6*c*d*e**2*x**2 + 12*
sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)...
```

3.88 $\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3} \, dx$

Optimal result

Integrand size = 26, antiderivative size = 373

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3} \, dx = -\frac{(cd-be)\,(6bBcd-12Ac^2d-2b^2Be+9Abce)\,\sqrt{d+ex}}{4b^3c(b+cx)^2}$$
$$+\frac{(24Ac^3d^2+b^3Be^2-12bc^2d(Bd+2Ae)+b^2ce(7Bd+3Ae))\,\sqrt{d+ex}}{4b^4c(b+cx)}$$
$$-\frac{(4bBd-8Acd+5Abe)(d+ex)^{3/2}}{4b^2x(b+cx)^2}-\frac{A(d+ex)^{5/2}}{2bx^2(b+cx)^2}$$
$$-\frac{\sqrt{d}(48Ac^2d^2+5b^2e(4Bd+3Ae)-12bcd(2Bd+5Ae))\,\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4b^5}$$
$$+\frac{\sqrt{cd-be}(48Ac^3d^2+b^3Be^2-12bc^2d(2Bd+3Ae)+b^2ce(8Bd+3Ae))\,\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{4b^5c^{3/2}}$$

output

```
-1/4*(-b*e+c*d)*(9*A*b*c*e-12*A*c^2*d-2*B*b^2*e+6*B*b*c*d)*(e*x+d)^(1/2)/b
^3/c/(c*x+b)^2+1/4*(24*A*c^3*d^2+b^3*B*e^2-12*b*c^2*d*(2*A*e+B*d)+b^2*c*e*
(3*A*e+7*B*d))*(e*x+d)^(1/2)/b^4/c/(c*x+b)-1/4*(5*A*b*e-8*A*c*d+4*B*b*d)*(
e*x+d)^(3/2)/b^2/x/(c*x+b)^2-1/2*A*(e*x+d)^(5/2)/b/x^2/(c*x+b)^2-1/4*d^(1/
2)*(48*A*c^2*d^2+5*b^2*e*(3*A*e+4*B*d)-12*b*c*d*(5*A*e+2*B*d))*arctanh((e*
x+d)^(1/2)/d^(1/2))/b^5+1/4*(-b*e+c*d)^(1/2)*(48*A*c^3*d^2+b^3*B*e^2-12*b*
c^2*d*(3*A*e+2*B*d)+b^2*c*e*(3*A*e+8*B*d))*arctanh(c^(1/2)*(e*x+d)^(1/2)/(
-b*e+c*d)^(1/2))/b^5/c^(3/2)
```

Mathematica [A] (verified)

Time = 2.86 (sec) , antiderivative size = 334, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3}\,dx = \frac{-\frac{b\sqrt{d+ex}\left(Ac\left(-24c^3d^2x^3+12bc^2dx^2(-3d+2ex)+b^3\left(2d^2+9dex-5e^2x^2\right)+b^2cx\left(-8d^2+37dex-3e^2x^2\right)\right)\cdots}{cx^2(b+cx)^2}}{}$$

input

```
Integrate[((A + B*x)*(d + e*x)^(5/2))/(b*x + c*x^2)^3,x]
```

output

```
(-((b*Sqrt[d + e*x]*(A*c*(-24*c^3*d^2*x^3 + 12*b*c^2*d*x^2*(-3*d + 2*e*x)
+ b^3*(2*d^2 + 9*d*e*x - 5*e^2*x^2) + b^2*c*x*(-8*d^2 + 37*d*e*x - 3*e^2*x
^2)) + b*B*x*(b^3*e^2*x + 12*c^3*d^2*x^2 + b*c^2*d*x*(18*d - 7*e*x) + b^2*
c*(4*d^2 - 11*d*e*x - e^2*x^2))))/(c*x^2*(b + c*x)^2)) + (Sqrt[-(c*d) + b*
e]*(48*A*c^3*d^2 + b^3*B*e^2 - 12*b*c^2*d*(2*B*d + 3*A*e) + b^2*c*e*(8*B*d
 + 3*A*e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/c^(3/2) + S
qrt[d]*(-48*A*c^2*d^2 - 5*b^2*e*(4*B*d + 3*A*e) + 12*b*c*d*(2*B*d + 5*A*e)
)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(4*b^5)
```

Rubi [A] (verified)

Time = 1.34 (sec) , antiderivative size = 358, normalized size of antiderivative = 0.96, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {1233, 27, 1234, 27, 1197, 27, 1480, 221}

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

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3}\,dx$$

$$\Big\downarrow \; 1233$$

$$\frac{\int \frac{\sqrt{d+ex}\left(d\left(-2Beb^2+6Bcdb+9Aceb-12Ac^2d\right)-e\left(-Beb^2-3c(Bd+Ae)b+6Ac^2d\right)x\right)}{2(cx^2+bx)^2}dx}{2b^2c} - \frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{\sqrt{d+ex}(d(-2Beb^2+6Bcdb+9Aceb-12Ac^2d)-e(-Beb^2-3c(Bd+Ae)b+6Ac^2d)x)}{(cx^2+bx)^2}dx}{4b^2c} - \frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\big\downarrow$ 1234

$$\frac{-\frac{\int -\frac{cd\left(5e(4Bd+3Ae)b^2-12cd(2Bd+5Ae)b+48Ac^2d^2\right)+e\left(Be^2b^3+ce(7Bd+3Ae)b^2-12c^2d(Bd+2Ae)b+24Ac^3d^2\right)x}{2\sqrt{d+ex}\left(cx^2+bx\right)}dx}{b^2} - \frac{\sqrt{d+ex}\left(bd\left(9Abce-12Ac^2d-2b\right.\right.}{}}{4b^2c} - \frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\big\downarrow$ 27

$$\frac{\frac{\int \frac{cd\left(5e(4Bd+3Ae)b^2-12cd(2Bd+5Ae)b+48Ac^2d^2\right)+e\left(Be^2b^3+ce(7Bd+3Ae)b^2-12c^2d(Bd+2Ae)b+24Ac^3d^2\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{2b^2} - \frac{\sqrt{d+ex}\left(bd\left(9Abce-12Ac^2d-2b^2Be\right.\right.}{}}{4b^2c} - \frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\big\downarrow$ 1197

$$\frac{\frac{\int \frac{e\left(d(cd-be)\left(Beb^2-12c(Bd+Ae)b+24Ac^2d\right)+\left(Be^2b^3+ce(7Bd+3Ae)b^2-12c^2d(Bd+2Ae)b+24Ac^3d^2\right)(d+ex)\right)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2} - \frac{\sqrt{d+ex}\left(bd\left(9Abce-12Ac^2d-\right.\right.}{}}{4b^2c} - \frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\big\downarrow$ 27

$$\frac{\frac{e\int \frac{d(cd-be)\left(Beb^2-12c(Bd+Ae)b+24Ac^2d\right)+\left(Be^2b^3+ce(7Bd+3Ae)b^2-12c^2d(Bd+2Ae)b+24Ac^3d^2\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2} - \frac{\sqrt{d+ex}\left(bd\left(9Abce-12Ac^2d-2b\right.\right.}{}}{4b^2c} - \frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\big\downarrow$ 1480

$$\frac{e\left(\frac{c^2d\left(5b^2e(3Ae+4Bd)-12bcd(5Ae+2Bd)+48Ac^2d^2\right)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}-\frac{(cd-be)\left(b^2ce(3Ae+8Bd)-12bc^2d(3Ae+2Bd)+48Ac^3d^2+b^3Be^2\right)\int \frac{1}{-cd+be+c}}{be}\right.}{b^2}$$

$$4b^2c$$

$$\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 221$$

$$\frac{e\left(\frac{\sqrt{cd-be}\left(b^2ce(3Ae+8Bd)-12bc^2d(3Ae+2Bd)+48Ac^3d^2+b^3Be^2\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{b\sqrt{c}e}-\frac{c\sqrt{d}\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(5b^2e(3Ae+4Bd)-12bcd(5Ae+2Bd)\right.}{be}\right.}{b^2}$$

$$4b^2c$$

$$\frac{(d+ex)^{3/2}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

input

```
Int[((A + B*x)*(d + e*x)^(5/2))/(b*x + c*x^2)^3,x]
```

output

```
-1/2*((d + e*x)^(3/2)*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x
))/(b^2*c*(b*x + c*x^2)^2) + (-((Sqrt[d + e*x]*(b*d*(6*b*B*c*d - 12*A*c^2*
d - 2*b^2*B*e + 9*A*b*c*e) - (24*A*c^3*d^2 + b^3*B*e^2 - 12*b*c^2*d*(B*d +
 2*A*e) + b^2*c*e*(7*B*d + 3*A*e))*x))/(b^2*(b*x + c*x^2))) + (e*(-((c*Sqr
t[d]*(48*A*c^2*d^2 + 5*b^2*e*(4*B*d + 3*A*e) - 12*b*c*d*(2*B*d + 5*A*e))*A
rcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*e)) + (Sqrt[c*d - b*e]*(48*A*c^3*d^2 + b
^3*B*e^2 - 12*b*c^2*d*(2*B*d + 3*A*e) + b^2*c*e*(8*B*d + 3*A*e))*ArcTanh[(
Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*Sqrt[c]*e)))/b^2)/(4*b^2*c)
```

Defintions of rubi rules used

rule 27

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

rule 221

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

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1234
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^m*(a + b*x + c*x^2)^(p + 1)*(
(f*b - 2*a*g + (2*c*f - b*g)*x)/((p + 1)*(b^2 - 4*a*c))), x] + Simp[1/((p +
 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 1)*(a + b*x + c*x^2)^(p + 1)*Simp[g
*(2*a*e*m + b*d*(2*p + 3)) - f*(b*e*m + 2*c*d*(2*p + 3)) - e*(2*c*f - b*g)*
(m + 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1
] && GtQ[m, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.37 (sec) , antiderivative size = 360, normalized size of antiderivative = 0.97

method	result
pseudoelliptic	$-\frac{-\frac{\left(3A\,b^{2}e^{2}c-36Ab\,c^{2}de+48A\,c^{3}d^{2}+b^{3}B\,e^{2}+8B\,b^{2}cde-24Bb\,c^{2}d^{2}\right)x^{2}(cx+b)^{2}\sqrt{d}\,(be-cd)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2}+\left(\frac{cd\left(15A\,b^{2}e\right.}{}\right.}{}$
derivativedivides	$2e^{4}\left(\frac{(be-cd)\left(\frac{\left(\frac{3}{8}A\,b^{2}e^{2}c-\frac{3}{2}Ab\,c^{2}de+\frac{1}{8}b^{3}B\,e^{2}+B\,b^{2}cde\right)(ex+d)^{\frac{3}{2}}+\frac{be\left(5A\,b^{2}e^{2}c-17Ab\,c^{2}de+12A\,c^{3}d^{2}-b^{3}B\,e^{2}+9B\,b^{2}cde-\right.}{8c}}{((ex+d)c+be-cd)^{2}}\right.}{e^{4}b^{5}}\right.$
default	$2e^{4}\left(\frac{(be-cd)\left(\frac{\left(\frac{3}{8}A\,b^{2}e^{2}c-\frac{3}{2}Ab\,c^{2}de+\frac{1}{8}b^{3}B\,e^{2}+B\,b^{2}cde\right)(ex+d)^{\frac{3}{2}}+\frac{be\left(5A\,b^{2}e^{2}c-17Ab\,c^{2}de+12A\,c^{3}d^{2}-b^{3}B\,e^{2}+9B\,b^{2}cde-\right.}{8c}}{((ex+d)c+be-cd)^{2}}\right.}{e^{4}b^{5}}\right.$
risch	$-\frac{d\sqrt{ex+d}\,(9Abex-12cxAd+4Bbdx+2Abd)}{4b^{4}x^{2}}-\frac{e\left(\frac{\sqrt{d}\left(15A\,b^{2}e^{2}-60Abcde+48A\,c^{2}d^{2}+20B\,b^{2}de-24Bbc\,d^{2}\right)\operatorname{arctanh}\left(\frac{\sqrt{ex}}{\sqrt{}}\right.}{eb}\right.}{}$

input
```
int((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
-1/2/d^(1/2)*(-1/2*(3*A*b^2*c*e^2-36*A*b*c^2*d*e+48*A*c^3*d^2+B*b^3*e^2+8*
B*b^2*c*d*e-24*B*b*c^2*d^2)*x^2*(c*x+b)^2*d^(1/2)*(b*e-c*d)*arctan(c*(e*x+
d)^(1/2)/(c*(b*e-c*d))^(1/2))+(1/2*c*d*(15*A*b^2*e^2-60*A*b*c*d*e+48*A*c^2
*d^2+20*B*b^2*d*e-24*B*b*c*d^2)*x^2*(c*x+b)^2*arctanh((e*x+d)^(1/2)/d^(1/2
))+d^(1/2)*(-12*A*c^4*d^2*x^3-18*((-1/3*B*x+A)*d-2/3*A*e*x)*d*x^2*b*c^3-4*
((-9/4*B*x+A)*d^2-37/8*(-7/37*B*x+A)*e*x*d+3/8*A*e^2*x^2)*x*b^2*c^2+((2*B*
x+A)*d^2+9/2*e*(-11/9*B*x+A)*x*d-5/2*e^2*x^2*(1/5*B*x+A))*b^3*c+1/2*B*b^4*
e^2*x^2)*b*(e*x+d)^(1/2))*(c*(b*e-c*d))^(1/2))/(c*(b*e-c*d))^(1/2)/b^5/x^2
/(c*x+b)^2/c
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 677 vs. $2(337) = 674$.

Time = 1.88 (sec) , antiderivative size = 2748, normalized size of antiderivative = 7.37

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
[-1/8*(((24*(B*b*c^4 - 2*A*c^5)*d^2 - 4*(2*B*b^2*c^3 - 9*A*b*c^4)*d*e - (B
*b^3*c^2 + 3*A*b^2*c^3)*e^2)*x^4 + 2*(24*(B*b^2*c^3 - 2*A*b*c^4)*d^2 - 4*(
2*B*b^3*c^2 - 9*A*b^2*c^3)*d*e - (B*b^4*c + 3*A*b^3*c^2)*e^2)*x^3 + (24*(B
*b^3*c^2 - 2*A*b^2*c^3)*d^2 - 4*(2*B*b^4*c - 9*A*b^3*c^2)*d*e - (B*b^5 + 3
*A*b^4*c)*e^2)*x^2)*sqrt((c*d - b*e)/c)*log((c*e*x + 2*c*d - b*e + 2*sqrt(
e*x + d)*c*sqrt((c*d - b*e)/c))/(c*x + b)) - ((15*A*b^2*c^3*e^2 - 24*(B*b*
c^4 - 2*A*c^5)*d^2 + 20*(B*b^2*c^3 - 3*A*b*c^4)*d*e)*x^4 + 2*(15*A*b^3*c^2
*e^2 - 24*(B*b^2*c^3 - 2*A*b*c^4)*d^2 + 20*(B*b^3*c^2 - 3*A*b^2*c^3)*d*e)*
x^3 + (15*A*b^4*c*e^2 - 24*(B*b^3*c^2 - 2*A*b^2*c^3)*d^2 + 20*(B*b^4*c - 3
*A*b^3*c^2)*d*e)*x^2)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x)
 + 2*(2*A*b^4*c*d^2 + (12*(B*b^2*c^3 - 2*A*b*c^4)*d^2 - (7*B*b^3*c^2 - 24*
A*b^2*c^3)*d*e - (B*b^4*c + 3*A*b^3*c^2)*e^2)*x^3 + (18*(B*b^3*c^2 - 2*A*b
^2*c^3)*d^2 - (11*B*b^4*c - 37*A*b^3*c^2)*d*e + (B*b^5 - 5*A*b^4*c)*e^2)*x
^2 + (9*A*b^4*c*d*e + 4*(B*b^4*c - 2*A*b^3*c^2)*d^2)*x)*sqrt(e*x + d))/(b^
5*c^3*x^4 + 2*b^6*c^2*x^3 + b^7*c*x^2), -1/8*(2*((24*(B*b*c^4 - 2*A*c^5)*d
^2 - 4*(2*B*b^2*c^3 - 9*A*b*c^4)*d*e - (B*b^3*c^2 + 3*A*b^2*c^3)*e^2)*x^4
+ 2*(24*(B*b^2*c^3 - 2*A*b*c^4)*d^2 - 4*(2*B*b^3*c^2 - 9*A*b^2*c^3)*d*e -
(B*b^4*c + 3*A*b^3*c^2)*e^2)*x^3 + (24*(B*b^3*c^2 - 2*A*b^2*c^3)*d^2 - 4*(
2*B*b^4*c - 9*A*b^3*c^2)*d*e - (B*b^5 + 3*A*b^4*c)*e^2)*x^2)*sqrt(-(c*d -
b*e)/c)*arctan(-sqrt(e*x + d)*c*sqrt(-(c*d - b*e)/c)/(c*d - b*e)) - ((1...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(5/2)/(c*x**2+b*x)**3,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^3,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 817 vs. $2(337) = 674$.

Time = 0.29 (sec) , antiderivative size = 817, normalized size of antiderivative = 2.19

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
-1/4*(24*B*b*c*d^3 - 48*A*c^2*d^3 - 20*B*b^2*d^2*e + 60*A*b*c*d^2*e - 15*A
*b^2*d*e^2)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^5*sqrt(-d)) + 1/4*(24*B*b*c^
3*d^3 - 48*A*c^4*d^3 - 32*B*b^2*c^2*d^2*e + 84*A*b*c^3*d^2*e + 7*B*b^3*c*d
*e^2 - 39*A*b^2*c^2*d*e^2 + B*b^4*e^3 + 3*A*b^3*c*e^3)*arctan(sqrt(e*x + d
)*c/sqrt(-c^2*d + b*c*e))/(sqrt(-c^2*d + b*c*e)*b^5*c) - 1/4*(12*(e*x + d)
^(7/2)*B*b*c^3*d^2*e - 24*(e*x + d)^(7/2)*A*c^4*d^2*e - 36*(e*x + d)^(5/2)
*B*b*c^3*d^3*e + 72*(e*x + d)^(5/2)*A*c^4*d^3*e + 36*(e*x + d)^(3/2)*B*b*c
^3*d^4*e - 72*(e*x + d)^(3/2)*A*c^4*d^4*e - 12*sqrt(e*x + d)*B*b*c^3*d^5*e
 + 24*sqrt(e*x + d)*A*c^4*d^5*e - 7*(e*x + d)^(7/2)*B*b^2*c^2*d*e^2 + 24*(
e*x + d)^(7/2)*A*b*c^3*d*e^2 + 39*(e*x + d)^(5/2)*B*b^2*c^2*d^2*e^2 - 108*
(e*x + d)^(5/2)*A*b*c^3*d^2*e^2 - 57*(e*x + d)^(3/2)*B*b^2*c^2*d^3*e^2 + 1
44*(e*x + d)^(3/2)*A*b*c^3*d^3*e^2 + 25*sqrt(e*x + d)*B*b^2*c^2*d^4*e^2 -
60*sqrt(e*x + d)*A*b*c^3*d^4*e^2 - (e*x + d)^(7/2)*B*b^3*c*e^3 - 3*(e*x +
d)^(7/2)*A*b^2*c^2*e^3 - 8*(e*x + d)^(5/2)*B*b^3*c*d*e^3 + 46*(e*x + d)^(5
/2)*A*b^2*c^2*d*e^3 + 23*(e*x + d)^(3/2)*B*b^3*c*d^2*e^3 - 91*(e*x + d)^(3
/2)*A*b^2*c^2*d^2*e^3 - 14*sqrt(e*x + d)*B*b^3*c*d^3*e^3 + 48*sqrt(e*x + d
)*A*b^2*c^2*d^3*e^3 + (e*x + d)^(5/2)*B*b^4*e^4 - 5*(e*x + d)^(5/2)*A*b^3*
c*e^4 - 2*(e*x + d)^(3/2)*B*b^4*d*e^4 + 19*(e*x + d)^(3/2)*A*b^3*c*d*e^4 +
 sqrt(e*x + d)*B*b^4*d^2*e^4 - 12*sqrt(e*x + d)*A*b^3*c*d^2*e^4)/(((e*x +
d)^2*c - 2*(e*x + d)*c*d + c*d^2 + (e*x + d)*b*e - b*d*e)^2*b^4*c)
```

Mupad [B] (verification not implemented)

Time = 13.49 (sec) , antiderivative size = 7001, normalized size of antiderivative = 18.77

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(5/2))/(b*x + c*x^2)^3,x)
```

output
```
(((d + e*x)^(7/2)*(B*b^3*e^3 + 3*A*b^2*c*e^3 + 24*A*c^3*d^2*e - 24*A*b*c^2
*d*e^2 - 12*B*b*c^2*d^2*e + 7*B*b^2*c*d*e^2))/(4*b^4) - ((d + e*x)^(5/2)*(
B*b^4*e^4 - 5*A*b^3*c*e^4 + 72*A*c^4*d^3*e - 108*A*b*c^3*d^2*e^2 + 46*A*b^
2*c^2*d*e^3 + 39*B*b^2*c^2*d^2*e^2 - 36*B*b*c^3*d^3*e - 8*B*b^3*c*d*e^3))/
(4*b^4*c) - ((d + e*x)^(1/2)*(24*A*c^4*d^5*e + B*b^4*d^2*e^4 - 60*A*b*c^3*
d^4*e^2 - 12*A*b^3*c*d^2*e^4 - 14*B*b^3*c*d^3*e^3 + 48*A*b^2*c^2*d^3*e^3 +
 25*B*b^2*c^2*d^4*e^2 - 12*B*b*c^3*d^5*e))/(4*b^4*c) + ((d + e*x)^(3/2)*(7
2*A*c^4*d^4*e + 2*B*b^4*d*e^4 - 144*A*b*c^3*d^3*e^2 - 23*B*b^3*c*d^2*e^3 +
 91*A*b^2*c^2*d^2*e^3 + 57*B*b^2*c^2*d^3*e^2 - 19*A*b^3*c*d*e^4 - 36*B*b*c
^3*d^4*e))/(4*b^4*c))/(c^2*(d + e*x)^4 - (d + e*x)*(4*c^2*d^3 + 2*b^2*d*e^
2 - 6*b*c*d^2*e) - (4*c^2*d - 2*b*c*e)*(d + e*x)^3 + (d + e*x)^2*(b^2*e^2
+ 6*c^2*d^2 - 6*b*c*d*e) + c^2*d^4 + b^2*d^2*e^2 - 2*b*c*d^3*e) - (d^(1/2)
*atan(((d^(1/2)*((d^(1/2)*((12*A*b^12*c^3*d*e^5 - B*b^13*c^2*d*e^5 + 24*A*
b^10*c^5*d^3*e^3 - 36*A*b^11*c^4*d^2*e^4 - 12*B*b^11*c^4*d^3*e^3 + 13*B*b^
12*c^3*d^2*e^4)/(b^12*c) - (d^(1/2)*(64*b^11*c^3*e^3 - 128*b^10*c^4*d*e^2)
*(d + e*x)^(1/2)*(15*A*b^2*e^2 + 48*A*c^2*d^2 - 24*B*b*c*d^2 + 20*B*b^2*d*
e - 60*A*b*c*d*e))/(64*b^13*c))*(15*A*b^2*e^2 + 48*A*c^2*d^2 - 24*B*b*c*d^
2 + 20*B*b^2*d*e - 60*A*b*c*d*e))/(8*b^5) - ((d + e*x)^(1/2)*(B^2*b^8*e^8
+ 9*A^2*b^6*c^2*e^8 + 4608*A^2*c^8*d^6*e^2 + 15840*A^2*b^2*c^6*d^4*e^4 - 8
640*A^2*b^3*c^5*d^3*e^5 + 2250*A^2*b^4*c^4*d^2*e^6 + 1152*B^2*b^2*c^6*d...
```

Reduce [B] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 2012, normalized size of antiderivative = 5.39

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(5/2)/(c*x^2+b*x)^3,x)
```

output

```
(6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)
))*a*b**4*c*e**2*x**2 - 72*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/
(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**2*d*e*x**2 + 12*sqrt(c)*sqrt(b*e - c*
d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**2*e**2*x**3
 + 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c
*d)))*a*b**2*c**3*d**2*x**2 - 144*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e
*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**3*d*e*x**3 + 6*sqrt(c)*sqrt(b*
e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**3*e**
2*x**4 + 192*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(
b*e - c*d)))*a*b*c**4*d**2*x**3 - 72*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d
+ e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**4*d*e*x**4 + 96*sqrt(c)*sqrt(b
*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*c**5*d**2*x*
*4 + 2*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
c*d)))*b**6*e**2*x**2 + 16*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/
(sqrt(c)*sqrt(b*e - c*d)))*b**5*c*d*e*x**2 + 4*sqrt(c)*sqrt(b*e - c*d)*ata
n((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**5*c*e**2*x**3 - 48*sqrt(
c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*
c**2*d**2*x**2 + 32*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c
)*sqrt(b*e - c*d)))*b**4*c**2*d*e*x**3 + 2*sqrt(c)*sqrt(b*e - c*d)*atan((s
qrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c**2*e**2*x**4 - 96*sqr...
```

3.89 $\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3} dx$

Optimal result

Integrand size = 26, antiderivative size = 335

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3} dx = -\frac{(6bBcd-12Ac^2d-2b^2Be+7Abce)\sqrt{d+ex}}{4b^3(b+cx)^2}$$
$$-\frac{(4bBd-8Acd+3Abe)\sqrt{d+ex}}{4b^2x(b+cx)^2}+\frac{3(8Ac^2d+b^2Be-4bc(Bd+Ae))\sqrt{d+ex}}{4b^4(b+cx)}$$
$$-\frac{A(d+ex)^{3/2}}{2bx^2(b+cx)^2}-\frac{3(16Ac^2d^2+b^2e(4Bd+Ae)-4bcd(2Bd+3Ae))\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4b^5\sqrt{d}}$$
$$+\frac{3(16Ac^3d^2-b^3Be^2-4bc^2d(2Bd+5Ae)+b^2ce(8Bd+5Ae))\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{4b^5\sqrt{c}\sqrt{cd-be}}$$

output
```
-1/4*(7*A*b*c*e-12*A*c^2*d-2*B*b^2*e+6*B*b*c*d)*(e*x+d)^(1/2)/b^3/(c*x+b)^
2-1/4*(3*A*b*e-8*A*c*d+4*B*b*d)*(e*x+d)^(1/2)/b^2/x/(c*x+b)^2+3/4*(8*A*c^2
*d+b^2*B*e-4*b*c*(A*e+B*d))*(e*x+d)^(1/2)/b^4/(c*x+b)-1/2*A*(e*x+d)^(3/2)/
b/x^2/(c*x+b)^2-3/4*(16*A*c^2*d^2+b^2*e*(A*e+4*B*d)-4*b*c*d*(3*A*e+2*B*d))
*arctanh((e*x+d)^(1/2)/d^(1/2))/b^5/d^(1/2)+3/4*(16*A*c^3*d^2-b^3*B*e^2-4*
b*c^2*d*(5*A*e+2*B*d)+b^2*c*e*(5*A*e+8*B*d))*arctanh(c^(1/2)*(e*x+d)^(1/2)
/(-b*e+c*d)^(1/2))/b^5/c^(1/2)/(-b*e+c*d)^(1/2)
```

Mathematica [A] (verified)

Time = 2.87 (sec) , antiderivative size = 279, normalized size of antiderivative = 0.83

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3}\,dx =$$

$$-\frac{\frac{b\sqrt{d+ex}(bBx(12c^2dx^2+b^2(4d-5ex)-3bcx(-6d+ex))+A(-24c^3dx^3+12bc^2x^2(-3d+ex)+b^3(2d+5ex)+b^2cx(-8d+19ex)))}{x^2(b+cx)^2}-\frac{3(-16Ac^3d^2+}{}}{4b^5}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(3/2))/(b*x + c*x^2)^3,x]
```

output
```
-1/4*((b*Sqrt[d + e*x]*(b*B*x*(12*c^2*d*x^2 + b^2*(4*d - 5*e*x) - 3*b*c*x*
(-6*d + e*x)) + A*(-24*c^3*d*x^3 + 12*b*c^2*x^2*(-3*d + e*x) + b^3*(2*d +
5*e*x) + b^2*c*x*(-8*d + 19*e*x))))/(x^2*(b + c*x)^2) - (3*(-16*A*c^3*d^2
+ b^3*B*e^2 + 4*b*c^2*d*(2*B*d + 5*A*e) - b^2*c*e*(8*B*d + 5*A*e))*ArcTan[
(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(Sqrt[c]*Sqrt[-(c*d) + b*e])
+ (3*(16*A*c^2*d^2 + b^2*e*(4*B*d + A*e) - 4*b*c*d*(2*B*d + 3*A*e))*ArcTan
h[Sqrt[d + e*x]/Sqrt[d]])/Sqrt[d])/b^5
```

Rubi [F]

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

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3}\,dx$$

$$\Big\downarrow \text{1233}$$

$$\frac{\int -\frac{d(2Beb^2-c(6Bd+7Ae)b+12Ac^2d)+e(Beb^2-5c(Bd+Ae)b+10Ac^2d)x}{2\sqrt{d+ex}(cx^2+bx)^2}dx}{2b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \ 25$$

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\Big\downarrow$ 25

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\Big\downarrow$ 25

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\Big\downarrow$ 25

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\Big\downarrow$ 25

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\Big\downarrow$ 25

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$\Big\downarrow$ 25

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 25$$

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$\frac{\int -\frac{d\left(2Beb^2-c(6Bd+7Ae)b+12Ac^2d\right)+e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

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

$$-\frac{\int -\frac{d\left(-2Beb^2+6Bcdb+7Aceb-12Ac^2d\right)-e\left(Beb^2-5c(Bd+Ae)b+10Ac^2d\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)^2}dx}{4b^2c}-\frac{\sqrt{d+ex}\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{2b^2c\left(bx+cx^2\right)^2}$$

input
```
Int[((A + B*x)*(d + e*x)^(3/2))/(b*x + c*x^2)^3,x]
```

output
```
$Aborted
```

Defintions of rubi rules used

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

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

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

Maple [A] (verified)

Time = 1.24 (sec) , antiderivative size = 314, normalized size of antiderivative = 0.94

method	result
pseudoelliptic	$-\frac{12\left(\left(\frac{5e^2\left(Ac-\frac{Bb}{5}\right)b^2\sqrt{d}}{16}+c\,d^{\frac{3}{2}}\left(\frac{b^2Be}{2}-\frac{5b\left(Ae+\frac{2Bd}{5}\right)c}{4}+A\,c^2d\right)\right)x^2(cx+b)^2\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)+\frac{\sqrt{c(be-cd)}\left(\frac{3x^2\cdots}{\cdots}\right.}{\cdots}\right.}{\cdots}$
risch	$-\frac{\sqrt{ex+d}\,(5Abex-12cxAd+4Bbdx+2Abd)}{4b^4x^2}-\frac{e\left(-\frac{\left(-3A\,b^2e^2+36Abcde-48A\,c^2d^2-12B\,b^2de+24Bbc\,d^2\right)\operatorname{arctanh}\left(\frac{\sqrt{ex+\cdots}}{\sqrt{d}}\right)}{be\sqrt{d}}\right.}{\cdots}$
derivativedivides	$2e^4\left(-\frac{\frac{\left(\frac{7}{8}A\,b^2c^2e^2-\frac{3}{2}Ab\,c^3de-\frac{3}{8}B\,b^3c\,e^2+B\,b^2c^2de\right)(ex+d)^{\frac{3}{2}}+\frac{eb\left(9A\,b^2e^2c-21Ab\,c^2de+12A\,c^3d^2-5b^3B\,e^2+13B\,b^2cde-8\cdots\right.}{8}}{((ex+d)c+be-cd)^2}}{e^4b^5}\right.$
default	$2e^4\left(-\frac{\frac{\left(\frac{7}{8}A\,b^2c^2e^2-\frac{3}{2}Ab\,c^3de-\frac{3}{8}B\,b^3c\,e^2+B\,b^2c^2de\right)(ex+d)^{\frac{3}{2}}+\frac{eb\left(9A\,b^2e^2c-21Ab\,c^2de+12A\,c^3d^2-5b^3B\,e^2+13B\,b^2cde-8\cdots\right.}{8}}{((ex+d)c+be-cd)^2}}{e^4b^5}\right.$

input

```
int((B*x+A)*(e*x+d)^(3/2)/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output

```
-12/d^(1/2)/(c*(b*e-c*d))^(1/2)*((5/16*e^2*(A*c-1/5*B*b)*b^2*d^(1/2)+c*d^(
3/2)*(1/2*b^2*B*e-5/4*b*(A*e+2/5*B*d)*c+A*c^2*d))*x^2*(c*x+b)^2*arctan(c*(
e*x+d)^(1/2)/(c*(b*e-c*d))^(1/2))+1/24*(c*(b*e-c*d))^(1/2)*(3/2*x^2*(c*x+b
)^2*((A*e^2+4*B*d*e)*b^2+4*(-3*A*d*e-2*B*d^2)*b*c+16*A*c^2*d^2)*arctanh((e
*x+d)^(1/2)/d^(1/2))+(5/2*e*(3/5*(4*A*c^2-B*b*c)*x^2+(19/5*A*b*c-B*b^2)*x+
b^2*A)*x*b*d^(1/2)+(6*(-2*A*c^3+B*b*c^2)*x^3+9*(-2*A*b*c^2+B*b^2*c)*x^2+2*
(-2*A*b^2*c+B*b^3)*x+A*b^3)*d^(3/2))*b*(e*x+d)^(1/2)))/x^2/b^5/(c*x+b)^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 856 vs. $2(299) = 598$.

Time = 1.02 (sec) , antiderivative size = 3465, normalized size of antiderivative = 10.34

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

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

output
```
Too large to include
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(3/2)/(c*x**2+b*x)**3,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3}\,dx = \text{Exception raised: ValueError}$$

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

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 635 vs. $2(299) = 598$.

Time = 0.27 (sec) , antiderivative size = 635, normalized size of antiderivative = 1.90

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3}\,dx = \frac{3\,(8\,Bbc^2d^2-16\,Ac^3d^2-8\,Bb^2cde+20\,Abc^2de+Bb^3e^2-5\,Ab^2ce^2)\arctan}{4\sqrt{-c^2d+bce}b^5}$$
$$-\frac{3\,(8\,Bbcd^2-16\,Ac^2d^2-4\,Bb^2de+12\,Abcde-Ab^2e^2)\arctan\left(\frac{\sqrt{ex+d}}{\sqrt{-d}}\right)}{4\,b^5\sqrt{-d}}$$
$$-\frac{12\,(ex+d)^{\frac{7}{2}}Bbc^2de-24\,(ex+d)^{\frac{7}{2}}Ac^3de-36\,(ex+d)^{\frac{5}{2}}Bbc^2d^2e+72\,(ex+d)^{\frac{5}{2}}Ac^3d^2e+36\,(ex+d)^{\frac{3}{2}}B}{}$$

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

output
```
3/4*(8*B*b*c^2*d^2 - 16*A*c^3*d^2 - 8*B*b^2*c*d*e + 20*A*b*c^2*d*e + B*b^3
*e^2 - 5*A*b^2*c*e^2)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c*e))/(sqrt(-
c^2*d + b*c*e)*b^5) - 3/4*(8*B*b*c*d^2 - 16*A*c^2*d^2 - 4*B*b^2*d*e + 12*A
*b*c*d*e - A*b^2*e^2)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^5*sqrt(-d)) - 1/4*
(12*(e*x + d)^(7/2)*B*b*c^2*d*e - 24*(e*x + d)^(7/2)*A*c^3*d*e - 36*(e*x +
 d)^(5/2)*B*b*c^2*d^2*e + 72*(e*x + d)^(5/2)*A*c^3*d^2*e + 36*(e*x + d)^(3
/2)*B*b*c^2*d^3*e - 72*(e*x + d)^(3/2)*A*c^3*d^3*e - 12*sqrt(e*x + d)*B*b*
c^2*d^4*e + 24*sqrt(e*x + d)*A*c^3*d^4*e - 3*(e*x + d)^(7/2)*B*b^2*c*e^2 +
 12*(e*x + d)^(7/2)*A*b*c^2*e^2 + 27*(e*x + d)^(5/2)*B*b^2*c*d*e^2 - 72*(e
*x + d)^(5/2)*A*b*c^2*d*e^2 - 45*(e*x + d)^(3/2)*B*b^2*c*d^2*e^2 + 108*(e*
x + d)^(3/2)*A*b*c^2*d^2*e^2 + 21*sqrt(e*x + d)*B*b^2*c*d^3*e^2 - 48*sqrt(
e*x + d)*A*b*c^2*d^3*e^2 - 5*(e*x + d)^(5/2)*B*b^3*e^3 + 19*(e*x + d)^(5/2
)*A*b^2*c*e^3 + 14*(e*x + d)^(3/2)*B*b^3*d*e^3 - 46*(e*x + d)^(3/2)*A*b^2*
c*d*e^3 - 9*sqrt(e*x + d)*B*b^3*d^2*e^3 + 27*sqrt(e*x + d)*A*b^2*c*d^2*e^3
 + 5*(e*x + d)^(3/2)*A*b^3*e^4 - 3*sqrt(e*x + d)*A*b^3*d*e^4)/(((e*x + d)^
2*c - 2*(e*x + d)*c*d + c*d^2 + (e*x + d)*b*e - b*d*e)^2*b^4)
```

Mupad [B] (verification not implemented)

Time = 13.98 (sec) , antiderivative size = 5796, normalized size of antiderivative = 17.30

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(3/2))/(b*x + c*x^2)^3,x)
```

output
```
((3*(d + e*x)^(1/2)*(A*b^3*d*e^4 - 8*A*c^3*d^4*e + 3*B*b^3*d^2*e^3 + 16*A*
b*c^2*d^3*e^2 - 9*A*b^2*c*d^2*e^3 - 7*B*b^2*c*d^3*e^2 + 4*B*b*c^2*d^4*e))/
(4*b^4) - ((d + e*x)^(3/2)*(5*A*b^3*e^4 - 72*A*c^3*d^3*e + 14*B*b^3*d*e^3
+ 108*A*b*c^2*d^2*e^2 - 45*B*b^2*c*d^2*e^2 - 46*A*b^2*c*d*e^3 + 36*B*b*c^2
*d^3*e))/(4*b^4) + ((d + e*x)^(5/2)*(5*B*b^3*e^3 - 19*A*b^2*c*e^3 - 72*A*c
^3*d^2*e + 72*A*b*c^2*d*e^2 + 36*B*b*c^2*d^2*e - 27*B*b^2*c*d*e^2))/(4*b^4
) + (3*c*(d + e*x)^(7/2)*(B*b^2*e^2 - 4*A*b*c*e^2 + 8*A*c^2*d*e - 4*B*b*c*
d*e))/(4*b^4))/(c^2*(d + e*x)^4 - (d + e*x)*(4*c^2*d^3 + 2*b^2*d*e^2 - 6*b
*c*d^2*e) - (4*c^2*d - 2*b*c*e)*(d + e*x)^3 + (d + e*x)^2*(b^2*e^2 + 6*c^2
*d^2 - 6*b*c*d*e) + c^2*d^4 + b^2*d^2*e^2 - 2*b*c*d^3*e) + (atan((((-c*(b*
e - c*d))^(1/2)*(((d + e*x)^(1/2)*(234*A^2*b^4*c^3*e^6 + 4608*A^2*c^7*d^4*
e^2 + 9*B^2*b^6*c*e^6 + 6624*A^2*b^2*c^5*d^2*e^4 + 1152*B^2*b^2*c^5*d^4*e^
2 - 1728*B^2*b^3*c^4*d^3*e^3 + 864*B^2*b^4*c^3*d^2*e^4 - 90*A*B*b^5*c^2*e^
6 - 9216*A^2*b*c^6*d^3*e^3 - 2016*A^2*b^3*c^4*d*e^5 - 144*B^2*b^5*c^2*d*e^
5 - 4608*A*B*b*c^6*d^4*e^2 + 1152*A*B*b^4*c^3*d*e^5 + 8064*A*B*b^2*c^5*d^3
*e^3 - 4896*A*B*b^3*c^4*d^2*e^4))/(8*b^8) - (3*(-c*(b*e - c*d))^(1/2)*((3*
A*b^12*c^2*e^5 - 24*A*b^11*c^3*d*e^4 + 9*B*b^12*c^2*d*e^4 + 24*A*b^10*c^4*
d^2*e^3 - 12*B*b^11*c^3*d^2*e^3)/b^12 - (3*(64*b^11*c^2*e^3 - 128*b^10*c^3
*d*e^2)*(-c*(b*e - c*d))^(1/2)*(d + e*x)^(1/2)*(16*A*c^3*d^2 - B*b^3*e^2 +
 5*A*b^2*c*e^2 - 8*B*b*c^2*d^2 - 20*A*b*c^2*d*e + 8*B*b^2*c*d*e))/(64*b...
```

Reduce [B] (verification not implemented)

Time = 0.28 (sec) , antiderivative size = 2488, normalized size of antiderivative = 7.43

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(3/2)/(c*x^2+b*x)^3,x)
```

output
```
( - 30*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
c*d)))*a*b**4*c*d*e**2*x**2 + 120*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e
*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**2*d**2*e*x**2 - 60*sqrt(c)*sqr
t(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**2
*d*e**2*x**3 - 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*
sqrt(b*e - c*d)))*a*b**2*c**3*d**3*x**2 + 240*sqrt(c)*sqrt(b*e - c*d)*atan
((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**3*d**2*e*x**3 - 30
*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))
*a*b**2*c**3*d*e**2*x**4 - 192*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)
*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**4*d**3*x**3 + 120*sqrt(c)*sqrt(b*e -
 c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**4*d**2*e*x*
*4 - 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
 c*d)))*a*c**5*d**3*x**4 + 6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c
)/(sqrt(c)*sqrt(b*e - c*d)))*b**6*d*e**2*x**2 - 48*sqrt(c)*sqrt(b*e - c*d)
*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**5*c*d**2*e*x**2 + 12
*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))
*b**5*c*d*e**2*x**3 + 48*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(s
qrt(c)*sqrt(b*e - c*d)))*b**4*c**2*d**3*x**2 - 96*sqrt(c)*sqrt(b*e - c*d)*
atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c**2*d**2*e*x**3 +
6*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*...
```

3.90 $\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 355

$$\begin{aligned}\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx &= -\frac{c(6bBd-12Acd+Abe)\sqrt{d+ex}}{4b^3d(b+cx)^2} - \frac{A\sqrt{d+ex}}{2bx^2(b+cx)^2} - \frac{(4bBd-8Acd+Abe)\sqrt{d+ex}}{4b^2dx(b+cx)^2} \\ &\quad + \frac{c\left(24Ac^2d^2+b^2e(11Bd+Ae)-12bcd(Bd+2Ae)\right)\sqrt{d+ex}}{4b^4d(cd-be)(b+cx)} \\ &\quad - \frac{\left(48Ac^2d^2+b^2e(4Bd-Ae)-12bcd(2Bd+Ae)\right)\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4b^5d^{3/2}} \\ &\quad + \frac{\sqrt{c}\left(48Ac^3d^2-15b^3Be^2-12bc^2d(2Bd+7Ae)+5b^2ce(8Bd+7Ae)\right)\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{4b^5(cd-be)^{3/2}}\end{aligned}$$

output
```
-1/4*c*(A*b*e-12*A*c*d+6*B*b*d)*(e*x+d)^(1/2)/b^3/d/(c*x+b)^2-1/2*A*(e*x+d
)^(1/2)/b/x^2/(c*x+b)^2-1/4*(A*b*e-8*A*c*d+4*B*b*d)*(e*x+d)^(1/2)/b^2/d/x/
(c*x+b)^2+1/4*c*(24*A*c^2*d^2+b^2*e*(A*e+11*B*d)-12*b*c*d*(2*A*e+B*d))*(e*
x+d)^(1/2)/b^4/d/(-b*e+c*d)/(c*x+b)-1/4*(48*A*c^2*d^2+b^2*e*(-A*e+4*B*d)-1
2*b*c*d*(A*e+2*B*d))*arctanh((e*x+d)^(1/2)/d^(1/2))/b^5/d^(3/2)+1/4*c^(1/2
)*(48*A*c^3*d^2-15*b^3*B*e^2-12*b*c^2*d*(7*A*e+2*B*d)+5*b^2*c*e*(7*A*e+8*B
*d))*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b^5/(-b*e+c*d)^(3/2)
```

Mathematica [A] (verified)

Time = 4.09 (sec) , antiderivative size = 342, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx$$

$$= \frac{-\frac{b\sqrt{d+ex}(bBdx(-4b^3e+12c^3dx^2+b^2c(4d-17ex)+bc^2x(18d-11ex))-A(24c^4d^2x^3+12bc^3dx^2(3d-2ex)+b^4e(2d+ex)+b^2c^2x(8d^2-37dex+e^2}{d(cd-be)x^2(b+cx)^2}}{}$$

input
```
Integrate[((A + B*x)*Sqrt[d + e*x])/(b*x + c*x^2)^3,x]
```

output
```
(-((b*Sqrt[d + e*x]*(b*B*d*x*(-4*b^3*e + 12*c^3*d*x^2 + b^2*c*(4*d - 17*e*
x) + b*c^2*x*(18*d - 11*e*x)) - A*(24*c^4*d^2*x^3 + 12*b*c^3*d*x^2*(3*d -
2*e*x) + b^4*e*(2*d + e*x) + b^2*c^2*x*(8*d^2 - 37*d*e*x + e^2*x^2) + b^3*
c*(-2*d^2 - 9*d*e*x + 2*e^2*x^2))))/(d*(c*d - b*e)*x^2*(b + c*x)^2)) + (Sq
rt[c]*(48*A*c^3*d^2 - 15*b^3*B*e^2 - 12*b*c^2*d*(2*B*d + 7*A*e) + 5*b^2*c*
e*(8*B*d + 7*A*e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(-(
c*d) + b*e)^(3/2) + ((-48*A*c^2*d^2 + b^2*e*(-4*B*d + A*e) + 12*b*c*d*(2*B
*d + A*e))*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(3/2))/(4*b^5)
```

Rubi [A] (verified)

Time = 1.39 (sec) , antiderivative size = 352, normalized size of antiderivative = 0.99, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.346$, Rules used = {1234, 27, 25, 1235, 27, 1197, 27, 1480, 221}

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

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx$$

$$\Big\downarrow \text{1234}$$

$$-\frac{\int \frac{12Acd-b(6Bd+Ae)-5(bB-2Ac)ex}{2\sqrt{d+ex}(cx^2+bx)^2}dx}{2b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{2b^2(bx+cx^2)^2}$$

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

$$-\frac{\int -\frac{6bBd-12Acd+Abe+5(bB-2Ac)ex}{\sqrt{d+ex}(cx^2+bx)^2}dx}{4b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{2b^2(bx+cx^2)^2}$$

$\Big\downarrow$ 25

$$\frac{\int \frac{6bBd-12Acd+Abe+5(bB-2Ac)ex}{\sqrt{d+ex}(cx^2+bx)^2}dx}{4b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{2b^2(bx+cx^2)^2}$$

$\Big\downarrow$ 1235

$$\frac{-\frac{\int -\frac{(cd-be)\left(e(4Bd-Ae)b^2-12cd(2Bd+Ae)b+48Ac^2d^2\right)+ce\left(e(11Bd+Ae)b^2-12cd(Bd+2Ae)b+24Ac^2d^2\right)x}{2\sqrt{d+ex}\left(cx^2+bx\right)}dx}{b^2d(cd-be)}-\frac{\sqrt{d+ex}(b(cd-be)(Abe-12Acd+6bBd \cdots}{b^2d \cdots}}{4b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{2b^2(bx+cx^2)^2}$$

$\Big\downarrow$ 27

$$\frac{\frac{\int \frac{(cd-be)\left(e(4Bd-Ae)b^2-12cd(2Bd+Ae)b+48Ac^2d^2\right)+ce\left(e(11Bd+Ae)b^2-12cd(Bd+2Ae)b+24Ac^2d^2\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{2b^2d(cd-be)}-\frac{\sqrt{d+ex}(b(cd-be)(Abe-12Acd+6bBd)-c \cdots}{b^2d(bx \cdots}}{4b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{2b^2(bx+cx^2)^2}$$

$\Big\downarrow$ 1197

$$\frac{\frac{\int \frac{e\left(-e^2(4Bd-Ae)b^3+cde(17Bd+10Ae)b^2-12c^2d^2(Bd+3Ae)b+24Ac^3d^3+c\left(e(11Bd+Ae)b^2-12cd(Bd+2Ae)b+24Ac^2d^2\right)(d+ex)\right)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2d(cd-be)}-\frac{\sqrt{d+ex}(b(cd \cdots}{\cdots}}{4b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{2b^2(bx+cx^2)^2}$$

$\Big\downarrow$ 27

$$\frac{\frac{e\int \frac{-e^2(4Bd-Ae)b^3+cde(17Bd+10Ae)b^2-12c^2d^2(Bd+3Ae)b+24Ac^3d^3+c\left(e(11Bd+Ae)b^2-12cd(Bd+2Ae)b+24Ac^2d^2\right)(d+ex)}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}d\sqrt{d+ex}}{b^2d(cd-be)}-\frac{\sqrt{d+ex}(b(cd- \cdots}{\cdots}}{4b^2}-\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{2b^2(bx+cx^2)^2}$$

$\Big\downarrow$ 1480

$$\frac{e\left(\frac{c(cd-be)\left(b^2e(4Bd-Ae)-12bcd(Ae+2Bd)+48Ac^2d^2\right)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}-\frac{cd\left(5b^2ce(7Ae+8Bd)-12bc^2d(7Ae+2Bd)+48Ac^3d^2-15b^3Be^2\right)\int \frac{1}{-cd+be+c(}}{be}\right.}{b^2d(cd-be)}$$

$$4b^2$$

$$\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{2b^2\left(bx+cx^2\right)^2}$$

$$\Big\downarrow \; 221$$

$$\frac{e\left(\frac{\sqrt{c}d\left(5b^2ce(7Ae+8Bd)-12bc^2d(7Ae+2Bd)+48Ac^3d^2-15b^3Be^2\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{be\sqrt{cd-be}}-\frac{\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)\left(b^2e(4Bd-Ae)-12bcd(Ae+2Bd)\right.}{b\sqrt{d}e}\right.}{b^2d(cd-be)}$$

$$4b^2$$

$$\frac{\sqrt{d+ex}(Ab-x(bB-2Ac))}{2b^2\left(bx+cx^2\right)^2}$$

input
```
Int[((A + B*x)*Sqrt[d + e*x])/(b*x + c*x^2)^3,x]
```

output
```
-1/2*((A*b - (b*B - 2*A*c)*x)*Sqrt[d + e*x])/(b^2*(b*x + c*x^2)^2) + (-((S
qrt[d + e*x]*(b*(c*d - b*e)*(6*b*B*d - 12*A*c*d + A*b*e) - c*(24*A*c^2*d^2
 + b^2*e*(11*B*d + A*e) - 12*b*c*d*(B*d + 2*A*e))*x))/(b^2*d*(c*d - b*e)*(
b*x + c*x^2))) + (e*(-(((c*d - b*e)*(48*A*c^2*d^2 + b^2*e*(4*B*d - A*e) -
12*b*c*d*(2*B*d + A*e))*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d]*e)) + (
Sqrt[c]*d*(48*A*c^3*d^2 - 15*b^3*B*e^2 - 12*b*c^2*d*(2*B*d + 7*A*e) + 5*b^
2*c*e*(8*B*d + 7*A*e))*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(
b*e*Sqrt[c*d - b*e])))/(b^2*d*(c*d - b*e)))/(4*b^2)
```

Defintions of rubi rules used

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

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1234
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^m*(a + b*x + c*x^2)^(p + 1)*(
(f*b - 2*a*g + (2*c*f - b*g)*x)/((p + 1)*(b^2 - 4*a*c))), x] + Simp[1/((p +
 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 1)*(a + b*x + c*x^2)^(p + 1)*Simp[g
*(2*a*e*m + b*d*(2*p + 3)) - f*(b*e*m + 2*c*d*(2*p + 3)) - e*(2*c*f - b*g)*
(m + 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1
] && GtQ[m, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.36 (sec) , antiderivative size = 337, normalized size of antiderivative = 0.95

method	result
risch	$-\frac{\sqrt{ex+d}\,(Abex-12cxAd+4Bbdx+2Abd)}{4d\,b^4x^2}-\frac{e\left(-\frac{\left(A\,b^2e^2+12Abcde-48A\,c^2d^2-4B\,b^2de+24Bbc\,d^2\right)\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{be\sqrt{d}}-\cdots\right.}{\cdots}$
pseudoelliptic	$\frac{12c\,x^2(cx+b)^2\left(\frac{35\left(Ac-\frac{3Bb}{7}\right)e^2b^2d^{\frac{5}{2}}}{48}+c\left(\frac{5b^2Be}{6}-\frac{7c\left(Ae+\frac{2Bd}{7}\right)b}{4}+A\,c^2d\right)d^{\frac{7}{2}}\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)+\frac{\sqrt{c(be-cd)}\left(\left(\left(\cdots\right.\right.\right.}{\cdots}}{\cdots}$
derivativedivides	$2e^4\left(\frac{c\left(\frac{\frac{ceb\left(11Aceb-12A\,c^2d-7b^2Be+8Bbcd\right)(ex+d)^{\frac{3}{2}}}{8be-8cd}+\frac{eb\left(13Aceb-12A\,c^2d-9b^2Be+8Bbcd\right)\sqrt{ex+d}}{8}}{((ex+d)c+be-cd)^2}+\frac{\left(35A\,b^2e^2c-84Ab\,c^{\cdots}\right.}{\cdots}\right.}{b^5e^4}\cdots\right.$
default	$2e^4\left(\frac{c\left(\frac{\frac{ceb\left(11Aceb-12A\,c^2d-7b^2Be+8Bbcd\right)(ex+d)^{\frac{3}{2}}}{8be-8cd}+\frac{eb\left(13Aceb-12A\,c^2d-9b^2Be+8Bbcd\right)\sqrt{ex+d}}{8}}{((ex+d)c+be-cd)^2}+\frac{\left(35A\,b^2e^2c-84Ab\,c^{\cdots}\right.}{\cdots}\right.}{b^5e^4}\cdots\right.$

input

```
int((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output

```
-1/4*(e*x+d)^(1/2)*(A*b*e*x-12*A*c*d*x+4*B*b*d*x+2*A*b*d)/d/b^4/x^2-1/4/b^
4/d*e*(-1/b/e*(A*b^2*e^2+12*A*b*c*d*e-48*A*c^2*d^2-4*B*b^2*d*e+24*B*b*c*d^
2)/d^(1/2)*arctanh((e*x+d)^(1/2)/d^(1/2))-8*c*d/b/e*((1/8*c*e*b*(11*A*b*c*
e-12*A*c^2*d-7*B*b^2*e+8*B*b*c*d)/(b*e-c*d)*(e*x+d)^(3/2)+1/8*e*b*(13*A*b*
c*e-12*A*c^2*d-9*B*b^2*e+8*B*b*c*d)*(e*x+d)^(1/2))/((e*x+d)*c+b*e-c*d)^2+1
/8*(35*A*b^2*c*e^2-84*A*b*c^2*d*e+48*A*c^3*d^2-15*B*b^3*e^2+40*B*b^2*c*d*e
-24*B*b*c^2*d^2)/(b*e-c*d)/(c*(b*e-c*d))^(1/2)*arctan(c*(e*x+d)^(1/2)/(c*(
b*e-c*d))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 819 vs. $2(319) = 638$.

Time = 3.87 (sec) , antiderivative size = 3353, normalized size of antiderivative = 9.45

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(1/2)/(c*x**2+b*x)**3,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^3,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 813 vs. $2(319) = 638$.

Time = 0.28 (sec) , antiderivative size = 813, normalized size of antiderivative = 2.29

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
1/4*(24*B*b*c^3*d^2 - 48*A*c^4*d^2 - 40*B*b^2*c^2*d*e + 84*A*b*c^3*d*e + 1
5*B*b^3*c*e^2 - 35*A*b^2*c^2*e^2)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*c
*e))/((b^5*c*d - b^6*e)*sqrt(-c^2*d + b*c*e)) - 1/4*(12*(e*x + d)^(7/2)*B*
b*c^3*d^2*e - 24*(e*x + d)^(7/2)*A*c^4*d^2*e - 36*(e*x + d)^(5/2)*B*b*c^3*
d^3*e + 72*(e*x + d)^(5/2)*A*c^4*d^3*e + 36*(e*x + d)^(3/2)*B*b*c^3*d^4*e
- 72*(e*x + d)^(3/2)*A*c^4*d^4*e - 12*sqrt(e*x + d)*B*b*c^3*d^5*e + 24*sqr
t(e*x + d)*A*c^4*d^5*e - 11*(e*x + d)^(7/2)*B*b^2*c^2*d*e^2 + 24*(e*x + d)
^(7/2)*A*b*c^3*d*e^2 + 51*(e*x + d)^(5/2)*B*b^2*c^2*d^2*e^2 - 108*(e*x + d
)^(5/2)*A*b*c^3*d^2*e^2 - 69*(e*x + d)^(3/2)*B*b^2*c^2*d^3*e^2 + 144*(e*x
+ d)^(3/2)*A*b*c^3*d^3*e^2 + 29*sqrt(e*x + d)*B*b^2*c^2*d^4*e^2 - 60*sqrt(
e*x + d)*A*b*c^3*d^4*e^2 - (e*x + d)^(7/2)*A*b^2*c^2*e^3 - 17*(e*x + d)^(5
/2)*B*b^3*c*d*e^3 + 40*(e*x + d)^(5/2)*A*b^2*c^2*d*e^3 + 38*(e*x + d)^(3/2
)*B*b^3*c*d^2*e^3 - 85*(e*x + d)^(3/2)*A*b^2*c^2*d^2*e^3 - 21*sqrt(e*x + d
)*B*b^3*c*d^3*e^3 + 46*sqrt(e*x + d)*A*b^2*c^2*d^3*e^3 - 2*(e*x + d)^(5/2)
*A*b^3*c*e^4 - 4*(e*x + d)^(3/2)*B*b^4*d*e^4 + 13*(e*x + d)^(3/2)*A*b^3*c*
d*e^4 + 4*sqrt(e*x + d)*B*b^4*d^2*e^4 - 9*sqrt(e*x + d)*A*b^3*c*d^2*e^4 -
(e*x + d)^(3/2)*A*b^4*e^5 - sqrt(e*x + d)*A*b^4*d*e^5)/((b^4*c*d^2 - b^5*d
*e)*((e*x + d)^2*c - 2*(e*x + d)*c*d + c*d^2 + (e*x + d)*b*e - b*d*e)^2) -
 1/4*(24*B*b*c*d^2 - 48*A*c^2*d^2 - 4*B*b^2*d*e + 12*A*b*c*d*e + A*b^2*e^2
)*arctan(sqrt(e*x + d)/sqrt(-d))/(b^5*sqrt(-d)*d)
```

Mupad [B] (verification not implemented)

Time = 15.45 (sec) , antiderivative size = 8411, normalized size of antiderivative = 23.69

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int(((A + B*x)*(d + e*x)^(1/2))/(b*x + c*x^2)^3,x)
```

output
```
(((d + e*x)^(3/2)*(A*b^4*e^5 + 72*A*c^4*d^4*e + 4*B*b^4*d*e^4 - 144*A*b*c^
3*d^3*e^2 - 38*B*b^3*c*d^2*e^3 + 85*A*b^2*c^2*d^2*e^3 + 69*B*b^2*c^2*d^3*e
^2 - 13*A*b^3*c*d*e^4 - 36*B*b*c^3*d^4*e))/(4*b^4*(c*d^2 - b*d*e)) - ((d +
 e*x)^(1/2)*(A*b^3*e^4 + 24*A*c^3*d^3*e - 4*B*b^3*d*e^3 - 36*A*b*c^2*d^2*e
^2 + 17*B*b^2*c*d^2*e^2 + 10*A*b^2*c*d*e^3 - 12*B*b*c^2*d^3*e))/(4*b^4) +
((d + e*x)^(5/2)*(2*A*b^3*c*e^4 - 72*A*c^4*d^3*e + 108*A*b*c^3*d^2*e^2 - 4
0*A*b^2*c^2*d*e^3 - 51*B*b^2*c^2*d^2*e^2 + 36*B*b*c^3*d^3*e + 17*B*b^3*c*d
*e^3))/(4*b^4*(c*d^2 - b*d*e)) + (c*(d + e*x)^(7/2)*(A*b^2*c*e^3 + 24*A*c^
3*d^2*e - 24*A*b*c^2*d*e^2 - 12*B*b*c^2*d^2*e + 11*B*b^2*c*d*e^2))/(4*b^4*
(c*d^2 - b*d*e)))/(c^2*(d + e*x)^4 - (d + e*x)*(4*c^2*d^3 + 2*b^2*d*e^2 -
6*b*c*d^2*e) - (4*c^2*d - 2*b*c*e)*(d + e*x)^3 + (d + e*x)^2*(b^2*e^2 + 6*
c^2*d^2 - 6*b*c*d*e) + c^2*d^4 + b^2*d^2*e^2 - 2*b*c*d^3*e) - (atan((((-c*
(b*e - c*d)^3)^(1/2)*(((d + e*x)^(1/2)*(A^2*b^6*c^3*e^8 + 4608*A^2*c^9*d^6
*e^2 + 15072*A^2*b^2*c^7*d^4*e^4 - 7104*A^2*b^3*c^6*d^3*e^5 + 1226*A^2*b^4
*c^5*d^2*e^6 + 1152*B^2*b^2*c^7*d^6*e^2 - 3264*B^2*b^3*c^6*d^5*e^3 + 3296*
B^2*b^4*c^5*d^4*e^4 - 1424*B^2*b^5*c^4*d^3*e^5 + 241*B^2*b^6*c^3*d^2*e^6 -
 13824*A^2*b*c^8*d^5*e^3 + 22*A^2*b^5*c^4*d*e^7 - 4608*A*B*b*c^8*d^6*e^2 -
 8*A*B*b^6*c^3*d*e^7 + 13440*A*B*b^2*c^7*d^5*e^3 - 14112*A*B*b^3*c^6*d^4*e
^4 + 6368*A*B*b^4*c^5*d^3*e^5 - 1082*A*B*b^5*c^4*d^2*e^6))/(8*(b^8*c^2*d^4
 + b^10*d^2*e^2 - 2*b^9*c*d^3*e)) + (((A*b^14*c^2*d*e^7 - 24*A*b^10*c^6...
```

Reduce [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 2990, normalized size of antiderivative = 8.42

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(1/2)/(c*x^2+b*x)^3,x)
```

output
```
(70*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d
)))*a*b**4*c*d**2*e**2*x**2 - 168*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e
*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**2*d**3*e*x**2 + 140*sqrt(c)*sq
rt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**
2*d**2*e**2*x**3 + 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt
(c)*sqrt(b*e - c*d)))*a*b**2*c**3*d**4*x**2 - 336*sqrt(c)*sqrt(b*e - c*d)*
atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**3*d**3*e*x**3
+ 70*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*
d)))*a*b**2*c**3*d**2*e**2*x**4 + 192*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d
 + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**4*d**4*x**3 - 168*sqrt(c)*sqr
t(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**4*d*
*3*e*x**4 + 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqr
t(b*e - c*d)))*a*c**5*d**4*x**4 - 30*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d
+ e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**6*d**2*e**2*x**2 + 80*sqrt(c)*sqrt
(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**5*c*d**3*
e*x**2 - 60*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b
*e - c*d)))*b**5*c*d**2*e**2*x**3 - 48*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(
d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c**2*d**4*x**2 + 160*sqrt(c)*s
qrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c**2
*d**3*e*x**3 - 30*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(...
```

3.91 $\int \frac{A+Bx}{\sqrt{d+ex}\left(bx+cx^2\right)^3}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 418

$$\begin{aligned}\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^3}\,dx &= \frac{c(12Ac^2d^2+b^2e(4Bd-3Ae)-bcd(6Bd+7Ae))\sqrt{d+ex}}{4b^3d^2(cd-be)(b+cx)^2} \\ &- \frac{A\sqrt{d+ex}}{2bdx^2(b+cx)^2} - \frac{(4bBd-8Acd-3Abe)\sqrt{d+ex}}{4b^2d^2x(b+cx)^2} \\ &+ \frac{c(24Ac^3d^3-b^3e^2(4Bd-3Ae)-12bc^2d^2(Bd+3Ae)+b^2cde(19Bd+6Ae))\sqrt{d+ex}}{4b^4d^2(cd-be)^2(b+cx)} \\ &- \frac{(48Ac^2d^2-b^2e(4Bd-3Ae)-12bcd(2Bd-Ae))\,\mathrm{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4b^5d^{5/2}} \\ &+ \frac{c^{3/2}(48Ac^3d^2-35b^3Be^2-12bc^2d(2Bd+9Ae)+7b^2ce(8Bd+9Ae))\,\mathrm{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{4b^5(cd-be)^{5/2}}\end{aligned}$$

output
```
1/4*c*(12*A*c^2*d^2+b^2*e*(-3*A*e+4*B*d)-b*c*d*(7*A*e+6*B*d))*(e*x+d)^(1/2
)/b^3/d^2/(-b*e+c*d)/(c*x+b)^2-1/2*A*(e*x+d)^(1/2)/b/d/x^2/(c*x+b)^2-1/4*(
-3*A*b*e-8*A*c*d+4*B*b*d)*(e*x+d)^(1/2)/b^2/d^2/x/(c*x+b)^2+1/4*c*(24*A*c^
3*d^3-b^3*e^2*(-3*A*e+4*B*d)-12*b*c^2*d^2*(3*A*e+B*d)+b^2*c*d*e*(6*A*e+19*
B*d))*(e*x+d)^(1/2)/b^4/d^2/(-b*e+c*d)^2/(c*x+b)-1/4*(48*A*c^2*d^2-b^2*e*(
-3*A*e+4*B*d)-12*b*c*d*(-A*e+2*B*d))*arctanh((e*x+d)^(1/2)/d^(1/2))/b^5/d^
(5/2)+1/4*c^(3/2)*(48*A*c^3*d^2-35*b^3*B*e^2-12*b*c^2*d*(9*A*e+2*B*d)+7*b^
2*c*e*(9*A*e+8*B*d))*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(1/2))/b^5/(
-b*e+c*d)^(5/2)
```

Mathematica [A] (verified)

Time = 4.68 (sec) , antiderivative size = 416, normalized size of antiderivative = 1.00

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^3}\,dx =$$

$$-\frac{\frac{b\sqrt{d+ex}\left(bBdx\left(4b^4e^2+12c^4d^2x^2+bc^3dx(18d-19ex)+8b^3ce(-d+ex)+b^2c^2\left(4d^2-29dex+4e^2x^2\right)\right)+A\left(-24c^5d^3x^3+b^5e^2(2d-3ex)-36bc^4d^2\right.\right.}{d^2(cd-be)^2x^2(b+cx)^2}}{}$$

input
```
Integrate[(A + B*x)/(Sqrt[d + e*x]*(b*x + c*x^2)^3),x]
```

output
```
-1/4*((b*Sqrt[d + e*x]*(b*B*d*x*(4*b^4*e^2 + 12*c^4*d^2*x^2 + b*c^3*d*x*(1
8*d - 19*e*x) + 8*b^3*c*e*(-d + e*x) + b^2*c^2*(4*d^2 - 29*d*e*x + 4*e^2*x
^2)) + A*(-24*c^5*d^3*x^3 + b^5*e^2*(2*d - 3*e*x) - 36*b*c^4*d^2*x^2*(d -
e*x) + b^2*c^3*d*x*(-8*d^2 + 55*d*e*x - 6*e^2*x^2) - 2*b^4*c*e*(2*d^2 + d*
e*x + 3*e^2*x^2) + b^3*c^2*(2*d^3 + 13*d^2*e*x - 10*d*e^2*x^2 - 3*e^3*x^3)
)))/(d^2*(c*d - b*e)^2*x^2*(b + c*x)^2) + (c^(3/2)*(48*A*c^3*d^2 - 35*b^3*
B*e^2 - 12*b*c^2*d*(2*B*d + 9*A*e) + 7*b^2*c*e*(8*B*d + 9*A*e))*ArcTan[(Sq
rt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(-(c*d) + b*e)^(5/2) + ((48*A*c^
2*d^2 + 12*b*c*d*(-2*B*d + A*e) + b^2*e*(-4*B*d + 3*A*e))*ArcTanh[Sqrt[d +
 e*x]/Sqrt[d]])/d^(5/2))/b^5
```

Rubi [A] (verified)

Time = 1.78 (sec) , antiderivative size = 447, normalized size of antiderivative = 1.07, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = $\{1235, 27, 1235, 27, 1197, 27, 1480, 221\}$

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

$$\int \frac{A+Bx}{(bx+cx^2)^3\sqrt{d+ex}}dx$$

$$\Big\downarrow \ 1235$$

$$-\frac{\int \frac{e(4Bd-3Ae)b^2-cd(6Bd+7Ae)b+12Ac^2d^2-5ce(bBd-2Acd+Abe)x}{2\sqrt{d+ex}(cx^2+bx)^2}dx}{2b^2d(cd-be)}-\frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d\left(bx+cx^2\right)^2(cd-be)}$$

$$\Big\downarrow \ 27$$

$$-\frac{\int \frac{e(4Bd-3Ae)b^2-cd(6Bd+7Ae)b+12Ac^2d^2-5ce(bBd-2Acd+Abe)x}{\sqrt{d+ex}(cx^2+bx)^2}dx}{4b^2d(cd-be)}-\frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d\left(bx+cx^2\right)^2(cd-be)}$$

$$\Big\downarrow \ 1235$$

$$-\frac{-\frac{\int \frac{\left(-e(4Bd-3Ae)b^2-12cd(2Bd-Ae)b+48Ac^2d^2\right)(cd-be)^2+ce\left(-e^2(4Bd-3Ae)b^3+cde(19Bd+6Ae)b^2-12c^2d^2(Bd+3Ae)b+24Ac^3d^3\right)x}{2\sqrt{d+ex}\left(cx^2+bx\right)}dx}{b^2d(cd-be)}-\frac{\sqrt{d+ex}(b\cdots}{\cdots}}{4b^2d(cd-\cdots}-\frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d\left(bx+cx^2\right)^2(cd-be)}$$

$$\Big\downarrow \ 27$$

$$-\frac{-\frac{\int \frac{\left(-e(4Bd-3Ae)b^2-12cd(2Bd-Ae)b+48Ac^2d^2\right)(cd-be)^2+ce\left(-e^2(4Bd-3Ae)b^3+cde(19Bd+6Ae)b^2-12c^2d^2(Bd+3Ae)b+24Ac^3d^3\right)x}{\sqrt{d+ex}\left(cx^2+bx\right)}dx}{2b^2d(cd-be)}-\frac{\sqrt{d+ex}(b\cdots}{\cdots}}{4b^2d(cd-\cdots}-\frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d\left(bx+cx^2\right)^2(cd-be)}$$

$$\Big\downarrow \ 1197$$

$$-\frac{-\frac{\int \frac{e\left(-e^3(4Bd-3Ae)b^4-3cde^2(4Bd-Ae)b^3+c^2d^2e(25Bd+21Ae)b^2-12c^3d^3(Bd+4Ae)b+24Ac^4d^4+c\left(-e^2(4Bd-3Ae)b^3+cde(19Bd+6Ae)b^2-12c^2d^2(Bd+3\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{b^2d(cd-be)}}{}$$

$$\frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d\left(bx+cx^2\right)^2(cd-be)}$$

$$\Big\downarrow \ 27$$

$$-\frac{-\frac{e\int \frac{-e^3(4Bd-3Ae)b^4-3cde^2(4Bd-Ae)b^3+c^2d^2e(25Bd+21Ae)b^2-12c^3d^3(Bd+4Ae)b+24Ac^4d^4+c\left(-e^2(4Bd-3Ae)b^3+cde(19Bd+6Ae)b^2-12c^2d^2(Bd+3\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{b^2d(cd-be)}}{}$$

$$\frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d\left(bx+cx^2\right)^2(cd-be)}$$

$$\Big\downarrow \ 1480$$

$$-\frac{-\frac{e\left(\frac{c(cd-be)^2\left(b^2(-e)(4Bd-3Ae)-12bcd(2Bd-Ae)+48Ac^2d^2\right)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}-\frac{c^2d^2\left(7b^2ce(9Ae+8Bd)-12bc^2d(9Ae+2Bd)+48Ac^3d^2-35b^3Be^2\right)}{be}\right.}{b^2d(cd-be)}}{}$$

$$\frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d\left(bx+cx^2\right)^2(cd-be)}$$

$$\Big\downarrow \ 221$$

$$-\frac{-\frac{e\left(\frac{c^{3/2}d^2\left(7b^2ce(9Ae+8Bd)-12bc^2d(9Ae+2Bd)+48Ac^3d^2-35b^3Be^2\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{be\sqrt{cd-be}}-\frac{\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)^2\left(b^2(-e)(4Bd-3Ae)-12\right.}{b\sqrt{d}e}\right.}{b^2d(cd-be)}}{}$$

$$\frac{\sqrt{d+ex}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d\left(bx+cx^2\right)^2(cd-be)}$$

input

```
Int[(A + B*x)/(Sqrt[d + e*x]*(b*x + c*x^2)^3),x]
```

output
```
-1/2*(Sqrt[d + e*x]*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x))/(b^
2*d*(c*d - b*e)*(b*x + c*x^2)^2) - (-((Sqrt[d + e*x]*(b*(c*d - b*e)*(12*A*
c^2*d^2 + b^2*e*(4*B*d - 3*A*e) - b*c*d*(6*B*d + 7*A*e)) + c*(24*A*c^3*d^3
 - b^3*e^2*(4*B*d - 3*A*e) - 12*b*c^2*d^2*(B*d + 3*A*e) + b^2*c*d*e*(19*B*
d + 6*A*e))*x))/(b^2*d*(c*d - b*e)*(b*x + c*x^2))) - (e*(-(((c*d - b*e)^2*
(48*A*c^2*d^2 - b^2*e*(4*B*d - 3*A*e) - 12*b*c*d*(2*B*d - A*e))*ArcTanh[Sq
rt[d + e*x]/Sqrt[d]])/(b*Sqrt[d]*e)) + (c^(3/2)*d^2*(48*A*c^3*d^2 - 35*b^3
*B*e^2 - 12*b*c^2*d*(2*B*d + 9*A*e) + 7*b^2*c*e*(8*B*d + 9*A*e))*ArcTanh[(
Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*e*Sqrt[c*d - b*e])))/(b^2*d*(c
*d - b*e)))/(4*b^2*d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.43 (sec) , antiderivative size = 379, normalized size of antiderivative = 0.91

method	result
risch	$-\frac{\sqrt{ex+d}\,(-3Abex-12cxAd+4Bbdx+2Abd)}{4d^2b^4x^2}+\frac{e\left(-\frac{\left(3A\,b^2e^2+12Abcde+48A\,c^2d^2-4B\,b^2de-24Bbc\,d^2\right)\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{be\sqrt{d}} \cdots\right)}{\cdots}$
derivativedivides	$2e^4\left(-\frac{\frac{-\frac{be(3Abe+12Acd-4Bbd)(ex+d)^{\frac{3}{2}}}{8d^2}+\frac{be(5Abe+12Acd-4Bbd)\sqrt{ex+d}}{8d}}{e^2x^2}+\frac{\left(3A\,b^2e^2+12Abcde+48A\,c^2d^2-4B\,b^2de-24Bbc \cdots\right.}{8d^{\frac{5}{2}}}}{b^5e^4} \cdots\right.$
default	$2e^4\left(-\frac{\frac{-\frac{be(3Abe+12Acd-4Bbd)(ex+d)^{\frac{3}{2}}}{8d^2}+\frac{be(5Abe+12Acd-4Bbd)\sqrt{ex+d}}{8d}}{e^2x^2}+\frac{\left(3A\,b^2e^2+12Abcde+48A\,c^2d^2-4B\,b^2de-24Bbc \cdots\right.}{8d^{\frac{5}{2}}}}{b^5e^4} \cdots\right.$
pseudoelliptic	$\frac{-\frac{c^2(be-cd)d^{\frac{9}{2}}x^2(cx+b)^2\left(63A\,b^2e^2c-108Ab\,c^2de+48A\,c^3d^2-35b^3B\,e^2+56B\,b^2cde-24Bb\,c^2d^2\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2}+\left(-\frac{d^2\left(\cdots\right.}{\cdots}\right.}{\cdots}$

input
```
int((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
-1/4*(e*x+d)^(1/2)*(-3*A*b*e*x-12*A*c*d*x+4*B*b*d*x+2*A*b*d)/d^2/b^4/x^2+1
/4/b^4/d^2*e*(-1/b/e*(3*A*b^2*e^2+12*A*b*c*d*e+48*A*c^2*d^2-4*B*b^2*d*e-24
*B*b*c*d^2)/d^(1/2)*arctanh((e*x+d)^(1/2)/d^(1/2))-8*c^2*d^2/b/e*((1/8*b*c
*e*(15*A*b*c*e-12*A*c^2*d-11*B*b^2*e+8*B*b*c*d)/(b^2*e^2-2*b*c*d*e+c^2*d^2
)*(e*x+d)^(3/2)+1/8*(17*A*b*c*e-12*A*c^2*d-13*B*b^2*e+8*B*b*c*d)*b*e/(b*e-
c*d)*(e*x+d)^(1/2))/((e*x+d)*c+b*e-c*d)^2+1/8*(63*A*b^2*c*e^2-108*A*b*c^2*
d*e+48*A*c^3*d^2-35*B*b^3*e^2+56*B*b^2*c*d*e-24*B*b*c^2*d^2)/(b^2*e^2-2*b*
c*d*e+c^2*d^2)/(c*(b*e-c*d))^(1/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1
/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1047 vs. $2(382) = 764$.

Time = 16.73 (sec) , antiderivative size = 4265, normalized size of antiderivative = 10.20

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^3}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**(1/2)/(c*x**2+b*x)**3,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^3,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1020 vs. 2(382) = 764.

Time = 0.26 (sec) , antiderivative size = 1020, normalized size of antiderivative = 2.44

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
1/4*(24*B*b*c^4*d^2 - 48*A*c^5*d^2 - 56*B*b^2*c^3*d*e + 108*A*b*c^4*d*e +
35*B*b^3*c^2*e^2 - 63*A*b^2*c^3*e^2)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d +
b*c*e))/((b^5*c^2*d^2 - 2*b^6*c*d*e + b^7*e^2)*sqrt(-c^2*d + b*c*e)) - 1/4
*(12*(e*x + d)^(7/2)*B*b*c^4*d^3*e - 24*(e*x + d)^(7/2)*A*c^5*d^3*e - 36*(
e*x + d)^(5/2)*B*b*c^4*d^4*e + 72*(e*x + d)^(5/2)*A*c^5*d^4*e + 36*(e*x +
d)^(3/2)*B*b*c^4*d^5*e - 72*(e*x + d)^(3/2)*A*c^5*d^5*e - 12*sqrt(e*x + d)
*B*b*c^4*d^6*e + 24*sqrt(e*x + d)*A*c^5*d^6*e - 19*(e*x + d)^(7/2)*B*b^2*c
^3*d^2*e^2 + 36*(e*x + d)^(7/2)*A*b*c^4*d^2*e^2 + 75*(e*x + d)^(5/2)*B*b^2
*c^3*d^3*e^2 - 144*(e*x + d)^(5/2)*A*b*c^4*d^3*e^2 - 93*(e*x + d)^(3/2)*B*
b^2*c^3*d^4*e^2 + 180*(e*x + d)^(3/2)*A*b*c^4*d^4*e^2 + 37*sqrt(e*x + d)*B
*b^2*c^3*d^5*e^2 - 72*sqrt(e*x + d)*A*b*c^4*d^5*e^2 + 4*(e*x + d)^(7/2)*B*
b^3*c^2*d*e^3 - 6*(e*x + d)^(7/2)*A*b^2*c^3*d*e^3 - 41*(e*x + d)^(5/2)*B*b
^3*c^2*d^2*e^3 + 73*(e*x + d)^(5/2)*A*b^2*c^3*d^2*e^3 + 74*(e*x + d)^(3/2)
*B*b^3*c^2*d^3*e^3 - 136*(e*x + d)^(3/2)*A*b^2*c^3*d^3*e^3 - 37*sqrt(e*x +
 d)*B*b^3*c^2*d^4*e^3 + 69*sqrt(e*x + d)*A*b^2*c^3*d^4*e^3 - 3*(e*x + d)^(
7/2)*A*b^3*c^2*e^4 + 8*(e*x + d)^(5/2)*B*b^4*c*d*e^4 - (e*x + d)^(5/2)*A*b
^3*c^2*d*e^4 - 24*(e*x + d)^(3/2)*B*b^4*c*d^2*e^4 + 24*(e*x + d)^(3/2)*A*b
^3*c^2*d^2*e^4 + 16*sqrt(e*x + d)*B*b^4*c*d^3*e^4 - 18*sqrt(e*x + d)*A*b^3
*c^2*d^3*e^4 - 6*(e*x + d)^(5/2)*A*b^4*c*e^5 + 4*(e*x + d)^(3/2)*B*b^5*d*e
^5 + 10*(e*x + d)^(3/2)*A*b^4*c*d*e^5 - 4*sqrt(e*x + d)*B*b^5*d^2*e^5 -...
```

Mupad [B] (verification not implemented)

Time = 16.90 (sec) , antiderivative size = 11338, normalized size of antiderivative = 27.12

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)^3*(d + e*x)^(1/2)),x)
```

output

```
log((((((c^2*e^3*(3*A*b^4*e^4 + 24*A*c^4*d^4 - 12*B*b*c^3*d^4 - 4*B*b^4*d*
e^3 + 25*B*b^2*c^2*d^3*e - 12*B*b^3*c*d^2*e^2 + 21*A*b^2*c^2*d^2*e^2 - 48*
A*b*c^3*d^3*e + 3*A*b^3*c*d*e^3))/(b^2*d^2*(b*e - c*d)^2) - b^2*c^2*e^2*(b
*e - 2*c*d)*(d + e*x)^(1/2)*((3*A*b^2*e^2 + 48*A*c^2*d^2 - 24*B*b*c*d^2 -
4*B*b^2*d*e + 12*A*b*c*d*e)^2/(b^10*d^5))^(1/2))*((3*A*b^2*e^2 + 48*A*c^2*
d^2 - 24*B*b*c*d^2 - 4*B*b^2*d*e + 12*A*b*c*d*e)^2/(b^10*d^5))^(1/2))/8 -
((d + e*x)^(1/2)*(9*A^2*b^8*c^3*e^10 + 4608*A^2*c^11*d^8*e^2 + 27360*A^2*b
^2*c^9*d^6*e^4 - 17568*A^2*b^3*c^8*d^5*e^5 + 3978*A^2*b^4*c^7*d^4*e^6 - 18
0*A^2*b^5*c^6*d^3*e^7 + 198*A^2*b^6*c^5*d^2*e^8 + 1152*B^2*b^2*c^9*d^8*e^2
 - 4800*B^2*b^3*c^8*d^7*e^3 + 7520*B^2*b^4*c^7*d^6*e^4 - 5136*B^2*b^5*c^6*
d^5*e^5 + 1129*B^2*b^6*c^5*d^4*e^6 + 128*B^2*b^7*c^4*d^3*e^7 + 16*B^2*b^8*
c^3*d^2*e^8 - 18432*A^2*b*c^10*d^7*e^3 + 36*A^2*b^7*c^4*d*e^9 - 4608*A*B*b
*c^10*d^8*e^2 - 24*A*B*b^8*c^3*d*e^9 + 18816*A*B*b^2*c^9*d^7*e^3 - 28704*A
*B*b^3*c^8*d^6*e^4 + 19008*A*B*b^4*c^7*d^5*e^5 - 4218*A*B*b^5*c^6*d^4*e^6
- 144*A*B*b^6*c^5*d^3*e^7 - 144*A*B*b^7*c^4*d^2*e^8))/(8*b^8*d^4*(b*e - c*
d)^4))*((3*A*b^2*e^2 + 48*A*c^2*d^2 - 24*B*b*c*d^2 - 4*B*b^2*d*e + 12*A*b*
c*d*e)^2/(b^10*d^5))^(1/2))/8 - (567*A^3*b^7*c^5*e^10 + 55296*A^3*c^12*d^7
*e^3 + 224640*A^3*b^2*c^10*d^5*e^5 - 77760*A^3*b^3*c^9*d^4*e^6 - 13608*A^3
*b^4*c^8*d^3*e^7 + 1404*A^3*b^5*c^7*d^2*e^8 - 6912*B^3*b^3*c^9*d^7*e^3 + 2
5920*B^3*b^4*c^8*d^6*e^4 - 33408*B^3*b^5*c^7*d^5*e^5 + 15016*B^3*b^6*c^...
```

Reduce [B] (verification not implemented)

Time = 0.32 (sec) , antiderivative size = 3571, normalized size of antiderivative = 8.54

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx+cx^2)^3}\,dx = \text{Too large to display}$$

input

```
int((B*x+A)/(e*x+d)^(1/2)/(c*x^2+b*x)^3,x)
```

output
```
( - 126*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
 c*d)))*a*b**4*c**2*d**3*e**2*x**2 + 216*sqrt(c)*sqrt(b*e - c*d)*atan((sqr
t(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**3*d**4*e*x**2 - 252*sqr
t(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b
**3*c**3*d**3*e**2*x**3 - 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c
)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**4*d**5*x**2 + 432*sqrt(c)*sqrt(b*e
- c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**4*d**4*
e*x**3 - 126*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(
b*e - c*d)))*a*b**2*c**4*d**3*e**2*x**4 - 192*sqrt(c)*sqrt(b*e - c*d)*atan
((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**5*d**5*x**3 + 216*sqr
t(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b
*c**5*d**4*e*x**4 - 96*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqr
t(c)*sqrt(b*e - c*d)))*a*c**6*d**5*x**4 + 70*sqrt(c)*sqrt(b*e - c*d)*atan(
(sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**6*c*d**3*e**2*x**2 - 112*s
qrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b
**5*c**2*d**4*e*x**2 + 140*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/
(sqrt(c)*sqrt(b*e - c*d)))*b**5*c**2*d**3*e**2*x**3 + 48*sqrt(c)*sqrt(b*e
- c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**4*c**3*d**5*x*
*2 - 224*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e
- c*d)))*b**4*c**3*d**4*e*x**3 + 70*sqrt(c)*sqrt(b*e - c*d)*atan((sqrt(...
```

3.92 $\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)^3} dx$

Optimal result

Integrand size = 26, antiderivative size = 530

$$\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)^3} dx = \frac{3e(8Ac^4d^4+b^4e^3(4Bd-5Ae)-b^3cde^2(4Bd-3Ae)-4bc^3d^3(Bd+4Ae)}{4b^4d^3(cd-be)^3\sqrt{d+ex}}$$
$$+\frac{c(12Ac^2d^2+b^2e(4Bd-5Ae)-bcd(6Bd+5Ae))}{4b^3d^2(cd-be)(b+cx)^2\sqrt{d+ex}}$$
$$-\frac{A}{2bdx^2(b+cx)^2\sqrt{d+ex}}-\frac{4bBd-8Acd-5Abe}{4b^2d^2x(b+cx)^2\sqrt{d+ex}}$$
$$+\frac{c(24Ac^3d^3-b^3e^2(4Bd-5Ae)+b^2cde(21Bd+2Ae)-12bc^2d^2(Bd+3Ae))}{4b^4d^2(cd-be)^2(b+cx)\sqrt{d+ex}}$$
$$-\frac{3(16Ac^2d^2-b^2e(4Bd-5Ae)-4bcd(2Bd-3Ae))\operatorname{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4b^5d^{7/2}}$$
$$+\frac{3c^{5/2}(16Ac^3d^2-21b^3Be^2-4bc^2d(2Bd+11Ae)+3b^2ce(8Bd+11Ae))\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{4b^5(cd-be)^{7/2}}$$

output
```
3/4*e*(8*A*c^4*d^4+b^4*e^3*(-5*A*e+4*B*d)-b^3*c*d*e^2*(-3*A*e+4*B*d)-4*b*c
^3*d^3*(4*A*e+B*d)+b^2*c^2*d^2*e*(5*A*e+9*B*d))/b^4/d^3/(-b*e+c*d)^3/(e*x+
d)^(1/2)+1/4*c*(12*A*c^2*d^2+b^2*e*(-5*A*e+4*B*d)-b*c*d*(5*A*e+6*B*d))/b^3
/d^2/(-b*e+c*d)/(c*x+b)^2/(e*x+d)^(1/2)-1/2*A/b/d/x^2/(c*x+b)^2/(e*x+d)^(1
/2)-1/4*(-5*A*b*e-8*A*c*d+4*B*b*d)/b^2/d^2/x/(c*x+b)^2/(e*x+d)^(1/2)+1/4*c
*(24*A*c^3*d^3-b^3*e^2*(-5*A*e+4*B*d)+b^2*c*d*e*(2*A*e+21*B*d)-12*b*c^2*d^
2*(3*A*e+B*d))/b^4/d^2/(-b*e+c*d)^2/(c*x+b)/(e*x+d)^(1/2)-3/4*(16*A*c^2*d^
2-b^2*e*(-5*A*e+4*B*d)-4*b*c*d*(-3*A*e+2*B*d))*arctanh((e*x+d)^(1/2)/d^(1/
2))/b^5/d^(7/2)+3/4*c^(5/2)*(16*A*c^3*d^2-21*b^3*B*e^2-4*b*c^2*d*(11*A*e+2
*B*d)+3*b^2*c*e*(11*A*e+8*B*d))*arctanh(c^(1/2)*(e*x+d)^(1/2)/(-b*e+c*d)^(
1/2))/b^5/(-b*e+c*d)^(7/2)
```

Mathematica [A] (verified)

Time = 4.51 (sec) , antiderivative size = 622, normalized size of antiderivative = 1.17

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx+cx^2\right)^3}\,dx = \frac{b(bBdx(-12c^5d^3x^2(d+ex)+4b^5e^3(d+3ex)-4b^4ce^2(3d^2+dex-6e^2x^2)+9bc^4d^2x(-2d^2+dex+3e^2x^2)+\cdots}{\cdots}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(3/2)*(b*x + c*x^2)^3),x]
```

output
```
((b*(b*B*d*x*(-12*c^5*d^3*x^2*(d + e*x) + 4*b^5*e^3*(d + 3*e*x) - 4*b^4*c*
e^2*(3*d^2 + d*e*x - 6*e^2*x^2) + 9*b*c^4*d^2*x*(-2*d^2 + d*e*x + 3*e^2*x^
2) + b^2*c^3*d*(-4*d^3 + 37*d^2*e*x + 29*d*e^2*x^2 - 12*e^3*x^3) + 4*b^3*c
^2*e*(3*d^3 - 3*d^2*e*x - 5*d*e^2*x^2 + 3*e^3*x^3)) + A*(24*c^6*d^4*x^3*(d
 + e*x) + b^6*e^3*(2*d^2 - 5*d*e*x - 15*e^2*x^2) - 12*b*c^5*d^3*x^2*(-3*d^
2 + d*e*x + 4*e^2*x^2) + b^2*c^4*d^2*x*(8*d^3 - 65*d^2*e*x - 58*d*e^2*x^2
+ 15*e^3*x^3) - b^5*c*e^2*(6*d^3 - 7*d^2*e*x + d*e^2*x^2 + 30*e^3*x^3) + b
^4*c^2*e*(6*d^4 + 9*d^3*e*x + 23*d^2*e^2*x^2 + 13*d*e^3*x^3 - 15*e^4*x^4)
+ b^3*c^3*d*(-2*d^4 - 19*d^3*e*x + 7*d^2*e^2*x^2 + 33*d*e^3*x^3 + 9*e^4*x^
4))))/(d^3*(c*d - b*e)^3*x^2*(b + c*x)^2*Sqrt[d + e*x]) + (3*c^(5/2)*(16*A
*c^3*d^2 - 21*b^3*B*e^2 - 4*b*c^2*d*(2*B*d + 11*A*e) + 3*b^2*c*e*(8*B*d +
11*A*e))*ArcTan[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[-(c*d) + b*e]])/(-(c*d) + b*e
)^(7/2) + (3*(-16*A*c^2*d^2 + b^2*e*(4*B*d - 5*A*e) + 4*b*c*d*(2*B*d - 3*A
*e))*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(7/2))/(4*b^5)
```

Rubi [A] (verified)

Time = 2.35 (sec) , antiderivative size = 572, normalized size of antiderivative = 1.08, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.346, Rules used = {1235, 27, 1235, 27, 1198, 1197, 27, 1480, 221}

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

$$\int \frac{A+Bx}{(bx+cx^2)^3 (d+ex)^{3/2}} \, dx$$

$$\Big\downarrow \ 1235$$

$$-\frac{\int \frac{e(4Bd-5Ae)b^2-cd(6Bd+5Ae)b+12Ac^2d^2-7ce(bBd-2Acd+Abe)x}{2(d+ex)^{3/2}(cx^2+bx)^2}dx}{2b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{2b^2d\,(bx+cx^2)^2\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \ 27$$

$$-\frac{\int \frac{e(4Bd-5Ae)b^2-cd(6Bd+5Ae)b+12Ac^2d^2-7ce(bBd-2Acd+Abe)x}{(d+ex)^{3/2}(cx^2+bx)^2}dx}{4b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{2b^2d\,(bx+cx^2)^2\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \ 1235$$

$$-\frac{-\frac{\int \frac{3\left(\left(-e(4Bd-5Ae)b^2-4cd(2Bd-3Ae)b+16Ac^2d^2\right)(cd-be)^2+ce\left(-e^2(4Bd-5Ae)b^3+cde(21Bd+2Ae)b^2-12c^2d^2(Bd+3Ae)b+24Ac^3d^3\right)x\right)}{2(d+ex)^{3/2}\left(cx^2+bx\right)}dx}{b^2d(cd-be)}-\frac{b(cd-b}{}}{4b^2d(cd-be}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{2b^2d\,(bx+cx^2)^2\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \ 27$$

$$-\frac{-\frac{3\int \frac{\left(-e(4Bd-5Ae)b^2-4cd(2Bd-3Ae)b+16Ac^2d^2\right)(cd-be)^2+ce\left(-e^2(4Bd-5Ae)b^3+cde(21Bd+2Ae)b^2-12c^2d^2(Bd+3Ae)b+24Ac^3d^3\right)x}{(d+ex)^{3/2}\left(cx^2+bx\right)}dx}{2b^2d(cd-be)}-\frac{b(cd-be}{}}{4b^2d(cd-be)}-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{2b^2d\,(bx+cx^2)^2\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \ 1198$$

$$-\frac{3\left(\frac{\int \frac{\left(-e(4Bd-5Ae)b^2-4cd(2Bd-3Ae)b+16Ac^2d^2\right)(cd-be)^3+ce\left(e^3(4Bd-5Ae)b^4-cde^2(4Bd-3Ae)b^3+c^2d^2e(9Bd+5Ae)b^2-4c^3d^3(Bd+4Ae)b+8Ac^4d^4\right.}{\sqrt{d+ex}\left(cx^2+bx\right)}}{d(cd-be)}\right.}{2b^2d(cd-be)}$$

$$-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{2b^2d\left(bx+cx^2\right)^2\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 1197$$

$$-\frac{3\left(\frac{2\int \frac{e\left(e^4(4Bd-5Ae)b^5-8cde^3(Bd-Ae)b^4-2c^2d^2e^2(4Bd-Ae)b^3+c^3d^3e(11Bd+12Ae)b^2-4c^4d^4(Bd+5Ae)b+8Ac^5d^5+c\left(e^3(4Bd-5Ae)b^4-cde^2(4Bd-3\right.\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{d(cd-be)}\right.}{}$$

$$-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{2b^2d\left(bx+cx^2\right)^2\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 27$$

$$-\frac{3\left(\frac{2e\int \frac{e^4(4Bd-5Ae)b^5-8cde^3(Bd-Ae)b^4-2c^2d^2e^2(4Bd-Ae)b^3+c^3d^3e(11Bd+12Ae)b^2-4c^4d^4(Bd+5Ae)b+8Ac^5d^5+c\left(e^3(4Bd-5Ae)b^4-cde^2(4Bd-3A\right.}{c(d+ex)^2-(2cd-be)(d+ex)+d(cd-be)}}{d(cd-be)}\right.}{}$$

$$-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{2b^2d\left(bx+cx^2\right)^2\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 1480$$

$$-\frac{3\left(\frac{2e\left(\frac{c(cd-be)^3\left(b^2(-e)(4Bd-5Ae)-4bcd(2Bd-3Ae)+16Ac^2d^2\right)\int \frac{1}{c(d+ex)-cd}d\sqrt{d+ex}}{be}-\frac{c^3d^3\left(3b^2ce(11Ae+8Bd)-4bc^2d(11Ae+2Bd)+16Ac^3d^2-21b^3\right.}{be}\right.}{d(cd-be)}\right.}{2b^2d(cd-be)}$$

$$-\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{2b^2d\left(bx+cx^2\right)^2\sqrt{d+ex}(cd-be)}$$

$$\Big\downarrow \; 221$$

$$- \frac{- \frac{3\left(\frac{2e\left(\frac{c^{5/2}d^3\left(3b^2ce(11Ae+8Bd)-4bc^2d(11Ae+2Bd)+16Ac^3d^2-21b^3Be^2\right)\text{arctanh}\left(\frac{\sqrt{c}\sqrt{d+ex}}{\sqrt{cd-be}}\right)}{be\sqrt{cd-be}} - \frac{\text{arctanh}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(cd-be)^3\left(b^2(-e)(4Bd-5A\ldots\right.}{b\sqrt{d}e}}{d(cd-be)}\right.}{2b^2d(cd-be)}}{\ldots}$$

$$\frac{cx(2Acd-b(Ae+Bd))+Ab(cd-be)}{2b^2d\left(bx+cx^2\right)^2\sqrt{d+ex}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^(3/2)*(b*x + c*x^2)^3),x]
```

output
```
-1/2*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x)/(b^2*d*(c*d - b*e)*
Sqrt[d + e*x]*(b*x + c*x^2)^2) - (-((b*(c*d - b*e)*(12*A*c^2*d^2 + b^2*e*(
4*B*d - 5*A*e) - b*c*d*(6*B*d + 5*A*e)) + c*(24*A*c^3*d^3 - b^3*e^2*(4*B*d
 - 5*A*e) + b^2*c*d*e*(21*B*d + 2*A*e) - 12*b*c^2*d^2*(B*d + 3*A*e))*x)/(b
^2*d*(c*d - b*e)*Sqrt[d + e*x]*(b*x + c*x^2))) - (3*((2*e*(8*A*c^4*d^4 + b
^4*e^3*(4*B*d - 5*A*e) - b^3*c*d*e^2*(4*B*d - 3*A*e) - 4*b*c^3*d^3*(B*d +
4*A*e) + b^2*c^2*d^2*e*(9*B*d + 5*A*e)))/(d*(c*d - b*e)*Sqrt[d + e*x]) + (
2*e*(-(((c*d - b*e)^3*(16*A*c^2*d^2 - b^2*e*(4*B*d - 5*A*e) - 4*b*c*d*(2*B
*d - 3*A*e))*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(b*Sqrt[d]*e)) + (c^(5/2)*d^3
*(16*A*c^3*d^2 - 21*b^3*B*e^2 - 4*b*c^2*d*(2*B*d + 11*A*e) + 3*b^2*c*e*(8*
B*d + 11*A*e))*ArcTanh[(Sqrt[c]*Sqrt[d + e*x])/Sqrt[c*d - b*e]])/(b*e*Sqrt
[c*d - b*e])))/(d*(c*d - b*e))))/(2*b^2*d*(c*d - b*e)))/(4*b^2*d*(c*d - b*
e))
```

Defintions of rubi rules used

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

rule 221
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-a/b, 2]/a)*ArcTanh[x
/Rt[-a/b, 2]], x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

rule 1197
```
Int[((f_.) + (g_.)*(x_))/(Sqrt[(d_.) + (e_.)*(x_)]*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)), x_Symbol] :> Simp[2   Subst[Int[(e*f - d*g + g*x^2)/(c*d^2 -
b*d*e + a*e^2 - (2*c*d - b*e)*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x] /; Fr
eeQ[{a, b, c, d, e, f, g}, x]
```

rule 1198
```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Simp[(e*f - d*g)*((d + e*x)^(m + 1)/((m + 1)*(c
*d^2 - b*d*e + a*e^2))), x] + Simp[1/(c*d^2 - b*d*e + a*e^2)   Int[(d + e*x
)^(m + 1)*(Simp[c*d*f - f*b*e + a*e*g - c*(e*f - d*g)*x, x]/(a + b*x + c*x^
2)), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && FractionQ[m] && LtQ[m, -1
]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1480
```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[b^2 - 4*a*c, 2]}, Simp[(e/2 + (2*c*d - b*e)/(2*q))   Int[1/(
b/2 - q/2 + c*x^2), x], x] + Simp[(e/2 - (2*c*d - b*e)/(2*q))   Int[1/(b/2
+ q/2 + c*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0]
 && NeQ[c*d^2 - a*e^2, 0] && PosQ[b^2 - 4*a*c]
```

Maple [A] (verified)

Time = 1.52 (sec) , antiderivative size = 407, normalized size of antiderivative = 0.77

method	result
risch	$-\frac{\sqrt{ex+d}\,(-7Abex-12cxAd+4Bbdx+2Abd)}{4d^3b^4x^2}+\frac{e\left(-\frac{\left(15Ab^2e^2+36Abcde+48Ac^2d^2-12Bb^2de-24Bbcd^2\right)\operatorname{arctanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)}{be\sqrt{d}}\cdots\right.}{\cdots}$
derivativedivides	$2e^4\left(-\frac{-Ae+Bd}{d^3(be-cd)^3\sqrt{ex+d}}-\frac{\frac{-\frac{eb(7Abe+12Acd-4Bbd)(ex+d)^{\frac{3}{2}}}{8}+\left(\frac{9}{8}Ab^2de^2+\frac{3}{2}Abcd^2e-\frac{1}{2}Bb^2d^2e\right)\sqrt{ex+d}}{e^2x^2}+\frac{3\left(5Ab^2e^2\cdots\right.}{\cdots}}{d^3e^4b^5}\cdots\right)$
default	$2e^4\left(-\frac{-Ae+Bd}{d^3(be-cd)^3\sqrt{ex+d}}-\frac{\frac{-\frac{eb(7Abe+12Acd-4Bbd)(ex+d)^{\frac{3}{2}}}{8}+\left(\frac{9}{8}Ab^2de^2+\frac{3}{2}Abcd^2e-\frac{1}{2}Bb^2d^2e\right)\sqrt{ex+d}}{e^2x^2}+\frac{3\left(5Ab^2e^2\cdots\right.}{\cdots}}{d^3e^4b^5}\cdots\right)$
pseudoelliptic	$\frac{\frac{3c^3d^{\frac{7}{2}}x^2(cx+b)^2\sqrt{ex+d}\left(33Ab^2e^2c-44Abc^2de+16Ac^3d^2-21b^3Be^2+24Bb^2cde-8Bbc^2d^2\right)\arctan\left(\frac{c\sqrt{ex+d}}{\sqrt{c(be-cd)}}\right)}{2}+\left(-\frac{3\left(5Ab^2\cdots\right.}{\cdots}\right.\cdots}{\cdots}$

input
```
int((B*x+A)/(e*x+d)^(3/2)/(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
-1/4*(e*x+d)^(1/2)*(-7*A*b*e*x-12*A*c*d*x+4*B*b*d*x+2*A*b*d)/d^3/b^4/x^2+1
/4/b^4/d^3*e*(-(15*A*b^2*e^2+36*A*b*c*d*e+48*A*c^2*d^2-12*B*b^2*d*e-24*B*b
*c*d^2)/b/e/d^(1/2)*arctanh((e*x+d)^(1/2)/d^(1/2))+8*d^3*c^3/(b*e-c*d)^3/b
/e*(((19/8*A*b^2*c^2*e^2-3/2*A*b*c^3*d*e-15/8*B*b^3*c*e^2+B*b^2*c^2*d*e)*(
e*x+d)^(3/2)+1/8*b*e*(21*A*b^2*c*e^2-33*A*b*c^2*d*e+12*A*c^3*d^2-17*B*b^3*
e^2+25*B*b^2*c*d*e-8*B*b*c^2*d^2)*(e*x+d)^(1/2))/((e*x+d)*c+b*e-c*d)^2+3/8
*(33*A*b^2*c*e^2-44*A*b*c^2*d*e+16*A*c^3*d^2-21*B*b^3*e^2+24*B*b^2*c*d*e-8
*B*b*c^2*d^2)/(c*(b*e-c*d))^(1/2)*arctan(c*(e*x+d)^(1/2)/(c*(b*e-c*d))^(1/
2)))+8*b^4*e^3*(A*e-B*d)/(b*e-c*d)^3/(e*x+d)^(1/2))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1821 vs. $2(490) = 980$.

Time = 58.10 (sec) , antiderivative size = 7357, normalized size of antiderivative = 13.88

$$\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)^3}\,dx = \text{Too large to display}$$

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

output
```
Too large to include
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)^3}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**(3/2)/(c*x**2+b*x)**3,x)
```

output
```
Timed out
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^{3/2}(bx+cx^2)^3}\,dx = \text{Exception raised: ValueError}$$

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

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1291 vs. $2(490) = 980$.

Time = 0.28 (sec) , antiderivative size = 1291, normalized size of antiderivative = 2.44

$$\int \frac{A + Bx}{(d + ex)^{3/2} (bx + cx^2)^3} \, dx = \text{Too large to display}$$

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

output
```
3/4*(8*B*b*c^5*d^2 - 16*A*c^6*d^2 - 24*B*b^2*c^4*d*e + 44*A*b*c^5*d*e + 21
*B*b^3*c^3*e^2 - 33*A*b^2*c^4*e^2)*arctan(sqrt(e*x + d)*c/sqrt(-c^2*d + b*
c*e))/((b^5*c^3*d^3 - 3*b^6*c^2*d^2*e + 3*b^7*c*d*e^2 - b^8*e^3)*sqrt(-c^2
*d + b*c*e)) + 2*(B*d*e^4 - A*e^5)/((c^3*d^6 - 3*b*c^2*d^5*e + 3*b^2*c*d^4
*e^2 - b^3*d^3*e^3)*sqrt(e*x + d)) - 1/4*(12*(e*x + d)^(7/2)*B*b*c^5*d^4*e
 - 24*(e*x + d)^(7/2)*A*c^6*d^4*e - 36*(e*x + d)^(5/2)*B*b*c^5*d^5*e + 72*
(e*x + d)^(5/2)*A*c^6*d^5*e + 36*(e*x + d)^(3/2)*B*b*c^5*d^6*e - 72*(e*x +
 d)^(3/2)*A*c^6*d^6*e - 12*sqrt(e*x + d)*B*b*c^5*d^7*e + 24*sqrt(e*x + d)*
A*c^6*d^7*e - 27*(e*x + d)^(7/2)*B*b^2*c^4*d^3*e^2 + 48*(e*x + d)^(7/2)*A*
b*c^5*d^3*e^2 + 99*(e*x + d)^(5/2)*B*b^2*c^4*d^4*e^2 - 180*(e*x + d)^(5/2)
*A*b*c^5*d^4*e^2 - 117*(e*x + d)^(3/2)*B*b^2*c^4*d^5*e^2 + 216*(e*x + d)^(
3/2)*A*b*c^5*d^5*e^2 + 45*sqrt(e*x + d)*B*b^2*c^4*d^6*e^2 - 84*sqrt(e*x +
d)*A*b*c^5*d^6*e^2 + 12*(e*x + d)^(7/2)*B*b^3*c^3*d^2*e^3 - 15*(e*x + d)^(
7/2)*A*b^2*c^4*d^2*e^3 - 77*(e*x + d)^(5/2)*B*b^3*c^3*d^3*e^3 + 118*(e*x +
 d)^(5/2)*A*b^2*c^4*d^3*e^3 + 122*(e*x + d)^(3/2)*B*b^3*c^3*d^4*e^3 - 199*
(e*x + d)^(3/2)*A*b^2*c^4*d^4*e^3 - 57*sqrt(e*x + d)*B*b^3*c^3*d^5*e^3 + 9
6*sqrt(e*x + d)*A*b^2*c^4*d^5*e^3 - 4*(e*x + d)^(7/2)*B*b^4*c^2*d*e^4 - 9*
(e*x + d)^(7/2)*A*b^3*c^3*d*e^4 + 36*(e*x + d)^(5/2)*B*b^4*c^2*d^2*e^4 + 3
*(e*x + d)^(5/2)*A*b^3*c^3*d^2*e^4 - 72*(e*x + d)^(3/2)*B*b^4*c^2*d^3*e^4
+ 38*(e*x + d)^(3/2)*A*b^3*c^3*d^3*e^4 + 40*sqrt(e*x + d)*B*b^4*c^2*d^4...
```

Mupad [B] (verification not implemented)

Time = 19.47 (sec) , antiderivative size = 23541, normalized size of antiderivative = 44.42

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx+cx^2\right)^3}\,dx = \text{Too large to display}$$

input
```
int((A + B*x)/((b*x + c*x^2)^3*(d + e*x)^(3/2)),x)
```

output
```
- ((2*(A*e^5 - B*d*e^4))/(c*d^2 - b*d*e) + ((d + e*x)^2*(15*A*b^6*e^7 - 72
*A*c^6*d^6*e - 12*B*b^6*d*e^6 + 216*A*b*c^5*d^5*e^2 + 76*B*b^5*c*d^2*e^5 -
 199*A*b^2*c^4*d^4*e^3 + 38*A*b^3*c^3*d^3*e^4 + 106*A*b^4*c^2*d^2*e^5 - 11
7*B*b^2*c^4*d^5*e^2 + 122*B*b^3*c^3*d^4*e^3 - 120*B*b^4*c^2*d^3*e^4 - 89*A
*b^5*c*d*e^6 + 36*B*b*c^5*d^6*e))/(4*b^4*(c*d^2 - b*d*e)^3) + ((d + e*x)^3
*(30*A*b^5*c*e^6 + 72*A*c^6*d^5*e - 180*A*b*c^5*d^4*e^2 - 73*A*b^4*c^2*d*e
^5 + 118*A*b^2*c^4*d^3*e^3 + 3*A*b^3*c^3*d^2*e^4 + 99*B*b^2*c^4*d^4*e^2 -
77*B*b^3*c^3*d^3*e^3 + 68*B*b^4*c^2*d^2*e^4 - 36*B*b*c^5*d^5*e - 24*B*b^5*
c*d*e^5))/(4*b^4*(c*d^2 - b*d*e)^3) + ((d + e*x)*(25*A*b^5*e^6 + 24*A*c^5*
d^5*e - 20*B*b^5*d*e^5 - 60*A*b*c^4*d^4*e^2 + 48*B*b^4*c*d^2*e^4 + 36*A*b^
2*c^3*d^3*e^3 + 6*A*b^3*c^2*d^2*e^4 + 33*B*b^2*c^3*d^4*e^2 - 24*B*b^3*c^2*
d^3*e^3 - 56*A*b^4*c*d*e^5 - 12*B*b*c^4*d^5*e))/(4*b^4*(c*d^2 - b*d*e)^2)
- (3*(d + e*x)^4*(8*A*c^6*d^4*e - 5*A*b^4*c^2*e^5 - 16*A*b*c^5*d^3*e^2 + 3
*A*b^3*c^3*d*e^4 + 4*B*b^4*c^2*d*e^4 + 5*A*b^2*c^4*d^2*e^3 + 9*B*b^2*c^4*d
^3*e^2 - 4*B*b^3*c^3*d^2*e^3 - 4*B*b*c^5*d^4*e))/(4*b^4*(c*d^2 - b*d*e)^3)
)/(c^2*(d + e*x)^(9/2) - (4*c^2*d - 2*b*c*e)*(d + e*x)^(7/2) - (d + e*x)^(
3/2)*(4*c^2*d^3 + 2*b^2*d*e^2 - 6*b*c*d^2*e) + (d + e*x)^(5/2)*(b^2*e^2 +
6*c^2*d^2 - 6*b*c*d*e) + (d + e*x)^(1/2)*(c^2*d^4 + b^2*d^2*e^2 - 2*b*c*d^
3*e)) - atan(-(((d + e*x)^(1/2)*(589824*A^2*b^12*c^22*d^28*e^2 - 8257536*A
^2*b^13*c^21*d^27*e^3 + 53342208*A^2*b^14*c^20*d^26*e^4 - 210382848*A^2...
```

Reduce [B] (verification not implemented)

Time = 0.34 (sec) , antiderivative size = 4744, normalized size of antiderivative = 8.95

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx+cx^2\right)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(3/2)/(c*x^2+b*x)^3,x)
```

output
```
(198*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)
*sqrt(b*e - c*d)))*a*b**4*c**3*d**4*e**2*x**2 - 264*sqrt(c)*sqrt(d + e*x)*
sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c
**4*d**5*e*x**2 + 396*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d +
 e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**3*c**4*d**4*e**2*x**3 + 96*sqrt(c
)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e -
 c*d)))*a*b**2*c**5*d**6*x**2 - 528*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*
atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b**2*c**5*d**5*e*x**3
+ 198*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c
)*sqrt(b*e - c*d)))*a*b**2*c**5*d**4*e**2*x**4 + 192*sqrt(c)*sqrt(d + e*x)
*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**
6*d**6*x**3 - 264*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x
)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*b*c**6*d**5*e*x**4 + 96*sqrt(c)*sqrt(d +
 e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*a*
c**7*d**6*x**4 - 126*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d +
e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**6*c**2*d**4*e**2*x**2 + 144*sqrt(c)*
sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c
*d)))*b**5*c**3*d**5*e*x**2 - 252*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*at
an((sqrt(d + e*x)*c)/(sqrt(c)*sqrt(b*e - c*d)))*b**5*c**3*d**4*e**2*x**3 -
 48*sqrt(c)*sqrt(d + e*x)*sqrt(b*e - c*d)*atan((sqrt(d + e*x)*c)/(sqrt(...
```

3.93 $\int (A+Bx)(d+ex)^3\sqrt{bx+cx^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 506

$$\int (A+Bx)(d+ex)^3\sqrt{bx+cx^2}\,dx$$

$$= \frac{b(128Ac^4d^3+21b^4Be^3+120b^2c^2de(Bd+Ae)-28b^3ce^2(3Bd+Ae)-64bc^3d^2(Bd+3Ae))\sqrt{bx+cx^2}}{512c^5}$$

$$+\frac{(128Ac^4d^3+21b^4Be^3+120b^2c^2de(Bd+Ae)-28b^3ce^2(3Bd+Ae)-64bc^3d^2(Bd+3Ae))\,x\sqrt{bx+c}}{256c^4}$$

$$+\frac{(4Ace(48c^2d^2-30bcde+7b^2e^2)+B(64c^3d^3-120bc^2d^2e+84b^2cde^2-21b^3e^3))\,(bx+cx^2)^{3/2}}{192c^4}$$

$$+\frac{e(4Ace(30cd-7be)+3B(40c^2d^2-28bcde+7b^2e^2))\,x(bx+cx^2)^{3/2}}{160c^3}$$

$$+\frac{e^2(12Bcd-3bBe+4Ace)x^2(bx+cx^2)^{3/2}}{20c^2}+\frac{Be^3x^3(bx+cx^2)^{3/2}}{6c}$$

$$-\frac{b^2(128Ac^4d^3+21b^4Be^3+120b^2c^2de(Bd+Ae)-28b^3ce^2(3Bd+Ae)-64bc^3d^2(Bd+3Ae))\operatorname{arctanh}}{512c^{11/2}}$$

output
```
1/512*b*(128*A*c^4*d^3+21*b^4*B*e^3+120*b^2*c^2*d*e*(A*e+B*d)-28*b^3*c*e^2
*(A*e+3*B*d)-64*b*c^3*d^2*(3*A*e+B*d))*(c*x^2+b*x)^(1/2)/c^5+1/256*(128*A*
c^4*d^3+21*b^4*B*e^3+120*b^2*c^2*d*e*(A*e+B*d)-28*b^3*c*e^2*(A*e+3*B*d)-64
*b*c^3*d^2*(3*A*e+B*d))*x*(c*x^2+b*x)^(1/2)/c^4+1/192*(4*A*c*e*(7*b^2*e^2-
30*b*c*d*e+48*c^2*d^2)+B*(-21*b^3*e^3+84*b^2*c*d*e^2-120*b*c^2*d^2*e+64*c^
3*d^3))*(c*x^2+b*x)^(3/2)/c^4+1/160*e*(4*A*c*e*(-7*b*e+30*c*d)+3*B*(7*b^2*
e^2-28*b*c*d*e+40*c^2*d^2))*x*(c*x^2+b*x)^(3/2)/c^3+1/20*e^2*(4*A*c*e-3*B*
b*e+12*B*c*d)*x^2*(c*x^2+b*x)^(3/2)/c^2+1/6*B*e^3*x^3*(c*x^2+b*x)^(3/2)/c-
1/512*b^2*(128*A*c^4*d^3+21*b^4*B*e^3+120*b^2*c^2*d*e*(A*e+B*d)-28*b^3*c*e
^2*(A*e+3*B*d)-64*b*c^3*d^2*(3*A*e+B*d))*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/
2))/c^(11/2)
```

Mathematica [A] (verified)

Time = 6.56 (sec) , antiderivative size = 500, normalized size of antiderivative = 0.99

$$\int (A+Bx)(d+ex)^3\sqrt{bx+cx^2}\,dx$$
$$=\frac{\sqrt{x}\sqrt{b+cx}\left(\sqrt{c}\sqrt{x}\sqrt{b+cx}(315b^5Be^3-210b^4ce^2(6Bd+2Ae+Bex)+8b^3c^2e(5Ae(45d+7ex)+3B(7\right.}{}$$

input
```
Integrate[(A + B*x)*(d + e*x)^3*Sqrt[b*x + c*x^2],x]
```

output
```
(Sqrt[x]*Sqrt[b + c*x]*(Sqrt[c]*Sqrt[x]*Sqrt[b + c*x]*(315*b^5*B*e^3 - 210
*b^4*c*e^2*(6*B*d + 2*A*e + B*e*x) + 8*b^3*c^2*e*(5*A*e*(45*d + 7*e*x) + 3
*B*(75*d^2 + 35*d*e*x + 7*e^2*x^2)) + 64*b*c^4*(3*A*(10*d^3 + 10*d^2*e*x +
 5*d*e^2*x^2 + e^3*x^3) + B*x*(10*d^3 + 15*d^2*e*x + 9*d*e^2*x^2 + 2*e^3*x
^3)) - 16*b^2*c^3*(A*e*(180*d^2 + 75*d*e*x + 14*e^2*x^2) + B*(60*d^3 + 75*
d^2*e*x + 42*d*e^2*x^2 + 9*e^3*x^3)) + 128*c^5*x*(3*A*(10*d^3 + 20*d^2*e*x
 + 15*d*e^2*x^2 + 4*e^3*x^3) + B*x*(20*d^3 + 45*d^2*e*x + 36*d*e^2*x^2 + 1
0*e^3*x^3))) + 30*b^2*(3*b^2*B*e*(40*c^2*d^2 + 7*b^2*e^2) + 8*A*(16*c^4*d^
3 + 15*b^2*c^2*d*e^2))*ArcTanh[(Sqrt[c]*Sqrt[x])/(Sqrt[b] - Sqrt[b + c*x])
] + 120*b^3*c*(16*B*c^2*d^3 + 48*A*c^2*d^2*e + 21*b^2*B*d*e^2 + 7*A*b^2*e^
3)*ArcTanh[(Sqrt[c]*Sqrt[x])/(-Sqrt[b] + Sqrt[b + c*x])]))/(7680*c^(11/2)*
Sqrt[x*(b + c*x)])
```

Rubi [F]

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

$$\int (A+Bx)\sqrt{bx+cx^2}(d+ex)^3\,dx$$

$$\Big\downarrow \text{ 1236}$$

$$\frac{\int -\frac{3}{2}(d+ex)^2((bB-4Ac)d-(2Bcd-3bBe+4Ace)x)\sqrt{cx^2+bx}dx}{6c}+\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}$$

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

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\int (d+ex)^2((bB-4Ac)d-(2Bcd-3bBe+4Ace)x)\sqrt{cx^2+bx}dx}{4c}$$

$$\Big\downarrow \text{ 1236}$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\frac{\int \frac{1}{2}(d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}dx}{5c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac}{5c}}{4c}$$

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

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac}{5c}}{4c}$$

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

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)}{}}{4c}$$

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

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac}{5c}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)}{}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac}{5c}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)}{}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac}{5c}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)}{}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac\cdots}{5c}}{4c}$$

$\downarrow$ 25

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)\cdots}{\cdots}}{4c}$$

$\downarrow$ 25

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac\cdots}{5c}}{4c}$$

$\downarrow$ 25

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)\cdots}{\cdots}}{4c}$$

$\downarrow$ 25

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac\cdots}{5c}}{4c}$$

$\downarrow$ 25

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)\cdots}{\cdots}}{4c}$$

$\downarrow$ 25

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac\cdots}{5c}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)\cdots}{}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac\cdots}{5c}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)\cdots}{}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac\cdots}{5c}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)\cdots}{}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4A\cdots}{5c}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)\cdots}{}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4A\cdots}{5c}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)\cdots}{}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4A\cdots}{5c}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-$$
$$\frac{-\frac{\int -\left((d+ex)\left(d\left(-9Beb^2+16Bcdb+12Aceb-40Ac^2d\right)-\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)\cdots}{}}{4c}$$

$$\Big\downarrow \; 25$$

$$\frac{\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^3}{6c}-\frac{\frac{\int -\left((d+ex)\left(d\left(9Beb^2-4c(4Bd+3Ae)b+40Ac^2d\right)+\left(28Ace(2cd-be)+B\left(8c^2d^2-36bced+21b^2e^2\right)\right)x\right)\sqrt{cx^2+bx}\right)dx}{10c}-\frac{\left(bx+cx^2\right)^{3/2}(d+ex)^2(4Ac}{5c}}{4c}}{}$$

input
```
Int[(A + B*x)*(d + e*x)^3*Sqrt[b*x + c*x^2],x]
```

output
```
$Aborted
```

Defintions of rubi rules used

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

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

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

Maple [A] (verified)

Time = 1.12 (sec) , antiderivative size = 354, normalized size of antiderivative = 0.70

method	result
pseudoelliptic	$-\frac{7\left(-\left(b^{3}\left(Ac-\frac{3Bb}{4}\right)e^{3}+3d\left(-\frac{10}{7}A\,b^{2}c^{2}+B\,b^{3}c\right)e^{2}+\frac{48c^{2}d^{2}\left(Ac-\frac{5Bb}{8}\right)be}{7}-\frac{32c^{3}d^{3}\left(Ac-\frac{Bb}{2}\right)}{7}\right)b^{2}\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)+\left(\right.}{}$
risch	$-\frac{\left(-1280B\,c^{5}e^{3}x^{5}-1536A\,c^{5}e^{3}x^{4}-128Bb\,c^{4}e^{3}x^{4}-4608B\,c^{5}d\,e^{2}x^{4}-192Ab\,c^{4}e^{3}x^{3}-5760A\,c^{5}d\,e^{2}x^{3}+144B\,b^{2}c^{3}e^{3}x^{3}-57\right.}{}$
default	$A\,d^{3}\left(\frac{(2cx+b)\sqrt{c\,x^{2}+bx}}{4c}-\frac{b^{2}\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^{2}+bx}\right)}{8c^{\frac{3}{2}}}\right)+e^{2}(Ae+3Bd)\left(\frac{x^{2}\left(c\,x^{2}+bx\right)^{\frac{3}{2}}}{5c}-\frac{7b\left(\frac{x\left(c\,x^{2}+bx\right.}{4c}\right.}{}\right.$

input
```
int((B*x+A)*(e*x+d)^3*(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-7/128*(-(b^3*(A*c-3/4*B*b)*e^3+3*d*(-10/7*A*b^2*c^2+B*b^3*c)*e^2+48/7*c^2
*d^2*(A*c-5/8*B*b)*b*e-32/7*c^3*d^3*(A*c-1/2*B*b))*b^2*arctanh((x*(c*x+b))
^(1/2)/x/c^(1/2))+(-64/7*(2/5*(5/6*B*x+A)*x^3*e^3+3/2*d*(4/5*B*x+A)*x^2*e^
2+2*d^2*x*(3/4*B*x+A)*e+d^3*(2/3*B*x+A))*x*c^(11/2)+(16/7*(-1/5*x^3*(2/3*B
*x+A)*e^3-d*(3/5*B*x+A)*x^2*e^2-2*d^2*x*(1/2*B*x+A)*e-2*d^3*(1/3*B*x+A))*c
^(9/2)+(4*(2/15*(9/14*B*x+A)*x^2*e^3+5/7*d*(14/25*B*x+A)*x*e^2+12/7*d^2*(5
/12*B*x+A)*e+4/7*B*d^3)*c^(7/2)+e*(2*(-1/3*(3/5*B*x+A)*e^2*x-15/7*d*(7/15*
B*x+A)*e-15/7*B*d^2)*c^(5/2)+e*(((1/2*B*x+A)*e+3*B*d)*c^(3/2)-3/4*B*b*e*c^
(1/2))*b)*b)*b)*b)*(x*(c*x+b))^(1/2))/c^(11/2)
```

Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 1023, normalized size of antiderivative = 2.02

$$\int (A+Bx)(d+ex)^3\sqrt{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^3*(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
[1/15360*(15*(64*(B*b^3*c^3 - 2*A*b^2*c^4)*d^3 - 24*(5*B*b^4*c^2 - 8*A*b^3
*c^3)*d^2*e + 12*(7*B*b^5*c - 10*A*b^4*c^2)*d*e^2 - 7*(3*B*b^6 - 4*A*b^5*c
)*e^3)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) + 2*(1280*B*c^
6*e^3*x^5 + 128*(36*B*c^6*d*e^2 + (B*b*c^5 + 12*A*c^6)*e^3)*x^4 - 960*(B*b
^2*c^4 - 2*A*b*c^5)*d^3 + 360*(5*B*b^3*c^3 - 8*A*b^2*c^4)*d^2*e - 180*(7*B
*b^4*c^2 - 10*A*b^3*c^3)*d*e^2 + 105*(3*B*b^5*c - 4*A*b^4*c^2)*e^3 + 48*(1
20*B*c^6*d^2*e + 12*(B*b*c^5 + 10*A*c^6)*d*e^2 - (3*B*b^2*c^4 - 4*A*b*c^5)
*e^3)*x^3 + 8*(320*B*c^6*d^3 + 120*(B*b*c^5 + 8*A*c^6)*d^2*e - 12*(7*B*b^2
*c^4 - 10*A*b*c^5)*d*e^2 + 7*(3*B*b^3*c^3 - 4*A*b^2*c^4)*e^3)*x^2 + 10*(64
*(B*b*c^5 + 6*A*c^6)*d^3 - 24*(5*B*b^2*c^4 - 8*A*b*c^5)*d^2*e + 12*(7*B*b^
3*c^3 - 10*A*b^2*c^4)*d*e^2 - 7*(3*B*b^4*c^2 - 4*A*b^3*c^3)*e^3)*x)*sqrt(c
*x^2 + b*x))/c^6, -1/7680*(15*(64*(B*b^3*c^3 - 2*A*b^2*c^4)*d^3 - 24*(5*B*
b^4*c^2 - 8*A*b^3*c^3)*d^2*e + 12*(7*B*b^5*c - 10*A*b^4*c^2)*d*e^2 - 7*(3*
B*b^6 - 4*A*b^5*c)*e^3)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x +
b)) - (1280*B*c^6*e^3*x^5 + 128*(36*B*c^6*d*e^2 + (B*b*c^5 + 12*A*c^6)*e^3
)*x^4 - 960*(B*b^2*c^4 - 2*A*b*c^5)*d^3 + 360*(5*B*b^3*c^3 - 8*A*b^2*c^4)*
d^2*e - 180*(7*B*b^4*c^2 - 10*A*b^3*c^3)*d*e^2 + 105*(3*B*b^5*c - 4*A*b^4*
c^2)*e^3 + 48*(120*B*c^6*d^2*e + 12*(B*b*c^5 + 10*A*c^6)*d*e^2 - (3*B*b^2*
c^4 - 4*A*b*c^5)*e^3)*x^3 + 8*(320*B*c^6*d^3 + 120*(B*b*c^5 + 8*A*c^6)*d^2
*e - 12*(7*B*b^2*c^4 - 10*A*b*c^5)*d*e^2 + 7*(3*B*b^3*c^3 - 4*A*b^2*c^4...
```

Sympy [A] (verification not implemented)

Time = 0.82 (sec) , antiderivative size = 906, normalized size of antiderivative = 1.79

$$\int (A+Bx)(d+ex)^3\sqrt{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)**3*(c*x**2+b*x)**(1/2),x)
```

output
```
Piecewise((-b*(A*b*d**3 - 3*b*(3*A*b*d**2*e + A*c*d**3 + B*b*d**3 - 5*b*(3
*A*b*d*e**2 + 3*A*c*d**2*e + 3*B*b*d**2*e + B*c*d**3 - 7*b*(A*b*e**3 + 3*A
*c*d*e**2 + 3*B*b*d*e**2 + 3*B*c*d**2*e - 9*b*(A*c*e**3 + B*b*e**3/12 + 3*
B*c*d*e**2)/(10*c))/(8*c))/(6*c))/(4*c))*Piecewise((log(b + 2*sqrt(c)*sqrt
(b*x + c*x**2) + 2*c*x)/sqrt(c), Ne(b**2/c, 0)), ((b/(2*c) + x)*log(b/(2*c
) + x)/sqrt(c*(b/(2*c) + x)**2), True))/(2*c) + sqrt(b*x + c*x**2)*(B*e**3
*x**5/6 + x**4*(A*c*e**3 + B*b*e**3/12 + 3*B*c*d*e**2)/(5*c) + x**3*(A*b*e
**3 + 3*A*c*d*e**2 + 3*B*b*d*e**2 + 3*B*c*d**2*e - 9*b*(A*c*e**3 + B*b*e**
3/12 + 3*B*c*d*e**2)/(10*c))/(4*c) + x**2*(3*A*b*d*e**2 + 3*A*c*d**2*e + 3
*B*b*d**2*e + B*c*d**3 - 7*b*(A*b*e**3 + 3*A*c*d*e**2 + 3*B*b*d*e**2 + 3*B
*c*d**2*e - 9*b*(A*c*e**3 + B*b*e**3/12 + 3*B*c*d*e**2)/(10*c))/(8*c))/(3*
c) + x*(3*A*b*d**2*e + A*c*d**3 + B*b*d**3 - 5*b*(3*A*b*d*e**2 + 3*A*c*d**
2*e + 3*B*b*d**2*e + B*c*d**3 - 7*b*(A*b*e**3 + 3*A*c*d*e**2 + 3*B*b*d*e**
2 + 3*B*c*d**2*e - 9*b*(A*c*e**3 + B*b*e**3/12 + 3*B*c*d*e**2)/(10*c))/(8*
c))/(6*c))/(2*c) + (A*b*d**3 - 3*b*(3*A*b*d**2*e + A*c*d**3 + B*b*d**3 - 5
*b*(3*A*b*d*e**2 + 3*A*c*d**2*e + 3*B*b*d**2*e + B*c*d**3 - 7*b*(A*b*e**3
+ 3*A*c*d*e**2 + 3*B*b*d*e**2 + 3*B*c*d**2*e - 9*b*(A*c*e**3 + B*b*e**3/12
 + 3*B*c*d*e**2)/(10*c))/(8*c))/(6*c))/(4*c))/c), Ne(c, 0)), (2*(A*d**3*(b
*x)**(3/2)/3 + B*e**3*(b*x)**(11/2)/(11*b**4) + (b*x)**(5/2)*(3*A*d**2*e +
 B*d**3)/(5*b) + (b*x)**(7/2)*(3*A*d*e**2 + 3*B*d**2*e)/(7*b**2) + (b*x...
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 760, normalized size of antiderivative = 1.50

$$\int (A+Bx)(d+ex)^3\sqrt{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^3*(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
1/6*(c*x^2 + b*x)^(3/2)*B*e^3*x^3/c - 3/20*(c*x^2 + b*x)^(3/2)*B*b*e^3*x^2
/c^2 + 1/2*sqrt(c*x^2 + b*x)*A*d^3*x + 21/256*sqrt(c*x^2 + b*x)*B*b^4*e^3*
x/c^4 + 21/160*(c*x^2 + b*x)^(3/2)*B*b^2*e^3*x/c^3 - 1/8*A*b^2*d^3*log(2*c
*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(3/2) - 21/1024*B*b^6*e^3*log(2*c*
x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(11/2) + 1/4*sqrt(c*x^2 + b*x)*A*b*
d^3/c + 21/512*sqrt(c*x^2 + b*x)*B*b^5*e^3/c^5 - 7/64*(c*x^2 + b*x)^(3/2)*
B*b^3*e^3/c^4 + 1/5*(3*B*d*e^2 + A*e^3)*(c*x^2 + b*x)^(3/2)*x^2/c - 7/64*(
3*B*d*e^2 + A*e^3)*sqrt(c*x^2 + b*x)*b^3*x/c^3 - 7/40*(3*B*d*e^2 + A*e^3)*
(c*x^2 + b*x)^(3/2)*b*x/c^2 + 15/32*(B*d^2*e + A*d*e^2)*sqrt(c*x^2 + b*x)*
b^2*x/c^2 + 3/4*(B*d^2*e + A*d*e^2)*(c*x^2 + b*x)^(3/2)*x/c - 1/4*(B*d^3 +
 3*A*d^2*e)*sqrt(c*x^2 + b*x)*b*x/c + 7/256*(3*B*d*e^2 + A*e^3)*b^5*log(2*
c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(9/2) - 15/128*(B*d^2*e + A*d*e^2
)*b^4*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(7/2) + 1/16*(B*d^3 +
 3*A*d^2*e)*b^3*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(5/2) - 7/1
28*(3*B*d*e^2 + A*e^3)*sqrt(c*x^2 + b*x)*b^4/c^4 + 7/48*(3*B*d*e^2 + A*e^3
)*(c*x^2 + b*x)^(3/2)*b^2/c^3 + 15/64*(B*d^2*e + A*d*e^2)*sqrt(c*x^2 + b*x
)*b^3/c^3 - 5/8*(B*d^2*e + A*d*e^2)*(c*x^2 + b*x)^(3/2)*b/c^2 - 1/8*(B*d^3
 + 3*A*d^2*e)*sqrt(c*x^2 + b*x)*b^2/c^2 + 1/3*(B*d^3 + 3*A*d^2*e)*(c*x^2 +
 b*x)^(3/2)/c
```

Giac [A] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 534, normalized size of antiderivative = 1.06

$$\int (A+Bx)(d+ex)^3\sqrt{bx+cx^2}\,dx$$
$$= \frac{1}{7680}\sqrt{cx^2+bx}\left(2\left(4\left(2\left(8\left(10\,Be^3x+\frac{36\,Bc^5de^2+Bbc^4e^3+12\,Ac^5e^3}{c^5}\right)x+\frac{3\,(120\,Bc^5d^2e+12\,Bbc\right.\right.\right.\right.\right.$$
$$-\frac{(64\,Bb^3c^3d^3-128\,Ab^2c^4d^3-120\,Bb^4c^2d^2e+192\,Ab^3c^3d^2e+84\,Bb^5cde^2-120\,Ab^4c^2de^2-21\,Bb^6e^3+}{1024\,c^{\frac{11}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)^3*(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
1/7680*sqrt(c*x^2 + b*x)*(2*(4*(2*(8*(10*B*e^3*x + (36*B*c^5*d*e^2 + B*b*c
^4*e^3 + 12*A*c^5*e^3)/c^5)*x + 3*(120*B*c^5*d^2*e + 12*B*b*c^4*d*e^2 + 12
0*A*c^5*d*e^2 - 3*B*b^2*c^3*e^3 + 4*A*b*c^4*e^3)/c^5)*x + (320*B*c^5*d^3 +
 120*B*b*c^4*d^2*e + 960*A*c^5*d^2*e - 84*B*b^2*c^3*d*e^2 + 120*A*b*c^4*d*
e^2 + 21*B*b^3*c^2*e^3 - 28*A*b^2*c^3*e^3)/c^5)*x + 5*(64*B*b*c^4*d^3 + 38
4*A*c^5*d^3 - 120*B*b^2*c^3*d^2*e + 192*A*b*c^4*d^2*e + 84*B*b^3*c^2*d*e^2
 - 120*A*b^2*c^3*d*e^2 - 21*B*b^4*c*e^3 + 28*A*b^3*c^2*e^3)/c^5)*x - 15*(6
4*B*b^2*c^3*d^3 - 128*A*b*c^4*d^3 - 120*B*b^3*c^2*d^2*e + 192*A*b^2*c^3*d^
2*e + 84*B*b^4*c*d*e^2 - 120*A*b^3*c^2*d*e^2 - 21*B*b^5*e^3 + 28*A*b^4*c*e
^3)/c^5) - 1/1024*(64*B*b^3*c^3*d^3 - 128*A*b^2*c^4*d^3 - 120*B*b^4*c^2*d^
2*e + 192*A*b^3*c^3*d^2*e + 84*B*b^5*c*d*e^2 - 120*A*b^4*c^2*d*e^2 - 21*B*
b^6*e^3 + 28*A*b^5*c*e^3)*log(abs(2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c
) + b))/c^(11/2)
```

Mupad [B] (verification not implemented)

Time = 13.56 (sec) , antiderivative size = 827, normalized size of antiderivative = 1.63

$$\int (A+Bx)(d+ex)^3\sqrt{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
int((b*x + c*x^2)^(1/2)*(A + B*x)*(d + e*x)^3,x)
```

output
```
A*d^3*(b*x + c*x^2)^(1/2)*(x/2 + b/(4*c)) - (7*A*b*e^3*((x*(b*x + c*x^2)^(
3/2))/(4*c) - (5*b*((b^3*log((b + 2*c*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))
/(16*c^(5/2)) + ((b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3*b^2 + 2*b*c*x))/(24*c^
2)))/(8*c)))/(10*c) + (A*e^3*x^2*(b*x + c*x^2)^(3/2))/(5*c) + (B*e^3*x^3*(
b*x + c*x^2)^(3/2))/(6*c) - (A*b^2*d^3*log((b/2 + c*x)/c^(1/2) + (b*x + c*
x^2)^(1/2)))/(8*c^(3/2)) + (B*b^3*d^3*log((b + 2*c*x)/c^(1/2) + 2*(b*x + c
*x^2)^(1/2)))/(16*c^(5/2)) + (B*d^3*(b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3*b^2
 + 2*b*c*x))/(24*c^2) + (3*B*b*e^3*((7*b*((x*(b*x + c*x^2)^(3/2))/(4*c) -
(5*b*((b^3*log((b + 2*c*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5/2))
+ ((b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3*b^2 + 2*b*c*x))/(24*c^2)))/(8*c)))/(
10*c) - (x^2*(b*x + c*x^2)^(3/2))/(5*c)))/(4*c) + (3*A*b^3*d^2*e*log((b +
2*c*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5/2)) + (A*d^2*e*(b*x + c*
x^2)^(1/2)*(8*c^2*x^2 - 3*b^2 + 2*b*c*x))/(8*c^2) + (3*A*d*e^2*x*(b*x + c*
x^2)^(3/2))/(4*c) + (3*B*d^2*e*x*(b*x + c*x^2)^(3/2))/(4*c) - (15*A*b*d*e^
2*((b^3*log((b + 2*c*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5/2)) + (
(b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3*b^2 + 2*b*c*x))/(24*c^2)))/(8*c) - (15*
B*b*d^2*e*((b^3*log((b + 2*c*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5
/2)) + ((b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3*b^2 + 2*b*c*x))/(24*c^2)))/(8*c
) - (21*B*b*d*e^2*((x*(b*x + c*x^2)^(3/2))/(4*c) - (5*b*((b^3*log((b + 2*c
*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5/2)) + ((b*x + c*x^2)^(1/...
```

Reduce [F]

$$\int (A+Bx)(d+ex)^3\sqrt{bx+cx^2}\,dx = \int (Bx+A)\,(ex+d)^3\,\sqrt{c\,x^2+bx}dx$$

input
```
int((B*x+A)*(e*x+d)^3*(c*x^2+b*x)^(1/2),x)
```

output
```
int((B*x+A)*(e*x+d)^3*(c*x^2+b*x)^(1/2),x)
```

3.94 $\int (A+Bx)(d+ex)^2\sqrt{bx+cx^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 348

$$\begin{aligned}\int (A+Bx)(d+ex)^2\sqrt{bx+cx^2}\,dx &= \frac{b(32Ac^3d^2-7b^3Be^2+10b^2ce(2Bd+Ae)-16bc^2d(Bd+2Ae))\sqrt{bx+cx^2}}{128c^4}\\
&\quad+\frac{(32Ac^3d^2-7b^3Be^2+10b^2ce(2Bd+Ae)-16bc^2d(Bd+2Ae))\,x\sqrt{bx+cx^2}}{64c^3}\\
&\quad+\frac{(2Ace(16cd-5be)+B(16c^2d^2-20bcde+7b^2e^2))\,(bx+cx^2)^{3/2}}{48c^3}\\
&\quad+\frac{e(20Bcd-7bBe+10Ace)x(bx+cx^2)^{3/2}}{40c^2}+\frac{Be^2x^2(bx+cx^2)^{3/2}}{5c}\\
&\quad-\frac{b^2(32Ac^3d^2-7b^3Be^2+10b^2ce(2Bd+Ae)-16bc^2d(Bd+2Ae))\,\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{128c^{9/2}}\end{aligned}$$

output
```
1/128*b*(32*A*c^3*d^2-7*b^3*B*e^2+10*b^2*c*e*(A*e+2*B*d)-16*b*c^2*d*(2*A*e
+B*d))*(c*x^2+b*x)^(1/2)/c^4+1/64*(32*A*c^3*d^2-7*b^3*B*e^2+10*b^2*c*e*(A*
e+2*B*d)-16*b*c^2*d*(2*A*e+B*d))*x*(c*x^2+b*x)^(1/2)/c^3+1/48*(2*A*c*e*(-5
*b*e+16*c*d)+B*(7*b^2*e^2-20*b*c*d*e+16*c^2*d^2))*(c*x^2+b*x)^(3/2)/c^3+1/
40*e*(10*A*c*e-7*B*b*e+20*B*c*d)*x*(c*x^2+b*x)^(3/2)/c^2+1/5*B*e^2*x^2*(c*
x^2+b*x)^(3/2)/c-1/128*b^2*(32*A*c^3*d^2-7*b^3*B*e^2+10*b^2*c*e*(A*e+2*B*d
)-16*b*c^2*d*(2*A*e+B*d))*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(9/2)
```

Mathematica [A] (verified)

Time = 3.29 (sec) , antiderivative size = 302, normalized size of antiderivative = 0.87

$$\int (A+Bx)(d+ex)^2\sqrt{bx+cx^2}\,dx$$

$$= \frac{\sqrt{x(b+cx)}\Big(\sqrt{c}(-105b^4Be^2+10b^3ce(30Bd+15Ae+7Bex)+16bc^3(5A(6d^2+4dex+e^2x^2)+Bx(10$$

input
```
Integrate[(A + B*x)*(d + e*x)^2*Sqrt[b*x + c*x^2],x]
```

output
```
(Sqrt[x*(b + c*x)]*(Sqrt[c]*(-105*b^4*B*e^2 + 10*b^3*c*e*(30*B*d + 15*A*e
+ 7*B*e*x) + 16*b*c^3*(5*A*(6*d^2 + 4*d*e*x + e^2*x^2) + B*x*(10*d^2 + 10*
d*e*x + 3*e^2*x^2)) + 32*c^4*x*(5*A*(6*d^2 + 8*d*e*x + 3*e^2*x^2) + 2*B*x*
(10*d^2 + 15*d*e*x + 6*e^2*x^2)) - 4*b^2*c^2*(5*A*e*(24*d + 5*e*x) + 2*B*(
30*d^2 + 25*d*e*x + 7*e^2*x^2))) + (30*b^2*(-32*A*c^3*d^2 + 7*b^3*B*e^2 -
10*b^2*c*e*(2*B*d + A*e) + 16*b*c^2*d*(B*d + 2*A*e))*ArcTanh[(Sqrt[c]*Sqrt
[x])/(-Sqrt[b] + Sqrt[b + c*x])])/(Sqrt[x]*Sqrt[b + c*x])))/(1920*c^(9/2))
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.68, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {1236, 27, 1225, 1087, 1091, 219}

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

$$\int (A+Bx)\sqrt{bx+cx^2}(d+ex)^2\,dx$$

$$\Big\downarrow \ 1236$$

$$\frac{\int -\frac{1}{2}(d+ex)((3bB-10Ac)d-(4Bcd-7bBe+10Ace)x)\sqrt{cx^2+bx}dx}{5c}+\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^2}{5c}$$

$$\Big\downarrow \ 27$$

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^2}{5c}-\frac{\int (d+ex)((3bB-10Ac)d-(4Bcd-7bBe+10Ace)x)\sqrt{cx^2+bx}dx}{10c}$$

$\Big\downarrow$ 1225

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^2}{5c}-\frac{-\frac{5\left(10b^2ce(Ae+2Bd)-16bc^2d(2Ae+Bd)+32Ac^3d^2-7b^3Be^2\right)\int \sqrt{cx^2+bx}dx}{16c^2}-\frac{\left(bx+cx^2\right)^{3/2}\left(6cex(10Ace-7bBe+4Bcd)+10Ace(16cd-5be)+\right.}{24c^2}}{10c}$$

$\Big\downarrow$ 1087

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^2}{5c}-\frac{-\frac{5\left(10b^2ce(Ae+2Bd)-16bc^2d(2Ae+Bd)+32Ac^3d^2-7b^3Be^2\right)\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int \frac{1}{\sqrt{cx^2+bx}}dx}{8c}\right)}{16c^2}-\frac{\left(bx+cx^2\right)^{3/2}\left(6cex(10Ace-7bBe+4B\right.}{}}{10c}$$

$\Big\downarrow$ 1091

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^2}{5c}-\frac{-\frac{5\left(10b^2ce(Ae+2Bd)-16bc^2d(2Ae+Bd)+32Ac^3d^2-7b^3Be^2\right)\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int \frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{4c}\right)}{16c^2}-\frac{\left(bx+cx^2\right)^{3/2}\left(6cex(10Ace-7\right.}{}}{10c}$$

$\Big\downarrow$ 219

$$\frac{B\left(bx+cx^2\right)^{3/2}(d+ex)^2}{5c}-\frac{-\frac{5\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4c^{3/2}}\right)\left(10b^2ce(Ae+2Bd)-16bc^2d(2Ae+Bd)+32Ac^3d^2-7b^3Be^2\right)}{16c^2}-\frac{\left(bx+cx^2\right)^{3/2}\left(6cex(10Ace-7b\right.}{}}{10c}$$

input

```
Int[(A + B*x)*(d + e*x)^2*Sqrt[b*x + c*x^2],x]
```

output
```
(B*(d + e*x)^2*(b*x + c*x^2)^(3/2))/(5*c) - (-1/24*((10*A*c*e*(16*c*d - 5*
b*e) + 2*B*(16*c^2*d^2 - 50*b*c*d*e + (35*b^2*e^2)/2) + 6*c*e*(4*B*c*d - 7
*b*B*e + 10*A*c*e)*x)*(b*x + c*x^2)^(3/2))/c^2 - (5*(32*A*c^3*d^2 - 7*b^3*
B*e^2 + 10*b^2*c*e*(2*B*d + A*e) - 16*b*c^2*d*(B*d + 2*A*e))*(((b + 2*c*x)
*Sqrt[b*x + c*x^2])/(4*c) - (b^2*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(
4*c^(3/2))))/(16*c^2))/(10*c)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1087
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(b + 2*c*x)
*((a + b*x + c*x^2)^p/(2*c*(2*p + 1))), x] - Simp[p*((b^2 - 4*a*c)/(2*c*(2*
p + 1)))   Int[(a + b*x + c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] &&
GtQ[p, 0] && (IntegerQ[4*p] || IntegerQ[3*p])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

Maple [A] (verified)

Time = 1.09 (sec) , antiderivative size = 239, normalized size of antiderivative = 0.69

method	result
pseudoelliptic	$-\frac{5\left(-\frac{7b^3Be^2}{10}+b^2ce(Ae+2Bd)-\frac{16c^2d\left(Ae+\frac{Bd}{2}\right)b}{5}+\frac{16Ac^3d^2}{5}\right)b^2\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)}{64}+\frac{5\left(\frac{16b\left(\frac{\left(\frac{3Bx}{5}+A\right)x^2e^2}{6}+\frac{2dx\left(\frac{Bx}{2}+A\right)e}{3}\right.}{5}\right.}{}$
risch	$(384Bc^4e^2x^4+480Ac^4e^2x^3+48Bbc^3e^2x^3+960Bc^4dex^3+80Abc^3e^2x^2+1280Ac^4dex^2-56Bb^2c^2e^2x^2+160Bbc^3dex^2+$
default	$Ad^2\left(\frac{(2cx+b)\sqrt{cx^2+bx}}{4c}-\frac{b^2\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{cx^2+bx}\right)}{8c^{\frac{3}{2}}}\right)+e(Ae+2Bd)\left(\frac{x(cx^2+bx)^{\frac{3}{2}}}{4c}-\frac{5b\left(\frac{(cx^2+bx)^{\frac{3}{2}}}{3c}\right.}{}\right.$

input
```
int((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
5/64/c^(9/2)*(-(-7/10*b^3*B*e^2+b^2*c*e*(A*e+2*B*d)-16/5*c^2*d*(A*e+1/2*B*
d)*b+16/5*A*c^3*d^2)*b^2*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))+(16/5*b*(1/6
*(3/5*B*x+A)*x^2*e^2+2/3*d*x*(1/2*B*x+A)*e+d^2*(1/3*B*x+A))*c^(7/2)+32/5*x
*(1/2*(4/5*B*x+A)*x^2*e^2+4/3*d*x*(3/4*B*x+A)*e+d^2*(2/3*B*x+A))*c^(9/2)+(
(-2/3*(14/25*B*x+A)*x*e^2-16/5*d*(5/12*B*x+A)*e-8/5*B*d^2)*c^(5/2)+(((7/15
*B*x+A)*e+2*B*d)*c^(3/2)-7/10*B*b*e*c^(1/2))*e*b)*b^2)*(x*(c*x+b))^(1/2))
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 685, normalized size of antiderivative = 1.97

$$\int (A+Bx)(d+ex)^2\sqrt{bx+cx^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
[-1/3840*(15*(16*(B*b^3*c^2 - 2*A*b^2*c^3)*d^2 - 4*(5*B*b^4*c - 8*A*b^3*c^
2)*d*e + (7*B*b^5 - 10*A*b^4*c)*e^2)*sqrt(c)*log(2*c*x + b - 2*sqrt(c*x^2
+ b*x)*sqrt(c)) - 2*(384*B*c^5*e^2*x^4 + 48*(20*B*c^5*d*e + (B*b*c^4 + 10*
A*c^5)*e^2)*x^3 - 240*(B*b^2*c^3 - 2*A*b*c^4)*d^2 + 60*(5*B*b^3*c^2 - 8*A*
b^2*c^3)*d*e - 15*(7*B*b^4*c - 10*A*b^3*c^2)*e^2 + 8*(80*B*c^5*d^2 + 20*(B
*b*c^4 + 8*A*c^5)*d*e - (7*B*b^2*c^3 - 10*A*b*c^4)*e^2)*x^2 + 10*(16*(B*b*
c^4 + 6*A*c^5)*d^2 - 4*(5*B*b^2*c^3 - 8*A*b*c^4)*d*e + (7*B*b^3*c^2 - 10*A
*b^2*c^3)*e^2)*x)*sqrt(c*x^2 + b*x))/c^5, -1/1920*(15*(16*(B*b^3*c^2 - 2*A
*b^2*c^3)*d^2 - 4*(5*B*b^4*c - 8*A*b^3*c^2)*d*e + (7*B*b^5 - 10*A*b^4*c)*e
^2)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) - (384*B*c^5*e^2
*x^4 + 48*(20*B*c^5*d*e + (B*b*c^4 + 10*A*c^5)*e^2)*x^3 - 240*(B*b^2*c^3 -
 2*A*b*c^4)*d^2 + 60*(5*B*b^3*c^2 - 8*A*b^2*c^3)*d*e - 15*(7*B*b^4*c - 10*
A*b^3*c^2)*e^2 + 8*(80*B*c^5*d^2 + 20*(B*b*c^4 + 8*A*c^5)*d*e - (7*B*b^2*c
^3 - 10*A*b*c^4)*e^2)*x^2 + 10*(16*(B*b*c^4 + 6*A*c^5)*d^2 - 4*(5*B*b^2*c^
3 - 8*A*b*c^4)*d*e + (7*B*b^3*c^2 - 10*A*b^2*c^3)*e^2)*x)*sqrt(c*x^2 + b*x
))/c^5]
```

Sympy [A] (verification not implemented)

Time = 0.77 (sec) , antiderivative size = 578, normalized size of antiderivative = 1.66

$$\int (A+Bx)(d+ex)^2\sqrt{bx+cx^2}\,dx$$

$$= \begin{cases} -\frac{b\left(Abd^2-\frac{3b\left(2Abde+Acd^2+Bbd^2-\frac{5b\left(Abe^2+2Acde+2Bbde+Bcd^2-\frac{7b\left(Ace^2+\frac{Bbe^2}{10}+2Bcde\right)}{8c}\right)}{6c}\right)}{4c}\right)\left(\begin{cases}\frac{\log\left(b+2\sqrt{c}\sqrt{bx+cx^2}+2cx\right)}{\sqrt{c}} & \text{for } \frac{b^2}{c} \\ \frac{\left(\frac{b}{2c}+x\right)\log\left(\frac{b}{2c}+x\right)}{\sqrt{c\left(\frac{b}{2c}+x\right)^2}} & \text{other}\end{cases}\right.}{2c} \\ \frac{2\left(\frac{Ad^2(bx)^{\frac{3}{2}}}{3}+\frac{Be^2(bx)^{\frac{9}{2}}}{9b^3}+\frac{(bx)^{\frac{5}{2}}\cdot(2Ade+Bd^2)}{5b}+\frac{(bx)^{\frac{7}{2}}(Ae^2+2Bde)}{7b^2}\right)}{b} \\ 0 \end{cases}$$

input

```
integrate((B*x+A)*(e*x+d)**2*(c*x**2+b*x)**(1/2),x)
```

output

```
Piecewise((-b*(A*b*d**2 - 3*b*(2*A*b*d*e + A*c*d**2 + B*b*d**2 - 5*b*(A*b*
e**2 + 2*A*c*d*e + 2*B*b*d*e + B*c*d**2 - 7*b*(A*c*e**2 + B*b*e**2/10 + 2*
B*c*d*e)/(8*c))/(6*c))/(4*c))*Piecewise((log(b + 2*sqrt(c)*sqrt(b*x + c*x*
*2) + 2*c*x)/sqrt(c), Ne(b**2/c, 0)), ((b/(2*c) + x)*log(b/(2*c) + x)/sqrt
(c*(b/(2*c) + x)**2), True))/(2*c) + sqrt(b*x + c*x**2)*(B*e**2*x**4/5 + x
**3*(A*c*e**2 + B*b*e**2/10 + 2*B*c*d*e)/(4*c) + x**2*(A*b*e**2 + 2*A*c*d*
e + 2*B*b*d*e + B*c*d**2 - 7*b*(A*c*e**2 + B*b*e**2/10 + 2*B*c*d*e)/(8*c))
/(3*c) + x*(2*A*b*d*e + A*c*d**2 + B*b*d**2 - 5*b*(A*b*e**2 + 2*A*c*d*e +
2*B*b*d*e + B*c*d**2 - 7*b*(A*c*e**2 + B*b*e**2/10 + 2*B*c*d*e)/(8*c))/(6*
c))/(2*c) + (A*b*d**2 - 3*b*(2*A*b*d*e + A*c*d**2 + B*b*d**2 - 5*b*(A*b*e*
*2 + 2*A*c*d*e + 2*B*b*d*e + B*c*d**2 - 7*b*(A*c*e**2 + B*b*e**2/10 + 2*B*
c*d*e)/(8*c))/(6*c))/(4*c))/c), Ne(c, 0)), (2*(A*d**2*(b*x)**(3/2)/3 + B*e
**2*(b*x)**(9/2)/(9*b**3) + (b*x)**(5/2)*(2*A*d*e + B*d**2)/(5*b) + (b*x)*
*(7/2)*(A*e**2 + 2*B*d*e)/(7*b**2))/b, Ne(b, 0)), (0, True))
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 512, normalized size of antiderivative = 1.47

$$\int (A+Bx)(d+ex)^2\sqrt{bx+cx^2}\,dx$$
$$= \frac{(cx^2+bx)^{\frac{3}{2}}Be^2x^2}{5\,c} + \frac{1}{2}\sqrt{cx^2+bx}Ad^2x - \frac{7\sqrt{cx^2+bx}Bb^3e^2x}{64\,c^3} - \frac{7\,(cx^2+bx)^{\frac{3}{2}}Bbe^2x}{40\,c^2}$$
$$- \frac{Ab^2d^2\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{8\,c^{\frac{3}{2}}} + \frac{7\,Bb^5e^2\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{256\,c^{\frac{9}{2}}}$$
$$+ \frac{\sqrt{cx^2+bx}Abd^2}{4\,c} - \frac{7\sqrt{cx^2+bx}Bb^4e^2}{128\,c^4} + \frac{7\,(cx^2+bx)^{\frac{3}{2}}Bb^2e^2}{48\,c^3}$$
$$+ \frac{5\,(2\,Bde+Ae^2)\sqrt{cx^2+bx}b^2x}{32\,c^2} + \frac{(2\,Bde+Ae^2)(cx^2+bx)^{\frac{3}{2}}x}{4\,c}$$
$$- \frac{(Bd^2+2\,Ade)\sqrt{cx^2+bx}bx}{4\,c} - \frac{5\,(2\,Bde+Ae^2)b^4\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{128\,c^{\frac{7}{2}}}$$
$$+ \frac{(Bd^2+2\,Ade)b^3\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{16\,c^{\frac{5}{2}}}$$
$$+ \frac{5\,(2\,Bde+Ae^2)\sqrt{cx^2+bx}b^3}{64\,c^3} - \frac{5\,(2\,Bde+Ae^2)(cx^2+bx)^{\frac{3}{2}}b}{24\,c^2}$$
$$- \frac{(Bd^2+2\,Ade)\sqrt{cx^2+bx}b^2}{8\,c^2} + \frac{(Bd^2+2\,Ade)(cx^2+bx)^{\frac{3}{2}}}{3\,c}$$

input
```
integrate((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
1/5*(c*x^2 + b*x)^(3/2)*B*e^2*x^2/c + 1/2*sqrt(c*x^2 + b*x)*A*d^2*x - 7/64
*sqrt(c*x^2 + b*x)*B*b^3*e^2*x/c^3 - 7/40*(c*x^2 + b*x)^(3/2)*B*b*e^2*x/c^
2 - 1/8*A*b^2*d^2*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(3/2) + 7
/256*B*b^5*e^2*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(9/2) + 1/4*
sqrt(c*x^2 + b*x)*A*b*d^2/c - 7/128*sqrt(c*x^2 + b*x)*B*b^4*e^2/c^4 + 7/48
*(c*x^2 + b*x)^(3/2)*B*b^2*e^2/c^3 + 5/32*(2*B*d*e + A*e^2)*sqrt(c*x^2 + b
*x)*b^2*x/c^2 + 1/4*(2*B*d*e + A*e^2)*(c*x^2 + b*x)^(3/2)*x/c - 1/4*(B*d^2
 + 2*A*d*e)*sqrt(c*x^2 + b*x)*b*x/c - 5/128*(2*B*d*e + A*e^2)*b^4*log(2*c*
x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(7/2) + 1/16*(B*d^2 + 2*A*d*e)*b^3*
log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(5/2) + 5/64*(2*B*d*e + A*e
^2)*sqrt(c*x^2 + b*x)*b^3/c^3 - 5/24*(2*B*d*e + A*e^2)*(c*x^2 + b*x)^(3/2)
*b/c^2 - 1/8*(B*d^2 + 2*A*d*e)*sqrt(c*x^2 + b*x)*b^2/c^2 + 1/3*(B*d^2 + 2*
A*d*e)*(c*x^2 + b*x)^(3/2)/c
```

Giac [A] (verification not implemented)

Time = 0.24 (sec) , antiderivative size = 349, normalized size of antiderivative = 1.00

$$\int (A+Bx)(d+ex)^2\sqrt{bx+cx^2}\,dx$$
$$= \frac{1}{1920}\sqrt{cx^2+bx}\left(2\left(4\left(6\left(8\,Be^2x+\frac{20\,Bc^4de+Bbc^3e^2+10\,Ac^4e^2}{c^4}\right)x+\frac{80\,Bc^4d^2+20\,Bbc^3de+160\,\ldots}{\ldots}\right.\right.\right.$$
$$-\frac{(16\,Bb^3c^2d^2-32\,Ab^2c^3d^2-20\,Bb^4cde+32\,Ab^3c^2de+7\,Bb^5e^2-10\,Ab^4ce^2)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+b\ldots}\right.\right.\right.}{256\,c^{\frac{9}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
1/1920*sqrt(c*x^2 + b*x)*(2*(4*(6*(8*B*e^2*x + (20*B*c^4*d*e + B*b*c^3*e^2
 + 10*A*c^4*e^2)/c^4)*x + (80*B*c^4*d^2 + 20*B*b*c^3*d*e + 160*A*c^4*d*e -
 7*B*b^2*c^2*e^2 + 10*A*b*c^3*e^2)/c^4)*x + 5*(16*B*b*c^3*d^2 + 96*A*c^4*d
^2 - 20*B*b^2*c^2*d*e + 32*A*b*c^3*d*e + 7*B*b^3*c*e^2 - 10*A*b^2*c^2*e^2)
/c^4)*x - 15*(16*B*b^2*c^2*d^2 - 32*A*b*c^3*d^2 - 20*B*b^3*c*d*e + 32*A*b^
2*c^2*d*e + 7*B*b^4*e^2 - 10*A*b^3*c*e^2)/c^4) - 1/256*(16*B*b^3*c^2*d^2 -
 32*A*b^2*c^3*d^2 - 20*B*b^4*c*d*e + 32*A*b^3*c^2*d*e + 7*B*b^5*e^2 - 10*A
*b^4*c*e^2)*log(abs(2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) + b))/c^(9/2
)
```

Mupad [B] (verification not implemented)

Time = 12.57 (sec) , antiderivative size = 537, normalized size of antiderivative = 1.54

$$\int (A+Bx)(d+ex)^2\sqrt{bx+cx^2}\,dx$$
$$= A\,d^2\,\sqrt{c\,x^2+b\,x}\,\left(\frac{x}{2}+\frac{b}{4\,c}\right)+\frac{A\,e^2\,x\,{\left(c\,x^2+b\,x\right)}^{3/2}}{4\,c}$$
$$-\frac{5\,A\,b\,e^2\,\left(\frac{b^3\,\ln\left(\frac{b+2\,c\,x}{\sqrt{c}}+2\,\sqrt{c\,x^2+b\,x}\right)}{16\,c^{5/2}}+\frac{\sqrt{c\,x^2+b\,x}\,\left(-3\,b^2+2\,b\,c\,x+8\,c^2\,x^2\right)}{24\,c^2}\right)}{8\,c}$$
$$-\frac{7\,B\,b\,e^2\,\left(\frac{x\,{\left(c\,x^2+b\,x\right)}^{3/2}}{4\,c}-\frac{5\,b\,\left(\frac{b^3\,\ln\left(\frac{b+2\,c\,x}{\sqrt{c}}+2\,\sqrt{c\,x^2+b\,x}\right)}{16\,c^{5/2}}+\frac{\sqrt{c\,x^2+b\,x}\,\left(-3\,b^2+2\,b\,c\,x+8\,c^2\,x^2\right)}{24\,c^2}\right)}{8\,c}\right)}{10\,c}$$
$$+\frac{B\,e^2\,x^2\,{\left(c\,x^2+b\,x\right)}^{3/2}}{5\,c}-\frac{A\,b^2\,d^2\,\ln\left(\frac{\frac{b}{2}+c\,x}{\sqrt{c}}+\sqrt{c\,x^2+b\,x}\right)}{8\,c^{3/2}}$$
$$+\frac{B\,b^3\,d^2\,\ln\left(\frac{b+2\,c\,x}{\sqrt{c}}+2\,\sqrt{c\,x^2+b\,x}\right)}{16\,c^{5/2}}$$
$$+\frac{B\,d^2\,\sqrt{c\,x^2+b\,x}\,\left(-3\,b^2+2\,b\,c\,x+8\,c^2\,x^2\right)}{24\,c^2}+\frac{B\,d\,e\,x\,{\left(c\,x^2+b\,x\right)}^{3/2}}{2\,c}$$
$$-\frac{5\,B\,b\,d\,e\,\left(\frac{b^3\,\ln\left(\frac{b+2\,c\,x}{\sqrt{c}}+2\,\sqrt{c\,x^2+b\,x}\right)}{16\,c^{5/2}}+\frac{\sqrt{c\,x^2+b\,x}\,\left(-3\,b^2+2\,b\,c\,x+8\,c^2\,x^2\right)}{24\,c^2}\right)}{4\,c}$$
$$+\frac{A\,b^3\,d\,e\,\ln\left(\frac{b+2\,c\,x}{\sqrt{c}}+2\,\sqrt{c\,x^2+b\,x}\right)}{8\,c^{5/2}}+\frac{A\,d\,e\,\sqrt{c\,x^2+b\,x}\,\left(-3\,b^2+2\,b\,c\,x+8\,c^2\,x^2\right)}{12\,c^2}$$

input
```
int((b*x + c*x^2)^(1/2)*(A + B*x)*(d + e*x)^2,x)
```

output
```
A*d^2*(b*x + c*x^2)^(1/2)*(x/2 + b/(4*c)) + (A*e^2*x*(b*x + c*x^2)^(3/2))/
(4*c) - (5*A*b*e^2*((b^3*log((b + 2*c*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))
/(16*c^(5/2)) + ((b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3*b^2 + 2*b*c*x))/(24*c^
2)))/(8*c) - (7*B*b*e^2*((x*(b*x + c*x^2)^(3/2))/(4*c) - (5*b*((b^3*log((b
 + 2*c*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5/2)) + ((b*x + c*x^2)^
(1/2)*(8*c^2*x^2 - 3*b^2 + 2*b*c*x))/(24*c^2)))/(8*c)))/(10*c) + (B*e^2*x^
2*(b*x + c*x^2)^(3/2))/(5*c) - (A*b^2*d^2*log((b/2 + c*x)/c^(1/2) + (b*x +
 c*x^2)^(1/2)))/(8*c^(3/2)) + (B*b^3*d^2*log((b + 2*c*x)/c^(1/2) + 2*(b*x
+ c*x^2)^(1/2)))/(16*c^(5/2)) + (B*d^2*(b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3*
b^2 + 2*b*c*x))/(24*c^2) + (B*d*e*x*(b*x + c*x^2)^(3/2))/(2*c) - (5*B*b*d*
e*((b^3*log((b + 2*c*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5/2)) + (
(b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3*b^2 + 2*b*c*x))/(24*c^2)))/(4*c) + (A*b
^3*d*e*log((b + 2*c*x)/c^(1/2) + 2*(b*x + c*x^2)^(1/2)))/(8*c^(5/2)) + (A*
d*e*(b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3*b^2 + 2*b*c*x))/(12*c^2)
```

Reduce [B] (verification not implemented)

Time = 1.43 (sec) , antiderivative size = 597, normalized size of antiderivative = 1.72

$$\int (A+Bx)(d+ex)^2\sqrt{bx+cx^2}\,dx$$
$$= \frac{320\sqrt{x}\,\sqrt{cx+b}\,ab\,c^4dex+105\sqrt{c}\log\left(\frac{\sqrt{cx+b}+\sqrt{x}\,\sqrt{c}}{\sqrt{b}}\right)b^6e^2-105\sqrt{x}\,\sqrt{cx+b}\,b^5c\,e^2-240\sqrt{x}\,\sqrt{cx+b}\,b^3c^3}{}$$

input
```
int((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(1/2),x)
```

output
```
(150*sqrt(x)*sqrt(b + c*x)*a*b**3*c**2*e**2 - 480*sqrt(x)*sqrt(b + c*x)*a*
b**2*c**3*d*e - 100*sqrt(x)*sqrt(b + c*x)*a*b**2*c**3*e**2*x + 480*sqrt(x)
*sqrt(b + c*x)*a*b*c**4*d**2 + 320*sqrt(x)*sqrt(b + c*x)*a*b*c**4*d*e*x +
80*sqrt(x)*sqrt(b + c*x)*a*b*c**4*e**2*x**2 + 960*sqrt(x)*sqrt(b + c*x)*a*
c**5*d**2*x + 1280*sqrt(x)*sqrt(b + c*x)*a*c**5*d*e*x**2 + 480*sqrt(x)*sqr
t(b + c*x)*a*c**5*e**2*x**3 - 105*sqrt(x)*sqrt(b + c*x)*b**5*c*e**2 + 300*
sqrt(x)*sqrt(b + c*x)*b**4*c**2*d*e + 70*sqrt(x)*sqrt(b + c*x)*b**4*c**2*e
**2*x - 240*sqrt(x)*sqrt(b + c*x)*b**3*c**3*d**2 - 200*sqrt(x)*sqrt(b + c*
x)*b**3*c**3*d*e*x - 56*sqrt(x)*sqrt(b + c*x)*b**3*c**3*e**2*x**2 + 160*sq
rt(x)*sqrt(b + c*x)*b**2*c**4*d**2*x + 160*sqrt(x)*sqrt(b + c*x)*b**2*c**4
*d*e*x**2 + 48*sqrt(x)*sqrt(b + c*x)*b**2*c**4*e**2*x**3 + 640*sqrt(x)*sqr
t(b + c*x)*b*c**5*d**2*x**2 + 960*sqrt(x)*sqrt(b + c*x)*b*c**5*d*e*x**3 +
384*sqrt(x)*sqrt(b + c*x)*b*c**5*e**2*x**4 - 150*sqrt(c)*log((sqrt(b + c*x
) + sqrt(x)*sqrt(c))/sqrt(b))*a*b**4*c*e**2 + 480*sqrt(c)*log((sqrt(b + c*
x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b**3*c**2*d*e - 480*sqrt(c)*log((sqrt(b +
 c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b**2*c**3*d**2 + 105*sqrt(c)*log((sqrt
(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**6*e**2 - 300*sqrt(c)*log((sqrt(b
+ c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**5*c*d*e + 240*sqrt(c)*log((sqrt(b +
c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**4*c**2*d**2)/(1920*c**5)
```

3.95 $\int (A+Bx)(d+ex)\sqrt{bx+cx^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 213

$$\begin{aligned}\int (A+Bx)(d+ex)\sqrt{bx+cx^2}\,dx &= \frac{b(16Ac^2d+5b^2Be-8bc(Bd+Ae))\sqrt{bx+cx^2}}{64c^3} \\ &\quad+\frac{(16Ac^2d+5b^2Be-8bc(Bd+Ae))\,x\sqrt{bx+cx^2}}{32c^2} \\ &\quad+\frac{(8Bcd-5bBe+8Ace)\left(bx+cx^2\right)^{3/2}}{24c^2}+\frac{Bex(bx+cx^2)^{3/2}}{4c} \\ &\quad-\frac{b^2(16Ac^2d+5b^2Be-8bc(Bd+Ae))\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{64c^{7/2}}\end{aligned}$$

output
```
1/64*b*(16*A*c^2*d+5*b^2*B*e-8*b*c*(A*e+B*d))*(c*x^2+b*x)^(1/2)/c^3+1/32*(
16*A*c^2*d+5*b^2*B*e-8*b*c*(A*e+B*d))*x*(c*x^2+b*x)^(1/2)/c^2+1/24*(8*A*c*
e-5*B*b*e+8*B*c*d)*(c*x^2+b*x)^(3/2)/c^2+1/4*B*e*x*(c*x^2+b*x)^(3/2)/c-1/6
4*b^2*(16*A*c^2*d+5*b^2*B*e-8*b*c*(A*e+B*d))*arctanh(c^(1/2)*x/(c*x^2+b*x)
^(1/2))/c^(7/2)
```

Mathematica [A] (verified)

Time = 1.27 (sec) , antiderivative size = 186, normalized size of antiderivative = 0.87

$$\int (A+Bx)(d+ex)\sqrt{bx+cx^2}\,dx$$

$$= \frac{\sqrt{x(b+cx)}\left(\sqrt{c}(15b^3Be-2b^2c(12Bd+12Ae+5Bex)+8bc^2(Bx(2d+ex)+2A(3d+ex))+16c^3x(B\right.}{192c^{7/2}}$$

input
```
Integrate[(A + B*x)*(d + e*x)*Sqrt[b*x + c*x^2],x]
```

output
```
(Sqrt[x*(b + c*x)]*(Sqrt[c]*(15*b^3*B*e - 2*b^2*c*(12*B*d + 12*A*e + 5*B*e
*x) + 8*b*c^2*(B*x*(2*d + e*x) + 2*A*(3*d + e*x)) + 16*c^3*x*(B*x*(4*d + 3
*e*x) + A*(6*d + 4*e*x))) - (6*b^2*(16*A*c^2*d + 5*b^2*B*e - 8*b*c*(B*d +
A*e))*ArcTanh[(Sqrt[c]*Sqrt[x])/(-Sqrt[b] + Sqrt[b + c*x])])/(Sqrt[x]*Sqrt
[b + c*x])))/(192*c^(7/2))
```

Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 136, normalized size of antiderivative = 0.64, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {1225, 1087, 1091, 219}

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

$$\int (A+Bx)\sqrt{bx+cx^2}(d+ex)\,dx$$

$$\Big\downarrow \text{1225}$$

$$\frac{(-8bc(Ae+Bd)+16Ac^2d+5b^2Be)\int \sqrt{cx^2+bx}dx}{16c^2}-\frac{(bx+cx^2)^{3/2}(-8c(Ae+Bd)+5bBe-6Bcex)}{24c^2}$$

$$\Big\downarrow \text{1087}$$

$$\frac{\left(-8bc(Ae+Bd)+16Ac^2d+5b^2Be\right)\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int\frac{1}{\sqrt{cx^2+bx}}dx}{8c}\right)}{16c^2}-\frac{\left(bx+cx^2\right)^{3/2}\left(-8c(Ae+Bd)+5bBe-6Bcex\right)}{24c^2}$$

$\Big\downarrow$ 1091

$$\frac{\left(-8bc(Ae+Bd)+16Ac^2d+5b^2Be\right)\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int\frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{4c}\right)}{16c^2}-\frac{\left(bx+cx^2\right)^{3/2}\left(-8c(Ae+Bd)+5bBe-6Bcex\right)}{24c^2}$$

$\Big\downarrow$ 219

$$\frac{\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4c^{3/2}}\right)\left(-8bc(Ae+Bd)+16Ac^2d+5b^2Be\right)}{16c^2}-\frac{\left(bx+cx^2\right)^{3/2}\left(-8c(Ae+Bd)+5bBe-6Bcex\right)}{24c^2}$$

input
```
Int[(A + B*x)*(d + e*x)*Sqrt[b*x + c*x^2],x]
```

output
```
-1/24*((5*b*B*e - 8*c*(B*d + A*e) - 6*B*c*e*x)*(b*x + c*x^2)^(3/2))/c^2 +
((16*A*c^2*d + 5*b^2*B*e - 8*b*c*(B*d + A*e))*(((b + 2*c*x)*Sqrt[b*x + c*x
^2])/(4*c) - (b^2*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(4*c^(3/2))))/(1
6*c^2)
```

Defintions of rubi rules used

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1087
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(b + 2*c*x)
*((a + b*x + c*x^2)^p/(2*c*(2*p + 1))), x] - Simp[p*((b^2 - 4*a*c)/(2*c*(2*
p + 1)))   Int[(a + b*x + c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] &&
GtQ[p, 0] && (IntegerQ[4*p] || IntegerQ[3*p])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

Maple [A] (verified)

Time = 0.87 (sec) , antiderivative size = 144, normalized size of antiderivative = 0.68

method	result
pseudoelliptic	$-\frac{-b^2\left(-\frac{5b^2Be}{8}+bc(Ae+Bd)-2A\,c^2d\right)\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)+\left(-2\left(\frac{\left(\frac{ex}{2}+d\right)xB}{3}+A\left(\frac{ex}{3}+d\right)\right)b\,c^{\frac{5}{2}}-4x\left(\frac{2\left(\frac{3ex}{4}+d\right)xB}{3}+A\right.}{8c^{\frac{7}{2}}}$
risch	$-\frac{(-48B\,c^3e\,x^3-64A\,c^3e\,x^2-8Bb\,c^2e\,x^2-64B\,c^3d\,x^2-16Ab\,c^2ex-96A\,c^3dx+10B\,b^2cex-16Bb\,c^2dx+24A\,b^2ce-48Ab\,c^2}{192c^3\sqrt{x(cx+b)}}$
default	$Ad\left(\frac{(2cx+b)\sqrt{c\,x^2+bx}}{4c}-\frac{b^2\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^2+bx}\right)}{8c^{\frac{3}{2}}}\right)+(Ae+Bd)\left(\frac{(c\,x^2+bx)^{\frac{3}{2}}}{3c}-\frac{b\left(\frac{(2cx+b)\sqrt{c\,x^2+bx}}{4c}-\right.}{}\right.$

input
```
int((B*x+A)*(e*x+d)*(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-1/8/c^(7/2)*(-b^2*(-5/8*b^2*B*e+b*c*(A*e+B*d)-2*A*c^2*d)*arctanh((x*(c*x+
b))^(1/2)/x/c^(1/2))+(-2*(1/3*(1/2*e*x+d)*x*B+A*(1/3*e*x+d))*b*c^(5/2)-4*x
*(2/3*(3/4*e*x+d)*x*B+A*(2/3*e*x+d))*c^(7/2)+(((5/12*e*x+d)*B+A*e)*c^(3/2)
-5/8*B*b*e*c^(1/2))*b^2)*(x*(c*x+b))^(1/2))
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 409, normalized size of antiderivative = 1.92

$$\int (A+Bx)(d+ex)\sqrt{bx+cx^2}\,dx$$
$$=\left[\frac{3\,(8\,(Bb^3c-2\,Ab^2c^2)d-(5\,Bb^4-8\,Ab^3c)e)\sqrt{c}\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)+2\,(48\,Bc^4ex^3+8\,(8\,B\right.}{}\right.$$
$$-\frac{3\,(8\,(Bb^3c-2\,Ab^2c^2)d-(5\,Bb^4-8\,Ab^3c)e)\sqrt{-c}\arctan\left(\frac{\sqrt{cx^2+bx}\sqrt{-c}}{cx+b}\right)-(48\,Bc^4ex^3+8\,(8\,Bc^4d+(B\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
[1/384*(3*(8*(B*b^3*c - 2*A*b^2*c^2)*d - (5*B*b^4 - 8*A*b^3*c)*e)*sqrt(c)*
log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) + 2*(48*B*c^4*e*x^3 + 8*(8*B*
c^4*d + (B*b*c^3 + 8*A*c^4)*e)*x^2 - 24*(B*b^2*c^2 - 2*A*b*c^3)*d + 3*(5*B
*b^3*c - 8*A*b^2*c^2)*e + 2*(8*(B*b*c^3 + 6*A*c^4)*d - (5*B*b^2*c^2 - 8*A*
b*c^3)*e)*x)*sqrt(c*x^2 + b*x))/c^4, -1/192*(3*(8*(B*b^3*c - 2*A*b^2*c^2)*
d - (5*B*b^4 - 8*A*b^3*c)*e)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c
*x + b)) - (48*B*c^4*e*x^3 + 8*(8*B*c^4*d + (B*b*c^3 + 8*A*c^4)*e)*x^2 - 2
4*(B*b^2*c^2 - 2*A*b*c^3)*d + 3*(5*B*b^3*c - 8*A*b^2*c^2)*e + 2*(8*(B*b*c^
3 + 6*A*c^4)*d - (5*B*b^2*c^2 - 8*A*b*c^3)*e)*x)*sqrt(c*x^2 + b*x))/c^4]
```

Sympy [A] (verification not implemented)

Time = 0.83 (sec) , antiderivative size = 311, normalized size of antiderivative = 1.46

$$\int (A+Bx)(d+ex)\sqrt{bx+cx^2}\,dx$$
$$= \begin{cases} -\frac{b\left(Abd-\frac{3b\left(Abe+Acd+Bbd-\frac{5b\left(Ace+\frac{Bbe}{8}+Bcd\right)}{6c}\right)}{4c}\right)\left(\begin{cases}\frac{\log\left(b+2\sqrt{c}\sqrt{bx+cx^2}+2cx\right)}{\sqrt{c}} & \text{for } \frac{b^2}{c}\neq 0\\ \frac{\left(\frac{b}{2c}+x\right)\log\left(\frac{b}{2c}+x\right)}{\sqrt{c\left(\frac{b}{2c}+x\right)^2}} & \text{otherwise}\end{cases}\right)}{2c} + \sqrt{bx+cx^2}\left(\frac{Bex^3}{4}+\frac{x}{\cdot}\right. \\ \frac{2\left(\frac{Ad(bx)^{\frac{3}{2}}}{3}+\frac{Be(bx)^{\frac{7}{2}}}{7b^2}+\frac{(bx)^{\frac{5}{2}}(Ae+Bd)}{5b}\right)}{b} \\ 0 \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x**2+b*x)**(1/2),x)
```

output
```
Piecewise((-b*(A*b*d - 3*b*(A*b*e + A*c*d + B*b*d - 5*b*(A*c*e + B*b*e/8 +
 B*c*d)/(6*c))/(4*c))*Piecewise((log(b + 2*sqrt(c)*sqrt(b*x + c*x**2) + 2*
c*x)/sqrt(c), Ne(b**2/c, 0)), ((b/(2*c) + x)*log(b/(2*c) + x)/sqrt(c*(b/(2
*c) + x)**2), True))/(2*c) + sqrt(b*x + c*x**2)*(B*e*x**3/4 + x**2*(A*c*e
+ B*b*e/8 + B*c*d)/(3*c) + x*(A*b*e + A*c*d + B*b*d - 5*b*(A*c*e + B*b*e/8
 + B*c*d)/(6*c))/(2*c) + (A*b*d - 3*b*(A*b*e + A*c*d + B*b*d - 5*b*(A*c*e
+ B*b*e/8 + B*c*d)/(6*c))/(4*c))/c), Ne(c, 0)), (2*(A*d*(b*x)**(3/2)/3 + B
*e*(b*x)**(7/2)/(7*b**2) + (b*x)**(5/2)*(A*e + B*d)/(5*b))/b, Ne(b, 0)), (
0, True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 295, normalized size of antiderivative = 1.38

$$\int (A+Bx)(d+ex)\sqrt{bx+cx^2}\,dx = \frac{1}{2}\sqrt{cx^2+bx}Adx + \frac{5\sqrt{cx^2+bx}Bb^2ex}{32\,c^2} + \frac{(cx^2+bx)^{\frac{3}{2}}Bex}{4\,c} - \frac{Ab^2d\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{8\,c^{\frac{3}{2}}} - \frac{5\,Bb^4e\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{128\,c^{\frac{7}{2}}} + \frac{\sqrt{cx^2+bx}Abd}{4\,c} + \frac{5\sqrt{cx^2+bx}Bb^3e}{64\,c^3} - \frac{5\,(cx^2+bx)^{\frac{3}{2}}Bbe}{24\,c^2} - \frac{\sqrt{cx^2+bx}(Bd+Ae)bx}{4\,c} + \frac{(Bd+Ae)b^3\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{16\,c^{\frac{5}{2}}} - \frac{\sqrt{cx^2+bx}(Bd+Ae)b^2}{8\,c^2} + \frac{(cx^2+bx)^{\frac{3}{2}}(Bd+Ae)}{3\,c}$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
1/2*sqrt(c*x^2 + b*x)*A*d*x + 5/32*sqrt(c*x^2 + b*x)*B*b^2*e*x/c^2 + 1/4*(
c*x^2 + b*x)^(3/2)*B*e*x/c - 1/8*A*b^2*d*log(2*c*x + b + 2*sqrt(c*x^2 + b*
x)*sqrt(c))/c^(3/2) - 5/128*B*b^4*e*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sq
rt(c))/c^(7/2) + 1/4*sqrt(c*x^2 + b*x)*A*b*d/c + 5/64*sqrt(c*x^2 + b*x)*B*
b^3*e/c^3 - 5/24*(c*x^2 + b*x)^(3/2)*B*b*e/c^2 - 1/4*sqrt(c*x^2 + b*x)*(B*
d + A*e)*b*x/c + 1/16*(B*d + A*e)*b^3*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*
sqrt(c))/c^(5/2) - 1/8*sqrt(c*x^2 + b*x)*(B*d + A*e)*b^2/c^2 + 1/3*(c*x^2
+ b*x)^(3/2)*(B*d + A*e)/c
```

Giac [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 194, normalized size of antiderivative = 0.91

$$\int (A+Bx)(d+ex)\sqrt{bx+cx^2}\,dx$$
$$= \frac{1}{192}\sqrt{cx^2+bx}\left(2\left(4\left(6\,Bex+\frac{8\,Bc^3d+Bbc^2e+8\,Ac^3e}{c^3}\right)x+\frac{8\,Bbc^2d+48\,Ac^3d-5\,Bb^2ce+8\,Abc^2e}{c^3}\right.\right.$$
$$-\frac{(8\,Bb^3cd-16\,Ab^2c^2d-5\,Bb^4e+8\,Ab^3ce)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{c}+b\right|\right)}{128\,c^{\frac{7}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
1/192*sqrt(c*x^2 + b*x)*(2*(4*(6*B*e*x + (8*B*c^3*d + B*b*c^2*e + 8*A*c^3*
e)/c^3)*x + (8*B*b*c^2*d + 48*A*c^3*d - 5*B*b^2*c*e + 8*A*b*c^2*e)/c^3)*x
- 3*(8*B*b^2*c*d - 16*A*b*c^2*d - 5*B*b^3*e + 8*A*b^2*c*e)/c^3) - 1/128*(8
*B*b^3*c*d - 16*A*b^2*c^2*d - 5*B*b^4*e + 8*A*b^3*c*e)*log(abs(2*(sqrt(c)*
x - sqrt(c*x^2 + b*x))*sqrt(c) + b))/c^(7/2)
```

Mupad [B] (verification not implemented)

Time = 12.16 (sec) , antiderivative size = 299, normalized size of antiderivative = 1.40

$$\int (A+Bx)(d+ex)\sqrt{bx+cx^2}\,dx$$
$$= A\,d\,\sqrt{c\,x^2+b\,x}\,\left(\frac{x}{2}+\frac{b}{4\,c}\right) - \frac{5\,B\,b\,e\left(\frac{b^3\,\ln\left(\frac{b+2\,c\,x}{\sqrt{c}}+2\,\sqrt{c\,x^2+b\,x}\right)}{16\,c^{5/2}}+\frac{\sqrt{c\,x^2+b\,x}\,\left(-3\,b^2+2\,b\,c\,x+8\,c^2\,x^2\right)}{24\,c^2}\right)}{8\,c} - \frac{A\,b^2\,d\,\ln\left(\frac{\frac{b}{2}+c\,x}{\sqrt{c}}+\sqrt{c\,x^2+b\,x}\right)}{8\,c^{3/2}} + \frac{A\,b^3\,e\,\ln\left(\frac{b+2\,c\,x}{\sqrt{c}}+2\,\sqrt{c\,x^2+b\,x}\right)}{16\,c^{5/2}} + \frac{B\,b^3\,d\,\ln\left(\frac{b+2\,c\,x}{\sqrt{c}}+2\,\sqrt{c\,x^2+b\,x}\right)}{16\,c^{5/2}} + \frac{A\,e\,\sqrt{c\,x^2+b\,x}\,\left(-3\,b^2+2\,b\,c\,x+8\,c^2\,x^2\right)}{24\,c^2} + \frac{B\,d\,\sqrt{c\,x^2+b\,x}\,\left(-3\,b^2+2\,b\,c\,x+8\,c^2\,x^2\right)}{24\,c^2} + \frac{B\,e\,x\,{\left(c\,x^2+b\,x\right)}^{3/2}}{4\,c}$$

input
```
int((b*x + c*x^2)^(1/2)*(A + B*x)*(d + e*x),x)
```

output
```
A*d*(b*x + c*x^2)^(1/2)*(x/2 + b/(4*c)) - (5*B*b*e*((b^3*log((b + 2*c*x)/c
^(1/2) + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5/2)) + ((b*x + c*x^2)^(1/2)*(8*c^
2*x^2 - 3*b^2 + 2*b*c*x))/(24*c^2)))/(8*c) - (A*b^2*d*log((b/2 + c*x)/c^(1
/2) + (b*x + c*x^2)^(1/2)))/(8*c^(3/2)) + (A*b^3*e*log((b + 2*c*x)/c^(1/2)
 + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5/2)) + (B*b^3*d*log((b + 2*c*x)/c^(1/2)
 + 2*(b*x + c*x^2)^(1/2)))/(16*c^(5/2)) + (A*e*(b*x + c*x^2)^(1/2)*(8*c^2*
x^2 - 3*b^2 + 2*b*c*x))/(24*c^2) + (B*d*(b*x + c*x^2)^(1/2)*(8*c^2*x^2 - 3
*b^2 + 2*b*c*x))/(24*c^2) + (B*e*x*(b*x + c*x^2)^(3/2))/(4*c)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 326, normalized size of antiderivative = 1.53

$$\int (A+Bx)(d+ex)\sqrt{bx+cx^2}\,dx$$
$$= \frac{-24\sqrt{x}\,\sqrt{cx+b}\,a\,b^2c^2e+48\sqrt{x}\,\sqrt{cx+b}\,ab\,c^3d+16\sqrt{x}\,\sqrt{cx+b}\,ab\,c^3ex+96\sqrt{x}\,\sqrt{cx+b}\,a\,c^4dx+64\sqrt{x}}{}$$

input
```
int((B*x+A)*(e*x+d)*(c*x^2+b*x)^(1/2),x)
```

output
```
( - 24*sqrt(x)*sqrt(b + c*x)*a*b**2*c**2*e + 48*sqrt(x)*sqrt(b + c*x)*a*b*
c**3*d + 16*sqrt(x)*sqrt(b + c*x)*a*b*c**3*e*x + 96*sqrt(x)*sqrt(b + c*x)*
a*c**4*d*x + 64*sqrt(x)*sqrt(b + c*x)*a*c**4*e*x**2 + 15*sqrt(x)*sqrt(b +
c*x)*b**4*c*e - 24*sqrt(x)*sqrt(b + c*x)*b**3*c**2*d - 10*sqrt(x)*sqrt(b +
 c*x)*b**3*c**2*e*x + 16*sqrt(x)*sqrt(b + c*x)*b**2*c**3*d*x + 8*sqrt(x)*s
qrt(b + c*x)*b**2*c**3*e*x**2 + 64*sqrt(x)*sqrt(b + c*x)*b*c**4*d*x**2 + 4
8*sqrt(x)*sqrt(b + c*x)*b*c**4*e*x**3 + 24*sqrt(c)*log((sqrt(b + c*x) + sq
rt(x)*sqrt(c))/sqrt(b))*a*b**3*c*e - 48*sqrt(c)*log((sqrt(b + c*x) + sqrt(
x)*sqrt(c))/sqrt(b))*a*b**2*c**2*d - 15*sqrt(c)*log((sqrt(b + c*x) + sqrt(
x)*sqrt(c))/sqrt(b))*b**5*e + 24*sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt
(c))/sqrt(b))*b**4*c*d)/(192*c**4)
```

3.96 $\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 199

$$
\begin{aligned}
\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx
&= -\frac{(4Bcd-bBe-4Ace)\sqrt{bx+cx^2}}{4ce^2}+\frac{Bx\sqrt{bx+cx^2}}{2e} \\
&\quad -\frac{(4Ace(2cd-be)-B(8c^2d^2-4bcde-b^2e^2))\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4c^{3/2}e^3} \\
&\quad -\frac{2\sqrt{d}(Bd-Ae)\sqrt{cd-be}\operatorname{arctanh}\left(\frac{\sqrt{cd-bex}}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{e^3}
\end{aligned}
$$

output
```
-1/4*(-4*A*c*e-B*b*e+4*B*c*d)*(c*x^2+b*x)^(1/2)/c/e^2+1/2*B*x*(c*x^2+b*x)^
(1/2)/e-1/4*(4*A*c*e*(-b*e+2*c*d)-B*(-b^2*e^2-4*b*c*d*e+8*c^2*d^2))*arctan
h(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(3/2)/e^3-2*d^(1/2)*(-A*e+B*d)*(-b*e+c*d)
^(1/2)*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/e^3
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 4.47 (sec) , antiderivative size = 483, normalized size of antiderivative = 2.43

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx$$
$$= \frac{\sqrt{x}\sqrt{b+cx}\Big(\sqrt{c}\sqrt{d}e\sqrt{x}\sqrt{b+cx}(4Ace+B(-4cd+be+2cex))+8\sqrt{c}(Bd-Ae)\left(cd-be-i\sqrt{b}\sqrt{e}\sqrt{c}\right.}{}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x),x]
```

output
```
(Sqrt[x]*Sqrt[b + c*x]*(Sqrt[c]*Sqrt[d]*e*Sqrt[x]*Sqrt[b + c*x]*(4*A*c*e +
 B*(-4*c*d + b*e + 2*c*e*x)) + 8*Sqrt[c]*(B*d - A*e)*(c*d - b*e - I*Sqrt[b
]*Sqrt[e]*Sqrt[c*d - b*e])*Sqrt[-(c*d) + 2*b*e - (2*I)*Sqrt[b]*Sqrt[e]*Sqr
t[c*d - b*e]]*ArcTan[(Sqrt[-(c*d) + 2*b*e - (2*I)*Sqrt[b]*Sqrt[e]*Sqrt[c*d
 - b*e]]*Sqrt[x])/(Sqrt[d]*(-Sqrt[b] + Sqrt[b + c*x]))] + 8*Sqrt[c]*(B*d -
 A*e)*(c*d - b*e + I*Sqrt[b]*Sqrt[e]*Sqrt[c*d - b*e])*Sqrt[-(c*d) + 2*b*e
+ (2*I)*Sqrt[b]*Sqrt[e]*Sqrt[c*d - b*e]]*ArcTan[(Sqrt[-(c*d) + 2*b*e + (2*
I)*Sqrt[b]*Sqrt[e]*Sqrt[c*d - b*e]]*Sqrt[x])/(Sqrt[d]*(-Sqrt[b] + Sqrt[b +
 c*x]))] + 2*Sqrt[d]*(4*A*c*e*(-2*c*d + b*e) + B*(8*c^2*d^2 - 4*b*c*d*e -
b^2*e^2))*ArcTanh[(Sqrt[c]*Sqrt[x])/(-Sqrt[b] + Sqrt[b + c*x])]))/(4*c^(3/
2)*Sqrt[d]*e^3*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.85 (sec) , antiderivative size = 210, normalized size of antiderivative = 1.06, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.269$, Rules used = {1231, 27, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx$$

$$\Big\downarrow \text{1231}$$

$$-\frac{\int -\frac{bd(4Bcd-bBe-4Ace)-\left(4Ace(2cd-be)-B\left(8c^2d^2-4bced-b^2e^2\right)\right)x}{2(d+ex)\sqrt{cx^2+bx}}dx}{4ce^2}-\frac{\sqrt{bx+cx^2}(-4Ace-bBe+4Bcd-2Bcex)}{4ce^2}$$

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

$$\frac{\int \frac{bd(4Bcd-bBe-4Ace)-\left(4Ace(2cd-be)-B\left(8c^2d^2-4bced-b^2e^2\right)\right)x}{(d+ex)\sqrt{cx^2+bx}}dx}{8ce^2}-\frac{\sqrt{bx+cx^2}(-4Ace-bBe+4Bcd-2Bcex)}{4ce^2}$$

$$\Big\downarrow \text{1269}$$

$$\frac{-\frac{\left(4Ace(2cd-be)-B\left(-b^2e^2-4bcde+8c^2d^2\right)\right)\int \frac{1}{\sqrt{cx^2+bx}}dx}{e}-\frac{8cd(Bd-Ae)(cd-be)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}}{8ce^2}-\frac{\sqrt{bx+cx^2}(-4Ace-bBe+4Bcd-2Bcex)}{4ce^2}$$

$$\Big\downarrow \text{1091}$$

$$\frac{-\frac{2\left(4Ace(2cd-be)-B\left(-b^2e^2-4bcde+8c^2d^2\right)\right)\int \frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{e}-\frac{8cd(Bd-Ae)(cd-be)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}}{8ce^2}-\frac{\sqrt{bx+cx^2}(-4Ace-bBe+4Bcd-2Bcex)}{4ce^2}$$

$$\Big\downarrow \text{219}$$

$$\frac{-\frac{8cd(Bd-Ae)(cd-be)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}-\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(4Ace(2cd-be)-B\left(-b^2e^2-4bcde+8c^2d^2\right)\right)}{\sqrt{c}e}}{8ce^2}-\frac{\sqrt{bx+cx^2}(-4Ace-bBe+4Bcd-2Bcex)}{4ce^2}$$

$$\Big\downarrow \text{1154}$$

$$\frac{\frac{16cd(Bd-Ae)(cd-be)\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{e}-\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(4Ace(2cd-be)-B\left(-b^2e^2-4bcde+8c^2d^2\right)\right)}{\sqrt{c}e}}{8ce^2}-\frac{\sqrt{bx+cx^2}(-4Ace-bBe+4Bcd-2Bcex)}{4ce^2}$$

$$\Big\downarrow \text{219}$$

$$\frac{-\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(4Ace(2cd-be)-B\left(-b^2e^2-4bcde+8c^2d^2\right)\right)}{\sqrt{ce}}-\frac{8c\sqrt{d}(Bd-Ae)\sqrt{cd-be}\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{e}}{8ce^2}-\frac{\sqrt{bx+cx^2}(-4Ace-bBe+4Bcd-2Bcex)}{4ce^2}$$

input
```
Int[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x),x]
```

output
```
-1/4*((4*B*c*d - b*B*e - 4*A*c*e - 2*B*c*e*x)*Sqrt[b*x + c*x^2])/(c*e^2) +
 ((-2*(4*A*c*e*(2*c*d - b*e) - B*(8*c^2*d^2 - 4*b*c*d*e - b^2*e^2))*ArcTan
h[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(Sqrt[c]*e) - (8*c*Sqrt[d]*(B*d - A*e)*S
qrt[c*d - b*e]*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*
Sqrt[b*x + c*x^2])])/e)/(8*c*e^2)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.16 (sec) , antiderivative size = 165, normalized size of antiderivative = 0.83

method	result
pseudoelliptic	$-\frac{-\frac{e\sqrt{x(cx+b)}\,(2Bcex+4Ace+Bbe-4Bcd)}{4c}-\frac{\left(4Abc\,e^{2}-8A\,c^{2}de-B\,e^{2}b^{2}-4Bbcde+8B\,c^{2}d^{2}\right)\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)}{4c^{\frac{3}{2}}}-\frac{2(be-cd)(Ae-B\cdots}{\cdots}}{e^{3}}$
risch	$\frac{(2Bcex+4Ace+Bbe-4Bcd)x(cx+b)}{4c\,e^{2}\sqrt{x(cx+b)}}+\frac{\frac{\left(4Abc\,e^{2}-8A\,c^{2}de-B\,e^{2}b^{2}-4Bbcde+8B\,c^{2}d^{2}\right)\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^{2}+bx}\right)}{e\sqrt{c}}+\frac{8d\left(Ab\,e^{2}-Ac\cdots\right.}{\cdots}}{\cdots}$
default	$\frac{B\left(\frac{(2cx+b)\sqrt{c\,x^{2}+bx}}{4c}-\frac{b^{2}\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^{2}+bx}\right)}{8c^{\frac{3}{2}}}\right)}{e}+\frac{(Ae-Bd)\left(\sqrt{c\left(x+\frac{d}{e}\right)^{2}+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(be-cd)}{e^{2}}}+\frac{(be-2cd)\ln\left(\cdots\right.}{\cdots}\cdots\right.}{\cdots}$

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d),x,method=_RETURNVERBOSE)
```

output
```
-1/e^3*(-1/4*e*(x*(c*x+b))^(1/2)*(2*B*c*e*x+4*A*c*e+B*b*e-4*B*c*d)/c-1/4*(
4*A*b*c*e^2-8*A*c^2*d*e-B*b^2*e^2-4*B*b*c*d*e+8*B*c^2*d^2)/c^(3/2)*arctanh
((x*(c*x+b))^(1/2)/x/c^(1/2))-2*(b*e-c*d)*(A*e-B*d)*d/(d*(b*e-c*d))^(1/2)*
arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 793, normalized size of antiderivative = 3.98

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d),x, algorithm="fricas")
```

output
```
[1/8*((8*B*c^2*d^2 - 4*(B*b*c + 2*A*c^2)*d*e - (B*b^2 - 4*A*b*c)*e^2)*sqrt
(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) - 8*(B*c^2*d - A*c^2*e)*s
qrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^2 - b*d*e)*sqrt
(c*x^2 + b*x))/(e*x + d)) + 2*(2*B*c^2*e^2*x - 4*B*c^2*d*e + (B*b*c + 4*A*
c^2)*e^2)*sqrt(c*x^2 + b*x))/(c^2*e^3), 1/8*(16*(B*c^2*d - A*c^2*e)*sqrt(-
c*d^2 + b*d*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x + b*d)
) + (8*B*c^2*d^2 - 4*(B*b*c + 2*A*c^2)*d*e - (B*b^2 - 4*A*b*c)*e^2)*sqrt(c
)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) + 2*(2*B*c^2*e^2*x - 4*B*c^
2*d*e + (B*b*c + 4*A*c^2)*e^2)*sqrt(c*x^2 + b*x))/(c^2*e^3), -1/4*((8*B*c^
2*d^2 - 4*(B*b*c + 2*A*c^2)*d*e - (B*b^2 - 4*A*b*c)*e^2)*sqrt(-c)*arctan(s
qrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) + 4*(B*c^2*d - A*c^2*e)*sqrt(c*d^2 -
b*d*e)*log((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x
))/(e*x + d)) - (2*B*c^2*e^2*x - 4*B*c^2*d*e + (B*b*c + 4*A*c^2)*e^2)*sqrt
(c*x^2 + b*x))/(c^2*e^3), 1/4*(8*(B*c^2*d - A*c^2*e)*sqrt(-c*d^2 + b*d*e)*
arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x + b*d)) - (8*B*c^2*d^
2 - 4*(B*b*c + 2*A*c^2)*d*e - (B*b^2 - 4*A*b*c)*e^2)*sqrt(-c)*arctan(sqrt(
c*x^2 + b*x)*sqrt(-c)/(c*x + b)) + (2*B*c^2*e^2*x - 4*B*c^2*d*e + (B*b*c +
 4*A*c^2)*e^2)*sqrt(c*x^2 + b*x))/(c^2*e^3)]
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx = \int \frac{\sqrt{x\,(b+cx)}(A+Bx)}{d+ex}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(1/2)/(e*x+d),x)
```

output
```
Integral(sqrt(x*(b + c*x))*(A + B*x)/(d + e*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d),x, algorithm="maxima")
```

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

Giac [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d),x, algorithm="giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:Error: Bad Argument Type
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx = \int \frac{\sqrt{c\,x^2+b\,x}\,(A+B\,x)}{d+e\,x}\,dx$$

input
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x),x)
```

output
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x), x)
```

Reduce [B] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 437, normalized size of antiderivative = 2.20

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{d+ex}\,dx = \frac{8\sqrt{d}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{be-cd}-\sqrt{e}\,\sqrt{cx+b}-\sqrt{x}\,\sqrt{e}\,\sqrt{c}}{\sqrt{d}\,\sqrt{c}}\right)a\,c^2e-8\sqrt{d}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{be-cd}-\sqrt{e}\,\sqrt{cx+b}-\sqrt{x}\,\sqrt{e}\,\sqrt{c}}{\sqrt{d}\,\sqrt{c}}\right)b\,c^2}{}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d),x)
```

output
```
(8*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) -
 sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c**2*e - 8*sqrt(d)*sqrt(b*e
 - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sq
rt(c))/(sqrt(d)*sqrt(c)))*b*c**2*d + 8*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(
b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqr
t(c)))*a*c**2*e - 8*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e
)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b*c**2*d + 4
*sqrt(x)*sqrt(b + c*x)*a*c**2*e**2 + sqrt(x)*sqrt(b + c*x)*b**2*c*e**2 - 4
*sqrt(x)*sqrt(b + c*x)*b*c**2*d*e + 2*sqrt(x)*sqrt(b + c*x)*b*c**2*e**2*x
+ 4*sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b*c*e**2 - 8*
sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*c**2*d*e - sqrt(c
)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**3*e**2 - 4*sqrt(c)*log
((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**2*c*d*e + 8*sqrt(c)*log((sq
rt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b*c**2*d**2)/(4*c**2*e**3)
```

3.97 $\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 194

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx = \frac{(2Bd-Ae)\sqrt{bx+cx^2}}{de^2} - \frac{(Bd-Ae)x\sqrt{bx+cx^2}}{de(d+ex)} - \frac{(4Bcd-bBe-2Ace)\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{\sqrt{c}e^3} + \frac{(Bd(4cd-3be)-Ae(2cd-be))\text{arctanh}\left(\frac{\sqrt{cd-be}x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{\sqrt{d}e^3\sqrt{cd-be}}$$

output
```
(-A*e+2*B*d)*(c*x^2+b*x)^(1/2)/d/e^2-(-A*e+B*d)*x*(c*x^2+b*x)^(1/2)/d/e/(e
*x+d)-(-2*A*c*e-B*b*e+4*B*c*d)*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(1/2
)/e^3+(B*d*(-3*b*e+4*c*d)-A*e*(-b*e+2*c*d))*arctanh((-b*e+c*d)^(1/2)*x/d^(
1/2)/(c*x^2+b*x)^(1/2))/d^(1/2)/e^3/(-b*e+c*d)^(1/2)
```

Mathematica [A] (verified)

Time = 11.29 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.29

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx$$
$$= \frac{\sqrt{x(b+cx)}\left(\frac{(-Bd+Ae)x^{3/2}(b+cx)}{d+ex}+\frac{e\sqrt{x}(-Ae(-cd+be+cex)+Bd(-2cd+2be+cex))+\frac{d(-cd+be)(-4Bcd+bBe+2Ace)\operatorname{arcsinh}\left(\frac{\sqrt{c}\sqrt{\cdots}}{\sqrt{b}}\right.}{\sqrt{b}\sqrt{c}\sqrt{1+\frac{cx}{b}}}}{e^3}\right.}{d(-cd+be)\sqrt{x}}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^2,x]
```

output
```
(Sqrt[x*(b + c*x)]*(((-(B*d) + A*e)*x^(3/2)*(b + c*x))/(d + e*x) + (e*Sqrt
[x]*(-(A*e*(-(c*d) + b*e + c*e*x)) + B*d*(-2*c*d + 2*b*e + c*e*x)) + (d*(-
(c*d) + b*e)*(-4*B*c*d + b*B*e + 2*A*c*e)*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b
]])/(Sqrt[b]*Sqrt[c]*Sqrt[1 + (c*x)/b]) - (Sqrt[d]*Sqrt[c*d - b*e]*(B*d*(4
*c*d - 3*b*e) + A*e*(-2*c*d + b*e))*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqr
t[d]*Sqrt[b + c*x])])/Sqrt[b + c*x])/e^3))/(d*(-(c*d) + b*e)*Sqrt[x])
```

Rubi [A] (verified)

Time = 0.68 (sec) , antiderivative size = 191, normalized size of antiderivative = 0.98, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {1230, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx$$

$$\Big\downarrow \text{ 1230}$$

$$\frac{\sqrt{bx+cx^2}(-Ae+2Bd+Bex)}{e^2(d+ex)}-\frac{\int \frac{b(2Bd-Ae)+(4Bcd-bBe-2Ace)x}{(d+ex)\sqrt{cx^2+bx}}dx}{2e^2}$$

$$\Big\downarrow \text{ 1269}$$

$$\frac{\sqrt{bx+cx^2}(-Ae+2Bd+Bex)}{e^2(d+ex)}-\frac{\frac{(-2Ace-bBe+4Bcd)\int\frac{1}{\sqrt{cx^2+bx}}dx}{e}-\frac{(Bd(4cd-3be)-Ae(2cd-be))\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}}{2e^2}$$

$$\Big\downarrow \; 1091$$

$$\frac{\sqrt{bx+cx^2}(-Ae+2Bd+Bex)}{e^2(d+ex)}-\frac{\frac{2(-2Ace-bBe+4Bcd)\int\frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{e}-\frac{(Bd(4cd-3be)-Ae(2cd-be))\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}}{2e^2}$$

$$\Big\downarrow \; 219$$

$$\frac{\sqrt{bx+cx^2}(-Ae+2Bd+Bex)}{e^2(d+ex)}-\frac{\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)(-2Ace-bBe+4Bcd)}{\sqrt{c}e}-\frac{(Bd(4cd-3be)-Ae(2cd-be))\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}}{2e^2}$$

$$\Big\downarrow \; 1154$$

$$\frac{\sqrt{bx+cx^2}(-Ae+2Bd+Bex)}{e^2(d+ex)}-\frac{\frac{2(Bd(4cd-3be)-Ae(2cd-be))\int\frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{e}+\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)(-2Ace-bBe+4Bcd)}{\sqrt{c}e}}{2e^2}$$

$$\Big\downarrow \; 219$$

$$\frac{\sqrt{bx+cx^2}(-Ae+2Bd+Bex)}{e^2(d+ex)}-\frac{\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)(-2Ace-bBe+4Bcd)}{\sqrt{c}e}-\frac{(Bd(4cd-3be)-Ae(2cd-be))\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{\sqrt{d}e\sqrt{cd-be}}}{2e^2}$$

input
```
Int[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^2,x]
```

output
```
((2*B*d - A*e + B*e*x)*Sqrt[b*x + c*x^2])/(e^2*(d + e*x)) - ((2*(4*B*c*d -
 b*B*e - 2*A*c*e)*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(Sqrt[c]*e) - ((
B*d*(4*c*d - 3*b*e) - A*e*(2*c*d - b*e))*ArcTanh[(b*d + (2*c*d - b*e)*x)/(
2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(Sqrt[d]*e*Sqrt[c*d - b*e])
)/(2*e^2)
```

Defintions of rubi rules used

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.25 (sec) , antiderivative size = 173, normalized size of antiderivative = 0.89

method	result
pseudoelliptic	$\frac{2\sqrt{c}\,(ex+d)\left(-2Bc\,d^2+e\left(Ac+\frac{3Bb}{2}\right)d-\frac{Ab\,e^2}{2}\right)\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)-\left(-2(ex+d)\left(-2Bcd+e\left(Ac+\frac{Bb}{2}\right)\right)\operatorname{arctanh}\left(\frac{\sqrt{x(c}}{x\sqrt{}}\right.\right.}{\sqrt{c}\,e^3(ex+d)\sqrt{d(be-cd)}}$
risch	$\frac{Bx(cx+b)}{e^2\sqrt{x(cx+b)}}+\frac{\frac{(2Ace+Bbe-4Bcd)\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^2+bx}\right)}{e\sqrt{c}}-\frac{2\left(Ab\,e^2-2Acde-2Bbde+3Bc\,d^2\right)\ln\left(\frac{-\frac{2d(be-cd)}{e^2}+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}}{}\right.}{e^2\sqrt{-\frac{d(be}{e}}}}{}$
default	$\frac{B\left(\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(be-cd)}{e^2}}+\frac{(be-2cd)\ln\left(\frac{\frac{be-2cd}{2e}+c\left(x+\frac{d}{e}\right)}{\sqrt{c}}+\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(be-cd)}{e^2}}\right)}{2e\sqrt{c}}+\frac{d(}{}\right.}{e^2}$

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

output
```
2/c^(1/2)*(c^(1/2)*(e*x+d)*(-2*B*c*d^2+e*(A*c+3/2*B*b)*d-1/2*A*b*e^2)*arct
an((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))-1/2*(-2*(e*x+d)*(-2*B*c*d+e*
(A*c+1/2*B*b))*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))+c^(1/2)*e*(-2*B*d+e*(-
B*x+A))*(x*(c*x+b))^(1/2))*(d*(b*e-c*d))^(1/2))/(d*(b*e-c*d))^(1/2)/e^3/(e
*x+d)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 372 vs. $2(174) = 348$.

Time = 0.28 (sec) , antiderivative size = 1509, normalized size of antiderivative = 7.78

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^2,x, algorithm="fricas")
```

output
```
[-1/2*((4*B*c^2*d^4 - (5*B*b*c + 2*A*c^2)*d^3*e + (B*b^2 + 2*A*b*c)*d^2*e^
2 + (4*B*c^2*d^3*e - (5*B*b*c + 2*A*c^2)*d^2*e^2 + (B*b^2 + 2*A*b*c)*d*e^3
)*x)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) - (4*B*c^2*d^3 +
 A*b*c*d*e^2 - (3*B*b*c + 2*A*c^2)*d^2*e + (4*B*c^2*d^2*e + A*b*c*e^3 - (3
*B*b*c + 2*A*c^2)*d*e^2)*x)*sqrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x
 + 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d)) - 2*(2*B*c^2*d^3*e
+ A*b*c*d*e^3 - (2*B*b*c + A*c^2)*d^2*e^2 + (B*c^2*d^2*e^2 - B*b*c*d*e^3)*
x)*sqrt(c*x^2 + b*x))/(c^2*d^3*e^3 - b*c*d^2*e^4 + (c^2*d^2*e^4 - b*c*d*e^
5)*x), -1/2*(2*(4*B*c^2*d^3 + A*b*c*d*e^2 - (3*B*b*c + 2*A*c^2)*d^2*e + (4
*B*c^2*d^2*e + A*b*c*e^3 - (3*B*b*c + 2*A*c^2)*d*e^2)*x)*sqrt(-c*d^2 + b*d
*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x + b*d)) + (4*B*c^
2*d^4 - (5*B*b*c + 2*A*c^2)*d^3*e + (B*b^2 + 2*A*b*c)*d^2*e^2 + (4*B*c^2*d
^3*e - (5*B*b*c + 2*A*c^2)*d^2*e^2 + (B*b^2 + 2*A*b*c)*d*e^3)*x)*sqrt(c)*l
og(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) - 2*(2*B*c^2*d^3*e + A*b*c*d*e
^3 - (2*B*b*c + A*c^2)*d^2*e^2 + (B*c^2*d^2*e^2 - B*b*c*d*e^3)*x)*sqrt(c*x
^2 + b*x))/(c^2*d^3*e^3 - b*c*d^2*e^4 + (c^2*d^2*e^4 - b*c*d*e^5)*x), 1/2*
(2*(4*B*c^2*d^4 - (5*B*b*c + 2*A*c^2)*d^3*e + (B*b^2 + 2*A*b*c)*d^2*e^2 +
(4*B*c^2*d^3*e - (5*B*b*c + 2*A*c^2)*d^2*e^2 + (B*b^2 + 2*A*b*c)*d*e^3)*x)
*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) + (4*B*c^2*d^3 + A*
b*c*d*e^2 - (3*B*b*c + 2*A*c^2)*d^2*e + (4*B*c^2*d^2*e + A*b*c*e^3 - (3...
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx = \int \frac{\sqrt{x\,(b+cx)}(A+Bx)}{(d+ex)^2}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(1/2)/(e*x+d)**2,x)
```

output
```
Integral(sqrt(x*(b + c*x))*(A + B*x)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^2,x, algorithm="maxima")
```

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

Giac [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^2,x, algorithm="giac")
```

output
```
Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx = \int \frac{\sqrt{c\,x^2+b\,x}\,(A+B\,x)}{(d+e\,x)^2}\,dx$$

input
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^2,x)
```

output
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^2, x)
```

Reduce [B] (verification not implemented)

Time = 0.39 (sec) , antiderivative size = 1383, normalized size of antiderivative = 7.13

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^2,x)
```

output
```
( - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x)
- sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c*d*e**2 - sqrt(d)*sqrt(
b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)
*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c*e**3*x + 2*sqrt(d)*sqrt(b*e - c*d)*atan
((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt
(d)*sqrt(c)))*a*c**2*d**2*e + 2*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c
*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*
a*c**2*d*e**2*x + 3*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e
)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**2*c*d**2*
e + 3*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x
) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**2*c*d*e**2*x - 4*sqrt(d
)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*
sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b*c**2*d**3 - 4*sqrt(d)*sqrt(b*e - c*d
)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))
/(sqrt(d)*sqrt(c)))*b*c**2*d**2*e*x - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b
*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt
(c)))*a*b*c*d*e**2 - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(
e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c*e**3*
x + 2*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b + c*x
) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c**2*d**2*e + 2*sqrt(...
```

3.98 $\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 224

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx = -\frac{(Bd-Ae)x\sqrt{bx+cx^2}}{2de(d+ex)^2} - \frac{(4Bcd^2-be(3Bd+Ae))\sqrt{bx+cx^2}}{4de^2(cd-be)(d+ex)} + \frac{2B\sqrt{c}\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{e^3} - \frac{(Ab^2e^3+Bd(8c^2d^2-12bcde+3b^2e^2))\operatorname{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{4d^{3/2}e^3(cd-be)^{3/2}}$$

output

```
-1/2*(-A*e+B*d)*x*(c*x^2+b*x)^(1/2)/d/e/(e*x+d)^2-1/4*(4*B*c*d^2-b*e*(A*e+
3*B*d))*(c*x^2+b*x)^(1/2)/d/e^2/(-b*e+c*d)/(e*x+d)+2*B*c^(1/2)*arctanh(c^(
1/2)*x/(c*x^2+b*x)^(1/2))/e^3-1/4*(A*b^2*e^3+B*d*(3*b^2*e^2-12*b*c*d*e+8*c
^2*d^2))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(3/2)/e^3
/(-b*e+c*d)^(3/2)
```

Mathematica [A] (verified)

Time = 11.71 (sec) , antiderivative size = 364, normalized size of antiderivative = 1.62

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx$$

$$= \frac{\sqrt{x(b+cx)}\left(\frac{(-Bd+Ae)x^{3/2}(b+cx)}{(d+ex)^2}+\frac{(Bd(2cd-3be)+Ae(2cd-be))x^{3/2}(b+cx)}{2d(cd-be)(d+ex)}-\frac{e\sqrt{x}\left(Ae^2\left(-bcd+b^2e-2c^2dx+bcex\right)+Bd\left(3b^2e^2+2\right.\right.}{\quad}\right.}{2d(-cd}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^3,x]
```

output
```
(Sqrt[x*(b + c*x)]*(((-(B*d) + A*e)*x^(3/2)*(b + c*x))/(d + e*x)^2 + ((B*d
*(2*c*d - 3*b*e) + A*e*(2*c*d - b*e))*x^(3/2)*(b + c*x))/(2*d*(c*d - b*e)*
(d + e*x)) - (e*Sqrt[x]*(A*e^2*(-(b*c*d) + b^2*e - 2*c^2*d*x + b*c*e*x) +
B*d*(3*b^2*e^2 + 2*c^2*d*(2*d - e*x) + b*c*e*(-7*d + 3*e*x))) - (8*B*Sqrt[
c]*d^2*(c*d - b*e)^2*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(Sqrt[b]*Sqrt[1 +
 (c*x)/b]) + (Sqrt[d]*Sqrt[c*d - b*e]*(A*b^2*e^3 + B*d*(8*c^2*d^2 - 12*b*c
*d*e + 3*b^2*e^2))*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x
])])/Sqrt[b + c*x])/(2*d*e^3*(-(c*d) + b*e))))/(2*d*(-(c*d) + b*e)*Sqrt[x]
)
```

Rubi [A] (verified)

Time = 0.91 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.17, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.269$, Rules used = {1229, 27, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx$$

$$\Big\downarrow \text{ 1229}$$

$$\frac{\sqrt{bx+cx^2}\left(d\left(Abe^2-Bd(4cd-3be)\right)-ex(Bd(6cd-5be)-Ae(2cd-be))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{\int\frac{b\left(Abe^2-Bd(4cd-3be)\right)-8Bcd(cd-be)x}{2(d+ex)\sqrt{cx^2+bx}}dx}{4de^2(cd-be)}$$

$$\Big\downarrow \; 27$$

$$\frac{\sqrt{bx+cx^2}\left(d\left(Abe^2-Bd(4cd-3be)\right)-ex(Bd(6cd-5be)-Ae(2cd-be))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{\int\frac{b\left(Abe^2-Bd(4cd-3be)\right)-8Bcd(cd-be)x}{(d+ex)\sqrt{cx^2+bx}}dx}{8de^2(cd-be)}$$

$$\Big\downarrow \; 1269$$

$$\frac{\sqrt{bx+cx^2}\left(d\left(Abe^2-Bd(4cd-3be)\right)-ex(Bd(6cd-5be)-Ae(2cd-be))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{\frac{\left(Ab^2e^3+Bd\left(3b^2e^2-12bcde+8c^2d^2\right)\right)\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}-\frac{8Bcd(cd-be)\int\frac{1}{\sqrt{cx^2+bx}}dx}{e}}{8de^2(cd-be)}$$

$$\Big\downarrow \; 1091$$

$$\frac{\sqrt{bx+cx^2}\left(d\left(Abe^2-Bd(4cd-3be)\right)-ex(Bd(6cd-5be)-Ae(2cd-be))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{\frac{\left(Ab^2e^3+Bd\left(3b^2e^2-12bcde+8c^2d^2\right)\right)\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}-\frac{16Bcd(cd-be)\int\frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{e}}{8de^2(cd-be)}$$

$$\Big\downarrow \; 219$$

$$\frac{\sqrt{bx+cx^2}\left(d\left(Abe^2-Bd(4cd-3be)\right)-ex(Bd(6cd-5be)-Ae(2cd-be))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{\frac{\left(Ab^2e^3+Bd\left(3b^2e^2-12bcde+8c^2d^2\right)\right)\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}-\frac{16B\sqrt{c}d\,\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)(cd-be)}{e}}{8de^2(cd-be)}$$

$$\Big\downarrow \; 1154$$

$$\frac{\sqrt{bx+cx^2}\left(d\left(Abe^2-Bd(4cd-3be)\right)-ex(Bd(6cd-5be)-Ae(2cd-be))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{-\frac{2\left(Ab^2e^3+Bd\left(3b^2e^2-12bcde+8c^2d^2\right)\right)\int\frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{e}-\frac{16B\sqrt{c}d\,\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)(cd-be)}{e}}{8de^2(cd-be)}$$

$$\Big\downarrow \; 219$$

$$\frac{\sqrt{bx+cx^2}(d(Abe^2-Bd(4cd-3be))-ex(Bd(6cd-5be)-Ae(2cd-be)))}{4de^2(d+ex)^2(cd-be)}-\frac{\frac{(Ab^2e^3+Bd(3b^2e^2-12bcde+8c^2d^2))\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{\sqrt{d}e\sqrt{cd-be}}-\frac{16B\sqrt{c}d\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)(cd-be)}{e}}{8de^2(cd-be)}$$

input
```
Int[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^3,x]
```

output
```
((d*(A*b*e^2 - B*d*(4*c*d - 3*b*e)) - e*(B*d*(6*c*d - 5*b*e) - A*e*(2*c*d
- b*e))*x)*Sqrt[b*x + c*x^2])/(4*d*e^2*(c*d - b*e)*(d + e*x)^2) - ((-16*B*
Sqrt[c]*d*(c*d - b*e)*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/e + ((A*b^2*
e^3 + B*d*(8*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2))*ArcTanh[(b*d + (2*c*d - b*
e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(Sqrt[d]*e*Sqrt[c*d
- b*e]))/(8*d*e^2*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1229
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m + 1))*((a + b*x + c*x^2
)^p/(e^2*(m + 1)*(m + 2)*(c*d^2 - b*d*e + a*e^2)))*((d*g - e*f*(m + 2))*(c*
d^2 - b*d*e + a*e^2) - d*p*(2*c*d - b*e)*(e*f - d*g) - e*(g*(m + 1)*(c*d^2
- b*d*e + a*e^2) + p*(2*c*d - b*e)*(e*f - d*g))*x), x] - Simp[p/(e^2*(m + 1
)*(m + 2)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 2)*(a + b*x + c*x^2
)^(p - 1)*Simp[2*a*c*e*(e*f - d*g)*(m + 2) + b^2*e*(d*g*(p + 1) - e*f*(m +
p + 2)) + b*(a*e^2*g*(m + 1) - c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2))) - c
*(2*c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2)) - e*(2*a*e*g*(m + 1) - b*(d*g*(
m - 2*p) + e*f*(m + 2*p + 2))))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g
}, x] && GtQ[p, 0] && LtQ[m, -2] && LtQ[m + 2*p, 0] &&  !ILtQ[m + 2*p + 3,
0]
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.18 (sec) , antiderivative size = 255, normalized size of antiderivative = 1.14

method	result
pseudoelliptic	$-\frac{2\left(\frac{bx(ex+d)^2\left(A\,b^2e^3+3B\,b^2d\,e^2-12Bbc\,d^2e+8B\,c^2d^3\right)\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)}{8}+\sqrt{d(be-cd)}\left(d(ex+d)^2B\left(c^{\frac{3}{2}}d-be\sqrt{c}\right)xb\text{ ar}\right.\right.}{\sqrt{d(be-cd)}\,b\,e^3x(ex+}$
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
-2/(d*(b*e-c*d))^(1/2)*(1/8*b*x*(e*x+d)^2*(A*b^2*e^3+3*B*b^2*d*e^2-12*B*b*
c*d^2*e+8*B*c^2*d^3)*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))+(d*
(b*e-c*d))^(1/2)*(d*(e*x+d)^2*B*(c^(3/2)*d-b*e*c^(1/2))*x*b*arctanh((x*(c*
x+b))^(1/2)/x/c^(1/2))-1/8*e*((-A*b*d*e^2-3*B*b*d^2*e+4*B*c*d^3)*(x*(c*x+b
))^(3/2)+(x*(c*x+b))^(1/2)*x^2*(b*e-c*d)*(A*b*e^2-5*B*b*d*e+4*B*c*d^2))))/
b/e^3/x/(e*x+d)^2/(b*e-c*d)/d
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 552 vs. $2(198) = 396$.

Time = 0.90 (sec) , antiderivative size = 2230, normalized size of antiderivative = 9.96

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^3,x, algorithm="fricas")
```

output
```
[1/8*(8*(B*c^2*d^6 - 2*B*b*c*d^5*e + B*b^2*d^4*e^2 + (B*c^2*d^4*e^2 - 2*B*
b*c*d^3*e^3 + B*b^2*d^2*e^4)*x^2 + 2*(B*c^2*d^5*e - 2*B*b*c*d^4*e^2 + B*b^
2*d^3*e^3)*x)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) - (8*B*
c^2*d^5 - 12*B*b*c*d^4*e + 3*B*b^2*d^3*e^2 + A*b^2*d^2*e^3 + (8*B*c^2*d^3*
e^2 - 12*B*b*c*d^2*e^3 + 3*B*b^2*d*e^4 + A*b^2*e^5)*x^2 + 2*(8*B*c^2*d^4*e
 - 12*B*b*c*d^3*e^2 + 3*B*b^2*d^2*e^3 + A*b^2*d*e^4)*x)*sqrt(c*d^2 - b*d*e
)*log((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e
*x + d)) - 2*(4*B*c^2*d^5*e - 7*B*b*c*d^4*e^2 + A*b^2*d^2*e^4 + (3*B*b^2 -
 A*b*c)*d^3*e^3 + (6*B*c^2*d^4*e^2 - A*b^2*d*e^5 - (11*B*b*c + 2*A*c^2)*d^
3*e^3 + (5*B*b^2 + 3*A*b*c)*d^2*e^4)*x)*sqrt(c*x^2 + b*x))/(c^2*d^6*e^3 -
2*b*c*d^5*e^4 + b^2*d^4*e^5 + (c^2*d^4*e^5 - 2*b*c*d^3*e^6 + b^2*d^2*e^7)*
x^2 + 2*(c^2*d^5*e^4 - 2*b*c*d^4*e^5 + b^2*d^3*e^6)*x), 1/4*((8*B*c^2*d^5
- 12*B*b*c*d^4*e + 3*B*b^2*d^3*e^2 + A*b^2*d^2*e^3 + (8*B*c^2*d^3*e^2 - 12
*B*b*c*d^2*e^3 + 3*B*b^2*d*e^4 + A*b^2*e^5)*x^2 + 2*(8*B*c^2*d^4*e - 12*B*
b*c*d^3*e^2 + 3*B*b^2*d^2*e^3 + A*b^2*d*e^4)*x)*sqrt(-c*d^2 + b*d*e)*arcta
n(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x + b*d)) + 4*(B*c^2*d^6 - 2
*B*b*c*d^5*e + B*b^2*d^4*e^2 + (B*c^2*d^4*e^2 - 2*B*b*c*d^3*e^3 + B*b^2*d^
2*e^4)*x^2 + 2*(B*c^2*d^5*e - 2*B*b*c*d^4*e^2 + B*b^2*d^3*e^3)*x)*sqrt(c)*
log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) - (4*B*c^2*d^5*e - 7*B*b*c*d^
4*e^2 + A*b^2*d^2*e^4 + (3*B*b^2 - A*b*c)*d^3*e^3 + (6*B*c^2*d^4*e^2 - ...
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx = \int \frac{\sqrt{x(b+cx)}(A+Bx)}{(d+ex)^3}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(1/2)/(e*x+d)**3,x)
```

output
```
Integral(sqrt(x*(b + c*x))*(A + B*x)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^3,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 808 vs. $2(198) = 396$.

Time $= 0.26$ (sec) , antiderivative size $= 808$, normalized size of antiderivative $= 3.61$

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^3,x, algorithm="giac")
```

output
```
-1/4*(8*B*c^2*d^3 - 12*B*b*c*d^2*e + 3*B*b^2*d*e^2 + A*b^2*e^3)*arctan(-((
sqrt(c)*x - sqrt(c*x^2 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))/((c*d^
2*e^3 - b*d*e^4)*sqrt(-c*d^2 + b*d*e)) - B*sqrt(c)*log(abs(2*(sqrt(c)*x -
sqrt(c*x^2 + b*x))*sqrt(c) + b))/e^3 - 1/4*(16*(sqrt(c)*x - sqrt(c*x^2 + b
*x))^3*B*c^2*d^3*e - 20*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b*c*d^2*e^2 -
8*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*c^2*d^2*e^2 + 5*(sqrt(c)*x - sqrt(c*
x^2 + b*x))^3*B*b^2*d*e^3 + 8*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b*c*d*e^
3 - (sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b^2*e^4 + 24*(sqrt(c)*x - sqrt(c*x
^2 + b*x))^2*B*c^(5/2)*d^4 - 20*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*B*b*c^(3
/2)*d^3*e - 8*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*A*c^(5/2)*d^3*e - (sqrt(c)
*x - sqrt(c*x^2 + b*x))^2*B*b^2*sqrt(c)*d^2*e^2 + 5*(sqrt(c)*x - sqrt(c*x^
2 + b*x))^2*A*b^2*sqrt(c)*d*e^3 + 24*(sqrt(c)*x - sqrt(c*x^2 + b*x))*B*b*c
^2*d^4 - 24*(sqrt(c)*x - sqrt(c*x^2 + b*x))*B*b^2*c*d^3*e - 8*(sqrt(c)*x -
 sqrt(c*x^2 + b*x))*A*b*c^2*d^3*e + 3*(sqrt(c)*x - sqrt(c*x^2 + b*x))*B*b^
3*d^2*e^2 + 4*(sqrt(c)*x - sqrt(c*x^2 + b*x))*A*b^2*c*d^2*e^2 + (sqrt(c)*x
 - sqrt(c*x^2 + b*x))*A*b^3*d*e^3 + 6*B*b^2*c^(3/2)*d^4 - 5*B*b^3*sqrt(c)*
d^3*e - 2*A*b^2*c^(3/2)*d^3*e + A*b^3*sqrt(c)*d^2*e^2)/((c*d^2*e^3 - b*d*e
^4)*((sqrt(c)*x - sqrt(c*x^2 + b*x))^2*e + 2*(sqrt(c)*x - sqrt(c*x^2 + b*x
))*sqrt(c)*d + b*d)^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx = \int \frac{\sqrt{c\,x^2+b\,x}\,(A+B\,x)}{(d+e\,x)^3}\,dx$$

input
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^3,x)
```

output
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^3, x)
```

Reduce [B] (verification not implemented)

Time = 0.50 (sec) , antiderivative size = 3315, normalized size of antiderivative = 14.80

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^3}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^3,x)
```

output
```
( - 2*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x
) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*d**2*e**4 - 4*sqrt(
d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)
*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*d*e**5*x - 2*sqrt(d)*sqrt(b*e
- c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqr
t(c))/(sqrt(d)*sqrt(c)))*a*b**3*e**6*x**2 + 4*sqrt(d)*sqrt(b*e - c*d)*atan
((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt
(d)*sqrt(c)))*a*b**2*c*d**3*e**3 + 8*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*
e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(
c)))*a*b**2*c*d**2*e**4*x + 4*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d
) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*
b**2*c*d*e**5*x**2 - 6*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqr
t(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**4*d**3
*e**3 - 12*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b
+ c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**4*d**2*e**4*x - 6*
sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sq
rt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**4*d*e**5*x**2 + 36*sqrt(d)*sq
rt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt
(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**3*c*d**4*e**2 + 72*sqrt(d)*sqrt(b*e - c
*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqr...
```

3.99 $\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4} dx$

Optimal result

Integrand size = 26, antiderivative size = 268

$$\begin{aligned}\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4}\,dx &= -\frac{(Bd-Ae)x\sqrt{bx+cx^2}}{3de(d+ex)^3} + \frac{(3be(Bd+Ae)-2cd(2Bd+Ae))\sqrt{bx+cx^2}}{12de^2(cd-be)(d+ex)^2} \\ &\quad + \frac{(Bd(8c^2d^2-14bcde+3b^2e^2)+Ae(4c^2d^2-4bcde+3b^2e^2))\sqrt{bx+cx^2}}{24d^2e^2(cd-be)^2(d+ex)} \\ &\quad + \frac{b^2(bBd-2Acd+Abe)\operatorname{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{8d^{5/2}(cd-be)^{5/2}}\end{aligned}$$

output
```
-1/3*(-A*e+B*d)*x*(c*x^2+b*x)^(1/2)/d/e/(e*x+d)^3+1/12*(3*b*e*(A*e+B*d)-2*
c*d*(A*e+2*B*d))*(c*x^2+b*x)^(1/2)/d/e^2/(-b*e+c*d)/(e*x+d)^2+1/24*(B*d*(3
*b^2*e^2-14*b*c*d*e+8*c^2*d^2)+A*e*(3*b^2*e^2-4*b*c*d*e+4*c^2*d^2))*(c*x^2
+b*x)^(1/2)/d^2/e^2/(-b*e+c*d)^2/(e*x+d)+1/8*b^2*(A*b*e-2*A*c*d+B*b*d)*arc
tanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(5/2)/(-b*e+c*d)^(5/2
)
```

Mathematica [A] (verified)

Time = 10.48 (sec) , antiderivative size = 199, normalized size of antiderivative = 0.74

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4}\,dx$$
$$= \frac{\sqrt{x(b+cx)}\left(8(-Bd+Ae)x^{3/2}(b+cx)-\frac{3(bBd-2Acd+Abe)(d+ex)\left(\sqrt{d}\sqrt{cd-be}\sqrt{x}\sqrt{b+cx}(-bd-2cdx+bex)+b^2(d+ex)^2\mathrm{arc}\right.}{d^{3/2}(cd-be)^{3/2}\sqrt{b+cx}}}{24d(-cd+be)\sqrt{x}(d+ex)^3}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^4,x]
```

output
```
(Sqrt[x*(b + c*x)]*(8*(-(B*d) + A*e)*x^(3/2)*(b + c*x) - (3*(b*B*d - 2*A*c
*d + A*b*e)*(d + e*x)*(Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[x]*Sqrt[b + c*x]*(-(b*
d) - 2*c*d*x + b*e*x) + b^2*(d + e*x)^2*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/
(Sqrt[d]*Sqrt[b + c*x])]))/(d^(3/2)*(c*d - b*e)^(3/2)*Sqrt[b + c*x])))/(24
*d*(-(c*d) + b*e)*Sqrt[x]*(d + e*x)^3)
```

Rubi [A] (verified)

Time = 0.60 (sec) , antiderivative size = 204, normalized size of antiderivative = 0.76, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {1228, 1152, 1154, 219}

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

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4}\,dx$$

$$\Big\downarrow \text{ 1228}$$

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{(Abe-2Acd+bBd)\int \frac{\sqrt{cx^2+bx}}{(d+ex)^3}dx}{2d(cd-be)}$$

$$\Big\downarrow \text{ 1152}$$

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{(Abe-2Acd+bBd)\left(\frac{\sqrt{bx+cx^2}(x(2cd-be)+bd)}{4d(d+ex)^2(cd-be)}-\frac{b^2\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{8d(cd-be)}\right)}{2d(cd-be)}$$

$$\Big\downarrow \ 1154$$

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{(Abe-2Acd+bBd)\left(\frac{b^2\int\frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{4d(cd-be)}+\frac{\sqrt{bx+cx^2}(x(2cd-be)+bd)}{4d(d+ex)^2(cd-be)}\right)}{2d(cd-be)}$$

$$\Big\downarrow \ 219$$

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{(Abe-2Acd+bBd)\left(\frac{\sqrt{bx+cx^2}(x(2cd-be)+bd)}{4d(d+ex)^2(cd-be)}-\frac{b^2\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{8d^{3/2}(cd-be)^{3/2}}\right)}{2d(cd-be)}$$

input
```
Int[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^4,x]
```

output
```
((B*d - A*e)*(b*x + c*x^2)^(3/2))/(3*d*(c*d - b*e)*(d + e*x)^3) - ((b*B*d
- 2*A*c*d + A*b*e)*(((b*d + (2*c*d - b*e)*x)*Sqrt[b*x + c*x^2])/(4*d*(c*d
- b*e)*(d + e*x)^2) - (b^2*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt
[c*d - b*e]*Sqrt[b*x + c*x^2])])/(8*d^(3/2)*(c*d - b*e)^(3/2))))/(2*d*(c*d
 - b*e))
```

Defintions of rubi rules used

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1152
```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[(-(d + e*x)^(m + 1))*(d*b - 2*a*e + (2*c*d - b*e)*x)*((a + b
*x + c*x^2)^p/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[p*((b^2 - 4*a
*c)/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2)))   Int[(d + e*x)^(m + 2)*(a + b*x +
 c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[m + 2*p + 2, 0]
 && GtQ[p, 0]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

Maple [A] (verified)

Time = 1.32 (sec) , antiderivative size = 213, normalized size of antiderivative = 0.79

method	result
pseudoelliptic	$-\frac{(ex+d)^3 b^2((-2Ac+Bb)d+Abe)\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)+\sqrt{x(cx+b)}\left(\left(B\,b^2-2c\left(\frac{Bx}{3}+A\right)b-4c^2x\left(\frac{2Bx}{3}+A\right)\right)d^3+e\left(\left(\frac{8B}{3}\right.\right.\right.}{8\sqrt{d(be-cd)}\,(ex+d)^3(be-cd)^2}$
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
-1/8*((e*x+d)^3*b^2*((-2*A*c+B*b)*d+A*b*e)*arctan((x*(c*x+b))^(1/2)/x*d/(d
*(b*e-c*d))^(1/2))+(x*(c*x+b))^(1/2)*((B*b^2-2*c*(1/3*B*x+A)*b-4*c^2*x*(2/
3*B*x+A))*d^3+e*((8/3*B*x+A)*b^2+14/3*c*x*(B*x+A)*b-4/3*A*c^2*x^2)*d^2-8/3
*e^2*x*b*((3/8*B*x+A)*b-1/2*A*c*x)*d-A*b^2*e^3*x^2)*(d*(b*e-c*d))^(1/2))/(
d*(b*e-c*d))^(1/2)/(e*x+d)^3/(b*e-c*d)^2/d^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 599 vs. $2(244) = 488$.

Time = 0.11 (sec) , antiderivative size = 1213, normalized size of antiderivative = 4.53

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^4,x, algorithm="fricas")
```

output
```
[1/48*(3*(A*b^3*d^3*e + (B*b^3 - 2*A*b^2*c)*d^4 + (A*b^3*e^4 + (B*b^3 - 2*
A*b^2*c)*d*e^3)*x^3 + 3*(A*b^3*d*e^3 + (B*b^3 - 2*A*b^2*c)*d^2*e^2)*x^2 +
3*(A*b^3*d^2*e^2 + (B*b^3 - 2*A*b^2*c)*d^3*e)*x)*sqrt(c*d^2 - b*d*e)*log((
b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d)
) + 2*(3*A*b^3*d^3*e^2 - 3*(B*b^2*c - 2*A*b*c^2)*d^5 + 3*(B*b^3 - 3*A*b^2*
c)*d^4*e + (8*B*c^3*d^5 - 3*A*b^3*d*e^4 - 2*(11*B*b*c^2 - 2*A*c^3)*d^4*e +
 (17*B*b^2*c - 8*A*b*c^2)*d^3*e^2 - (3*B*b^3 - 7*A*b^2*c)*d^2*e^3)*x^2 - 2
*(4*A*b^3*d^2*e^3 - (B*b*c^2 + 6*A*c^3)*d^5 + (5*B*b^2*c + 13*A*b*c^2)*d^4
*e - (4*B*b^3 + 11*A*b^2*c)*d^3*e^2)*x)*sqrt(c*x^2 + b*x))/(c^3*d^9 - 3*b*
c^2*d^8*e + 3*b^2*c*d^7*e^2 - b^3*d^6*e^3 + (c^3*d^6*e^3 - 3*b*c^2*d^5*e^4
 + 3*b^2*c*d^4*e^5 - b^3*d^3*e^6)*x^3 + 3*(c^3*d^7*e^2 - 3*b*c^2*d^6*e^3 +
 3*b^2*c*d^5*e^4 - b^3*d^4*e^5)*x^2 + 3*(c^3*d^8*e - 3*b*c^2*d^7*e^2 + 3*b
^2*c*d^6*e^3 - b^3*d^5*e^4)*x), -1/24*(3*(A*b^3*d^3*e + (B*b^3 - 2*A*b^2*c
)*d^4 + (A*b^3*e^4 + (B*b^3 - 2*A*b^2*c)*d*e^3)*x^3 + 3*(A*b^3*d*e^3 + (B*
b^3 - 2*A*b^2*c)*d^2*e^2)*x^2 + 3*(A*b^3*d^2*e^2 + (B*b^3 - 2*A*b^2*c)*d^3
*e)*x)*sqrt(-c*d^2 + b*d*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^2 + b*x)/
(c*d*x + b*d)) - (3*A*b^3*d^3*e^2 - 3*(B*b^2*c - 2*A*b*c^2)*d^5 + 3*(B*b^3
 - 3*A*b^2*c)*d^4*e + (8*B*c^3*d^5 - 3*A*b^3*d*e^4 - 2*(11*B*b*c^2 - 2*A*c
^3)*d^4*e + (17*B*b^2*c - 8*A*b*c^2)*d^3*e^2 - (3*B*b^3 - 7*A*b^2*c)*d^2*e
^3)*x^2 - 2*(4*A*b^3*d^2*e^3 - (B*b*c^2 + 6*A*c^3)*d^5 + (5*B*b^2*c + 1...
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4}\,dx = \int \frac{\sqrt{x\,(b+cx)}(A+Bx)}{(d+ex)^4}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(1/2)/(e*x+d)**4,x)
```

output
```
Integral(sqrt(x*(b + c*x))*(A + B*x)/(d + e*x)**4, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^4,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1576 vs. $2(244) = 488$.

Time = 0.24 (sec) , antiderivative size = 1576, normalized size of antiderivative = 5.88

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^4,x, algorithm="giac")
```

output
```
1/8*(B*b^3*d - 2*A*b^2*c*d + A*b^3*e)*arctan(-((sqrt(c)*x - sqrt(c*x^2 + b
*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))/((c^2*d^4 - 2*b*c*d^3*e + b^2*d^
2*e^2)*sqrt(-c*d^2 + b*d*e)) + 1/24*(48*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*
B*c^3*d^4*e^2 - 96*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*B*b*c^2*d^3*e^3 + 48*
(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*B*b^2*c*d^2*e^4 - 3*(sqrt(c)*x - sqrt(c*
x^2 + b*x))^5*B*b^3*d*e^5 + 6*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*A*b^2*c*d*
e^5 - 3*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*A*b^3*e^6 + 96*(sqrt(c)*x - sqrt
(c*x^2 + b*x))^4*B*c^(7/2)*d^5*e - 144*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*B
*b*c^(5/2)*d^4*e^2 + 48*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*A*c^(7/2)*d^4*e^
2 - 96*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*A*b*c^(5/2)*d^3*e^3 + 33*(sqrt(c)
*x - sqrt(c*x^2 + b*x))^4*B*b^3*sqrt(c)*d^2*e^4 + 78*(sqrt(c)*x - sqrt(c*x
^2 + b*x))^4*A*b^2*c^(3/2)*d^2*e^4 - 15*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*
A*b^3*sqrt(c)*d*e^5 + 64*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*c^4*d^6 - 16*
(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b*c^3*d^5*e + 32*(sqrt(c)*x - sqrt(c*x
^2 + b*x))^3*A*c^4*d^5*e - 144*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b^2*c^2
*d^4*e^2 + 16*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b*c^3*d^4*e^2 + 58*(sqrt
(c)*x - sqrt(c*x^2 + b*x))^3*B*b^3*c*d^3*e^3 - 84*(sqrt(c)*x - sqrt(c*x^2
+ b*x))^3*A*b^2*c^2*d^3*e^3 + 8*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b^4*d^
2*e^4 + 74*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b^3*c*d^2*e^4 - 8*(sqrt(c)*
x - sqrt(c*x^2 + b*x))^3*A*b^4*d*e^5 + 96*(sqrt(c)*x - sqrt(c*x^2 + b*x...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4}\,dx=\int \frac{\sqrt{c\,x^2+b\,x}\,(A+B\,x)}{(d+e\,x)^4}\,dx$$

input
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^4,x)
```

output
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^4, x)
```

Reduce [B] (verification not implemented)

Time = 1.23 (sec) , antiderivative size = 3909, normalized size of antiderivative = 14.59

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^4,x)
```

output
```
( - 3*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x
) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**4*d**3*e**4 - 9*sqrt(
d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)
*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**4*d**2*e**5*x - 9*sqrt(d)*sqrt(b
*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*
sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**4*d*e**6*x**2 - 3*sqrt(d)*sqrt(b*e - c*d)
*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/
(sqrt(d)*sqrt(c)))*a*b**4*e**7*x**3 + 12*sqrt(d)*sqrt(b*e - c*d)*atan((sqr
t(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*s
qrt(c)))*a*b**3*c*d**4*e**3 + 36*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e -
c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))
*a*b**3*c*d**3*e**4*x + 36*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) -
 sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**
3*c*d**2*e**5*x**2 + 12*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sq
rt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*c
*d*e**6*x**3 - 12*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*
sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**2*c**2*d*
*5*e**2 - 36*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(
b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**2*c**2*d**4*e*
*3*x - 36*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(...
```

3.100 $\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 413

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx$$
$$= -\frac{(Bd-Ae)x\sqrt{bx+cx^2}}{4de(d+ex)^4} - \frac{(4cd(Bd+Ae)-be(3Bd+5Ae))\sqrt{bx+cx^2}}{24de^2(cd-be)(d+ex)^3}$$
$$+ \frac{(Bd(8c^2d^2-16bcde+3b^2e^2)+Ae(8c^2d^2-8bcde+5b^2e^2))\sqrt{bx+cx^2}}{96d^2e^2(cd-be)^2(d+ex)^2}$$
$$+ \frac{(Ae(16c^3d^3-24bc^2d^2e+38b^2cde^2-15b^3e^3)+Bd(16c^3d^3-40bc^2d^2e+18b^2cde^2-9b^3e^3))\sqrt{bx+cx^2}}{192d^3e^2(cd-be)^3(d+ex)}$$
$$- \frac{b^2(16Ac^2d^2-8bcd(Bd+2Ae)+b^2e(3Bd+5Ae))\,\text{arctanh}\left(\frac{\sqrt{cd-be}x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{64d^{7/2}(cd-be)^{7/2}}$$

output
```
-1/4*(-A*e+B*d)*x*(c*x^2+b*x)^(1/2)/d/e/(e*x+d)^4-1/24*(4*c*d*(A*e+B*d)-b*
e*(5*A*e+3*B*d))*(c*x^2+b*x)^(1/2)/d/e^2/(-b*e+c*d)/(e*x+d)^3+1/96*(B*d*(3
*b^2*e^2-16*b*c*d*e+8*c^2*d^2)+A*e*(5*b^2*e^2-8*b*c*d*e+8*c^2*d^2))*(c*x^2
+b*x)^(1/2)/d^2/e^2/(-b*e+c*d)^2/(e*x+d)^2+1/192*(A*e*(-15*b^3*e^3+38*b^2*
c*d*e^2-24*b*c^2*d^2*e+16*c^3*d^3)+B*d*(-9*b^3*e^3+18*b^2*c*d*e^2-40*b*c^2
*d^2*e+16*c^3*d^3))*(c*x^2+b*x)^(1/2)/d^3/e^2/(-b*e+c*d)^3/(e*x+d)-1/64*b^
2*(16*A*c^2*d^2-8*b*c*d*(2*A*e+B*d)+b^2*e*(5*A*e+3*B*d))*arctanh((-b*e+c*d
)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(7/2)/(-b*e+c*d)^(7/2)
```

Mathematica [A] (verified)

Time = 10.94 (sec) , antiderivative size = 279, normalized size of antiderivative = 0.68

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx = \frac{\sqrt{x(b+cx)}\Big(48(-Bd+Ae)x^{3/2}(b+cx) - \frac{8(5Ae(-2cd+be)+Bd(2cd+3be))x^{3/2}(b+cx)(d+ex)}{d(cd-be)} + \frac{3(16Ac^2d^2-8bcd(Bd+2A}{}}{192d(-cd+be)\sqrt{x}(d+e}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^5,x]
```

output
```
(Sqrt[x*(b + c*x)]*(48*(-(B*d) + A*e)*x^(3/2)*(b + c*x) - (8*(5*A*e*(-2*c*
d + b*e) + B*d*(2*c*d + 3*b*e))*x^(3/2)*(b + c*x)*(d + e*x))/(d*(c*d - b*e
)) + (3*(16*A*c^2*d^2 - 8*b*c*d*(B*d + 2*A*e) + b^2*e*(3*B*d + 5*A*e))*(d
+ e*x)^2*(Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[x]*Sqrt[b + c*x]*(-(b*d) - 2*c*d*x
+ b*e*x) + b^2*(d + e*x)^2*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt
[b + c*x])]))/(d^(5/2)*(c*d - b*e)^(5/2)*Sqrt[b + c*x])))/(192*d*(-(c*d) +
 b*e)*Sqrt[x]*(d + e*x)^4)
```

Rubi [A] (verified)

Time = 0.87 (sec) , antiderivative size = 309, normalized size of antiderivative = 0.75, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {1237, 27, 1228, 1152, 1154, 219}

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

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx$$

$$\Big\downarrow \text{1237}$$

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{4d(d+ex)^4(cd-be)} - \frac{\int \frac{(3bBd-8Acd+5Abe-2c(Bd-Ae)x)\sqrt{cx^2+bx}}{2(d+ex)^4}dx}{4d(cd-be)}$$

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

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{4d(d+ex)^4(cd-be)}-\frac{\int \frac{(3bBd-8Acd+5Abe-2c(Bd-Ae)x)\sqrt{cx^2+bx}}{(d+ex)^4}dx}{8d(cd-be)}$$

$$\Big\downarrow \; 1228$$

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{4d(d+ex)^4(cd-be)}-\frac{\frac{(bx+cx^2)^{3/2}(5Ae(2cd-be)-Bd(3be+2cd))}{3d(d+ex)^3(cd-be)}-\frac{(b^2e(5Ae+3Bd)-8bcd(2Ae+Bd)+16Ac^2d^2)\int \frac{\sqrt{cx^2+bx}}{(d+ex)^3}dx}{2d(cd-be)}}{8d(cd-be)}$$

$$\Big\downarrow \; 1152$$

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{4d(d+ex)^4(cd-be)}-\frac{\frac{(bx+cx^2)^{3/2}(5Ae(2cd-be)-Bd(3be+2cd))}{3d(d+ex)^3(cd-be)}-\frac{(b^2e(5Ae+3Bd)-8bcd(2Ae+Bd)+16Ac^2d^2)\left(\frac{\sqrt{bx+cx^2}(x(2cd-be)+bd)}{4d(d+ex)^2(cd-be)}-\frac{b^2\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{8d(cd-be)}\right)}{2d(cd-be)}}{8d(cd-be)}$$

$$\Big\downarrow \; 1154$$

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{4d(d+ex)^4(cd-be)}-\frac{\frac{(bx+cx^2)^{3/2}(5Ae(2cd-be)-Bd(3be+2cd))}{3d(d+ex)^3(cd-be)}-\frac{(b^2e(5Ae+3Bd)-8bcd(2Ae+Bd)+16Ac^2d^2)\left(\frac{b^2\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{4d(cd-be)}\cdots\right)}{2d(cd-be)}}{8d(cd-be)}$$

$$\Big\downarrow \; 219$$

$$\frac{(bx+cx^2)^{3/2}(Bd-Ae)}{4d(d+ex)^4(cd-be)}-\frac{\frac{(bx+cx^2)^{3/2}(5Ae(2cd-be)-Bd(3be+2cd))}{3d(d+ex)^3(cd-be)}-\frac{(b^2e(5Ae+3Bd)-8bcd(2Ae+Bd)+16Ac^2d^2)\left(\frac{\sqrt{bx+cx^2}(x(2cd-be)+bd)}{4d(d+ex)^2(cd-be)}-\frac{b^2\text{arctanh}\left(\frac{x(2cd-\cdots}{2\sqrt{d}\sqrt{bx+\cdots}}\right)}{8d^{3/2}(cd-be)^{3\cdots}}\cdots\right)}{2d(cd-be)}}{8d(cd-be)}$$

input
```
Int[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^5,x]
```

output
```
((B*d - A*e)*(b*x + c*x^2)^(3/2))/(4*d*(c*d - b*e)*(d + e*x)^4) - (((5*A*e
*(2*c*d - b*e) - B*d*(2*c*d + 3*b*e))*(b*x + c*x^2)^(3/2))/(3*d*(c*d - b*e
)*(d + e*x)^3) - ((16*A*c^2*d^2 - 8*b*c*d*(B*d + 2*A*e) + b^2*e*(3*B*d + 5
*A*e))*(((b*d + (2*c*d - b*e)*x)*Sqrt[b*x + c*x^2])/(4*d*(c*d - b*e)*(d +
e*x)^2) - (b^2*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*
Sqrt[b*x + c*x^2])])/(8*d^(3/2)*(c*d - b*e)^(3/2))))/(2*d*(c*d - b*e)))/(8
*d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1152
```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[(-(d + e*x)^(m + 1))*(d*b - 2*a*e + (2*c*d - b*e)*x)*((a + b
*x + c*x^2)^p/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[p*((b^2 - 4*a
*c)/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2)))   Int[(d + e*x)^(m + 2)*(a + b*x +
 c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[m + 2*p + 2, 0]
 && GtQ[p, 0]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Maple [A] (verified)

Time = 1.27 (sec) , antiderivative size = 355, normalized size of antiderivative = 0.86

method	result
pseudoelliptic	$-\frac{5\left((ex+d)^4\left(\frac{8\left(2A c^2-Bbc\right)d^2}{5}-\frac{16e\left(Ac-\frac{3Bb}{16}\right)bd}{5}+A b^2e^2\right)b^2\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)+\sqrt{x(cx+b)}\left(\frac{16c\left(-\frac{B b^2}{2}+c\left(\frac{Bx}{3}+A\right.\right.}{}\right.\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

output
```
-5/64*((e*x+d)^4*(8/5*(2*A*c^2-B*b*c)*d^2-16/5*e*(A*c-3/16*B*b)*b*d+A*b^2*
e^2)*b^2*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))+(x*(c*x+b))^(1/
2)*(16/5*c*(-1/2*B*b^2+c*(1/3*B*x+A)*b+2*c^2*x*(2/3*B*x+A))*d^5-16/5*e*(-3
/16*B*b^3+c*(47/24*B*x+A)*b^2+11/3*c^2*(21/22*B*x+A)*x*b-4/3*(1/4*B*x+A)*c
^3*x^2)*d^4+e^2*((11/5*B*x+A)*b^3+66/5*c*x*(46/99*B*x+A)*b^2-104/15*(5/13*
B*x+A)*c^2*x^2*b+16/15*A*c^3*x^3)*d^3-73/15*e^3*((33/73*B*x+A)*b^2-140/73*
c*(9/70*B*x+A)*x*b+24/73*A*c^2*x^2)*x*b*d^2-11/3*e^4*((9/55*B*x+A)*b-38/55
*A*c*x)*x^2*b^2*d-A*b^3*e^5*x^3)*(d*(b*e-c*d))^(1/2))/(d*(b*e-c*d))^(1/2)/
(e*x+d)^4/(b*e-c*d)^3/d^3
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1086 vs. $2(385) = 770$.

Time = 0.15 (sec) , antiderivative size = 2187, normalized size of antiderivative = 5.30

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^5,x, algorithm="fricas")
```

output
```
[-1/384*(3*(5*A*b^4*d^4*e^2 - 8*(B*b^3*c - 2*A*b^2*c^2)*d^6 + (3*B*b^4 - 1
6*A*b^3*c)*d^5*e + (5*A*b^4*e^6 - 8*(B*b^3*c - 2*A*b^2*c^2)*d^2*e^4 + (3*B
*b^4 - 16*A*b^3*c)*d*e^5)*x^4 + 4*(5*A*b^4*d*e^5 - 8*(B*b^3*c - 2*A*b^2*c^
2)*d^3*e^3 + (3*B*b^4 - 16*A*b^3*c)*d^2*e^4)*x^3 + 6*(5*A*b^4*d^2*e^4 - 8*
(B*b^3*c - 2*A*b^2*c^2)*d^4*e^2 + (3*B*b^4 - 16*A*b^3*c)*d^3*e^3)*x^2 + 4*
(5*A*b^4*d^3*e^3 - 8*(B*b^3*c - 2*A*b^2*c^2)*d^5*e + (3*B*b^4 - 16*A*b^3*c
)*d^4*e^2)*x)*sqrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^
2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d)) + 2*(15*A*b^4*d^4*e^3 + 24*(B*b^2
*c^2 - 2*A*b*c^3)*d^7 - 3*(11*B*b^3*c - 32*A*b^2*c^2)*d^6*e + 9*(B*b^4 - 7
*A*b^3*c)*d^5*e^2 - (16*B*c^4*d^6*e + 15*A*b^4*d*e^6 - 8*(7*B*b*c^3 - 2*A*
c^4)*d^5*e^2 + 2*(29*B*b^2*c^2 - 20*A*b*c^3)*d^4*e^3 - (27*B*b^3*c - 62*A*
b^2*c^2)*d^3*e^4 + (9*B*b^4 - 53*A*b^3*c)*d^2*e^5)*x^3 - (64*B*c^4*d^7 + 5
5*A*b^4*d^2*e^5 - 8*(29*B*b*c^3 - 8*A*c^4)*d^6*e + 4*(65*B*b^2*c^2 - 42*A*
b*c^3)*d^5*e^2 - (125*B*b^3*c - 244*A*b^2*c^2)*d^4*e^3 + 3*(11*B*b^4 - 65*
A*b^3*c)*d^3*e^4)*x^2 - (73*A*b^4*d^3*e^4 + 16*(B*b*c^3 + 6*A*c^4)*d^7 - 2
*(55*B*b^2*c^2 + 136*A*b*c^3)*d^6*e + (127*B*b^3*c + 374*A*b^2*c^2)*d^5*e^
2 - (33*B*b^4 + 271*A*b^3*c)*d^4*e^3)*x)*sqrt(c*x^2 + b*x))/(c^4*d^12 - 4*
b*c^3*d^11*e + 6*b^2*c^2*d^10*e^2 - 4*b^3*c*d^9*e^3 + b^4*d^8*e^4 + (c^4*d
^8*e^4 - 4*b*c^3*d^7*e^5 + 6*b^2*c^2*d^6*e^6 - 4*b^3*c*d^5*e^7 + b^4*d^4*e
^8)*x^4 + 4*(c^4*d^9*e^3 - 4*b*c^3*d^8*e^4 + 6*b^2*c^2*d^7*e^5 - 4*b^3*...
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx = \int \frac{\sqrt{x\,(b+cx)}(A+Bx)}{(d+ex)^5}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(1/2)/(e*x+d)**5,x)
```

output
```
Integral(sqrt(x*(b + c*x))*(A + B*x)/(d + e*x)**5, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^5,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1841 vs. $2(385) = 770$.

Time = 0.63 (sec) , antiderivative size = 1841, normalized size of antiderivative = 4.46

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^5,x, algorithm="giac")
```

output
```
1/384*((24*B*b^3*c*d^2*e^4*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d*e)
*sqrt(c)*abs(e))) - 48*A*b^2*c^2*d^2*e^4*log(abs(2*c*d*e - b*e^2 - 2*sqrt(
c*d^2 - b*d*e)*sqrt(c)*abs(e))) - 9*B*b^4*d*e^5*log(abs(2*c*d*e - b*e^2 -
2*sqrt(c*d^2 - b*d*e)*sqrt(c)*abs(e))) + 48*A*b^3*c*d*e^5*log(abs(2*c*d*e
- b*e^2 - 2*sqrt(c*d^2 - b*d*e)*sqrt(c)*abs(e))) - 15*A*b^4*e^6*log(abs(2*
c*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d*e)*sqrt(c)*abs(e))) - 32*sqrt(c*d^2 - b
*d*e)*B*c^(7/2)*d^4*abs(e) + 80*sqrt(c*d^2 - b*d*e)*B*b*c^(5/2)*d^3*e*abs(
e) - 32*sqrt(c*d^2 - b*d*e)*A*c^(7/2)*d^3*e*abs(e) - 36*sqrt(c*d^2 - b*d*e
)*B*b^2*c^(3/2)*d^2*e^2*abs(e) + 48*sqrt(c*d^2 - b*d*e)*A*b*c^(5/2)*d^2*e^
2*abs(e) + 18*sqrt(c*d^2 - b*d*e)*B*b^3*sqrt(c)*d*e^3*abs(e) - 76*sqrt(c*d
^2 - b*d*e)*A*b^2*c^(3/2)*d*e^3*abs(e) + 30*sqrt(c*d^2 - b*d*e)*A*b^3*sqrt
(c)*e^4*abs(e))*sgn(1/(e*x + d))*sgn(e)/(sqrt(c*d^2 - b*d*e)*c^3*d^6*e^5*a
bs(e) - 3*sqrt(c*d^2 - b*d*e)*b*c^2*d^5*e^6*abs(e) + 3*sqrt(c*d^2 - b*d*e)
*b^2*c*d^4*e^7*abs(e) - sqrt(c*d^2 - b*d*e)*b^3*d^3*e^8*abs(e)) + 2*sqrt(c
 - 2*c*d/(e*x + d) + c*d^2/(e*x + d)^2 + b*e/(e*x + d) - b*d*e/(e*x + d)^2
)*((16*B*c^3*d^4*e^9*sgn(1/(e*x + d))*sgn(e) - 40*B*b*c^2*d^3*e^10*sgn(1/(
e*x + d))*sgn(e) + 16*A*c^3*d^3*e^10*sgn(1/(e*x + d))*sgn(e) + 18*B*b^2*c*
d^2*e^11*sgn(1/(e*x + d))*sgn(e) - 24*A*b*c^2*d^2*e^11*sgn(1/(e*x + d))*sg
n(e) - 9*B*b^3*d*e^12*sgn(1/(e*x + d))*sgn(e) + 38*A*b^2*c*d*e^12*sgn(1/(e
*x + d))*sgn(e) - 15*A*b^3*e^13*sgn(1/(e*x + d))*sgn(e))/(c^3*d^6*e^14 ...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx = \int \frac{\sqrt{c\,x^2+b\,x}\,(A+B\,x)}{(d+e\,x)^5}\,dx$$

input
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^5,x)
```

output
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^5, x)
```

Reduce [B] (verification not implemented)

Time = 91.31 (sec) , antiderivative size = 6853, normalized size of antiderivative = 16.59

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^5}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^5,x)
```

output
```
( - 60*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*
x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**5*d**4*e**6 - 240*sq
rt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt
(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**5*d**3*e**7*x - 360*sqrt(d)*s
qrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqr
t(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**5*d**2*e**8*x**2 - 240*sqrt(d)*sqrt(
b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)
*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**5*d*e**9*x**3 - 60*sqrt(d)*sqrt(b*e - c*
d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c)
)/(sqrt(d)*sqrt(c)))*a*b**5*e**10*x**4 + 312*sqrt(d)*sqrt(b*e - c*d)*atan(
(sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(
d)*sqrt(c)))*a*b**4*c*d**5*e**5 + 1248*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(
b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqr
t(c)))*a*b**4*c*d**4*e**6*x + 1872*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e
- c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)
))*a*b**4*c*d**3*e**7*x**2 + 1248*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e -
 c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c))
)*a*b**4*c*d**2*e**8*x**3 + 312*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c
*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*
a*b**4*c*d*e**9*x**4 - 576*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d...
```

3.101 $\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 586

$$\begin{aligned}
&\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx \\
&= -\frac{(Bd-Ae)x\sqrt{bx+cx^2}}{5de(d+ex)^5} - \frac{(Ae(6cd-7be)+Bd(4cd-3be))\sqrt{bx+cx^2}}{40de^2(cd-be)(d+ex)^4} \\
&\quad + \frac{(Bd(8c^2d^2-18bcde+3b^2e^2)+Ae(12c^2d^2-12bcde+7b^2e^2))\sqrt{bx+cx^2}}{240d^2e^2(cd-be)^2(d+ex)^3} \\
&\quad + \frac{(Ae(48c^3d^3-72bc^2d^2e+94b^2cde^2-35b^3e^3)+Bd(32c^3d^3-88bc^2d^2e+36b^2cde^2-15b^3e^3))\sqrt{bx+cx^2}}{960d^3e^2(cd-be)^3(d+ex)^2} \\
&\quad + \frac{(Bd(64c^4d^4-208bc^3d^3e+144b^2c^2d^2e^2-150b^3cde^3+45b^4e^4)+Ae(96c^4d^4-192bc^3d^3e+476b^2c^2d^2e}{1920d^4e^2(cd-be)^4(d+ex)} \\
&\quad - \frac{b^2(32Ac^3d^3-16bc^2d^2(Bd+3Ae)+6b^2cde(2Bd+5Ae)-b^3e^2(3Bd+7Ae))\,\mathrm{arctanh}\left(\frac{\sqrt{cd-be}x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{128d^{9/2}(cd-be)^{9/2}}
\end{aligned}$$

output
```
-1/5*(-A*e+B*d)*x*(c*x^2+b*x)^(1/2)/d/e/(e*x+d)^5-1/40*(A*e*(-7*b*e+6*c*d)
+B*d*(-3*b*e+4*c*d))*(c*x^2+b*x)^(1/2)/d/e^2/(-b*e+c*d)/(e*x+d)^4+1/240*(B
*d*(3*b^2*e^2-18*b*c*d*e+8*c^2*d^2)+A*e*(7*b^2*e^2-12*b*c*d*e+12*c^2*d^2))
*(c*x^2+b*x)^(1/2)/d^2/e^2/(-b*e+c*d)^2/(e*x+d)^3+1/960*(A*e*(-35*b^3*e^3+
94*b^2*c*d*e^2-72*b*c^2*d^2*e+48*c^3*d^3)+B*d*(-15*b^3*e^3+36*b^2*c*d*e^2-
88*b*c^2*d^2*e+32*c^3*d^3))*(c*x^2+b*x)^(1/2)/d^3/e^2/(-b*e+c*d)^3/(e*x+d)
^2+1/1920*(B*d*(45*b^4*e^4-150*b^3*c*d*e^3+144*b^2*c^2*d^2*e^2-208*b*c^3*d
^3*e+64*c^4*d^4)+A*e*(105*b^4*e^4-380*b^3*c*d*e^3+476*b^2*c^2*d^2*e^2-192*
b*c^3*d^3*e+96*c^4*d^4))*(c*x^2+b*x)^(1/2)/d^4/e^2/(-b*e+c*d)^4/(e*x+d)-1/
128*b^2*(32*A*c^3*d^3-16*b*c^2*d^2*(3*A*e+B*d)+6*b^2*c*d*e*(5*A*e+2*B*d)-b
^3*e^2*(7*A*e+3*B*d))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2)
)/d^(9/2)/(-b*e+c*d)^(9/2)
```

Mathematica [A] (verified)

Time = 12.85 (sec) , antiderivative size = 387, normalized size of antiderivative = 0.66

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx =$$

$$-\frac{\sqrt{x(b+cx)}\left(384(Bd-Ae)x^{3/2}(b+cx)+\frac{48(7Ae(-2cd+be)+Bd(4cd+3be))x^{3/2}(b+cx)(d+ex)}{d(cd-be)}+\frac{8\left(Ae\left(-108c^2d^2+108\right.\right.}{}\right.}{}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^6,x]
```

output
```
-1/1920*(Sqrt[x*(b + c*x)]*(384*(B*d - A*e)*x^(3/2)*(b + c*x) + (48*(7*A*e
*(-2*c*d + b*e) + B*d*(4*c*d + 3*b*e))*x^(3/2)*(b + c*x)*(d + e*x))/(d*(c*
d - b*e)) + (8*(A*e*(-108*c^2*d^2 + 108*b*c*d*e - 35*b^2*e^2) + B*d*(8*c^2
*d^2 + 42*b*c*d*e - 15*b^2*e^2))*x^(3/2)*(b + c*x)*(d + e*x)^2)/(d^2*(c*d
- b*e)^2) + (15*(-32*A*c^3*d^3 + 16*b*c^2*d^2*(B*d + 3*A*e) - 6*b^2*c*d*e*
(2*B*d + 5*A*e) + b^3*e^2*(3*B*d + 7*A*e))*(d + e*x)^3*(Sqrt[d]*Sqrt[c*d -
 b*e]*Sqrt[x]*Sqrt[b + c*x]*(-(b*d) - 2*c*d*x + b*e*x) + b^2*(d + e*x)^2*A
rcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x])]))/(d^(7/2)*(c*d
- b*e)^(7/2)*Sqrt[b + c*x])))/(d*(-(c*d) + b*e)*Sqrt[x]*(d + e*x)^5)
```

Rubi [A] (verified)

Time = 1.36 (sec) , antiderivative size = 442, normalized size of antiderivative = 0.75, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.346, Rules used = {1237, 27, 25, 1237, 27, 1228, 1152, 1154, 219}

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

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx$$

$$\Big\downarrow \text{ 1237}$$

$$\frac{\left(bx+cx^2\right)^{3/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-\frac{\int -\frac{(10Acd-b(3Bd+7Ae)+4c(Bd-Ae)x)\sqrt{cx^2+bx}}{2(d+ex)^5}dx}{5d(cd-be)}$$

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

$$\frac{\int -\frac{(3bBd-10Acd+7Abe-4c(Bd-Ae)x)\sqrt{cx^2+bx}}{(d+ex)^5}dx}{10d(cd-be)}+\frac{\left(bx+cx^2\right)^{3/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}$$

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

$$\frac{\left(bx+cx^2\right)^{3/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-\frac{\int \frac{(3bBd-10Acd+7Abe-4c(Bd-Ae)x)\sqrt{cx^2+bx}}{(d+ex)^5}dx}{10d(cd-be)}$$

$$\Big\downarrow \text{ 1237}$$

$$\frac{\left(bx+cx^2\right)^{3/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{3/2}(7Ae(2cd-be)-Bd(3be+4cd))}{4d(d+ex)^4(cd-be)}-\frac{\int \frac{\left(5e(3Bd+7Ae)b^2-2cd(18Bd+47Ae)b+80Ac^2d^2-2c(7Ae(2cd-be)-Bd(4cd+3be))x\right)\sqrt{cx^2+bx}}{2(d+ex)^4}dx}{4d(cd-be)}}{10d(cd-be)}$$

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

$$\frac{\left(bx+cx^2\right)^{3/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{3/2}(7Ae(2cd-be)-Bd(3be+4cd))}{4d(d+ex)^4(cd-be)}-\frac{\int \frac{\left(5e(3Bd+7Ae)b^2-2cd(18Bd+47Ae)b+80Ac^2d^2-2c(7Ae(2cd-be)-Bd(4cd+3be))x\right)\sqrt{cx^2+bx}}{(d+ex)^4}dx}{8d(cd-be)}}{10d(cd-be)}$$

$$\Big\downarrow \text{ 1228}$$

$$\frac{\left(bx+cx^2\right)^{3/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-$$

$$\frac{\frac{\left(bx+cx^2\right)^{3/2}(7Ae(2cd-be)-Bd(3be+4cd))}{4d(d+ex)^4(cd-be)}-\frac{\frac{5\left(b^3\left(-e^2\right)(7Ae+3Bd)+6b^2cde(5Ae+2Bd)-16bc^2d^2(3Ae+Bd)+32Ac^3d^3\right)\int\frac{\sqrt{cx^2+bx}}{(d+ex)^3}dx}{2d(cd-be)}+\frac{\left(bx+cx^2\right)^{3/2}}{}}{8d(cd-be)}}{10d(cd-be)}$$

$\Big\downarrow$ 1152

$$\frac{\left(bx+cx^2\right)^{3/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-$$

$$\frac{\frac{\left(bx+cx^2\right)^{3/2}(7Ae(2cd-be)-Bd(3be+4cd))}{4d(d+ex)^4(cd-be)}-\frac{\frac{5\left(b^3\left(-e^2\right)(7Ae+3Bd)+6b^2cde(5Ae+2Bd)-16bc^2d^2(3Ae+Bd)+32Ac^3d^3\right)\left(\frac{\sqrt{bx+cx^2}(x(2cd-be)+bd)}{4d(d+ex)^2(cd-be)}-\frac{b}{}\right.}{2d(cd-be)}}{8d(c}}{10d(cd-be)}$$

$\Big\downarrow$ 1154

$$\frac{\left(bx+cx^2\right)^{3/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-$$

$$\frac{\frac{\left(bx+cx^2\right)^{3/2}(7Ae(2cd-be)-Bd(3be+4cd))}{4d(d+ex)^4(cd-be)}-\frac{5\left(b^3\left(-e^2\right)(7Ae+3Bd)+6b^2cde(5Ae+2Bd)-16bc^2d^2(3Ae+Bd)+32Ac^3d^3\right)\left(\frac{b^2\int\frac{1}{4d(cd-be)-\frac{(bd+(2cd-b}{cx^2+bx}}}{4d(cd-}\right.}{2d(cd-be)}}{10d(cd-be)}$$

$\Big\downarrow$ 219

$$\frac{\left(bx+cx^2\right)^{3/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-$$

$$\frac{\frac{\left(bx+cx^2\right)^{3/2}(7Ae(2cd-be)-Bd(3be+4cd))}{4d(d+ex)^4(cd-be)}-\frac{5\left(b^3\left(-e^2\right)(7Ae+3Bd)+6b^2cde(5Ae+2Bd)-16bc^2d^2(3Ae+Bd)+32Ac^3d^3\right)\left(\frac{\sqrt{bx+cx^2}(x(2cd-be)+bd)}{4d(d+ex)^2(cd-be)}-\frac{b}{}\right.}{2d(cd-be)}}{10d(cd-be)}$$

input

```
Int[((A + B*x)*Sqrt[b*x + c*x^2])/(d + e*x)^6,x]
```

output
```
((B*d - A*e)*(b*x + c*x^2)^(3/2))/(5*d*(c*d - b*e)*(d + e*x)^5) - (((7*A*e
*(2*c*d - b*e) - B*d*(4*c*d + 3*b*e))*(b*x + c*x^2)^(3/2))/(4*d*(c*d - b*e
)*(d + e*x)^4) - (((B*d*(8*c^2*d^2 + 42*b*c*d*e - 15*b^2*e^2) - A*e*(108*c
^2*d^2 - 108*b*c*d*e + 35*b^2*e^2))*(b*x + c*x^2)^(3/2))/(3*d*(c*d - b*e)*
(d + e*x)^3) + (5*(32*A*c^3*d^3 - 16*b*c^2*d^2*(B*d + 3*A*e) + 6*b^2*c*d*e
*(2*B*d + 5*A*e) - b^3*e^2*(3*B*d + 7*A*e))*(((b*d + (2*c*d - b*e)*x)*Sqrt
[b*x + c*x^2])/(4*d*(c*d - b*e)*(d + e*x)^2) - (b^2*ArcTanh[(b*d + (2*c*d
- b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(8*d^(3/2)*(c*d
- b*e)^(3/2))))/(2*d*(c*d - b*e)))/(8*d*(c*d - b*e)))/(10*d*(c*d - b*e))
```

Defintions of rubi rules used

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

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1152
```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[(-(d + e*x)^(m + 1))*(d*b - 2*a*e + (2*c*d - b*e)*x)*((a + b
*x + c*x^2)^p/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[p*((b^2 - 4*a
*c)/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2)))   Int[(d + e*x)^(m + 2)*(a + b*x +
 c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[m + 2*p + 2, 0]
 && GtQ[p, 0]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Maple [A] (verified)

Time = 1.49 (sec) , antiderivative size = 528, normalized size of antiderivative = 0.90

method	result
pseudoelliptic	$-\frac{7\left(\left(\frac{16\left(-2Ac^{3}+Bbc^{2}\right)d^{3}}{7}+\frac{48ce\left(Ac-\frac{Bb}{4}\right)bd^{2}}{7}-\frac{30e^{2}\left(Ac-\frac{Bb}{10}\right)b^{2}d}{7}+Ab^{3}e^{3}\right)(ex+d)^{5}b^{2}\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)+\left(-\frac{32c^{2}(\cdots}{\cdots}\right.\right.}{\cdots}$
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

output
```
-7/128*((16/7*(-2*A*c^3+B*b*c^2)*d^3+48/7*c*e*(A*c-1/4*B*b)*b*d^2-30/7*e^2
*(A*c-1/10*B*b)*b^2*d+A*b^3*e^3)*(e*x+d)^5*b^2*arctan((x*(c*x+b))^(1/2)/x*
d/(d*(b*e-c*d))^(1/2))+(-32/7*c^2*(-1/2*B*b^2+c*(1/3*B*x+A)*b+2*c^2*x*(2/3
*B*x+A))*d^7+48/7*c*(-1/4*B*b^3+c*(31/18*B*x+A)*b^2+10/3*c^2*x*(14/15*B*x+
A)*b-4/3*c^3*x^2*(1/3*B*x+A))*e*d^6-30/7*(-1/10*B*b^4+c*(29/15*B*x+A)*b^3+
134/15*c^2*x*(496/1005*B*x+A)*b^2-24/5*c^3*x^2*(67/135*B*x+A)*b+16/15*(2/1
5*B*x+A)*c^4*x^3)*e^2*d^5+e^3*((2*B*x+A)*b^4+590/21*c*(699/1475*B*x+A)*x*b
^3-4196/105*c^2*x^2*(206/1049*B*x+A)*b^2+48/5*c^3*x^3*(13/63*B*x+A)*b-32/3
5*A*c^4*x^4)*d^4-158/21*e^4*((192/395*B*x+A)*b^3-1631/395*c*(351/1631*B*x+
A)*x*b^2+1118/395*c^2*x^2*(36/559*B*x+A)*b-96/395*A*c^3*x^3)*x*b*d^3-128/1
5*e^5*((15/64*B*x+A)*b^2-127/64*c*(75/889*B*x+A)*x*b+17/32*A*c^2*x^2)*x^2*
b^2*d^2-14/3*((9/98*B*x+A)*b-38/49*A*c*x)*e^6*x^3*b^3*d-A*b^4*e^7*x^4)*(x*
(c*x+b))^(1/2)*(d*(b*e-c*d))^(1/2))/(d*(b*e-c*d))^(1/2)/(e*x+d)^5/(b*e-c*d
)^4/d^4
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1718 vs. $2(554) = 1108$.

Time = 0.26 (sec) , antiderivative size = 3451, normalized size of antiderivative = 5.89

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^6,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx = \int \frac{\sqrt{x\,(b+cx)}(A+Bx)}{(d+ex)^6}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(1/2)/(e*x+d)**6,x)
```

output
```
Integral(sqrt(x*(b + c*x))*(A + B*x)/(d + e*x)**6, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^6,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 4192 vs. $2(554) = 1108$.

Time = 0.30 (sec) , antiderivative size = 4192, normalized size of antiderivative = 7.15

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^6,x, algorithm="giac")
```

output
```
1/128*(16*B*b^3*c^2*d^3 - 32*A*b^2*c^3*d^3 - 12*B*b^4*c*d^2*e + 48*A*b^3*c
^2*d^2*e + 3*B*b^5*d*e^2 - 30*A*b^4*c*d*e^2 + 7*A*b^5*e^3)*arctan(-((sqrt(
c)*x - sqrt(c*x^2 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))/((c^4*d^8 -
 4*b*c^3*d^7*e + 6*b^2*c^2*d^6*e^2 - 4*b^3*c*d^5*e^3 + b^4*d^4*e^4)*sqrt(-
c*d^2 + b*d*e)) - 1/1920*(240*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*B*b^3*c^2*
d^3*e^7 - 480*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*A*b^2*c^3*d^3*e^7 - 180*(s
qrt(c)*x - sqrt(c*x^2 + b*x))^9*B*b^4*c*d^2*e^8 + 720*(sqrt(c)*x - sqrt(c*
x^2 + b*x))^9*A*b^3*c^2*d^2*e^8 + 45*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*B*b
^5*d*e^9 - 450*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*A*b^4*c*d*e^9 + 105*(sqrt
(c)*x - sqrt(c*x^2 + b*x))^9*A*b^5*e^10 + 2160*(sqrt(c)*x - sqrt(c*x^2 + b
*x))^8*B*b^3*c^(5/2)*d^4*e^6 - 4320*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*A*b^
2*c^(7/2)*d^4*e^6 - 1620*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*B*b^4*c^(3/2)*d
^3*e^7 + 6480*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*A*b^3*c^(5/2)*d^3*e^7 + 40
5*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*B*b^5*sqrt(c)*d^2*e^8 - 4050*(sqrt(c)*
x - sqrt(c*x^2 + b*x))^8*A*b^4*c^(3/2)*d^2*e^8 + 945*(sqrt(c)*x - sqrt(c*x
^2 + b*x))^8*A*b^5*sqrt(c)*d*e^9 - 5120*(sqrt(c)*x - sqrt(c*x^2 + b*x))^7*
B*c^6*d^8*e^2 + 20480*(sqrt(c)*x - sqrt(c*x^2 + b*x))^7*B*b*c^5*d^7*e^3 -
30720*(sqrt(c)*x - sqrt(c*x^2 + b*x))^7*B*b^2*c^4*d^6*e^4 + 28000*(sqrt(c)
*x - sqrt(c*x^2 + b*x))^7*B*b^3*c^3*d^5*e^5 - 15040*(sqrt(c)*x - sqrt(c*x^
2 + b*x))^7*A*b^2*c^4*d^5*e^5 - 9640*(sqrt(c)*x - sqrt(c*x^2 + b*x))^7*...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx = \int \frac{\sqrt{c\,x^2+b\,x}\,(A+B\,x)}{(d+e\,x)^6}\,dx$$

input
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^6,x)
```

output
```
int(((b*x + c*x^2)^(1/2)*(A + B*x))/(d + e*x)^6, x)
```

Reduce [F]

$$\int \frac{(A+Bx)\sqrt{bx+cx^2}}{(d+ex)^6}\,dx = \int \frac{(Bx+A)\sqrt{c\,x^2+bx}}{(ex+d)^6}dx$$

input
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^6,x)
```

output
```
int((B*x+A)*(c*x^2+b*x)^(1/2)/(e*x+d)^6,x)
```

3.102 $\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{3/2} \, dx$

Optimal result

Integrand size = 26, antiderivative size = 498

$$\begin{aligned}
\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{3/2} \, dx = & -\frac{b^3(48Ac^3d^2-9b^3Be^2+14b^2ce(2Bd+Ae)-24bc^2d(Bd+2Ae))\sqrt{bx+cx^2}}{1024c^5} \\
& +\frac{b^2(48Ac^3d^2-9b^3Be^2+14b^2ce(2Bd+Ae)-24bc^2d(Bd+2Ae))\,x\sqrt{bx+cx^2}}{1536c^4} \\
& +\frac{b(48Ac^3d^2-9b^3Be^2+14b^2ce(2Bd+Ae)-24bc^2d(Bd+2Ae))\,x^2\sqrt{bx+cx^2}}{128c^3} \\
& +\frac{(48Ac^3d^2-9b^3Be^2+14b^2ce(2Bd+Ae)-24bc^2d(Bd+2Ae))\,x^3\sqrt{bx+cx^2}}{192c^2} \\
& +\frac{(2Ace(24cd-7be)+B(24c^2d^2-28bcde+9b^2e^2))\left(bx+cx^2\right)^{5/2}}{120c^3} \\
& +\frac{e(28Bcd-9bBe+14Ace)x(bx+cx^2)^{5/2}}{84c^2}+\frac{Be^2x^2(bx+cx^2)^{5/2}}{7c} \\
& +\frac{b^4(48Ac^3d^2-9b^3Be^2+14b^2ce(2Bd+Ae)-24bc^2d(Bd+2Ae))\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{1024c^{11/2}}
\end{aligned}$$

output
```
-1/1024*b^3*(48*A*c^3*d^2-9*b^3*B*e^2+14*b^2*c*e*(A*e+2*B*d)-24*b*c^2*d*(2
*A*e+B*d))*(c*x^2+b*x)^(1/2)/c^5+1/1536*b^2*(48*A*c^3*d^2-9*b^3*B*e^2+14*b
^2*c*e*(A*e+2*B*d)-24*b*c^2*d*(2*A*e+B*d))*x*(c*x^2+b*x)^(1/2)/c^4+1/128*b
*(48*A*c^3*d^2-9*b^3*B*e^2+14*b^2*c*e*(A*e+2*B*d)-24*b*c^2*d*(2*A*e+B*d))*
x^2*(c*x^2+b*x)^(1/2)/c^3+1/192*(48*A*c^3*d^2-9*b^3*B*e^2+14*b^2*c*e*(A*e+
2*B*d)-24*b*c^2*d*(2*A*e+B*d))*x^3*(c*x^2+b*x)^(1/2)/c^2+1/120*(2*A*c*e*(-
7*b*e+24*c*d)+B*(9*b^2*e^2-28*b*c*d*e+24*c^2*d^2))*(c*x^2+b*x)^(5/2)/c^3+1
/84*e*(14*A*c*e-9*B*b*e+28*B*c*d)*x*(c*x^2+b*x)^(5/2)/c^2+1/7*B*e^2*x^2*(c
*x^2+b*x)^(5/2)/c+1/1024*b^4*(48*A*c^3*d^2-9*b^3*B*e^2+14*b^2*c*e*(A*e+2*B
*d)-24*b*c^2*d*(2*A*e+B*d))*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(11/2)
```

Mathematica [A] (verified)

Time = 4.37 (sec) , antiderivative size = 471, normalized size of antiderivative = 0.95

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^{3/2}\,dx=\frac{\sqrt{x}\sqrt{b+cx}\left(\sqrt{c}\sqrt{x}\sqrt{b+cx}(945b^6Be^2-210b^5ce(14Bd+7Ae+3Bex)+96b^2c^4x(7A(5d^2\right.}{}$$

input
```
Integrate[(A + B*x)*(d + e*x)^2*(b*x + c*x^2)^(3/2),x]
```

output
```
(Sqrt[x]*Sqrt[b + c*x]*(Sqrt[c]*Sqrt[x]*Sqrt[b + c*x]*(945*b^6*B*e^2 - 210
*b^5*c*e*(14*B*d + 7*A*e + 3*B*e*x) + 96*b^2*c^4*x*(7*A*(5*d^2 + 4*d*e*x +
 e^2*x^2) + 2*B*x*(7*d^2 + 7*d*e*x + 2*e^2*x^2)) + 28*b^4*c^2*(5*A*e*(36*d
 + 7*e*x) + 2*B*(45*d^2 + 35*d*e*x + 9*e^2*x^2)) + 256*c^6*x^3*(7*A*(15*d^
2 + 24*d*e*x + 10*e^2*x^2) + 4*B*x*(21*d^2 + 35*d*e*x + 15*e^2*x^2)) - 16*
b^3*c^3*(7*A*(45*d^2 + 30*d*e*x + 7*e^2*x^2) + B*x*(105*d^2 + 98*d*e*x + 2
7*e^2*x^2)) + 128*b*c^5*x^2*(7*A*(45*d^2 + 66*d*e*x + 26*e^2*x^2) + B*x*(2
31*d^2 + 364*d*e*x + 150*e^2*x^2))) + 630*b^5*(8*B*c^2*d^2 + 16*A*c^2*d*e
+ 3*b^2*B*e^2)*ArcTanh[(Sqrt[c]*Sqrt[x])/(Sqrt[b] - Sqrt[b + c*x])] + 420*
b^4*c*(24*A*c^2*d^2 + 14*b^2*B*d*e + 7*A*b^2*e^2)*ArcTanh[(Sqrt[c]*Sqrt[x]
)/(-Sqrt[b] + Sqrt[b + c*x])]))/(107520*c^(11/2)*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.82 (sec) , antiderivative size = 274, normalized size of antiderivative = 0.55, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {1236, 27, 1225, 1087, 1087, 1091, 219}

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

$$\int (A+Bx) \left(bx+cx^2\right)^{3/2} (d+ex)^2 \, dx$$

$$\Big\downarrow \text{1236}$$

$$\frac{\int -\frac{1}{2}(d+ex)((5bB-14Ac)d-(4Bcd-9bBe+14Ace)x) \left(cx^2+bx\right)^{3/2}dx}{7c}+\frac{B\left(bx+cx^2\right)^{5/2}(d+ex)^2}{7c}$$

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

$$\frac{B\left(bx+cx^2\right)^{5/2}(d+ex)^2}{7c}-\frac{\int (d+ex)((5bB-14Ac)d-(4Bcd-9bBe+14Ace)x) \left(cx^2+bx\right)^{3/2}dx}{14c}$$

$$\Big\downarrow \text{1225}$$

$$\frac{B\left(bx+cx^2\right)^{5/2}(d+ex)^2}{7c}-\frac{-\frac{7\left(14b^2ce(Ae+2Bd)-24bc^2d(2Ae+Bd)+48Ac^3d^2-9b^3Be^2\right)\int \left(cx^2+bx\right)^{3/2}dx}{24c^2}-\frac{\left(bx+cx^2\right)^{5/2}\left(10cex(14Ace-9bBe+4Bcd)+14Ace(24cd-7b\right.}{60c^2}}{14c}$$

$$\Big\downarrow \text{1087}$$

$$\frac{B\left(bx+cx^2\right)^{5/2}(d+ex)^2}{7c}-\frac{-\frac{7\left(14b^2ce(Ae+2Bd)-24bc^2d(2Ae+Bd)+48Ac^3d^2-9b^3Be^2\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\int \sqrt{cx^2+bx}dx}{16c}\right)}{24c^2}-\frac{\left(bx+cx^2\right)^{5/2}\left(10cex(14Ace-9bBe\right.}{}}{14c}$$

$$\Big\downarrow \text{1087}$$

$$\frac{B\left(bx+cx^2\right)^{5/2}(d+ex)^2}{7c} - \frac{-\frac{7\left(14b^2ce(Ae+2Bd)-24bc^2d(2Ae+Bd)+48Ac^3d^2-9b^3Be^2\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int\frac{1}{\sqrt{cx^2+bx}}dx}{8c}\right)}{16c}\right)}{24c^2} - \frac{(bx+cx^2)}{}}{14c}$$

$$\Big\downarrow \; 1091$$

$$\frac{B\left(bx+cx^2\right)^{5/2}(d+ex)^2}{7c} - \frac{-\frac{7\left(14b^2ce(Ae+2Bd)-24bc^2d(2Ae+Bd)+48Ac^3d^2-9b^3Be^2\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int\frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{4c}\right)}{16c}\right)}{24c^2} - }{14c}$$

$$\Big\downarrow \; 219$$

$$\frac{B\left(bx+cx^2\right)^{5/2}(d+ex)^2}{7c} - \frac{-\frac{7\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4c^{3/2}}\right)}{16c}\right)\left(14b^2ce(Ae+2Bd)-24bc^2d(2Ae+Bd)+48Ac^3d^2-9b^3Be^2\right)}{24c^2} - \frac{(}{}}{14c}$$

input

```
Int[(A + B*x)*(d + e*x)^2*(b*x + c*x^2)^(3/2),x]
```

output

```
(B*(d + e*x)^2*(b*x + c*x^2)^(5/2))/(7*c) - (-1/60*((14*A*c*e*(24*c*d - 7*
b*e) + 2*B*(24*c^2*d^2 - 98*b*c*d*e + (63*b^2*e^2)/2) + 10*c*e*(4*B*c*d -
9*b*B*e + 14*A*c*e)*x)*(b*x + c*x^2)^(5/2))/c^2 - (7*(48*A*c^3*d^2 - 9*b^3
*B*e^2 + 14*b^2*c*e*(2*B*d + A*e) - 24*b*c^2*d*(B*d + 2*A*e))*(((b + 2*c*x
)*(b*x + c*x^2)^(3/2))/(8*c) - (3*b^2*(((b + 2*c*x)*Sqrt[b*x + c*x^2])/(4*
c) - (b^2*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(4*c^(3/2))))/(16*c)))/(
24*c^2))/(14*c)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1087
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(b + 2*c*x)
*((a + b*x + c*x^2)^p/(2*c*(2*p + 1))), x] - Simp[p*((b^2 - 4*a*c)/(2*c*(2*
p + 1)))   Int[(a + b*x + c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] &&
GtQ[p, 0] && (IntegerQ[4*p] || IntegerQ[3*p])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

Maple [A] (verified)

Time = 1.05 (sec) , antiderivative size = 336, normalized size of antiderivative = 0.67

method	result
pseudoelliptic	$-\frac{7\left(-\left(-\frac{9b^3Be^2}{14}+b^2ce(Ae+2Bd)-\frac{24c^2d\left(Ae+\frac{Bd}{2}\right)b}{7}+\frac{24Ac^3d^2}{7}\right)b^4\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)+\left(-\frac{192x^2\left(\frac{26x^2\left(\frac{75Bx}{91}+A\right)e^2}{45}\right.}{}\right.\right.}{}$
default	$A\,d^2\left(\frac{(2cx+b)(c\,x^2+bx)^{\frac{3}{2}}}{8c}-\frac{3b^2\left(\frac{(2cx+b)\sqrt{c\,x^2+bx}}{4c}-\frac{b^2\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^2+bx}\right)}{8c^{\frac{3}{2}}}\right)}{16c}\right)+e(Ae+2Bd)\left(\frac{x(c\,x^2+}{6c}\right.$
risch	$-\frac{(-15360B\,c^6e^2x^6-17920A\,c^6e^2x^5-19200Bb\,c^5e^2x^5-35840B\,c^6de\,x^5-23296Ab\,c^5e^2x^4-43008A\,c^6de\,x^4-384B\,b^2c^4e^2}{}$

input
```
int((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-7/512*(-(-9/14*b^3*B*e^2+b^2*c*e*(A*e+2*B*d)-24/7*c^2*d*(A*e+1/2*B*d)*b+2
4/7*A*c^3*d^2)*b^4*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))+(-192/7*x^2*(26/45
*x^2*(75/91*B*x+A)*e^2+22/15*d*(26/33*B*x+A)*x*e+d^2*(11/15*B*x+A))*b*c^(1
1/2)-128/7*(2/3*(6/7*B*x+A)*x^2*e^2+8/5*(5/6*B*x+A)*d*x*e+d^2*(4/5*B*x+A))
*x^3*c^(13/2)+b^2*(24/7*((3/35*B*x^3+7/45*A*x^2)*e^2+2/3*d*x*(7/15*B*x+A)*
e+d^2*(1/3*B*x+A))*b*c^(7/2)-16/7*(1/5*(4/7*B*x+A)*x^2*e^2+4/5*d*x*(1/2*B*
x+A)*e+d^2*(2/5*B*x+A))*x*c^(9/2)+((-2/3*(18/35*B*x+A)*x*e^2-24/7*d*(7/18*
B*x+A)*e-12/7*B*d^2)*c^(5/2)+e*b*(((3/7*B*x+A)*e+2*B*d)*c^(3/2)-9/14*B*b*e
*c^(1/2)))*b^2))*(x*(c*x+b))^(1/2))/c^(11/2)
```

Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 988, normalized size of antiderivative = 1.98

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{3/2} \, dx = \text{Too large to display}$$

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

output
```
[-1/215040*(105*(24*(B*b^5*c^2 - 2*A*b^4*c^3)*d^2 - 4*(7*B*b^6*c - 12*A*b^
5*c^2)*d*e + (9*B*b^7 - 14*A*b^6*c)*e^2)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*
x^2 + b*x)*sqrt(c)) - 2*(15360*B*c^7*e^2*x^6 + 1280*(28*B*c^7*d*e + (15*B*
b*c^6 + 14*A*c^7)*e^2)*x^5 + 128*(168*B*c^7*d^2 + 28*(13*B*b*c^6 + 12*A*c^
7)*d*e + (3*B*b^2*c^5 + 182*A*b*c^6)*e^2)*x^4 + 48*(56*(11*B*b*c^6 + 10*A*
c^7)*d^2 + 28*(B*b^2*c^5 + 44*A*b*c^6)*d*e - (9*B*b^3*c^4 - 14*A*b^2*c^5)*
e^2)*x^3 + 2520*(B*b^4*c^3 - 2*A*b^3*c^4)*d^2 - 420*(7*B*b^5*c^2 - 12*A*b^
4*c^3)*d*e + 105*(9*B*b^6*c - 14*A*b^5*c^2)*e^2 + 56*(24*(B*b^2*c^5 + 30*A
*b*c^6)*d^2 - 4*(7*B*b^3*c^4 - 12*A*b^2*c^5)*d*e + (9*B*b^4*c^3 - 14*A*b^3
*c^4)*e^2)*x^2 - 70*(24*(B*b^3*c^4 - 2*A*b^2*c^5)*d^2 - 4*(7*B*b^4*c^3 - 1
2*A*b^3*c^4)*d*e + (9*B*b^5*c^2 - 14*A*b^4*c^3)*e^2)*x)*sqrt(c*x^2 + b*x))
/c^6, 1/107520*(105*(24*(B*b^5*c^2 - 2*A*b^4*c^3)*d^2 - 4*(7*B*b^6*c - 12*
A*b^5*c^2)*d*e + (9*B*b^7 - 14*A*b^6*c)*e^2)*sqrt(-c)*arctan(sqrt(c*x^2 +
b*x)*sqrt(-c)/(c*x + b)) + (15360*B*c^7*e^2*x^6 + 1280*(28*B*c^7*d*e + (15
*B*b*c^6 + 14*A*c^7)*e^2)*x^5 + 128*(168*B*c^7*d^2 + 28*(13*B*b*c^6 + 12*A
*c^7)*d*e + (3*B*b^2*c^5 + 182*A*b*c^6)*e^2)*x^4 + 48*(56*(11*B*b*c^6 + 10
*A*c^7)*d^2 + 28*(B*b^2*c^5 + 44*A*b*c^6)*d*e - (9*B*b^3*c^4 - 14*A*b^2*c^
5)*e^2)*x^3 + 2520*(B*b^4*c^3 - 2*A*b^3*c^4)*d^2 - 420*(7*B*b^5*c^2 - 12*A
*b^4*c^3)*d*e + 105*(9*B*b^6*c - 14*A*b^5*c^2)*e^2 + 56*(24*(B*b^2*c^5 + 3
0*A*b*c^6)*d^2 - 4*(7*B*b^3*c^4 - 12*A*b^2*c^5)*d*e + (9*B*b^4*c^3 - 14...
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1224 vs. $2(513) = 1026$.

Time = 0.83 (sec) , antiderivative size = 1224, normalized size of antiderivative = 2.46

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^{3/2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)**2*(c*x**2+b*x)**(3/2),x)
```

output
```
Piecewise((3*b**2*(A*b**2*d**2 - 5*b*(2*A*b**2*d*e + 2*A*b*c*d**2 + B*b**2
*d**2 - 7*b*(A*b**2*e**2 + 4*A*b*c*d*e + A*c**2*d**2 + 2*B*b**2*d*e + 2*B*
b*c*d**2 - 9*b*(2*A*b*c*e**2 + 2*A*c**2*d*e + B*b**2*e**2 + 4*B*b*c*d*e +
B*c**2*d**2 - 11*b*(A*c**2*e**2 + 15*B*b*c*e**2/14 + 2*B*c**2*d*e)/(12*c))
/(10*c))/(8*c))/(6*c))*Piecewise((log(b + 2*sqrt(c)*sqrt(b*x + c*x**2) + 2
*c*x)/sqrt(c), Ne(b**2/c, 0)), ((b/(2*c) + x)*log(b/(2*c) + x)/sqrt(c*(b/(
2*c) + x)**2), True))/(8*c**2) + sqrt(b*x + c*x**2)*(B*c*e**2*x**6/7 - 3*b
*(A*b**2*d**2 - 5*b*(2*A*b**2*d*e + 2*A*b*c*d**2 + B*b**2*d**2 - 7*b*(A*b*
*2*e**2 + 4*A*b*c*d*e + A*c**2*d**2 + 2*B*b**2*d*e + 2*B*b*c*d**2 - 9*b*(2
*A*b*c*e**2 + 2*A*c**2*d*e + B*b**2*e**2 + 4*B*b*c*d*e + B*c**2*d**2 - 11*
b*(A*c**2*e**2 + 15*B*b*c*e**2/14 + 2*B*c**2*d*e)/(12*c))/(10*c))/(8*c))/(
6*c))/(4*c**2) + x**5*(A*c**2*e**2 + 15*B*b*c*e**2/14 + 2*B*c**2*d*e)/(6*c
) + x**4*(2*A*b*c*e**2 + 2*A*c**2*d*e + B*b**2*e**2 + 4*B*b*c*d*e + B*c**2
*d**2 - 11*b*(A*c**2*e**2 + 15*B*b*c*e**2/14 + 2*B*c**2*d*e)/(12*c))/(5*c)
 + x**3*(A*b**2*e**2 + 4*A*b*c*d*e + A*c**2*d**2 + 2*B*b**2*d*e + 2*B*b*c*
d**2 - 9*b*(2*A*b*c*e**2 + 2*A*c**2*d*e + B*b**2*e**2 + 4*B*b*c*d*e + B*c*
*2*d**2 - 11*b*(A*c**2*e**2 + 15*B*b*c*e**2/14 + 2*B*c**2*d*e)/(12*c))/(10
*c))/(4*c) + x**2*(2*A*b**2*d*e + 2*A*b*c*d**2 + B*b**2*d**2 - 7*b*(A*b**2
*e**2 + 4*A*b*c*d*e + A*c**2*d**2 + 2*B*b**2*d*e + 2*B*b*c*d**2 - 9*b*(2*A
*b*c*e**2 + 2*A*c**2*d*e + B*b**2*e**2 + 4*B*b*c*d*e + B*c**2*d**2 - 11...
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 728, normalized size of antiderivative = 1.46

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{3/2} \, dx = \text{Too large to display}$$

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

output
```
1/7*(c*x^2 + b*x)^(5/2)*B*e^2*x^2/c + 1/4*(c*x^2 + b*x)^(3/2)*A*d^2*x - 3/
32*sqrt(c*x^2 + b*x)*A*b^2*d^2*x/c + 9/512*sqrt(c*x^2 + b*x)*B*b^5*e^2*x/c
^4 - 3/64*(c*x^2 + b*x)^(3/2)*B*b^3*e^2*x/c^3 - 3/28*(c*x^2 + b*x)^(5/2)*B
*b*e^2*x/c^2 + 3/128*A*b^4*d^2*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)
)/c^(5/2) - 9/2048*B*b^7*e^2*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/
c^(11/2) - 3/64*sqrt(c*x^2 + b*x)*A*b^3*d^2/c^2 + 1/8*(c*x^2 + b*x)^(3/2)*
A*b*d^2/c + 9/1024*sqrt(c*x^2 + b*x)*B*b^6*e^2/c^5 - 3/128*(c*x^2 + b*x)^(
3/2)*B*b^4*e^2/c^4 + 3/40*(c*x^2 + b*x)^(5/2)*B*b^2*e^2/c^3 - 7/256*(2*B*d
*e + A*e^2)*sqrt(c*x^2 + b*x)*b^4*x/c^3 + 7/96*(2*B*d*e + A*e^2)*(c*x^2 +
b*x)^(3/2)*b^2*x/c^2 + 3/64*(B*d^2 + 2*A*d*e)*sqrt(c*x^2 + b*x)*b^3*x/c^2
+ 1/6*(2*B*d*e + A*e^2)*(c*x^2 + b*x)^(5/2)*x/c - 1/8*(B*d^2 + 2*A*d*e)*(c
*x^2 + b*x)^(3/2)*b*x/c + 7/1024*(2*B*d*e + A*e^2)*b^6*log(2*c*x + b + 2*s
qrt(c*x^2 + b*x)*sqrt(c))/c^(9/2) - 3/256*(B*d^2 + 2*A*d*e)*b^5*log(2*c*x
+ b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(7/2) - 7/512*(2*B*d*e + A*e^2)*sqrt(
c*x^2 + b*x)*b^5/c^4 + 7/192*(2*B*d*e + A*e^2)*(c*x^2 + b*x)^(3/2)*b^3/c^3
 + 3/128*(B*d^2 + 2*A*d*e)*sqrt(c*x^2 + b*x)*b^4/c^3 - 7/60*(2*B*d*e + A*e
^2)*(c*x^2 + b*x)^(5/2)*b/c^2 - 1/16*(B*d^2 + 2*A*d*e)*(c*x^2 + b*x)^(3/2)
*b^2/c^2 + 1/5*(B*d^2 + 2*A*d*e)*(c*x^2 + b*x)^(5/2)/c
```

Giac [A] (verification not implemented)

Time = 0.21 (sec) , antiderivative size = 518, normalized size of antiderivative = 1.04

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{3/2} dx = \frac{1}{107520}\sqrt{cx^2+bx}\left(2\left(4\left(2\left(8\left(10\left(12\,Bce^2x+\frac{28\,Bc^7de+15\,Bbc^6e^2+14\,Ac^7e^2}{c^6}\right)x+\frac{16}{}\right.\right.\right.\right.\right.\right. + \frac{\left(24\,Bb^5c^2d^2-48\,Ab^4c^3d^2-28\,Bb^6cde+48\,Ab^5c^2de+9\,Bb^7e^2-14\,Ab^6ce^2\right)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{}\right.\right.}{2048\,c^{\frac{11}{2}}}$$

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

output
```
1/107520*sqrt(c*x^2 + b*x)*(2*(4*(2*(8*(10*(12*B*c*e^2*x + (28*B*c^7*d*e +
 15*B*b*c^6*e^2 + 14*A*c^7*e^2)/c^6)*x + (168*B*c^7*d^2 + 364*B*b*c^6*d*e
+ 336*A*c^7*d*e + 3*B*b^2*c^5*e^2 + 182*A*b*c^6*e^2)/c^6)*x + 3*(616*B*b*c
^6*d^2 + 560*A*c^7*d^2 + 28*B*b^2*c^5*d*e + 1232*A*b*c^6*d*e - 9*B*b^3*c^4
*e^2 + 14*A*b^2*c^5*e^2)/c^6)*x + 7*(24*B*b^2*c^5*d^2 + 720*A*b*c^6*d^2 -
28*B*b^3*c^4*d*e + 48*A*b^2*c^5*d*e + 9*B*b^4*c^3*e^2 - 14*A*b^3*c^4*e^2)/
c^6)*x - 35*(24*B*b^3*c^4*d^2 - 48*A*b^2*c^5*d^2 - 28*B*b^4*c^3*d*e + 48*A
*b^3*c^4*d*e + 9*B*b^5*c^2*e^2 - 14*A*b^4*c^3*e^2)/c^6)*x + 105*(24*B*b^4*
c^3*d^2 - 48*A*b^3*c^4*d^2 - 28*B*b^5*c^2*d*e + 48*A*b^4*c^3*d*e + 9*B*b^6
*c*e^2 - 14*A*b^5*c^2*e^2)/c^6) + 1/2048*(24*B*b^5*c^2*d^2 - 48*A*b^4*c^3*
d^2 - 28*B*b^6*c*d*e + 48*A*b^5*c^2*d*e + 9*B*b^7*e^2 - 14*A*b^6*c*e^2)*lo
g(abs(2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) + b))/c^(11/2)
```

Mupad [F(-1)]

Timed out.

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^{3/2}\,dx=\int \left(c\,x^2+b\,x\right)^{3/2}\,\left(A+B\,x\right)\,\left(d+e\,x\right)^2\,dx$$

input
```
int((b*x + c*x^2)^(3/2)*(A + B*x)*(d + e*x)^2,x)
```

output
```
int((b*x + c*x^2)^(3/2)*(A + B*x)*(d + e*x)^2, x)
```

Reduce [B] (verification not implemented)

Time = 43.31 (sec) , antiderivative size = 863, normalized size of antiderivative = 1.73

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^{3/2}\,dx=\text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(3/2),x)
```

output
```
( - 1470*sqrt(x)*sqrt(b + c*x)*a*b**5*c**2*e**2 + 5040*sqrt(x)*sqrt(b + c*
x)*a*b**4*c**3*d*e + 980*sqrt(x)*sqrt(b + c*x)*a*b**4*c**3*e**2*x - 5040*s
qrt(x)*sqrt(b + c*x)*a*b**3*c**4*d**2 - 3360*sqrt(x)*sqrt(b + c*x)*a*b**3*
c**4*d*e*x - 784*sqrt(x)*sqrt(b + c*x)*a*b**3*c**4*e**2*x**2 + 3360*sqrt(x
)*sqrt(b + c*x)*a*b**2*c**5*d**2*x + 2688*sqrt(x)*sqrt(b + c*x)*a*b**2*c**
5*d*e*x**2 + 672*sqrt(x)*sqrt(b + c*x)*a*b**2*c**5*e**2*x**3 + 40320*sqrt(
x)*sqrt(b + c*x)*a*b*c**6*d**2*x**2 + 59136*sqrt(x)*sqrt(b + c*x)*a*b*c**6
*d*e*x**3 + 23296*sqrt(x)*sqrt(b + c*x)*a*b*c**6*e**2*x**4 + 26880*sqrt(x)
*sqrt(b + c*x)*a*c**7*d**2*x**3 + 43008*sqrt(x)*sqrt(b + c*x)*a*c**7*d*e*x
**4 + 17920*sqrt(x)*sqrt(b + c*x)*a*c**7*e**2*x**5 + 945*sqrt(x)*sqrt(b +
c*x)*b**7*c*e**2 - 2940*sqrt(x)*sqrt(b + c*x)*b**6*c**2*d*e - 630*sqrt(x)*
sqrt(b + c*x)*b**6*c**2*e**2*x + 2520*sqrt(x)*sqrt(b + c*x)*b**5*c**3*d**2
 + 1960*sqrt(x)*sqrt(b + c*x)*b**5*c**3*d*e*x + 504*sqrt(x)*sqrt(b + c*x)*
b**5*c**3*e**2*x**2 - 1680*sqrt(x)*sqrt(b + c*x)*b**4*c**4*d**2*x - 1568*s
qrt(x)*sqrt(b + c*x)*b**4*c**4*d*e*x**2 - 432*sqrt(x)*sqrt(b + c*x)*b**4*c
**4*e**2*x**3 + 1344*sqrt(x)*sqrt(b + c*x)*b**3*c**5*d**2*x**2 + 1344*sqrt
(x)*sqrt(b + c*x)*b**3*c**5*d*e*x**3 + 384*sqrt(x)*sqrt(b + c*x)*b**3*c**5
*e**2*x**4 + 29568*sqrt(x)*sqrt(b + c*x)*b**2*c**6*d**2*x**3 + 46592*sqrt(
x)*sqrt(b + c*x)*b**2*c**6*d*e*x**4 + 19200*sqrt(x)*sqrt(b + c*x)*b**2*c**
6*e**2*x**5 + 21504*sqrt(x)*sqrt(b + c*x)*b*c**7*d**2*x**4 + 35840*sqrt...
```

3.103 $\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{3/2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 317

$$\begin{aligned}\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{3/2}\,dx =& -\frac{b^3(24Ac^2d+7b^2Be-12bc(Bd+Ae))\sqrt{bx+cx^2}}{512c^4} \\ &+\frac{b^2(24Ac^2d+7b^2Be-12bc(Bd+Ae))\,x\sqrt{bx+cx^2}}{768c^3} \\ &+\frac{b(24Ac^2d+7b^2Be-12bc(Bd+Ae))\,x^2\sqrt{bx+cx^2}}{64c^2} \\ &+\frac{(24Ac^2d+7b^2Be-12bc(Bd+Ae))\,x^3\sqrt{bx+cx^2}}{96c} \\ &+\frac{(12Bcd-7bBe+12Ace)\left(bx+cx^2\right)^{5/2}}{60c^2}+\frac{Bex\left(bx+cx^2\right)^{5/2}}{6c} \\ &+\frac{b^4(24Ac^2d+7b^2Be-12bc(Bd+Ae))\,\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{512c^{9/2}}\end{aligned}$$

output
```
-1/512*b^3*(24*A*c^2*d+7*b^2*B*e-12*b*c*(A*e+B*d))*(c*x^2+b*x)^(1/2)/c^4+1
/768*b^2*(24*A*c^2*d+7*b^2*B*e-12*b*c*(A*e+B*d))*x*(c*x^2+b*x)^(1/2)/c^3+1
/64*b*(24*A*c^2*d+7*b^2*B*e-12*b*c*(A*e+B*d))*x^2*(c*x^2+b*x)^(1/2)/c^2+1/
96*(24*A*c^2*d+7*b^2*B*e-12*b*c*(A*e+B*d))*x^3*(c*x^2+b*x)^(1/2)/c+1/60*(1
2*A*c*e-7*B*b*e+12*B*c*d)*(c*x^2+b*x)^(5/2)/c^2+1/6*B*e*x*(c*x^2+b*x)^(5/2
)/c+1/512*b^4*(24*A*c^2*d+7*b^2*B*e-12*b*c*(A*e+B*d))*arctanh(c^(1/2)*x/(c
*x^2+b*x)^(1/2))/c^(9/2)
```

Mathematica [A] (verified)

Time = 2.49 (sec) , antiderivative size = 301, normalized size of antiderivative = 0.95

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{3/2}\,dx = \frac{\sqrt{x}\sqrt{b+cx}\left(\sqrt{c}\sqrt{x}\sqrt{b+cx}(-105b^5Be+10b^4c(18Bd+18Ae+7Bex)+48b^2c^3x(Bx(2d+\right.}{}$$

input
```
Integrate[(A + B*x)*(d + e*x)*(b*x + c*x^2)^(3/2),x]
```

output
```
(Sqrt[x]*Sqrt[b + c*x]*(Sqrt[c]*Sqrt[x]*Sqrt[b + c*x]*(-105*b^5*B*e + 10*b
^4*c*(18*B*d + 18*A*e + 7*B*e*x) + 48*b^2*c^3*x*(B*x*(2*d + e*x) + A*(5*d
+ 2*e*x)) + 128*c^5*x^3*(3*A*(5*d + 4*e*x) + 2*B*x*(6*d + 5*e*x)) - 8*b^3*
c^2*(15*A*(3*d + e*x) + B*x*(15*d + 7*e*x)) + 64*b*c^4*x^2*(B*x*(33*d + 26
*e*x) + A*(45*d + 33*e*x))) + 360*b^5*c*(B*d + A*e)*ArcTanh[(Sqrt[c]*Sqrt[
x])/(Sqrt[b] - Sqrt[b + c*x])] + 30*b^4*(24*A*c^2*d + 7*b^2*B*e)*ArcTanh[(
Sqrt[c]*Sqrt[x])/(-Sqrt[b] + Sqrt[b + c*x])]))/(7680*c^(9/2)*Sqrt[x*(b + c
*x)])
```

Rubi [A] (verified)

Time = 0.57 (sec) , antiderivative size = 173, normalized size of antiderivative = 0.55, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {1225, 1087, 1087, 1091, 219}

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

$$\int (A+Bx)\left(bx+cx^2\right)^{3/2}(d+ex)\,dx$$

$$\Big\downarrow \; 1225$$

$$\frac{\left(-12bc(Ae+Bd)+24Ac^2d+7b^2Be\right)\int \left(cx^2+bx\right)^{3/2}dx}{24c^2}-\frac{\left(bx+cx^2\right)^{5/2}\left(-12c(Ae+Bd)+7bBe-10Bcex\right)}{60c^2}$$

$$\Big\downarrow \; 1087$$

$$\frac{\left(-12bc(Ae+Bd)+24Ac^2d+7b^2Be\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\int \sqrt{cx^2+bx}dx}{16c}\right)}{24c^2}-\frac{\left(bx+cx^2\right)^{5/2}\left(-12c(Ae+Bd)+7bBe-10Bcex\right)}{60c^2}$$

$$\Big\downarrow \; 1087$$

$$\frac{\left(-12bc(Ae+Bd)+24Ac^2d+7b^2Be\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int \frac{1}{\sqrt{cx^2+bx}}dx}{8c}\right)}{16c}\right)}{24c^2}-\frac{\left(bx+cx^2\right)^{5/2}\left(-12c(Ae+Bd)+7bBe-10Bcex\right)}{60c^2}$$

$$\Big\downarrow \; 1091$$

$$\frac{\left(-12bc(Ae+Bd)+24Ac^2d+7b^2Be\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int \frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{4c}\right)}{16c}\right)}{24c^2}-\frac{\left(bx+cx^2\right)^{5/2}\left(-12c(Ae+Bd)+7bBe-10Bcex\right)}{60c^2}$$

$$\Big\downarrow \; 219$$

$$\frac{\left(\frac{(b+2cx)(bx+cx^2)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4c^{3/2}}\right)}{16c}\right)(-12bc(Ae+Bd)+24Ac^2d+7b^2Be)}{24c^2}-\frac{(bx+cx^2)^{5/2}(-12c(Ae+Bd)+7bBe-10Bcex)}{60c^2}$$

input
```
Int[(A + B*x)*(d + e*x)*(b*x + c*x^2)^(3/2),x]
```

output
```
-1/60*((7*b*B*e - 12*c*(B*d + A*e) - 10*B*c*e*x)*(b*x + c*x^2)^(5/2))/c^2
+ ((24*A*c^2*d + 7*b^2*B*e - 12*b*c*(B*d + A*e))*(((b + 2*c*x)*(b*x + c*x^
2)^(3/2))/(8*c) - (3*b^2*(((b + 2*c*x)*Sqrt[b*x + c*x^2])/(4*c) - (b^2*Arc
Tanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(4*c^(3/2))))/(16*c)))/(24*c^2)
```

Defintions of rubi rules used

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1087
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(b + 2*c*x)
*((a + b*x + c*x^2)^p/(2*c*(2*p + 1))), x] - Simp[p*((b^2 - 4*a*c)/(2*c*(2*
p + 1)))   Int[(a + b*x + c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] &&
GtQ[p, 0] && (IntegerQ[4*p] || IntegerQ[3*p])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

Maple [A] (verified)

Time = 0.96 (sec) , antiderivative size = 212, normalized size of antiderivative = 0.67

method	result
pseudoelliptic	$\frac{-\frac{3\left(-\frac{7b^2Be}{12}+bc(Ae+Bd)-2A\,c^2d\right)b^4\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)}{128}+\frac{3\left(\frac{32\left(\frac{2Be\,x^2}{3}+\frac{4(Ae+Bd)x}{5}+Ad\right)x^3c^{\frac{11}{2}}}{3}+b\left(-2\left(\frac{7Be\,x^2}{45}+\frac{(Ae+Bd)}{3}\right.\right.\right.}{}}{}$
risch	$\frac{(1280B\,c^5e\,x^5+1536A\,c^5e\,x^4+1664Bb\,c^4e\,x^4+1536B\,c^5d\,x^4+2112Ab\,c^4e\,x^3+1920A\,c^5d\,x^3+48B\,b^2c^3e\,x^3+2112Bb\,c^4d\,x^3}{}$
default	$Ad\left(\frac{(2cx+b)(c\,x^2+bx)^{\frac{3}{2}}}{8c}-\frac{3b^2\left(\frac{(2cx+b)\sqrt{c\,x^2+bx}}{4c}-\frac{b^2\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^2+bx}\right)}{8c^{\frac{3}{2}}}\right)}{16c}\right)+(Ae+Bd)\left(\frac{(c\,x^2+bx)^{\frac{5}{2}}}{5c}\right.$

input
```
int((B*x+A)*(e*x+d)*(c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
3/128/c^(9/2)*(-(-7/12*b^2*B*e+b*c*(A*e+B*d)-2*A*c^2*d)*b^4*arctanh((x*(c*
x+b))^(1/2)/x/c^(1/2))+(32/3*(2/3*B*e*x^2+4/5*(A*e+B*d)*x+A*d)*x^3*c^(11/2
)+b*(-2*(7/45*B*e*x^2+1/3*(A*e+B*d)*x+A*d)*b^2*c^(5/2)+4/3*(1/5*B*e*x^2+2/
5*(A*e+B*d)*x+A*d)*x*b*c^(7/2)+16*x^2*(26/45*B*e*x^2+11/15*(A*e+B*d)*x+A*d
)*c^(9/2)+((7/18*B*e*x+A*e+B*d)*c^(3/2)-7/12*B*b*e*c^(1/2))*b^3))*(x*(c*x+
b))^(1/2))
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 604, normalized size of antiderivative = 1.91

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{3/2}\,dx=\left[\frac{15\left(12\left(Bb^5c-2\,Ab^4c^2\right)d-\left(7\,Bb^6-12\,Ab^5c\right)e\right)\sqrt{c}\log\left(2\,cx+b-2\,\sqrt{cx^2+bx}\sqrt{c}\right)+2\,(12$$

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

output
```
[1/15360*(15*(12*(B*b^5*c - 2*A*b^4*c^2)*d - (7*B*b^6 - 12*A*b^5*c)*e)*sqr
t(c)*log(2*c*x + b - 2*sqrt(c*x^2 + b*x)*sqrt(c)) + 2*(1280*B*c^6*e*x^5 +
128*(12*B*c^6*d + (13*B*b*c^5 + 12*A*c^6)*e)*x^4 + 48*(4*(11*B*b*c^5 + 10*
A*c^6)*d + (B*b^2*c^4 + 44*A*b*c^5)*e)*x^3 + 8*(12*(B*b^2*c^4 + 30*A*b*c^5
)*d - (7*B*b^3*c^3 - 12*A*b^2*c^4)*e)*x^2 + 180*(B*b^4*c^2 - 2*A*b^3*c^3)*
d - 15*(7*B*b^5*c - 12*A*b^4*c^2)*e - 10*(12*(B*b^3*c^3 - 2*A*b^2*c^4)*d -
 (7*B*b^4*c^2 - 12*A*b^3*c^3)*e)*x)*sqrt(c*x^2 + b*x))/c^5, 1/7680*(15*(12
*(B*b^5*c - 2*A*b^4*c^2)*d - (7*B*b^6 - 12*A*b^5*c)*e)*sqrt(-c)*arctan(sqr
t(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) + (1280*B*c^6*e*x^5 + 128*(12*B*c^6*d +
 (13*B*b*c^5 + 12*A*c^6)*e)*x^4 + 48*(4*(11*B*b*c^5 + 10*A*c^6)*d + (B*b^2
*c^4 + 44*A*b*c^5)*e)*x^3 + 8*(12*(B*b^2*c^4 + 30*A*b*c^5)*d - (7*B*b^3*c^
3 - 12*A*b^2*c^4)*e)*x^2 + 180*(B*b^4*c^2 - 2*A*b^3*c^3)*d - 15*(7*B*b^5*c
 - 12*A*b^4*c^2)*e - 10*(12*(B*b^3*c^3 - 2*A*b^2*c^4)*d - (7*B*b^4*c^2 - 1
2*A*b^3*c^3)*e)*x)*sqrt(c*x^2 + b*x))/c^5]
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 666 vs. $2(314) = 628$.

Time = 0.93 (sec) , antiderivative size = 666, normalized size of antiderivative = 2.10

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{3/2}\,dx = \begin{cases} \frac{3b^2\left(Ab^2d-\frac{5b\left(Ab^2e+2Abcd+Bb^2d-\frac{7b\left(2Abce+Ac^2d+Bb^2e+2Bbcd-\frac{9b\left(Ac^2e+\frac{13Bbce}{12}+Bc^2d\right)}{10c}\right)}{8c}\right)}{6c}\right)\left(\begin{cases}\frac{\log\left(b+2\sqrt{c}\sqrt{bx+cx^2}\right.}{\sqrt{c}} \\ \frac{\left(\frac{b}{2c}+x\right)\log\left(\frac{b}{2c}+x\right)}{\sqrt{c\left(\frac{b}{2c}+x\right)^2}}\end{cases}\right.}{8c^2} \\ \frac{2\left(\frac{Ad(bx)^{\frac{5}{2}}}{5}+\frac{Be(bx)^{\frac{9}{2}}}{9b^2}+\frac{(bx)^{\frac{7}{2}}(Ae+Bd)}{7b}\right)}{b} \\ 0 \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x**2+b*x)**(3/2),x)
```

output
```
Piecewise((3*b**2*(A*b**2*d - 5*b*(A*b**2*e + 2*A*b*c*d + B*b**2*d - 7*b*(
2*A*b*c*e + A*c**2*d + B*b**2*e + 2*B*b*c*d - 9*b*(A*c**2*e + 13*B*b*c*e/1
2 + B*c**2*d)/(10*c))/(8*c))/(6*c))*Piecewise((log(b + 2*sqrt(c)*sqrt(b*x
+ c*x**2) + 2*c*x)/sqrt(c), Ne(b**2/c, 0)), ((b/(2*c) + x)*log(b/(2*c) + x
)/sqrt(c*(b/(2*c) + x)**2), True))/(8*c**2) + sqrt(b*x + c*x**2)*(B*c*e*x*
*5/6 - 3*b*(A*b**2*d - 5*b*(A*b**2*e + 2*A*b*c*d + B*b**2*d - 7*b*(2*A*b*c
*e + A*c**2*d + B*b**2*e + 2*B*b*c*d - 9*b*(A*c**2*e + 13*B*b*c*e/12 + B*c
**2*d)/(10*c))/(8*c))/(6*c))/(4*c**2) + x**4*(A*c**2*e + 13*B*b*c*e/12 + B
*c**2*d)/(5*c) + x**3*(2*A*b*c*e + A*c**2*d + B*b**2*e + 2*B*b*c*d - 9*b*(
A*c**2*e + 13*B*b*c*e/12 + B*c**2*d)/(10*c))/(4*c) + x**2*(A*b**2*e + 2*A*
b*c*d + B*b**2*d - 7*b*(2*A*b*c*e + A*c**2*d + B*b**2*e + 2*B*b*c*d - 9*b*
(A*c**2*e + 13*B*b*c*e/12 + B*c**2*d)/(10*c))/(8*c))/(3*c) + x*(A*b**2*d -
 5*b*(A*b**2*e + 2*A*b*c*d + B*b**2*d - 7*b*(2*A*b*c*e + A*c**2*d + B*b**2
*e + 2*B*b*c*d - 9*b*(A*c**2*e + 13*B*b*c*e/12 + B*c**2*d)/(10*c))/(8*c))/
(6*c))/(2*c)), Ne(c, 0)), (2*(A*d*(b*x)**(5/2)/5 + B*e*(b*x)**(9/2)/(9*b**
2) + (b*x)**(7/2)*(A*e + B*d)/(7*b))/b, Ne(b, 0)), (0, True))
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 434, normalized size of antiderivative = 1.37

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{3/2}\,dx = \frac{1}{4}\left(cx^2+bx\right)^{\frac{3}{2}}Adx - \frac{3\sqrt{cx^2+bx}Ab^2dx}{32\,c} - \frac{7\sqrt{cx^2+bx}Bb^4ex}{256\,c^3} + \frac{7\left(cx^2+bx\right)^{\frac{3}{2}}Bb^2ex}{96\,c^2} + \frac{\left(cx^2+bx\right)^{\frac{5}{2}}Bex}{6\,c} + \frac{3\,Ab^4d\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{128\,c^{\frac{5}{2}}} + \frac{7\,Bb^6e\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{1024\,c^{\frac{9}{2}}} - \frac{3\sqrt{cx^2+bx}Ab^3d}{64\,c^2} + \frac{\left(cx^2+bx\right)^{\frac{3}{2}}Abd}{8\,c} - \frac{7\sqrt{cx^2+bx}Bb^5e}{512\,c^4} + \frac{7\left(cx^2+bx\right)^{\frac{3}{2}}Bb^3e}{192\,c^3} - \frac{7\left(cx^2+bx\right)^{\frac{5}{2}}Bbe}{60\,c^2} + \frac{3\sqrt{cx^2+bx}(Bd+Ae)b^3x}{64\,c^2} - \frac{\left(cx^2+bx\right)^{\frac{3}{2}}(Bd+Ae)bx}{8\,c} - \frac{3\,(Bd+Ae)b^5\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{256\,c^{\frac{7}{2}}} + \frac{3\sqrt{cx^2+bx}(Bd+Ae)b^4}{128\,c^3} - \frac{\left(cx^2+bx\right)^{\frac{3}{2}}(Bd+Ae)b^2}{16\,c^2} + \frac{\left(cx^2+bx\right)^{\frac{5}{2}}(Bd+Ae)}{5\,c}$$

input

```
integrate((B*x+A)*(e*x+d)*(c*x^2+b*x)^(3/2),x, algorithm="maxima")
```

output

```
1/4*(c*x^2 + b*x)^(3/2)*A*d*x - 3/32*sqrt(c*x^2 + b*x)*A*b^2*d*x/c - 7/256
*sqrt(c*x^2 + b*x)*B*b^4*e*x/c^3 + 7/96*(c*x^2 + b*x)^(3/2)*B*b^2*e*x/c^2
+ 1/6*(c*x^2 + b*x)^(5/2)*B*e*x/c + 3/128*A*b^4*d*log(2*c*x + b + 2*sqrt(c
*x^2 + b*x)*sqrt(c))/c^(5/2) + 7/1024*B*b^6*e*log(2*c*x + b + 2*sqrt(c*x^2
 + b*x)*sqrt(c))/c^(9/2) - 3/64*sqrt(c*x^2 + b*x)*A*b^3*d/c^2 + 1/8*(c*x^2
 + b*x)^(3/2)*A*b*d/c - 7/512*sqrt(c*x^2 + b*x)*B*b^5*e/c^4 + 7/192*(c*x^2
 + b*x)^(3/2)*B*b^3*e/c^3 - 7/60*(c*x^2 + b*x)^(5/2)*B*b*e/c^2 + 3/64*sqrt
(c*x^2 + b*x)*(B*d + A*e)*b^3*x/c^2 - 1/8*(c*x^2 + b*x)^(3/2)*(B*d + A*e)*
b*x/c - 3/256*(B*d + A*e)*b^5*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))
/c^(7/2) + 3/128*sqrt(c*x^2 + b*x)*(B*d + A*e)*b^4/c^3 - 1/16*(c*x^2 + b*x
)^(3/2)*(B*d + A*e)*b^2/c^2 + 1/5*(c*x^2 + b*x)^(5/2)*(B*d + A*e)/c
```

Giac [A] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 302, normalized size of antiderivative = 0.95

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{3/2}\,dx=\frac{1}{7680}\sqrt{cx^2+bx}\left(2\left(4\left(2\left(8\left(10\,Bcex+\frac{12\,Bc^6d+13\,Bbc^5e+12\,Ac^6e}{c^5}\right)x+\frac{3\,(44\,Bbc^5d\cdots}{}\right.\right.\right.\right.\right.$$
$$+\frac{\left(12\,Bb^5cd-24\,Ab^4c^2d-7\,Bb^6e+12\,Ab^5ce\right)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{c}+b\right|\right)}{1024\,c^{\frac{9}{2}}}$$

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

output
```
1/7680*sqrt(c*x^2 + b*x)*(2*(4*(2*(8*(10*B*c*e*x + (12*B*c^6*d + 13*B*b*c^
5*e + 12*A*c^6*e)/c^5)*x + 3*(44*B*b*c^5*d + 40*A*c^6*d + B*b^2*c^4*e + 44
*A*b*c^5*e)/c^5)*x + (12*B*b^2*c^4*d + 360*A*b*c^5*d - 7*B*b^3*c^3*e + 12*
A*b^2*c^4*e)/c^5)*x - 5*(12*B*b^3*c^3*d - 24*A*b^2*c^4*d - 7*B*b^4*c^2*e +
 12*A*b^3*c^3*e)/c^5)*x + 15*(12*B*b^4*c^2*d - 24*A*b^3*c^3*d - 7*B*b^5*c*
e + 12*A*b^4*c^2*e)/c^5) + 1/1024*(12*B*b^5*c*d - 24*A*b^4*c^2*d - 7*B*b^6
*e + 12*A*b^5*c*e)*log(abs(2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) + b))
/c^(9/2)
```

Mupad [F(-1)]

Timed out.

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{3/2}\,dx=\int \left(c\,x^2+b\,x\right)^{3/2}\,\left(A+B\,x\right)\,\left(d+e\,x\right)\,dx$$

input
```
int((b*x + c*x^2)^(3/2)*(A + B*x)*(d + e*x),x)
```

output
```
int((b*x + c*x^2)^(3/2)*(A + B*x)*(d + e*x), x)
```

Reduce [B] (verification not implemented)

Time = 0.31 (sec) , antiderivative size = 490, normalized size of antiderivative = 1.55

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{3/2}\,dx = \frac{180\sqrt{x}\,\sqrt{cx+b}\,a\,b^4c^2e-360\sqrt{x}\,\sqrt{cx+b}\,a\,b^3c^3d-120\sqrt{x}\,\sqrt{cx+b}\,a\,b^3c^3ex+240\sqrt{x}\,\sqrt{cx-}}{}$$

input
```
int((B*x+A)*(e*x+d)*(c*x^2+b*x)^(3/2),x)
```

output
```
(180*sqrt(x)*sqrt(b + c*x)*a*b**4*c**2*e - 360*sqrt(x)*sqrt(b + c*x)*a*b**
3*c**3*d - 120*sqrt(x)*sqrt(b + c*x)*a*b**3*c**3*e*x + 240*sqrt(x)*sqrt(b
 + c*x)*a*b**2*c**4*d*x + 96*sqrt(x)*sqrt(b + c*x)*a*b**2*c**4*e*x**2 + 288
0*sqrt(x)*sqrt(b + c*x)*a*b*c**5*d*x**2 + 2112*sqrt(x)*sqrt(b + c*x)*a*b*c
**5*e*x**3 + 1920*sqrt(x)*sqrt(b + c*x)*a*c**6*d*x**3 + 1536*sqrt(x)*sqrt(
b + c*x)*a*c**6*e*x**4 - 105*sqrt(x)*sqrt(b + c*x)*b**6*c*e + 180*sqrt(x)*
sqrt(b + c*x)*b**5*c**2*d + 70*sqrt(x)*sqrt(b + c*x)*b**5*c**2*e*x - 120*s
qrt(x)*sqrt(b + c*x)*b**4*c**3*d*x - 56*sqrt(x)*sqrt(b + c*x)*b**4*c**3*e*
x**2 + 96*sqrt(x)*sqrt(b + c*x)*b**3*c**4*d*x**2 + 48*sqrt(x)*sqrt(b + c*x
)*b**3*c**4*e*x**3 + 2112*sqrt(x)*sqrt(b + c*x)*b**2*c**5*d*x**3 + 1664*sq
rt(x)*sqrt(b + c*x)*b**2*c**5*e*x**4 + 1536*sqrt(x)*sqrt(b + c*x)*b*c**6*d
*x**4 + 1280*sqrt(x)*sqrt(b + c*x)*b*c**6*e*x**5 - 180*sqrt(c)*log((sqrt(b
 + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b**5*c*e + 360*sqrt(c)*log((sqrt(b +
 c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b**4*c**2*d + 105*sqrt(c)*log((sqrt(b
+ c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**7*e - 180*sqrt(c)*log((sqrt(b + c*x)
 + sqrt(x)*sqrt(c))/sqrt(b))*b**6*c*d)/(7680*c**5)
```

3.104 $\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 410

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx = \frac{(8Ace(8c^2d^2-10bcde+b^2e^2)-B(64c^3d^3-80bc^2d^2e+8b^2cde^2+3b^3e^3))}{64c^2e^4}$$

$$-\frac{(8Ace(6cd-7be)-B(48c^2d^2-56bcde+3b^2e^2))\,x\sqrt{bx+cx^2}}{96ce^3}$$

$$-\frac{(8Bcd-3bBe-8Ace)x^2\sqrt{bx+cx^2}}{24e^2}+\frac{Bx(bx+cx^2)^{3/2}}{4e}$$

$$-\frac{(8Ace(16c^3d^3-24bc^2d^2e+6b^2cde^2+b^3e^3)-B(128c^4d^4-192bc^3d^3e+48b^2c^2d^2e^2+8b^3cde^3+3b^4e^4))}{64c^{5/2}e^5}$$

$$-\frac{2d^{3/2}(Bd-Ae)(cd-be)^{3/2}\text{arctanh}\left(\frac{\sqrt{cd-be}x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{e^5}$$

output
```
1/64*(8*A*c*e*(b^2*e^2-10*b*c*d*e+8*c^2*d^2)-B*(3*b^3*e^3+8*b^2*c*d*e^2-80
*b*c^2*d^2*e+64*c^3*d^3))*(c*x^2+b*x)^(1/2)/c^2/e^4-1/96*(8*A*c*e*(-7*b*e+
6*c*d)-B*(3*b^2*e^2-56*b*c*d*e+48*c^2*d^2))*x*(c*x^2+b*x)^(1/2)/c/e^3-1/24
*(-8*A*c*e-3*B*b*e+8*B*c*d)*x^2*(c*x^2+b*x)^(1/2)/e^2+1/4*B*x*(c*x^2+b*x)^
(3/2)/e-1/64*(8*A*c*e*(b^3*e^3+6*b^2*c*d*e^2-24*b*c^2*d^2*e+16*c^3*d^3)-B*
(3*b^4*e^4+8*b^3*c*d*e^3+48*b^2*c^2*d^2*e^2-192*b*c^3*d^3*e+128*c^4*d^4))*
arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(5/2)/e^5-2*d^(3/2)*(-A*e+B*d)*(-b*
e+c*d)^(3/2)*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/e^5
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 8.93 (sec) , antiderivative size = 669, normalized size of antiderivative = 1.63

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx = \frac{(x(b+cx))^{3/2}\left(\sqrt{c}e\sqrt{x}\sqrt{b+cx}(8Ace(3b^2e^2+2bce(-15d+7ex)+4c^2(6d\right.}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x),x]
```

output
```
((x*(b + c*x))^(3/2)*(Sqrt[c]*e*Sqrt[x]*Sqrt[b + c*x]*(8*A*c*e*(3*b^2*e^2
+ 2*b*c*e*(-15*d + 7*e*x) + 4*c^2*(6*d^2 - 3*d*e*x + 2*e^2*x^2)) + B*(-9*b
^3*e^3 + 6*b^2*c*e^2*(-4*d + e*x) + 8*b*c^2*e*(30*d^2 - 14*d*e*x + 9*e^2*x
^2) - 16*c^3*(12*d^3 - 6*d^2*e*x + 4*d*e^2*x^2 - 3*e^3*x^3))) + 384*c^(3/2
)*Sqrt[d]*(B*d - A*e)*(c*d - b*e)*(c*d - b*e - I*Sqrt[b]*Sqrt[e]*Sqrt[c*d
- b*e])*Sqrt[-(c*d) + 2*b*e - (2*I)*Sqrt[b]*Sqrt[e]*Sqrt[c*d - b*e]]*ArcTa
n[(Sqrt[-(c*d) + 2*b*e - (2*I)*Sqrt[b]*Sqrt[e]*Sqrt[c*d - b*e]]*Sqrt[x])/(
Sqrt[d]*(-Sqrt[b] + Sqrt[b + c*x]))] + 384*c^(3/2)*Sqrt[d]*(B*d - A*e)*(c*
d - b*e)*(c*d - b*e + I*Sqrt[b]*Sqrt[e]*Sqrt[c*d - b*e])*Sqrt[-(c*d) + 2*b
*e + (2*I)*Sqrt[b]*Sqrt[e]*Sqrt[c*d - b*e]]*ArcTan[(Sqrt[-(c*d) + 2*b*e +
(2*I)*Sqrt[b]*Sqrt[e]*Sqrt[c*d - b*e]]*Sqrt[x])/(Sqrt[d]*(-Sqrt[b] + Sqrt[
b + c*x]))] + 6*(-8*A*c*e*(16*c^3*d^3 - 24*b*c^2*d^2*e + 6*b^2*c*d*e^2 + b
^3*e^3) + B*(128*c^4*d^4 - 192*b*c^3*d^3*e + 48*b^2*c^2*d^2*e^2 + 8*b^3*c*
d*e^3 + 3*b^4*e^4))*ArcTanh[(Sqrt[c]*Sqrt[x])/(-Sqrt[b] + Sqrt[b + c*x])])
)/(192*c^(5/2)*e^5*x^(3/2)*(b + c*x)^(3/2))
```

Rubi [A] (verified)

Time = 1.57 (sec) , antiderivative size = 416, normalized size of antiderivative = 1.01, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.346$, Rules used = {1231, 27, 1231, 27, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx$$

$$\Big\downarrow \; 1231$$

$$-\frac{\int -\frac{(bd(8Bcd-3bBe-8Ace)-(8Ace(2cd-be)-B(16c^2d^2-8bced-3b^2e^2))x)\sqrt{cx^2+bx}}{2(d+ex)}dx}{8ce^2}-\frac{\left(bx+cx^2\right)^{3/2}(-8Ace-3bBe+8Bcd-6Bcex)}{24ce^2}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{(bd(8Bcd-3bBe-8Ace)-(8Ace(2cd-be)-B(16c^2d^2-8bced-3b^2e^2))x)\sqrt{cx^2+bx}}{d+ex}dx}{16ce^2}-\frac{\left(bx+cx^2\right)^{3/2}(-8Ace-3bBe+8Bcd-6Bcex)}{24ce^2}$$

$$\Big\downarrow \; 1231$$

$$\frac{\frac{\sqrt{bx+cx^2}\left(-2cex\left(8Ace(2cd-be)-B\left(-3b^2e^2-8bcde+16c^2d^2\right)\right)+8Ace\left(b^2e^2-10bcde+8c^2d^2\right)-B\left(3b^3e^3+8b^2cde^2-80bc^2d^2e+64c^3d^3\right)\right)}{4ce^2}-\frac{\int \frac{bd(\cdots}{\cdots}}{\cdots}}{\cdots}-\frac{\left(bx+cx^2\right)^{3/2}(-8Ace-3bBe+8Bcd-6Bcex)}{24ce^2}$$

$$\Big\downarrow \; 27$$

$$\frac{\frac{\sqrt{bx+cx^2}\left(-2cex\left(8Ace(2cd-be)-B\left(-3b^2e^2-8bcde+16c^2d^2\right)\right)+8Ace\left(b^2e^2-10bcde+8c^2d^2\right)-B\left(3b^3e^3+8b^2cde^2-80bc^2d^2e+64c^3d^3\right)\right)}{4ce^2}-\frac{\int \frac{bd(\cdots}{\cdots}}{\cdots}}{\cdots}-\frac{\left(bx+cx^2\right)^{3/2}(-8Ace-3bBe+8Bcd-6Bcex)}{24ce^2}$$

$$\Big\downarrow \; 1269$$

$$\frac{\frac{\sqrt{bx+cx^2}\left(-2cex\left(8Ace(2cd-be)-B\left(-3b^2e^2-8bcde+16c^2d^2\right)\right)+8Ace\left(b^2e^2-10bcde+8c^2d^2\right)-B\left(3b^3e^3+8b^2cde^2-80bc^2d^2e+64c^3d^3\right)\right)}{4ce^2}-\frac{((-b\cdots}{\cdots}}{\cdots}-\frac{\left(bx+cx^2\right)^{3/2}(-8Ace-3bBe+8Bcd-6Bcex)}{24ce^2}$$

$$\Big\downarrow \; 1091$$

$$\frac{\frac{\sqrt{bx+cx^2}\left(-2cex\left(8Ace(2cd-be)-B\left(-3b^2e^2-8bcde+16c^2d^2\right)\right)+8Ace\left(b^2e^2-10bcde+8c^2d^2\right)-B\left(3b^3e^3+8b^2cde^2-80bc^2d^2e+64c^3d^3\right)\right)}{4ce^2}-\frac{2((-}{}}{}$$

$$\frac{\left(bx+cx^2\right)^{3/2}\left(-8Ace-3bBe+8Bcd-6Bcex\right)}{24ce^2}$$

$\Big\downarrow$ 219

$$\frac{\frac{\sqrt{bx+cx^2}\left(-2cex\left(8Ace(2cd-be)-B\left(-3b^2e^2-8bcde+16c^2d^2\right)\right)+8Ace\left(b^2e^2-10bcde+8c^2d^2\right)-B\left(3b^3e^3+8b^2cde^2-80bc^2d^2e+64c^3d^3\right)\right)}{4ce^2}-\frac{128c^2}{}}{}$$

$$\frac{\left(bx+cx^2\right)^{3/2}\left(-8Ace-3bBe+8Bcd-6Bcex\right)}{24ce^2}$$

$\Big\downarrow$ 1154

$$\frac{\frac{\sqrt{bx+cx^2}\left(-2cex\left(8Ace(2cd-be)-B\left(-3b^2e^2-8bcde+16c^2d^2\right)\right)+8Ace\left(b^2e^2-10bcde+8c^2d^2\right)-B\left(3b^3e^3+8b^2cde^2-80bc^2d^2e+64c^3d^3\right)\right)}{4ce^2}-\frac{2\text{arc}}{}}{}$$

$$\frac{\left(bx+cx^2\right)^{3/2}\left(-8Ace-3bBe+8Bcd-6Bcex\right)}{24ce^2}$$

$\Big\downarrow$ 219

$$\frac{\frac{\sqrt{bx+cx^2}\left(-2cex\left(8Ace(2cd-be)-B\left(-3b^2e^2-8bcde+16c^2d^2\right)\right)+8Ace\left(b^2e^2-10bcde+8c^2d^2\right)-B\left(3b^3e^3+8b^2cde^2-80bc^2d^2e+64c^3d^3\right)\right)}{4ce^2}-\frac{2\text{arc}}{}}{}$$

$$\frac{\left(bx+cx^2\right)^{3/2}\left(-8Ace-3bBe+8Bcd-6Bcex\right)}{24ce^2}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x),x]
```

output
```
-1/24*((8*B*c*d - 3*b*B*e - 8*A*c*e - 6*B*c*e*x)*(b*x + c*x^2)^(3/2))/(c*e
^2) + (((8*A*c*e*(8*c^2*d^2 - 10*b*c*d*e + b^2*e^2) - B*(64*c^3*d^3 - 80*b
*c^2*d^2*e + 8*b^2*c*d*e^2 + 3*b^3*e^3) - 2*c*e*(8*A*c*e*(2*c*d - b*e) - B
*(16*c^2*d^2 - 8*b*c*d*e - 3*b^2*e^2))*x)*Sqrt[b*x + c*x^2])/(4*c*e^2) - (
(2*(4*b*c*d*e*(2*c*d - b*e)*(8*B*c*d - 3*b*B*e - 8*A*c*e) + (8*c^2*d^2 - 4
*b*c*d*e - b^2*e^2)*(8*A*c*e*(2*c*d - b*e) - B*(16*c^2*d^2 - 8*b*c*d*e - 3
*b^2*e^2)))*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(Sqrt[c]*e) + (128*c^2
*d^(3/2)*(B*d - A*e)*(c*d - b*e)^(3/2)*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*
Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/e)/(8*c*e^2))/(16*c*e^2)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.20 (sec) , antiderivative size = 344, normalized size of antiderivative = 0.84

method	result
pseudoelliptic	$\frac{-16d^2\left(c^{\frac{5}{2}}b^2e^2-2c^{\frac{7}{2}}bde+c^{\frac{9}{2}}d^2\right)(Ae-Bd)\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)+\left(\left(\left(-A\,b^3c+\frac{3}{8}B\,b^4\right)e^4+\left(-6A\,b^2c^2+B\,b^3c\right)d\,e^3+6(4Ab\right.\right.}{}$
risch	$\frac{(48B\,c^3e^3x^3+64A\,c^3e^3x^2+72Bb\,c^2e^3x^2-64B\,c^3d\,e^2x^2+112Ab\,c^2e^3x-96A\,c^3d\,e^2x+6B\,b^2c\,e^3x-112Bb\,c^2d\,e^2x+96B\,c^3d}{192c^2e^4\sqrt{x(cx+b)}}$
default	$\frac{B\left(\frac{(2cx+b)\left(c\,x^2+bx\right)^{\frac{3}{2}}}{8c}-\frac{3b^2\left(\frac{(2cx+b)\sqrt{c\,x^2+bx}}{4c}-\frac{b^2\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^2+bx}\right)}{8c^{\frac{3}{2}}}\right)}{16c}\right)}{e}+\frac{(Ae-Bd)\left(\frac{\left(c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}\right.}{3}\right.}{}$

input

```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d),x,method=_RETURNVERBOSE)
```

output

```
1/8/c^(5/2)/(d*(b*e-c*d))^(1/2)*(-16*d^2*(c^(5/2)*b^2*e^2-2*c^(7/2)*b*d*e+
c^(9/2)*d^2)*(A*e-B*d)*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))+(
((-A*b^3*c+3/8*B*b^4)*e^4+(-6*A*b^2*c^2+B*b^3*c)*d*e^3+6*(4*A*b*c^3+B*b^2*
c^2)*d^2*e^2-16*c^3*d^3*(A*c+3/2*B*b)*e+16*B*c^4*d^4)*arctanh((x*(c*x+b))^
(1/2)/x/c^(1/2))+e*(x*(c*x+b))^(1/2)*(2*((4/3*A*x^2+B*x^3)*e^3-2*d*x*(2/3*
B*x+A)*e^2+4*e*(1/2*B*x+A)*d^2-4*B*d^3)*c^(7/2)+e*(((3*B*x^2+14/3*A*x)*e^2
-10*d*(7/15*B*x+A)*e+10*B*d^2)*c^(5/2)+(((1/4*B*x+A)*e-B*d)*c^(3/2)-3/8*B*
b*e*c^(1/2))*e*b)*b))*(d*(b*e-c*d))^(1/2))/e^5
```

Fricas [A] (verification not implemented)

Time = 17.08 (sec) , antiderivative size = 1688, normalized size of antiderivative = 4.12

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx = \text{Too large to display}$$

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

output
```
[-1/384*(3*(128*B*c^4*d^4 - 64*(3*B*b*c^3 + 2*A*c^4)*d^3*e + 48*(B*b^2*c^2
 + 4*A*b*c^3)*d^2*e^2 + 8*(B*b^3*c - 6*A*b^2*c^2)*d*e^3 + (3*B*b^4 - 8*A*b
^3*c)*e^4)*sqrt(c)*log(2*c*x + b - 2*sqrt(c*x^2 + b*x)*sqrt(c)) - 384*(B*c
^4*d^3 + A*b*c^3*d*e^2 - (B*b*c^3 + A*c^4)*d^2*e)*sqrt(c*d^2 - b*d*e)*log(
(b*d + (2*c*d - b*e)*x - 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d
)) - 2*(48*B*c^4*e^4*x^3 - 192*B*c^4*d^3*e + 48*(5*B*b*c^3 + 4*A*c^4)*d^2*
e^2 - 24*(B*b^2*c^2 + 10*A*b*c^3)*d*e^3 - 3*(3*B*b^3*c - 8*A*b^2*c^2)*e^4
- 8*(8*B*c^4*d*e^3 - (9*B*b*c^3 + 8*A*c^4)*e^4)*x^2 + 2*(48*B*c^4*d^2*e^2
- 8*(7*B*b*c^3 + 6*A*c^4)*d*e^3 + (3*B*b^2*c^2 + 56*A*b*c^3)*e^4)*x)*sqrt(
c*x^2 + b*x))/(c^3*e^5), 1/384*(768*(B*c^4*d^3 + A*b*c^3*d*e^2 - (B*b*c^3
+ A*c^4)*d^2*e)*sqrt(-c*d^2 + b*d*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^
2 + b*x)/(c*d*x + b*d)) - 3*(128*B*c^4*d^4 - 64*(3*B*b*c^3 + 2*A*c^4)*d^3*
e + 48*(B*b^2*c^2 + 4*A*b*c^3)*d^2*e^2 + 8*(B*b^3*c - 6*A*b^2*c^2)*d*e^3 +
 (3*B*b^4 - 8*A*b^3*c)*e^4)*sqrt(c)*log(2*c*x + b - 2*sqrt(c*x^2 + b*x)*sq
rt(c)) + 2*(48*B*c^4*e^4*x^3 - 192*B*c^4*d^3*e + 48*(5*B*b*c^3 + 4*A*c^4)*
d^2*e^2 - 24*(B*b^2*c^2 + 10*A*b*c^3)*d*e^3 - 3*(3*B*b^3*c - 8*A*b^2*c^2)*
e^4 - 8*(8*B*c^4*d*e^3 - (9*B*b*c^3 + 8*A*c^4)*e^4)*x^2 + 2*(48*B*c^4*d^2*
e^2 - 8*(7*B*b*c^3 + 6*A*c^4)*d*e^3 + (3*B*b^2*c^2 + 56*A*b*c^3)*e^4)*x)*s
qrt(c*x^2 + b*x))/(c^3*e^5), -1/192*(3*(128*B*c^4*d^4 - 64*(3*B*b*c^3 + 2*
A*c^4)*d^3*e + 48*(B*b^2*c^2 + 4*A*b*c^3)*d^2*e^2 + 8*(B*b^3*c - 6*A*b^...
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx = \int \frac{(x(b+cx))^{\frac{3}{2}}\,(A+Bx)}{d+ex}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(3/2)/(e*x+d),x)
```

output
```
Integral((x*(b + c*x))**(3/2)*(A + B*x)/(d + e*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx=\text{Exception raised: ValueError}$$

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

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

Giac [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx=\text{Exception raised: TypeError}$$

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

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:Error: Bad Argument Type
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx=\int \frac{\left(c\,x^2+b\,x\right)^{3/2}\,\left(A+B\,x\right)}{d+e\,x}\,dx$$

input
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x),x)
```

output
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x), x)
```

Reduce [B] (verification not implemented)

Time = 0.36 (sec) , antiderivative size = 1075, normalized size of antiderivative = 2.62

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{d+ex}\,dx=\text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d),x)
```

output
```
( - 384*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c
*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c**3*d*e**2 + 384*sq
rt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt
(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c**4*d**2*e + 384*sqrt(d)*sqrt(b
*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*
sqrt(c))/(sqrt(d)*sqrt(c)))*b**2*c**3*d**2*e - 384*sqrt(d)*sqrt(b*e - c*d)
*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/
(sqrt(d)*sqrt(c)))*b*c**4*d**3 - 384*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*
e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(
c)))*a*b*c**3*d*e**2 + 384*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) +
 sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c**
4*d**2*e + 384*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqr
t(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**2*c**3*d**2*e
- 384*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b + c*x
) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b*c**4*d**3 + 24*sqrt(x)*s
qrt(b + c*x)*a*b**2*c**2*e**4 - 240*sqrt(x)*sqrt(b + c*x)*a*b*c**3*d*e**3
+ 112*sqrt(x)*sqrt(b + c*x)*a*b*c**3*e**4*x + 192*sqrt(x)*sqrt(b + c*x)*a*
c**4*d**2*e**2 - 96*sqrt(x)*sqrt(b + c*x)*a*c**4*d*e**3*x + 64*sqrt(x)*sqr
t(b + c*x)*a*c**4*e**4*x**2 - 9*sqrt(x)*sqrt(b + c*x)*b**4*c*e**4 - 24*sqr
t(x)*sqrt(b + c*x)*b**3*c**2*d*e**3 + 6*sqrt(x)*sqrt(b + c*x)*b**3*c**2...
```

3.105 $\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 367

$$\begin{aligned}\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx = & -\frac{(6Ace(4cd-3be)-B(32c^2d^2-28bcde+b^2e^2))\sqrt{bx+cx^2}}{8ce^4} \\ & -\frac{(Bd(24cd-19be)-6Ae(3cd-2be))x\sqrt{bx+cx^2}}{12de^3} \\ & +\frac{c(4Bd-3Ae)x^2\sqrt{bx+cx^2}}{3de^2}-\frac{(Bd-Ae)x(bx+cx^2)^{3/2}}{de(d+ex)} \\ & +\frac{(6Ace(8c^2d^2-8bcde+b^2e^2)-B(64c^3d^3-72bc^2d^2e+12b^2cde^2+b^3e^3))\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{8c^{3/2}e^5} \\ & +\frac{\sqrt{d}\sqrt{cd-be}(Bd(8cd-5be)-3Ae(2cd-be))\operatorname{arctanh}\left(\frac{\sqrt{cd-bex}}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{e^5}\end{aligned}$$

output
```
-1/8*(6*A*c*e*(-3*b*e+4*c*d)-B*(b^2*e^2-28*b*c*d*e+32*c^2*d^2))*(c*x^2+b*x
)^(1/2)/c/e^4-1/12*(B*d*(-19*b*e+24*c*d)-6*A*e*(-2*b*e+3*c*d))*x*(c*x^2+b*
x)^(1/2)/d/e^3+1/3*c*(-3*A*e+4*B*d)*x^2*(c*x^2+b*x)^(1/2)/d/e^2-(-A*e+B*d)
*x*(c*x^2+b*x)^(3/2)/d/e/(e*x+d)+1/8*(6*A*c*e*(b^2*e^2-8*b*c*d*e+8*c^2*d^2
)-B*(b^3*e^3+12*b^2*c*d*e^2-72*b*c^2*d^2*e+64*c^3*d^3))*arctanh(c^(1/2)*x/
(c*x^2+b*x)^(1/2))/c^(3/2)/e^5+d^(1/2)*(-b*e+c*d)^(1/2)*(B*d*(-5*b*e+8*c*d
)-3*A*e*(-b*e+2*c*d))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2)
)/e^5
```

Mathematica [A] (verified)

Time = 11.88 (sec) , antiderivative size = 353, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx = \frac{\sqrt{x(b+cx)}\left(-\frac{3\left(-6Ace\left(8c^2d^2-8bcde+b^2e^2\right)+B\left(64c^3d^3-72bc^2d^2e+12b^2cde^2+b^3e^3\right)\right)\text{arcsi}}{\sqrt{b}\sqrt{1+\frac{cx}{b}}}\right.}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^2,x]
```

output
```
(Sqrt[x*(b + c*x)]*((-3*(-6*A*c*e*(8*c^2*d^2 - 8*b*c*d*e + b^2*e^2) + B*(6
4*c^3*d^3 - 72*b*c^2*d^2*e + 12*b^2*c*d*e^2 + b^3*e^3))*ArcSinh[(Sqrt[c]*S
qrt[x])/Sqrt[b]])/(Sqrt[b]*Sqrt[1 + (c*x)/b]) + Sqrt[c]*((e*Sqrt[x]*(6*A*c
*e*(b*e*(9*d + 5*e*x) - 2*c*(6*d^2 + 3*d*e*x - e^2*x^2)) + B*(3*b^2*e^2*(d
 + e*x) + 2*b*c*e*(-42*d^2 - 23*d*e*x + 7*e^2*x^2) + 8*c^2*(12*d^3 + 6*d^2
*e*x - 2*d*e^2*x^2 + e^3*x^3))))/(d + e*x) + (24*c*Sqrt[d]*Sqrt[c*d - b*e]
*(B*d*(8*c*d - 5*b*e) + 3*A*e*(-2*c*d + b*e))*ArcTanh[(Sqrt[c*d - b*e]*Sqr
t[x])/(Sqrt[d]*Sqrt[b + c*x])])/Sqrt[b + c*x])))/(24*c^(3/2)*e^5*Sqrt[x])
```

Rubi [A] (verified)

Time = 1.21 (sec) , antiderivative size = 339, normalized size of antiderivative = 0.92, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {1230, 1231, 27, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx$$

$\big\downarrow$ 1230

$$\frac{\left(bx+cx^2\right)^{3/2}(-3Ae+4Bd+Bex)}{3e^2(d+ex)}-\frac{\int \frac{(b(4Bd-3Ae)+(8Bcd-bBe-6Ace)x)\sqrt{cx^2+bx}}{d+ex}dx}{2e^2}$$

$\big\downarrow$ 1231

$$\frac{\left(bx+cx^2\right)^{3/2}(-3Ae+4Bd+Bex)}{3e^2(d+ex)}-\frac{\frac{\sqrt{bx+cx^2}\left(2cex(-6Ace-bBe+8Bcd)+6Ace(4cd-3be)-B\left(b^2e^2-28bcde+32c^2d^2\right)\right)}{4ce^2}-\frac{\int \frac{bd\left(6Ace(4cd-3be)-B\left(32c^2d^2-28bced+b^2e^2\right)\right)+\left(4bce(4Bd\cdots\right.}{2(d+ex)\cdots}\cdots}{4c\cdots}}{2e^2}$$

$\big\downarrow$ 27

$$\frac{\left(bx+cx^2\right)^{3/2}(-3Ae+4Bd+Bex)}{3e^2(d+ex)}-\frac{\frac{\sqrt{bx+cx^2}\left(2cex(-6Ace-bBe+8Bcd)+6Ace(4cd-3be)-B\left(b^2e^2-28bcde+32c^2d^2\right)\right)}{4ce^2}-\frac{\int \frac{bd\left(6Ace(4cd-3be)-B\left(32c^2d^2-28bced+b^2e^2\right)\right)+\left(4bce(4Bd\cdots\right.}{(d+ex)\cdots}\cdots}{8c\cdots}}{2e^2}$$

$\big\downarrow$ 1269

$$\frac{\left(bx+cx^2\right)^{3/2}(-3Ae+4Bd+Bex)}{3e^2(d+ex)}-\frac{\frac{\sqrt{bx+cx^2}\left(2cex(-6Ace-bBe+8Bcd)+6Ace(4cd-3be)-B\left(b^2e^2-28bcde+32c^2d^2\right)\right)}{4ce^2}-\frac{\frac{\left(4bce(4Bd-3Ae)(2cd-be)-\left(-b^2e^2-4bcde+8c^2d^2\right)(-6Ace-b\cdots\right.}{e}\cdots}{\cdots}}{2e^2}$$

$\big\downarrow$ 1091

$$\frac{\left(bx+cx^2\right)^{3/2}(-3Ae+4Bd+Bex)}{3e^2(d+ex)}-\frac{\frac{\sqrt{bx+cx^2}\left(2cex(-6Ace-bBe+8Bcd)+6Ace(4cd-3be)-B\left(b^2e^2-28bcde+32c^2d^2\right)\right)}{4ce^2}-\frac{\frac{2\left(4bce(4Bd-3Ae)(2cd-be)-\left(-b^2e^2-4bcde+8c^2d^2\right)(-6Ace-\cdots\right.}{e}\cdots}{\cdots}}{2e^2}$$

$\big\downarrow$ 219

$$\frac{\left(bx+cx^2\right)^{3/2}(-3Ae+4Bd+Bex)}{3e^2(d+ex)}-\frac{\frac{\sqrt{bx+cx^2}\left(2cex(-6Ace-bBe+8Bcd)+6Ace(4cd-3be)-B\left(b^2e^2-28bcde+32c^2d^2\right)\right)}{4ce^2}-\frac{\frac{8cd(cd-be)(Bd(8cd-5be)-3Ae(2cd-be))\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx\cdots}{e}\cdots}{\cdots}}{2e^2}$$

$$\Big\downarrow \text{1154}$$

$$\frac{(bx+cx^2)^{3/2}(-3Ae+4Bd+Bex)}{3e^2(d+ex)}-\frac{\frac{\sqrt{bx+cx^2}(2cex(-6Ace-bBe+8Bcd)+6Ace(4cd-3be)-B(b^2e^2-28bcde+32c^2d^2))}{4ce^2}-\frac{\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(4bce(4Bd-3Ae)(2cd-be)-\left(-b^2e^2-\right.\right.}{\sqrt{ce}}}{}}{2e^2}$$

$$\Big\downarrow \text{219}$$

$$\frac{(bx+cx^2)^{3/2}(-3Ae+4Bd+Bex)}{3e^2(d+ex)}-\frac{\frac{\sqrt{bx+cx^2}(2cex(-6Ace-bBe+8Bcd)+6Ace(4cd-3be)-B(b^2e^2-28bcde+32c^2d^2))}{4ce^2}-\frac{\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(4bce(4Bd-3Ae)(2cd-be)-\left(-b^2e^2-\right.\right.}{\sqrt{ce}}}{}}{2e^2}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^2,x]
```

output
```
((4*B*d - 3*A*e + B*e*x)*(b*x + c*x^2)^(3/2))/(3*e^2*(d + e*x)) - (((6*A*c
*e*(4*c*d - 3*b*e) - B*(32*c^2*d^2 - 28*b*c*d*e + b^2*e^2) + 2*c*e*(8*B*c*
d - b*B*e - 6*A*c*e)*x)*Sqrt[b*x + c*x^2])/(4*c*e^2) - ((2*(4*b*c*e*(4*B*d
 - 3*A*e)*(2*c*d - b*e) - (8*B*c*d - b*B*e - 6*A*c*e)*(8*c^2*d^2 - 4*b*c*d
*e - b^2*e^2))*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(Sqrt[c]*e) + (8*c*
Sqrt[d]*Sqrt[c*d - b*e]*(B*d*(8*c*d - 5*b*e) - 3*A*e*(2*c*d - b*e))*ArcTan
h[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/
e)/(8*c*e^2))/(2*e^2)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.24 (sec) , antiderivative size = 314, normalized size of antiderivative = 0.86

method	result
pseudoelliptic	$-\frac{3\left(-2d(-be+cd)(ex+d)\left(-\frac{4Bc\,d^2}{3}+e\left(Ac+\frac{5Bb}{6}\right)d-\frac{Ab\,e^2}{2}\right)c^{\frac{5}{2}}\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)+\left(-\frac{\left(-\frac{32B\,c^3d^3}{3}+8c^2e\left(Ac+\frac{3Bb}{2}\right)\cdots\right.}{\cdots}\right.\right.}{\cdots}$
risch	$\frac{(8B\,c^2x^2e^2+12A\,c^2e^2x+14Bbc\,e^2x-24B\,c^2dex+30Abc\,e^2-48A\,c^2de+3B\,e^2b^2-60Bbcde+72B\,c^2d^2)x(cx+b)}{24c\,e^4\sqrt{x(cx+b)}}+\frac{\left(6A\,b^2\cdots\right.}{\cdots}$
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

output
```
-3/(d*(b*e-c*d))^(1/2)*(-2*d*(-b*e+c*d)*(e*x+d)*(-4/3*B*c*d^2+e*(A*c+5/6*B
*b)*d-1/2*A*b*e^2)*c^(5/2)*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2
))+(-1/4*(-32/3*B*c^3*d^3+8*c^2*e*(A*c+3/2*B*b)*d^2+2*e^2*(-4*A*b*c^2-B*b^
2*c)*d+b^2*e^3*(A*c-1/6*B*b))*c*(e*x+d)*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2
))+(-4/3*B*c^2*d^3+c*e*((A-2/3*B*x)*c+7/6*B*b)*d^2-3/4*e^2*(-2/3*(4/9*B*x+
A)*x*c^2+b*(-23/27*B*x+A)*c+1/18*B*b^2)*d-5/12*e^3*(2/5*c^2*x*(2/3*B*x+A)+
b*(7/15*B*x+A)*c+1/10*B*b^2)*x)*e*c^(3/2)*(x*(c*x+b))^(1/2))*(d*(b*e-c*d))
^(1/2))/c^(5/2)/e^5/(e*x+d)
```

Fricas [A] (verification not implemented)

Time = 1.90 (sec) , antiderivative size = 2012, normalized size of antiderivative = 5.48

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx = \text{Too large to display}$$

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

output
```
[-1/48*(3*(64*B*c^3*d^4 - 24*(3*B*b*c^2 + 2*A*c^3)*d^3*e + 12*(B*b^2*c + 4
*A*b*c^2)*d^2*e^2 + (B*b^3 - 6*A*b^2*c)*d*e^3 + (64*B*c^3*d^3*e - 24*(3*B*
b*c^2 + 2*A*c^3)*d^2*e^2 + 12*(B*b^2*c + 4*A*b*c^2)*d*e^3 + (B*b^3 - 6*A*b
^2*c)*e^4)*x)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) - 24*(8
*B*c^3*d^3 + 3*A*b*c^2*d*e^2 - (5*B*b*c^2 + 6*A*c^3)*d^2*e + (8*B*c^3*d^2*
e + 3*A*b*c^2*e^3 - (5*B*b*c^2 + 6*A*c^3)*d*e^2)*x)*sqrt(c*d^2 - b*d*e)*lo
g((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x +
 d)) - 2*(8*B*c^3*e^4*x^3 + 96*B*c^3*d^3*e - 12*(7*B*b*c^2 + 6*A*c^3)*d^2*
e^2 + 3*(B*b^2*c + 18*A*b*c^2)*d*e^3 - 2*(8*B*c^3*d*e^3 - (7*B*b*c^2 + 6*A
*c^3)*e^4)*x^2 + (48*B*c^3*d^2*e^2 - 2*(23*B*b*c^2 + 18*A*c^3)*d*e^3 + 3*(
B*b^2*c + 10*A*b*c^2)*e^4)*x)*sqrt(c*x^2 + b*x))/(c^2*e^6*x + c^2*d*e^5),
-1/48*(48*(8*B*c^3*d^3 + 3*A*b*c^2*d*e^2 - (5*B*b*c^2 + 6*A*c^3)*d^2*e + (
8*B*c^3*d^2*e + 3*A*b*c^2*e^3 - (5*B*b*c^2 + 6*A*c^3)*d*e^2)*x)*sqrt(-c*d^
2 + b*d*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x + b*d)) +
3*(64*B*c^3*d^4 - 24*(3*B*b*c^2 + 2*A*c^3)*d^3*e + 12*(B*b^2*c + 4*A*b*c^2
)*d^2*e^2 + (B*b^3 - 6*A*b^2*c)*d*e^3 + (64*B*c^3*d^3*e - 24*(3*B*b*c^2 +
2*A*c^3)*d^2*e^2 + 12*(B*b^2*c + 4*A*b*c^2)*d*e^3 + (B*b^3 - 6*A*b^2*c)*e^
4)*x)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) - 2*(8*B*c^3*e^
4*x^3 + 96*B*c^3*d^3*e - 12*(7*B*b*c^2 + 6*A*c^3)*d^2*e^2 + 3*(B*b^2*c + 1
8*A*b*c^2)*d*e^3 - 2*(8*B*c^3*d*e^3 - (7*B*b*c^2 + 6*A*c^3)*e^4)*x^2 + ...
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx = \int \frac{\left(x(b+cx)\right)^{\frac{3}{2}}(A+Bx)}{\left(d+ex\right)^2}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(3/2)/(e*x+d)**2,x)
```

output
```
Integral((x*(b + c*x))**(3/2)*(A + B*x)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx = \text{Exception raised: ValueError}$$

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

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

Giac [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx = \text{Timed out}$$

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

output
```
Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx = \int \frac{\left(c\,x^2+b\,x\right)^{3/2}\,\left(A+B\,x\right)}{\left(d+e\,x\right)^2}\,dx$$

input
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^2,x)
```

output
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^2, x)
```

Reduce [B] (verification not implemented)

Time = 0.47 (sec) , antiderivative size = 1676, normalized size of antiderivative = 4.57

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^2,x)
```

output
```
(72*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x)
- sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c**2*d*e**2 + 72*sqrt(d)
*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*s
qrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c**2*e**3*x - 144*sqrt(d)*sqrt(b*e
- c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqr
t(c))/(sqrt(d)*sqrt(c)))*a*c**3*d**2*e - 144*sqrt(d)*sqrt(b*e - c*d)*atan(
(sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(
d)*sqrt(c)))*a*c**3*d*e**2*x - 120*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e
- c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)
))*b**2*c**2*d**2*e - 120*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) -
sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**2*c
**2*d*e**2*x + 192*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)
*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b*c**3*d**3 +
 192*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x)
 - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b*c**3*d**2*e*x + 72*sqrt(d
)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*
sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c**2*d*e**2 + 72*sqrt(d)*sqrt(b*e
- c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqr
t(c))/(sqrt(d)*sqrt(c)))*a*b*c**2*e**3*x - 144*sqrt(d)*sqrt(b*e - c*d)*ata
n((sqrt(b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(...
```

3.106 $\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 382

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^3}\,dx = -\frac{3(4Bd(2cd-be)-Ae(4cd-be))\sqrt{bx+cx^2}}{4de^4} + \frac{(Bd(12cd-5be)-Ae(6cd-be))x\sqrt{bx+cx^2}}{4d^2e^3} - \frac{(Bd(8cd-5be)-Ae(4cd-be))x^2\sqrt{bx+cx^2}}{4d^2e^2(d+ex)} - \frac{(Bd-Ae)x(bx+cx^2)^{3/2}}{2de(d+ex)^2} - \frac{3(4Ace(2cd-be)-B(16c^2d^2-12bcde+b^2e^2))\,\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4\sqrt{c}e^5} + \frac{3(Ae(8c^2d^2-8bcde+b^2e^2)-Bd(16c^2d^2-20bcde+5b^2e^2))\,\text{arctanh}\left(\frac{\sqrt{cd-be}x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{4\sqrt{d}e^5\sqrt{cd-be}}$$

output
```
-3/4*(4*B*d*(-b*e+2*c*d)-A*e*(-b*e+4*c*d))*(c*x^2+b*x)^(1/2)/d/e^4+1/4*(B*
d*(-5*b*e+12*c*d)-A*e*(-b*e+6*c*d))*x*(c*x^2+b*x)^(1/2)/d^2/e^3-1/4*(B*d*(
-5*b*e+8*c*d)-A*e*(-b*e+4*c*d))*x^2*(c*x^2+b*x)^(1/2)/d^2/e^2/(e*x+d)-1/2*
(-A*e+B*d)*x*(c*x^2+b*x)^(3/2)/d/e/(e*x+d)^2-3/4*(4*A*c*e*(-b*e+2*c*d)-B*(
b^2*e^2-12*b*c*d*e+16*c^2*d^2))*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(1/
2)/e^5+3/4*(A*e*(b^2*e^2-8*b*c*d*e+8*c^2*d^2)-B*d*(5*b^2*e^2-20*b*c*d*e+16
*c^2*d^2))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(1/2)/e
^5/(-b*e+c*d)^(1/2)
```

Mathematica [A] (verified)

Time = 14.61 (sec) , antiderivative size = 702, normalized size of antiderivative = 1.84

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^3}\,dx = \frac{(x(b+cx))^{3/2}\left(\frac{(-Bd+Ae)x^{5/2}(b+cx)}{(d+ex)^2}+\frac{(Bd(6cd-5be)+Ae(-2cd+be))x^{5/2}(b+cx)}{2d(cd-be)(d+ex)}+\frac{e(-\cdots}{\cdots}\right.}{\cdots}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^3,x]
```

output
```
((x*(b + c*x))^(3/2)*(((-(B*d) + A*e)*x^(5/2)*(b + c*x))/(d + e*x)^2 + ((B
*d*(6*c*d - 5*b*e) + A*e*(-2*c*d + b*e))*x^(5/2)*(b + c*x))/(2*d*(c*d - b*
e)*(d + e*x)) + (e*(-8*A*c^2*d^2 - 4*b*c*d*(5*B*d - 4*A*e) - 3*b^2*e*(-5*B
*d + A*e))*(3*(16*c^3*d^3 - 24*b*c^2*d^2*e + 6*b^2*c*d*e^2 + b^3*e^3)*(b +
 c*x)*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]] - Sqrt[b]*Sqrt[c]*Sqrt[1 + (c*x)/
b]*(e*Sqrt[x]*(b + c*x)*(3*b^2*e^2 + 2*b*c*e*(-15*d + 7*e*x) + 4*c^2*(6*d^
2 - 3*d*e*x + 2*e^2*x^2)) + 48*c*d^(3/2)*(c*d - b*e)^(3/2)*Sqrt[b + c*x]*A
rcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x])])) + (B*d*(6*c*d
- 5*b*e) + A*e*(-2*c*d + b*e))*(3*(128*c^4*d^4 - 192*b*c^3*d^3*e + 48*b^2*
c^2*d^2*e^2 + 8*b^3*c*d*e^3 + 3*b^4*e^4)*(b + c*x)*ArcSinh[(Sqrt[c]*Sqrt[x
])/Sqrt[b]] - Sqrt[b]*Sqrt[c]*Sqrt[1 + (c*x)/b]*(e*Sqrt[x]*(b + c*x)*(9*b^
3*e^3 - 6*b^2*c*e^2*(-4*d + e*x) - 8*b*c^2*e*(30*d^2 - 14*d*e*x + 9*e^2*x^
2) + 16*c^3*(12*d^3 - 6*d^2*e*x + 4*d*e^2*x^2 - 3*e^3*x^3)) + 384*c^2*d^(5
/2)*(c*d - b*e)^(3/2)*Sqrt[b + c*x]*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqr
t[d]*Sqrt[b + c*x])])))/(96*Sqrt[b]*c^(3/2)*d*e^5*(-(c*d) + b*e)*(b + c*x)
^2*Sqrt[1 + (c*x)/b])))/(2*d*(-(c*d) + b*e)*x^(3/2))
```

Rubi [A] (verified)

Time = 1.10 (sec) , antiderivative size = 322, normalized size of antiderivative = 0.84, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {1230, 27, 1230, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^3}\,dx$$

$$\Big\downarrow \; 1230$$

$$\frac{\left(bx+cx^2\right)^{3/2}(-Ae+2Bd+Bex)}{2e^2(d+ex)^2}-\frac{3\int \frac{2(b(2Bd-Ae)+(4Bcd-bBe-2Ace)x)\sqrt{cx^2+bx}}{(d+ex)^2}dx}{8e^2}$$

$$\Big\downarrow \; 27$$

$$\frac{\left(bx+cx^2\right)^{3/2}(-Ae+2Bd+Bex)}{2e^2(d+ex)^2}-\frac{3\int \frac{(b(2Bd-Ae)+(4Bcd-bBe-2Ace)x)\sqrt{cx^2+bx}}{(d+ex)^2}dx}{4e^2}$$

$$\Big\downarrow \; 1230$$

$$\frac{\left(bx+cx^2\right)^{3/2}(-Ae+2Bd+Bex)}{2e^2(d+ex)^2}-$$

$$\frac{3\left(\frac{\sqrt{bx+cx^2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{e^2(d+ex)}-\frac{\int \frac{b(4Bd(2cd-be)-Ae(4cd-be))-\left(4Ace(2cd-be)-B\left(16c^2d^2-12bced+b^2e^2\right)\right)}{(d+ex)\sqrt{cx^2+bx}}}{2e^2}\right.}{4e^2}$$

$$\Big\downarrow \; 1269$$

$$\frac{\left(bx+cx^2\right)^{3/2}(-Ae+2Bd+Bex)}{2e^2(d+ex)^2}-$$

$$\frac{3\left(\frac{\sqrt{bx+cx^2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{e^2(d+ex)}-\frac{\frac{\left(Ae\left(b^2e^2-8bcde+8c^2d^2\right)-Bd\left(5b^2e^2-20bcde+16c^2d^2\right)\right)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}d}{e}}{2e^2}\right.}{4e^2}$$

$$\Big\downarrow \; 1091$$

$$\frac{\left(bx+cx^2\right)^{3/2}(-Ae+2Bd+Bex)}{2e^2(d+ex)^2}-$$

$$\frac{3\left(\frac{\sqrt{bx+cx^2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{e^2(d+ex)}-\frac{\frac{\left(Ae\left(b^2e^2-8bcde+8c^2d^2\right)-Bd\left(5b^2e^2-20bcde+16c^2d^2\right)\right)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}d}{e}}{2e}\right.}{4e^2}$$

$$\Big\downarrow \; 219$$

$$\frac{(bx+cx^2)^{3/2}(-Ae+2Bd+Bex)}{2e^2(d+ex)^2}-\frac{3\left(\frac{\sqrt{bx+cx^2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{e^2(d+ex)}-\frac{\frac{\left(Ae\left(b^2e^2-8bcde+8c^2d^2\right)-Bd\left(5b^2e^2-20bcde+16c^2d^2\right)\right)\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}d}{e}}{2e^2}\right.}{4e^2}$$

$$\Big\downarrow \; 1154$$

$$\frac{(bx+cx^2)^{3/2}(-Ae+2Bd+Bex)}{2e^2(d+ex)^2}-\frac{3\left(\frac{\sqrt{bx+cx^2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{e^2(d+ex)}-\frac{-\frac{2\left(Ae\left(b^2e^2-8bcde+8c^2d^2\right)-Bd\left(5b^2e^2-20bcde+16c^2d^2\right)\right)\int\frac{}{4d(cd-be)-\frac{(b}{}}}{e}}{}\right.}{4e^2}$$

$$\Big\downarrow \; 219$$

$$\frac{(bx+cx^2)^{3/2}(-Ae+2Bd+Bex)}{2e^2(d+ex)^2}-\frac{3\left(\frac{\sqrt{bx+cx^2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{e^2(d+ex)}-\frac{\frac{\left(Ae\left(b^2e^2-8bcde+8c^2d^2\right)-Bd\left(5b^2e^2-20bcde+16c^2d^2\right)\right)\operatorname{arctanh}\left(\frac{x(2}{2\sqrt{d}\sqrt{b}}\right.}{\sqrt{de}\sqrt{cd-be}}}{}\right.}{4e^2}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^3,x]
```

output
```
((2*B*d - A*e + B*e*x)*(b*x + c*x^2)^(3/2))/(2*e^2*(d + e*x)^2) - (3*(((4*
B*d*(2*c*d - b*e) - A*e*(4*c*d - b*e) + e*(4*B*c*d - b*B*e - 2*A*c*e)*x)*S
qrt[b*x + c*x^2])/(e^2*(d + e*x)) - ((-2*(4*A*c*e*(2*c*d - b*e) - B*(16*c^
2*d^2 - 12*b*c*d*e + b^2*e^2))*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(Sq
rt[c]*e) + ((A*e*(8*c^2*d^2 - 8*b*c*d*e + b^2*e^2) - B*d*(16*c^2*d^2 - 20*
b*c*d*e + 5*b^2*e^2))*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d
- b*e]*Sqrt[b*x + c*x^2])])/(Sqrt[d]*e*Sqrt[c*d - b*e]))/(2*e^2)))/(4*e^2)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.36 (sec) , antiderivative size = 351, normalized size of antiderivative = 0.92

method	result
pseudoelliptic	$-\frac{2\left(3\left(-2B\,c^2d^3+ce\left(Ac+\frac{5Bb}{2}\right)d^2-\left(Ac+\frac{5Bb}{8}\right)e^2bd+\frac{A\,b^2e^3}{8}\right)(ex+d)^2\sqrt{c}\,xb\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)+\frac{\left(-3(ex+d)^2xb\left(4B\,c\right.\right.}{}\right.}{}$
risch	Expression too large to display
default	Expression too large to display

input

```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output

```
-2*(3*(-2*B*c^2*d^3+c*e*(A*c+5/2*B*b)*d^2-(A*c+5/8*B*b)*e^2*b*d+1/8*A*b^2*
e^3)*(e*x+d)^2*c^(1/2)*x*b*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2
))+1/2*(-3*(e*x+d)^2*x*b*(4*B*c^2*d^2+(-2*A*c^2-3*B*b*c)*e*d+b*e^2*(A*c+1/
4*B*b))*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))+1/4*e*(3*d*(4*B*c*d^2-8/3*e*(
A*c+7/8*B*b)*d+A*b*e^2)*(x*(c*x+b))^(3/2)+5*x*(x*(c*x+b))^(1/2)*(12/5*B*c*
(-c*x+b)*d^3-4/5*e*(5/4*B*b^2+c*(-43/4*B*x+A)*b-2*A*c^2*x)*d^2-21/5*e^2*(1
9/21*B*b+c*(-8/21*B*x+A))*x*b*d+(b*(-B*x+A)-4/5*c*x*(1/2*B*x+A))*e^3*x*b))
*c^(1/2))*(d*(b*e-c*d))^(1/2))/c^(1/2)/(d*(b*e-c*d))^(1/2)/b/e^5/x/(e*x+d)
^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 829 vs. 2(346) = 692.

Time = 0.84 (sec) , antiderivative size = 3337, normalized size of antiderivative = 8.74

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^3}\,dx = \text{Too large to display}$$

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

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\,(bx+cx^2)^{3/2}}{(d+ex)^3}\,dx = \int \frac{(x(b+cx))^{\frac{3}{2}}\,(A+Bx)}{(d+ex)^3}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(3/2)/(e*x+d)**3,x)
```

output
```
Integral((x*(b + c*x))**(3/2)*(A + B*x)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\,(bx+cx^2)^{3/2}}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

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

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 933 vs. $2(346) = 692$.

Time = 0.29 (sec) , antiderivative size = 933, normalized size of antiderivative = 2.44

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^3}\,dx = \text{Too large to display}$$

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

output
```
1/4*sqrt(c*x^2 + b*x)*(2*B*c*x/e^3 - (12*B*c^2*d*e^8 - 5*B*b*c*e^9 - 4*A*c
^2*e^9)/(c*e^12)) - 3/4*(16*B*c^2*d^3 - 20*B*b*c*d^2*e - 8*A*c^2*d^2*e + 5
*B*b^2*d*e^2 + 8*A*b*c*d*e^2 - A*b^2*e^3)*arctan(-((sqrt(c)*x - sqrt(c*x^2
 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))/(sqrt(-c*d^2 + b*d*e)*e^5) -
 3/8*(16*B*c^2*d^2 - 12*B*b*c*d*e - 8*A*c^2*d*e + B*b^2*e^2 + 4*A*b*c*e^2)
*log(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) - b))/(sqrt(c)*e^5) -
1/4*(32*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*c^2*d^3*e - 36*(sqrt(c)*x - sq
rt(c*x^2 + b*x))^3*B*b*c*d^2*e^2 - 24*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*
c^2*d^2*e^2 + 9*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b^2*d*e^3 + 24*(sqrt(c
)*x - sqrt(c*x^2 + b*x))^3*A*b*c*d*e^3 - 5*(sqrt(c)*x - sqrt(c*x^2 + b*x))
^3*A*b^2*e^4 + 56*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*B*c^(5/2)*d^4 - 44*(sq
rt(c)*x - sqrt(c*x^2 + b*x))^2*B*b*c^(3/2)*d^3*e - 40*(sqrt(c)*x - sqrt(c*
x^2 + b*x))^2*A*c^(5/2)*d^3*e + 3*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*B*b^2*
sqrt(c)*d^2*e^2 + 24*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*A*b*c^(3/2)*d^2*e^2
 + (sqrt(c)*x - sqrt(c*x^2 + b*x))^2*A*b^2*sqrt(c)*d*e^3 + 56*(sqrt(c)*x -
 sqrt(c*x^2 + b*x))*B*b*c^2*d^4 - 48*(sqrt(c)*x - sqrt(c*x^2 + b*x))*B*b^2
*c*d^3*e - 40*(sqrt(c)*x - sqrt(c*x^2 + b*x))*A*b*c^2*d^3*e + 7*(sqrt(c)*x
 - sqrt(c*x^2 + b*x))*B*b^3*d^2*e^2 + 28*(sqrt(c)*x - sqrt(c*x^2 + b*x))*A
*b^2*c*d^2*e^2 - 3*(sqrt(c)*x - sqrt(c*x^2 + b*x))*A*b^3*d*e^3 + 14*B*b^2*
c^(3/2)*d^4 - 9*B*b^3*sqrt(c)*d^3*e - 10*A*b^2*c^(3/2)*d^3*e + 5*A*b^3*...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^3}\,dx=\int \frac{{\left(c\,x^2+b\,x\right)}^{3/2}\,\left(A+B\,x\right)}{{\left(d+e\,x\right)}^3}\,dx$$

input
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^3,x)
```

output
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^3, x)
```

Reduce [B] (verification not implemented)

Time = 3.26 (sec) , antiderivative size = 4983, normalized size of antiderivative = 13.04

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^3}\,dx=\text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^3,x)
```

output
```
( - 24*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*
x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*c*d**2*e**4 - 48*s
qrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqr
t(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*c*d*e**5*x - 24*sqrt(d)*sq
rt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt
(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*c*e**6*x**2 + 240*sqrt(d)*sqrt(b*e
 - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqr
t(c))/(sqrt(d)*sqrt(c)))*a*b**2*c**2*d**3*e**3 + 480*sqrt(d)*sqrt(b*e - c*
d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c)
)/(sqrt(d)*sqrt(c)))*a*b**2*c**2*d**2*e**4*x + 240*sqrt(d)*sqrt(b*e - c*d)
*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/
(sqrt(d)*sqrt(c)))*a*b**2*c**2*d*e**5*x**2 - 576*sqrt(d)*sqrt(b*e - c*d)*a
tan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(s
qrt(d)*sqrt(c)))*a*b*c**3*d**4*e**2 - 1152*sqrt(d)*sqrt(b*e - c*d)*atan((s
qrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)
*sqrt(c)))*a*b*c**3*d**3*e**3*x - 576*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b
*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt
(c)))*a*b*c**3*d**2*e**4*x**2 + 384*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e
 - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c
)))*a*c**4*d**5*e + 768*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) -...
```

3.107 $\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^4} dx$

Optimal result

Integrand size = 26, antiderivative size = 465

$$\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^4}\,dx = -\frac{(Ae(8c^2d^2-6bcde-b^2e^2)-Bd(32c^2d^2-36bcde+5b^2e^2))\sqrt{bx+cx^2}}{8d^2e^4(cd-be)} - \frac{(Bd(8cd-5be)-Ae(2cd+be))x^2\sqrt{bx+cx^2}}{12d^2e^2(d+ex)^2} + \frac{(Ae(12c^2d^2-8bcde-b^2e^2)-Bd(48c^2d^2-50bcde+5b^2e^2))\,x\sqrt{bx+cx^2}}{24d^2e^3(cd-be)(d+ex)} - \frac{(Bd-Ae)x(bx+cx^2)^{3/2}}{3de(d+ex)^3} - \frac{\sqrt{c}(8Bcd-3bBe-2Ace)\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{e^5} + \frac{(Bd(64c^3d^3-120bc^2d^2e+60b^2cde^2-5b^3e^3)-Ae(16c^3d^3-24bc^2d^2e+6b^2cde^2+b^3e^3))\,\text{arctanh}\left(\frac{\sqrt{cd-}}{\sqrt{d}\sqrt{bx-}}\right.}{8d^{3/2}e^5(cd-be)^{3/2}}$$

output
```
-1/8*(A*e*(-b^2*e^2-6*b*c*d*e+8*c^2*d^2)-B*d*(5*b^2*e^2-36*b*c*d*e+32*c^2*
d^2))*(c*x^2+b*x)^(1/2)/d^2/e^4/(-b*e+c*d)-1/12*(B*d*(-5*b*e+8*c*d)-A*e*(b
*e+2*c*d))*x^2*(c*x^2+b*x)^(1/2)/d^2/e^2/(e*x+d)^2+1/24*(A*e*(-b^2*e^2-8*b
*c*d*e+12*c^2*d^2)-B*d*(5*b^2*e^2-50*b*c*d*e+48*c^2*d^2))*x*(c*x^2+b*x)^(1
/2)/d^2/e^3/(-b*e+c*d)/(e*x+d)-1/3*(-A*e+B*d)*x*(c*x^2+b*x)^(3/2)/d/e/(e*x
+d)^3-c^(1/2)*(-2*A*c*e-3*B*b*e+8*B*c*d)*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/
2))/e^5+1/8*(B*d*(-5*b^3*e^3+60*b^2*c*d*e^2-120*b*c^2*d^2*e+64*c^3*d^3)-A*
e*(b^3*e^3+6*b^2*c*d*e^2-24*b*c^2*d^2*e+16*c^3*d^3))*arctanh((-b*e+c*d)^(1
/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(3/2)/e^5/(-b*e+c*d)^(3/2)
```

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 1416 vs. $2(465) = 930$.

Time = 16.26 (sec) , antiderivative size = 1416, normalized size of antiderivative = 3.05

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^4,x]
```

output
```
((-(B*d) + A*e)*x*(b + c*x)*(x*(b + c*x))^(3/2))/(3*d*(-(c*d) + b*e)*(d +
e*x)^3) + ((x*(b + c*x))^(3/2)*(((-2*c*d*(B*d - A*e) + (e*(5*b*B*d - 6*A*c
*d + A*b*e))/2)*x^(5/2)*(b + c*x)^(5/2))/(2*d*(-(c*d) + b*e)*(d + e*x)^2)
+ ((((-3*c*d*(B*d*(4*c*d - 5*b*e) + A*e*(2*c*d - b*e)))/2 + (e*(-5*b^2*B*d
*e + A*(24*c^2*d^2 - 18*b*c*d*e - b^2*e^2)))/4)*x^(5/2)*(b + c*x)^(5/2))/(
d*(-(c*d) + b*e)*(d + e*x)) + (((-48*A*c^3*d^3 - 2*b^2*c*d*e*(70*B*d - 13*
A*e) + 24*b*c^2*d^2*(5*B*d + A*e) + 3*b^3*e^2*(5*B*d + A*e))*(((b^2*Sqrt[x
]*Sqrt[b + c*x])/(8*c) + (7*b*x^(3/2)*Sqrt[b + c*x])/12 + (c*x^(5/2)*Sqrt[
b + c*x])/3 - (b^(5/2)*Sqrt[b + c*x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(
8*c^(3/2)*Sqrt[1 + (c*x)/b]))/e - (d*(((5*b*Sqrt[x]*Sqrt[b + c*x])/4 + (c*
x^(3/2)*Sqrt[b + c*x])/2 + (3*b^(3/2)*Sqrt[b + c*x]*ArcSinh[(Sqrt[c]*Sqrt[
x])/Sqrt[b]])/(4*Sqrt[c]*Sqrt[1 + (c*x)/b]))/e - (d*((c*(Sqrt[x]*Sqrt[b +
c*x] + (Sqrt[b]*Sqrt[b + c*x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(Sqrt[c]
*Sqrt[1 + (c*x)/b])))/e - ((c*d - b*e)*((2*Sqrt[b]*Sqrt[c]*Sqrt[1 + (c*x)/
b]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(e*Sqrt[b + c*x]) - (2*Sqrt[c*d - b
*e]*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x])])/(Sqrt[d]*e
)))/e))/e))/e))/8 - c*(A*e*(12*c^2*d^2 - 12*b*c*d*e - b^2*e^2) - B*d*(24*c
^2*d^2 - 30*b*c*d*e + 5*b^2*e^2))*(((-3*b^3*Sqrt[x]*Sqrt[b + c*x])/(64*c^2
) + (b^2*x^(3/2)*Sqrt[b + c*x])/(32*c) + (3*b*x^(5/2)*Sqrt[b + c*x])/8 + (
c*x^(7/2)*Sqrt[b + c*x])/4 + (3*b^(7/2)*Sqrt[b + c*x]*ArcSinh[(Sqrt[c]*...
```

Rubi [A] (verified)

Time = 1.48 (sec) , antiderivative size = 446, normalized size of antiderivative = 0.96, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.346$, Rules used = {1229, 27, 1230, 25, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^4}\,dx$$

$$\Big\downarrow \text{1229}$$

$$-\frac{\int -\frac{(b(Bd(8cd-5be)-Ae(2cd+be))+2c(Bd(8cd-7be)-Ae(2cd-be))x)\sqrt{cx^2+bx}}{2(d+ex)^2}dx}{4de^2(cd-be)}-\frac{\left(bx+cx^2\right)^{3/2}(3ex(Bd(4cd-3be)-Ae(2cd-be))+d(Bd(8cd-5be)-Ae(be+2cd)))}{12de^2(d+ex)^3(cd-be)}$$

$\downarrow$ 27

$$\frac{\int \frac{(b(Bd(8cd-5be)-Ae(2cd+be))+2c(Bd(8cd-7be)-Ae(2cd-be))x)\sqrt{cx^2+bx}}{(d+ex)^2}dx}{8de^2(cd-be)}-$$
$$\frac{\left(bx+cx^2\right)^{3/2}(3ex(Bd(4cd-3be)-Ae(2cd-be))+d(Bd(8cd-5be)-Ae(be+2cd)))}{12de^2(d+ex)^3(cd-be)}$$

$\downarrow$ 1230

$$\frac{-\frac{\int -\frac{b\left(Ae\left(8c^2d^2-6bced-b^2e^2\right)-Bd\left(32c^2d^2-36bced+5b^2e^2\right)\right)-8cd(cd-be)(8Bcd-3bBe-2Ace)x}{(d+ex)\sqrt{cx^2+bx}}dx}{2e^2}-\frac{\sqrt{bx+cx^2}\left(Ae\left(-b^2e^2-6bcde+8c^2d^2\right)-2cex(B\ldots}{\ldots}}{8de^2(cd-be)}$$
$$\frac{\left(bx+cx^2\right)^{3/2}(3ex(Bd(4cd-3be)-Ae(2cd-be))+d(Bd(8cd-5be)-Ae(be+2cd)))}{12de^2(d+ex)^3(cd-be)}$$

$\downarrow$ 25

$$\frac{\frac{\int \frac{b\left(Ae\left(8c^2d^2-6bced-b^2e^2\right)-Bd\left(32c^2d^2-36bced+5b^2e^2\right)\right)-8cd(cd-be)(8Bcd-3bBe-2Ace)x}{(d+ex)\sqrt{cx^2+bx}}dx}{2e^2}-\frac{\sqrt{bx+cx^2}\left(Ae\left(-b^2e^2-6bcde+8c^2d^2\right)-2cex(Bd(8c\ldots}{e^2(\ldots}}{8de^2(cd-be)}$$
$$\frac{\left(bx+cx^2\right)^{3/2}(3ex(Bd(4cd-3be)-Ae(2cd-be))+d(Bd(8cd-5be)-Ae(be+2cd)))}{12de^2(d+ex)^3(cd-be)}$$

$\downarrow$ 1269

$$\frac{\frac{\frac{\left(Bd\left(-5b^3e^3+60b^2cde^2-120bc^2d^2e+64c^3d^3\right)-Ae\left(b^3e^3+6b^2cde^2-24bc^2d^2e+16c^3d^3\right)\right)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}-\frac{8cd(cd-be)(-2Ace-3bBe+8Bcd)\int \frac{1}{\sqrt{cx^2+bx}}\ldots}{e}}{2e^2}\ldots}{8de^2(cd-be)}$$
$$\frac{\left(bx+cx^2\right)^{3/2}(3ex(Bd(4cd-3be)-Ae(2cd-be))+d(Bd(8cd-5be)-Ae(be+2cd)))}{12de^2(d+ex)^3(cd-be)}$$

$\downarrow$ 1091

$$\frac{\frac{\frac{\left(Bd\left(-5b^3e^3+60b^2cde^2-120bc^2d^2e+64c^3d^3\right)-Ae\left(b^3e^3+6b^2cde^2-24bc^2d^2e+16c^3d^3\right)\right)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}-\frac{16cd(cd-be)(-2Ace-3bBe+8Bcd)\int \frac{1}{1-\frac{cx^2}{cx^2+\ldots}}\ldots}{e}}{2e^2}\ldots}{8de^2(cd-be)}$$
$$\frac{\left(bx+cx^2\right)^{3/2}(3ex(Bd(4cd-3be)-Ae(2cd-be))+d(Bd(8cd-5be)-Ae(be+2cd)))}{12de^2(d+ex)^3(cd-be)}$$

$\downarrow$ 219

$$\frac{\frac{\frac{\left(Bd\left(-5b^3e^3+60b^2cde^2-120bc^2d^2e+64c^3d^3\right)-Ae\left(b^3e^3+6b^2cde^2-24bc^2d^2e+16c^3d^3\right)\right)\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}-\frac{16\sqrt{c}d\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)(cd-be)(-2Ac}{e}}{2e^2}}{8de^2(cd-be)}$$

$$\frac{\left(bx+cx^2\right)^{3/2}(3ex(Bd(4cd-3be)-Ae(2cd-be))+d(Bd(8cd-5be)-Ae(be+2cd)))}{12de^2(d+ex)^3(cd-be)}$$

$\downarrow$ 1154

$$\frac{-\frac{2\left(Bd\left(-5b^3e^3+60b^2cde^2-120bc^2d^2e+64c^3d^3\right)-Ae\left(b^3e^3+6b^2cde^2-24bc^2d^2e+16c^3d^3\right)\right)\int\frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{e}-16\sqrt{c}d\text{arc}}{2e^2}$$

$8de$

$$\frac{\left(bx+cx^2\right)^{3/2}(3ex(Bd(4cd-3be)-Ae(2cd-be))+d(Bd(8cd-5be)-Ae(be+2cd)))}{12de^2(d+ex)^3(cd-be)}$$

$\downarrow$ 219

$$\frac{\frac{\left(Bd\left(-5b^3e^3+60b^2cde^2-120bc^2d^2e+64c^3d^3\right)-Ae\left(b^3e^3+6b^2cde^2-24bc^2d^2e+16c^3d^3\right)\right)\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{\sqrt{d}e\sqrt{cd-be}}-\frac{16\sqrt{c}d\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{e}}{2e^2}$$

$8de^2(cd-$

$$\frac{\left(bx+cx^2\right)^{3/2}(3ex(Bd(4cd-3be)-Ae(2cd-be))+d(Bd(8cd-5be)-Ae(be+2cd)))}{12de^2(d+ex)^3(cd-be)}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^4,x]
```

output
```
-1/12*((d*(B*d*(8*c*d - 5*b*e) - A*e*(2*c*d + b*e)) + 3*e*(B*d*(4*c*d - 3*
b*e) - A*e*(2*c*d - b*e))*x)*(b*x + c*x^2)^(3/2))/(d*e^2*(c*d - b*e)*(d +
e*x)^3) + (-(((A*e*(8*c^2*d^2 - 6*b*c*d*e - b^2*e^2) - B*d*(32*c^2*d^2 - 3
6*b*c*d*e + 5*b^2*e^2) - 2*c*e*(B*d*(8*c*d - 7*b*e) - A*e*(2*c*d - b*e))*x
)*Sqrt[b*x + c*x^2])/(e^2*(d + e*x))) + ((-16*Sqrt[c]*d*(c*d - b*e)*(8*B*c
*d - 3*b*B*e - 2*A*c*e)*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/e + ((B*d*
(64*c^3*d^3 - 120*b*c^2*d^2*e + 60*b^2*c*d*e^2 - 5*b^3*e^3) - A*e*(16*c^3*
d^3 - 24*b*c^2*d^2*e + 6*b^2*c*d*e^2 + b^3*e^3))*ArcTanh[(b*d + (2*c*d - b
*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(Sqrt[d]*e*Sqrt[c*d
 - b*e]))/(2*e^2))/(8*d*e^2*(c*d - b*e))
```

Defintions of rubi rules used

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

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1229
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m + 1))*((a + b*x + c*x^2
)^p/(e^2*(m + 1)*(m + 2)*(c*d^2 - b*d*e + a*e^2)))*((d*g - e*f*(m + 2))*(c*
d^2 - b*d*e + a*e^2) - d*p*(2*c*d - b*e)*(e*f - d*g) - e*(g*(m + 1)*(c*d^2
- b*d*e + a*e^2) + p*(2*c*d - b*e)*(e*f - d*g))*x), x] - Simp[p/(e^2*(m + 1
)*(m + 2)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 2)*(a + b*x + c*x^2
)^(p - 1)*Simp[2*a*c*e*(e*f - d*g)*(m + 2) + b^2*e*(d*g*(p + 1) - e*f*(m +
p + 2)) + b*(a*e^2*g*(m + 1) - c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2))) - c
*(2*c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2)) - e*(2*a*e*g*(m + 1) - b*(d*g*(
m - 2*p) + e*f*(m + 2*p + 2))))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g
}, x] && GtQ[p, 0] && LtQ[m, -2] && LtQ[m + 2*p, 0] &&  !ILtQ[m + 2*p + 3,
0]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.58 (sec) , antiderivative size = 502, normalized size of antiderivative = 1.08

method	result
pseudoelliptic	$\frac{-2\sqrt{c}\,(ex+d)^3x^2b^2\left(-4B\,c^3d^4+c^2e\left(Ac+\frac{15Bb}{2}\right)d^3-\frac{3c\,e^2\left(Ac+\frac{5Bb}{2}\right)b\,d^2}{2}+\frac{3e^3b^2\left(Ac+\frac{5Bb}{6}\right)d}{8}+\frac{A\,b^3e^4}{16}\right)\arctan\left(\frac{\sqrt{x(cx+b)}\,\ldots}{x\sqrt{d(be-cd\ldots}}\right.}{\ldots}$
risch	Expression too large to display
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
1/(d*(b*e-c*d))^(1/2)/c^(1/2)*(-2*c^(1/2)*(e*x+d)^3*x^2*b^2*(-4*B*c^3*d^4+
c^2*e*(A*c+15/2*B*b)*d^3-3/2*c*e^2*(A*c+5/2*B*b)*b*d^2+3/8*e^3*b^2*(A*c+5/
6*B*b)*d+1/16*A*b^3*e^4)*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))
+(2*c*d*(e*x+d)^3*x^2*(b*e-c*d)*b^2*(-4*B*c*d+e*(A*c+3/2*B*b))*arctanh((x*
(c*x+b))^(1/2)/x/c^(1/2))+c^(1/2)*e*(-1/3*d*(18*B*c^2*d^3-6*c*e*(A*c+4*B*b
)*d^2+e^2*(6*A*b*c+5*B*b^2)*d+A*b^2*e^3)*x^2*(b*e-c*d)*(x*(c*x+b))^(3/2)-1
/8*d^2*(24*B*c^2*d^3-8*c*e*(A*c+7/2*B*b)*d^2+e^2*(6*A*b*c+5*B*b^2)*d+A*b^2
*e^3)*(x*(c*x+b))^(5/2)+1/8*x^2*(8*B*c*(3*c^2*x^2+b^2)*d^4-8*c*e*x*(A*c^2*
x+15/2*B*b*c*x-3*B*b^2)*d^3+18*c*e^2*(A*c+71/18*B*b)*x^2*b*d^2-11*e^3*x^2*
((-8/11*B*x+A)*c+B*b)*b^2*d+A*b^3*e^4*x^2)*(b*e-c*d)*(x*(c*x+b))^(1/2)))*(
d*(b*e-c*d))^(1/2))/b^2/d/(b*e-c*d)/e^5/(e*x+d)^3/x^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1245 vs. $2(431) = 862$.

Time = 3.16 (sec) , antiderivative size = 5001, normalized size of antiderivative = 10.75

$$\int \frac{(A+Bx)\,(bx+cx^2)^{3/2}}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^4,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\,(bx+cx^2)^{3/2}}{(d+ex)^4}\,dx = \int \frac{(x(b+cx))^{\frac{3}{2}}\,(A+Bx)}{(d+ex)^4}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(3/2)/(e*x+d)**4,x)
```

output
```
Integral((x*(b + c*x))**(3/2)*(A + B*x)/(d + e*x)**4, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^4}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^4,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1796 vs. $2(431) = 862$.

Time = 0.33 (sec) , antiderivative size = 1796, normalized size of antiderivative = 3.86

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^4,x, algorithm="giac")
```

output
```
1/8*(64*B*c^3*d^4 - 120*B*b*c^2*d^3*e - 16*A*c^3*d^3*e + 60*B*b^2*c*d^2*e^
2 + 24*A*b*c^2*d^2*e^2 - 5*B*b^3*d*e^3 - 6*A*b^2*c*d*e^3 - A*b^3*e^4)*arct
an(-((sqrt(c)*x - sqrt(c*x^2 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))/
((c*d^2*e^5 - b*d*e^6)*sqrt(-c*d^2 + b*d*e)) + sqrt(c*x^2 + b*x)*B*c/e^4 +
 1/24*(288*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*B*c^3*d^4*e^2 - 504*(sqrt(c)*
x - sqrt(c*x^2 + b*x))^5*B*b*c^2*d^3*e^3 - 144*(sqrt(c)*x - sqrt(c*x^2 + b
*x))^5*A*c^3*d^3*e^3 + 252*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*B*b^2*c*d^2*e
^4 + 216*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*A*b*c^2*d^2*e^4 - 33*(sqrt(c)*x
 - sqrt(c*x^2 + b*x))^5*B*b^3*d*e^5 - 78*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5
*A*b^2*c*d*e^5 + 3*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*A*b^3*e^6 + 960*(sqrt
(c)*x - sqrt(c*x^2 + b*x))^4*B*c^(7/2)*d^5*e - 1464*(sqrt(c)*x - sqrt(c*x^
2 + b*x))^4*B*b*c^(5/2)*d^4*e^2 - 432*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*A*
c^(7/2)*d^4*e^2 + 540*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*B*b^2*c^(3/2)*d^3*
e^3 + 504*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*A*b*c^(5/2)*d^3*e^3 - 21*(sqrt
(c)*x - sqrt(c*x^2 + b*x))^4*B*b^3*sqrt(c)*d^2*e^4 - 54*(sqrt(c)*x - sqrt(
c*x^2 + b*x))^4*A*b^2*c^(3/2)*d^2*e^4 - 33*(sqrt(c)*x - sqrt(c*x^2 + b*x))
^4*A*b^3*sqrt(c)*d*e^5 + 832*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*c^4*d^6 -
 400*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b*c^3*d^5*e - 352*(sqrt(c)*x - sq
rt(c*x^2 + b*x))^3*A*c^4*d^5*e - 840*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b
^2*c^2*d^4*e^2 + 16*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b*c^3*d^4*e^2 +...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^4}\,dx=\int \frac{(c\,x^2+b\,x)^{3/2}\,(A+B\,x)}{(d+e\,x)^4}\,dx$$

input
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^4,x)
```

output
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^4, x)
```

Reduce [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^4}\,dx = \int \frac{(Bx+A)\left(c\,x^2+bx\right)^{\frac{3}{2}}}{(ex+d)^4}dx$$

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^4,x)
```

output
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^4,x)
```

3.108 $\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^5}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 413

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^5}\,dx = \frac{(3Abe^2-Bd(8cd-5be))\,x^2\sqrt{bx+cx^2}}{24d^2e^2(d+ex)^3} - \frac{(48Bc^2d^3-be(3Abe^2+5Bd(8cd+be)))\,x\sqrt{bx+cx^2}}{96d^2e^3(cd-be)(d+ex)^2} - \frac{(3Ab^3e^4+Bd(64c^3d^3-112bc^2d^2e+40b^2cde^2+5b^3e^3))\sqrt{bx+cx^2}}{64d^2e^4(cd-be)^2(d+ex)} - \frac{(Bd-Ae)x(bx+cx^2)^{3/2}}{4de(d+ex)^4} + \frac{2Bc^{3/2}\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{e^5} + \frac{(3Ab^4e^5-Bd(128c^4d^4-320bc^3d^3e+240b^2c^2d^2e^2-40b^3cde^3-5b^4e^4))\,\text{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{64d^{5/2}e^5(cd-be)^{5/2}}$$

output
```
1/24*(3*A*b*e^2-B*d*(-5*b*e+8*c*d))*x^2*(c*x^2+b*x)^(1/2)/d^2/e^2/(e*x+d)^
3-1/96*(48*B*c^2*d^3-b*e*(3*A*b*e^2+5*B*d*(b*e+8*c*d)))*x*(c*x^2+b*x)^(1/2
)/d^2/e^3/(-b*e+c*d)/(e*x+d)^2-1/64*(3*A*b^3*e^4+B*d*(5*b^3*e^3+40*b^2*c*d
*e^2-112*b*c^2*d^2*e+64*c^3*d^3))*(c*x^2+b*x)^(1/2)/d^2/e^4/(-b*e+c*d)^2/(
e*x+d)-1/4*(-A*e+B*d)*x*(c*x^2+b*x)^(3/2)/d/e/(e*x+d)^4+2*B*c^(3/2)*arctan
h(c^(1/2)*x/(c*x^2+b*x)^(1/2))/e^5+1/64*(3*A*b^4*e^5-B*d*(-5*b^4*e^4-40*b^
3*c*d*e^3+240*b^2*c^2*d^2*e^2-320*b*c^3*d^3*e+128*c^4*d^4))*arctanh((-b*e+
c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(5/2)/e^5/(-b*e+c*d)^(5/2)
```

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 1867 vs. $2(413) = 826$.

Time = 16.30 (sec) , antiderivative size = 1867, normalized size of antiderivative = 4.52

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^5}\,dx = \text{Too large to display}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^5,x]
```

output
```
((-(B*d) + A*e)*x*(b + c*x)*(x*(b + c*x))^(3/2))/(4*d*(-(c*d) + b*e)*(d +
e*x)^4) + ((x*(b + c*x))^(3/2)*(((-(c*d*(B*d - A*e)) + (e*(5*b*B*d - 8*A*c
*d + 3*A*b*e))/2)*x^(5/2)*(b + c*x)^(5/2))/(3*d*(-(c*d) + b*e)*(d + e*x)^3
) + ((((e*(48*A*c^2*d^2 + b^2*e*(5*B*d + 3*A*e) - 4*b*c*d*(5*B*d + 9*A*e))
)/4 - c*d*(B*d*(2*c*d - 5*b*e) + 3*A*e*(2*c*d - b*e)))*x^(5/2)*(b + c*x)^(
5/2))/(2*d*(-(c*d) + b*e)*(d + e*x)^2) + ((((e*(-192*A*c^3*d^3 - b^3*e^2*(
5*B*d + 3*A*e) + 24*b*c^2*d^2*(5*B*d + 9*A*e) - 4*b^2*c*d*e*(25*B*d + 9*A*
e)))/8 + (3*c*d*(3*A*e*(8*c^2*d^2 - 8*b*c*d*e + b^2*e^2) - B*(8*c^2*d^3 -
5*b^2*d*e^2)))/4)*x^(5/2)*(b + c*x)^(5/2))/(d*(-(c*d) + b*e)*(d + e*x)) +
((-1/8*(c*d*(-192*A*c^3*d^3 - b^3*e^2*(5*B*d + 3*A*e) + 24*b*c^2*d^2*(5*B*
d + 9*A*e) - 4*b^2*c*d*e*(25*B*d + 9*A*e))) + (b*e*(-192*A*c^3*d^3 - b^3*e
^2*(5*B*d + 3*A*e) + 24*b*c^2*d^2*(5*B*d + 9*A*e) - 4*b^2*c*d*e*(25*B*d +
9*A*e)))/8 - (5*b*((e*(-192*A*c^3*d^3 - b^3*e^2*(5*B*d + 3*A*e) + 24*b*c^2
*d^2*(5*B*d + 9*A*e) - 4*b^2*c*d*e*(25*B*d + 9*A*e)))/8 + (3*c*d*(3*A*e*(8
*c^2*d^2 - 8*b*c*d*e + b^2*e^2) - B*(8*c^2*d^3 - 5*b^2*d*e^2)))/4))/2)*(((
b^2*Sqrt[x]*Sqrt[b + c*x])/(8*c) + (7*b*x^(3/2)*Sqrt[b + c*x])/12 + (c*x^(
5/2)*Sqrt[b + c*x])/3 - (b^(5/2)*Sqrt[b + c*x]*ArcSinh[(Sqrt[c]*Sqrt[x])/S
qrt[b]])/(8*c^(3/2)*Sqrt[1 + (c*x)/b]))/e - (d*(((5*b*Sqrt[x]*Sqrt[b + c*x
])/4 + (c*x^(3/2)*Sqrt[b + c*x])/2 + (3*b^(3/2)*Sqrt[b + c*x]*ArcSinh[(Sqr
t[c]*Sqrt[x])/Sqrt[b]])/(4*Sqrt[c]*Sqrt[1 + (c*x)/b]))/e - (d*((c*(Sqrt...
```

Rubi [A] (verified)

Time = 1.49 (sec) , antiderivative size = 473, normalized size of antiderivative = 1.15, number of steps used = 10, number of rules used = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.346$, Rules used = {1229, 27, 1229, 27, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^5}\,dx$$

$$\Big\downarrow \; 1229$$

$$\frac{\left(bx+cx^2\right)^{3/2}\left(d\left(3Abe^2-Bd(8cd-5be)\right)-ex(Bd(14cd-11be)-3Ae(2cd-be))\right)}{24de^2(d+ex)^4(cd-be)}-\frac{\int \frac{(b(3Abe^2-Bd(8cd-5be))-16Bcd(cd-be)x)\sqrt{cx^2+bx}}{2(d+ex)^3}dx}{8de^2(cd-be)}$$

$$\Big\downarrow \; 27$$

$$\frac{\left(bx+cx^2\right)^{3/2}\left(d\left(3Abe^2-Bd(8cd-5be)\right)-ex(Bd(14cd-11be)-3Ae(2cd-be))\right)}{24de^2(d+ex)^4(cd-be)}-\frac{\int \frac{(b(3Abe^2-Bd(8cd-5be))-16Bcd(cd-be)x)\sqrt{cx^2+bx}}{(d+ex)^3}dx}{16de^2(cd-be)}$$

$$\Big\downarrow \; 1229$$

$$\frac{\left(bx+cx^2\right)^{3/2}\left(d\left(3Abe^2-Bd(8cd-5be)\right)-ex(Bd(14cd-11be)-3Ae(2cd-be))\right)}{24de^2(d+ex)^4(cd-be)}-\frac{\frac{\sqrt{bx+cx^2}\left(ex\left(3Ab^2e^3(2cd-be)+Bd\left(-5b^3e^3+98b^2cde^2-192bc^2d^2e+96c^3d^3\right)\right)+d\left(3Ab^3e^4+Bd\left(5b^3e^3+40b^2cde^2-112bc^2d^2e+64c^3d^3\right)\right)\right)}{4de^2(d+ex)^2(cd-be)}-\int \frac{12\cdots}{\cdots}}{16de^2(cd-be)}$$

$$\Big\downarrow \; 27$$

$$\frac{\left(bx+cx^2\right)^{3/2}\left(d\left(3Abe^2-Bd(8cd-5be)\right)-ex(Bd(14cd-11be)-3Ae(2cd-be))\right)}{24de^2(d+ex)^4(cd-be)}-\frac{\frac{\sqrt{bx+cx^2}\left(ex\left(3Ab^2e^3(2cd-be)+Bd\left(-5b^3e^3+98b^2cde^2-192bc^2d^2e+96c^3d^3\right)\right)+d\left(3Ab^3e^4+Bd\left(5b^3e^3+40b^2cde^2-112bc^2d^2e+64c^3d^3\right)\right)\right)}{4de^2(d+ex)^2(cd-be)}-\int \frac{12\cdots}{\cdots}}{16de^2(cd-be)}$$

$$\Big\downarrow \; 1269$$

$$\frac{(bx+cx^2)^{3/2}\left(d(3Abe^2-Bd(8cd-5be))-ex(Bd(14cd-11be)-3Ae(2cd-be))\right)}{24de^2(d+ex)^4(cd-be)}-$$

$$\frac{\frac{\sqrt{bx+cx^2}\left(ex(3Ab^2e^3(2cd-be)+Bd(-5b^3e^3+98b^2cde^2-192bc^2d^2e+96c^3d^3))+d(3Ab^3e^4+Bd(5b^3e^3+40b^2cde^2-112bc^2d^2e+64c^3d^3))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{(3A}{}}{16de^2(cd-be)}$$

$\downarrow$ 1091

$$\frac{(bx+cx^2)^{3/2}\left(d(3Abe^2-Bd(8cd-5be))-ex(Bd(14cd-11be)-3Ae(2cd-be))\right)}{24de^2(d+ex)^4(cd-be)}-$$

$$\frac{\frac{\sqrt{bx+cx^2}\left(ex(3Ab^2e^3(2cd-be)+Bd(-5b^3e^3+98b^2cde^2-192bc^2d^2e+96c^3d^3))+d(3Ab^3e^4+Bd(5b^3e^3+40b^2cde^2-112bc^2d^2e+64c^3d^3))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{(3A}{}}{16de^2(cd-be)}$$

$\downarrow$ 219

$$\frac{(bx+cx^2)^{3/2}\left(d(3Abe^2-Bd(8cd-5be))-ex(Bd(14cd-11be)-3Ae(2cd-be))\right)}{24de^2(d+ex)^4(cd-be)}-$$

$$\frac{\frac{\sqrt{bx+cx^2}\left(ex(3Ab^2e^3(2cd-be)+Bd(-5b^3e^3+98b^2cde^2-192bc^2d^2e+96c^3d^3))+d(3Ab^3e^4+Bd(5b^3e^3+40b^2cde^2-112bc^2d^2e+64c^3d^3))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{(3A}{}}{16de^2(cd-be}$$

$\downarrow$ 1154

$$\frac{(bx+cx^2)^{3/2}\left(d(3Abe^2-Bd(8cd-5be))-ex(Bd(14cd-11be)-3Ae(2cd-be))\right)}{24de^2(d+ex)^4(cd-be)}-$$

$$\frac{\frac{\sqrt{bx+cx^2}\left(ex(3Ab^2e^3(2cd-be)+Bd(-5b^3e^3+98b^2cde^2-192bc^2d^2e+96c^3d^3))+d(3Ab^3e^4+Bd(5b^3e^3+40b^2cde^2-112bc^2d^2e+64c^3d^3))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{256.}{}}{16}$$

$\downarrow$ 219

$$\frac{(bx+cx^2)^{3/2}\left(d(3Abe^2-Bd(8cd-5be))-ex(Bd(14cd-11be)-3Ae(2cd-be))\right)}{24de^2(d+ex)^4(cd-be)}-$$

$$\frac{\frac{\sqrt{bx+cx^2}\left(ex(3Ab^2e^3(2cd-be)+Bd(-5b^3e^3+98b^2cde^2-192bc^2d^2e+96c^3d^3))+d(3Ab^3e^4+Bd(5b^3e^3+40b^2cde^2-112bc^2d^2e+64c^3d^3))\right)}{4de^2(d+ex)^2(cd-be)}-\frac{(3A}{}}{16de^2(cd}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^5,x]
```

output
```
((d*(3*A*b*e^2 - B*d*(8*c*d - 5*b*e)) - e*(B*d*(14*c*d - 11*b*e) - 3*A*e*(
2*c*d - b*e))*x)*(b*x + c*x^2)^(3/2))/(24*d*e^2*(c*d - b*e)*(d + e*x)^4) -
 (((d*(3*A*b^3*e^4 + B*d*(64*c^3*d^3 - 112*b*c^2*d^2*e + 40*b^2*c*d*e^2 +
5*b^3*e^3)) + e*(3*A*b^2*e^3*(2*c*d - b*e) + B*d*(96*c^3*d^3 - 192*b*c^2*d
^2*e + 98*b^2*c*d*e^2 - 5*b^3*e^3))*x)*Sqrt[b*x + c*x^2])/(4*d*e^2*(c*d -
b*e)*(d + e*x)^2) - ((256*B*c^(3/2)*d^2*(c*d - b*e)^2*ArcTanh[(Sqrt[c]*x)/
Sqrt[b*x + c*x^2]])/e + ((3*A*b^4*e^5 - B*d*(128*c^4*d^4 - 320*b*c^3*d^3*e
 + 240*b^2*c^2*d^2*e^2 - 40*b^3*c*d*e^3 - 5*b^4*e^4))*ArcTanh[(b*d + (2*c*
d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(Sqrt[d]*e*Sqr
t[c*d - b*e]))/(8*d*e^2*(c*d - b*e)))/(16*d*e^2*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1229
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m + 1))*((a + b*x + c*x^2
)^p/(e^2*(m + 1)*(m + 2)*(c*d^2 - b*d*e + a*e^2)))*((d*g - e*f*(m + 2))*(c*
d^2 - b*d*e + a*e^2) - d*p*(2*c*d - b*e)*(e*f - d*g) - e*(g*(m + 1)*(c*d^2
- b*d*e + a*e^2) + p*(2*c*d - b*e)*(e*f - d*g))*x), x] - Simp[p/(e^2*(m + 1
)*(m + 2)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 2)*(a + b*x + c*x^2
)^(p - 1)*Simp[2*a*c*e*(e*f - d*g)*(m + 2) + b^2*e*(d*g*(p + 1) - e*f*(m +
p + 2)) + b*(a*e^2*g*(m + 1) - c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2))) - c
*(2*c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2)) - e*(2*a*e*g*(m + 1) - b*(d*g*(
m - 2*p) + e*f*(m + 2*p + 2))))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g
}, x] && GtQ[p, 0] && LtQ[m, -2] && LtQ[m + 2*p, 0] &&  !ILtQ[m + 2*p + 3,
0]
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.33 (sec) , antiderivative size = 464, normalized size of antiderivative = 1.12

method	result
pseudoelliptic	$-\frac{3\left((ex+d)^4\left(A b^4 e^5+\frac{5}{3} B b^4 d e^4+\frac{40}{3} B b^3 c d^2 e^3-80 B b^2 c^2 d^3 e^2+\frac{320}{3} B b c^3 d^4 e-\frac{128}{3} B c^4 d^5\right) \arctan\left(\frac{\sqrt{x(cx+b)}\, d}{x\sqrt{d(be-cd)}}\right)+\sqrt{d(b\right.}{}}$
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

output
```
-3/64*((e*x+d)^4*(A*b^4*e^5+5/3*B*b^4*d*e^4+40/3*B*b^3*c*d^2*e^3-80*B*b^2*
c^2*d^3*e^2+320/3*B*b*c^3*d^4*e-128/3*B*c^4*d^5)*arctan((x*(c*x+b))^(1/2)/
x*d/(d*(b*e-c*d))^(1/2))+(d*(b*e-c*d))^(1/2)*(256/3*d^2*(e*x+d)^4*B*(-1/2*
e^2*c^(3/2)*b^2+d*(c^(5/2)*b*e-1/2*c^(7/2)*d))*arctanh((x*(c*x+b))^(1/2)/x
/c^(1/2))+(x*(c*x+b))^(1/2)*e*(64/3*B*c^3*d^7-112/3*B*c^2*e*(-2*c*x+b)*d^6
+40/3*c*e^2*B*(104/15*c^2*x^2-148/15*c*b*x+b^2)*d^5+5/3*e^3*B*(80/3*c^3*x^
3-296/3*b*c^2*x^2+86/3*b^2*c*x+b^3)*d^4+((-16/3*A*c^3-776/9*B*b*c^2)*x^3+(
548/9*B*b^2*c-8*A*b*c^2)*x^2+(55/9*B*b^3-2/3*A*b^2*c)*x+A*b^3)*e^4*d^3+11/
3*((24/11*A*c^2+382/33*B*b*c)*x^2+(4*A*b*c+73/33*B*b^2)*x+b^2*A)*e^5*x*b*d
^2-11/3*e^6*x^2*((2/11*A*c+5/11*B*b)*x+A*b)*b^2*d-A*x^3*b^3*e^7)))/(d*(b*e
-c*d))^(1/2)/(b*e-c*d)^2/d^2/e^5/(e*x+d)^4
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1439 vs. $2(379) = 758$.

Time = 11.08 (sec) , antiderivative size = 5777, normalized size of antiderivative = 13.99

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^5}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^5,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^5}\,dx = \int \frac{(x(b+cx))^{\frac{3}{2}}\,(A+Bx)}{(d+ex)^5}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(3/2)/(e*x+d)**5,x)
```

output
```
Integral((x*(b + c*x))**(3/2)*(A + B*x)/(d + e*x)**5, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^5}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^5,x, algorithm="maxima")
```

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

Giac [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^5}\,dx=\text{Exception raised: TypeError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^5,x, algorithm="giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:Error: Bad Argument Type
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^5}\,dx=\int \frac{\left(c\,x^2+b\,x\right)^{3/2}\,\left(A+B\,x\right)}{\left(d+e\,x\right)^5}\,dx$$

input
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^5,x)
```

output
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^5, x)
```

Reduce [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^5}\,dx=\int \frac{(Bx+A)\left(c\,x^2+bx\right)^{\frac{3}{2}}}{(ex+d)^5}dx$$

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^5,x)
```

output
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^5,x)
```

3.109 $\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^6}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 526

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^6}\,dx = \frac{(5be(Bd+Ae)-2cd(4Bd+Ae))x^2\sqrt{bx+cx^2}}{40d^2e^2(d+ex)^4}$$
$$-\frac{\left(Ae(4c^2d^2-5b^2e^2)+Bd(16c^2d^2-10bcde-5b^2e^2)\right)x\sqrt{bx+cx^2}}{80d^2e^3(cd-be)(d+ex)^3}$$
$$-\frac{\left(Ae(16c^3d^3-16bc^2d^2e-10b^2cde^2+15b^3e^3)+Bd(64c^3d^3-104bc^2d^2e+20b^2cde^2+15b^3e^3)\right)\sqrt{bx+cx^2}}{320d^2e^4(cd-be)^2(d+ex)^2}$$
$$+\frac{(Bd(128c^4d^4-336bc^3d^3e+248b^2c^2d^2e^2-10b^3cde^3-15b^4e^4)+Ae(32c^4d^4-64bc^3d^3e+12b^2c^2d^2e^2+2}{640d^3e^4(cd-be)^3(d+ex)}$$
$$-\frac{(Bd-Ae)x(bx+cx^2)^{3/2}}{5de(d+ex)^5}-\frac{3b^4(bBd-2Acd+Abe)\operatorname{arctanh}\left(\frac{\sqrt{cd-bex}}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{128d^{7/2}(cd-be)^{7/2}}$$

output
```
1/40*(5*b*e*(A*e+B*d)-2*c*d*(A*e+4*B*d))*x^2*(c*x^2+b*x)^(1/2)/d^2/e^2/(e*
x+d)^4-1/80*(A*e*(-5*b^2*e^2+4*c^2*d^2)+B*d*(-5*b^2*e^2-10*b*c*d*e+16*c^2*
d^2))*x*(c*x^2+b*x)^(1/2)/d^2/e^3/(-b*e+c*d)/(e*x+d)^3-1/320*(A*e*(15*b^3*
e^3-10*b^2*c*d*e^2-16*b*c^2*d^2*e+16*c^3*d^3)+B*d*(15*b^3*e^3+20*b^2*c*d*e
^2-104*b*c^2*d^2*e+64*c^3*d^3))*(c*x^2+b*x)^(1/2)/d^2/e^4/(-b*e+c*d)^2/(e*
x+d)^2+1/640*(B*d*(-15*b^4*e^4-10*b^3*c*d*e^3+248*b^2*c^2*d^2*e^2-336*b*c^
3*d^3*e+128*c^4*d^4)+A*e*(-15*b^4*e^4+20*b^3*c*d*e^3+12*b^2*c^2*d^2*e^2-64
*b*c^3*d^3*e+32*c^4*d^4))*(c*x^2+b*x)^(1/2)/d^3/e^4/(-b*e+c*d)^3/(e*x+d)-1
/5*(-A*e+B*d)*x*(c*x^2+b*x)^(3/2)/d/e/(e*x+d)^5-3/128*b^4*(A*b*e-2*A*c*d+B
*b*d)*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(7/2)/(-b*e+
c*d)^(7/2)
```

Mathematica [A] (verified)

Time = 11.15 (sec) , antiderivative size = 268, normalized size of antiderivative = 0.51

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^6}\,dx = \frac{(x(b+cx))^{3/2}\left(\frac{2(-Bd+Ae)x^{5/2}(b+cx)}{(d+ex)^5} + \frac{5(bBd-2Acd+Abe)\left(-\frac{2x^{3/2}(b+cx)^{5/2}}{(d+ex)^4} + \frac{b\sqrt{x}(b+c\cdots}{(cd-be)(\cdots}\cdots\right)}{8\cdots}\cdots\right)}{10d(-cd+be)x^{3/2}\cdots}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^6,x]
```

output
```
((x*(b + c*x))^(3/2)*((2*(-(B*d) + A*e)*x^(5/2)*(b + c*x))/(d + e*x)^5 + (
5*(b*B*d - 2*A*c*d + A*b*e)*((-2*x^(3/2)*(b + c*x)^(5/2))/(d + e*x)^4 + (b
*Sqrt[x]*(b + c*x)^(5/2))/((c*d - b*e)*(d + e*x)^3) - (b^2*Sqrt[x]*Sqrt[b
+ c*x]*(5*b*d + 2*c*d*x + 3*b*e*x))/(8*d^2*(c*d - b*e)*(d + e*x)^2) - (3*b
^4*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x])])/(8*d^(5/2)*
(c*d - b*e)^(3/2))))/(8*(-(c*d) + b*e)*(b + c*x)^(3/2))))/(10*d*(-(c*d) +
b*e)*x^(3/2))
```

Rubi [A] (verified)

Time = 0.73 (sec) , antiderivative size = 277, normalized size of antiderivative = 0.53, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {1228, 1152, 1152, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^6}dx$$

$$\Big\downarrow \text{1228}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-\frac{(Abe-2Acd+bBd)\int \frac{\left(cx^2+bx\right)^{3/2}}{(d+ex)^5}dx}{2d(cd-be)}$$

$$\Big\downarrow \text{1152}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-\frac{(Abe-2Acd+bBd)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+bd)}{8d(d+ex)^4(cd-be)}-\frac{3b^2\int \frac{\sqrt{cx^2+bx}}{(d+ex)^3}dx}{16d(cd-be)}\right)}{2d(cd-be)}$$

$$\Big\downarrow \text{1152}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-\frac{(Abe-2Acd+bBd)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+bd)}{8d(d+ex)^4(cd-be)}-\frac{3b^2\left(\frac{\sqrt{bx+cx^2}(x(2cd-be)+bd)}{4d(d+ex)^2(cd-be)}-\frac{b^2\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{8d(cd-be)}\right)}{16d(cd-be)}\right)}{2d(cd-be)}$$

$$\Big\downarrow \text{1154}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-\frac{(Abe-2Acd+bBd)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+bd)}{8d(d+ex)^4(cd-be)}-\frac{3b^2\left(\frac{b^2\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{4d(cd-be)}+\frac{\sqrt{bx+cx^2}(x(2cd-be)+b}{4d(d+ex)^2(cd-be)}\right.}{16d(cd-be)}\right.}{2d(cd-be)}$$

$$\downarrow \text{219}$$

$$\frac{(bx+cx^2)^{5/2}(Bd-Ae)}{5d(d+ex)^5(cd-be)}-\frac{(Abe-2Acd+bBd)\left(\frac{(bx+cx^2)^{3/2}(x(2cd-be)+bd)}{8d(d+ex)^4(cd-be)}-\frac{3b^2\left(\frac{\sqrt{bx+cx^2}(x(2cd-be)+bd)}{4d(d+ex)^2(cd-be)}-\frac{b^2\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{8d^{3/2}(cd-be)^{3/2}}\right)}{16d(cd-be)}\right)}{2d(cd-be)}$$

input

```
Int[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^6,x]
```

output

```
((B*d - A*e)*(b*x + c*x^2)^(5/2))/(5*d*(c*d - b*e)*(d + e*x)^5) - ((b*B*d
- 2*A*c*d + A*b*e)*(((b*d + (2*c*d - b*e)*x)*(b*x + c*x^2)^(3/2))/(8*d*(c*
d - b*e)*(d + e*x)^4) - (3*b^2*(((b*d + (2*c*d - b*e)*x)*Sqrt[b*x + c*x^2]
)/(4*d*(c*d - b*e)*(d + e*x)^2) - (b^2*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*
Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(8*d^(3/2)*(c*d - b*e)^(3/2))
))/(16*d*(c*d - b*e))))/(2*d*(c*d - b*e))
```

Defintions of rubi rules used

rule 219

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

rule 1152

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[(-(d + e*x)^(m + 1))*(d*b - 2*a*e + (2*c*d - b*e)*x)*((a + b
*x + c*x^2)^p/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[p*((b^2 - 4*a
*c)/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2)))   Int[(d + e*x)^(m + 2)*(a + b*x +
 c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[m + 2*p + 2, 0]
 && GtQ[p, 0]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

Maple [A] (verified)

Time = 1.38 (sec) , antiderivative size = 387, normalized size of antiderivative = 0.74

method	result
pseudoelliptic	$-\frac{3\left((ex+d)^5 b^4((-2Ac+Bb)d+Abe)\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)+\left(\left(B b^4-2c\left(\frac{Bx}{3}+A\right)b^3+\frac{4c^2x\left(\frac{2Bx}{5}+A\right)b^2}{3}+16c^3x^2\left(\frac{11Bx}{15}\right.\right.\right.\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^6,x,method=_RETURNVERBOSE)
```

output
```
-3/128*((e*x+d)^5*b^4*((-2*A*c+B*b)*d+A*b*e)*arctan((x*(c*x+b))^(1/2)/x*d/
(d*(b*e-c*d))^(1/2))+((B*b^4-2*c*(1/3*B*x+A)*b^3+4/3*c^2*x*(2/5*B*x+A)*b^2
+16*c^3*x^2*(11/15*B*x+A)*b+32/3*c^4*(4/5*B*x+A)*x^3)*d^5+((14/3*B*x+A)*b^
4-10*c*x*(23/75*B*x+A)*b^3-668/15*c^2*(128/167*B*x+A)*x^2*b^2-112/5*c^3*x^
3*(B*x+A)*b+32/15*A*c^4*x^4)*e*d^4+14/3*e^2*((64/35*B*x+A)*b^3+233/35*c*x*
(B*x+A)*b^2+46/35*c^2*x^2*(62/23*B*x+A)*b-32/35*A*c^3*x^3)*x*b*d^3-128/15*
e^3*x^2*b^2*((35/64*B*x+A)*b^2-47/64*c*(-5/47*B*x+A)*x*b-3/32*A*c^2*x^2)*d
^2-14/3*((3/14*B*x+A)*b-2/7*A*c*x)*e^4*x^3*b^3*d-A*b^4*e^5*x^4)*(x*(c*x+b)
)^(1/2)*(d*(b*e-c*d))^(1/2))/(d*(b*e-c*d))^(1/2)/(e*x+d)^5/(b*e-c*d)^3/d^3
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1160 vs. $2(494) = 988$.

Time = 0.16 (sec) , antiderivative size = 2335, normalized size of antiderivative = 4.44

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^6}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^6,x, algorithm="fricas")
```

output
```
[-1/1280*(15*(A*b^5*d^5*e + (B*b^5 - 2*A*b^4*c)*d^6 + (A*b^5*e^6 + (B*b^5
- 2*A*b^4*c)*d*e^5)*x^5 + 5*(A*b^5*d*e^5 + (B*b^5 - 2*A*b^4*c)*d^2*e^4)*x^
4 + 10*(A*b^5*d^2*e^4 + (B*b^5 - 2*A*b^4*c)*d^3*e^3)*x^3 + 10*(A*b^5*d^3*e
^3 + (B*b^5 - 2*A*b^4*c)*d^4*e^2)*x^2 + 5*(A*b^5*d^4*e^2 + (B*b^5 - 2*A*b^
4*c)*d^5*e)*x)*sqrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d
^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d)) + 2*(15*A*b^5*d^5*e^2 - 15*(B*b^
4*c - 2*A*b^3*c^2)*d^7 + 15*(B*b^5 - 3*A*b^4*c)*d^6*e - (128*B*c^5*d^7 + 1
5*A*b^5*d*e^6 - 16*(29*B*b*c^4 - 2*A*c^5)*d^6*e + 8*(73*B*b^2*c^3 - 12*A*b
*c^4)*d^5*e^2 - 2*(129*B*b^3*c^2 - 38*A*b^2*c^3)*d^4*e^3 - (5*B*b^4*c - 8*
A*b^3*c^2)*d^3*e^4 + 5*(3*B*b^5 - 7*A*b^4*c)*d^2*e^5)*x^4 - 2*(35*A*b^5*d^
2*e^5 + 8*(11*B*b*c^4 + 10*A*c^5)*d^7 - 8*(43*B*b^2*c^3 + 31*A*b*c^4)*d^6*
e + (489*B*b^3*c^2 + 214*A*b^2*c^3)*d^5*e^2 - (268*B*b^4*c - A*b^3*c^2)*d^
4*e^3 + (35*B*b^5 - 82*A*b^4*c)*d^3*e^4)*x^3 - 2*(64*A*b^5*d^3*e^4 + 4*(B*
b^2*c^3 + 30*A*b*c^4)*d^7 - (27*B*b^3*c^2 + 454*A*b^2*c^3)*d^6*e + 3*(29*B
*b^4*c + 189*A*b^3*c^2)*d^5*e^2 - (64*B*b^5 + 297*A*b^4*c)*d^4*e^3)*x^2 +
10*(7*A*b^5*d^4*e^3 + (B*b^3*c^2 - 2*A*b^2*c^3)*d^7 - (8*B*b^4*c - 17*A*b^
3*c^2)*d^6*e + (7*B*b^5 - 22*A*b^4*c)*d^5*e^2)*x)*sqrt(c*x^2 + b*x))/(c^4*
d^13 - 4*b*c^3*d^12*e + 6*b^2*c^2*d^11*e^2 - 4*b^3*c*d^10*e^3 + b^4*d^9*e^
4 + (c^4*d^8*e^5 - 4*b*c^3*d^7*e^6 + 6*b^2*c^2*d^6*e^7 - 4*b^3*c*d^5*e^8 +
 b^4*d^4*e^9)*x^5 + 5*(c^4*d^9*e^4 - 4*b*c^3*d^8*e^5 + 6*b^2*c^2*d^7*e^...
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^6}\,dx=\int \frac{(x(b+cx))^{\frac{3}{2}}\,(A+Bx)}{(d+ex)^6}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(3/2)/(e*x+d)**6,x)
```

output
```
Integral((x*(b + c*x))**(3/2)*(A + B*x)/(d + e*x)**6, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^6}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^6,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 4306 vs. 2(494) = 988.

Time = 0.34 (sec) , antiderivative size = 4306, normalized size of antiderivative = 8.19

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^6}\,dx=\text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^6,x, algorithm="giac")
```

output
```
-3/128*(B*b^5*d - 2*A*b^4*c*d + A*b^5*e)*arctan(-((sqrt(c)*x - sqrt(c*x^2
+ b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))/((c^3*d^6 - 3*b*c^2*d^5*e + 3
*b^2*c*d^4*e^2 - b^3*d^3*e^3)*sqrt(-c*d^2 + b*d*e)) + 1/640*(1280*(sqrt(c)
*x - sqrt(c*x^2 + b*x))^9*B*c^5*d^6*e^4 - 3840*(sqrt(c)*x - sqrt(c*x^2 + b
*x))^9*B*b*c^4*d^5*e^5 + 3840*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*B*b^2*c^3*
d^4*e^6 - 1280*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*B*b^3*c^2*d^3*e^7 + 15*(s
qrt(c)*x - sqrt(c*x^2 + b*x))^9*B*b^5*d*e^9 - 30*(sqrt(c)*x - sqrt(c*x^2 +
 b*x))^9*A*b^4*c*d*e^9 + 15*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*A*b^5*e^10 +
 5120*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*B*c^(11/2)*d^7*e^3 - 12800*(sqrt(c
)*x - sqrt(c*x^2 + b*x))^8*B*b*c^(9/2)*d^6*e^4 + 1280*(sqrt(c)*x - sqrt(c*
x^2 + b*x))^8*A*c^(11/2)*d^6*e^4 + 7680*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*
B*b^2*c^(7/2)*d^5*e^5 - 3840*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*A*b*c^(9/2)
*d^5*e^5 + 2560*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*B*b^3*c^(5/2)*d^4*e^6 +
3840*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*A*b^2*c^(7/2)*d^4*e^6 - 2560*(sqrt(
c)*x - sqrt(c*x^2 + b*x))^8*B*b^4*c^(3/2)*d^3*e^7 - 1280*(sqrt(c)*x - sqrt
(c*x^2 + b*x))^8*A*b^3*c^(5/2)*d^3*e^7 + 135*(sqrt(c)*x - sqrt(c*x^2 + b*x
))^8*B*b^5*sqrt(c)*d^2*e^8 - 270*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*A*b^4*c
^(3/2)*d^2*e^8 + 135*(sqrt(c)*x - sqrt(c*x^2 + b*x))^8*A*b^5*sqrt(c)*d*e^9
 + 10240*(sqrt(c)*x - sqrt(c*x^2 + b*x))^7*B*c^6*d^8*e^2 - 21760*(sqrt(c)*
x - sqrt(c*x^2 + b*x))^7*B*b*c^5*d^7*e^3 + 2560*(sqrt(c)*x - sqrt(c*x^2...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^6}\,dx=\int \frac{\left(c\,x^2+b\,x\right)^{3/2}\,\left(A+B\,x\right)}{\left(d+e\,x\right)^6}\,dx$$

input
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^6,x)
```

output
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^6, x)
```

Reduce [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^6}\,dx=\int \frac{(Bx+A)\left(c\,x^2+bx\right)^{\frac{3}{2}}}{(ex+d)^6}dx$$

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^6,x)
```

output
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^6,x)
```

3.110 $\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^7} dx$

Optimal result

Integrand size = 26, antiderivative size = 709

$$\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^7} dx = -\frac{(Ae(4cd-7be)+Bd(8cd-5be))x^2\sqrt{bx+cx^2}}{60d^2e^2(d+ex)^5}$$
$$-\frac{(Ae(24c^2d^2+8bcde-35b^2e^2)+Bd(48c^2d^2-20bcde-25b^2e^2))\,x\sqrt{bx+cx^2}}{480d^2e^3(cd-be)(d+ex)^4}$$
$$-\frac{(Ae(32c^3d^3-24bc^2d^2e-36b^2cde^2+35b^3e^3)+B(64c^3d^4-96bc^2d^3e+25b^3de^3))\sqrt{bx+cx^2}}{960d^2e^4(cd-be)^2(d+ex)^3}$$
$$+\frac{(Ae(64c^4d^4-128bc^3d^3e+64b^3cde^3-35b^4e^4)+Bd(128c^4d^4-352bc^3d^3e+264b^2c^2d^2e^2+20b^3cde^3-25}{3840d^3e^4(cd-be)^3(d+ex)^2}$$
$$+\frac{(Bd(256c^5d^5-832bc^4d^4e+816b^2c^3d^3e^2-80b^3c^2d^2e^3-130b^4cde^4+75b^5e^5)+Ae(128c^5d^5-320bc^4d^4e}{7680d^4e^4(cd-be)^4(d+ex)}$$
$$-\frac{(Bd-Ae)x(bx+cx^2)^{3/2}}{6de(d+ex)^6}$$
$$+\frac{b^4(24Ac^2d^2-12bcd(Bd+2Ae)+b^2e(5Bd+7Ae))\operatorname{arctanh}\left(\frac{\sqrt{cd-be}x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{512d^{9/2}(cd-be)^{9/2}}$$

output
```
-1/60*(A*e*(-7*b*e+4*c*d)+B*d*(-5*b*e+8*c*d))*x^2*(c*x^2+b*x)^(1/2)/d^2/e^
2/(e*x+d)^5-1/480*(A*e*(-35*b^2*e^2+8*b*c*d*e+24*c^2*d^2)+B*d*(-25*b^2*e^2
-20*b*c*d*e+48*c^2*d^2))*x*(c*x^2+b*x)^(1/2)/d^2/e^3/(-b*e+c*d)/(e*x+d)^4-
1/960*(A*e*(35*b^3*e^3-36*b^2*c*d*e^2-24*b*c^2*d^2*e+32*c^3*d^3)+B*(25*b^3
*d*e^3-96*b*c^2*d^3*e+64*c^3*d^4))*(c*x^2+b*x)^(1/2)/d^2/e^4/(-b*e+c*d)^2/
(e*x+d)^3+1/3840*(A*e*(-35*b^4*e^4+64*b^3*c*d*e^3-128*b*c^3*d^3*e+64*c^4*d
^4)+B*d*(-25*b^4*e^4+20*b^3*c*d*e^3+264*b^2*c^2*d^2*e^2-352*b*c^3*d^3*e+12
8*c^4*d^4))*(c*x^2+b*x)^(1/2)/d^3/e^4/(-b*e+c*d)^3/(e*x+d)^2+1/7680*(B*d*(
75*b^5*e^5-130*b^4*c*d*e^4-80*b^3*c^2*d^2*e^3+816*b^2*c^3*d^3*e^2-832*b*c^
4*d^4*e+256*c^5*d^5)+A*e*(105*b^5*e^5-290*b^4*c*d*e^4+176*b^3*c^2*d^2*e^3+
96*b^2*c^3*d^3*e^2-320*b*c^4*d^4*e+128*c^5*d^5))*(c*x^2+b*x)^(1/2)/d^4/e^4
/(-b*e+c*d)^4/(e*x+d)-1/6*(-A*e+B*d)*x*(c*x^2+b*x)^(3/2)/d/e/(e*x+d)^6+1/5
12*b^4*(24*A*c^2*d^2-12*b*c*d*(2*A*e+B*d)+b^2*e*(7*A*e+5*B*d))*arctanh((-b
*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(9/2)/(-b*e+c*d)^(9/2)
```

Mathematica [A] (verified)

Time = 11.67 (sec) , antiderivative size = 352, normalized size of antiderivative = 0.50

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^7}\,dx = \frac{(x(b+cx))^{3/2}\left(\frac{(-Bd+Ae)x^{5/2}(b+cx)}{(d+ex)^6}-\frac{(7Ae(-2cd+be)+Bd(2cd+5be))x^{5/2}(b+cx)}{10d(cd-be)(d+ex)^5}+\cdots\right.}{\cdots}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^7,x]
```

output
```
((x*(b + c*x))^(3/2)*(((-(B*d) + A*e)*x^(5/2)*(b + c*x))/(d + e*x)^6 - ((7
*A*e*(-2*c*d + b*e) + B*d*(2*c*d + 5*b*e))*x^(5/2)*(b + c*x))/(10*d*(c*d -
 b*e)*(d + e*x)^5) + ((24*A*c^2*d^2 - 12*b*c*d*(B*d + 2*A*e) + b^2*e*(5*B*
d + 7*A*e))*((-2*x^(3/2)*(b + c*x)^(5/2))/(d + e*x)^4 + (b*Sqrt[x]*(b + c*
x)^(5/2))/((c*d - b*e)*(d + e*x)^3) - (b^2*Sqrt[x]*Sqrt[b + c*x]*(5*b*d +
2*c*d*x + 3*b*e*x))/(8*d^2*(c*d - b*e)*(d + e*x)^2) - (3*b^4*ArcTanh[(Sqrt
[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x])])/(8*d^(5/2)*(c*d - b*e)^(3/2
))))/(32*d*(c*d - b*e)^2*(b + c*x)^(3/2))))/(6*d*(-(c*d) + b*e)*x^(3/2))
```

Rubi [A] (verified)

Time = 1.04 (sec) , antiderivative size = 382, normalized size of antiderivative = 0.54, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {1237, 27, 25, 1228, 1152, 1152, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^7}dx$$

$$\Big\downarrow \ 1237$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{6d(d+ex)^6(cd-be)}-\frac{\int -\frac{(12Acd-b(5Bd+7Ae)+2c(Bd-Ae)x)\left(cx^2+bx\right)^{3/2}}{2(d+ex)^6}dx}{6d(cd-be)}$$

$$\Big\downarrow \ 27$$

$$\frac{\int -\frac{(5bBd-12Acd+7Abe-2c(Bd-Ae)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^6}dx}{12d(cd-be)}+\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{6d(d+ex)^6(cd-be)}$$

$$\Big\downarrow \ 25$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{6d(d+ex)^6(cd-be)}-\frac{\int \frac{(5bBd-12Acd+7Abe-2c(Bd-Ae)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^6}dx}{12d(cd-be)}$$

$$\Big\downarrow \ 1228$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{6d(d+ex)^6(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(7Ae(2cd-be)-Bd(5be+2cd))}{5d(d+ex)^5(cd-be)}-\frac{\left(b^2e(7Ae+5Bd)-12bcd(2Ae+Bd)+24Ac^2d^2\right)\int \frac{\left(cx^2+bx\right)^{3/2}}{(d+ex)^5}dx}{2d(cd-be)}}{12d(cd-be)}$$

$$\Big\downarrow \ 1152$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{6d(d+ex)^6(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(7Ae(2cd-be)-Bd(5be+2cd))}{5d(d+ex)^5(cd-be)}-\frac{\left(b^2e(7Ae+5Bd)-12bcd(2Ae+Bd)+24Ac^2d^2\right)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+bd)}{8d(d+ex)^4(cd-be)}-\frac{3b^2\int \frac{\sqrt{cx^2+bx}}{(d+ex)^3}dx}{16d(cd-be)}\right)}{2d(cd-be)}}{12d(cd-be)}$$

$$\Big\downarrow \; 1152$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{6d(d+ex)^6(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(7Ae(2cd-be)-Bd(5be+2cd))}{5d(d+ex)^5(cd-be)}-\frac{\left(b^2e(7Ae+5Bd)-12bcd(2Ae+Bd)+24Ac^2d^2\right)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+bd)}{8d(d+ex)^4(cd-be)}-\frac{3b^2\left(\frac{\sqrt{bx+cx^2}(x(2c}{4d(d+ex)^2(}\right.}{}\right.}{2d(cd-be)}}{12d(cd-be)}$$

$$\Big\downarrow \; 1154$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{6d(d+ex)^6(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(7Ae(2cd-be)-Bd(5be+2cd))}{5d(d+ex)^5(cd-be)}-\frac{\left(b^2e(7Ae+5Bd)-12bcd(2Ae+Bd)+24Ac^2d^2\right)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+bd)}{8d(d+ex)^4(cd-be)}-\frac{3b^2\left(\frac{b^2\int}{4d(cd-be)}\right.}{}\right.}{2d(cd-be)}}{12d(cd-be)}$$

$$\Big\downarrow \; 219$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{6d(d+ex)^6(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(7Ae(2cd-be)-Bd(5be+2cd))}{5d(d+ex)^5(cd-be)}-\frac{\left(b^2e(7Ae+5Bd)-12bcd(2Ae+Bd)+24Ac^2d^2\right)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+bd)}{8d(d+ex)^4(cd-be)}-\frac{3b^2\left(\frac{\sqrt{bx+cx^2}(x(2c}{4d(d+ex)^2(}\right.}{}\right.}{2d(cd-be)}}{12d(cd-be)}$$

input

```
Int[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^7,x]
```

output
```
((B*d - A*e)*(b*x + c*x^2)^(5/2))/(6*d*(c*d - b*e)*(d + e*x)^6) - (((7*A*e
*(2*c*d - b*e) - B*d*(2*c*d + 5*b*e))*(b*x + c*x^2)^(5/2))/(5*d*(c*d - b*e
)*(d + e*x)^5) - ((24*A*c^2*d^2 - 12*b*c*d*(B*d + 2*A*e) + b^2*e*(5*B*d +
7*A*e))*(((b*d + (2*c*d - b*e)*x)*(b*x + c*x^2)^(3/2))/(8*d*(c*d - b*e)*(d
 + e*x)^4) - (3*b^2*(((b*d + (2*c*d - b*e)*x)*Sqrt[b*x + c*x^2])/(4*d*(c*d
 - b*e)*(d + e*x)^2) - (b^2*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqr
t[c*d - b*e]*Sqrt[b*x + c*x^2])])/(8*d^(3/2)*(c*d - b*e)^(3/2))))/(16*d*(c
*d - b*e))))/(2*d*(c*d - b*e)))/(12*d*(c*d - b*e))
```

Defintions of rubi rules used

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

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1152
```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[(-(d + e*x)^(m + 1))*(d*b - 2*a*e + (2*c*d - b*e)*x)*((a + b
*x + c*x^2)^p/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[p*((b^2 - 4*a
*c)/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2)))   Int[(d + e*x)^(m + 2)*(a + b*x +
 c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[m + 2*p + 2, 0]
 && GtQ[p, 0]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Maple [A] (verified)

Time = 1.55 (sec) , antiderivative size = 598, normalized size of antiderivative = 0.84

method	result
pseudoelliptic	$-\frac{7\left(\left(\frac{12\left(2A\,c^{2}-Bbc\right)d^{2}}{7}-\frac{24e\left(Ac-\frac{5Bb}{24}\right)bd}{7}+A\,b^{2}e^{2}\right)(ex+d)^{6}b^{4}\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)+\left(\frac{24c\left(-\frac{B\,b^{4}}{2}+c\left(\frac{Bx}{3}+A\right)b^{3}-\frac{2c^{2}x}{\cdots}\right.}{\cdots}\right.\right.}{\cdots}$
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^7,x,method=_RETURNVERBOSE)
```

output
```
-7/512*((12/7*(2*A*c^2-B*b*c)*d^2-24/7*e*(A*c-5/24*B*b)*b*d+A*b^2*e^2)*(e*
x+d)^6*b^4*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))+(24/7*c*(-1/2
*B*b^4+c*(1/3*B*x+A)*b^3-2/3*c^2*x*(2/5*B*x+A)*b^2-8*c^3*x^2*(11/15*B*x+A)
*b-16/3*c^4*(4/5*B*x+A)*x^3)*d^7-24/7*e*(-5/24*b^5*B+c*(107/36*B*x+A)*b^4-
19/3*c^2*x*(89/285*B*x+A)*b^3-448/15*c^3*(171/224*B*x+A)*x^2*b^2-72/5*c^4*
x^3*(80/81*B*x+A)*b+32/15*c^5*x^4*(1/3*B*x+A))*d^6+e^2*((85/21*B*x+A)*b^5-
422/21*c*x*(1328/1055*B*x+A)*b^4-2456/21*c^2*x^2*(285/307*B*x+A)*b^3-816/3
5*c^3*(332/153*B*x+A)*x^3*b^2+1984/105*c^4*x^4*(13/31*B*x+A)*b-128/105*x^5
*c^5*A)*d^5+17/3*e^3*((198/119*B*x+A)*b^4+7144/595*c*(69/94*B*x+A)*x*b^3-2
232/595*c^2*(-37/93*B*x+A)*x^2*b^2-736/595*c^3*(51/46*B*x+A)*x^3*b+64/119*
A*c^4*x^4)*x*b*d^4-562/35*e^4*((165/281*B*x+A)*b^3-642/281*c*(185/963*B*x+
A)*x*b^2+168/281*c^2*(-5/63*B*x+A)*x^2*b+16/281*A*c^3*x^3)*x^2*b^2*d^3-66/
5*e^5*x^3*b^3*((425/1386*B*x+A)*b^2-824/693*c*(65/824*B*x+A)*x*b+8/63*A*c^
2*x^2)*d^2-17/3*((15/119*B*x+A)*b-58/119*A*c*x)*e^6*x^4*b^4*d-A*b^5*e^7*x^
5)*(x*(c*x+b))^(1/2)*(d*(b*e-c*d))^(1/2))/(d*(b*e-c*d))^(1/2)/(e*x+d)^6/(b
*e-c*d)^4/d^4
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1858 vs. $2(673) = 1346$.

Time = 0.26 (sec) , antiderivative size = 3731, normalized size of antiderivative = 5.26

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^7}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^7,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^7}\,dx = \int \frac{(x(b+cx))^{\frac{3}{2}}(A+Bx)}{(d+ex)^7}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(3/2)/(e*x+d)**7,x)
```

output
```
Integral((x*(b + c*x))**(3/2)*(A + B*x)/(d + e*x)**7, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^7}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^7,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 5881 vs. $2(673) = 1346$.

Time = 0.36 (sec) , antiderivative size = 5881, normalized size of antiderivative = 8.29

$$\int \frac{(A+Bx)(bx+cx^2)^{3/2}}{(d+ex)^7}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^7,x, algorithm="giac")
```

output
```
-1/512*(12*B*b^5*c*d^2 - 24*A*b^4*c^2*d^2 - 5*B*b^6*d*e + 24*A*b^5*c*d*e -
 7*A*b^6*e^2)*arctan(-((sqrt(c)*x - sqrt(c*x^2 + b*x))*e + sqrt(c)*d)/sqrt
(-c*d^2 + b*d*e))/((c^4*d^8 - 4*b*c^3*d^7*e + 6*b^2*c^2*d^6*e^2 - 4*b^3*c*
d^5*e^3 + b^4*d^4*e^4)*sqrt(-c*d^2 + b*d*e)) + 1/7680*(180*(sqrt(c)*x - sq
rt(c*x^2 + b*x))^11*B*b^5*c*d^2*e^10 - 360*(sqrt(c)*x - sqrt(c*x^2 + b*x))
^11*A*b^4*c^2*d^2*e^10 - 75*(sqrt(c)*x - sqrt(c*x^2 + b*x))^11*B*b^6*d*e^1
1 + 360*(sqrt(c)*x - sqrt(c*x^2 + b*x))^11*A*b^5*c*d*e^11 - 105*(sqrt(c)*x
 - sqrt(c*x^2 + b*x))^11*A*b^6*e^12 + 15360*(sqrt(c)*x - sqrt(c*x^2 + b*x)
)^10*B*c^(13/2)*d^8*e^4 - 61440*(sqrt(c)*x - sqrt(c*x^2 + b*x))^10*B*b*c^(
11/2)*d^7*e^5 + 92160*(sqrt(c)*x - sqrt(c*x^2 + b*x))^10*B*b^2*c^(9/2)*d^6
*e^6 - 61440*(sqrt(c)*x - sqrt(c*x^2 + b*x))^10*B*b^3*c^(7/2)*d^5*e^7 + 15
360*(sqrt(c)*x - sqrt(c*x^2 + b*x))^10*B*b^4*c^(5/2)*d^4*e^8 + 1980*(sqrt(
c)*x - sqrt(c*x^2 + b*x))^10*B*b^5*c^(3/2)*d^3*e^9 - 3960*(sqrt(c)*x - sqr
t(c*x^2 + b*x))^10*A*b^4*c^(5/2)*d^3*e^9 - 825*(sqrt(c)*x - sqrt(c*x^2 + b
*x))^10*B*b^6*sqrt(c)*d^2*e^10 + 3960*(sqrt(c)*x - sqrt(c*x^2 + b*x))^10*A
*b^5*c^(3/2)*d^2*e^10 - 1155*(sqrt(c)*x - sqrt(c*x^2 + b*x))^10*A*b^6*sqrt
(c)*d*e^11 + 40960*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*B*c^7*d^9*e^3 - 11776
0*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*B*b*c^6*d^8*e^4 + 20480*(sqrt(c)*x - s
qrt(c*x^2 + b*x))^9*A*c^7*d^8*e^4 + 61440*(sqrt(c)*x - sqrt(c*x^2 + b*x))^
9*B*b^2*c^5*d^7*e^5 - 81920*(sqrt(c)*x - sqrt(c*x^2 + b*x))^9*A*b*c^6*d...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^7}\,dx=\int \frac{{\left(c\,x^2+b\,x\right)}^{3/2}\,\left(A+B\,x\right)}{{\left(d+e\,x\right)}^7}\,dx$$

input
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^7,x)
```

output
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^7, x)
```

Reduce [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^7}\,dx=\int \frac{(Bx+A)\left(c\,x^2+bx\right)^{\frac{3}{2}}}{(ex+d)^7}dx$$

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^7,x)
```

output
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^7,x)
```

3.111 $\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8} \, dx$

Optimal result

Integrand size = 26, antiderivative size = 968

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8} \, dx = -\frac{(Bd(8cd-5be)+3Ae(2cd-3be))x^2\sqrt{bx+cx^2}}{84d^2e^2(d+ex)^6}$$

$$-\frac{\left(Bd(48c^2d^2-10bcde-35b^2e^2)+3Ae(12c^2d^2+8bcde-21b^2e^2)\right)x\sqrt{bx+cx^2}}{840d^2e^3(cd-be)(d+ex)^5}$$

$$-\frac{\left(3Ae(16c^3d^3-8bc^2d^2e-26b^2cde^2+21b^3e^3)+Bd(64c^3d^3-88bc^2d^2e-20b^2cde^2+35b^3e^3)\right)\sqrt{bx+cx^2}}{2240d^2e^4(cd-be)^2(d+ex)^4}$$

$$+\frac{(Bd(128c^4d^4-368bc^3d^3e+288b^2c^2d^2e^2+50b^3cde^3-35b^4e^4)+3Ae(32c^4d^4-64bc^3d^3e-12b^2c^2d^2e^2+\cdots}{13440d^3e^4(cd-be)^3(d+ex)^3}$$

$$+\frac{(3Ae(128c^5d^5-320bc^4d^4e+32b^2c^3d^3e^2+272b^3c^2d^2e^3-322b^4cde^4+105b^5e^5)+Bd(512c^5d^5-1728bc^4\cdots}{53760d^4e^4(cd-be)^4(d+ex)^2}$$

$$+\frac{(Bd(1024c^6d^6-3968bc^5d^5e+4864b^2c^4d^4e^2-800b^3c^3d^3e^3-1400b^4c^2d^2e^4+1750b^5cde^5-525b^6e^6)+3A\cdots}{107520d^5e^4(cd\cdots}$$

$$-\frac{(Bd-Ae)x(bx+cx^2)^{3/2}}{7de(d+ex)^7}$$

$$+\frac{b^4(48Ac^3d^3-24bc^2d^2(Bd+3Ae)-b^3e^2(5Bd+9Ae)+2b^2cde(10Bd+21Ae))\operatorname{arctanh}\left(\frac{\sqrt{cd-be}x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{1024d^{11/2}(cd-be)^{11/2}}$$

output
```
-1/84*(B*d*(-5*b*e+8*c*d)+3*A*e*(-3*b*e+2*c*d))*x^2*(c*x^2+b*x)^(1/2)/d^2/
e^2/(e*x+d)^6-1/840*(B*d*(-35*b^2*e^2-10*b*c*d*e+48*c^2*d^2)+3*A*e*(-21*b^
2*e^2+8*b*c*d*e+12*c^2*d^2))*x*(c*x^2+b*x)^(1/2)/d^2/e^3/(-b*e+c*d)/(e*x+d
)^5-1/2240*(3*A*e*(21*b^3*e^3-26*b^2*c*d*e^2-8*b*c^2*d^2*e+16*c^3*d^3)+B*d
*(35*b^3*e^3-20*b^2*c*d*e^2-88*b*c^2*d^2*e+64*c^3*d^3))*(c*x^2+b*x)^(1/2)/
d^2/e^4/(-b*e+c*d)^2/(e*x+d)^4+1/13440*(B*d*(-35*b^4*e^4+50*b^3*c*d*e^3+28
8*b^2*c^2*d^2*e^2-368*b*c^3*d^3*e+128*c^4*d^4)+3*A*e*(-21*b^4*e^4+44*b^3*c
*d*e^3-12*b^2*c^2*d^2*e^2-64*b*c^3*d^3*e+32*c^4*d^4))*(c*x^2+b*x)^(1/2)/d^
3/e^4/(-b*e+c*d)^3/(e*x+d)^3+1/53760*(3*A*e*(105*b^5*e^5-322*b^4*c*d*e^4+2
72*b^3*c^2*d^2*e^3+32*b^2*c^3*d^3*e^2-320*b*c^4*d^4*e+128*c^5*d^5)+B*d*(17
5*b^5*e^5-420*b^4*c*d*e^4+80*b^3*c^2*d^2*e^3+1696*b^2*c^3*d^3*e^2-1728*b*c
^4*d^4*e+512*c^5*d^5))*(c*x^2+b*x)^(1/2)/d^4/e^4/(-b*e+c*d)^4/(e*x+d)^2+1/
107520*(B*d*(-525*b^6*e^6+1750*b^5*c*d*e^5-1400*b^4*c^2*d^2*e^4-800*b^3*c^
3*d^3*e^3+4864*b^2*c^4*d^4*e^2-3968*b*c^5*d^5*e+1024*c^6*d^6)+3*A*e*(-315*
b^6*e^6+1260*b^5*c*d*e^5-1708*b^4*c^2*d^2*e^4+640*b^3*c^3*d^3*e^3+320*b^2*
c^4*d^4*e^2-768*b*c^5*d^5*e+256*c^6*d^6))*(c*x^2+b*x)^(1/2)/d^5/e^4/(-b*e+
c*d)^5/(e*x+d)-1/7*(-A*e+B*d)*x*(c*x^2+b*x)^(3/2)/d/e/(e*x+d)^7+1/1024*b^4
*(48*A*c^3*d^3-24*b*c^2*d^2*(3*A*e+B*d)-b^3*e^2*(9*A*e+5*B*d)+2*b^2*c*d*e*
(21*A*e+10*B*d))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(
11/2)/(-b*e+c*d)^(11/2)
```

Mathematica [A] (verified)

Time = 13.45 (sec) , antiderivative size = 505, normalized size of antiderivative = 0.52

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8}\,dx=\frac{(x(b+cx))^{3/2}\left(-\frac{(Bd-Ae)x^{5/2}(b+cx)}{(d+ex)^7}-\frac{(9Ae(-2cd+be)+Bd(4cd+5be))x^{5/2}(b+cx)}{12d(cd-be)(d+ex)^6}-\frac{(B}{}\right.}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^8,x]
```

output
```
((x*(b + c*x))^(3/2)*(-(((B*d - A*e)*x^(5/2)*(b + c*x))/(d + e*x)^7) - ((9
*A*e*(-2*c*d + b*e) + B*d*(4*c*d + 5*b*e))*x^(5/2)*(b + c*x))/(12*d*(c*d -
 b*e)*(d + e*x)^6) - ((B*d*(8*c^2*d^2 + 90*b*c*d*e - 35*b^2*e^2) - 3*A*e*(
68*c^2*d^2 - 68*b*c*d*e + 21*b^2*e^2))*x^(5/2)*(b + c*x))/(120*d^2*(c*d -
b*e)^2*(d + e*x)^5) - (7*(48*A*c^3*d^3 - 24*b*c^2*d^2*(B*d + 3*A*e) - b^3*
e^2*(5*B*d + 9*A*e) + 2*b^2*c*d*e*(10*B*d + 21*A*e))*(16*d^(5/2)*(c*d - b*
e)^(3/2)*x^(3/2)*(b + c*x)^(5/2) - b*(d + e*x)*(8*d^(5/2)*Sqrt[c*d - b*e]*
Sqrt[x]*(b + c*x)^(5/2) - b*(d + e*x)*(2*d^(3/2)*Sqrt[c*d - b*e]*Sqrt[x]*(
b + c*x)^(3/2) + 3*b*(d + e*x)*(Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[x]*Sqrt[b + c
*x] + b*(d + e*x)*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x]
)])))))/(3072*d^(9/2)*(c*d - b*e)^(9/2)*(b + c*x)^(3/2)*(d + e*x)^4)))/(7*
d*(-(c*d) + b*e)*x^(3/2))
```

Rubi [A] (verified)

Time = 1.52 (sec) , antiderivative size = 515, normalized size of antiderivative = 0.53, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.385$, Rules used = {1237, 27, 25, 1237, 27, 1228, 1152, 1152, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8}dx$$

$$\Big\downarrow \text{1237}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}-\frac{\int -\frac{(14Acd-b(5Bd+9Ae)+4c(Bd-Ae)x)\left(cx^2+bx\right)^{3/2}}{2(d+ex)^7}dx}{7d(cd-be)}$$

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

$$\frac{\int -\frac{(5bBd-14Acd+9Abe-4c(Bd-Ae)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^7}dx}{14d(cd-be)}+\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}$$

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

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}-\frac{\int \frac{(5bBd-14Acd+9Abe-4c(Bd-Ae)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^7}dx}{14d(cd-be)}$$

$$\Big\downarrow \text{1237}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(9Ae(2cd-be)-Bd(5be+4cd))}{6d(d+ex)^6(cd-be)}-\frac{\int\frac{\left(7e(5Bd+9Ae)b^2-2cd(40Bd+93Ae)b+168Ac^2d^2-2c(9Ae(2cd-be)-Bd(4cd+5be))x\right)\left(cx^2+bx\right)^{3/2}}{2(d+ex)^6}dx}{6d(cd-be)}}{14d(cd-be)}$$

↓ 27

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(9Ae(2cd-be)-Bd(5be+4cd))}{6d(d+ex)^6(cd-be)}-\frac{\int\frac{\left(7e(5Bd+9Ae)b^2-2cd(40Bd+93Ae)b+168Ac^2d^2-2c(9Ae(2cd-be)-Bd(4cd+5be))x\right)\left(cx^2+bx\right)^{3/2}}{(d+ex)^6}dx}{12d(cd-be)}}{14d(cd-be)}$$

↓ 1228

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(9Ae(2cd-be)-Bd(5be+4cd))}{6d(d+ex)^6(cd-be)}-\frac{\frac{7\left(b^3\left(-e^2\right)(9Ae+5Bd)+2b^2cde(21Ae+10Bd)-24bc^2d^2(3Ae+Bd)+48Ac^3d^3\right)\int\frac{\left(cx^2+bx\right)^{3/2}}{(d+ex)^5}dx}{2d(cd-be)}+\frac{(bx+cx}{}}{12d(cd-be)}}{14d(cd-be)}$$

↓ 1152

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(9Ae(2cd-be)-Bd(5be+4cd))}{6d(d+ex)^6(cd-be)}-\frac{\frac{7\left(b^3\left(-e^2\right)(9Ae+5Bd)+2b^2cde(21Ae+10Bd)-24bc^2d^2(3Ae+Bd)+48Ac^3d^3\right)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+}{8d(d+ex)^4(cd-be)}\right.}{2d(cd-be)}}{12d(c}}{14d(cd-be)}$$

↓ 1152

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}-\frac{\frac{\left(bx+cx^2\right)^{5/2}(9Ae(2cd-be)-Bd(5be+4cd))}{6d(d+ex)^6(cd-be)}-\frac{7\left(b^3\left(-e^2\right)(9Ae+5Bd)+2b^2cde(21Ae+10Bd)-24bc^2d^2(3Ae+Bd)+48Ac^3d^3\right)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+}{8d(d+ex)^4(cd-be)}\right.}{2d(cd-be)}}{14d(cd-}$$

↓ 1154

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}-$$

$$\frac{\left(bx+cx^2\right)^{5/2}(9Ae(2cd-be)-Bd(5be+4cd))}{6d(d+ex)^6(cd-be)}-\frac{7\left(b^3\left(-e^2\right)(9Ae+5Bd)+2b^2cde(21Ae+10Bd)-24bc^2d^2(3Ae+Bd)+48Ac^3d^3\right)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+}{8d(d+ex)^4(cd-be)}\right.}{2d(cd-b}$$

$\downarrow$ 219

$$\frac{\left(bx+cx^2\right)^{5/2}(Bd-Ae)}{7d(d+ex)^7(cd-be)}-$$

$$\frac{\left(bx+cx^2\right)^{5/2}(9Ae(2cd-be)-Bd(5be+4cd))}{6d(d+ex)^6(cd-be)}-\frac{7\left(b^3\left(-e^2\right)(9Ae+5Bd)+2b^2cde(21Ae+10Bd)-24bc^2d^2(3Ae+Bd)+48Ac^3d^3\right)\left(\frac{\left(bx+cx^2\right)^{3/2}(x(2cd-be)+}{8d(d+ex)^4(cd-be)}\right.}{2d(cd-be)}$$

$$14d($$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(3/2))/(d + e*x)^8,x]
```

output
```
((B*d - A*e)*(b*x + c*x^2)^(5/2))/(7*d*(c*d - b*e)*(d + e*x)^7) - (((9*A*e
*(2*c*d - b*e) - B*d*(4*c*d + 5*b*e))*(b*x + c*x^2)^(5/2))/(6*d*(c*d - b*e
)*(d + e*x)^6) - (((B*d*(8*c^2*d^2 + 90*b*c*d*e - 35*b^2*e^2) - 3*A*e*(68*
c^2*d^2 - 68*b*c*d*e + 21*b^2*e^2))*(b*x + c*x^2)^(5/2))/(5*d*(c*d - b*e)*
(d + e*x)^5) + (7*(48*A*c^3*d^3 - 24*b*c^2*d^2*(B*d + 3*A*e) - b^3*e^2*(5*
B*d + 9*A*e) + 2*b^2*c*d*e*(10*B*d + 21*A*e))*(((b*d + (2*c*d - b*e)*x)*(b
*x + c*x^2)^(3/2))/(8*d*(c*d - b*e)*(d + e*x)^4) - (3*b^2*(((b*d + (2*c*d
- b*e)*x)*Sqrt[b*x + c*x^2])/(4*d*(c*d - b*e)*(d + e*x)^2) - (b^2*ArcTanh[
(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(8
*d^(3/2)*(c*d - b*e)^(3/2))))/(16*d*(c*d - b*e))))/(2*d*(c*d - b*e)))/(12*
d*(c*d - b*e)))/(14*d*(c*d - b*e))
```

Defintions of rubi rules used

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

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1152
```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_S
ymbol] :> Simp[(-(d + e*x)^(m + 1))*(d*b - 2*a*e + (2*c*d - b*e)*x)*((a + b
*x + c*x^2)^p/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[p*((b^2 - 4*a
*c)/(2*(m + 1)*(c*d^2 - b*d*e + a*e^2)))   Int[(d + e*x)^(m + 2)*(a + b*x +
 c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[m + 2*p + 2, 0]
 && GtQ[p, 0]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Maple [A] (verified)

Time = 1.88 (sec) , antiderivative size = 839, normalized size of antiderivative = 0.87

method	result	size
pseudoelliptic	Expression too large to display	839
default	Expression too large to display	22885

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^8,x,method=_RETURNVERBOSE)
```

output
```
-9/1024*((e*x+d)^7*(8/3*(-2*A*c^3+B*b*c^2)*d^3+8*c*(A*c-5/18*B*b)*e*b*d^2-
14/3*e^2*(A*c-5/42*B*b)*b^2*d+A*b^3*e^3)*b^4*arctan((x*(c*x+b))^(1/2)/x*d/
(d*(b*e-c*d))^(1/2))+(-16/3*c^2*(-1/2*B*b^4+c*(1/3*B*x+A)*b^3-2/3*c^2*x*(2
/5*B*x+A)*b^2-8*c^3*x^2*(11/15*B*x+A)*b-16/3*c^4*(4/5*B*x+A)*x^3)*d^9+8*c*
e*(-5/18*b^5*B+c*(65/27*B*x+A)*b^4-46/9*c^2*x*(109/345*B*x+A)*b^3-1124/45*
c^3*x^2*(214/281*B*x+A)*b^2-176/15*c^4*(97/99*B*x+A)*x^3*b+32/15*c^5*(4/9*
B*x+A)*x^4)*d^8-14/3*e^2*(-5/42*B*b^6+c*(205/63*B*x+A)*b^5-254/21*c^2*x*(2
038/1905*B*x+A)*b^4-2376/35*c^3*x^2*(16787/18711*B*x+A)*b^3-1424/105*c^4*x
^3*(3638/1869*B*x+A)*b^2+1216/105*c^5*(221/399*B*x+A)*x^4*b-128/105*c^6*(4
/21*B*x+A)*x^5)*d^7+e^3*((A+100/27*B*x)*b^6-286/9*c*(599/429*B*x+A)*x*b^5-
2548/9*c^2*(51448/66885*B*x+A)*x^2*b^4+5648/105*c^3*(-2207/3177*B*x+A)*x^3
*b^3+1056/35*c^4*x^4*(1126/891*B*x+A)*b^2-5504/315*c^5*x^5*(31/129*B*x+A)*
b+256/315*x^6*c^6*A)*d^6+20/3*e^4*x*((283/180*B*x+A)*b^5+304/15*c*x*(4285/
6384*B*x+A)*b^4-2522/105*c^2*(3097/18915*B*x+A)*x^2*b^3+3008/525*c^3*x^3*(
-251/1128*B*x+A)*b^2+656/525*(76/123*B*x+A)*c^4*x^4*b-64/175*x^5*c^5*A)*b*
d^5-1199/45*e^5*x^2*b^2*((5120/8393*B*x+A)*b^4-37084/8393*c*x*(8290/27813*
B*x+A)*b^3+32528/8393*c^2*(1175/12198*B*x+A)*x^2*b^2-4320/8393*c^3*x^3*(-5
/81*B*x+A)*b-320/8393*A*c^4*x^4)*d^4-1024/35*e^6*x^3*b^3*((9905/27648*B*x+
A)*b^3-11929/4608*c*(5845/35787*B*x+A)*x*b^2+953/768*c^2*(350/8577*B*x+A)*
x^2*b-5/72*A*c^3*x^3)*d^3-283/15*e^7*((500/2547*B*x+A)*b^2-1202/849*c*x...
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2690 vs. $2(928) = 1856$.

Time = 0.43 (sec) , antiderivative size = 5395, normalized size of antiderivative = 5.57

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^8,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8}\,dx=\int \frac{(x(b+cx))^{\frac{3}{2}}\,(A+Bx)}{(d+ex)^8}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(3/2)/(e*x+d)**8,x)
```

output
```
Integral((x*(b + c*x))**(3/2)*(A + B*x)/(d + e*x)**8, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^8,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 8108 vs. $2(928) = 1856$.

Time = 0.40 (sec) , antiderivative size = 8108, normalized size of antiderivative = 8.38

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8}\,dx=\text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^8,x, algorithm="giac")
```

output
```
-1/1024*(24*B*b^5*c^2*d^3 - 48*A*b^4*c^3*d^3 - 20*B*b^6*c*d^2*e + 72*A*b^5
*c^2*d^2*e + 5*B*b^7*d*e^2 - 42*A*b^6*c*d*e^2 + 9*A*b^7*e^3)*arctan(-((sqr
t(c)*x - sqrt(c*x^2 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))/((c^5*d^1
0 - 5*b*c^4*d^9*e + 10*b^2*c^3*d^8*e^2 - 10*b^3*c^2*d^7*e^3 + 5*b^4*c*d^6*
e^4 - b^5*d^5*e^5)*sqrt(-c*d^2 + b*d*e)) + 1/107520*(2520*(sqrt(c)*x - sqr
t(c*x^2 + b*x))^13*B*b^5*c^2*d^3*e^11 - 5040*(sqrt(c)*x - sqrt(c*x^2 + b*x
))^13*A*b^4*c^3*d^3*e^11 - 2100*(sqrt(c)*x - sqrt(c*x^2 + b*x))^13*B*b^6*c
*d^2*e^12 + 7560*(sqrt(c)*x - sqrt(c*x^2 + b*x))^13*A*b^5*c^2*d^2*e^12 + 5
25*(sqrt(c)*x - sqrt(c*x^2 + b*x))^13*B*b^7*d*e^13 - 4410*(sqrt(c)*x - sqr
t(c*x^2 + b*x))^13*A*b^6*c*d*e^13 + 945*(sqrt(c)*x - sqrt(c*x^2 + b*x))^13
*A*b^7*e^14 + 32760*(sqrt(c)*x - sqrt(c*x^2 + b*x))^12*B*b^5*c^(5/2)*d^4*e
^10 - 65520*(sqrt(c)*x - sqrt(c*x^2 + b*x))^12*A*b^4*c^(7/2)*d^4*e^10 - 27
300*(sqrt(c)*x - sqrt(c*x^2 + b*x))^12*B*b^6*c^(3/2)*d^3*e^11 + 98280*(sqr
t(c)*x - sqrt(c*x^2 + b*x))^12*A*b^5*c^(5/2)*d^3*e^11 + 6825*(sqrt(c)*x -
sqrt(c*x^2 + b*x))^12*B*b^7*sqrt(c)*d^2*e^12 - 57330*(sqrt(c)*x - sqrt(c*x
^2 + b*x))^12*A*b^6*c^(3/2)*d^2*e^12 + 12285*(sqrt(c)*x - sqrt(c*x^2 + b*x
))^12*A*b^7*sqrt(c)*d*e^13 + 286720*(sqrt(c)*x - sqrt(c*x^2 + b*x))^11*B*c
^8*d^10*e^4 - 1433600*(sqrt(c)*x - sqrt(c*x^2 + b*x))^11*B*b*c^7*d^9*e^5 +
 2867200*(sqrt(c)*x - sqrt(c*x^2 + b*x))^11*B*b^2*c^6*d^8*e^6 - 2867200*(s
qrt(c)*x - sqrt(c*x^2 + b*x))^11*B*b^3*c^5*d^7*e^7 + 1433600*(sqrt(c)*x...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8}\,dx=\int \frac{\left(c\,x^2+b\,x\right)^{3/2}\,\left(A+B\,x\right)}{\left(d+e\,x\right)^8}\,dx$$

input
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^8,x)
```

output
```
int(((b*x + c*x^2)^(3/2)*(A + B*x))/(d + e*x)^8, x)
```

Reduce [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{3/2}}{(d+ex)^8}\,dx = \int \frac{(Bx+A)\left(c\,x^2+bx\right)^{\frac{3}{2}}}{(ex+d)^8}dx$$

input
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^8,x)
```

output
```
int((B*x+A)*(c*x^2+b*x)^(3/2)/(e*x+d)^8,x)
```

3.112 $\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{5/2} dx$

Optimal result

Integrand size = 26, antiderivative size = 648

$$\begin{aligned}
&\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{5/2} dx = \frac{5b^5(64Ac^3d^2-11b^3Be^2+18b^2ce(2Bd+Ae)-32bc^2d(Bd+2Ae))\sqrt{bx+cx^2}}{32768c^6} \\
&- \frac{5b^4(64Ac^3d^2-11b^3Be^2+18b^2ce(2Bd+Ae)-32bc^2d(Bd+2Ae))\,x\sqrt{bx+cx^2}}{49152c^5} \\
&+ \frac{b^3(64Ac^3d^2-11b^3Be^2+18b^2ce(2Bd+Ae)-32bc^2d(Bd+2Ae))\,x^2\sqrt{bx+cx^2}}{12288c^4} \\
&+ \frac{9b^2(64Ac^3d^2-11b^3Be^2+18b^2ce(2Bd+Ae)-32bc^2d(Bd+2Ae))\,x^3\sqrt{bx+cx^2}}{2048c^3} \\
&+ \frac{5b(64Ac^3d^2-11b^3Be^2+18b^2ce(2Bd+Ae)-32bc^2d(Bd+2Ae))\,x^4\sqrt{bx+cx^2}}{768c^2} \\
&+ \frac{(64Ac^3d^2-11b^3Be^2+18b^2ce(2Bd+Ae)-32bc^2d(Bd+2Ae))\,x^5\sqrt{bx+cx^2}}{384c} \\
&+ \frac{(2Ace(32cd-9be)+B(32c^2d^2-36bcde+11b^2e^2))\left(bx+cx^2\right)^{7/2}}{224c^3} \\
&+ \frac{e(36Bcd-11bBe+18Ace)x\left(bx+cx^2\right)^{7/2}}{144c^2} + \frac{Be^2x^2\left(bx+cx^2\right)^{7/2}}{9c} \\
&- \frac{5b^6(64Ac^3d^2-11b^3Be^2+18b^2ce(2Bd+Ae)-32bc^2d(Bd+2Ae))\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{32768c^{13/2}}
\end{aligned}$$

output
```
5/32768*b^5*(64*A*c^3*d^2-11*b^3*B*e^2+18*b^2*c*e*(A*e+2*B*d)-32*b*c^2*d*(
2*A*e+B*d))*(c*x^2+b*x)^(1/2)/c^6-5/49152*b^4*(64*A*c^3*d^2-11*b^3*B*e^2+1
8*b^2*c*e*(A*e+2*B*d)-32*b*c^2*d*(2*A*e+B*d))*x*(c*x^2+b*x)^(1/2)/c^5+1/12
288*b^3*(64*A*c^3*d^2-11*b^3*B*e^2+18*b^2*c*e*(A*e+2*B*d)-32*b*c^2*d*(2*A*
e+B*d))*x^2*(c*x^2+b*x)^(1/2)/c^4+9/2048*b^2*(64*A*c^3*d^2-11*b^3*B*e^2+18
*b^2*c*e*(A*e+2*B*d)-32*b*c^2*d*(2*A*e+B*d))*x^3*(c*x^2+b*x)^(1/2)/c^3+5/7
68*b*(64*A*c^3*d^2-11*b^3*B*e^2+18*b^2*c*e*(A*e+2*B*d)-32*b*c^2*d*(2*A*e+B
*d))*x^4*(c*x^2+b*x)^(1/2)/c^2+1/384*(64*A*c^3*d^2-11*b^3*B*e^2+18*b^2*c*e
*(A*e+2*B*d)-32*b*c^2*d*(2*A*e+B*d))*x^5*(c*x^2+b*x)^(1/2)/c+1/224*(2*A*c*
e*(-9*b*e+32*c*d)+B*(11*b^2*e^2-36*b*c*d*e+32*c^2*d^2))*(c*x^2+b*x)^(7/2)/
c^3+1/144*e*(18*A*c*e-11*B*b*e+36*B*c*d)*x*(c*x^2+b*x)^(7/2)/c^2+1/9*B*e^2
*x^2*(c*x^2+b*x)^(7/2)/c-5/32768*b^6*(64*A*c^3*d^2-11*b^3*B*e^2+18*b^2*c*e
*(A*e+2*B*d)-32*b*c^2*d*(2*A*e+B*d))*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/
c^(13/2)
```

Mathematica [A] (verified)

Time = 6.63 (sec) , antiderivative size = 582, normalized size of antiderivative = 0.90

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{5/2} dx = \frac{\sqrt{x}\sqrt{b+cx}\left(\sqrt{c}\sqrt{x}\sqrt{b+cx}(-3465b^8Be^2+210b^7ce(54Bd+27Ae+11Bex)+256b^3c^5x^2(B\right.}{}$$

input
```
Integrate[(A + B*x)*(d + e*x)^2*(b*x + c*x^2)^(5/2),x]
```

output
```
(Sqrt[x]*Sqrt[b + c*x]*(Sqrt[c]*Sqrt[x]*Sqrt[b + c*x]*(-3465*b^8*B*e^2 + 2
10*b^7*c*e*(54*B*d + 27*A*e + 11*B*e*x) + 256*b^3*c^5*x^2*(B*x*(18*d^2 + 1
8*d*e*x + 5*e^2*x^2) + A*(42*d^2 + 36*d*e*x + 9*e^2*x^2)) - 84*b^6*c^2*(15
*A*e*(16*d + 3*e*x) + 2*B*(60*d^2 + 45*d*e*x + 11*e^2*x^2)) + 4096*c^8*x^5
*(3*A*(28*d^2 + 48*d*e*x + 21*e^2*x^2) + 2*B*x*(36*d^2 + 63*d*e*x + 28*e^2
*x^2)) + 48*b^5*c^3*(7*A*(60*d^2 + 40*d*e*x + 9*e^2*x^2) + B*x*(140*d^2 +
126*d*e*x + 33*e^2*x^2)) - 32*b^4*c^4*x*(2*B*x*(84*d^2 + 81*d*e*x + 22*e^2
*x^2) + A*(420*d^2 + 336*d*e*x + 81*e^2*x^2)) + 1536*b^2*c^6*x^3*(2*B*x*(1
48*d^2 + 243*d*e*x + 103*e^2*x^2) + A*(378*d^2 + 592*d*e*x + 243*e^2*x^2))
 + 2048*b*c^7*x^4*(3*A*(140*d^2 + 232*d*e*x + 99*e^2*x^2) + B*x*(348*d^2 +
 594*d*e*x + 259*e^2*x^2))) + 1260*b^6*c*(32*A*c^2*d^2 + 18*b^2*B*d*e + 9*
A*b^2*e^2)*ArcTanh[(Sqrt[c]*Sqrt[x])/(Sqrt[b] - Sqrt[b + c*x])] + 630*b^7*
(32*B*c^2*d^2 + 64*A*c^2*d*e + 11*b^2*B*e^2)*ArcTanh[(Sqrt[c]*Sqrt[x])/(-S
qrt[b] + Sqrt[b + c*x])]))/(2064384*c^(13/2)*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.90 (sec) , antiderivative size = 311, normalized size of antiderivative = 0.48, number of steps used = 9, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {1236, 27, 1225, 1087, 1087, 1087, 1091, 219}

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

$$\int (A+Bx)\left(bx+cx^2\right)^{5/2}(d+ex)^2\,dx$$

$$\Big\downarrow \text{1236}$$

$$\frac{\int -\frac{1}{2}(d+ex)((7bB-18Ac)d-(4Bcd-11bBe+18Ace)x)\left(cx^2+bx\right)^{5/2}dx}{9c}+\frac{B\left(bx+cx^2\right)^{7/2}(d+ex)^2}{9c}$$

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

$$\frac{B\left(bx+cx^2\right)^{7/2}(d+ex)^2}{9c}-\frac{\int (d+ex)((7bB-18Ac)d-(4Bcd-11bBe+18Ace)x)\left(cx^2+bx\right)^{5/2}dx}{18c}$$

$$\Big\downarrow \text{1225}$$

$$\frac{B\left(bx+cx^2\right)^{7/2}(d+ex)^2}{9c}-\frac{-\frac{9\left(18b^2ce(Ae+2Bd)-32bc^2d(2Ae+Bd)+64Ac^3d^2-11b^3Be^2\right)\int\left(cx^2+bx\right)^{5/2}dx}{32c^2}-\frac{\left(bx+cx^2\right)^{7/2}\left(14cex(18Ace-11bBe+4Bcd)+18Ace(32cd-\ldots\right)}{112c^2}}{18c}$$

$\downarrow$ 1087

$$\frac{B\left(bx+cx^2\right)^{7/2}(d+ex)^2}{9c}-\frac{-\frac{9\left(18b^2ce(Ae+2Bd)-32bc^2d(2Ae+Bd)+64Ac^3d^2-11b^3Be^2\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\int\left(cx^2+bx\right)^{3/2}dx}{24c}\right)}{32c^2}-\frac{\left(bx+cx^2\right)^{7/2}\left(14cex(18Ace-\ldots\right)}{\ldots}}{18c}$$

$\downarrow$ 1087

$$\frac{B\left(bx+cx^2\right)^{7/2}(d+ex)^2}{9c}-\frac{-\frac{9\left(18b^2ce(Ae+2Bd)-32bc^2d(2Ae+Bd)+64Ac^3d^2-11b^3Be^2\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\int\sqrt{cx^2+bx}dx}{16c}\right)}{24c}\right)}{32c^2}-\frac{\left(bx-\ldots\right)}{\ldots}}{18c}$$

$\downarrow$ 1087

$$\frac{B\left(bx+cx^2\right)^{7/2}(d+ex)^2}{9c}-\frac{-\frac{9\left(18b^2ce(Ae+2Bd)-32bc^2d(2Ae+Bd)+64Ac^3d^2-11b^3Be^2\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int\frac{\ldots}{\sqrt{\ldots}}}{\ldots}\right)}{16c}\right)}{24c}\ldots\right)}{32c^2}\ldots}{18c}$$

$\downarrow$ 1091

$$\frac{B\left(bx+cx^2\right)^{7/2}(d+ex)^2}{9c}-\frac{-\frac{9\left(18b^2ce(Ae+2Bd)-32bc^2d(2Ae+Bd)+64Ac^3d^2-11b^3Be^2\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int\ldots}{\ldots}\right)}{16c}\right)}{24c}\right)}{32c^2}\ldots}{18c}$$

$\downarrow$ 219

$$\frac{B\left(bx+cx^2\right)^{7/2}(d+ex)^2}{9c}-\frac{-\frac{9\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4c^{3/2}}\right)}{16c}\right)}{24c}\right)\left(18b^2ce(Ae+2Bd)-32bc^2d(2Ae+\ldots\right.}{32c^2}\ldots}{18c}$$

input

```
Int[(A + B*x)*(d + e*x)^2*(b*x + c*x^2)^(5/2),x]
```

output

```
(B*(d + e*x)^2*(b*x + c*x^2)^(7/2))/(9*c) - (-1/112*((18*A*c*e*(32*c*d - 9
*b*e) + 2*B*(32*c^2*d^2 - 162*b*c*d*e + (99*b^2*e^2)/2) + 14*c*e*(4*B*c*d
- 11*b*B*e + 18*A*c*e)*x)*(b*x + c*x^2)^(7/2))/c^2 - (9*(64*A*c^3*d^2 - 11
*b^3*B*e^2 + 18*b^2*c*e*(2*B*d + A*e) - 32*b*c^2*d*(B*d + 2*A*e))*(((b + 2
*c*x)*(b*x + c*x^2)^(5/2))/(12*c) - (5*b^2*(((b + 2*c*x)*(b*x + c*x^2)^(3/
2))/(8*c) - (3*b^2*(((b + 2*c*x)*Sqrt[b*x + c*x^2])/(4*c) - (b^2*ArcTanh[(
Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(4*c^(3/2))))/(16*c)))/(24*c)))/(32*c^2))/(
18*c)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1087
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(b + 2*c*x)
*((a + b*x + c*x^2)^p/(2*c*(2*p + 1))), x] - Simp[p*((b^2 - 4*a*c)/(2*c*(2*
p + 1)))   Int[(a + b*x + c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] &&
GtQ[p, 0] && (IntegerQ[4*p] || IntegerQ[3*p])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

Maple [A] (verified)

Time = 0.98 (sec) , antiderivative size = 643, normalized size of antiderivative = 0.99

method	result
default	$A\,d^{2}\left(\frac{(2cx+b)\left(c\,x^{2}+bx\right)^{\frac{5}{2}}}{12c}-\frac{5b^{2}\left(\frac{(2cx+b)\left(c\,x^{2}+bx\right)^{\frac{3}{2}}}{8c}-\frac{3b^{2}\left(\frac{(2cx+b)\sqrt{c\,x^{2}+bx}}{4c}-\frac{b^{2}\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^{2}+bx}\right)}{8c^{\frac{3}{2}}}\right)}{16c}\right)}{24c}\right)+e(Ae+$

input
```
int((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
A*d^2*(1/12*(2*c*x+b)/c*(c*x^2+b*x)^(5/2)-5/24*b^2/c*(1/8*(2*c*x+b)/c*(c*x
^2+b*x)^(3/2)-3/16*b^2/c*(1/4*(2*c*x+b)/c*(c*x^2+b*x)^(1/2)-1/8*b^2/c^(3/2
)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x)^(1/2)))))+e*(A*e+2*B*d)*(1/8*x*(c*x^2
+b*x)^(7/2)/c-9/16*b/c*(1/7*(c*x^2+b*x)^(7/2)/c-1/2*b/c*(1/12*(2*c*x+b)/c*
(c*x^2+b*x)^(5/2)-5/24*b^2/c*(1/8*(2*c*x+b)/c*(c*x^2+b*x)^(3/2)-3/16*b^2/c
*(1/4*(2*c*x+b)/c*(c*x^2+b*x)^(1/2)-1/8*b^2/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)
+(c*x^2+b*x)^(1/2)))))))+d*(2*A*e+B*d)*(1/7*(c*x^2+b*x)^(7/2)/c-1/2*b/c*(1
/12*(2*c*x+b)/c*(c*x^2+b*x)^(5/2)-5/24*b^2/c*(1/8*(2*c*x+b)/c*(c*x^2+b*x)^
(3/2)-3/16*b^2/c*(1/4*(2*c*x+b)/c*(c*x^2+b*x)^(1/2)-1/8*b^2/c^(3/2)*ln((1/
2*b+c*x)/c^(1/2)+(c*x^2+b*x)^(1/2))))))+B*e^2*(1/9*x^2*(c*x^2+b*x)^(7/2)/c
-11/18*b/c*(1/8*x*(c*x^2+b*x)^(7/2)/c-9/16*b/c*(1/7*(c*x^2+b*x)^(7/2)/c-1/
2*b/c*(1/12*(2*c*x+b)/c*(c*x^2+b*x)^(5/2)-5/24*b^2/c*(1/8*(2*c*x+b)/c*(c*x
^2+b*x)^(3/2)-3/16*b^2/c*(1/4*(2*c*x+b)/c*(c*x^2+b*x)^(1/2)-1/8*b^2/c^(3/2
)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x)^(1/2))))))))
```

Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 1293, normalized size of antiderivative = 2.00

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{5/2} dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
[-1/4128768*(315*(32*(B*b^7*c^2 - 2*A*b^6*c^3)*d^2 - 4*(9*B*b^8*c - 16*A*b
^7*c^2)*d*e + (11*B*b^9 - 18*A*b^8*c)*e^2)*sqrt(c)*log(2*c*x + b - 2*sqrt(
c*x^2 + b*x)*sqrt(c)) - 2*(229376*B*c^9*e^2*x^8 + 14336*(36*B*c^9*d*e + (3
7*B*b*c^8 + 18*A*c^9)*e^2)*x^7 + 3072*(96*B*c^9*d^2 + 12*(33*B*b*c^8 + 16*
A*c^9)*d*e + (103*B*b^2*c^7 + 198*A*b*c^8)*e^2)*x^6 + 256*(96*(29*B*b*c^8
+ 14*A*c^9)*d^2 + 12*(243*B*b^2*c^7 + 464*A*b*c^8)*d*e + (5*B*b^3*c^6 + 14
58*A*b^2*c^7)*e^2)*x^5 + 128*(96*(37*B*b^2*c^7 + 70*A*b*c^8)*d^2 + 12*(3*B
*b^3*c^6 + 592*A*b^2*c^7)*d*e - (11*B*b^4*c^5 - 18*A*b^3*c^6)*e^2)*x^4 + 1
44*(32*(B*b^3*c^6 + 126*A*b^2*c^7)*d^2 - 4*(9*B*b^4*c^5 - 16*A*b^3*c^6)*d*
e + (11*B*b^5*c^4 - 18*A*b^4*c^5)*e^2)*x^3 - 10080*(B*b^6*c^3 - 2*A*b^5*c^
4)*d^2 + 1260*(9*B*b^7*c^2 - 16*A*b^6*c^3)*d*e - 315*(11*B*b^8*c - 18*A*b^
7*c^2)*e^2 - 168*(32*(B*b^4*c^5 - 2*A*b^3*c^6)*d^2 - 4*(9*B*b^5*c^4 - 16*A
*b^4*c^5)*d*e + (11*B*b^6*c^3 - 18*A*b^5*c^4)*e^2)*x^2 + 210*(32*(B*b^5*c^
4 - 2*A*b^4*c^5)*d^2 - 4*(9*B*b^6*c^3 - 16*A*b^5*c^4)*d*e + (11*B*b^7*c^2
- 18*A*b^6*c^3)*e^2)*x)*sqrt(c*x^2 + b*x))/c^7, -1/2064384*(315*(32*(B*b^7
*c^2 - 2*A*b^6*c^3)*d^2 - 4*(9*B*b^8*c - 16*A*b^7*c^2)*d*e + (11*B*b^9 - 1
8*A*b^8*c)*e^2)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) - (2
29376*B*c^9*e^2*x^8 + 14336*(36*B*c^9*d*e + (37*B*b*c^8 + 18*A*c^9)*e^2)*x
^7 + 3072*(96*B*c^9*d^2 + 12*(33*B*b*c^8 + 16*A*c^9)*d*e + (103*B*b^2*c^7
+ 198*A*b*c^8)*e^2)*x^6 + 256*(96*(29*B*b*c^8 + 14*A*c^9)*d^2 + 12*(243...
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2140 vs. $2(677) = 1354$.

Time = 0.97 (sec) , antiderivative size = 2140, normalized size of antiderivative = 3.30

$$\int (A+Bx)(d+ex)^2\left(bx+cx^2\right)^{5/2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)**2*(c*x**2+b*x)**(5/2),x)
```

output
```
Piecewise((-5*b**3*(A*b**3*d**2 - 7*b*(2*A*b**3*d*e + 3*A*b**2*c*d**2 + B*
b**3*d**2 - 9*b*(A*b**3*e**2 + 6*A*b**2*c*d*e + 3*A*b*c**2*d**2 + 2*B*b**3
*d*e + 3*B*b**2*c*d**2 - 11*b*(3*A*b**2*c*e**2 + 6*A*b*c**2*d*e + A*c**3*d
**2 + B*b**3*e**2 + 6*B*b**2*c*d*e + 3*B*b*c**2*d**2 - 13*b*(3*A*b*c**2*e*
*2 + 2*A*c**3*d*e + 3*B*b**2*c*e**2 + 6*B*b*c**2*d*e + B*c**3*d**2 - 15*b*
(A*c**3*e**2 + 37*B*b*c**2*e**2/18 + 2*B*c**3*d*e)/(16*c))/(14*c))/(12*c))
/(10*c))/(8*c))*Piecewise((log(b + 2*sqrt(c)*sqrt(b*x + c*x**2) + 2*c*x)/s
qrt(c), Ne(b**2/c, 0)), ((b/(2*c) + x)*log(b/(2*c) + x)/sqrt(c*(b/(2*c) +
x)**2), True))/(16*c**3) + sqrt(b*x + c*x**2)*(B*c**2*e**2*x**8/9 + 5*b**2
*(A*b**3*d**2 - 7*b*(2*A*b**3*d*e + 3*A*b**2*c*d**2 + B*b**3*d**2 - 9*b*(A
*b**3*e**2 + 6*A*b**2*c*d*e + 3*A*b*c**2*d**2 + 2*B*b**3*d*e + 3*B*b**2*c*
d**2 - 11*b*(3*A*b**2*c*e**2 + 6*A*b*c**2*d*e + A*c**3*d**2 + B*b**3*e**2
+ 6*B*b**2*c*d*e + 3*B*b*c**2*d**2 - 13*b*(3*A*b*c**2*e**2 + 2*A*c**3*d*e
+ 3*B*b**2*c*e**2 + 6*B*b*c**2*d*e + B*c**3*d**2 - 15*b*(A*c**3*e**2 + 37*
B*b*c**2*e**2/18 + 2*B*c**3*d*e)/(16*c))/(14*c))/(12*c))/(10*c))/(8*c))/(8
*c**3) - 5*b*x*(A*b**3*d**2 - 7*b*(2*A*b**3*d*e + 3*A*b**2*c*d**2 + B*b**3
*d**2 - 9*b*(A*b**3*e**2 + 6*A*b**2*c*d*e + 3*A*b*c**2*d**2 + 2*B*b**3*d*e
 + 3*B*b**2*c*d**2 - 11*b*(3*A*b**2*c*e**2 + 6*A*b*c**2*d*e + A*c**3*d**2
+ B*b**3*e**2 + 6*B*b**2*c*d*e + 3*B*b*c**2*d**2 - 13*b*(3*A*b*c**2*e**2 +
 2*A*c**3*d*e + 3*B*b**2*c*e**2 + 6*B*b*c**2*d*e + B*c**3*d**2 - 15*b*(...
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 944, normalized size of antiderivative = 1.46

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{5/2} dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
1/9*(c*x^2 + b*x)^(7/2)*B*e^2*x^2/c + 1/6*(c*x^2 + b*x)^(5/2)*A*d^2*x + 5/
256*sqrt(c*x^2 + b*x)*A*b^4*d^2*x/c^2 - 5/96*(c*x^2 + b*x)^(3/2)*A*b^2*d^2
*x/c - 55/16384*sqrt(c*x^2 + b*x)*B*b^7*e^2*x/c^5 + 55/6144*(c*x^2 + b*x)^
(3/2)*B*b^5*e^2*x/c^4 - 11/384*(c*x^2 + b*x)^(5/2)*B*b^3*e^2*x/c^3 - 11/14
4*(c*x^2 + b*x)^(7/2)*B*b*e^2*x/c^2 - 5/1024*A*b^6*d^2*log(2*c*x + b + 2*s
qrt(c*x^2 + b*x)*sqrt(c))/c^(7/2) + 55/65536*B*b^9*e^2*log(2*c*x + b + 2*s
qrt(c*x^2 + b*x)*sqrt(c))/c^(13/2) + 5/512*sqrt(c*x^2 + b*x)*A*b^5*d^2/c^3
 - 5/192*(c*x^2 + b*x)^(3/2)*A*b^3*d^2/c^2 + 1/12*(c*x^2 + b*x)^(5/2)*A*b*
d^2/c - 55/32768*sqrt(c*x^2 + b*x)*B*b^8*e^2/c^6 + 55/12288*(c*x^2 + b*x)^
(3/2)*B*b^6*e^2/c^5 - 11/768*(c*x^2 + b*x)^(5/2)*B*b^4*e^2/c^4 + 11/224*(c
*x^2 + b*x)^(7/2)*B*b^2*e^2/c^3 + 45/8192*(2*B*d*e + A*e^2)*sqrt(c*x^2 + b
*x)*b^6*x/c^4 - 15/1024*(2*B*d*e + A*e^2)*(c*x^2 + b*x)^(3/2)*b^4*x/c^3 -
5/512*(B*d^2 + 2*A*d*e)*sqrt(c*x^2 + b*x)*b^5*x/c^3 + 3/64*(2*B*d*e + A*e^
2)*(c*x^2 + b*x)^(5/2)*b^2*x/c^2 + 5/192*(B*d^2 + 2*A*d*e)*(c*x^2 + b*x)^(
3/2)*b^3*x/c^2 + 1/8*(2*B*d*e + A*e^2)*(c*x^2 + b*x)^(7/2)*x/c - 1/12*(B*d
^2 + 2*A*d*e)*(c*x^2 + b*x)^(5/2)*b*x/c - 45/32768*(2*B*d*e + A*e^2)*b^8*l
og(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(11/2) + 5/2048*(B*d^2 + 2*A
*d*e)*b^7*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(9/2) + 45/16384*
(2*B*d*e + A*e^2)*sqrt(c*x^2 + b*x)*b^7/c^5 - 15/2048*(2*B*d*e + A*e^2)*(c
*x^2 + b*x)^(3/2)*b^5/c^4 - 5/1024*(B*d^2 + 2*A*d*e)*sqrt(c*x^2 + b*x)*...
```

Giac [A] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 681, normalized size of antiderivative = 1.05

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{5/2} dx = \frac{1}{2064384}\sqrt{cx^2+bx}\Bigg(2\Bigg(4\Bigg(2\Bigg(8\Bigg(2\Bigg(4\Bigg(14\Bigg(16\,Bc^2e^2x+\frac{36\,Bc^{10}de+37\,Bbc^9e^2+18\,Ac^{10}}{c^8}\right.$$
$$-\frac{5\left(32\,Bb^7c^2d^2-64\,Ab^6c^3d^2-36\,Bb^8cde+64\,Ab^7c^2de+11\,Bb^9e^2-18\,Ab^8ce^2\right)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right.\right.\right.}{65536\,c^{\frac{13}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
1/2064384*sqrt(c*x^2 + b*x)*(2*(4*(2*(8*(2*(4*(14*(16*B*c^2*e^2*x + (36*B*
c^10*d*e + 37*B*b*c^9*e^2 + 18*A*c^10*e^2)/c^8)*x + 3*(96*B*c^10*d^2 + 396
*B*b*c^9*d*e + 192*A*c^10*d*e + 103*B*b^2*c^8*e^2 + 198*A*b*c^9*e^2)/c^8)*
x + (2784*B*b*c^9*d^2 + 1344*A*c^10*d^2 + 2916*B*b^2*c^8*d*e + 5568*A*b*c^
9*d*e + 5*B*b^3*c^7*e^2 + 1458*A*b^2*c^8*e^2)/c^8)*x + (3552*B*b^2*c^8*d^2
 + 6720*A*b*c^9*d^2 + 36*B*b^3*c^7*d*e + 7104*A*b^2*c^8*d*e - 11*B*b^4*c^6
*e^2 + 18*A*b^3*c^7*e^2)/c^8)*x + 9*(32*B*b^3*c^7*d^2 + 4032*A*b^2*c^8*d^2
 - 36*B*b^4*c^6*d*e + 64*A*b^3*c^7*d*e + 11*B*b^5*c^5*e^2 - 18*A*b^4*c^6*e
^2)/c^8)*x - 21*(32*B*b^4*c^6*d^2 - 64*A*b^3*c^7*d^2 - 36*B*b^5*c^5*d*e +
64*A*b^4*c^6*d*e + 11*B*b^6*c^4*e^2 - 18*A*b^5*c^5*e^2)/c^8)*x + 105*(32*B
*b^5*c^5*d^2 - 64*A*b^4*c^6*d^2 - 36*B*b^6*c^4*d*e + 64*A*b^5*c^5*d*e + 11
*B*b^7*c^3*e^2 - 18*A*b^6*c^4*e^2)/c^8)*x - 315*(32*B*b^6*c^4*d^2 - 64*A*b
^5*c^5*d^2 - 36*B*b^7*c^3*d*e + 64*A*b^6*c^4*d*e + 11*B*b^8*c^2*e^2 - 18*A
*b^7*c^3*e^2)/c^8) - 5/65536*(32*B*b^7*c^2*d^2 - 64*A*b^6*c^3*d^2 - 36*B*b
^8*c*d*e + 64*A*b^7*c^2*d*e + 11*B*b^9*e^2 - 18*A*b^8*c*e^2)*log(abs(2*(sq
rt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) + b))/c^(13/2)
```

Mupad [F(-1)]

Timed out.

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{5/2} dx = \int \left(c\,x^2+b\,x\right)^{5/2} \left(A+B\,x\right) \left(d+e\,x\right)^2 dx$$

input
```
int((b*x + c*x^2)^(5/2)*(A + B*x)*(d + e*x)^2,x)
```

output
```
int((b*x + c*x^2)^(5/2)*(A + B*x)*(d + e*x)^2, x)
```

Reduce [F]

$$\int (A+Bx)(d+ex)^2 \left(bx+cx^2\right)^{5/2} dx = \int (Bx+A)\,(ex+d)^2 \left(c\,x^2+bx\right)^{\frac{5}{2}} dx$$

input
```
int((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(5/2),x)
```

output
```
int((B*x+A)*(e*x+d)^2*(c*x^2+b*x)^(5/2),x)
```

3.113 $\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{5/2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 418

$$\begin{aligned}\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{5/2}\,dx &= \frac{5b^5(32Ac^2d+9b^2Be-16bc(Bd+Ae))\sqrt{bx+cx^2}}{16384c^5} \\ &- \frac{5b^4(32Ac^2d+9b^2Be-16bc(Bd+Ae))\,x\sqrt{bx+cx^2}}{24576c^4} \\ &+ \frac{b^3(32Ac^2d+9b^2Be-16bc(Bd+Ae))\,x^2\sqrt{bx+cx^2}}{6144c^3} \\ &+ \frac{9b^2(32Ac^2d+9b^2Be-16bc(Bd+Ae))\,x^3\sqrt{bx+cx^2}}{1024c^2} \\ &+ \frac{5b(32Ac^2d+9b^2Be-16bc(Bd+Ae))\,x^4\sqrt{bx+cx^2}}{384c} \\ &+ \frac{1}{192}(32Ac^2d+9b^2Be-16bc(Bd+Ae))\,x^5\sqrt{bx+cx^2} \\ &+ \frac{(16Bcd-9bBe+16Ace)\left(bx+cx^2\right)^{7/2}}{112c^2} + \frac{Bex\left(bx+cx^2\right)^{7/2}}{8c} \\ &- \frac{5b^6(32Ac^2d+9b^2Be-16bc(Bd+Ae))\,\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{16384c^{11/2}}\end{aligned}$$

output
```
5/16384*b^5*(32*A*c^2*d+9*b^2*B*e-16*b*c*(A*e+B*d))*(c*x^2+b*x)^(1/2)/c^5-
5/24576*b^4*(32*A*c^2*d+9*b^2*B*e-16*b*c*(A*e+B*d))*x*(c*x^2+b*x)^(1/2)/c^
4+1/6144*b^3*(32*A*c^2*d+9*b^2*B*e-16*b*c*(A*e+B*d))*x^2*(c*x^2+b*x)^(1/2)
/c^3+9/1024*b^2*(32*A*c^2*d+9*b^2*B*e-16*b*c*(A*e+B*d))*x^3*(c*x^2+b*x)^(1
/2)/c^2+5/384*b*(32*A*c^2*d+9*b^2*B*e-16*b*c*(A*e+B*d))*x^4*(c*x^2+b*x)^(1
/2)/c+1/192*(32*A*c^2*d+9*b^2*B*e-16*b*c*(A*e+B*d))*x^5*(c*x^2+b*x)^(1/2)+
1/112*(16*A*c*e-9*B*b*e+16*B*c*d)*(c*x^2+b*x)^(7/2)/c^2+1/8*B*e*x*(c*x^2+b
*x)^(7/2)/c-5/16384*b^6*(32*A*c^2*d+9*b^2*B*e-16*b*c*(A*e+B*d))*arctanh(c^
(1/2)*x/(c*x^2+b*x)^(1/2))/c^(11/2)
```

Mathematica [A] (verified)

Time = 3.80 (sec) , antiderivative size = 371, normalized size of antiderivative = 0.89

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{5/2}\,dx = \frac{\sqrt{x}\sqrt{b+cx}\Big(\sqrt{c}\sqrt{x}\sqrt{b+cx}(945b^7Be-210b^6c(8Bd+8Ae+3Bex)+128b^3c^4x^2(3Bx(2d+$$

input
```
Integrate[(A + B*x)*(d + e*x)*(b*x + c*x^2)^(5/2),x]
```

output
```
(Sqrt[x]*Sqrt[b + c*x]*(Sqrt[c]*Sqrt[x]*Sqrt[b + c*x]*(945*b^7*B*e - 210*b
^6*c*(8*B*d + 8*A*e + 3*B*e*x) + 128*b^3*c^4*x^2*(3*B*x*(2*d + e*x) + 2*A*
(7*d + 3*e*x)) + 2048*c^7*x^5*(4*A*(7*d + 6*e*x) + 3*B*x*(8*d + 7*e*x)) +
56*b^5*c^2*(20*A*(3*d + e*x) + B*x*(20*d + 9*e*x)) - 16*b^4*c^3*x*(28*A*(5
*d + 2*e*x) + B*x*(56*d + 27*e*x)) + 1024*b*c^6*x^4*(4*A*(35*d + 29*e*x) +
 B*x*(116*d + 99*e*x)) + 256*b^2*c^5*x^3*(B*x*(296*d + 243*e*x) + A*(378*d
 + 296*e*x))) + 210*b^6*(32*A*c^2*d + 9*b^2*B*e)*ArcTanh[(Sqrt[c]*Sqrt[x])
/(Sqrt[b] - Sqrt[b + c*x])] + 3360*b^7*c*(B*d + A*e)*ArcTanh[(Sqrt[c]*Sqrt
[x])/(-Sqrt[b] + Sqrt[b + c*x])]))/(344064*c^(11/2)*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.65 (sec) , antiderivative size = 210, normalized size of antiderivative = 0.50, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {1225, 1087, 1087, 1087, 1091, 219}

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

$$\int (A+Bx)\left(bx+cx^2\right)^{5/2}(d+ex)\,dx$$

$$\Big\downarrow \text{1225}$$

$$\frac{\left(-16bc(Ae+Bd)+32Ac^2d+9b^2Be\right)\int \left(cx^2+bx\right)^{5/2}dx}{32c^2}-\frac{\left(bx+cx^2\right)^{7/2}\left(-16c(Ae+Bd)+9bBe-14Bcex\right)}{112c^2}$$

$$\Big\downarrow \text{1087}$$

$$\frac{\left(-16bc(Ae+Bd)+32Ac^2d+9b^2Be\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\int \left(cx^2+bx\right)^{3/2}dx}{24c}\right)}{32c^2}-\frac{\left(bx+cx^2\right)^{7/2}\left(-16c(Ae+Bd)+9bBe-14Bcex\right)}{112c^2}$$

$$\Big\downarrow \text{1087}$$

$$\frac{\left(-16bc(Ae+Bd)+32Ac^2d+9b^2Be\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\int \sqrt{cx^2+bx}dx}{16c}\right)}{24c}\right)}{32c^2}-\frac{\left(bx+cx^2\right)^{7/2}\left(-16c(Ae+Bd)+9bBe-14Bcex\right)}{112c^2}$$

$$\Big\downarrow \text{1087}$$

$$\frac{\left(-16bc(Ae+Bd)+32Ac^2d+9b^2Be\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int\frac{1}{\sqrt{cx^2+bx}}d}{8c}\right.}{16c}\right.}{24c}\right.}{32c^2}$$

$$\frac{\left(bx+cx^2\right)^{7/2}\left(-16c(Ae+Bd)+9bBe-14Bcex\right)}{112c^2}$$

$$\Big\downarrow \; 1091$$

$$\frac{\left(-16bc(Ae+Bd)+32Ac^2d+9b^2Be\right)\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\int\frac{1}{1-\frac{cx^2}{cx^2+bx}}}{4c}\right.}{16c}\right.}{24c}\right.}{32c^2}$$

$$\frac{\left(bx+cx^2\right)^{7/2}\left(-16c(Ae+Bd)+9bBe-14Bcex\right)}{112c^2}$$

$$\Big\downarrow \; 219$$

$$\frac{\left(\frac{(b+2cx)\left(bx+cx^2\right)^{5/2}}{12c}-\frac{5b^2\left(\frac{(b+2cx)\left(bx+cx^2\right)^{3/2}}{8c}-\frac{3b^2\left(\frac{(b+2cx)\sqrt{bx+cx^2}}{4c}-\frac{b^2\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4c^{3/2}}\right)}{16c}\right)}{24c}\right)\left(-16bc(Ae+Bd)+32A\right.}{32c^2}$$

$$\frac{\left(bx+cx^2\right)^{7/2}\left(-16c(Ae+Bd)+9bBe-14Bcex\right)}{112c^2}$$

input
```
Int[(A + B*x)*(d + e*x)*(b*x + c*x^2)^(5/2),x]
```

output
```
-1/112*((9*b*B*e - 16*c*(B*d + A*e) - 14*B*c*e*x)*(b*x + c*x^2)^(7/2))/c^2
 + ((32*A*c^2*d + 9*b^2*B*e - 16*b*c*(B*d + A*e))*(((b + 2*c*x)*(b*x + c*x
^2)^(5/2))/(12*c) - (5*b^2*(((b + 2*c*x)*(b*x + c*x^2)^(3/2))/(8*c) - (3*b
^2*(((b + 2*c*x)*Sqrt[b*x + c*x^2])/(4*c) - (b^2*ArcTanh[(Sqrt[c]*x)/Sqrt[
b*x + c*x^2]])/(4*c^(3/2))))/(16*c)))/(24*c)))/(32*c^2)
```

Defintions of rubi rules used

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1087
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(b + 2*c*x)
*((a + b*x + c*x^2)^p/(2*c*(2*p + 1))), x] - Simp[p*((b^2 - 4*a*c)/(2*c*(2*
p + 1)))   Int[(a + b*x + c*x^2)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] &&
GtQ[p, 0] && (IntegerQ[4*p] || IntegerQ[3*p])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

Maple [A] (verified)

Time = 0.94 (sec) , antiderivative size = 397, normalized size of antiderivative = 0.95

method	result
risch	$-\frac{\left(-43008 B\,c^7 e\,x^7-49152 A\,c^7 e\,x^6-101376 B b\,c^6 e\,x^6-49152 B\,c^7 d\,x^6-118784 A b\,c^6 e\,x^5-57344 A\,c^7 d\,x^5-62208 B\,b^2 c^5 e\,x^5-11878\right.}{}$
default	$Ad\left(\frac{(2cx+b)\left(c\,x^2+bx\right)^{\frac{5}{2}}}{12c}-\frac{5b^2\left(\frac{(2cx+b)\left(c\,x^2+bx\right)^{\frac{3}{2}}}{8c}-\frac{3b^2\left(\frac{(2cx+b)\sqrt{c\,x^2+bx}}{4c}-\frac{b^2\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^2+bx}\right)}{8c^{\frac{3}{2}}}\right)}{16c}\right)}{24c}\right)+(Ae+B$

input
```
int((B*x+A)*(e*x+d)*(c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-1/344064/c^5*(-43008*B*c^7*e*x^7-49152*A*c^7*e*x^6-101376*B*b*c^6*e*x^6-4
9152*B*c^7*d*x^6-118784*A*b*c^6*e*x^5-57344*A*c^7*d*x^5-62208*B*b^2*c^5*e*
x^5-118784*B*b*c^6*d*x^5-75776*A*b^2*c^5*e*x^4-143360*A*b*c^6*d*x^4-384*B*
b^3*c^4*e*x^4-75776*B*b^2*c^5*d*x^4-768*A*b^3*c^4*e*x^3-96768*A*b^2*c^5*d*
x^3+432*B*b^4*c^3*e*x^3-768*B*b^3*c^4*d*x^3+896*A*b^4*c^3*e*x^2-1792*A*b^3
*c^4*d*x^2-504*B*b^5*c^2*e*x^2+896*B*b^4*c^3*d*x^2-1120*A*b^5*c^2*e*x+2240
*A*b^4*c^3*d*x+630*B*b^6*c*e*x-1120*B*b^5*c^2*d*x+1680*A*b^6*c*e-3360*A*b^
5*c^2*d-945*B*b^7*e+1680*B*b^6*c*d)*x*(c*x+b)/(x*(c*x+b))^(1/2)+5/32768*b^
6*(16*A*b*c*e-32*A*c^2*d-9*B*b^2*e+16*B*b*c*d)/c^(11/2)*ln((1/2*b+c*x)/c^(
1/2)+(c*x^2+b*x)^(1/2))
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 803, normalized size of antiderivative = 1.92

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{5/2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
[1/688128*(105*(16*(B*b^7*c - 2*A*b^6*c^2)*d - (9*B*b^8 - 16*A*b^7*c)*e)*s
qrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) + 2*(43008*B*c^8*e*x^7
 + 3072*(16*B*c^8*d + (33*B*b*c^7 + 16*A*c^8)*e)*x^6 + 256*(16*(29*B*b*c^7
 + 14*A*c^8)*d + (243*B*b^2*c^6 + 464*A*b*c^7)*e)*x^5 + 128*(16*(37*B*b^2*
c^6 + 70*A*b*c^7)*d + (3*B*b^3*c^5 + 592*A*b^2*c^6)*e)*x^4 + 48*(16*(B*b^3
*c^5 + 126*A*b^2*c^6)*d - (9*B*b^4*c^4 - 16*A*b^3*c^5)*e)*x^3 - 56*(16*(B*
b^4*c^4 - 2*A*b^3*c^5)*d - (9*B*b^5*c^3 - 16*A*b^4*c^4)*e)*x^2 - 1680*(B*b
^6*c^2 - 2*A*b^5*c^3)*d + 105*(9*B*b^7*c - 16*A*b^6*c^2)*e + 70*(16*(B*b^5
*c^3 - 2*A*b^4*c^4)*d - (9*B*b^6*c^2 - 16*A*b^5*c^3)*e)*x)*sqrt(c*x^2 + b*
x))/c^6, -1/344064*(105*(16*(B*b^7*c - 2*A*b^6*c^2)*d - (9*B*b^8 - 16*A*b^
7*c)*e)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) - (43008*B*c
^8*e*x^7 + 3072*(16*B*c^8*d + (33*B*b*c^7 + 16*A*c^8)*e)*x^6 + 256*(16*(29
*B*b*c^7 + 14*A*c^8)*d + (243*B*b^2*c^6 + 464*A*b*c^7)*e)*x^5 + 128*(16*(3
7*B*b^2*c^6 + 70*A*b*c^7)*d + (3*B*b^3*c^5 + 592*A*b^2*c^6)*e)*x^4 + 48*(1
6*(B*b^3*c^5 + 126*A*b^2*c^6)*d - (9*B*b^4*c^4 - 16*A*b^3*c^5)*e)*x^3 - 56
*(16*(B*b^4*c^4 - 2*A*b^3*c^5)*d - (9*B*b^5*c^3 - 16*A*b^4*c^4)*e)*x^2 - 1
680*(B*b^6*c^2 - 2*A*b^5*c^3)*d + 105*(9*B*b^7*c - 16*A*b^6*c^2)*e + 70*(1
6*(B*b^5*c^3 - 2*A*b^4*c^4)*d - (9*B*b^6*c^2 - 16*A*b^5*c^3)*e)*x)*sqrt(c*
x^2 + b*x))/c^6]
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1188 vs. $2(425) = 850$.

Time = 1.30 (sec) , antiderivative size = 1188, normalized size of antiderivative = 2.84

$$\int (A + Bx)(d + ex)\left(bx + cx^2\right)^{5/2} dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x**2+b*x)**(5/2),x)
```

output
```
Piecewise((-5*b**3*(A*b**3*d - 7*b*(A*b**3*e + 3*A*b**2*c*d + B*b**3*d - 9
*b*(3*A*b**2*c*e + 3*A*b*c**2*d + B*b**3*e + 3*B*b**2*c*d - 11*b*(3*A*b*c*
*2*e + A*c**3*d + 3*B*b**2*c*e + 3*B*b*c**2*d - 13*b*(A*c**3*e + 33*B*b*c*
*2*e/16 + B*c**3*d)/(14*c))/(12*c))/(10*c))/(8*c))*Piecewise((log(b + 2*sq
rt(c)*sqrt(b*x + c*x**2) + 2*c*x)/sqrt(c), Ne(b**2/c, 0)), ((b/(2*c) + x)*
log(b/(2*c) + x)/sqrt(c*(b/(2*c) + x)**2), True))/(16*c**3) + sqrt(b*x + c
*x**2)*(B*c**2*e*x**7/8 + 5*b**2*(A*b**3*d - 7*b*(A*b**3*e + 3*A*b**2*c*d
+ B*b**3*d - 9*b*(3*A*b**2*c*e + 3*A*b*c**2*d + B*b**3*e + 3*B*b**2*c*d -
11*b*(3*A*b*c**2*e + A*c**3*d + 3*B*b**2*c*e + 3*B*b*c**2*d - 13*b*(A*c**3
*e + 33*B*b*c**2*e/16 + B*c**3*d)/(14*c))/(12*c))/(10*c))/(8*c))/(8*c**3)
- 5*b*x*(A*b**3*d - 7*b*(A*b**3*e + 3*A*b**2*c*d + B*b**3*d - 9*b*(3*A*b**
2*c*e + 3*A*b*c**2*d + B*b**3*e + 3*B*b**2*c*d - 11*b*(3*A*b*c**2*e + A*c*
*3*d + 3*B*b**2*c*e + 3*B*b*c**2*d - 13*b*(A*c**3*e + 33*B*b*c**2*e/16 + B
*c**3*d)/(14*c))/(12*c))/(10*c))/(8*c))/(12*c**2) + x**6*(A*c**3*e + 33*B*
b*c**2*e/16 + B*c**3*d)/(7*c) + x**5*(3*A*b*c**2*e + A*c**3*d + 3*B*b**2*c
*e + 3*B*b*c**2*d - 13*b*(A*c**3*e + 33*B*b*c**2*e/16 + B*c**3*d)/(14*c))/
(6*c) + x**4*(3*A*b**2*c*e + 3*A*b*c**2*d + B*b**3*e + 3*B*b**2*c*d - 11*b
*(3*A*b*c**2*e + A*c**3*d + 3*B*b**2*c*e + 3*B*b*c**2*d - 13*b*(A*c**3*e +
 33*B*b*c**2*e/16 + B*c**3*d)/(14*c))/(12*c))/(5*c) + x**3*(A*b**3*e + 3*A
*b**2*c*d + B*b**3*d - 9*b*(3*A*b**2*c*e + 3*A*b*c**2*d + B*b**3*e + 3*...
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 573, normalized size of antiderivative = 1.37

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{5/2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
1/6*(c*x^2 + b*x)^(5/2)*A*d*x + 5/256*sqrt(c*x^2 + b*x)*A*b^4*d*x/c^2 - 5/
96*(c*x^2 + b*x)^(3/2)*A*b^2*d*x/c + 45/8192*sqrt(c*x^2 + b*x)*B*b^6*e*x/c
^4 - 15/1024*(c*x^2 + b*x)^(3/2)*B*b^4*e*x/c^3 + 3/64*(c*x^2 + b*x)^(5/2)*
B*b^2*e*x/c^2 + 1/8*(c*x^2 + b*x)^(7/2)*B*e*x/c - 5/1024*A*b^6*d*log(2*c*x
 + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(7/2) - 45/32768*B*b^8*e*log(2*c*x +
 b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(11/2) + 5/512*sqrt(c*x^2 + b*x)*A*b^5
*d/c^3 - 5/192*(c*x^2 + b*x)^(3/2)*A*b^3*d/c^2 + 1/12*(c*x^2 + b*x)^(5/2)*
A*b*d/c + 45/16384*sqrt(c*x^2 + b*x)*B*b^7*e/c^5 - 15/2048*(c*x^2 + b*x)^(
3/2)*B*b^5*e/c^4 + 3/128*(c*x^2 + b*x)^(5/2)*B*b^3*e/c^3 - 9/112*(c*x^2 +
b*x)^(7/2)*B*b*e/c^2 - 5/512*sqrt(c*x^2 + b*x)*(B*d + A*e)*b^5*x/c^3 + 5/1
92*(c*x^2 + b*x)^(3/2)*(B*d + A*e)*b^3*x/c^2 - 1/12*(c*x^2 + b*x)^(5/2)*(B
*d + A*e)*b*x/c + 5/2048*(B*d + A*e)*b^7*log(2*c*x + b + 2*sqrt(c*x^2 + b*
x)*sqrt(c))/c^(9/2) - 5/1024*sqrt(c*x^2 + b*x)*(B*d + A*e)*b^6/c^4 + 5/384
*(c*x^2 + b*x)^(3/2)*(B*d + A*e)*b^4/c^3 - 1/24*(c*x^2 + b*x)^(5/2)*(B*d +
 A*e)*b^2/c^2 + 1/7*(c*x^2 + b*x)^(7/2)*(B*d + A*e)/c
```

Giac [A] (verification not implemented)

Time = 0.27 (sec) , antiderivative size = 406, normalized size of antiderivative = 0.97

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{5/2}\,dx = \frac{1}{344064}\sqrt{cx^2+bx}\left(2\left(4\left(2\left(8\left(2\left(12\left(14\,Bc^2ex+\frac{16\,Bc^9d+33\,Bbc^8e+16\,Ac^9e}{c^7}\right)x+\frac{4}{}\right.\right.\right.\right.\right.\right. - \frac{5\left(16\,Bb^7cd-32\,Ab^6c^2d-9\,Bb^8e+16\,Ab^7ce\right)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{c}+b\right|\right)}{32768\,c^{\frac{11}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)*(c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
1/344064*sqrt(c*x^2 + b*x)*(2*(4*(2*(8*(2*(12*(14*B*c^2*e*x + (16*B*c^9*d
+ 33*B*b*c^8*e + 16*A*c^9*e)/c^7)*x + (464*B*b*c^8*d + 224*A*c^9*d + 243*B
*b^2*c^7*e + 464*A*b*c^8*e)/c^7)*x + (592*B*b^2*c^7*d + 1120*A*b*c^8*d + 3
*B*b^3*c^6*e + 592*A*b^2*c^7*e)/c^7)*x + 3*(16*B*b^3*c^6*d + 2016*A*b^2*c^
7*d - 9*B*b^4*c^5*e + 16*A*b^3*c^6*e)/c^7)*x - 7*(16*B*b^4*c^5*d - 32*A*b^
3*c^6*d - 9*B*b^5*c^4*e + 16*A*b^4*c^5*e)/c^7)*x + 35*(16*B*b^5*c^4*d - 32
*A*b^4*c^5*d - 9*B*b^6*c^3*e + 16*A*b^5*c^4*e)/c^7)*x - 105*(16*B*b^6*c^3*
d - 32*A*b^5*c^4*d - 9*B*b^7*c^2*e + 16*A*b^6*c^3*e)/c^7) - 5/32768*(16*B*
b^7*c*d - 32*A*b^6*c^2*d - 9*B*b^8*e + 16*A*b^7*c*e)*log(abs(2*(sqrt(c)*x
- sqrt(c*x^2 + b*x))*sqrt(c) + b))/c^(11/2)
```

Mupad [F(-1)]

Timed out.

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{5/2}\,dx=\int \left(c\,x^2+b\,x\right)^{5/2}\,\left(A+B\,x\right)\,\left(d+e\,x\right)\,dx$$

input
```
int((b*x + c*x^2)^(5/2)*(A + B*x)*(d + e*x),x)
```

output
```
int((b*x + c*x^2)^(5/2)*(A + B*x)*(d + e*x), x)
```

Reduce [B] (verification not implemented)

Time = 0.44 (sec) , antiderivative size = 654, normalized size of antiderivative = 1.56

$$\int (A+Bx)(d+ex)\left(bx+cx^2\right)^{5/2}\,dx=\frac{-945\sqrt{c}\log\left(\frac{\sqrt{cx+b}+\sqrt{x}\sqrt{c}}{\sqrt{b}}\right)b^9e+945\sqrt{x}\,\sqrt{cx+b}\,b^8ce-1680\sqrt{x}\,\sqrt{cx+b}\,b^7c^2d+1680\sqrt{c}\,\mathrm{lo}}{}$$

input
```
int((B*x+A)*(e*x+d)*(c*x^2+b*x)^(5/2),x)
```

output
```
( - 1680*sqrt(x)*sqrt(b + c*x)*a*b**6*c**2*e + 3360*sqrt(x)*sqrt(b + c*x)*
a*b**5*c**3*d + 1120*sqrt(x)*sqrt(b + c*x)*a*b**5*c**3*e*x - 2240*sqrt(x)*
sqrt(b + c*x)*a*b**4*c**4*d*x - 896*sqrt(x)*sqrt(b + c*x)*a*b**4*c**4*e*x*
*2 + 1792*sqrt(x)*sqrt(b + c*x)*a*b**3*c**5*d*x**2 + 768*sqrt(x)*sqrt(b +
c*x)*a*b**3*c**5*e*x**3 + 96768*sqrt(x)*sqrt(b + c*x)*a*b**2*c**6*d*x**3 +
 75776*sqrt(x)*sqrt(b + c*x)*a*b**2*c**6*e*x**4 + 143360*sqrt(x)*sqrt(b +
c*x)*a*b*c**7*d*x**4 + 118784*sqrt(x)*sqrt(b + c*x)*a*b*c**7*e*x**5 + 5734
4*sqrt(x)*sqrt(b + c*x)*a*c**8*d*x**5 + 49152*sqrt(x)*sqrt(b + c*x)*a*c**8
*e*x**6 + 945*sqrt(x)*sqrt(b + c*x)*b**8*c*e - 1680*sqrt(x)*sqrt(b + c*x)*
b**7*c**2*d - 630*sqrt(x)*sqrt(b + c*x)*b**7*c**2*e*x + 1120*sqrt(x)*sqrt(
b + c*x)*b**6*c**3*d*x + 504*sqrt(x)*sqrt(b + c*x)*b**6*c**3*e*x**2 - 896*
sqrt(x)*sqrt(b + c*x)*b**5*c**4*d*x**2 - 432*sqrt(x)*sqrt(b + c*x)*b**5*c*
*4*e*x**3 + 768*sqrt(x)*sqrt(b + c*x)*b**4*c**5*d*x**3 + 384*sqrt(x)*sqrt(
b + c*x)*b**4*c**5*e*x**4 + 75776*sqrt(x)*sqrt(b + c*x)*b**3*c**6*d*x**4 +
 62208*sqrt(x)*sqrt(b + c*x)*b**3*c**6*e*x**5 + 118784*sqrt(x)*sqrt(b + c*
x)*b**2*c**7*d*x**5 + 101376*sqrt(x)*sqrt(b + c*x)*b**2*c**7*e*x**6 + 4915
2*sqrt(x)*sqrt(b + c*x)*b*c**8*d*x**6 + 43008*sqrt(x)*sqrt(b + c*x)*b*c**8
*e*x**7 + 1680*sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b*
*7*c*e - 3360*sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b**
6*c**2*d - 945*sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b...
```

3.114 $\int \frac{(A+Bx)(bx+cx^2)^{5/2}}{d+ex}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 739

$$\int \frac{(A+Bx)(bx+cx^2)^{5/2}}{d+ex}\,dx = \frac{(4Ace(128c^4d^4-288bc^3d^3e+176b^2c^2d^2e^2-10b^3cde^3-3b^4e^4)-B(512c^5\cdots}{51\cdots}$$
$$-\frac{(4Ace(96c^3d^3-208bc^2d^2e+118b^2cde^2-3b^3e^3)-B(384c^4d^4-832bc^3d^3e+472b^2c^2d^2e^2-12b^3cde^3-5\cdots}{768c^2e^5}$$
$$+\frac{(4Ace(80c^2d^2-170bcde+93b^2e^2)-B(320c^3d^3-680bc^2d^2e+372b^2cde^2-5b^3e^3))\,x^2\sqrt{bx+cx^2}}{960ce^4}$$
$$-\frac{(4Ace(10cd-13be)-B(40c^2d^2-52bcde+5b^2e^2))\,x^3\sqrt{bx+cx^2}}{160e^3}$$
$$-\frac{(12Bcd-5bBe-12Ace)x^2(bx+cx^2)^{3/2}}{60e^2}+\frac{Bx(bx+cx^2)^{5/2}}{6e}$$
$$-\frac{(4Ace(256c^5d^5-640bc^4d^4e+480b^2c^3d^3e^2-80b^3c^2d^2e^3-10b^4cde^4-3b^5e^5)-B(1024c^6d^6-2560bc^5d^5\cdots}{512c^{7/2}e^7}$$
$$-\frac{2d^{5/2}(Bd-Ae)(cd-be)^{5/2}\operatorname{arctanh}\left(\frac{\sqrt{cd-be}x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{e^7}$$

output
```
1/512*(4*A*c*e*(-3*b^4*e^4-10*b^3*c*d*e^3+176*b^2*c^2*d^2*e^2-288*b*c^3*d^
3*e+128*c^4*d^4)-B*(-5*b^5*e^5-12*b^4*c*d*e^4-40*b^3*c^2*d^2*e^3+704*b^2*c
^3*d^3*e^2-1152*b*c^4*d^4*e+512*c^5*d^5))*(c*x^2+b*x)^(1/2)/c^3/e^6-1/768*
(4*A*c*e*(-3*b^3*e^3+118*b^2*c*d*e^2-208*b*c^2*d^2*e+96*c^3*d^3)-B*(-5*b^4
*e^4-12*b^3*c*d*e^3+472*b^2*c^2*d^2*e^2-832*b*c^3*d^3*e+384*c^4*d^4))*x*(c
*x^2+b*x)^(1/2)/c^2/e^5+1/960*(4*A*c*e*(93*b^2*e^2-170*b*c*d*e+80*c^2*d^2)
-B*(-5*b^3*e^3+372*b^2*c*d*e^2-680*b*c^2*d^2*e+320*c^3*d^3))*x^2*(c*x^2+b*
x)^(1/2)/c/e^4-1/160*(4*A*c*e*(-13*b*e+10*c*d)-B*(5*b^2*e^2-52*b*c*d*e+40*
c^2*d^2))*x^3*(c*x^2+b*x)^(1/2)/e^3-1/60*(-12*A*c*e-5*B*b*e+12*B*c*d)*x^2*
(c*x^2+b*x)^(3/2)/e^2+1/6*B*x*(c*x^2+b*x)^(5/2)/e-1/512*(4*A*c*e*(-3*b^5*e
^5-10*b^4*c*d*e^4-80*b^3*c^2*d^2*e^3+480*b^2*c^3*d^3*e^2-640*b*c^4*d^4*e+2
56*c^5*d^5)-B*(-5*b^6*e^6-12*b^5*c*d*e^5-40*b^4*c^2*d^2*e^4-320*b^3*c^3*d^
3*e^3+1920*b^2*c^4*d^4*e^2-2560*b*c^5*d^5*e+1024*c^6*d^6))*arctanh(c^(1/2)
*x/(c*x^2+b*x)^(1/2))/c^(7/2)/e^7-2*d^(5/2)*(-A*e+B*d)*(-b*e+c*d)^(5/2)*ar
ctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/e^7
```

Mathematica [A] (verified)

Time = 12.71 (sec) , antiderivative size = 650, normalized size of antiderivative = 0.88

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{d+ex}\,dx = \frac{\sqrt{x(b+cx)}\left(\frac{15\left(4Ace\left(-256c^5d^5+640bc^4d^4e-480b^2c^3d^3e^2+80b^3c^2d^2e^3+10b^4cde^4+3b^5e^5\right)+B\left(\cdots\right.}{\cdots}\right.}{\cdots}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x),x]
```

output
```
(Sqrt[x*(b + c*x)]*((15*(4*A*c*e*(-256*c^5*d^5 + 640*b*c^4*d^4*e - 480*b^2
*c^3*d^3*e^2 + 80*b^3*c^2*d^2*e^3 + 10*b^4*c*d*e^4 + 3*b^5*e^5) + B*(1024*
c^6*d^6 - 2560*b*c^5*d^5*e + 1920*b^2*c^4*d^4*e^2 - 320*b^3*c^3*d^3*e^3 -
40*b^4*c^2*d^2*e^4 - 12*b^5*c*d*e^5 - 5*b^6*e^6))*ArcSinh[(Sqrt[c]*Sqrt[x]
)/Sqrt[b]])/(Sqrt[b]*Sqrt[1 + (c*x)/b]) + Sqrt[c]*(e*Sqrt[x]*(4*A*c*e*(-45
*b^4*e^4 + 30*b^3*c*e^3*(-5*d + e*x) + 4*b^2*c^2*e^2*(660*d^2 - 295*d*e*x
+ 186*e^2*x^2) + 16*b*c^3*e*(-270*d^3 + 130*d^2*e*x - 85*d*e^2*x^2 + 63*e^
3*x^3) + 32*c^4*(60*d^4 - 30*d^3*e*x + 20*d^2*e^2*x^2 - 15*d*e^3*x^3 + 12*
e^4*x^4)) + B*(75*b^5*e^5 + 10*b^4*c*e^4*(18*d - 5*e*x) + 40*b^3*c^2*e^3*(
15*d^2 - 3*d*e*x + e^2*x^2) + 16*b^2*c^3*e^2*(-660*d^3 + 295*d^2*e*x - 186
*d*e^2*x^2 + 135*e^3*x^3) + 64*b*c^4*e*(270*d^4 - 130*d^3*e*x + 85*d^2*e^2
*x^2 - 63*d*e^3*x^3 + 50*e^4*x^4) - 128*c^5*(60*d^5 - 30*d^4*e*x + 20*d^3*
e^2*x^2 - 15*d^2*e^3*x^3 + 12*d*e^4*x^4 - 10*e^5*x^5))) - (15360*c^3*d^(5/
2)*(B*d - A*e)*(c*d - b*e)^(5/2)*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d
]*Sqrt[b + c*x])])/Sqrt[b + c*x])))/(7680*c^(7/2)*e^7*Sqrt[x])
```

Rubi [A] (verified)

Time = 2.59 (sec) , antiderivative size = 740, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.423$, Rules used = {1231, 27, 1231, 27, 1231, 27, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{d+ex}\,dx$$

$$\Big\downarrow \ 1231$$

$$-\frac{\int -\frac{(bd(12Bcd-5bBe-12Ace)-(12Ace(2cd-be)-B(24c^2d^2-12bced-5b^2e^2))x)\left(cx^2+bx\right)^{3/2}}{2(d+ex)}dx}{12ce^2}-\frac{\left(bx+cx^2\right)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}$$

$$\Big\downarrow \ 27$$

$$\frac{\int \frac{(bd(12Bcd-5bBe-12Ace)-(12Ace(2cd-be)-B(24c^2d^2-12bced-5b^2e^2))x)\left(cx^2+bx\right)^{3/2}}{d+ex}dx}{24ce^2}-\frac{\left(bx+cx^2\right)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}$$

$$\Big\downarrow \text{1231}$$

$$\frac{\frac{(bx+cx^2)^{3/2}(-2cex(12Ace(2cd-be)-B(-5b^2e^2-12bcde+24c^2d^2))+4Ace(3b^2e^2-22bcde+16c^2d^2)-B(5b^3e^3+12b^2cde^2-88bc^2d^2e+64c^3d^3))}{8ce^2}}{\frac{(bx+cx^2)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}}$$

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

$$\frac{\frac{(bx+cx^2)^{3/2}(-2cex(12Ace(2cd-be)-B(-5b^2e^2-12bcde+24c^2d^2))+4Ace(3b^2e^2-22bcde+16c^2d^2)-B(5b^3e^3+12b^2cde^2-88bc^2d^2e+64c^3d^3))}{8ce^2}}{\frac{(bx+cx^2)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}}$$

$$\Big\downarrow \text{1231}$$

$$\frac{\frac{(bx+cx^2)^{3/2}(-2cex(12Ace(2cd-be)-B(-5b^2e^2-12bcde+24c^2d^2))+4Ace(3b^2e^2-22bcde+16c^2d^2)-B(5b^3e^3+12b^2cde^2-88bc^2d^2e+64c^3d^3))}{8ce^2}}{\frac{(bx+cx^2)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}}$$

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

$$\frac{\frac{(bx+cx^2)^{3/2}(-2cex(12Ace(2cd-be)-B(-5b^2e^2-12bcde+24c^2d^2))+4Ace(3b^2e^2-22bcde+16c^2d^2)-B(5b^3e^3+12b^2cde^2-88bc^2d^2e+64c^3d^3))}{8ce^2}}{\frac{(bx+cx^2)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}}$$

$$\Big\downarrow \text{1269}$$

$$\frac{\frac{(bx+cx^2)^{3/2}(-2cex(12Ace(2cd-be)-B(-5b^2e^2-12bcde+24c^2d^2))+4Ace(3b^2e^2-22bcde+16c^2d^2)-B(5b^3e^3+12b^2cde^2-88bc^2d^2e+64c^3d^3))}{8ce^2}}{\frac{(bx+cx^2)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}}$$

$$\Big\downarrow \text{1091}$$

$$\frac{\frac{\left(bx+cx^2\right)^{3/2}\left(-2cex\left(12Ace(2cd-be)-B\left(-5b^2e^2-12bcde+24c^2d^2\right)\right)+4Ace\left(3b^2e^2-22bcde+16c^2d^2\right)-B\left(5b^3e^3+12b^2cde^2-88bc^2d^2e+64c^3d^3\right)\right)}{8ce^2}}{}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}$$

$\big\downarrow$ 219

$$\frac{\frac{\left(bx+cx^2\right)^{3/2}\left(-2cex\left(12Ace(2cd-be)-B\left(-5b^2e^2-12bcde+24c^2d^2\right)\right)+4Ace\left(3b^2e^2-22bcde+16c^2d^2\right)-B\left(5b^3e^3+12b^2cde^2-88bc^2d^2e+64c^3d^3\right)\right)}{8ce^2}}{}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}$$

$\big\downarrow$ 1154

$$\frac{\frac{\left(bx+cx^2\right)^{3/2}\left(-2cex\left(12Ace(2cd-be)-B\left(-5b^2e^2-12bcde+24c^2d^2\right)\right)+4Ace\left(3b^2e^2-22bcde+16c^2d^2\right)-B\left(5b^3e^3+12b^2cde^2-88bc^2d^2e+64c^3d^3\right)\right)}{8ce^2}}{}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}$$

$\big\downarrow$ 219

$$\frac{\frac{\left(bx+cx^2\right)^{3/2}\left(-2cex\left(12Ace(2cd-be)-B\left(-5b^2e^2-12bcde+24c^2d^2\right)\right)+4Ace\left(3b^2e^2-22bcde+16c^2d^2\right)-B\left(5b^3e^3+12b^2cde^2-88bc^2d^2e+64c^3d^3\right)\right)}{8ce^2}}{}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-12Ace-5bBe+12Bcd-10Bcex)}{60ce^2}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x),x]
```

output
```
-1/60*((12*B*c*d - 5*b*B*e - 12*A*c*e - 10*B*c*e*x)*(b*x + c*x^2)^(5/2))/(
c*e^2) + (((4*A*c*e*(16*c^2*d^2 - 22*b*c*d*e + 3*b^2*e^2) - B*(64*c^3*d^3
- 88*b*c^2*d^2*e + 12*b^2*c*d*e^2 + 5*b^3*e^3) - 2*c*e*(12*A*c*e*(2*c*d -
b*e) - B*(24*c^2*d^2 - 12*b*c*d*e - 5*b^2*e^2))*x)*(b*x + c*x^2)^(3/2))/(8
*c*e^2) - (-1/4*((3*(4*A*c*e*(128*c^4*d^4 - 288*b*c^3*d^3*e + 176*b^2*c^2*
d^2*e^2 - 10*b^3*c*d*e^3 - 3*b^4*e^4) - B*(512*c^5*d^5 - 1152*b*c^4*d^4*e
+ 704*b^2*c^3*d^3*e^2 - 40*b^3*c^2*d^2*e^3 - 12*b^4*c*d*e^4 - 5*b^5*e^5))
- 2*c*e*(8*b*c*d*e*(2*c*d - b*e)*(12*B*c*d - 5*b*B*e - 12*A*c*e) + 2*(8*c^
2*d^2 - 4*b*c*d*e - (3*b^2*e^2)/2)*(12*A*c*e*(2*c*d - b*e) - B*(24*c^2*d^2
 - 12*b*c*d*e - 5*b^2*e^2)))*x)*Sqrt[b*x + c*x^2])/(c*e^2) + (3*((2*(4*A*c
*e*(256*c^5*d^5 - 640*b*c^4*d^4*e + 480*b^2*c^3*d^3*e^2 - 80*b^3*c^2*d^2*e
^3 - 10*b^4*c*d*e^4 - 3*b^5*e^5) - B*(1024*c^6*d^6 - 2560*b*c^5*d^5*e + 19
20*b^2*c^4*d^4*e^2 - 320*b^3*c^3*d^3*e^3 - 40*b^4*c^2*d^2*e^4 - 12*b^5*c*d
*e^5 - 5*b^6*e^6))*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(Sqrt[c]*e) + (
1024*c^3*d^(5/2)*(B*d - A*e)*(c*d - b*e)^(5/2)*ArcTanh[(b*d + (2*c*d - b*e
)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/e))/(8*c*e^2))/(16*c*
e^2))/(24*c*e^2)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.09 (sec) , antiderivative size = 927, normalized size of antiderivative = 1.25

method	result
risch	$-\frac{(-1280B\,c^5e^5x^5-1536A\,c^5e^5x^4-3200Bb\,c^4e^5x^4+1536B\,c^5d\,e^4x^4-4032Ab\,c^4e^5x^3+1920A\,c^5d\,e^4x^3-2160B\,b^2c^3e^5x^3+4032Bb}{}$
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d),x,method=_RETURNVERBOSE)
```

output
```
-1/7680/c^3*(-1280*B*c^5*e^5*x^5-1536*A*c^5*e^5*x^4-3200*B*b*c^4*e^5*x^4+1
536*B*c^5*d*e^4*x^4-4032*A*b*c^4*e^5*x^3+1920*A*c^5*d*e^4*x^3-2160*B*b^2*c
^3*e^5*x^3+4032*B*b*c^4*d*e^4*x^3-1920*B*c^5*d^2*e^3*x^3-2976*A*b^2*c^3*e^
5*x^2+5440*A*b*c^4*d*e^4*x^2-2560*A*c^5*d^2*e^3*x^2-40*B*b^3*c^2*e^5*x^2+2
976*B*b^2*c^3*d*e^4*x^2-5440*B*b*c^4*d^2*e^3*x^2+2560*B*c^5*d^3*e^2*x^2-12
0*A*b^3*c^2*e^5*x+4720*A*b^2*c^3*d*e^4*x-8320*A*b*c^4*d^2*e^3*x+3840*A*c^5
*d^3*e^2*x+50*B*b^4*c*e^5*x+120*B*b^3*c^2*d*e^4*x-4720*B*b^2*c^3*d^2*e^3*x
+8320*B*b*c^4*d^3*e^2*x-3840*B*c^5*d^4*e*x+180*A*b^4*c*e^5+600*A*b^3*c^2*d
*e^4-10560*A*b^2*c^3*d^2*e^3+17280*A*b*c^4*d^3*e^2-7680*A*c^5*d^4*e-75*B*b
^5*e^5-180*B*b^4*c*d*e^4-600*B*b^3*c^2*d^2*e^3+10560*B*b^2*c^3*d^3*e^2-172
80*B*b*c^4*d^4*e+7680*B*c^5*d^5)*x*(c*x+b)/e^6/(x*(c*x+b))^(1/2)+1/1024/e^
6/c^3*((12*A*b^5*c*e^6+40*A*b^4*c^2*d*e^5+320*A*b^3*c^3*d^2*e^4-1920*A*b^2
*c^4*d^3*e^3+2560*A*b*c^5*d^4*e^2-1024*A*c^6*d^5*e-5*B*b^6*e^6-12*B*b^5*c*
d*e^5-40*B*b^4*c^2*d^2*e^4-320*B*b^3*c^3*d^3*e^3+1920*B*b^2*c^4*d^4*e^2-25
60*B*b*c^5*d^5*e+1024*B*c^6*d^6)/e*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x)^(1/2
))/c^(1/2)+1024*d^3*(A*b^3*e^4-3*A*b^2*c*d*e^3+3*A*b*c^2*d^2*e^2-A*c^3*d^3
*e-B*b^3*d*e^3+3*B*b^2*c*d^2*e^2-3*B*b*c^2*d^3*e+B*c^3*d^4)*c^3/e^2/(-d*(b
*e-c*d)/e^2)^(1/2)*ln((-2*d*(b*e-c*d)/e^2+(b*e-2*c*d)/e*(x+d/e)+2*(-d*(b*e
-c*d)/e^2)^(1/2)*(c*(x+d/e)^2+(b*e-2*c*d)/e*(x+d/e)-d*(b*e-c*d)/e^2)^(1/2)
)/(x+d/e)))
```

Fricas [A] (verification not implemented)

Time = 141.52 (sec) , antiderivative size = 3052, normalized size of antiderivative = 4.13

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{d+ex}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d),x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{d+ex}\,dx = \int \frac{(x(b+cx))^{\frac{5}{2}}\,(A+Bx)}{d+ex}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(5/2)/(e*x+d),x)
```

output
```
Integral((x*(b + c*x))**(5/2)*(A + B*x)/(d + e*x), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{d+ex}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d),x, algorithm="maxima")
```

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

Giac [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{d+ex}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d),x, algorithm="giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:Error: Bad Argument Type
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{d+ex}\,dx=\int \frac{{\left(c\,x^2+b\,x\right)}^{5/2}\,\left(A+B\,x\right)}{d+e\,x}\,dx$$

input
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x),x)
```

output
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x), x)
```

Reduce [B] (verification not implemented)

Time = 0.53 (sec) , antiderivative size = 1922, normalized size of antiderivative = 2.60

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{d+ex}\,dx=\text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d),x)
```

output
```
(15360*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*
x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**2*c**4*d**2*e**3 - 3
0720*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x)
 - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c**5*d**3*e**2 + 15360*
sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sq
rt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c**6*d**4*e - 15360*sqrt(d)*sq
rt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt
(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**3*c**4*d**3*e**2 + 30720*sqrt(d)*sqrt(b
*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*
sqrt(c))/(sqrt(d)*sqrt(c)))*b**2*c**5*d**4*e - 15360*sqrt(d)*sqrt(b*e - c*
d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c)
)/(sqrt(d)*sqrt(c)))*b*c**6*d**5 + 15360*sqrt(d)*sqrt(b*e - c*d)*atan((sqr
t(b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*s
qrt(c)))*a*b**2*c**4*d**2*e**3 - 30720*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(
b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqr
t(c)))*a*b*c**5*d**3*e**2 + 15360*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e -
 c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c))
)*a*c**6*d**4*e - 15360*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sq
rt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**3*c**
4*d**3*e**2 + 30720*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqr...
```

3.115 $\int \frac{(A+Bx)(bx+cx^2)^{5/2}}{(d+ex)^2} \, dx$

Optimal result

Integrand size = 26, antiderivative size = 659

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^2}\,dx =$$

$$-\frac{(10Ace(64c^3d^3-112bc^2d^2e+48b^2cde^2-b^3e^3)-B(768c^4d^4-1408bc^3d^3e+656b^2c^2d^2e^2-20b^3cde^3-3}{128c^2e^6}$$

$$+\frac{(10Ace(48c^2d^2-80bcde+31b^2e^2)-B(576c^3d^3-1008bc^2d^2e+428b^2cde^2-3b^3e^3))\,x\sqrt{bx+cx^2}}{192ce^5}$$

$$-\frac{(10Ae(40c^2d^2-65bcde+24b^2e^2)-Bd(480c^2d^2-820bcde+333b^2e^2))\,x^2\sqrt{bx+cx^2}}{240de^4}$$

$$-\frac{c(Bd(60cd-53be)-10Ae(5cd-4be))x^3\sqrt{bx+cx^2}}{40de^3}$$

$$+\frac{c(6Bd-5Ae)x^2(bx+cx^2)^{3/2}}{5de^2}-\frac{(Bd-Ae)x(bx+cx^2)^{5/2}}{de(d+ex)}$$

$$+\frac{(10Ace(128c^4d^4-256bc^3d^3e+144b^2c^2d^2e^2-16b^3cde^3-b^4e^4)-B(1536c^5d^5-3200bc^4d^4e+1920b^2c^3d^3}{128c^{5/2}e^7}$$

$$+\frac{d^{3/2}(cd-be)^{3/2}(Bd(12cd-7be)-5Ae(2cd-be))\text{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{e^7}$$

output
```
-1/128*(10*A*c*e*(-b^3*e^3+48*b^2*c*d*e^2-112*b*c^2*d^2*e+64*c^3*d^3)-B*(-
3*b^4*e^4-20*b^3*c*d*e^3+656*b^2*c^2*d^2*e^2-1408*b*c^3*d^3*e+768*c^4*d^4)
)*(c*x^2+b*x)^(1/2)/c^2/e^6+1/192*(10*A*c*e*(31*b^2*e^2-80*b*c*d*e+48*c^2*
d^2)-B*(-3*b^3*e^3+428*b^2*c*d*e^2-1008*b*c^2*d^2*e+576*c^3*d^3))*x*(c*x^2
+b*x)^(1/2)/c/e^5-1/240*(10*A*e*(24*b^2*e^2-65*b*c*d*e+40*c^2*d^2)-B*d*(33
3*b^2*e^2-820*b*c*d*e+480*c^2*d^2))*x^2*(c*x^2+b*x)^(1/2)/d/e^4-1/40*c*(B*
d*(-53*b*e+60*c*d)-10*A*e*(-4*b*e+5*c*d))*x^3*(c*x^2+b*x)^(1/2)/d/e^3+1/5*
c*(-5*A*e+6*B*d)*x^2*(c*x^2+b*x)^(3/2)/d/e^2-(-A*e+B*d)*x*(c*x^2+b*x)^(5/2
)/d/e/(e*x+d)+1/128*(10*A*c*e*(-b^4*e^4-16*b^3*c*d*e^3+144*b^2*c^2*d^2*e^2
-256*b*c^3*d^3*e+128*c^4*d^4)-B*(-3*b^5*e^5-20*b^4*c*d*e^4-240*b^3*c^2*d^2
*e^3+1920*b^2*c^3*d^3*e^2-3200*b*c^4*d^4*e+1536*c^5*d^5))*arctanh(c^(1/2)*
x/(c*x^2+b*x)^(1/2))/c^(5/2)/e^7+d^(3/2)*(-b*e+c*d)^(3/2)*(B*d*(-7*b*e+12*
c*d)-5*A*e*(-b*e+2*c*d))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1
/2))/e^7
```

Mathematica [A] (verified)

Time = 16.08 (sec) , antiderivative size = 855, normalized size of antiderivative = 1.30

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^2}\,dx=\frac{(x(b+cx))^{5/2}\left(\frac{(-Bd+Ae)x^{7/2}(b+cx)}{d+ex}+\frac{e(7bBd-2Acd-5Abe)\left(15\left(-256c^5d^5+640bc^4d^4e-4\right.\right.}{}\right.}{}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x)^2,x]
```

output
```
((x*(b + c*x))^(5/2)*(((-(B*d) + A*e)*x^(7/2)*(b + c*x))/(d + e*x) + (e*(7
*b*B*d - 2*A*c*d - 5*A*b*e)*(15*(-256*c^5*d^5 + 640*b*c^4*d^4*e - 480*b^2*
c^3*d^3*e^2 + 80*b^3*c^2*d^2*e^3 + 10*b^4*c*d*e^4 + 3*b^5*e^5)*(b + c*x)*A
rcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]] + Sqrt[b]*Sqrt[c]*Sqrt[1 + (c*x)/b]*(e*S
qrt[x]*(b + c*x)*(-45*b^4*e^4 + 30*b^3*c*e^3*(-5*d + e*x) + 4*b^2*c^2*e^2*
(660*d^2 - 295*d*e*x + 186*e^2*x^2) + 16*b*c^3*e*(-270*d^3 + 130*d^2*e*x -
 85*d*e^2*x^2 + 63*e^3*x^3) + 32*c^4*(60*d^4 - 30*d^3*e*x + 20*d^2*e^2*x^2
 - 15*d*e^3*x^3 + 12*e^4*x^4)) + 3840*c^2*d^(5/2)*(c*d - b*e)^(5/2)*Sqrt[b
 + c*x]*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x])])) + 3*(
B*d - A*e)*(-15*(-1024*c^6*d^6 + 2560*b*c^5*d^5*e - 1920*b^2*c^4*d^4*e^2 +
 320*b^3*c^3*d^3*e^3 + 40*b^4*c^2*d^2*e^4 + 12*b^5*c*d*e^5 + 5*b^6*e^6)*(b
 + c*x)*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]] + Sqrt[b]*Sqrt[c]*Sqrt[1 + (c*x
)/b]*(e*Sqrt[x]*(b + c*x)*(75*b^5*e^5 + 10*b^4*c*e^4*(18*d - 5*e*x) + 40*b
^3*c^2*e^3*(15*d^2 - 3*d*e*x + e^2*x^2) + 16*b^2*c^3*e^2*(-660*d^3 + 295*d
^2*e*x - 186*d*e^2*x^2 + 135*e^3*x^3) + 64*b*c^4*e*(270*d^4 - 130*d^3*e*x
+ 85*d^2*e^2*x^2 - 63*d*e^3*x^3 + 50*e^4*x^4) - 128*c^5*(60*d^5 - 30*d^4*e
*x + 20*d^3*e^2*x^2 - 15*d^2*e^3*x^3 + 12*d*e^4*x^4 - 10*e^5*x^5)) - 15360
*c^3*d^(7/2)*(c*d - b*e)^(5/2)*Sqrt[b + c*x]*ArcTanh[(Sqrt[c*d - b*e]*Sqrt
[x])/(Sqrt[d]*Sqrt[b + c*x])])))/(3840*Sqrt[b]*c^(5/2)*e^7*(b + c*x)^3*Sqr
t[1 + (c*x)/b]))/(d*(-(c*d) + b*e)*x^(5/2))
```

Rubi [A] (verified)

Time = 2.10 (sec) , antiderivative size = 607, normalized size of antiderivative = 0.92, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.385$, Rules used = {1230, 1231, 27, 1231, 27, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^2}dx$$

$$\Big\downarrow \text{1230}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-\frac{\int \frac{(b(6Bd-5Ae)+(12Bcd-bBe-10Ace)x)\left(cx^2+bx\right)^{3/2}}{d+ex}dx}{2e^2}$$

$$\Big\downarrow \text{1231}$$

$$\frac{(bx+cx^2)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-$$

$$\frac{\frac{(bx+cx^2)^{3/2}\left(6cex(-10Ace-bBe+12Bcd)+10Ace(8cd-7be)-2B\left(\frac{3b^2e^2}{2}-46bcde+48c^2d^2\right)\right)}{24ce^2}-\frac{\int\frac{\left(bd\left(10Ace(8cd-7be)-2B\left(48c^2d^2-46bced+\frac{3b^2}{2}\right.\right.\right.}{}}{}}{2e^2}$$

$$\Big\downarrow \; 27$$

$$\frac{(bx+cx^2)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-$$

$$\frac{\frac{(bx+cx^2)^{3/2}\left(6cex(-10Ace-bBe+12Bcd)+10Ace(8cd-7be)-2B\left(\frac{3b^2e^2}{2}-46bcde+48c^2d^2\right)\right)}{24ce^2}-\frac{\int\frac{\left(bd\left(10Ace(8cd-7be)-B\left(96c^2d^2-92bced+3b^2e^2\right.\right.\right.}{}}{}}{2e^2}$$

$$\Big\downarrow \; 1231$$

$$\frac{(bx+cx^2)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-$$

$$\frac{(bx+cx^2)^{3/2}\left(6cex(-10Ace-bBe+12Bcd)+10Ace(8cd-7be)-2B\left(\frac{3b^2e^2}{2}-46bcde+48c^2d^2\right)\right)}{24ce^2}-\frac{\int-\frac{bd\left(10Ace\left(64c^3d^3-112bc^2ed^2+48b^2ce^2d-b^3\right.\right.}{}}{}$$

$$\Big\downarrow \; 27$$

$$\frac{(bx+cx^2)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-$$

$$\frac{(bx+cx^2)^{3/2}\left(6cex(-10Ace-bBe+12Bcd)+10Ace(8cd-7be)-2B\left(\frac{3b^2e^2}{2}-46bcde+48c^2d^2\right)\right)}{24ce^2}-\frac{\int\frac{bd\left(10Ace\left(64c^3d^3-112bc^2ed^2+48b^2ce^2d-b^3e^3\right)\right.}{}}{}$$

$$\Big\downarrow \; 1269$$

$$\frac{(bx+cx^2)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-$$

$$\frac{(bx+cx^2)^{3/2}\left(6cex(-10Ace-bBe+12Bcd)+10Ace(8cd-7be)-2B\left(\frac{3b^2e^2}{2}-46bcde+48c^2d^2\right)\right)}{24ce^2}-\frac{\left(10Ace\left(-b^4e^4-16b^3cde^3+144b^2c^2d^2e^2-256bc^3d\right.\right.}{}$$

$$\Big\downarrow \; 1091$$

$$\frac{(bx+cx^2)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-$$

$$\frac{(bx+cx^2)^{3/2}\left(6cex(-10Ace-bBe+12Bcd)+10Ace(8cd-7be)-2B\left(\frac{3b^2e^2}{2}-46bcde+48c^2d^2\right)\right)}{24ce^2}-\frac{2\left(10Ace\left(-b^4e^4-16b^3cde^3+144b^2c^2d^2e^2-256bc^3\right.\right.}{}$$

$\Big\downarrow$ 219

$$\frac{(bx+cx^2)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-\frac{\frac{(bx+cx^2)^{3/2}\left(6cex(-10Ace-bBe+12Bcd)+10Ace(8cd-7be)-2B\left(\frac{3b^2e^2}{2}-46bcde+48c^2d^2\right)\right)}{24ce^2}-\frac{\frac{128c^2d^2(cd-be)^2(Bd(12cd-7be)-5Ae(2cd-be))\int}{e}}{}}{}$$

$\Big\downarrow$ 1154

$$\frac{(bx+cx^2)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-\frac{\frac{(bx+cx^2)^{3/2}\left(6cex(-10Ace-bBe+12Bcd)+10Ace(8cd-7be)-2B\left(\frac{3b^2e^2}{2}-46bcde+48c^2d^2\right)\right)}{24ce^2}-\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(10Ace\left(-b^4e^4-16b^3cd\right.\right.}{}}{}$$

$\Big\downarrow$ 219

$$\frac{(bx+cx^2)^{5/2}(-5Ae+6Bd+Bex)}{5e^2(d+ex)}-\frac{\frac{(bx+cx^2)^{3/2}\left(6cex(-10Ace-bBe+12Bcd)+10Ace(8cd-7be)-2B\left(\frac{3b^2e^2}{2}-46bcde+48c^2d^2\right)\right)}{24ce^2}-\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(10Ace\left(-b^4e^4-16b^3cd\right.\right.}{}}{}$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x)^2,x]
```

output
```
((6*B*d - 5*A*e + B*e*x)*(b*x + c*x^2)^(5/2))/(5*e^2*(d + e*x)) - (((10*A*
c*e*(8*c*d - 7*b*e) - 2*B*(48*c^2*d^2 - 46*b*c*d*e + (3*b^2*e^2)/2) + 6*c*
e*(12*B*c*d - b*B*e - 10*A*c*e)*x)*(b*x + c*x^2)^(3/2))/(24*c*e^2) - (-1/4
*((10*A*c*e*(64*c^3*d^3 - 112*b*c^2*d^2*e + 48*b^2*c*d*e^2 - b^3*e^3) - 2*
B*(384*c^4*d^4 - 704*b*c^3*d^3*e + 328*b^2*c^2*d^2*e^2 - 10*b^3*c*d*e^3 -
(3*b^4*e^4)/2) - 2*c*e*(8*b*c*e*(6*B*d - 5*A*e)*(2*c*d - b*e) - (12*B*c*d
- b*B*e - 10*A*c*e)*(16*c^2*d^2 - 8*b*c*d*e - 3*b^2*e^2))*x)*Sqrt[b*x + c*
x^2])/(c*e^2) + ((2*(10*A*c*e*(128*c^4*d^4 - 256*b*c^3*d^3*e + 144*b^2*c^2
*d^2*e^2 - 16*b^3*c*d*e^3 - b^4*e^4) - B*(1536*c^5*d^5 - 3200*b*c^4*d^4*e
+ 1920*b^2*c^3*d^3*e^2 - 240*b^3*c^2*d^2*e^3 - 20*b^4*c*d*e^4 - 3*b^5*e^5)
)*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(Sqrt[c]*e) + (128*c^2*d^(3/2)*(
c*d - b*e)^(3/2)*(B*d*(12*c*d - 7*b*e) - 5*A*e*(2*c*d - b*e))*ArcTanh[(b*d
 + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/e)/(8*
c*e^2))/(16*c*e^2))/(2*e^2)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.30 (sec) , antiderivative size = 1051, normalized size of antiderivative = 1.59

method	result	size
risch	Expression too large to display	1051
default	Expression too large to display	2390

input
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^2,x,method=_RETURNVERBOSE)
```

output
```
1/1920/c^2*(384*B*c^4*e^4*x^4+480*A*c^4*e^4*x^3+1008*B*b*c^3*e^4*x^3-960*B
*c^4*d*e^3*x^3+1360*A*b*c^3*e^4*x^2-1280*A*c^4*d*e^3*x^2+744*B*b^2*c^2*e^4
*x^2-2720*B*b*c^3*d*e^3*x^2+1920*B*c^4*d^2*e^2*x^2+1180*A*b^2*c^2*e^4*x-41
60*A*b*c^3*d*e^3*x+2880*A*c^4*d^2*e^2*x+30*B*b^3*c*e^4*x-2360*B*b^2*c^2*d*
e^3*x+6240*B*b*c^3*d^2*e^2*x-3840*B*c^4*d^3*e*x+150*A*b^3*c*e^4-5280*A*b^2
*c^2*d*e^3+12960*A*b*c^3*d^2*e^2-7680*A*c^4*d^3*e-45*B*b^4*e^4-300*B*b^3*c
*d*e^3+7920*B*b^2*c^2*d^2*e^2-17280*B*b*c^3*d^3*e+9600*B*c^4*d^4)*x*(c*x+b
)/e^6/(x*(c*x+b))^(1/2)-1/256/e^6/c^2*((10*A*b^4*c*e^5+160*A*b^3*c^2*d*e^4
-1440*A*b^2*c^3*d^2*e^3+2560*A*b*c^4*d^3*e^2-1280*A*c^5*d^4*e-3*B*b^5*e^5-
20*B*b^4*c*d*e^4-240*B*b^3*c^2*d^2*e^3+1920*B*b^2*c^3*d^3*e^2-3200*B*b*c^4
*d^4*e+1536*B*c^5*d^5)/e*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x)^(1/2))/c^(1/2)
+256*c^2*d^3*(A*b^3*e^4-3*A*b^2*c*d*e^3+3*A*b*c^2*d^2*e^2-A*c^3*d^3*e-B*b^
3*d*e^3+3*B*b^2*c*d^2*e^2-3*B*b*c^2*d^3*e+B*c^3*d^4)/e^3*(1/d/(b*e-c*d)*e^
2/(x+d/e)*(c*(x+d/e)^2+(b*e-2*c*d)/e*(x+d/e)-d*(b*e-c*d)/e^2)^(1/2)-1/2*(b
*e-2*c*d)*e/d/(b*e-c*d)/(-d*(b*e-c*d)/e^2)^(1/2)*ln((-2*d*(b*e-c*d)/e^2+(b
*e-2*c*d)/e*(x+d/e)+2*(-d*(b*e-c*d)/e^2)^(1/2)*(c*(x+d/e)^2+(b*e-2*c*d)/e*
(x+d/e)-d*(b*e-c*d)/e^2)^(1/2))/(x+d/e)))+256*d^2/e^2*c^2*(3*A*b^3*e^4-12*
A*b^2*c*d*e^3+15*A*b*c^2*d^2*e^2-6*A*c^3*d^3*e-4*B*b^3*d*e^3+15*B*b^2*c*d^
2*e^2-18*B*b*c^2*d^3*e+7*B*c^3*d^4)/(-d*(b*e-c*d)/e^2)^(1/2)*ln((-2*d*(b*e
-c*d)/e^2+(b*e-2*c*d)/e*(x+d/e)+2*(-d*(b*e-c*d)/e^2)^(1/2)*(c*(x+d/e)^2...
```

Fricas [A] (verification not implemented)

Time = 40.12 (sec) , antiderivative size = 3704, normalized size of antiderivative = 5.62

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^2}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^2,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^2}\,dx=\int \frac{(x(b+cx))^{\frac{5}{2}}\,(A+Bx)}{(d+ex)^2}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(5/2)/(e*x+d)**2,x)
```

output
```
Integral((x*(b + c*x))**(5/2)*(A + B*x)/(d + e*x)**2, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^2}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^2,x, algorithm="maxima")
```

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

Giac [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^2}\,dx=\text{Timed out}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^2,x, algorithm="giac")
```

output
```
Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^2}\,dx=\int \frac{{\left(c\,x^2+b\,x\right)}^{5/2}\,\left(A+B\,x\right)}{{\left(d+e\,x\right)}^2} \,dx$$

input
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x)^2,x)
```

output
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x)^2, x)
```

Reduce [B] (verification not implemented)

Time = 0.94 (sec) , antiderivative size = 2929, normalized size of antiderivative = 4.44

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^2}\,dx=\text{Too large to display}$$

input
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^2,x)
```

output
```
( - 9600*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b +
c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**2*c**3*d**2*e**3 -
 9600*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x
) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**2*c**3*d*e**4*x + 288
00*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) -
 sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c**4*d**3*e**2 + 28800*sq
rt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt
(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c**4*d**2*e**3*x - 19200*sqrt(
d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)
*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c**5*d**4*e - 19200*sqrt(d)*sqrt(b*
e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*s
qrt(c))/(sqrt(d)*sqrt(c)))*a*c**5*d**3*e**2*x + 13440*sqrt(d)*sqrt(b*e - c
*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c
))/(sqrt(d)*sqrt(c)))*b**3*c**3*d**3*e**2 + 13440*sqrt(d)*sqrt(b*e - c*d)*
atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(
sqrt(d)*sqrt(c)))*b**3*c**3*d**2*e**3*x - 36480*sqrt(d)*sqrt(b*e - c*d)*at
an((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sq
rt(d)*sqrt(c)))*b**2*c**4*d**4*e - 36480*sqrt(d)*sqrt(b*e - c*d)*atan((sqr
t(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*s
qrt(c)))*b**2*c**4*d**3*e**2*x + 23040*sqrt(d)*sqrt(b*e - c*d)*atan((sq...
```

3.116 $\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^3}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 645

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^3}\,dx = \frac{5(8Ace(16c^2d^2-20bcde+5b^2e^2)-B(192c^3d^3-272bc^2d^2e+88b^2cde^2-}{64ce^6}$$

$$-\frac{5(8Ae(12c^2d^2-14bcde+3b^2e^2)-Bd(144c^2d^2-192bcde+55b^2e^2))\,x\sqrt{bx+cx^2}}{96de^5}$$

$$+\frac{(2Ae(40c^2d^2-45bcde+9b^2e^2)-Bd(120c^2d^2-155bcde+42b^2e^2))\,x^2\sqrt{bx+cx^2}}{24d^2e^4}$$

$$+\frac{c(Bd(15cd-7be)-Ae(10cd-3be))x^3\sqrt{bx+cx^2}}{4d^2e^3}$$

$$-\frac{(Bd(12cd-7be)-Ae(8cd-3be))x^2(bx+cx^2)^{3/2}}{4d^2e^2(d+ex)}-\frac{(Bd-Ae)x(bx+cx^2)^{5/2}}{2de(d+ex)^2}$$

$$-\frac{5(8Ace(32c^3d^3-48bc^2d^2e+18b^2cde^2-b^3e^3)-B(384c^4d^4-640bc^3d^3e+288b^2c^2d^2e^2-24b^3cde^3-b^4e}{64c^{3/2}e^7}$$

$$+\frac{5\sqrt{d}\sqrt{cd-be}(Ae(16c^2d^2-16bcde+3b^2e^2)-Bd(24c^2d^2-28bcde+7b^2e^2))\,\operatorname{arctanh}\left(\frac{\sqrt{cd-bex}}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{4e^7}$$

output
```
5/64*(8*A*c*e*(5*b^2*e^2-20*b*c*d*e+16*c^2*d^2)-B*(-b^3*e^3+88*b^2*c*d*e^2
-272*b*c^2*d^2*e+192*c^3*d^3))*(c*x^2+b*x)^(1/2)/c/e^6-5/96*(8*A*e*(3*b^2*
e^2-14*b*c*d*e+12*c^2*d^2)-B*d*(55*b^2*e^2-192*b*c*d*e+144*c^2*d^2))*x*(c*
x^2+b*x)^(1/2)/d/e^5+1/24*(2*A*e*(9*b^2*e^2-45*b*c*d*e+40*c^2*d^2)-B*d*(42
*b^2*e^2-155*b*c*d*e+120*c^2*d^2))*x^2*(c*x^2+b*x)^(1/2)/d^2/e^4+1/4*c*(B*
d*(-7*b*e+15*c*d)-A*e*(-3*b*e+10*c*d))*x^3*(c*x^2+b*x)^(1/2)/d^2/e^3-1/4*(
B*d*(-7*b*e+12*c*d)-A*e*(-3*b*e+8*c*d))*x^2*(c*x^2+b*x)^(3/2)/d^2/e^2/(e*x
+d)-1/2*(-A*e+B*d)*x*(c*x^2+b*x)^(5/2)/d/e/(e*x+d)^2-5/64*(8*A*c*e*(-b^3*e
^3+18*b^2*c*d*e^2-48*b*c^2*d^2*e+32*c^3*d^3)-B*(-b^4*e^4-24*b^3*c*d*e^3+28
8*b^2*c^2*d^2*e^2-640*b*c^3*d^3*e+384*c^4*d^4))*arctanh(c^(1/2)*x/(c*x^2+b
*x)^(1/2))/c^(3/2)/e^7+5/4*d^(1/2)*(-b*e+c*d)^(1/2)*(A*e*(3*b^2*e^2-16*b*c
*d*e+16*c^2*d^2)-B*d*(7*b^2*e^2-28*b*c*d*e+24*c^2*d^2))*arctanh((-b*e+c*d)
^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/e^7
```

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 1945 vs. $2(645) = 1290$.

Time = 16.31 (sec) , antiderivative size = 1945, normalized size of antiderivative = 3.02

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^3}\,dx = \text{Too large to display}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x)^3,x]
```

output
```
((-(B*d) + A*e)*x*(b + c*x)*(x*(b + c*x))^(5/2))/(2*d*(-(c*d) + b*e)*(d +
e*x)^2) + ((x*(b + c*x))^(5/2)*(((-5*c*d*(B*d - A*e) + (e*(7*b*B*d - 4*A*c
*d - 3*A*b*e))/2)*x^(7/2)*(b + c*x)^(7/2))/(d*(-(c*d) + b*e)*(d + e*x)) +
(((8*A*c^2*d^2 + 4*b*c*d*(14*B*d - 11*A*e) - 5*b^2*e*(7*B*d - 3*A*e))*((2*
b^2*x^(5/2)*Sqrt[b + c*x]*(1 + (c*x)/b)^3*((5/(16*(1 + (c*x)/b)^3) + 5/(8*
(1 + (c*x)/b)^2) + (1 + (c*x)/b)^(-1))/2 - (15*b^3*((2*c*x)/b - (4*c^2*x^2
)/(3*b^2) - (2*Sqrt[c]*Sqrt[x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(Sqrt[b
]*Sqrt[1 + (c*x)/b])))/(512*c^3*x^3*(1 + (c*x)/b)^3)))/(5*e) - (d*(((5*b^3
*Sqrt[x]*Sqrt[b + c*x])/(64*c) + (59*b^2*x^(3/2)*Sqrt[b + c*x])/96 + (17*b
*c*x^(5/2)*Sqrt[b + c*x])/24 + (c^2*x^(7/2)*Sqrt[b + c*x])/4 - (5*b^(7/2)*
Sqrt[b + c*x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(64*c^(3/2)*Sqrt[1 + (c*
x)/b]))/e - (d*(((11*b^2*Sqrt[x]*Sqrt[b + c*x])/8 + (13*b*c*x^(3/2)*Sqrt[b
 + c*x])/12 + (c^2*x^(5/2)*Sqrt[b + c*x])/3 + (5*b^(5/2)*Sqrt[b + c*x]*Arc
Sinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(8*Sqrt[c]*Sqrt[1 + (c*x)/b]))/e - (d*((c
*((5*b*Sqrt[x]*Sqrt[b + c*x])/4 + (c*x^(3/2)*Sqrt[b + c*x])/2 + (3*b^(3/2)
*Sqrt[b + c*x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(4*Sqrt[c]*Sqrt[1 + (c*
x)/b])))/e - ((c*d - b*e)*((c*(Sqrt[x]*Sqrt[b + c*x] + (Sqrt[b]*Sqrt[b + c
*x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(Sqrt[c]*Sqrt[1 + (c*x)/b])))/e -
((c*d - b*e)*((2*Sqrt[b]*Sqrt[c]*Sqrt[1 + (c*x)/b]*ArcSinh[(Sqrt[c]*Sqrt[x
])/Sqrt[b]])/(e*Sqrt[b + c*x]) - (2*Sqrt[c*d - b*e]*ArcTanh[(Sqrt[c*d -...
```

Rubi [A] (verified)

Time = 1.82 (sec) , antiderivative size = 534, normalized size of antiderivative = 0.83, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.385$, Rules used = {1230, 27, 1230, 1231, 27, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^3}\,dx$$

$$\Big\downarrow \ 1230$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-\frac{5\int \frac{2(b(3Bd-2Ae)+(6Bcd-bBe-4Ace)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^2}dx}{16e^2}$$

$$\Big\downarrow \ 27$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-\frac{5\int \frac{(b(3Bd-2Ae)+(6Bcd-bBe-4Ace)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^2}dx}{8e^2}$$

$\Big\downarrow$ 1230

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-$$
$$\frac{5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-4Ace-bBe+6Bcd)-2Ae(8cd-3be)+Bd(24cd-13be))}{3e^2(d+ex)}-\frac{\int \frac{\left(b(Bd(24cd-13be)-2Ae(8cd-3be))-\left(16Ace(2cd-be)-B\left(48c^2d^2-\right.\right.\right.}{d+ex}}{2e^2}\right.}{8e^2}$$

$\Big\downarrow$ 1231

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-$$
$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-4Ace-bBe+6Bcd)-2Ae(8cd-3be)+Bd(24cd-13be))}{3e^2(d+ex)}-\frac{\sqrt{bx+cx^2}\left(-2cex\left(16Ace(2cd-be)-B\left(b^2e^2-32bcde+48c^2d^2\right)\right)+8Ac\right.}{}\right.$$

$\Big\downarrow$ 27

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-$$
$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-4Ace-bBe+6Bcd)-2Ae(8cd-3be)+Bd(24cd-13be))}{3e^2(d+ex)}-\frac{\sqrt{bx+cx^2}\left(-2cex\left(16Ace(2cd-be)-B\left(b^2e^2-32bcde+48c^2d^2\right)\right)+8Ac\right.}{}\right.$$

$\Big\downarrow$ 1269

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-$$
$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-4Ace-bBe+6Bcd)-2Ae(8cd-3be)+Bd(24cd-13be))}{3e^2(d+ex)}-\frac{\sqrt{bx+cx^2}\left(-2cex\left(16Ace(2cd-be)-B\left(b^2e^2-32bcde+48c^2d^2\right)\right)+8Ac\right.}{}\right.$$

$\Big\downarrow$ 1091

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-$$
$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-4Ace-bBe+6Bcd)-2Ae(8cd-3be)+Bd(24cd-13be))}{3e^2(d+ex)}-\frac{\sqrt{bx+cx^2}\left(-2cex\left(16Ace(2cd-be)-B\left(b^2e^2-32bcde+48c^2d^2\right)\right)+8Ac\right.}{}\right.$$

$\downarrow$ 219

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-$$
$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-4Ace-bBe+6Bcd)-2Ae(8cd-3be)+Bd(24cd-13be))}{3e^2(d+ex)}-\frac{\sqrt{bx+cx^2}\left(-2cex\left(16Ace(2cd-be)-B\left(b^2e^2-32bcde+48c^2d^2\right)\right)+8Ac\right.}{}\right.$$

$\downarrow$ 1154

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-$$
$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-4Ace-bBe+6Bcd)-2Ae(8cd-3be)+Bd(24cd-13be))}{3e^2(d+ex)}-\frac{\sqrt{bx+cx^2}\left(-2cex\left(16Ace(2cd-be)-B\left(b^2e^2-32bcde+48c^2d^2\right)\right)+8Ac\right.}{}\right.$$

$\downarrow$ 219

$$\frac{\left(bx+cx^2\right)^{5/2}(-2Ae+3Bd+Bex)}{4e^2(d+ex)^2}-$$
$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-4Ace-bBe+6Bcd)-2Ae(8cd-3be)+Bd(24cd-13be))}{3e^2(d+ex)}-\frac{\sqrt{bx+cx^2}\left(-2cex\left(16Ace(2cd-be)-B\left(b^2e^2-32bcde+48c^2d^2\right)\right)+8Ac\right.}{}\right.$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x)^3,x]
```

output
```
((3*B*d - 2*A*e + B*e*x)*(b*x + c*x^2)^(5/2))/(4*e^2*(d + e*x)^2) - (5*(((
B*d*(24*c*d - 13*b*e) - 2*A*e*(8*c*d - 3*b*e) + e*(6*B*c*d - b*B*e - 4*A*c
*e)*x)*(b*x + c*x^2)^(3/2))/(3*e^2*(d + e*x)) - (((8*A*c*e*(16*c^2*d^2 - 2
0*b*c*d*e + 5*b^2*e^2) - 2*B*(96*c^3*d^3 - 136*b*c^2*d^2*e + 44*b^2*c*d*e^
2 - (b^3*e^3)/2) - 2*c*e*(16*A*c*e*(2*c*d - b*e) - B*(48*c^2*d^2 - 32*b*c*
d*e + b^2*e^2))*x)*Sqrt[b*x + c*x^2])/(4*c*e^2) - ((2*(8*A*c*e*(32*c^3*d^3
 - 48*b*c^2*d^2*e + 18*b^2*c*d*e^2 - b^3*e^3) - B*(384*c^4*d^4 - 640*b*c^3
*d^3*e + 288*b^2*c^2*d^2*e^2 - 24*b^3*c*d*e^3 - b^4*e^4))*ArcTanh[(Sqrt[c]
*x)/Sqrt[b*x + c*x^2]])/(Sqrt[c]*e) - (16*c*Sqrt[d]*Sqrt[c*d - b*e]*(A*e*(
16*c^2*d^2 - 16*b*c*d*e + 3*b^2*e^2) - B*d*(24*c^2*d^2 - 28*b*c*d*e + 7*b^
2*e^2))*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*
x + c*x^2])])/e)/(8*c*e^2))/(2*e^2)))/(8*e^2)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.50 (sec) , antiderivative size = 498, normalized size of antiderivative = 0.77

method	result
pseudoelliptic	$\frac{\frac{15d(ex+d)^2\left(\frac{32e\,d^2\left(Ae-\frac{13Bd}{8}\right)b\,c^{\frac{7}{2}}}{3}-\frac{19e^2d\left(Ae-\frac{35Bd}{19}\right)b^2c^{\frac{5}{2}}}{3}+b^3e^3\left(Ae-\frac{7Bd}{3}\right)c^{\frac{3}{2}}-\frac{16d^3c^{\frac{9}{2}}\left(Ae-\frac{3Bd}{2}\right)}{3}\right)\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)}{4}}{}$
risch	Expression too large to display
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^3,x,method=_RETURNVERBOSE)
```

output
```
25/8/c^(3/2)/(d*(b*e-c*d))^(1/2)*(6/5*d*(e*x+d)^2*(32/3*e*d^2*(A*e-13/8*B*
d)*b*c^(7/2)-19/3*e^2*d*(A*e-35/19*B*d)*b^2*c^(5/2)+b^3*e^3*(A*e-7/3*B*d)*
c^(3/2)-16/3*d^3*c^(9/2)*(A*e-3/2*B*d))*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b
*e-c*d))^(1/2))+(1/5*(e*x+d)^2*(b^3*(A*c-1/8*B*b)*e^4+(-18*A*b^2*c^2-3*B*b
^3*c)*d*e^3+48*c^2*d^2*(A*c+3/4*B*b)*b*e^2-32*c^3*d^3*(A*c+5/2*B*b)*e+48*B
*c^4*d^4)*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))+e*(x*(c*x+b))^(1/2)*((8/75*
(3/4*B*x+A)*x^4*e^5-4/15*d*x^3*(3/5*B*x+A)*e^4+16/15*d^2*(3/8*B*x+A)*x^2*e
^3+24/5*d^3*x*(-1/3*B*x+A)*e^2+16/5*d^4*(-9/4*B*x+A)*e-24/5*B*d^5)*c^(7/2)
+e*((26/75*(17/26*B*x+A)*x^3*e^4-22/15*d*x^2*(2/5*B*x+A)*e^3-92/15*(-37/92
*B*x+A)*d^2*x*e^2-4*d^3*(-13/5*B*x+A)*e+34/5*B*d^4)*c^(5/2)+e*((11/25*x^2*
(59/132*B*x+A)*e^3+8/5*d*x*(-139/240*B*x+A)*e^2+d^2*(-209/60*B*x+A)*e-11/5
*B*d^3)*c^(3/2)+1/40*B*b*e*c^(1/2)*(e*x+d)^2)*b)*b))*(d*(b*e-c*d))^(1/2))/
e^7/(e*x+d)^2
```

Fricas [A] (verification not implemented)

Time = 5.78 (sec) , antiderivative size = 4068, normalized size of antiderivative = 6.31

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^3}\,dx=\text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^3,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^3}\,dx = \int \frac{(x(b+cx))^{\frac{5}{2}}\,(A+Bx)}{(d+ex)^3}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(5/2)/(e*x+d)**3,x)
```

output
```
Integral((x*(b + c*x))**(5/2)*(A + B*x)/(d + e*x)**3, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^3}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^3,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1448 vs. 2(599) = 1198.

Time = 0.32 (sec) , antiderivative size = 1448, normalized size of antiderivative = 2.24

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^3}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^3,x, algorithm="giac")
```

output
```
1/192*sqrt(c*x^2 + b*x)*(2*(4*(6*B*c^2*x/e^3 - (24*B*c^5*d*e^21 - 17*B*b*c
^4*e^22 - 8*A*c^5*e^22)/(c^3*e^25))*x + (288*B*c^5*d^2*e^20 - 312*B*b*c^4*
d*e^21 - 144*A*c^5*d*e^21 + 59*B*b^2*c^3*e^22 + 104*A*b*c^4*e^22)/(c^3*e^2
5))*x - 3*(640*B*c^5*d^3*e^19 - 864*B*b*c^4*d^2*e^20 - 384*A*c^5*d^2*e^20
+ 264*B*b^2*c^3*d*e^21 + 432*A*b*c^4*d*e^21 - 5*B*b^3*c^2*e^22 - 88*A*b^2*
c^3*e^22)/(c^3*e^25)) - 5/4*(24*B*c^3*d^5 - 52*B*b*c^2*d^4*e - 16*A*c^3*d^
4*e + 35*B*b^2*c*d^3*e^2 + 32*A*b*c^2*d^3*e^2 - 7*B*b^3*d^2*e^3 - 19*A*b^2
*c*d^2*e^3 + 3*A*b^3*d*e^4)*arctan(-((sqrt(c)*x - sqrt(c*x^2 + b*x))*e + s
qrt(c)*d)/sqrt(-c*d^2 + b*d*e))/(sqrt(-c*d^2 + b*d*e)*e^7) - 5/128*(384*B*
c^4*d^4 - 640*B*b*c^3*d^3*e - 256*A*c^4*d^3*e + 288*B*b^2*c^2*d^2*e^2 + 38
4*A*b*c^3*d^2*e^2 - 24*B*b^3*c*d*e^3 - 144*A*b^2*c^2*d*e^3 - B*b^4*e^4 + 8
*A*b^3*c*e^4)*log(abs(2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) + b))/(c^(
3/2)*e^7) - 1/4*(48*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*c^3*d^5*e - 100*(s
qrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b*c^2*d^4*e^2 - 40*(sqrt(c)*x - sqrt(c*x
^2 + b*x))^3*A*c^3*d^4*e^2 + 65*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b^2*c*
d^3*e^3 + 80*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b*c^2*d^3*e^3 - 13*(sqrt(
c)*x - sqrt(c*x^2 + b*x))^3*B*b^3*d^2*e^4 - 49*(sqrt(c)*x - sqrt(c*x^2 + b
*x))^3*A*b^2*c*d^2*e^4 + 9*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b^3*d*e^5 +
 88*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*B*c^(7/2)*d^6 - 156*(sqrt(c)*x - sqr
t(c*x^2 + b*x))^2*B*b*c^(5/2)*d^5*e - 72*(sqrt(c)*x - sqrt(c*x^2 + b*x)...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(bx+cx^2)^{5/2}}{(d+ex)^3}\,dx=\int \frac{(c\,x^2+b\,x)^{5/2}\,(A+B\,x)}{(d+e\,x)^3}\,dx$$

input
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x)^3,x)
```

output
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x)^3, x)
```

Reduce [F]

$$\int \frac{(A+Bx)\,(bx+cx^2)^{5/2}}{(d+ex)^3}\,dx = \int \frac{(Bx+A)\,(c\,x^2+bx)^{\frac{5}{2}}}{(ex+d)^3}dx$$

input
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^3,x)
```

output
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^3,x)
```

3.117 $\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4} dx$

Optimal result

Integrand size = 26, antiderivative size = 659

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4} dx =$$
$$-\frac{5(Ae(16c^2d^2-12bcde+b^2e^2)-2Bd(16c^2d^2-16bcde+3b^2e^2))\sqrt{bx+cx^2}}{8de^6}$$
$$+\frac{5(Ae(24c^2d^2-16bcde+b^2e^2)-Bd(48c^2d^2-44bcde+7b^2e^2))x\sqrt{bx+cx^2}}{24d^2e^5}$$
$$-\frac{(Ae(80c^2d^2-50bcde+3b^2e^2)-Bd(160c^2d^2-140bcde+21b^2e^2))x^2\sqrt{bx+cx^2}}{24d^3e^4}$$
$$+\frac{(Ae(20c^2d^2-16bcde+b^2e^2)-Bd(40c^2d^2-42bcde+7b^2e^2))x^3\sqrt{bx+cx^2}}{8d^3e^3(d+ex)}$$
$$-\frac{(Bd(12cd-7be)-Ae(6cd-be))x^2(bx+cx^2)^{3/2}}{12d^2e^2(d+ex)^2}-\frac{(Bd-Ae)x(bx+cx^2)^{5/2}}{3de(d+ex)^3}$$
$$+\frac{5(2Ace(16c^2d^2-16bcde+3b^2e^2)-B(64c^3d^3-80bc^2d^2e+24b^2cde^2-b^3e^3))\,\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{8\sqrt{c}e^7}$$
$$+\frac{5(Bd(64c^3d^3-112bc^2d^2e+56b^2cde^2-7b^3e^3)-Ae(32c^3d^3-48bc^2d^2e+18b^2cde^2-b^3e^3))\,\text{arctanh}\left(\frac{\sqrt{c}\ldots}{\sqrt{d}\sqrt{\ldots}}\right.}{8\sqrt{d}e^7\sqrt{cd-be}}$$

output
```
-5/8*(A*e*(b^2*e^2-12*b*c*d*e+16*c^2*d^2)-2*B*d*(3*b^2*e^2-16*b*c*d*e+16*c
^2*d^2))*(c*x^2+b*x)^(1/2)/d/e^6+5/24*(A*e*(b^2*e^2-16*b*c*d*e+24*c^2*d^2)
-B*d*(7*b^2*e^2-44*b*c*d*e+48*c^2*d^2))*x*(c*x^2+b*x)^(1/2)/d^2/e^5-1/24*(
A*e*(3*b^2*e^2-50*b*c*d*e+80*c^2*d^2)-B*d*(21*b^2*e^2-140*b*c*d*e+160*c^2*
d^2))*x^2*(c*x^2+b*x)^(1/2)/d^3/e^4+1/8*(A*e*(b^2*e^2-16*b*c*d*e+20*c^2*d^
2)-B*d*(7*b^2*e^2-42*b*c*d*e+40*c^2*d^2))*x^3*(c*x^2+b*x)^(1/2)/d^3/e^3/(e
*x+d)-1/12*(B*d*(-7*b*e+12*c*d)-A*e*(-b*e+6*c*d))*x^2*(c*x^2+b*x)^(3/2)/d^
2/e^2/(e*x+d)^2-1/3*(-A*e+B*d)*x*(c*x^2+b*x)^(5/2)/d/e/(e*x+d)^3+5/8*(2*A*
c*e*(3*b^2*e^2-16*b*c*d*e+16*c^2*d^2)-B*(-b^3*e^3+24*b^2*c*d*e^2-80*b*c^2*
d^2*e+64*c^3*d^3))*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(1/2)/e^7+5/8*(B
*d*(-7*b^3*e^3+56*b^2*c*d*e^2-112*b*c^2*d^2*e+64*c^3*d^3)-A*e*(-b^3*e^3+18
*b^2*c*d*e^2-48*b*c^2*d^2*e+32*c^3*d^3))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2
)/(c*x^2+b*x)^(1/2))/d^(1/2)/e^7/(-b*e+c*d)^(1/2)
```

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 2131 vs. $2(659) = 1318$.

Time = 16.50 (sec) , antiderivative size = 2131, normalized size of antiderivative = 3.23

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4}\,dx = \text{Result too large to show}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x)^4,x]
```

output
```
((-(B*d) + A*e)*x*(b + c*x)*(x*(b + c*x))^(5/2))/(3*d*(-(c*d) + b*e)*(d +
e*x)^3) + ((x*(b + c*x))^(5/2)*(((-4*c*d*(B*d - A*e) + (e*(7*b*B*d - 6*A*c
*d - A*b*e))/2)*x^(7/2)*(b + c*x)^(7/2))/(2*d*(-(c*d) + b*e)*(d + e*x)^2)
+ ((((e*(24*A*c^2*d^2 + 2*b*c*d*(14*B*d - 17*A*e) - 3*b^2*e*(7*B*d - A*e))
)/4 - (5*c*d*(B*d*(8*c*d - 7*b*e) - A*e*(2*c*d - b*e)))/2)*x^(7/2)*(b + c*
x)^(7/2))/(d*(-(c*d) + b*e)*(d + e*x)) + ((-3*(16*A*c^3*d^3 + 2*b^2*c*d*e*
(98*B*d - 39*A*e) - 8*b*c^2*d^2*(21*B*d - 8*A*e) - 5*b^3*e^2*(7*B*d - A*e)
)*((2*b^2*x^(5/2)*Sqrt[b + c*x]*(1 + (c*x)/b)^3*((5/(16*(1 + (c*x)/b)^3) +
 5/(8*(1 + (c*x)/b)^2) + (1 + (c*x)/b)^(-1))/2 - (15*b^3*((2*c*x)/b - (4*c
^2*x^2)/(3*b^2) - (2*Sqrt[c]*Sqrt[x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(
Sqrt[b]*Sqrt[1 + (c*x)/b])))/(512*c^3*x^3*(1 + (c*x)/b)^3)))/(5*e) - (d*((
(5*b^3*Sqrt[x]*Sqrt[b + c*x])/(64*c) + (59*b^2*x^(3/2)*Sqrt[b + c*x])/96 +
 (17*b*c*x^(5/2)*Sqrt[b + c*x])/24 + (c^2*x^(7/2)*Sqrt[b + c*x])/4 - (5*b^
(7/2)*Sqrt[b + c*x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(64*c^(3/2)*Sqrt[1
 + (c*x)/b]))/e - (d*(((11*b^2*Sqrt[x]*Sqrt[b + c*x])/8 + (13*b*c*x^(3/2)*
Sqrt[b + c*x])/12 + (c^2*x^(5/2)*Sqrt[b + c*x])/3 + (5*b^(5/2)*Sqrt[b + c*
x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(8*Sqrt[c]*Sqrt[1 + (c*x)/b]))/e -
(d*((c*((5*b*Sqrt[x]*Sqrt[b + c*x])/4 + (c*x^(3/2)*Sqrt[b + c*x])/2 + (3*b
^(3/2)*Sqrt[b + c*x]*ArcSinh[(Sqrt[c]*Sqrt[x])/Sqrt[b]])/(4*Sqrt[c]*Sqrt[1
 + (c*x)/b])))/e - ((c*d - b*e)*((c*(Sqrt[x]*Sqrt[b + c*x] + (Sqrt[b]*S...
```

Rubi [A] (verified)

Time = 1.72 (sec) , antiderivative size = 512, normalized size of antiderivative = 0.78, number of steps used = 12, number of rules used = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.423, Rules used = {1230, 27, 1230, 27, 1230, 25, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4}dx$$

$$\Big\downarrow \text{ 1230}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-\frac{5\int \frac{3(b(2Bd-Ae)+(4Bcd-bBe-2Ace)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^3}dx}{18e^2}$$

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

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-\frac{5\int \frac{(b(2Bd-Ae)+(4Bcd-bBe-2Ace)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^3}dx}{6e^2}$$

$\big\downarrow$ 1230

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-$$
$$\frac{5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{2e^2(d+ex)^2}-\frac{3\int \frac{2\left(b(4Bd(2cd-be)-Ae(4cd-be))-\left(4Ace(2cd-be)-B\left(16c^2d^2-12bced+\right.\right.\right.}{(d+ex)^2}}{8e^2}\right.}{6e^2}$$

$\big\downarrow$ 27

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-$$
$$\frac{5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{2e^2(d+ex)^2}-\frac{3\int \frac{\left(b(4Bd(2cd-be)-Ae(4cd-be))-\left(4Ace(2cd-be)-B\left(16c^2d^2-12bced+b\right.\right.\right.}{(d+ex)^2}}{4e^2}\right.}{6e^2}$$

$\big\downarrow$ 1230

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-$$
$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{2e^2(d+ex)^2}-\frac{3\left(-\frac{\int -\frac{b\left(-16c^2(2Bd-Ae)d^2+4bce(8Bd-3Ae)d-b^2e^2(6Bd-Ae)\right)+\left(2Ac\right.}{(d+e}}{}\right.}{}\right.$$

$\big\downarrow$ 25

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-$$
$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{2e^2(d+ex)^2}-\frac{3\left(\frac{\int \frac{b\left(-16c^2(2Bd-Ae)d^2+4bce(8Bd-3Ae)d-b^2e^2(6Bd-Ae)\right)+\left(2Ace\left(1\right.\right.}{(d+ex)\sqrt{}}}{2e}\right.}{}\right.$$

$\big\downarrow$ 1269

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-$$

$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{2e^2(d+ex)^2}-\frac{3\left(\frac{\left(2Ace\left(3b^2e^2-16bcde+16c^2d^2\right)-B\left(-b^3e^3+24b^2cde^2-80bc^2d^2e+64c^3 \right.\right.}{e}\right.}{}\right.$$

$$\Big\downarrow \; 1091$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-$$

$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{2e^2(d+ex)^2}-\frac{3\left(\frac{\left(Bd\left(-7b^3e^3+56b^2cde^2-112bc^2d^2e+64c^3d^3\right)-Ae\left(-b^3e^3+18b^2cde^2- \right.\right.}{e}\right.}{}\right.$$

$$\Big\downarrow \; 219$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-$$

$$5\left(\frac{\left(bx+cx^2\right)^{3/2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{2e^2(d+ex)^2}-\frac{3\left(\frac{\left(Bd\left(-7b^3e^3+56b^2cde^2-112bc^2d^2e+64c^3d^3\right)-Ae\left(-b^3e^3+18b^2cde^2- \right.\right.}{e}\right.}{}\right.$$

$$\Big\downarrow \; 1154$$

$$\frac{(bx+cx^2)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-$$

$$5\left(\frac{(bx+cx^2)^{3/2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{2e^2(d+ex)^2}-\frac{3\left(\frac{\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(2Ace\left(3b^2e^2-16bcde+16c^2d^2\right)-B\left(-b^3e^3+\right.\right.}{\sqrt{c}e}}{}\right.}{}\right.$$

$\Big\downarrow$ 219

$$\frac{(bx+cx^2)^{5/2}(-Ae+2Bd+Bex)}{3e^2(d+ex)^3}-$$

$$5\left(\frac{(bx+cx^2)^{3/2}(ex(-2Ace-bBe+4Bcd)-Ae(4cd-be)+4Bd(2cd-be))}{2e^2(d+ex)^2}-\frac{3\left(\frac{\frac{2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(2Ace\left(3b^2e^2-16bcde+16c^2d^2\right)-B\left(-b^3e^3+\right.\right.}{\sqrt{c}e}}{}\right.}{}\right.$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x)^4,x]
```

output
```
((2*B*d - A*e + B*e*x)*(b*x + c*x^2)^(5/2))/(3*e^2*(d + e*x)^3) - (5*(((4*
B*d*(2*c*d - b*e) - A*e*(4*c*d - b*e) + e*(4*B*c*d - b*B*e - 2*A*c*e)*x)*(
b*x + c*x^2)^(3/2))/(2*e^2*(d + e*x)^2) - (3*(-(((A*e*(16*c^2*d^2 - 12*b*c
*d*e + b^2*e^2) - 2*B*d*(16*c^2*d^2 - 16*b*c*d*e + 3*b^2*e^2) + e*(4*A*c*e
*(2*c*d - b*e) - B*(16*c^2*d^2 - 12*b*c*d*e + b^2*e^2))*x)*Sqrt[b*x + c*x^
2])/(e^2*(d + e*x))) + ((2*(2*A*c*e*(16*c^2*d^2 - 16*b*c*d*e + 3*b^2*e^2)
- B*(64*c^3*d^3 - 80*b*c^2*d^2*e + 24*b^2*c*d*e^2 - b^3*e^3))*ArcTanh[(Sqr
t[c]*x)/Sqrt[b*x + c*x^2]])/(Sqrt[c]*e) + ((B*d*(64*c^3*d^3 - 112*b*c^2*d^
2*e + 56*b^2*c*d*e^2 - 7*b^3*e^3) - A*e*(32*c^3*d^3 - 48*b*c^2*d^2*e + 18*
b^2*c*d*e^2 - b^3*e^3))*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*
d - b*e]*Sqrt[b*x + c*x^2])])/(Sqrt[d]*e*Sqrt[c*d - b*e]))/(2*e^2)))/(4*e^
2)))/(6*e^2)
```

Defintions of rubi rules used

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

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.72 (sec) , antiderivative size = 455, normalized size of antiderivative = 0.69

method	result
pseudoelliptic	$\frac{45\left(-\frac{8e\,d^2 b\left(Ae-\frac{7Bd}{3}\right)c^{\frac{5}{2}}}{3}+b^2 d\,e^2\left(Ae-\frac{28Bd}{9}\right)c^{\frac{3}{2}}+\frac{16d^3(Ae-2Bd)c^{\frac{7}{2}}}{9}-\frac{b^3 e^3\sqrt{c}\,(Ae-7Bd)}{18}\right)(ex+d)^3\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)}{4}+\frac{15\left(\cdots\right.}{}$
risch	Expression too large to display
default	Expression too large to display

input
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^4,x,method=_RETURNVERBOSE)
```

output
```
15/2/c^(1/2)/(d*(b*e-c*d))^(1/2)*(3/2*(-8/3*e*d^2*b*(A*e-7/3*B*d)*c^(5/2)+
b^2*d*e^2*(A*e-28/9*B*d)*c^(3/2)+16/9*d^3*(A*e-2*B*d)*c^(7/2)-1/18*b^3*e^3
*c^(1/2)*(A*e-7*B*d))*(e*x+d)^3*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))
^(1/2))+(1/2*(b^2*(A*c+1/6*B*b)*e^3-16/3*c*d*(A*c+3/4*B*b)*b*e^2+16/3*c^2*
d^2*(A*c+5/2*B*b)*e-32/3*B*c^3*d^3)*(e*x+d)^3*arctanh((x*(c*x+b))^(1/2)/x/
c^(1/2))+e*(x*(c*x+b))^(1/2)*(1/3*(1/5*x^4*(2/3*B*x+A)*e^5-d*x^3*(2/5*B*x+
A)*e^4-22/3*d^2*x^2*(-3/11*B*x+A)*e^3-10*d^3*x*(-22/15*B*x+A)*e^2-4*d^4*(-
5*B*x+A)*e+8*B*d^5)*c^(5/2)+e*b*((3/10*(13/27*B*x+A)*x^3*e^4+35/18*(-69/17
5*B*x+A)*d*x^2*e^3+23/9*d^2*x*(-2*B*x+A)*e^2+d^3*(-61/9*B*x+A)*e-8/3*B*d^4
)*c^(3/2)-1/12*e*b*(11/5*x^2*(-B*x+A)*e^3+8/3*(-93/20*B*x+A)*d*x*e^2+d^2*(
-47/3*B*x+A)*e-6*B*d^3)*c^(1/2))))*(d*(b*e-c*d))^(1/2))/(e*x+d)^3/e^7
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1477 vs. 2(616) = 1232.

Time = 2.69 (sec) , antiderivative size = 5929, normalized size of antiderivative = 9.00

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^4,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4}\,dx = \int \frac{(x(b+cx))^{\frac{5}{2}}\,(A+Bx)}{(d+ex)^4}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(5/2)/(e*x+d)**4,x)
```

output
```
Integral((x*(b + c*x))**(5/2)*(A + B*x)/(d + e*x)**4, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^4,x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1929 vs. $2(616) = 1232$.

Time = 0.37 (sec) , antiderivative size = 1929, normalized size of antiderivative = 2.93

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^4,x, algorithm="giac")
```

output
```
1/24*sqrt(c*x^2 + b*x)*(2*x*(4*B*c^2*x/e^4 - (24*B*c^4*d*e^17 - 13*B*b*c^3
*e^18 - 6*A*c^4*e^18)/(c^2*e^22)) + 3*(80*B*c^4*d^2*e^16 - 72*B*b*c^3*d*e^
17 - 32*A*c^4*d*e^17 + 11*B*b^2*c^2*e^18 + 18*A*b*c^3*e^18)/(c^2*e^22)) +
5/8*(64*B*c^3*d^4 - 112*B*b*c^2*d^3*e - 32*A*c^3*d^3*e + 56*B*b^2*c*d^2*e^
2 + 48*A*b*c^2*d^2*e^2 - 7*B*b^3*d*e^3 - 18*A*b^2*c*d*e^3 + A*b^3*e^4)*arc
tan(-((sqrt(c)*x - sqrt(c*x^2 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))
/(sqrt(-c*d^2 + b*d*e)*e^7) + 5/16*(64*B*c^3*d^3 - 80*B*b*c^2*d^2*e - 32*A
*c^3*d^2*e + 24*B*b^2*c*d*e^2 + 32*A*b*c^2*d*e^2 - B*b^3*e^3 - 6*A*b^2*c*e
^3)*log(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) - b))/(sqrt(c)*e^7)
 + 1/24*(720*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*B*c^3*d^4*e^2 - 1200*(sqrt(
c)*x - sqrt(c*x^2 + b*x))^5*B*b*c^2*d^3*e^3 - 480*(sqrt(c)*x - sqrt(c*x^2
+ b*x))^5*A*c^3*d^3*e^3 + 600*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*B*b^2*c*d^
2*e^4 + 720*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*A*b*c^2*d^2*e^4 - 87*(sqrt(c
)*x - sqrt(c*x^2 + b*x))^5*B*b^3*d*e^5 - 306*(sqrt(c)*x - sqrt(c*x^2 + b*x
))^5*A*b^2*c*d*e^5 + 33*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*A*b^3*e^6 + 2592
*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*B*c^(7/2)*d^5*e - 3840*(sqrt(c)*x - sqr
t(c*x^2 + b*x))^4*B*b*c^(5/2)*d^4*e^2 - 1680*(sqrt(c)*x - sqrt(c*x^2 + b*x
))^4*A*c^(7/2)*d^4*e^2 + 1560*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*B*b^2*c^(3
/2)*d^3*e^3 + 2160*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*A*b*c^(5/2)*d^3*e^3 -
 147*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*B*b^3*sqrt(c)*d^2*e^4 - 666*(sqr...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4}\,dx=\int \frac{{\left(c\,x^2+b\,x\right)}^{5/2}\,\left(A+B\,x\right)}{{\left(d+e\,x\right)}^4}\,dx$$

input
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x)^4,x)
```

output
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x)^4, x)
```

Reduce [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^4}\,dx=\int \frac{(Bx+A)\left(c\,x^2+bx\right)^{\frac{5}{2}}}{(ex+d)^4}dx$$

input
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^4,x)
```

output
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^4,x)
```

3.118 $\int \frac{(A+Bx)(bx+cx^2)^{5/2}}{(d+ex)^5}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 780

$$\int \frac{(A+Bx)(bx+cx^2)^{5/2}}{(d+ex)^5}\,dx =$$

$$-\frac{5(Bd(192c^3d^3-304bc^2d^2e+120b^2cde^2-7b^3e^3)-Ae(64c^3d^3-80bc^2d^2e+16b^2cde^2+b^3e^3))\sqrt{bx+cx^2}\cdots}{64d^2e^6(cd-be)}$$

$$+\frac{5(Bd(288c^3d^3-432bc^2d^2e+154b^2cde^2-7b^3e^3)-Ae(96c^3d^3-112bc^2d^2e+18b^2cde^2+b^3e^3))\,x\sqrt{bx+c\cdots}}{192d^3e^5(cd-be)}$$

$$+\frac{(Ae(40c^2d^2-24bcde-b^2e^2)-Bd(120c^2d^2-112bcde+7b^2e^2))\,x^3\sqrt{bx+cx^2}}{96d^3e^3(d+ex)^2}$$

$$-\frac{(Bd(960c^3d^3-1400bc^2d^2e+476b^2cde^2-21b^3e^3)-Ae(320c^3d^3-360bc^2d^2e+52b^2cde^2+3b^3e^3))\,x^2\sqrt{b\cdots}}{192d^3e^4(cd-be)(d+ex)}$$

$$-\frac{(Bd(12cd-7be)-Ae(4cd+be))x^2(bx+cx^2)^{3/2}}{24d^2e^2(d+ex)^3}-\frac{(Bd-Ae)x(bx+cx^2)^{5/2}}{4de(d+ex)^4}$$

$$-\frac{5\sqrt{c}(4Ace(2cd-be)-B(24c^2d^2-20bcde+3b^2e^2))\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4e^7}$$

$$+\frac{5(Ae(128c^4d^4-256bc^3d^3e+144b^2c^2d^2e^2-16b^3cde^3-b^4e^4)-Bd(384c^4d^4-896bc^3d^3e+672b^2c^2d^2e^2-\cdots}{64d^{3/2}e^7(cd-be)^{3/2}}$$

output
```
-5/64*(B*d*(-7*b^3*e^3+120*b^2*c*d*e^2-304*b*c^2*d^2*e+192*c^3*d^3)-A*e*(b
^3*e^3+16*b^2*c*d*e^2-80*b*c^2*d^2*e+64*c^3*d^3))*(c*x^2+b*x)^(1/2)/d^2/e^
6/(-b*e+c*d)+5/192*(B*d*(-7*b^3*e^3+154*b^2*c*d*e^2-432*b*c^2*d^2*e+288*c^
3*d^3)-A*e*(b^3*e^3+18*b^2*c*d*e^2-112*b*c^2*d^2*e+96*c^3*d^3))*x*(c*x^2+b
*x)^(1/2)/d^3/e^5/(-b*e+c*d)+1/96*(A*e*(-b^2*e^2-24*b*c*d*e+40*c^2*d^2)-B*
d*(7*b^2*e^2-112*b*c*d*e+120*c^2*d^2))*x^3*(c*x^2+b*x)^(1/2)/d^3/e^3/(e*x+
d)^2-1/192*(B*d*(-21*b^3*e^3+476*b^2*c*d*e^2-1400*b*c^2*d^2*e+960*c^3*d^3)
-A*e*(3*b^3*e^3+52*b^2*c*d*e^2-360*b*c^2*d^2*e+320*c^3*d^3))*x^2*(c*x^2+b*
x)^(1/2)/d^3/e^4/(-b*e+c*d)/(e*x+d)-1/24*(B*d*(-7*b*e+12*c*d)-A*e*(b*e+4*c
*d))*x^2*(c*x^2+b*x)^(3/2)/d^2/e^2/(e*x+d)^3-1/4*(-A*e+B*d)*x*(c*x^2+b*x)^
(5/2)/d/e/(e*x+d)^4-5/4*c^(1/2)*(4*A*c*e*(-b*e+2*c*d)-B*(3*b^2*e^2-20*b*c*
d*e+24*c^2*d^2))*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/e^7+5/64*(A*e*(-b^4*
e^4-16*b^3*c*d*e^3+144*b^2*c^2*d^2*e^2-256*b*c^3*d^3*e+128*c^4*d^4)-B*d*(7
*b^4*e^4-168*b^3*c*d*e^3+672*b^2*c^2*d^2*e^2-896*b*c^3*d^3*e+384*c^4*d^4))
*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(3/2)/e^7/(-b*e+c
*d)^(3/2)
```

Mathematica [B] (verified)

Leaf count is larger than twice the leaf count of optimal. 2578 vs. 2(780) = 1560.

Time = 16.64 (sec) , antiderivative size = 2578, normalized size of antiderivative = 3.31

$$\int \frac{(A+Bx)\,(bx+cx^2)^{5/2}}{(d+ex)^5}\,dx = \text{Result too large to show}$$

input
```
Integrate[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x)^5,x]
```

output
```
((-(B*d) + A*e)*x*(b + c*x)*(x*(b + c*x))^(5/2))/(4*d*(-(c*d) + b*e)*(d +
e*x)^4) + ((x*(b + c*x))^(5/2)*(((-3*c*d*(B*d - A*e) + (e*(7*b*B*d - 8*A*c
*d + A*b*e))/2)*x^(7/2)*(b + c*x)^(7/2))/(3*d*(-(c*d) + b*e)*(d + e*x)^3)
+ (((-2*c*d*(B*d*(6*c*d - 7*b*e) + A*e*(2*c*d - b*e)) + (e*(-7*b^2*B*d*e +
 A*(48*c^2*d^2 - 40*b*c*d*e - b^2*e^2)))/4)*x^(7/2)*(b + c*x)^(7/2))/(2*d*
(-(c*d) + b*e)*(d + e*x)^2) + ((((e*(-192*A*c^3*d^3 - 4*b^2*c*d*e*(91*B*d
- 17*A*e) + 3*b^3*e^2*(7*B*d + A*e) + 16*b*c^2*d^2*(21*B*d + 8*A*e)))/8 +
(5*c*d*(A*e*(32*c^2*d^2 - 32*b*c*d*e - b^2*e^2) - B*d*(48*c^2*d^2 - 56*b*c
*d*e + 7*b^2*e^2)))/4)*x^(7/2)*(b + c*x)^(7/2))/(d*(-(c*d) + b*e)*(d + e*x
)) + ((-1/8*(c*d*(-192*A*c^3*d^3 - 4*b^2*c*d*e*(91*B*d - 17*A*e) + 3*b^3*e
^2*(7*B*d + A*e) + 16*b*c^2*d^2*(21*B*d + 8*A*e))) + (b*e*(-192*A*c^3*d^3
- 4*b^2*c*d*e*(91*B*d - 17*A*e) + 3*b^3*e^2*(7*B*d + A*e) + 16*b*c^2*d^2*(
21*B*d + 8*A*e)))/8 - (7*b*((e*(-192*A*c^3*d^3 - 4*b^2*c*d*e*(91*B*d - 17*
A*e) + 3*b^3*e^2*(7*B*d + A*e) + 16*b*c^2*d^2*(21*B*d + 8*A*e)))/8 + (5*c*
d*(A*e*(32*c^2*d^2 - 32*b*c*d*e - b^2*e^2) - B*d*(48*c^2*d^2 - 56*b*c*d*e
+ 7*b^2*e^2)))/4))/2)*((2*b^2*x^(5/2)*Sqrt[b + c*x]*(1 + (c*x)/b)^3*((5/(1
6*(1 + (c*x)/b)^3) + 5/(8*(1 + (c*x)/b)^2) + (1 + (c*x)/b)^(-1))/2 - (15*b
^3*((2*c*x)/b - (4*c^2*x^2)/(3*b^2) - (2*Sqrt[c]*Sqrt[x]*ArcSinh[(Sqrt[c]*
Sqrt[x])/Sqrt[b]])/(Sqrt[b]*Sqrt[1 + (c*x)/b])))/(512*c^3*x^3*(1 + (c*x)/b
)^3)))/(5*e) - (d*(((5*b^3*Sqrt[x]*Sqrt[b + c*x])/(64*c) + (59*b^2*x^(3...
```

Rubi [A] (verified)

Time = 2.12 (sec) , antiderivative size = 660, normalized size of antiderivative = 0.85, number of steps used = 11, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.385$, Rules used = {1230, 27, 1229, 27, 1230, 1269, 1091, 219, 1154, 219}

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

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^5}\,dx$$

$$\Big\downarrow \text{1230}$$

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-\frac{5\int \frac{2(b(3Bd-Ae)+2(3Bcd-bBe-Ace)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^4}dx}{16e^2}$$

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

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-\frac{5\int \frac{(b(3Bd-Ae)+2(3Bcd-bBe-Ace)x)\left(cx^2+bx\right)^{3/2}}{(d+ex)^4}dx}{8e^2}$$

$\Big\downarrow$ 1229

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-\frac{5\left(\frac{\left(bx+cx^2\right)^{3/2}\left(3ex\left(Ae\left(b^2e^2-8bcde+8c^2d^2\right)-Bd\left(9b^2e^2-32bcde+24c^2d^2\right)\right)+d\left(Ae\left(-b^2e^2-12bcde+16c^2d^2\right)-Bd\left(7b^2e^2-52bcde+48c^2d^2\right)\right)\right)}{12de^2(d+ex)^3(cd-be)}\right.}{8e^2}$$

$\Big\downarrow$ 27

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-\frac{5\left(\frac{\left(bx+cx^2\right)^{3/2}\left(3ex\left(Ae\left(b^2e^2-8bcde+8c^2d^2\right)-Bd\left(9b^2e^2-32bcde+24c^2d^2\right)\right)+d\left(Ae\left(-b^2e^2-12bcde+16c^2d^2\right)-Bd\left(7b^2e^2-52bcde+48c^2d^2\right)\right)\right)}{12de^2(d+ex)^3(cd-be)}\right.}{8e^2}$$

$\Big\downarrow$ 1230

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-$$

$$5\left(\frac{\left(bx+cx^2\right)^{3/2}\left(3ex\left(Ae\left(b^2e^2-8bcde+8c^2d^2\right)-Bd\left(9b^2e^2-32bcde+24c^2d^2\right)\right)+d\left(Ae\left(-b^2e^2-12bcde+16c^2d^2\right)-Bd\left(7b^2e^2-52bcde+48c^2d^2\right)\right)\right)}{12de^2(d+ex)^3(cd-be)}\right.$$

$\Big\downarrow$ 1269

$$\frac{\left(bx+cx^2\right)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-$$

$$5\left(\frac{\left(bx+cx^2\right)^{3/2}\left(3ex\left(Ae\left(b^2e^2-8bcde+8c^2d^2\right)-Bd\left(9b^2e^2-32bcde+24c^2d^2\right)\right)+d\left(Ae\left(-b^2e^2-12bcde+16c^2d^2\right)-Bd\left(7b^2e^2-52bcde+48c^2d^2\right)\right)\right)}{12de^2(d+ex)^3(cd-be)}\right.$$

$\Big\downarrow$ 1091

$$\frac{(bx+cx^2)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-$$

$$5\left(\frac{(bx+cx^2)^{3/2}(3ex(Ae(b^2e^2-8bcde+8c^2d^2)-Bd(9b^2e^2-32bcde+24c^2d^2))+d(Ae(-b^2e^2-12bcde+16c^2d^2)-Bd(7b^2e^2-52bcde+48c^2d^2)))}{12de^2(d+ex)^3(cd-be)}\right.$$

$\big\downarrow$ 219

$$\frac{(bx+cx^2)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-$$

$$5\left(\frac{(bx+cx^2)^{3/2}(3ex(Ae(b^2e^2-8bcde+8c^2d^2)-Bd(9b^2e^2-32bcde+24c^2d^2))+d(Ae(-b^2e^2-12bcde+16c^2d^2)-Bd(7b^2e^2-52bcde+48c^2d^2)))}{12de^2(d+ex)^3(cd-be)}\right.$$

$\big\downarrow$ 1154

$$\frac{(bx+cx^2)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-$$

$$5\left(\frac{(bx+cx^2)^{3/2}(3ex(Ae(b^2e^2-8bcde+8c^2d^2)-Bd(9b^2e^2-32bcde+24c^2d^2))+d(Ae(-b^2e^2-12bcde+16c^2d^2)-Bd(7b^2e^2-52bcde+48c^2d^2)))}{12de^2(d+ex)^3(cd-be)}\right.$$

$\big\downarrow$ 219

$$\frac{(bx+cx^2)^{5/2}(-Ae+3Bd+2Bex)}{4e^2(d+ex)^4}-$$

$$5\left(\frac{(bx+cx^2)^{3/2}(3ex(Ae(b^2e^2-8bcde+8c^2d^2)-Bd(9b^2e^2-32bcde+24c^2d^2))+d(Ae(-b^2e^2-12bcde+16c^2d^2)-Bd(7b^2e^2-52bcde+48c^2d^2)))}{12de^2(d+ex)^3(cd-be)}\right.$$

input
```
Int[((A + B*x)*(b*x + c*x^2)^(5/2))/(d + e*x)^5,x]
```

output
```
((3*B*d - A*e + 2*B*e*x)*(b*x + c*x^2)^(5/2))/(4*e^2*(d + e*x)^4) - (5*(((
d*(A*e*(16*c^2*d^2 - 12*b*c*d*e - b^2*e^2) - B*d*(48*c^2*d^2 - 52*b*c*d*e
+ 7*b^2*e^2)) + 3*e*(A*e*(8*c^2*d^2 - 8*b*c*d*e + b^2*e^2) - B*d*(24*c^2*d
^2 - 32*b*c*d*e + 9*b^2*e^2))*x)*(b*x + c*x^2)^(3/2))/(12*d*e^2*(c*d - b*e
)*(d + e*x)^3) - (-(((B*d*(192*c^3*d^3 - 304*b*c^2*d^2*e + 120*b^2*c*d*e^2
 - 7*b^3*e^3) - A*e*(64*c^3*d^3 - 80*b*c^2*d^2*e + 16*b^2*c*d*e^2 + b^3*e^
3) - 2*c*e*(A*e*(16*c^2*d^2 - 16*b*c*d*e + b^2*e^2) - B*d*(48*c^2*d^2 - 64
*b*c*d*e + 17*b^2*e^2))*x)*Sqrt[b*x + c*x^2])/(e^2*(d + e*x))) - ((32*Sqrt
[c]*d*(c*d - b*e)*(4*A*c*e*(2*c*d - b*e) - B*(24*c^2*d^2 - 20*b*c*d*e + 3*
b^2*e^2))*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/e - ((A*e*(128*c^4*d^4 -
 256*b*c^3*d^3*e + 144*b^2*c^2*d^2*e^2 - 16*b^3*c*d*e^3 - b^4*e^4) - B*d*(
384*c^4*d^4 - 896*b*c^3*d^3*e + 672*b^2*c^2*d^2*e^2 - 168*b^3*c*d*e^3 + 7*
b^4*e^4))*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[
b*x + c*x^2])])/(Sqrt[d]*e*Sqrt[c*d - b*e]))/(2*e^2))/(8*d*e^2*(c*d - b*e)
)))/(8*e^2)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1229
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m + 1))*((a + b*x + c*x^2
)^p/(e^2*(m + 1)*(m + 2)*(c*d^2 - b*d*e + a*e^2)))*((d*g - e*f*(m + 2))*(c*
d^2 - b*d*e + a*e^2) - d*p*(2*c*d - b*e)*(e*f - d*g) - e*(g*(m + 1)*(c*d^2
- b*d*e + a*e^2) + p*(2*c*d - b*e)*(e*f - d*g))*x), x] - Simp[p/(e^2*(m + 1
)*(m + 2)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 2)*(a + b*x + c*x^2
)^(p - 1)*Simp[2*a*c*e*(e*f - d*g)*(m + 2) + b^2*e*(d*g*(p + 1) - e*f*(m +
p + 2)) + b*(a*e^2*g*(m + 1) - c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2))) - c
*(2*c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2)) - e*(2*a*e*g*(m + 1) - b*(d*g*(
m - 2*p) + e*f*(m + 2*p + 2))))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g
}, x] && GtQ[p, 0] && LtQ[m, -2] && LtQ[m + 2*p, 0] &&  !ILtQ[m + 2*p + 3,
0]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.70 (sec) , antiderivative size = 593, normalized size of antiderivative = 0.76

method	result
pseudoelliptic	$-\frac{5\left((ex+d)^4\left(3b^2(-3A\,d^2e^3+14B\,d^3e^2)c^{\frac{5}{2}}+16e\,d^3\left(Ae-\frac{7Bd}{2}\right)b\,c^{\frac{7}{2}}+b^3d\,e^3\left(Ae-\frac{21Bd}{2}\right)c^{\frac{3}{2}}+8(-A\,d^4e+3B\,d^5)c^{\frac{9}{2}}+\frac{b^4e}{}\right.\right.}{}$
risch	Expression too large to display
default	Expression too large to display

input

```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^5,x,method=_RETURNVERBOSE)
```

output

```
-5/4/c^(1/2)/(d*(b*e-c*d))^(1/2)*((e*x+d)^4*(3*b^2*(-3*A*d^2*e^3+14*B*d^3*
e^2)*c^(5/2)+16*e*d^3*(A*e-7/2*B*d)*b*c^(7/2)+b^3*d*e^3*(A*e-21/2*B*d)*c^(
3/2)+8*(-A*d^4*e+3*B*d^5)*c^(9/2)+1/16*b^4*e^4*c^(1/2)*(A*e+7*B*d))*arctan
((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))+(d*(b*e-c*d))^(1/2)*(-4*c*d*(e
*x+d)^4*(b*e-c*d)*(6*B*c^2*d^2+(-2*A*c^2-5*B*b*c)*e*d+b*e^2*(A*c+3/4*B*b))
*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))+e*(x*(c*x+b))^(1/2)*(-5*(-19/5*B*d^5
+e*(-67/5*B*x+A)*d^4+53/15*(-503/106*B*x+A)*e^2*x*d^3+133/30*e^3*(-1231/66
5*B*x+A)*x^2*d^2+109/50*e^4*x^3*(-42/109*B*x+A)*d+4/25*e^5*x^4*(1/2*B*x+A)
)*e*d*b*c^(5/2)+4*d^2*(-3*B*d^5+e*(-21/2*B*x+A)*d^4+7/2*e^2*(-26/7*B*x+A)*
x*d^3+13/3*e^3*(-75/52*B*x+A)*x^2*d^2+25/12*(-36/125*B*x+A)*e^4*x^3*d+1/5*
e^5*x^4*(1/2*B*x+A))*c^(7/2)+(d*(-15/2*B*d^4+e*(-643/24*B*x+A)*d^3+29/8*e^
2*x*(-1366/145*B*x+A)*d^2+283/60*e^3*x^2*(-2071/566*B*x+A)*d+323/120*e^4*(
-216/323*B*x+A)*x^3)*c^(3/2)+1/16*e*(7*B*d^4+e*(77/3*B*x+A)*d^3+11/3*e^2*(
511/55*B*x+A)*x*d^2+73/15*e^3*x^2*(279/73*B*x+A)*d-A*e^4*x^3)*b*c^(1/2))*e
^2*b^2)))/(e*x+d)^4/e^7/d/(b*e-c*d)
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2005 vs. 2(736) = 1472.

Time = 8.47 (sec) , antiderivative size = 8041, normalized size of antiderivative = 10.31

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^5}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^5,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^5}\,dx = \int \frac{(x(b+cx))^{\frac{5}{2}}\,(A+Bx)}{(d+ex)^5}\,dx$$

input
```
integrate((B*x+A)*(c*x**2+b*x)**(5/2)/(e*x+d)**5,x)
```

output
```
Integral((x*(b + c*x))**(5/2)*(A + B*x)/(d + e*x)**5, x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{(A+Bx)\left(bx+cx^2\right)^{5/2}}{(d+ex)^5}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^5,x, algorithm="maxima")
```

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

Giac [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\,(bx+cx^2)^{5/2}}{(d+ex)^5}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^5,x, algorithm="giac")
```

output
```
Timed out
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\,(bx+cx^2)^{5/2}}{(d+ex)^5}\,dx = \int \frac{\left(c\,x^2+b\,x\right)^{5/2}\,\left(A+B\,x\right)}{\left(d+e\,x\right)^5}\,dx$$

input
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x)^5,x)
```

output
```
int(((b*x + c*x^2)^(5/2)*(A + B*x))/(d + e*x)^5, x)
```

Reduce [F]

$$\int \frac{(A+Bx)\,(bx+cx^2)^{5/2}}{(d+ex)^5}\,dx = \int \frac{(Bx+A)\,(c\,x^2+bx)^{\frac{5}{2}}}{(ex+d)^5}dx$$

input
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^5,x)
```

output
```
int((B*x+A)*(c*x^2+b*x)^(5/2)/(e*x+d)^5,x)
```

3.119 $\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}} \, dx$

Optimal result

Integrand size = 26, antiderivative size = 320

$$\begin{aligned}
&\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}} \, dx \\
&= \frac{(8Ace(24c^2d^2-18bcde+5b^2e^2)+B(64c^3d^3-144bc^2d^2e+120b^2cde^2-35b^3e^3))\sqrt{bx+cx^2}}{64c^4} \\
&\quad + \frac{e(8Ace(18cd-5be)+B(144c^2d^2-120bcde+35b^2e^2))\,x\sqrt{bx+cx^2}}{96c^3} \\
&\quad + \frac{e^2(24Bcd-7bBe+8Ace)x^2\sqrt{bx+cx^2}}{24c^2} + \frac{Be^3x^3\sqrt{bx+cx^2}}{4c} \\
&\quad + \frac{(128Ac^4d^3+35b^4Be^3+144b^2c^2de(Bd+Ae)-40b^3ce^2(3Bd+Ae)-64bc^3d^2(Bd+3Ae))\,\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{64c^{9/2}}
\end{aligned}$$

output
```
1/64*(8*A*c*e*(5*b^2*e^2-18*b*c*d*e+24*c^2*d^2)+B*(-35*b^3*e^3+120*b^2*c*d
*e^2-144*b*c^2*d^2*e+64*c^3*d^3))*(c*x^2+b*x)^(1/2)/c^4+1/96*e*(8*A*c*e*(-
5*b*e+18*c*d)+B*(35*b^2*e^2-120*b*c*d*e+144*c^2*d^2))*x*(c*x^2+b*x)^(1/2)/
c^3+1/24*e^2*(8*A*c*e-7*B*b*e+24*B*c*d)*x^2*(c*x^2+b*x)^(1/2)/c^2+1/4*B*e^
3*x^3*(c*x^2+b*x)^(1/2)/c+1/64*(128*A*c^4*d^3+35*b^4*B*e^3+144*b^2*c^2*d*e
*(A*e+B*d)-40*b^3*c*e^2*(A*e+3*B*d)-64*b*c^3*d^2*(3*A*e+B*d))*arctanh(c^(1
/2)*x/(c*x^2+b*x)^(1/2))/c^(9/2)
```

Mathematica [A] (verified)

Time = 0.82 (sec) , antiderivative size = 286, normalized size of antiderivative = 0.89

$$\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}}\,dx$$
$$= \frac{\sqrt{x}\left(\sqrt{c}\sqrt{x}(b+cx)\left(8Ace(15b^2e^2-2bce(27d+5ex)+4c^2(18d^2+9dex+2e^2x^2))+B(-105b^3e^3+10b^2\right.\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^3)/Sqrt[b*x + c*x^2],x]
```

output
```
(Sqrt[x]*(Sqrt[c]*Sqrt[x]*(b + c*x)*(8*A*c*e*(15*b^2*e^2 - 2*b*c*e*(27*d +
 5*e*x) + 4*c^2*(18*d^2 + 9*d*e*x + 2*e^2*x^2)) + B*(-105*b^3*e^3 + 10*b^2
*c*e^2*(36*d + 7*e*x) - 8*b*c^2*e*(54*d^2 + 30*d*e*x + 7*e^2*x^2) + 48*c^3
*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^3*x^3))) + 3*(-128*A*c^4*d^3 - 35*b^
4*B*e^3 - 144*b^2*c^2*d*e*(B*d + A*e) + 40*b^3*c*e^2*(3*B*d + A*e) + 64*b*
c^3*d^2*(B*d + 3*A*e))*Sqrt[b + c*x]*Log[-(Sqrt[c]*Sqrt[x]) + Sqrt[b + c*x
]]))/(192*c^(9/2)*Sqrt[x*(b + c*x)])
```

Rubi [F]

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

$$\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}}\,dx$$

$$\Big\downarrow \ 1236$$

$$\frac{\int -\frac{(d+ex)^2((bB-8Ac)d-(6Bcd-7bBe+8Ace)x)}{2\sqrt{cx^2+bx}}dx}{4c}+\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}$$

$$\Big\downarrow \ 27$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\int \frac{(d+ex)^2((bB-8Ac)d-(6Bcd-7bBe+8Ace)x)}{\sqrt{cx^2+bx}}dx}{8c}$$

$$\Big\downarrow \ 1236$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int \frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{2\sqrt{cx^2+bx}}dx}{3c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\Big\downarrow$ 27

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\Big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\Big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\Big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\Big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\Big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$\big\downarrow$ 25

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{-\frac{\int -\frac{(d+ex)\left(d\left(-7Beb^2+12Bcdb+8Aceb-48Ac^2d\right)-\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

$$\Big\downarrow \; 25$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^3}{4c}-\frac{\frac{\int -\frac{(d+ex)\left(d\left(7Beb^2-4c(3Bd+2Ae)b+48Ac^2d\right)+\left(40Ace(2cd-be)+B\left(24c^2d^2-64bced+35b^2e^2\right)\right)x\right)}{\sqrt{cx^2+bx}}dx}{6c}-\frac{\sqrt{bx+cx^2}(d+ex)^2(8Ace-7bBe+6Bcd)}{3c}}{8c}$$

input
```
Int[((A + B*x)*(d + e*x)^3)/Sqrt[b*x + c*x^2],x]
```

output
```
$Aborted
```

Defintions of rubi rules used

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

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

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

Maple [A] (verified)

Time = 1.08 (sec) , antiderivative size = 225, normalized size of antiderivative = 0.70

method	result
pseudoelliptic	$\frac{5\left(\left(\left(-A b^3 c+\frac{7}{8} B b^4\right) e^3+\frac{18 c \left(A c-\frac{5 B b}{6}\right) d b^2 e^2}{5}-\frac{24 c^2 d^2 \left(A c-\frac{3 B b}{4}\right) b e}{5}+\frac{16 c^3 d^3 \left(A c-\frac{B b}{2}\right)}{5}\right) \operatorname{arctanh}\left(\frac{\sqrt{x (c x+b)}}{x \sqrt{c}}\right)}{8}+\frac{5\left(4\left(\frac{2\left(\frac{3 B x}{4}+A\right.}{3}\right.\right.}{}$
risch	$\frac{(48 B c^3 e^3 x^3+64 A c^3 e^3 x^2-56 B b c^2 e^3 x^2+192 B c^3 d e^2 x^2-80 A b c^2 e^3 x+288 A c^3 d e^2 x+70 B b^2 c e^3 x-240 B b c^2 d e^2 x+288 B}{192 c^4 \sqrt{x (c x-}}$
default	$\frac{A d^3 \ln\left(\frac{\frac{b}{2}+c x}{\sqrt{c}}+\sqrt{c x^2+b x}\right)}{\sqrt{c}}+e^2 (A e+3 B d) \left(\frac{x^2 \sqrt{c x^2+b x}}{3 c}-\frac{5 b \left(\frac{x \sqrt{c x^2+b x}}{2 c}-\frac{3 b \left(\frac{\sqrt{c x^2+b x}}{c}-\frac{b \ln\left(\frac{\frac{b}{2}+c x}{\sqrt{c}}+\sqrt{c x}\right.}{2 c^{\frac{3}{2}}}\right.}{4 c}\right.}{6 c}\right.$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
5/8*(((-A*b^3*c+7/8*B*b^4)*e^3+18/5*c*(A*c-5/6*B*b)*d*b^2*e^2-24/5*c^2*d^2
*(A*c-3/4*B*b)*b*e+16/5*c^3*d^3*(A*c-1/2*B*b))*arctanh((x*(c*x+b))^(1/2)/x
/c^(1/2))+(4/5*(2/3*(3/4*B*x+A)*x^2*e^3+3*d*x*(2/3*B*x+A)*e^2+6*e*(1/2*B*x
+A)*d^2+2*B*d^3)*c^(7/2)+e*(2*(-1/3*(7/10*B*x+A)*x*e^2-9/5*d*(5/9*B*x+A)*e
-9/5*B*d^2)*c^(5/2)+e*(((7/12*B*x+A)*e+3*B*d)*c^(3/2)-7/8*B*b*e*c^(1/2))*b
)*b)*(x*(c*x+b))^(1/2))/c^(9/2)
```

Fricas [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 622, normalized size of antiderivative = 1.94

$$\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}}\,dx$$

$$= \left[\frac{3\,(64\,(Bbc^3-2\,Ac^4)d^3-48\,(3\,Bb^2c^2-4\,Abc^3)d^2e+24\,(5\,Bb^3c-6\,Ab^2c^2)de^2-5\,(7\,Bb^4-8\,Ab^3c)e^3)\cdot\right.$$

input

```
integrate((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output

```
[1/384*(3*(64*(B*b*c^3 - 2*A*c^4)*d^3 - 48*(3*B*b^2*c^2 - 4*A*b*c^3)*d^2*e
 + 24*(5*B*b^3*c - 6*A*b^2*c^2)*d*e^2 - 5*(7*B*b^4 - 8*A*b^3*c)*e^3)*sqrt(
c)*log(2*c*x + b - 2*sqrt(c*x^2 + b*x)*sqrt(c)) + 2*(48*B*c^4*e^3*x^3 + 19
2*B*c^4*d^3 - 144*(3*B*b*c^3 - 4*A*c^4)*d^2*e + 72*(5*B*b^2*c^2 - 6*A*b*c^
3)*d*e^2 - 15*(7*B*b^3*c - 8*A*b^2*c^2)*e^3 + 8*(24*B*c^4*d*e^2 - (7*B*b*c
^3 - 8*A*c^4)*e^3)*x^2 + 2*(144*B*c^4*d^2*e - 24*(5*B*b*c^3 - 6*A*c^4)*d*e
^2 + 5*(7*B*b^2*c^2 - 8*A*b*c^3)*e^3)*x)*sqrt(c*x^2 + b*x))/c^5, 1/192*(3*
(64*(B*b*c^3 - 2*A*c^4)*d^3 - 48*(3*B*b^2*c^2 - 4*A*b*c^3)*d^2*e + 24*(5*B
*b^3*c - 6*A*b^2*c^2)*d*e^2 - 5*(7*B*b^4 - 8*A*b^3*c)*e^3)*sqrt(-c)*arctan
(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) + (48*B*c^4*e^3*x^3 + 192*B*c^4*d^3
 - 144*(3*B*b*c^3 - 4*A*c^4)*d^2*e + 72*(5*B*b^2*c^2 - 6*A*b*c^3)*d*e^2 -
15*(7*B*b^3*c - 8*A*b^2*c^2)*e^3 + 8*(24*B*c^4*d*e^2 - (7*B*b*c^3 - 8*A*c^
4)*e^3)*x^2 + 2*(144*B*c^4*d^2*e - 24*(5*B*b*c^3 - 6*A*c^4)*d*e^2 + 5*(7*B
*b^2*c^2 - 8*A*b*c^3)*e^3)*x)*sqrt(c*x^2 + b*x))/c^5]
```

Sympy [A] (verification not implemented)

Time = 0.87 (sec) , antiderivative size = 518, normalized size of antiderivative = 1.62

$$\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}}\,dx$$

$$= \begin{cases} \left(Ad^3 - \frac{b\left(3Ad^2e+Bd^3-\frac{3b\left(3Ade^2+3Bd^2e-\frac{5b\left(Ae^3-\frac{7Bbe^3}{8c}+3Bde^2\right)}{6c}\right)}{4c}\right)}{2c}\right)\left(\begin{cases} \frac{\log\left(b+2\sqrt{c}\sqrt{bx+cx^2}+2cx\right)}{\sqrt{c}} & \text{for } \frac{b^2}{c}\neq 0 \\ \frac{\left(\frac{b}{2c}+x\right)\log\left(\frac{b}{2c}+x\right)}{\sqrt{c\left(\frac{b}{2c}+x\right)^2}} & \text{otherwise} \end{cases}\right) + \\ \frac{2\left(Ad^3\sqrt{bx}+\frac{Be^3(bx)^{\frac{9}{2}}}{9b^4}+\frac{(bx)^{\frac{3}{2}}\cdot\left(3Ad^2e+Bd^3\right)}{3b}+\frac{(bx)^{\frac{5}{2}}\cdot\left(3Ade^2+3Bd^2e\right)}{5b^2}+\frac{(bx)^{\frac{7}{2}}\left(Ae^3+3Bde^2\right)}{7b^3}\right)}{b} \\ \tilde{\infty}\left(Ad^3x+\frac{Be^3x^5}{5}+\frac{x^4\left(Ae^3+3Bde^2\right)}{4}+\frac{x^3\cdot\left(3Ade^2+3Bd^2e\right)}{3}+\frac{x^2\cdot\left(3Ad^2e+Bd^3\right)}{2}\right) \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**3/(c*x**2+b*x)**(1/2),x)
```

output
```
Piecewise(((A*d**3 - b*(3*A*d**2*e + B*d**3 - 3*b*(3*A*d*e**2 + 3*B*d**2*e
 - 5*b*(A*e**3 - 7*B*b*e**3/(8*c) + 3*B*d*e**2)/(6*c))/(4*c))/(2*c))*Piece
wise((log(b + 2*sqrt(c)*sqrt(b*x + c*x**2) + 2*c*x)/sqrt(c), Ne(b**2/c, 0)
), ((b/(2*c) + x)*log(b/(2*c) + x)/sqrt(c*(b/(2*c) + x)**2), True)) + sqrt
(b*x + c*x**2)*(B*e**3*x**3/(4*c) + x**2*(A*e**3 - 7*B*b*e**3/(8*c) + 3*B*
d*e**2)/(3*c) + x*(3*A*d*e**2 + 3*B*d**2*e - 5*b*(A*e**3 - 7*B*b*e**3/(8*c
) + 3*B*d*e**2)/(6*c))/(2*c) + (3*A*d**2*e + B*d**3 - 3*b*(3*A*d*e**2 + 3*
B*d**2*e - 5*b*(A*e**3 - 7*B*b*e**3/(8*c) + 3*B*d*e**2)/(6*c))/(4*c))/c),
Ne(c, 0)), (2*(A*d**3*sqrt(b*x) + B*e**3*(b*x)**(9/2)/(9*b**4) + (b*x)**(3
/2)*(3*A*d**2*e + B*d**3)/(3*b) + (b*x)**(5/2)*(3*A*d*e**2 + 3*B*d**2*e)/(
5*b**2) + (b*x)**(7/2)*(A*e**3 + 3*B*d*e**2)/(7*b**3))/b, Ne(b, 0)), (zoo*
(A*d**3*x + B*e**3*x**5/5 + x**4*(A*e**3 + 3*B*d*e**2)/4 + x**3*(3*A*d*e**
2 + 3*B*d**2*e)/3 + x**2*(3*A*d**2*e + B*d**3)/2), True))
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 474, normalized size of antiderivative = 1.48

$$\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}}\,dx = \frac{\sqrt{cx^2+bx}Be^3x^3}{4\,c} - \frac{7\,\sqrt{cx^2+bx}Bbe^3x^2}{24\,c^2} + \frac{35\,\sqrt{cx^2+bx}Bb^2e^3x}{96\,c^3} + \frac{Ad^3\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{\sqrt{c}} + \frac{35\,Bb^4e^3\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{128\,c^{\frac{9}{2}}} - \frac{35\,\sqrt{cx^2+bx}Bb^3e^3}{64\,c^4} + \frac{(3\,Bde^2+Ae^3)\sqrt{cx^2+bx}x^2}{3\,c} - \frac{5\,(3\,Bde^2+Ae^3)\sqrt{cx^2+bx}bx}{12\,c^2} + \frac{3\,(Bd^2e+Ade^2)\sqrt{cx^2+bx}x}{2\,c} - \frac{5\,(3\,Bde^2+Ae^3)b^3\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{16\,c^{\frac{7}{2}}} + \frac{9\,(Bd^2e+Ade^2)b^2\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{8\,c^{\frac{5}{2}}} - \frac{(Bd^3+3\,Ad^2e)b\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{2\,c^{\frac{3}{2}}} + \frac{5\,(3\,Bde^2+Ae^3)\sqrt{cx^2+bx}b^2}{8\,c^3} - \frac{9\,(Bd^2e+Ade^2)\sqrt{cx^2+bx}b}{4\,c^2} + \frac{(Bd^3+3\,Ad^2e)\sqrt{cx^2+bx}}{c}$$

input
```
integrate((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
1/4*sqrt(c*x^2 + b*x)*B*e^3*x^3/c - 7/24*sqrt(c*x^2 + b*x)*B*b*e^3*x^2/c^2
 + 35/96*sqrt(c*x^2 + b*x)*B*b^2*e^3*x/c^3 + A*d^3*log(2*c*x + b + 2*sqrt(
c*x^2 + b*x)*sqrt(c))/sqrt(c) + 35/128*B*b^4*e^3*log(2*c*x + b + 2*sqrt(c*
x^2 + b*x)*sqrt(c))/c^(9/2) - 35/64*sqrt(c*x^2 + b*x)*B*b^3*e^3/c^4 + 1/3*
(3*B*d*e^2 + A*e^3)*sqrt(c*x^2 + b*x)*x^2/c - 5/12*(3*B*d*e^2 + A*e^3)*sqr
t(c*x^2 + b*x)*b*x/c^2 + 3/2*(B*d^2*e + A*d*e^2)*sqrt(c*x^2 + b*x)*x/c - 5
/16*(3*B*d*e^2 + A*e^3)*b^3*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c
^(7/2) + 9/8*(B*d^2*e + A*d*e^2)*b^2*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*s
qrt(c))/c^(5/2) - 1/2*(B*d^3 + 3*A*d^2*e)*b*log(2*c*x + b + 2*sqrt(c*x^2 +
 b*x)*sqrt(c))/c^(3/2) + 5/8*(3*B*d*e^2 + A*e^3)*sqrt(c*x^2 + b*x)*b^2/c^3
 - 9/4*(B*d^2*e + A*d*e^2)*sqrt(c*x^2 + b*x)*b/c^2 + (B*d^3 + 3*A*d^2*e)*s
qrt(c*x^2 + b*x)/c
```

Giac [A] (verification not implemented)

Time = 0.20 (sec) , antiderivative size = 320, normalized size of antiderivative = 1.00

$$\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}}\,dx$$
$$= \frac{1}{192}\sqrt{cx^2+bx}\left(2\left(4\left(\frac{6\,Be^3x}{c}+\frac{24\,Bc^3de^2-7\,Bbc^2e^3+8\,Ac^3e^3}{c^4}\right)x+\frac{144\,Bc^3d^2e-120\,Bbc^2de^2+14\cdots}{\cdots}\right.\right.$$
$$+\frac{(64\,Bbc^3d^3-128\,Ac^4d^3-144\,Bb^2c^2d^2e+192\,Abc^3d^2e+120\,Bb^3cde^2-144\,Ab^2c^2de^2-35\,Bb^4e^3+4\cdots}{128\,c^{\frac{9}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
1/192*sqrt(c*x^2 + b*x)*(2*(4*(6*B*e^3*x/c + (24*B*c^3*d*e^2 - 7*B*b*c^2*e
^3 + 8*A*c^3*e^3)/c^4)*x + (144*B*c^3*d^2*e - 120*B*b*c^2*d*e^2 + 144*A*c^
3*d*e^2 + 35*B*b^2*c*e^3 - 40*A*b*c^2*e^3)/c^4)*x + 3*(64*B*c^3*d^3 - 144*
B*b*c^2*d^2*e + 192*A*c^3*d^2*e + 120*B*b^2*c*d*e^2 - 144*A*b*c^2*d*e^2 -
35*B*b^3*e^3 + 40*A*b^2*c*e^3)/c^4) + 1/128*(64*B*b*c^3*d^3 - 128*A*c^4*d^
3 - 144*B*b^2*c^2*d^2*e + 192*A*b*c^3*d^2*e + 120*B*b^3*c*d*e^2 - 144*A*b^
2*c^2*d*e^2 - 35*B*b^4*e^3 + 40*A*b^3*c*e^3)*log(abs(2*(sqrt(c)*x - sqrt(c
*x^2 + b*x))*sqrt(c) + b))/c^(9/2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}}\,dx=\int \frac{(A+B\,x)\,{(d+e\,x)}^3}{\sqrt{c\,x^2+b\,x}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(1/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(1/2), x)
```

Reduce [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 562, normalized size of antiderivative = 1.76

$$\int \frac{(A+Bx)(d+ex)^3}{\sqrt{bx+cx^2}}\,dx = \frac{120\sqrt{x}\,\sqrt{cx+b}\,a\,b^2c^2e^3-432\sqrt{x}\,\sqrt{cx+b}\,ab\,c^3d\,e^2-80\sqrt{x}\,\sqrt{cx+b}\,ab\,c^3e^3x+576\sqrt{x}\,\sqrt{cx+b}\,a\,c^4d^2e-}{}$$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(1/2),x)
```

output

```
(120*sqrt(x)*sqrt(b + c*x)*a*b**2*c**2*e**3 - 432*sqrt(x)*sqrt(b + c*x)*a*
b*c**3*d*e**2 - 80*sqrt(x)*sqrt(b + c*x)*a*b*c**3*e**3*x + 576*sqrt(x)*sqr
t(b + c*x)*a*c**4*d**2*e + 288*sqrt(x)*sqrt(b + c*x)*a*c**4*d*e**2*x + 64*
sqrt(x)*sqrt(b + c*x)*a*c**4*e**3*x**2 - 105*sqrt(x)*sqrt(b + c*x)*b**4*c*
e**3 + 360*sqrt(x)*sqrt(b + c*x)*b**3*c**2*d*e**2 + 70*sqrt(x)*sqrt(b + c*
x)*b**3*c**2*e**3*x - 432*sqrt(x)*sqrt(b + c*x)*b**2*c**3*d**2*e - 240*sqr
t(x)*sqrt(b + c*x)*b**2*c**3*d*e**2*x - 56*sqrt(x)*sqrt(b + c*x)*b**2*c**3
*e**3*x**2 + 192*sqrt(x)*sqrt(b + c*x)*b*c**4*d**3 + 288*sqrt(x)*sqrt(b +
c*x)*b*c**4*d**2*e*x + 192*sqrt(x)*sqrt(b + c*x)*b*c**4*d*e**2*x**2 + 48*s
qrt(x)*sqrt(b + c*x)*b*c**4*e**3*x**3 - 120*sqrt(c)*log((sqrt(b + c*x) + s
qrt(x)*sqrt(c))/sqrt(b))*a*b**3*c*e**3 + 432*sqrt(c)*log((sqrt(b + c*x) +
sqrt(x)*sqrt(c))/sqrt(b))*a*b**2*c**2*d*e**2 - 576*sqrt(c)*log((sqrt(b + c
*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b*c**3*d**2*e + 384*sqrt(c)*log((sqrt(b
+ c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*c**4*d**3 + 105*sqrt(c)*log((sqrt(b +
 c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**5*e**3 - 360*sqrt(c)*log((sqrt(b + c*
x) + sqrt(x)*sqrt(c))/sqrt(b))*b**4*c*d*e**2 + 432*sqrt(c)*log((sqrt(b + c
*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**3*c**2*d**2*e - 192*sqrt(c)*log((sqrt(b
 + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**2*c**3*d**3)/(192*c**5)
```

3.120 $\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 205

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx &= \frac{(2Ace(8cd-3be)+B(8c^2d^2-12bcde+5b^2e^2))\sqrt{bx+cx^2}}{8c^3}\\ &\quad+\frac{e(12Bcd-5bBe+6Ace)x\sqrt{bx+cx^2}}{12c^2}+\frac{Be^2x^2\sqrt{bx+cx^2}}{3c}\\ &\quad+\frac{(16Ac^3d^2-5b^3Be^2+6b^2ce(2Bd+Ae)-8bc^2d(Bd+2Ae))\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{8c^{7/2}}\end{aligned}$$

output
```
1/8*(2*A*c*e*(-3*b*e+8*c*d)+B*(5*b^2*e^2-12*b*c*d*e+8*c^2*d^2))*(c*x^2+b*x
)^(1/2)/c^3+1/12*e*(6*A*c*e-5*B*b*e+12*B*c*d)*x*(c*x^2+b*x)^(1/2)/c^2+1/3*
B*e^2*x^2*(c*x^2+b*x)^(1/2)/c+1/8*(16*A*c^3*d^2-5*b^3*B*e^2+6*b^2*c*e*(A*e
+2*B*d)-8*b*c^2*d*(2*A*e+B*d))*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(7/2
)
```

Mathematica [A] (verified)

Time = 0.49 (sec) , antiderivative size = 192, normalized size of antiderivative = 0.94

$$\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx$$
$$= \frac{\sqrt{x}\left(\sqrt{c}\sqrt{x}(b+cx)\left(6Ace(8cd-3be+2cex)+B\left(15b^2e^2-2bce(18d+5ex)+8c^2\left(3d^2+3dex+e^2x^2\right)\right)\right)\right.}{24c^{7/2}\sqrt{x}}$$

input
```
Integrate[((A + B*x)*(d + e*x)^2)/Sqrt[b*x + c*x^2],x]
```

output
```
(Sqrt[x]*(Sqrt[c]*Sqrt[x]*(b + c*x)*(6*A*c*e*(8*c*d - 3*b*e + 2*c*e*x) + B
*(15*b^2*e^2 - 2*b*c*e*(18*d + 5*e*x) + 8*c^2*(3*d^2 + 3*d*e*x + e^2*x^2))
) + 3*(-16*A*c^3*d^2 + 5*b^3*B*e^2 - 6*b^2*c*e*(2*B*d + A*e) + 8*b*c^2*d*(
B*d + 2*A*e))*Sqrt[b + c*x]*Log[-(Sqrt[c]*Sqrt[x]) + Sqrt[b + c*x]]))/(24*
c^(7/2)*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 200, normalized size of antiderivative = 0.98, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {1236, 27, 1225, 1091, 219}

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

$$\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx$$
$$\Big\downarrow \text{1236}$$
$$\frac{\int -\frac{(d+ex)((bB-6Ac)d-(4Bcd-5bBe+6Ace)x)}{2\sqrt{cx^2+bx}}dx}{3c}+\frac{B\sqrt{bx+cx^2}(d+ex)^2}{3c}$$
$$\Big\downarrow \text{27}$$
$$\frac{B\sqrt{bx+cx^2}(d+ex)^2}{3c}-\frac{\int \frac{(d+ex)((bB-6Ac)d-(4Bcd-5bBe+6Ace)x)}{\sqrt{cx^2+bx}}dx}{6c}$$
$$\Big\downarrow \text{1225}$$

$$\frac{B\sqrt{bx+cx^2}(d+ex)^2}{3c}-\frac{-\frac{3\left(6b^2ce(Ae+2Bd)-8bc^2d(2Ae+Bd)+16Ac^3d^2-5b^3Be^2\right)\int\frac{1}{\sqrt{cx^2+bx}}dx}{8c^2}-\frac{\sqrt{bx+cx^2}\left(2cex(6Ace-5bBe+4Bcd)+6Ace(8cd-3be)+2B\left(\frac{15b^2e}{2}\right.\right.}{4c^2}}{6c}$$

$\downarrow$ 1091

$$\frac{B\sqrt{bx+cx^2}(d+ex)^2}{3c}-\frac{-\frac{3\left(6b^2ce(Ae+2Bd)-8bc^2d(2Ae+Bd)+16Ac^3d^2-5b^3Be^2\right)\int\frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{4c^2}-\frac{\sqrt{bx+cx^2}\left(2cex(6Ace-5bBe+4Bcd)+6Ace(8cd-3be)+\right.}{4c^2}}{6c}$$

$\downarrow$ 219

$$\frac{B\sqrt{bx+cx^2}(d+ex)^2}{3c}-\frac{-\frac{3\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(6b^2ce(Ae+2Bd)-8bc^2d(2Ae+Bd)+16Ac^3d^2-5b^3Be^2\right)}{4c^{5/2}}-\frac{\sqrt{bx+cx^2}\left(2cex(6Ace-5bBe+4Bcd)+6Ace(8cd-3be)+2\right.}{4c^2}}{6c}$$

input
```
Int[((A + B*x)*(d + e*x)^2)/Sqrt[b*x + c*x^2],x]
```

output
```
(B*(d + e*x)^2*Sqrt[b*x + c*x^2])/(3*c) - (-1/4*((6*A*c*e*(8*c*d - 3*b*e)
+ 2*B*(8*c^2*d^2 - 18*b*c*d*e + (15*b^2*e^2)/2) + 2*c*e*(4*B*c*d - 5*b*B*e
 + 6*A*c*e)*x)*Sqrt[b*x + c*x^2])/c^2 - (3*(16*A*c^3*d^2 - 5*b^3*B*e^2 + 6
*b^2*c*e*(2*B*d + A*e) - 8*b*c^2*d*(B*d + 2*A*e))*ArcTanh[(Sqrt[c]*x)/Sqrt
[b*x + c*x^2]])/(4*c^(5/2)))/(6*c)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

Maple [A] (verified)

Time = 1.04 (sec) , antiderivative size = 148, normalized size of antiderivative = 0.72

method	result
pseudoelliptic	$-\frac{3\left(\left(\left(-A\,b^{2}c+\frac{5}{6}B\,b^{3}\right)e^{2}+\frac{8cd\left(Ac-\frac{3Bb}{4}\right)be}{3}-\frac{8c^{2}d^{2}\left(Ac-\frac{Bb}{2}\right)}{3}\right)\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)+\sqrt{x(cx+b)}\,\left(\frac{2\left(-x\left(\frac{2Bx}{3}+A\right)e^{2}-4\right.}{}\right.\right.}{4c^{\frac{7}{2}}}$
risch	$-\frac{\left(-8B\,c^{2}x^{2}e^{2}-12A\,c^{2}e^{2}x+10Bbc\,e^{2}x-24B\,c^{2}dex+18Abc\,e^{2}-48A\,c^{2}de-15B\,e^{2}b^{2}+36Bbcde-24B\,c^{2}d^{2}\right)x(cx+b)}{24c^{3}\sqrt{x(cx+b)}}+$
default	$\frac{A\,d^{2}\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^{2}+bx}\right)}{\sqrt{c}}+e(Ae+2Bd)\left(\frac{x\sqrt{c\,x^{2}+bx}}{2c}-\frac{3b\left(\frac{\sqrt{c\,x^{2}+bx}}{c}-\frac{b\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^{2}+bx}\right)}{2c^{\frac{3}{2}}}\right)}{4c}\right)+d($

input
```
int((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-3/4*(((-A*b^2*c+5/6*B*b^3)*e^2+8/3*c*d*(A*c-3/4*B*b)*b*e-8/3*c^2*d^2*(A*c
-1/2*B*b))*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))+(x*(c*x+b))^(1/2)*(2/3*(-x
*(2/3*B*x+A)*e^2-4*d*(1/2*B*x+A)*e-2*B*d^2)*c^(5/2)+(((5/9*B*x+A)*e+2*B*d)
*c^(3/2)-5/6*B*b*e*c^(1/2))*e*b))/c^(7/2)
```

Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 392, normalized size of antiderivative = 1.91

$$\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx$$
$$=\left[-\frac{3\left(8\left(Bbc^2-2\,Ac^3\right)d^2-4\left(3\,Bb^2c-4\,Abc^2\right)de+\left(5\,Bb^3-6\,Ab^2c\right)e^2\right)\sqrt{c}\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{}\right.}{}\right.$$

input
```
integrate((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
[-1/48*(3*(8*(B*b*c^2 - 2*A*c^3)*d^2 - 4*(3*B*b^2*c - 4*A*b*c^2)*d*e + (5*
B*b^3 - 6*A*b^2*c)*e^2)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c
)) - 2*(8*B*c^3*e^2*x^2 + 24*B*c^3*d^2 - 12*(3*B*b*c^2 - 4*A*c^3)*d*e + 3*
(5*B*b^2*c - 6*A*b*c^2)*e^2 + 2*(12*B*c^3*d*e - (5*B*b*c^2 - 6*A*c^3)*e^2)
*x)*sqrt(c*x^2 + b*x))/c^4, 1/24*(3*(8*(B*b*c^2 - 2*A*c^3)*d^2 - 4*(3*B*b^
2*c - 4*A*b*c^2)*d*e + (5*B*b^3 - 6*A*b^2*c)*e^2)*sqrt(-c)*arctan(sqrt(c*x
^2 + b*x)*sqrt(-c)/(c*x + b)) + (8*B*c^3*e^2*x^2 + 24*B*c^3*d^2 - 12*(3*B*
b*c^2 - 4*A*c^3)*d*e + 3*(5*B*b^2*c - 6*A*b*c^2)*e^2 + 2*(12*B*c^3*d*e - (
5*B*b*c^2 - 6*A*c^3)*e^2)*x)*sqrt(c*x^2 + b*x))/c^4]
```

Sympy [A] (verification not implemented)

Time = 0.84 (sec) , antiderivative size = 347, normalized size of antiderivative = 1.69

$$\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx = \begin{cases} \left(Ad^2 - \frac{b\left(2Ade+Bd^2-\frac{3b\left(Ae^2-\frac{5Bbe^2}{6c}+2Bde\right)}{4c}\right)}{2c}\right)\left(\begin{cases}\frac{\log\left(b+2\sqrt{c}\sqrt{bx+cx^2}+2cx\right)}{\sqrt{c}} & \text{for } \frac{b^2}{c}\neq 0\\ \frac{\left(\frac{b}{2c}+x\right)\log\left(\frac{b}{2c}+x\right)}{\sqrt{c\left(\frac{b}{2c}+x\right)^2}} & \text{otherwise}\end{cases}\right) + \sqrt{bx+cx^2}\left(\frac{Be^2x}{3c} \right. \\ \frac{2\left(Ad^2\sqrt{bx}+\frac{Be^2(bx)^{\frac{7}{2}}}{7b^3}+\frac{(bx)^{\frac{3}{2}}\cdot\left(2Ade+Bd^2\right)}{3b}+\frac{(bx)^{\frac{5}{2}}\left(Ae^2+2Bde\right)}{5b^2}\right)}{b} \\ \tilde{\infty}\left(Ad^2x+\frac{Be^2x^4}{4}+\frac{x^3\left(Ae^2+2Bde\right)}{3}+\frac{x^2\cdot\left(2Ade+Bd^2\right)}{2}\right) \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)**2/(c*x**2+b*x)**(1/2),x)
```

output
```
Piecewise(((A*d**2 - b*(2*A*d*e + B*d**2 - 3*b*(A*e**2 - 5*B*b*e**2/(6*c)
+ 2*B*d*e)/(4*c))/(2*c))*Piecewise((log(b + 2*sqrt(c)*sqrt(b*x + c*x**2) +
 2*c*x)/sqrt(c), Ne(b**2/c, 0)), ((b/(2*c) + x)*log(b/(2*c) + x)/sqrt(c*(b
/(2*c) + x)**2), True)) + sqrt(b*x + c*x**2)*(B*e**2*x**2/(3*c) + x*(A*e**
2 - 5*B*b*e**2/(6*c) + 2*B*d*e)/(2*c) + (2*A*d*e + B*d**2 - 3*b*(A*e**2 -
5*B*b*e**2/(6*c) + 2*B*d*e)/(4*c))/c), Ne(c, 0)), (2*(A*d**2*sqrt(b*x) + B
*e**2*(b*x)**(7/2)/(7*b**3) + (b*x)**(3/2)*(2*A*d*e + B*d**2)/(3*b) + (b*x
)**(5/2)*(A*e**2 + 2*B*d*e)/(5*b**2))/b, Ne(b, 0)), (zoo*(A*d**2*x + B*e**
2*x**4/4 + x**3*(A*e**2 + 2*B*d*e)/3 + x**2*(2*A*d*e + B*d**2)/2), True))
```

Maxima [A] (verification not implemented)

Time = 0.07 (sec) , antiderivative size = 299, normalized size of antiderivative = 1.46

$$\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx = \frac{\sqrt{cx^2+bx}Be^2x^2}{3\,c} - \frac{5\,\sqrt{cx^2+bx}Bbe^2x}{12\,c^2} + \frac{Ad^2\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{\sqrt{c}} - \frac{5\,Bb^3e^2\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{16\,c^{\frac{7}{2}}} + \frac{5\,\sqrt{cx^2+bx}Bb^2e^2}{8\,c^3} + \frac{(2\,Bde+Ae^2)\sqrt{cx^2+bx}x}{2\,c} + \frac{3\,(2\,Bde+Ae^2)b^2\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{8\,c^{\frac{5}{2}}} - \frac{(Bd^2+2\,Ade)b\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{2\,c^{\frac{3}{2}}} - \frac{3\,(2\,Bde+Ae^2)\sqrt{cx^2+bx}b}{4\,c^2} + \frac{(Bd^2+2\,Ade)\sqrt{cx^2+bx}}{c}$$

input
```
integrate((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
1/3*sqrt(c*x^2 + b*x)*B*e^2*x^2/c - 5/12*sqrt(c*x^2 + b*x)*B*b*e^2*x/c^2 +
 A*d^2*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/sqrt(c) - 5/16*B*b^3*e
^2*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(7/2) + 5/8*sqrt(c*x^2 +
 b*x)*B*b^2*e^2/c^3 + 1/2*(2*B*d*e + A*e^2)*sqrt(c*x^2 + b*x)*x/c + 3/8*(2
*B*d*e + A*e^2)*b^2*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(5/2) -
 1/2*(B*d^2 + 2*A*d*e)*b*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(3
/2) - 3/4*(2*B*d*e + A*e^2)*sqrt(c*x^2 + b*x)*b/c^2 + (B*d^2 + 2*A*d*e)*sq
rt(c*x^2 + b*x)/c
```

Giac [A] (verification not implemented)

Time = 0.19 (sec) , antiderivative size = 196, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx$$
$$= \frac{1}{24}\sqrt{cx^2+bx}\left(2\left(\frac{4\,Be^2x}{c}+\frac{12\,Bc^2de-5\,Bbce^2+6\,Ac^2e^2}{c^3}\right)x+\frac{3\,(8\,Bc^2d^2-12\,Bbcde+16\,Ac^2de+5}{c^3}\right.$$
$$+\frac{(8\,Bbc^2d^2-16\,Ac^3d^2-12\,Bb^2cde+16\,Abc^2de+5\,Bb^3e^2-6\,Ab^2ce^2)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{c}-\right.\right.}{16\,c^{\frac{7}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
1/24*sqrt(c*x^2 + b*x)*(2*(4*B*e^2*x/c + (12*B*c^2*d*e - 5*B*b*c*e^2 + 6*A
*c^2*e^2)/c^3)*x + 3*(8*B*c^2*d^2 - 12*B*b*c*d*e + 16*A*c^2*d*e + 5*B*b^2*
e^2 - 6*A*b*c*e^2)/c^3) + 1/16*(8*B*b*c^2*d^2 - 16*A*c^3*d^2 - 12*B*b^2*c*
d*e + 16*A*b*c^2*d*e + 5*B*b^3*e^2 - 6*A*b^2*c*e^2)*log(abs(2*(sqrt(c)*x -
 sqrt(c*x^2 + b*x))*sqrt(c) + b))/c^(7/2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx = \int \frac{(A+B\,x)\,{(d+e\,x)}^2}{\sqrt{c\,x^2+b\,x}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^(1/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^(1/2), x)
```

Reduce [B] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 342, normalized size of antiderivative = 1.67

$$\int \frac{(A+Bx)(d+ex)^2}{\sqrt{bx+cx^2}}\,dx = \frac{-18\sqrt{x}\,\sqrt{cx+b}\,ab\,c^2e^2+48\sqrt{x}\,\sqrt{cx+b}\,a\,c^3de+12\sqrt{x}\,\sqrt{cx+b}\,a\,c^3e^2x+15\sqrt{x}\,\sqrt{cx+b}\,b^3c\,e^2-36\sqrt{x}}{}$$

input
```
int((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(1/2),x)
```

output
```
( - 18*sqrt(x)*sqrt(b + c*x)*a*b*c**2*e**2 + 48*sqrt(x)*sqrt(b + c*x)*a*c*
*3*d*e + 12*sqrt(x)*sqrt(b + c*x)*a*c**3*e**2*x + 15*sqrt(x)*sqrt(b + c*x)
*b**3*c*e**2 - 36*sqrt(x)*sqrt(b + c*x)*b**2*c**2*d*e - 10*sqrt(x)*sqrt(b
+ c*x)*b**2*c**2*e**2*x + 24*sqrt(x)*sqrt(b + c*x)*b*c**3*d**2 + 24*sqrt(x
)*sqrt(b + c*x)*b*c**3*d*e*x + 8*sqrt(x)*sqrt(b + c*x)*b*c**3*e**2*x**2 +
18*sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b**2*c*e**2 -
48*sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b*c**2*d*e + 4
8*sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*c**3*d**2 - 15*
sqrt(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**4*e**2 + 36*sqrt
(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**3*c*d*e - 24*sqrt(c)
*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**2*c**2*d**2)/(24*c**4)
```

3.121 $\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}} dx$

Optimal result

Integrand size = 24, antiderivative size = 116

$$\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}} dx = \frac{(4Bcd-3bBe+4Ace)\sqrt{bx+cx^2}}{4c^2} + \frac{Be\sqrt{bx+cx^2}}{2c} + \frac{(8Ac^2d+3b^2Be-4bc(Bd+Ae))\,\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4c^{5/2}}$$

output
```
1/4*(4*A*c*e-3*B*b*e+4*B*c*d)*(c*x^2+b*x)^(1/2)/c^2+1/2*B*e*x*(c*x^2+b*x)^
(1/2)/c+1/4*(8*A*c^2*d+3*b^2*B*e-4*b*c*(A*e+B*d))*arctanh(c^(1/2)*x/(c*x^2
+b*x)^(1/2))/c^(5/2)
```

Mathematica [A] (verified)

Time = 0.26 (sec) , antiderivative size = 123, normalized size of antiderivative = 1.06

$$\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}} dx = \frac{\sqrt{x}\left(\sqrt{c}\sqrt{x}(b+cx)(4Ace+B(4cd-3be+2cex)) + (-8Ac^2d-3b^2Be+4bc(Bd+Ae))\sqrt{b+cx}\log\left(-\right.\right.}{4c^{5/2}\sqrt{x(b+cx)}}$$

input
```
Integrate[((A + B*x)*(d + e*x))/Sqrt[b*x + c*x^2],x]
```

output
```
(Sqrt[x]*(Sqrt[c]*Sqrt[x]*(b + c*x)*(4*A*c*e + B*(4*c*d - 3*b*e + 2*c*e*x)
) + (-8*A*c^2*d - 3*b^2*B*e + 4*b*c*(B*d + A*e))*Sqrt[b + c*x]*Log[-(Sqrt[
c]*Sqrt[x]) + Sqrt[b + c*x]]))/(4*c^(5/2)*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.42 (sec) , antiderivative size = 99, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {1225, 1091, 219}

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

$$\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}}dx$$

$$\Big\downarrow \text{1225}$$

$$\frac{\left(-4bc(Ae+Bd)+8Ac^2d+3b^2Be\right)\int \frac{1}{\sqrt{cx^2+bx}}dx}{8c^2}-\frac{\sqrt{bx+cx^2}(-4c(Ae+Bd)+3bBe-2Bcex)}{4c^2}$$

$$\Big\downarrow \text{1091}$$

$$\frac{\left(-4bc(Ae+Bd)+8Ac^2d+3b^2Be\right)\int \frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{4c^2}-\frac{\sqrt{bx+cx^2}(-4c(Ae+Bd)+3bBe-2Bcex)}{4c^2}$$

$$\Big\downarrow \text{219}$$

$$\frac{\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(-4bc(Ae+Bd)+8Ac^2d+3b^2Be\right)}{4c^{5/2}}-\frac{\sqrt{bx+cx^2}(-4c(Ae+Bd)+3bBe-2Bcex)}{4c^2}$$

input
```
Int[((A + B*x)*(d + e*x))/Sqrt[b*x + c*x^2],x]
```

output
```
-1/4*((3*b*B*e - 4*c*(B*d + A*e) - 2*B*c*e*x)*Sqrt[b*x + c*x^2])/c^2 + ((8
*A*c^2*d + 3*b^2*B*e - 4*b*c*(B*d + A*e))*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c
*x^2]])/(4*c^(5/2))
```

Defintions of rubi rules used

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] && !LeQ[p, -1]
```

Maple [A] (verified)

Time = 0.80 (sec) , antiderivative size = 86, normalized size of antiderivative = 0.74

method	result
pseudoelliptic	$\frac{\left(\left(\frac{3}{4} e\,b^{2}-d b c\right) B-c A \left(b e-2 c d\right)\right) \operatorname{arctanh}\left(\frac{\sqrt{x \left(c x+b\right)}}{x \sqrt{c}}\right)+\sqrt{x \left(c x+b\right)}\, \left(\left(\left(\frac{e x}{2}+d\right) B+A e\right) c^{\frac{3}{2}}-\frac{3 B b e \sqrt{c}}{4}\right)}{c^{\frac{5}{2}}}$
risch	$\frac{\left(2 B c e x+4 A c e-3 B b e+4 B c d\right) x \left(c x+b\right)}{4 c^{2} \sqrt{x \left(c x+b\right)}}-\frac{\left(4 A c e b-8 A\,c^{2} d-3 b^{2} B e+4 B b c d\right) \ln\left(\frac{\frac{b}{2}+c x}{\sqrt{c}}+\sqrt{c\,x^{2}+b x}\right)}{8 c^{\frac{5}{2}}}$
default	$\frac{A d \ln\left(\frac{\frac{b}{2}+c x}{\sqrt{c}}+\sqrt{c\,x^{2}+b x}\right)}{\sqrt{c}}+\left(A e+B d\right) \left(\frac{\sqrt{c\,x^{2}+b x}}{c}-\frac{b \ln\left(\frac{\frac{b}{2}+c x}{\sqrt{c}}+\sqrt{c\,x^{2}+b x}\right)}{2 c^{\frac{3}{2}}}\right)+B e \left(\frac{x \sqrt{c\,x^{2}+b x}}{2 c}-\right.$

input
```
int((B*x+A)*(e*x+d)/(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/c^(5/2)*(((3/4*e*b^2-d*b*c)*B-c*A*(b*e-2*c*d))*arctanh((x*(c*x+b))^(1/2)
/x/c^(1/2))+(x*(c*x+b))^(1/2)*(((1/2*e*x+d)*B+A*e)*c^(3/2)-3/4*B*b*e*c^(1/
2)))
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.88

$$\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}}\,dx$$
$$= \left[\frac{(4\,(Bbc-2\,Ac^2)d-(3\,Bb^2-4\,Abc)e)\sqrt{c}\log\left(2\,cx+b-2\,\sqrt{cx^2+bx}\sqrt{c}\right)+2\,(2\,Bc^2ex+4\,Bc^2d-(3\right.}{8\,c^3}$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
[1/8*((4*(B*b*c - 2*A*c^2)*d - (3*B*b^2 - 4*A*b*c)*e)*sqrt(c)*log(2*c*x +
b - 2*sqrt(c*x^2 + b*x)*sqrt(c)) + 2*(2*B*c^2*e*x + 4*B*c^2*d - (3*B*b*c -
 4*A*c^2)*e)*sqrt(c*x^2 + b*x))/c^3, 1/4*((4*(B*b*c - 2*A*c^2)*d - (3*B*b^
2 - 4*A*b*c)*e)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) + (2
*B*c^2*e*x + 4*B*c^2*d - (3*B*b*c - 4*A*c^2)*e)*sqrt(c*x^2 + b*x))/c^3]
```

Sympy [A] (verification not implemented)

Time = 0.90 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.74

$$\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}}\,dx = \begin{cases} \left(Ad - \frac{b\left(Ae - \frac{3Bbe}{4c} + Bd\right)}{2c}\right)\left(\begin{cases} \frac{\log\left(b+2\sqrt{c}\sqrt{bx+cx^2}+2cx\right)}{\sqrt{c}} & \text{for } \frac{b^2}{c} \neq 0 \\ \frac{\left(\frac{b}{2c}+x\right)\log\left(\frac{b}{2c}+x\right)}{\sqrt{c\left(\frac{b}{2c}+x\right)^2}} & \text{otherwise} \end{cases}\right) + \sqrt{bx+cx^2}\left(\frac{Bex}{2c} + \frac{Ae-\frac{3Bbe}{4c}+Bd}{c}\right) & \text{fo} \\ \frac{2\left(Ad\sqrt{bx} + \frac{Be(bx)^{\frac{5}{2}}}{5b^2} + \frac{(bx)^{\frac{3}{2}}(Ae+Bd)}{3b}\right)}{b} & \text{fo} \\ \tilde{\infty}\left(Adx + \frac{Bex^3}{3} + \frac{x^2(Ae+Bd)}{2}\right) & \text{ot} \end{cases}$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x**2+b*x)**(1/2),x)
```

output
```
Piecewise(((A*d - b*(A*e - 3*B*b*e/(4*c) + B*d)/(2*c))*Piecewise((log(b +
2*sqrt(c)*sqrt(b*x + c*x**2) + 2*c*x)/sqrt(c), Ne(b**2/c, 0)), ((b/(2*c) +
 x)*log(b/(2*c) + x)/sqrt(c*(b/(2*c) + x)**2), True)) + sqrt(b*x + c*x**2)
*(B*e*x/(2*c) + (A*e - 3*B*b*e/(4*c) + B*d)/c), Ne(c, 0)), (2*(A*d*sqrt(b*
x) + B*e*(b*x)**(5/2)/(5*b**2) + (b*x)**(3/2)*(A*e + B*d)/(3*b))/b, Ne(b,
0)), (zoo*(A*d*x + B*e*x**3/3 + x**2*(A*e + B*d)/2), True))
```

Maxima [A] (verification not implemented)

Time = 0.03 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.37

$$\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}}\,dx = \frac{\sqrt{cx^2+bx}Bex}{2\,c} + \frac{Ad\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{\sqrt{c}} + \frac{3\,Bb^2e\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{8\,c^{\frac{5}{2}}} - \frac{3\,\sqrt{cx^2+bx}Bbe}{4\,c^2} - \frac{(Bd+Ae)b\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{2\,c^{\frac{3}{2}}} + \frac{\sqrt{cx^2+bx}(Bd+Ae)}{c}$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
1/2*sqrt(c*x^2 + b*x)*B*e*x/c + A*d*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sq
rt(c))/sqrt(c) + 3/8*B*b^2*e*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/
c^(5/2) - 3/4*sqrt(c*x^2 + b*x)*B*b*e/c^2 - 1/2*(B*d + A*e)*b*log(2*c*x +
b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(3/2) + sqrt(c*x^2 + b*x)*(B*d + A*e)/c
```

Giac [A] (verification not implemented)

Time = 0.17 (sec) , antiderivative size = 103, normalized size of antiderivative = 0.89

$$\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}}\,dx = \frac{1}{4}\sqrt{cx^2+bx}\left(\frac{2\,Bex}{c}+\frac{4\,Bcd-3\,Bbe+4\,Ace}{c^2}\right) + \frac{(4\,Bbcd-8\,Ac^2d-3\,Bb^2e+4\,Abce)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{c}+b\right|\right)}{8\,c^{\frac{5}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
1/4*sqrt(c*x^2 + b*x)*(2*B*e*x/c + (4*B*c*d - 3*B*b*e + 4*A*c*e)/c^2) + 1/
8*(4*B*b*c*d - 8*A*c^2*d - 3*B*b^2*e + 4*A*b*c*e)*log(abs(2*(sqrt(c)*x - s
qrt(c*x^2 + b*x))*sqrt(c) + b))/c^(5/2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)}{\sqrt{c\,x^2+b\,x}}\,dx$$

input
```
int(((A + B*x)*(d + e*x))/(b*x + c*x^2)^(1/2),x)
```

output
```
int(((A + B*x)*(d + e*x))/(b*x + c*x^2)^(1/2), x)
```

Reduce [B] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 173, normalized size of antiderivative = 1.49

$$\int \frac{(A+Bx)(d+ex)}{\sqrt{bx+cx^2}}\,dx$$
$$= \frac{4\sqrt{x}\,\sqrt{cx+b}\,a\,c^2e-3\sqrt{x}\,\sqrt{cx+b}\,b^2ce+4\sqrt{x}\,\sqrt{cx+b}\,b\,c^2d+2\sqrt{x}\,\sqrt{cx+b}\,b\,c^2ex-4\sqrt{c}\log\left(\frac{\sqrt{cx+b}+\sqrt{x}}{\sqrt{b}}\right.}{4c^3}$$

input
```
int((B*x+A)*(e*x+d)/(c*x^2+b*x)^(1/2),x)
```

output
```
(4*sqrt(x)*sqrt(b + c*x)*a*c**2*e - 3*sqrt(x)*sqrt(b + c*x)*b**2*c*e + 4*s
qrt(x)*sqrt(b + c*x)*b*c**2*d + 2*sqrt(x)*sqrt(b + c*x)*b*c**2*e*x - 4*sqr
t(c)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*b*c*e + 8*sqrt(c)*lo
g((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*c**2*d + 3*sqrt(c)*log((sqr
t(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**3*e - 4*sqrt(c)*log((sqrt(b + c*
x) + sqrt(x)*sqrt(c))/sqrt(b))*b**2*c*d)/(4*c**3)
```

3.122 $\int \frac{A+Bx}{(d+ex)\sqrt{bx+cx^2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 96

$$\int \frac{A+Bx}{(d+ex)\sqrt{bx+cx^2}}\,dx=\frac{2B\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{\sqrt{c}e}-\frac{2(Bd-Ae)\operatorname{arctanh}\left(\frac{\sqrt{cd-be}x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{\sqrt{d}e\sqrt{cd-be}}$$

output
```
2*B*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(1/2)/e-2*(-A*e+B*d)*arctanh((-
b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(1/2)/e/(-b*e+c*d)^(1/2)
```

Mathematica [A] (verified)

Time = 0.49 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.65

$$\int \frac{A+Bx}{(d+ex)\sqrt{bx+cx^2}}\,dx = -\frac{2\sqrt{x}\sqrt{b+cx}\left(-\sqrt{c}(Bd-Ae)\arctan\left(\frac{-e\sqrt{x}\sqrt{b+cx}+\sqrt{c}(d+ex)}{\sqrt{d}\sqrt{-cd+be}}\right)+B\sqrt{d}\sqrt{-cd+be}\log\left(-\sqrt{c}\sqrt{x}+\sqrt{b+c\right.\right.}{\sqrt{c}\sqrt{d}e\sqrt{-cd+be}\sqrt{x(b+cx)}}$$

input
```
Integrate[(A + B*x)/((d + e*x)*Sqrt[b*x + c*x^2]),x]
```

output
```
(-2*Sqrt[x]*Sqrt[b + c*x]*(-(Sqrt[c]*(B*d - A*e)*ArcTan[(-(e*Sqrt[x]*Sqrt[
b + c*x]) + Sqrt[c]*(d + e*x))/(Sqrt[d]*Sqrt[-(c*d) + b*e])]) + B*Sqrt[d]*
Sqrt[-(c*d) + b*e]*Log[-(Sqrt[c]*Sqrt[x]) + Sqrt[b + c*x]]))/(Sqrt[c]*Sqrt
[d]*e*Sqrt[-(c*d) + b*e]*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.47 (sec) , antiderivative size = 113, normalized size of antiderivative = 1.18, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {1269, 1091, 219, 1154, 219}

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

$$\int \frac{A+Bx}{\sqrt{bx+cx^2}(d+ex)}dx$$

$$\Big\downarrow \text{1269}$$

$$\frac{B\int \frac{1}{\sqrt{cx^2+bx}}dx}{e}-\frac{(Bd-Ae)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}$$

$$\Big\downarrow \text{1091}$$

$$\frac{2B\int \frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{e}-\frac{(Bd-Ae)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}$$

$$\Big\downarrow \text{219}$$

$$\frac{2B\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{\sqrt{c}e}-\frac{(Bd-Ae)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{e}$$

$$\Big\downarrow \text{1154}$$

$$\frac{2(Bd-Ae)\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{e}+\frac{2B\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{\sqrt{c}e}$$

$$\Big\downarrow \text{219}$$

$$\frac{2B\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{\sqrt{c}e}-\frac{(Bd-Ae)\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{\sqrt{d}e\sqrt{cd-be}}$$

input
```
Int[(A + B*x)/((d + e*x)*Sqrt[b*x + c*x^2]),x]
```

output
```
(2*B*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/(Sqrt[c]*e) - ((B*d - A*e)*Ar
cTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2]
)])/(Sqrt[d]*e*Sqrt[c*d - b*e])
```

Defintions of rubi rules used

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 0.98 (sec) , antiderivative size = 78, normalized size of antiderivative = 0.81

method	result
pseudoelliptic	$\frac{\frac{2B\,\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)}{\sqrt{c}}-\frac{2(Ae-Bd)\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)}{\sqrt{d(be-cd)}}}{e}$
default	$\frac{B\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^2+bx}\right)}{e\sqrt{c}}-\frac{(Ae-Bd)\ln\left(\frac{-\frac{2d(be-cd)}{e^2}+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}+2\sqrt{-\frac{d(be-cd)}{e^2}}\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(b}{}}}{x+\frac{d}{e}}\right.}{e^2\sqrt{-\frac{d(be-cd)}{e^2}}}$

input
```
int((B*x+A)/(e*x+d)/(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
2/e*(B/c^(1/2)*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))-(A*e-B*d)/(d*(b*e-c*d)
)^(1/2)*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2)))
```

Fricas [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 527, normalized size of antiderivative = 5.49

$$\int \frac{A+Bx}{(d+ex)\sqrt{bx+cx^2}}\,dx$$
$$=\left[\frac{(Bcd^2-Bbde)\sqrt{c}\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)-(Bcd-Ace)\sqrt{cd^2-bde}\log\left(\frac{bd+(2\,cd-be)x+2\,\sqrt{cd^2-b}}{ex+d}\right.}{c^2d^2e-bcde^2}\right.$$
$$-\frac{2\,(Bcd^2-Bbde)\sqrt{-c}\arctan\left(\frac{\sqrt{cx^2+bx}\sqrt{-c}}{cx+b}\right)+(Bcd-Ace)\sqrt{cd^2-bde}\log\left(\frac{bd+(2\,cd-be)x+2\,\sqrt{cd^2-bde}\sqrt{cx^2}}{ex+d}\right.}{c^2d^2e-bcde^2}$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
[((B*c*d^2 - B*b*d*e)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))
 - (B*c*d - A*c*e)*sqrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x + 2*sqrt
(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d)))/(c^2*d^2*e - b*c*d*e^2), (2
*(B*c*d - A*c*e)*sqrt(-c*d^2 + b*d*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x
^2 + b*x)/(c*d*x + b*d)) + (B*c*d^2 - B*b*d*e)*sqrt(c)*log(2*c*x + b + 2*s
qrt(c*x^2 + b*x)*sqrt(c)))/(c^2*d^2*e - b*c*d*e^2), -(2*(B*c*d^2 - B*b*d*e
)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) + (B*c*d - A*c*e)*
sqrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^2 - b*d*e)*sqr
t(c*x^2 + b*x))/(e*x + d)))/(c^2*d^2*e - b*c*d*e^2), 2*((B*c*d - A*c*e)*sq
rt(-c*d^2 + b*d*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x +
b*d)) - (B*c*d^2 - B*b*d*e)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*
x + b)))/(c^2*d^2*e - b*c*d*e^2)]
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)\sqrt{bx+cx^2}}\,dx = \int \frac{A+Bx}{\sqrt{x\,(b+cx)}\,(d+ex)}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)/(sqrt(x*(b + c*x))*(d + e*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)\sqrt{bx+cx^2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((b/e-(2*c*d)/e^2)^2>0)', see `as
sume?` for
```

Giac [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)\sqrt{bx+cx^2}}\,dx = \text{Exception raised: TypeError}$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
Exception raised: TypeError >> an error occurred running a Giac command:IN
PUT:sage2:=int(sage0,sageVARx):;OUTPUT:Error: Bad Argument Type
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)\sqrt{bx+cx^2}}\,dx = \int \frac{A+B\,x}{\sqrt{c\,x^2+b\,x}\,(d+e\,x)}\,dx$$

input
```
int((A + B*x)/((b*x + c*x^2)^(1/2)*(d + e*x)),x)
```

output
```
int((A + B*x)/((b*x + c*x^2)^(1/2)*(d + e*x)), x)
```

Reduce [B] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 285, normalized size of antiderivative = 2.97

$$\int \frac{A+Bx}{(d+ex)\sqrt{bx+cx^2}}\,dx = \frac{-2\sqrt{d}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{be-cd}-\sqrt{e}\,\sqrt{cx+b}-\sqrt{x}\,\sqrt{e}\,\sqrt{c}}{\sqrt{d}\,\sqrt{c}}\right)ace+2\sqrt{d}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{be-cd}-\sqrt{e}\,\sqrt{cx+b}-\sqrt{x}\,\sqrt{e}\,\sqrt{c}}{\sqrt{d}\,\sqrt{c}}\right)bc\ldots}{}$$

input
```
int((B*x+A)/(e*x+d)/(c*x^2+b*x)^(1/2),x)
```

output
```
(2*( - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*
x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c*e + sqrt(d)*sqrt(b*e
- c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqr
t(c))/(sqrt(d)*sqrt(c)))*b*c*d - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e -
c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))
*a*c*e + sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b +
c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b*c*d + sqrt(c)*log((sq
rt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**2*d*e - sqrt(c)*log((sqrt(b + c
*x) + sqrt(x)*sqrt(c))/sqrt(b))*b*c*d**2))/(c*d*e*(b*e - c*d))
```

3.123 $\int \frac{A+Bx}{(d+ex)^2\sqrt{bx+cx^2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 109

$$\int \frac{A+Bx}{(d+ex)^2\sqrt{bx+cx^2}}\,dx = \frac{(Bd-Ae)\sqrt{bx+cx^2}}{d(cd-be)(d+ex)} - \frac{(bBd-2Acd+Abe)\operatorname{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{d^{3/2}(cd-be)^{3/2}}$$

output
```
(-A*e+B*d)*(c*x^2+b*x)^(1/2)/d/(-b*e+c*d)/(e*x+d)-(A*b*e-2*A*c*d+B*b*d)*ar
ctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(3/2)/(-b*e+c*d)^(3/
2)
```

Mathematica [A] (verified)

Time = 0.89 (sec) , antiderivative size = 149, normalized size of antiderivative = 1.37

$$\int \frac{A+Bx}{(d+ex)^2\sqrt{bx+cx^2}}\,dx = \frac{\sqrt{x}\left(\frac{\sqrt{d}(Bd-Ae)\sqrt{x}(b+cx)}{(cd-be)(d+ex)} - \frac{(bBd-2Acd+Abe)\sqrt{b+cx}\arctan\left(\frac{-e\sqrt{x}\sqrt{b+cx}+\sqrt{c}(d+ex)}{\sqrt{d}\sqrt{-cd+be}}\right)}{(-cd+be)^{3/2}}\right)}{d^{3/2}\sqrt{x(b+cx)}}$$

input
```
Integrate[(A + B*x)/((d + e*x)^2*Sqrt[b*x + c*x^2]),x]
```

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

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 128, normalized size of antiderivative = 1.17, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.115$, Rules used = {1228, 1154, 219}

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

$$\int \frac{A+Bx}{\sqrt{bx+cx^2}(d+ex)^2}dx$$

$$\Big\downarrow \text{1228}$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{d(d+ex)(cd-be)}-\frac{(Abe-2Acd+bBd)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{2d(cd-be)}$$

$$\Big\downarrow \text{1154}$$

$$\frac{(Abe-2Acd+bBd)\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{d(cd-be)}+\frac{\sqrt{bx+cx^2}(Bd-Ae)}{d(d+ex)(cd-be)}$$

$$\Big\downarrow \text{219}$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{d(d+ex)(cd-be)}-\frac{(Abe-2Acd+bBd)\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{2d^{3/2}(cd-be)^{3/2}}$$

input
```
Int[(A + B*x)/((d + e*x)^2*Sqrt[b*x + c*x^2]),x]
```

output
```
((B*d - A*e)*Sqrt[b*x + c*x^2])/(d*(c*d - b*e)*(d + e*x)) - ((b*B*d - 2*A*
c*d + A*b*e)*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sq
rt[b*x + c*x^2])])/(2*d^(3/2)*(c*d - b*e)^(3/2))
```

Defintions of rubi rules used

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

Maple [A] (verified)

Time = 1.14 (sec) , antiderivative size = 96, normalized size of antiderivative = 0.88

method	result
pseudoelliptic	$\frac{\frac{(Ae-Bd)\sqrt{x(cx+b)}}{ex+d}-\frac{(Abe-2Acd+Bbd)\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)}{\sqrt{d(be-cd)}}}{d(be-cd)}$
default	$-\frac{B\ln\left(\frac{-\frac{2d(be-cd)}{e^2}+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}+2\sqrt{-\frac{d(be-cd)}{e^2}}\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(be-cd)}{e^2}}}{x+\frac{d}{e}}\right)}{e^2\sqrt{-\frac{d(be-cd)}{e^2}}}+\frac{(Ae-Bd)\left(\frac{e^2\sqrt{c\left(x+\frac{d}{e}\right)\cdots}}{\cdots}\right)}{\cdots}$

input
```
int((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

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

Fricas [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 393, normalized size of antiderivative = 3.61

$$\int \frac{A+Bx}{(d+ex)^2\sqrt{bx+cx^2}}\,dx$$
$$= \left[-\frac{(Abde+(Bb-2\,Ac)d^2+(Abe^2+(Bb-2\,Ac)de)x)\sqrt{cd^2-bde}\log\left(\frac{bd+(2\,cd-be)x+2\,\sqrt{cd^2-bde}\sqrt{cx^2+bx}}{ex+d}\right)}{2\,(c^2d^5-2\,bcd^4e+b^2d^3e^2+(c^2d^4e-2\,bcd^3e^2+b^2d^2e^3)}\right.$$

input
```
integrate((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
[-1/2*((A*b*d*e + (B*b - 2*A*c)*d^2 + (A*b*e^2 + (B*b - 2*A*c)*d*e)*x)*sqr
t(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^2 - b*d*e)*sqrt(c
*x^2 + b*x))/(e*x + d)) - 2*(B*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)*sqrt
(c*x^2 + b*x))/(c^2*d^5 - 2*b*c*d^4*e + b^2*d^3*e^2 + (c^2*d^4*e - 2*b*c*d
^3*e^2 + b^2*d^2*e^3)*x), ((A*b*d*e + (B*b - 2*A*c)*d^2 + (A*b*e^2 + (B*b
- 2*A*c)*d*e)*x)*sqrt(-c*d^2 + b*d*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x
^2 + b*x)/(c*d*x + b*d)) + (B*c*d^3 + A*b*d*e^2 - (B*b + A*c)*d^2*e)*sqrt(
c*x^2 + b*x))/(c^2*d^5 - 2*b*c*d^4*e + b^2*d^3*e^2 + (c^2*d^4*e - 2*b*c*d^
3*e^2 + b^2*d^2*e^3)*x)]
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^2\sqrt{bx+cx^2}}\,dx = \int \frac{A+Bx}{\sqrt{x\,(b+cx)}\,(d+ex)^2}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**2/(c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)/(sqrt(x*(b + c*x))*(d + e*x)**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^2\sqrt{bx+cx^2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 519 vs. 2(97) = 194.

Time = 0.34 (sec) , antiderivative size = 519, normalized size of antiderivative = 4.76

$$\int \frac{A+Bx}{(d+ex)^2\sqrt{bx+cx^2}}\,dx =$$

$$-\frac{\frac{\left(Bbde^3\log\left(\left|2\,cde-be^2-2\,\sqrt{cd^2-bde}\sqrt{c}|e|\right|\right)-2\,Acde^3\log\left(\left|2\,cde-be^2-2\,\sqrt{cd^2-bde}\sqrt{c}|e|\right|\right)+Abe^4\log\left(\left|2\,cde-be^2-2\,\sqrt{cd^2-bde}\sqrt{c}|e|\right|\right)+2\,\cdots}{\sqrt{cd^2-bde}cd^2|e|-\sqrt{cd^2-bde}bde|e|}}{\cdots}$$

input
```
integrate((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
-1/2*((B*b*d*e^3*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d*e)*sqrt(c)*a
bs(e))) - 2*A*c*d*e^3*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d*e)*sqrt
(c)*abs(e))) + A*b*e^4*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d*e)*sqr
t(c)*abs(e))) + 2*sqrt(c*d^2 - b*d*e)*B*sqrt(c)*d*e*abs(e) - 2*sqrt(c*d^2
- b*d*e)*A*sqrt(c)*e^2*abs(e))*sgn(1/(e*x + d))*sgn(e)/(sqrt(c*d^2 - b*d*e
)*c*d^2*abs(e) - sqrt(c*d^2 - b*d*e)*b*d*e*abs(e)) - 2*(B*d*e*sgn(1/(e*x +
 d))*sgn(e) - A*e^2*sgn(1/(e*x + d))*sgn(e))*sqrt(c - 2*c*d/(e*x + d) + c*
d^2/(e*x + d)^2 + b*e/(e*x + d) - b*d*e/(e*x + d)^2)/(c*d^2*sgn(1/(e*x + d
))^2*sgn(e)^2 - b*d*e*sgn(1/(e*x + d))^2*sgn(e)^2) - (B*b*d*e^3 - 2*A*c*d*
e^3 + A*b*e^4)*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d*e)*(sqrt(c - 2
*c*d/(e*x + d) + c*d^2/(e*x + d)^2 + b*e/(e*x + d) - b*d*e/(e*x + d)^2) +
sqrt(c*d^2*e^2 - b*d*e^3)/((e*x + d)*e))*abs(e)))/((c*d^2 - b*d*e)^(3/2)*a
bs(e)*sgn(1/(e*x + d))*sgn(e)))/e^2
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^2\sqrt{bx+cx^2}}\,dx = \int \frac{A+B\,x}{\sqrt{c\,x^2+b\,x}\,{\left(d+e\,x\right)}^2}\,dx$$

input
```
int((A + B*x)/((b*x + c*x^2)^(1/2)*(d + e*x)^2),x)
```

output
```
int((A + B*x)/((b*x + c*x^2)^(1/2)*(d + e*x)^2), x)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 783, normalized size of antiderivative = 7.18

$$\int \frac{A+Bx}{(d+ex)^2\sqrt{bx+cx^2}}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(1/2),x)
```

output
```
( - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x)
- sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*d*e - sqrt(d)*sqrt(b*e -
 c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt
(c))/(sqrt(d)*sqrt(c)))*a*b*e**2*x + 2*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(
b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqr
t(c)))*a*c*d**2 + 2*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e
)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c*d*e*x -
sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sq
rt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**2*d**2 - sqrt(d)*sqrt(b*e - c
*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c
))/(sqrt(d)*sqrt(c)))*b**2*d*e*x - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e
- c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)
))*a*b*d*e - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(
b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*e**2*x + 2*sqrt
(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x
)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c*d**2 + 2*sqrt(d)*sqrt(b*e - c*d)
*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/
(sqrt(d)*sqrt(c)))*a*c*d*e*x - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*
d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b
**2*d**2 - sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt...
```

3.124 $\int \frac{A+Bx}{(d+ex)^3\sqrt{bx+cx^2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 199

$$\int \frac{A+Bx}{(d+ex)^3\sqrt{bx+cx^2}}\,dx = \frac{(Bd-Ae)\sqrt{bx+cx^2}}{2d(cd-be)(d+ex)^2} - \frac{(3Ae(2cd-be)-Bd(2cd+be))\sqrt{bx+cx^2}}{4d^2(cd-be)^2(d+ex)} + \frac{(8Ac^2d^2-4bcd(Bd+2Ae)+b^2e(Bd+3Ae))\operatorname{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{4d^{5/2}(cd-be)^{5/2}}$$

output
```
1/2*(-A*e+B*d)*(c*x^2+b*x)^(1/2)/d/(-b*e+c*d)/(e*x+d)^2-1/4*(3*A*e*(-b*e+2
*c*d)-B*d*(b*e+2*c*d))*(c*x^2+b*x)^(1/2)/d^2/(-b*e+c*d)^2/(e*x+d)+1/4*(8*A
*c^2*d^2-4*b*c*d*(2*A*e+B*d)+b^2*e*(3*A*e+B*d))*arctanh((-b*e+c*d)^(1/2)*x
/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(5/2)/(-b*e+c*d)^(5/2)
```

Mathematica [A] (verified)

Time = 10.39 (sec) , antiderivative size = 217, normalized size of antiderivative = 1.09

$$\int \frac{A+Bx}{(d+ex)^3\sqrt{bx+cx^2}}\,dx$$
$$= \frac{\sqrt{x}\left(\frac{(-Bd+Ae)\sqrt{x}(b+cx)}{(d+ex)^2}-\frac{(3Ae(-2cd+be)+Bd(2cd+be))\sqrt{x}(b+cx)}{2d(cd-be)(d+ex)}-\frac{(8Ac^2d^2-4bcd(Bd+2Ae)+b^2e(Bd+3Ae))\sqrt{b+cx}\,\text{arctanh}(}{2d^{3/2}(cd-be)^{3/2}}\right.}{2d(-cd+be)\sqrt{x(b+cx)}}$$

input
```
Integrate[(A + B*x)/((d + e*x)^3*Sqrt[b*x + c*x^2]),x]
```

output
```
(Sqrt[x]*(((-(B*d) + A*e)*Sqrt[x]*(b + c*x))/(d + e*x)^2 - ((3*A*e*(-2*c*d
 + b*e) + B*d*(2*c*d + b*e))*Sqrt[x]*(b + c*x))/(2*d*(c*d - b*e)*(d + e*x)
) - ((8*A*c^2*d^2 - 4*b*c*d*(B*d + 2*A*e) + b^2*e*(B*d + 3*A*e))*Sqrt[b +
c*x]*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x])])/(2*d^(3/2
)*(c*d - b*e)^(3/2))))/(2*d*(-(c*d) + b*e)*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.72 (sec) , antiderivative size = 231, normalized size of antiderivative = 1.16, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {1237, 27, 1228, 1154, 219}

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

$$\int \frac{A+Bx}{\sqrt{bx+cx^2}(d+ex)^3}\,dx$$
$$\Big\downarrow \ 1237$$
$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{2d(d+ex)^2(cd-be)}-\frac{\int \frac{bBd-4Acd+3Abe-2c(Bd-Ae)x}{2(d+ex)^2\sqrt{cx^2+bx}}dx}{2d(cd-be)}$$
$$\Big\downarrow \ 27$$
$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{2d(d+ex)^2(cd-be)}-\frac{\int \frac{bBd-4Acd+3Abe-2c(Bd-Ae)x}{(d+ex)^2\sqrt{cx^2+bx}}dx}{4d(cd-be)}$$

$$\Big\downarrow \text{ 1228}$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{2d(d+ex)^2(cd-be)} - \frac{\frac{\sqrt{bx+cx^2}(3Ae(2cd-be)-Bd(be+2cd))}{d(d+ex)(cd-be)} - \frac{(b^2e(3Ae+Bd)-4bcd(2Ae+Bd)+8Ac^2d^2)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{2d(cd-be)}}{4d(cd-be)}$$

$$\Big\downarrow \text{ 1154}$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{2d(d+ex)^2(cd-be)} - \frac{\frac{(b^2e(3Ae+Bd)-4bcd(2Ae+Bd)+8Ac^2d^2)\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{d(cd-be)} + \frac{\sqrt{bx+cx^2}(3Ae(2cd-be)-Bd(be+2cd))}{d(d+ex)(cd-be)}}{4d(cd-be)}$$

$$\Big\downarrow \text{ 219}$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{2d(d+ex)^2(cd-be)} - \frac{\frac{\sqrt{bx+cx^2}(3Ae(2cd-be)-Bd(be+2cd))}{d(d+ex)(cd-be)} - \frac{(b^2e(3Ae+Bd)-4bcd(2Ae+Bd)+8Ac^2d^2)\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{2d^{3/2}(cd-be)^{3/2}}}{4d(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^3*Sqrt[b*x + c*x^2]),x]
```

output
```
((B*d - A*e)*Sqrt[b*x + c*x^2])/(2*d*(c*d - b*e)*(d + e*x)^2) - (((3*A*e*(
2*c*d - b*e) - B*d*(2*c*d + b*e))*Sqrt[b*x + c*x^2])/(d*(c*d - b*e)*(d + e
*x)) - ((8*A*c^2*d^2 - 4*b*c*d*(B*d + 2*A*e) + b^2*e*(B*d + 3*A*e))*ArcTan
h[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/
(2*d^(3/2)*(c*d - b*e)^(3/2)))/(4*d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Maple [A] (verified)

Time = 1.11 (sec) , antiderivative size = 187, normalized size of antiderivative = 0.94

method	result
pseudoelliptic	$\frac{-\frac{3\left(\frac{4\left(2A\,c^2-Bbc\right)d^2}{3}-\frac{8eb\left(Ac-\frac{Bb}{8}\right)d}{3}+A\,b^2e^2\right)(ex+d)^2\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)}{4}+\frac{5\sqrt{x(cx+b)}\left(\frac{4Bc\,d^3}{5}-\frac{8e\left(\frac{Bb}{8}+c\left(-\frac{Bx}{4}+A\right)\right)d^2}{5}\cdots\right.}{4\cdots}}{(be-cd)^2\sqrt{d(be-cd)}\,d^2(ex+d)^2}$
default	$\frac{B\left(\frac{e^2\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(be-cd)}{e^2}}}{d(be-cd)\left(x+\frac{d}{e}\right)}-\frac{(be-2cd)e\ln\left(\frac{-\frac{2d(be-cd)}{e^2}+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}+2\sqrt{-\frac{d(be-cd)}{e^2}}\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-\cdots}{\cdots}}}{x+\frac{d}{e}}\cdots\right)}{2d(be-cd)\sqrt{-\frac{d(be-cd)}{e^2}}}\cdots\right)}{e^3}$

input

```
int((B*x+A)/(e*x+d)^3/(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output

```
5/4*(-3/5*(4/3*(2*A*c^2-B*b*c)*d^2-8/3*e*b*(A*c-1/8*B*b)*d+A*b^2*e^2)*(e*x
+d)^2*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))+(x*(c*x+b))^(1/2)*
(4/5*B*c*d^3-8/5*e*(1/8*B*b+c*(-1/4*B*x+A))*d^2+((1/5*B*x+A)*b-6/5*A*c*x)*
e^2*d+3/5*A*x*b*e^3)*(d*(b*e-c*d))^(1/2))/(b*e-c*d)^2/(d*(b*e-c*d))^(1/2)/
d^2/(e*x+d)^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 468 vs. $2(178) = 356$.

Time = 0.11 (sec) , antiderivative size = 951, normalized size of antiderivative = 4.78

$$\int \frac{A+Bx}{(d+ex)^3\sqrt{bx+cx^2}}\,dx = \text{Too large to display}$$

input

```
integrate((B*x+A)/(e*x+d)^3/(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
[1/8*((3*A*b^2*d^2*e^2 - 4*(B*b*c - 2*A*c^2)*d^4 + (B*b^2 - 8*A*b*c)*d^3*e
 + (3*A*b^2*e^4 - 4*(B*b*c - 2*A*c^2)*d^2*e^2 + (B*b^2 - 8*A*b*c)*d*e^3)*x
^2 + 2*(3*A*b^2*d*e^3 - 4*(B*b*c - 2*A*c^2)*d^3*e + (B*b^2 - 8*A*b*c)*d^2*
e^2)*x)*sqrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^2 - b*
d*e)*sqrt(c*x^2 + b*x))/(e*x + d)) + 2*(4*B*c^2*d^5 - 5*A*b^2*d^2*e^3 - (5
*B*b*c + 8*A*c^2)*d^4*e + (B*b^2 + 13*A*b*c)*d^3*e^2 + (2*B*c^2*d^4*e - 3*
A*b^2*d*e^4 - (B*b*c + 6*A*c^2)*d^3*e^2 - (B*b^2 - 9*A*b*c)*d^2*e^3)*x)*sq
rt(c*x^2 + b*x))/(c^3*d^8 - 3*b*c^2*d^7*e + 3*b^2*c*d^6*e^2 - b^3*d^5*e^3
+ (c^3*d^6*e^2 - 3*b*c^2*d^5*e^3 + 3*b^2*c*d^4*e^4 - b^3*d^3*e^5)*x^2 + 2*
(c^3*d^7*e - 3*b*c^2*d^6*e^2 + 3*b^2*c*d^5*e^3 - b^3*d^4*e^4)*x), -1/4*((3
*A*b^2*d^2*e^2 - 4*(B*b*c - 2*A*c^2)*d^4 + (B*b^2 - 8*A*b*c)*d^3*e + (3*A*
b^2*e^4 - 4*(B*b*c - 2*A*c^2)*d^2*e^2 + (B*b^2 - 8*A*b*c)*d*e^3)*x^2 + 2*(
3*A*b^2*d*e^3 - 4*(B*b*c - 2*A*c^2)*d^3*e + (B*b^2 - 8*A*b*c)*d^2*e^2)*x)*
sqrt(-c*d^2 + b*d*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x
+ b*d)) - (4*B*c^2*d^5 - 5*A*b^2*d^2*e^3 - (5*B*b*c + 8*A*c^2)*d^4*e + (B*
b^2 + 13*A*b*c)*d^3*e^2 + (2*B*c^2*d^4*e - 3*A*b^2*d*e^4 - (B*b*c + 6*A*c^
2)*d^3*e^2 - (B*b^2 - 9*A*b*c)*d^2*e^3)*x)*sqrt(c*x^2 + b*x))/(c^3*d^8 - 3
*b*c^2*d^7*e + 3*b^2*c*d^6*e^2 - b^3*d^5*e^3 + (c^3*d^6*e^2 - 3*b*c^2*d^5*
e^3 + 3*b^2*c*d^4*e^4 - b^3*d^3*e^5)*x^2 + 2*(c^3*d^7*e - 3*b*c^2*d^6*e^2
+ 3*b^2*c*d^5*e^3 - b^3*d^4*e^4)*x)]
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^3\sqrt{bx+cx^2}}\,dx=\int \frac{A+Bx}{\sqrt{x\,(b+cx)}\,(d+ex)^3}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**3/(c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)/(sqrt(x*(b + c*x))*(d + e*x)**3), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^3\sqrt{bx+cx^2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^3/(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 772 vs. $2(178) = 356$.

Time = 0.34 (sec) , antiderivative size = 772, normalized size of antiderivative = 3.88

$$\int \frac{A+Bx}{(d+ex)^3\sqrt{bx+cx^2}}\,dx$$
$$= -\frac{(4\,Bbcd^2 - 8\,Ac^2d^2 - Bb^2de + 8\,Abcde - 3\,Ab^2e^2)\arctan\left(-\frac{\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)e+\sqrt{c}d}{\sqrt{-cd^2+bde}}\right)}{4\,(c^2d^4 - 2\,bcd^3e + b^2d^2e^2)\sqrt{-cd^2+bde}}$$
$$+ \frac{4\left(\sqrt{c}x - \sqrt{cx^2+bx}\right)^3 Bbcd^2e^2 - 8\left(\sqrt{c}x - \sqrt{cx^2+bx}\right)^3 Ac^2d^2e^2 - \left(\sqrt{c}x - \sqrt{cx^2+bx}\right)^3 Bb^2de^3 + 8\,(}{}$$

input
```
integrate((B*x+A)/(e*x+d)^3/(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
-1/4*(4*B*b*c*d^2 - 8*A*c^2*d^2 - B*b^2*d*e + 8*A*b*c*d*e - 3*A*b^2*e^2)*a
rctan(-((sqrt(c)*x - sqrt(c*x^2 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e
))/((c^2*d^4 - 2*b*c*d^3*e + b^2*d^2*e^2)*sqrt(-c*d^2 + b*d*e)) + 1/4*(4*(
sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b*c*d^2*e^2 - 8*(sqrt(c)*x - sqrt(c*x^2
 + b*x))^3*A*c^2*d^2*e^2 - (sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b^2*d*e^3 +
 8*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b*c*d*e^3 - 3*(sqrt(c)*x - sqrt(c*x
^2 + b*x))^3*A*b^2*e^4 + 8*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*B*c^(5/2)*d^4
 - 4*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*B*b*c^(3/2)*d^3*e - 24*(sqrt(c)*x -
 sqrt(c*x^2 + b*x))^2*A*c^(5/2)*d^3*e + 5*(sqrt(c)*x - sqrt(c*x^2 + b*x))^
2*B*b^2*sqrt(c)*d^2*e^2 + 24*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*A*b*c^(3/2)
*d^2*e^2 - 9*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*A*b^2*sqrt(c)*d*e^3 + 8*(sq
rt(c)*x - sqrt(c*x^2 + b*x))*B*b*c^2*d^4 - 24*(sqrt(c)*x - sqrt(c*x^2 + b*
x))*A*b*c^2*d^3*e + (sqrt(c)*x - sqrt(c*x^2 + b*x))*B*b^3*d^2*e^2 + 20*(sq
rt(c)*x - sqrt(c*x^2 + b*x))*A*b^2*c*d^2*e^2 - 5*(sqrt(c)*x - sqrt(c*x^2 +
 b*x))*A*b^3*d*e^3 + 2*B*b^2*c^(3/2)*d^4 + B*b^3*sqrt(c)*d^3*e - 6*A*b^2*c
^(3/2)*d^3*e + 3*A*b^3*sqrt(c)*d^2*e^2)/((c^2*d^4*e - 2*b*c*d^3*e^2 + b^2*
d^2*e^3)*((sqrt(c)*x - sqrt(c*x^2 + b*x))^2*e + 2*(sqrt(c)*x - sqrt(c*x^2
+ b*x))*sqrt(c)*d + b*d)^2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^3\sqrt{bx+cx^2}}\,dx = \int \frac{A+B\,x}{\sqrt{c\,x^2+b\,x}\,{(d+e\,x)}^3}\,dx$$

input
```
int((A + B*x)/((b*x + c*x^2)^(1/2)*(d + e*x)^3),x)
```

output
```
int((A + B*x)/((b*x + c*x^2)^(1/2)*(d + e*x)^3), x)
```

Reduce [B] (verification not implemented)

Time = 0.39 (sec) , antiderivative size = 3460, normalized size of antiderivative = 17.39

$$\int \frac{A+Bx}{(d+ex)^3\sqrt{bx+cx^2}}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^3/(c*x^2+b*x)^(1/2),x)
```

output
```
( - 6*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x
) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*d**2*e**4 - 12*sqrt
(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x
)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*d*e**5*x - 6*sqrt(d)*sqrt(b*e
 - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sq
rt(c))/(sqrt(d)*sqrt(c)))*a*b**3*e**6*x**2 + 28*sqrt(d)*sqrt(b*e - c*d)*at
an((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sq
rt(d)*sqrt(c)))*a*b**2*c*d**3*e**3 + 56*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt
(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sq
rt(c)))*a*b**2*c*d**2*e**4*x + 28*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e -
 c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c))
)*a*b**2*c*d*e**5*x**2 - 48*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d)
- sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*
c**2*d**4*e**2 - 96*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e
)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c**2*d**
3*e**3*x - 48*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt
(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b*c**2*d**2*e**4
*x**2 + 32*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b
+ c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*c**3*d**5*e + 64*sq
rt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - s...
```

3.125 $\int \frac{A+Bx}{(d+ex)^4\sqrt{bx+cx^2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 314

$$\int \frac{A+Bx}{(d+ex)^4\sqrt{bx+cx^2}}\,dx = \frac{(Bd-Ae)\sqrt{bx+cx^2}}{3d(cd-be)(d+ex)^3}-\frac{(5Ae(2cd-be)-Bd(4cd+be))\sqrt{bx+cx^2}}{12d^2(cd-be)^2(d+ex)^2}+\frac{(Bd(8c^2d^2+10bcde-3b^2e^2)-Ae(44c^2d^2-44bcde+15b^2e^2))\sqrt{bx+cx^2}}{24d^3(cd-be)^3(d+ex)}+\frac{(16Ac^3d^3-8bc^2d^2(Bd+3Ae)-b^3e^2(Bd+5Ae)+2b^2cde(2Bd+9Ae))\operatorname{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{8d^{7/2}(cd-be)^{7/2}}$$

output
```
1/3*(-A*e+B*d)*(c*x^2+b*x)^(1/2)/d/(-b*e+c*d)/(e*x+d)^3-1/12*(5*A*e*(-b*e+
2*c*d)-B*d*(b*e+4*c*d))*(c*x^2+b*x)^(1/2)/d^2/(-b*e+c*d)^2/(e*x+d)^2+1/24*
(B*d*(-3*b^2*e^2+10*b*c*d*e+8*c^2*d^2)-A*e*(15*b^2*e^2-44*b*c*d*e+44*c^2*d
^2))*(c*x^2+b*x)^(1/2)/d^3/(-b*e+c*d)^3/(e*x+d)+1/8*(16*A*c^3*d^3-8*b*c^2*
d^2*(3*A*e+B*d)-b^3*e^2*(5*A*e+B*d)+2*b^2*c*d*e*(9*A*e+2*B*d))*arctanh((-b
*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(7/2)/(-b*e+c*d)^(7/2)
```

Mathematica [A] (verified)

Time = 11.70 (sec) , antiderivative size = 345, normalized size of antiderivative = 1.10

$$\int \frac{A+Bx}{(d+ex)^4\sqrt{bx+cx^2}}\,dx =$$

$$-\frac{\sqrt{x}\left(8(Bd-Ae)\sqrt{x}(b+cx)+\frac{\sqrt{b+cx}(d+ex)\left(2d^{3/2}(cd-be)^{3/2}(5Ae(-2cd+be)+Bd(4cd+be))\sqrt{x}\sqrt{b+cx}-(d+ex)\left(-\sqrt{d}\sqrt{cd-\right.\right.}{}\right.}{24}$$

input
```
Integrate[(A + B*x)/((d + e*x)^4*Sqrt[b*x + c*x^2]),x]
```

output
```
-1/24*(Sqrt[x]*(8*(B*d - A*e)*Sqrt[x]*(b + c*x) + (Sqrt[b + c*x]*(d + e*x)
*(2*d^(3/2)*(c*d - b*e)^(3/2)*(5*A*e*(-2*c*d + b*e) + B*d*(4*c*d + b*e))*S
qrt[x]*Sqrt[b + c*x] - (d + e*x)*(-(Sqrt[d]*Sqrt[c*d - b*e]*(A*e*(-44*c^2*
d^2 + 44*b*c*d*e - 15*b^2*e^2) + B*d*(8*c^2*d^2 + 10*b*c*d*e - 3*b^2*e^2))
*Sqrt[x]*Sqrt[b + c*x]) - 3*(16*A*c^3*d^3 - 8*b*c^2*d^2*(B*d + 3*A*e) - b^
3*e^2*(B*d + 5*A*e) + 2*b^2*c*d*e*(2*B*d + 9*A*e))*(d + e*x)*ArcTanh[(Sqrt
[c*d - b*e]*Sqrt[x])/(Sqrt[d]*Sqrt[b + c*x])])))/(d^(5/2)*(c*d - b*e)^(5/2
))))/(d*(-(c*d) + b*e)*Sqrt[x*(b + c*x)]*(d + e*x)^3)
```

Rubi [A] (verified)

Time = 1.14 (sec) , antiderivative size = 364, normalized size of antiderivative = 1.16, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {1237, 27, 1237, 27, 1228, 1154, 219}

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

$$\int \frac{A+Bx}{\sqrt{bx+cx^2}(d+ex)^4}dx$$

$$\Big\downarrow \ 1237$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{\int \frac{bBd-6Acd+5Abe-4c(Bd-Ae)x}{2(d+ex)^3\sqrt{cx^2+bx}}dx}{3d(cd-be)}$$

$$\Big\downarrow \ 27$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{\int \frac{bBd-6Acd+5Abe-4c(Bd-Ae)x}{(d+ex)^3\sqrt{cx^2+bx}}dx}{6d(cd-be)}$$

$$\Big\downarrow \ 1237$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{\frac{\sqrt{bx+cx^2}(5Ae(2cd-be)-Bd(be+4cd))}{2d(d+ex)^2(cd-be)}-\frac{\int \frac{3e(Bd+5Ae)b^2-2cd(4Bd+17Ae)b+24Ac^2d^2-2c(5Ae(2cd-be)-Bd(4cd+be))x}{2(d+ex)^2\sqrt{cx^2+bx}}dx}{2d(cd-be)}}{6d(cd-be)}$$

$$\Big\downarrow \ 27$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{\frac{\sqrt{bx+cx^2}(5Ae(2cd-be)-Bd(be+4cd))}{2d(d+ex)^2(cd-be)}-\frac{\int \frac{3e(Bd+5Ae)b^2-2cd(4Bd+17Ae)b+24Ac^2d^2-2c(5Ae(2cd-be)-Bd(4cd+be))x}{(d+ex)^2\sqrt{cx^2+bx}}dx}{4d(cd-be)}}{6d(cd-be)}$$

$$\Big\downarrow \ 1228$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{\frac{\sqrt{bx+cx^2}(5Ae(2cd-be)-Bd(be+4cd))}{2d(d+ex)^2(cd-be)}-\frac{\frac{3\left(b^3\left(-e^2\right)(5Ae+Bd)+2b^2cde(9Ae+2Bd)-8bc^2d^2(3Ae+Bd)+16Ac^3d^3\right)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{2d(cd-be)}+\frac{\sqrt{bx+cx^2}\left(Bd\right.}{}}{4d(cd-be)}}{6d(cd-be)}$$

$$\Big\downarrow \ 1154$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{\frac{\sqrt{bx+cx^2}(5Ae(2cd-be)-Bd(be+4cd))}{2d(d+ex)^2(cd-be)}-\frac{\frac{\sqrt{bx+cx^2}\left(Bd\left(-3b^2e^2+10bcde+8c^2d^2\right)-Ae\left(15b^2e^2-44bcde+44c^2d^2\right)\right)}{d(d+ex)(cd-be)}-\frac{3\left(b^3\left(-e^2\right)(5Ae+Bd)+2b^2cde(9Ae+\right.}{}}{4d(cd-be)}}{6d(cd-be)}$$

$$\Big\downarrow \ 219$$

$$\frac{\sqrt{bx+cx^2}(Bd-Ae)}{3d(d+ex)^3(cd-be)}-\frac{\frac{\sqrt{bx+cx^2}(5Ae(2cd-be)-Bd(be+4cd))}{2d(d+ex)^2(cd-be)}-\frac{\frac{3\left(b^3\left(-e^2\right)(5Ae+Bd)+2b^2cde(9Ae+2Bd)-8bc^2d^2(3Ae+Bd)+16Ac^3d^3\right)\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{2d^{3/2}(cd-be)^{3/2}}+}{4d(cd-be)}}{6d(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^4*Sqrt[b*x + c*x^2]),x]
```

output
```
((B*d - A*e)*Sqrt[b*x + c*x^2])/(3*d*(c*d - b*e)*(d + e*x)^3) - (((5*A*e*(
2*c*d - b*e) - B*d*(4*c*d + b*e))*Sqrt[b*x + c*x^2])/(2*d*(c*d - b*e)*(d +
 e*x)^2) - (((B*d*(8*c^2*d^2 + 10*b*c*d*e - 3*b^2*e^2) - A*e*(44*c^2*d^2 -
 44*b*c*d*e + 15*b^2*e^2))*Sqrt[b*x + c*x^2])/(d*(c*d - b*e)*(d + e*x)) +
(3*(16*A*c^3*d^3 - 8*b*c^2*d^2*(B*d + 3*A*e) - b^3*e^2*(B*d + 5*A*e) + 2*b
^2*c*d*e*(2*B*d + 9*A*e))*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[
c*d - b*e]*Sqrt[b*x + c*x^2])])/(2*d^(3/2)*(c*d - b*e)^(3/2)))/(4*d*(c*d -
 b*e)))/(6*d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Maple [A] (verified)

Time = 1.35 (sec) , antiderivative size = 294, normalized size of antiderivative = 0.94

method	result
pseudoelliptic	$-\frac{5\left(-\frac{11\left(e^{2}\left(-\frac{B\,d^{3}}{11}+e\left(\frac{8Bx}{33}+A\right)d^{2}+\frac{40e^{2}x\left(\frac{3Bx}{40}+A\right)d}{33}+\frac{5A\,e^{3}x^{2}}{11}\right)b^{2}-\frac{30ced\left(-\frac{2B\,d^{3}}{15}+e\left(\frac{7Bx}{45}+A\right)d^{2}+\frac{59e^{2}\left(\frac{5Bx}{59}+A\right)xd}{45}+\frac{22}{\cdots}\right.}{11}\cdots}{5}\cdots\right.}{\cdots}$
default	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^4/(c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
-5/8*(-11/5*(e^2*(-1/11*B*d^3+e*(8/33*B*x+A)*d^2+40/33*e^2*x*(3/40*B*x+A)*
d+5/11*A*e^3*x^2)*b^2-30/11*c*e*d*(-2/15*B*d^3+e*(7/45*B*x+A)*d^2+59/45*e^
2*(5/59*B*x+A)*x*d+22/45*A*e^3*x^2)*b+24/11*c^2*d^2*(-1/3*B*d^3+e*(-1/3*B*
x+A)*d^2+3/2*e^2*x*(-2/27*B*x+A)*d+11/18*A*e^3*x^2))*(d*(b*e-c*d))^(1/2)*(
x*(c*x+b))^(1/2)+(e^2*(A*e+1/5*B*d)*b^3-18/5*c*(A*e+2/9*B*d)*e*d*b^2+24/5*
c^2*d^2*(A*e+1/3*B*d)*b-16/5*A*c^3*d^3)*(e*x+d)^3*arctan((x*(c*x+b))^(1/2)
/x*d/(d*(b*e-c*d))^(1/2)))/(d*(b*e-c*d))^(1/2)/(e*x+d)^3/(b*e-c*d)^3/d^3
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 880 vs. $2(289) = 578$.

Time = 0.15 (sec) , antiderivative size = 1776, normalized size of antiderivative = 5.66

$$\int \frac{A + Bx}{(d + ex)^4 \sqrt{bx + cx^2}} \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^4/(c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
[-1/48*(3*(5*A*b^3*d^3*e^3 + 8*(B*b*c^2 - 2*A*c^3)*d^6 - 4*(B*b^2*c - 6*A*
b*c^2)*d^5*e + (B*b^3 - 18*A*b^2*c)*d^4*e^2 + (5*A*b^3*e^6 + 8*(B*b*c^2 -
2*A*c^3)*d^3*e^3 - 4*(B*b^2*c - 6*A*b*c^2)*d^2*e^4 + (B*b^3 - 18*A*b^2*c)*
d*e^5)*x^3 + 3*(5*A*b^3*d*e^5 + 8*(B*b*c^2 - 2*A*c^3)*d^4*e^2 - 4*(B*b^2*c
 - 6*A*b*c^2)*d^3*e^3 + (B*b^3 - 18*A*b^2*c)*d^2*e^4)*x^2 + 3*(5*A*b^3*d^2
*e^4 + 8*(B*b*c^2 - 2*A*c^3)*d^5*e - 4*(B*b^2*c - 6*A*b*c^2)*d^4*e^2 + (B*
b^3 - 18*A*b^2*c)*d^3*e^3)*x)*sqrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)
*x + 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d)) - 2*(24*B*c^3*d^7
 + 33*A*b^3*d^3*e^4 - 36*(B*b*c^2 + 2*A*c^3)*d^6*e + 3*(5*B*b^2*c + 54*A*b
*c^2)*d^5*e^2 - 3*(B*b^3 + 41*A*b^2*c)*d^4*e^3 + (8*B*c^3*d^5*e^2 + 15*A*b
^3*d*e^6 + 2*(B*b*c^2 - 22*A*c^3)*d^4*e^3 - (13*B*b^2*c - 88*A*b*c^2)*d^3*
e^4 + (3*B*b^3 - 59*A*b^2*c)*d^2*e^5)*x^2 + 2*(12*B*c^3*d^6*e + 20*A*b^3*d
^2*e^5 - (5*B*b*c^2 + 54*A*c^3)*d^5*e^2 - (11*B*b^2*c - 113*A*b*c^2)*d^4*e
^3 + (4*B*b^3 - 79*A*b^2*c)*d^3*e^4)*x)*sqrt(c*x^2 + b*x))/(c^4*d^11 - 4*b
*c^3*d^10*e + 6*b^2*c^2*d^9*e^2 - 4*b^3*c*d^8*e^3 + b^4*d^7*e^4 + (c^4*d^8
*e^3 - 4*b*c^3*d^7*e^4 + 6*b^2*c^2*d^6*e^5 - 4*b^3*c*d^5*e^6 + b^4*d^4*e^7
)*x^3 + 3*(c^4*d^9*e^2 - 4*b*c^3*d^8*e^3 + 6*b^2*c^2*d^7*e^4 - 4*b^3*c*d^6
*e^5 + b^4*d^5*e^6)*x^2 + 3*(c^4*d^10*e - 4*b*c^3*d^9*e^2 + 6*b^2*c^2*d^8*
e^3 - 4*b^3*c*d^7*e^4 + b^4*d^6*e^5)*x), 1/24*(3*(5*A*b^3*d^3*e^3 + 8*(B*b
*c^2 - 2*A*c^3)*d^6 - 4*(B*b^2*c - 6*A*b*c^2)*d^5*e + (B*b^3 - 18*A*b^2...
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^4\sqrt{bx+cx^2}}\,dx=\int \frac{A+Bx}{\sqrt{x\,(b+cx)}\,(d+ex)^4}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**4/(c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)/(sqrt(x*(b + c*x))*(d + e*x)**4), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^4\sqrt{bx+cx^2}}\,dx=\text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^4/(c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1693 vs. $2(289) = 578$.

Time = 0.20 (sec) , antiderivative size = 1693, normalized size of antiderivative = 5.39

$$\int \frac{A+Bx}{(d+ex)^4\sqrt{bx+cx^2}}\,dx=\text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^4/(c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
-1/8*(8*B*b*c^2*d^3 - 16*A*c^3*d^3 - 4*B*b^2*c*d^2*e + 24*A*b*c^2*d^2*e +
B*b^3*d*e^2 - 18*A*b^2*c*d*e^2 + 5*A*b^3*e^3)*arctan(-((sqrt(c)*x - sqrt(c
*x^2 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))/((c^3*d^6 - 3*b*c^2*d^5*
e + 3*b^2*c*d^4*e^2 - b^3*d^3*e^3)*sqrt(-c*d^2 + b*d*e)) + 1/24*(24*(sqrt(
c)*x - sqrt(c*x^2 + b*x))^5*B*b*c^2*d^3*e^3 - 48*(sqrt(c)*x - sqrt(c*x^2 +
 b*x))^5*A*c^3*d^3*e^3 - 12*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*B*b^2*c*d^2*
e^4 + 72*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*A*b*c^2*d^2*e^4 + 3*(sqrt(c)*x
- sqrt(c*x^2 + b*x))^5*B*b^3*d*e^5 - 54*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*
A*b^2*c*d*e^5 + 15*(sqrt(c)*x - sqrt(c*x^2 + b*x))^5*A*b^3*e^6 + 120*(sqrt
(c)*x - sqrt(c*x^2 + b*x))^4*B*b*c^(5/2)*d^4*e^2 - 240*(sqrt(c)*x - sqrt(c
*x^2 + b*x))^4*A*c^(7/2)*d^4*e^2 - 60*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*B*
b^2*c^(3/2)*d^3*e^3 + 360*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*A*b*c^(5/2)*d^
3*e^3 + 15*(sqrt(c)*x - sqrt(c*x^2 + b*x))^4*B*b^3*sqrt(c)*d^2*e^4 - 270*(
sqrt(c)*x - sqrt(c*x^2 + b*x))^4*A*b^2*c^(3/2)*d^2*e^4 + 75*(sqrt(c)*x - s
qrt(c*x^2 + b*x))^4*A*b^3*sqrt(c)*d*e^5 + 64*(sqrt(c)*x - sqrt(c*x^2 + b*x
))^3*B*c^4*d^6 - 16*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b*c^3*d^5*e - 352*
(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*c^4*d^5*e + 168*(sqrt(c)*x - sqrt(c*x^
2 + b*x))^3*B*b^2*c^2*d^4*e^2 + 400*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b*
c^3*d^4*e^2 - 74*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b^3*c*d^3*e^3 - 204*(
sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b^2*c^2*d^3*e^3 + 8*(sqrt(c)*x - sqr...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^4\sqrt{bx+cx^2}}\,dx = \int \frac{A+B\,x}{\sqrt{c\,x^2+b\,x}\,{\left(d+e\,x\right)}^4}\,dx$$

input
```
int((A + B*x)/((b*x + c*x^2)^(1/2)*(d + e*x)^4),x)
```

output
```
int((A + B*x)/((b*x + c*x^2)^(1/2)*(d + e*x)^4), x)
```

Reduce [B] (verification not implemented)

Time = 1.02 (sec) , antiderivative size = 6129, normalized size of antiderivative = 19.52

$$\int \frac{A+Bx}{(d+ex)^4\sqrt{bx+cx^2}}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^4/(c*x^2+b*x)^(1/2),x)
```

output
```
( - 15*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*
x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**4*d**3*e**5 - 45*sqr
t(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(
x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**4*d**2*e**6*x - 45*sqrt(d)*sqr
t(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(
e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**4*d*e**7*x**2 - 15*sqrt(d)*sqrt(b*e -
c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(
c))/(sqrt(d)*sqrt(c)))*a*b**4*e**8*x**3 + 84*sqrt(d)*sqrt(b*e - c*d)*atan(
(sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(
d)*sqrt(c)))*a*b**3*c*d**4*e**4 + 252*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b
*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt
(c)))*a*b**3*c*d**3*e**5*x + 252*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e -
c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))
*a*b**3*c*d**2*e**6*x**2 + 84*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d
) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*
b**3*c*d*e**7*x**3 - 180*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - s
qrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**2*
c**2*d**5*e**3 - 540*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(
e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**2*c**2
*d**4*e**4*x - 540*sqrt(d)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt...
```

3.126 $\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 201

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx = \frac{2(bB-Ac)(cd-be)^3x}{b^2c^3\sqrt{bx+cx^2}} + \frac{e^2(12Bcd-7bBe+4Ace)\sqrt{bx+cx^2}}{4c^3} - \frac{2Ad^3\sqrt{bx+cx^2}}{b^2x} + \frac{Be^3x\sqrt{bx+cx^2}}{2c^2} + \frac{3e(4Ace(2cd-be)+B(8c^2d^2-12bcde+5b^2e^2))\,\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{4c^{7/2}}$$

output

```
2*(-A*c+B*b)*(-b*e+c*d)^3*x/b^2/c^3/(c*x^2+b*x)^(1/2)+1/4*e^2*(4*A*c*e-7*B
*b*e+12*B*c*d)*(c*x^2+b*x)^(1/2)/c^3-2*A*d^3*(c*x^2+b*x)^(1/2)/b^2/x+1/2*B
*e^3*x*(c*x^2+b*x)^(1/2)/c^2+3/4*e*(4*A*c*e*(-b*e+2*c*d)+B*(5*b^2*e^2-12*b
*c*d*e+8*c^2*d^2))*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(7/2)
```

Mathematica [A] (verified)

Time = 1.39 (sec) , antiderivative size = 287, normalized size of antiderivative = 1.43

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx = \frac{\sqrt{c}(4Ac(-4c^3d^3x+3b^3e^3x-2bc^2d^2(d-3ex)+b^2ce^2x(-6d+ex))+bBx(8c$$

input
```
Integrate[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(3/2),x]
```

output
```
(Sqrt[c]*(4*A*c*(-4*c^3*d^3*x + 3*b^3*e^3*x - 2*b*c^2*d^2*(d - 3*e*x) + b^
2*c*e^2*x*(-6*d + e*x)) + b*B*x*(8*c^3*d^3 - 15*b^3*e^3 + b^2*c*e^2*(36*d
- 5*e*x) + 2*b*c^2*e*(-12*d^2 + 6*d*e*x + e^2*x^2))) + 24*b^3*c*e^2*(3*B*d
 + A*e)*Sqrt[x]*Sqrt[b + c*x]*ArcTanh[(Sqrt[c]*Sqrt[x])/(Sqrt[b] - Sqrt[b
+ c*x])] + 6*b^2*e*(8*B*c^2*d^2 + 8*A*c^2*d*e + 5*b^2*B*e^2)*Sqrt[x]*Sqrt[
b + c*x]*ArcTanh[(Sqrt[c]*Sqrt[x])/(-Sqrt[b] + Sqrt[b + c*x])])/(4*b^2*c^(
7/2)*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.78 (sec) , antiderivative size = 245, normalized size of antiderivative = 1.22, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {1233, 27, 1225, 1091, 219}

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

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx$$

$$\Big\downarrow \text{1233}$$

$$\frac{2\int \frac{e(d+ex)(b(bB+4Ac)d+(5Beb^2-4c(Bd+Ae)b+8Ac^2d)x)}{2\sqrt{cx^2+bx}}dx}{b^2c}-\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

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

$$\frac{e\int\frac{(d+ex)\left(b(bB+4Ac)d+\left(5Beb^2-4c(Bd+Ae)b+8Ac^2d\right)x\right)}{\sqrt{cx^2+bx}}dx}{b^2c}-\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

$$\Big\downarrow \text{1225}$$

$$\frac{e\left(\frac{3b^2\left(4Ace(2cd-be)+B\left(5b^2e^2-12bcde+8c^2d^2\right)\right)\int\frac{1}{\sqrt{cx^2+bx}}dx}{8c^2}+\frac{\sqrt{bx+cx^2}\left(2cex\left(-4bc(Ae+Bd)+8Ac^2d+5b^2Be\right)+12b^2ce(Ae+3Bd)-8bc^2d\right.}{4c^2}\right.}{b^2c}$$
$$\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

$$\Big\downarrow \text{1091}$$

$$\frac{e\left(\frac{3b^2\left(4Ace(2cd-be)+B\left(5b^2e^2-12bcde+8c^2d^2\right)\right)\int\frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{4c^2}+\frac{\sqrt{bx+cx^2}\left(2cex\left(-4bc(Ae+Bd)+8Ac^2d+5b^2Be\right)+12b^2ce(Ae+3\right.}{4c^2}\right.}{b^2c}$$
$$\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

$$\Big\downarrow \text{219}$$

$$\frac{e\left(\frac{3b^2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)\left(4Ace(2cd-be)+B\left(5b^2e^2-12bcde+8c^2d^2\right)\right)}{4c^{5/2}}+\frac{\sqrt{bx+cx^2}\left(2cex\left(-4bc(Ae+Bd)+8Ac^2d+5b^2Be\right)+12b^2ce(Ae+3B\right.}{4c^2}\right.}{b^2c}$$
$$\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

input
```
Int[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(3/2),x]
```

output
```
(-2*(d + e*x)^2*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/(b^
2*c*Sqrt[b*x + c*x^2]) + (e*(((32*A*c^3*d^2 - 15*b^3*B*e^2 + 12*b^2*c*e*(3
*B*d + A*e) - 8*b*c^2*d*(2*B*d + 3*A*e) + 2*c*e*(8*A*c^2*d + 5*b^2*B*e - 4
*b*c*(B*d + A*e))*x)*Sqrt[b*x + c*x^2])/(4*c^2) + (3*b^2*(4*A*c*e*(2*c*d -
 b*e) + B*(8*c^2*d^2 - 12*b*c*d*e + 5*b^2*e^2))*ArcTanh[(Sqrt[c]*x)/Sqrt[b
*x + c*x^2]])/(4*c^(5/2))))/(b^2*c)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1225
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(b*e*g*(p + 2) - c*(e*f + d*g)*(2*p + 3) -
 2*c*e*g*(p + 1)*x))*((a + b*x + c*x^2)^(p + 1)/(2*c^2*(p + 1)*(2*p + 3))),
 x] + Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c*(2*c*d*f - b*(e*f + d*g))*(2*p
+ 3))/(2*c^2*(2*p + 3))   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c
, d, e, f, g, p}, x] &&  !LeQ[p, -1]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

Maple [A] (verified)

Time = 1.04 (sec) , antiderivative size = 218, normalized size of antiderivative = 1.08

method	result
pseudoelliptic	$-\frac{4\left(\frac{3e\left(\left(-2Ade-2B\,d^{2}\right)c^{2}+be(Ae+3Bd)c-\frac{5B\,e^{2}b^{2}}{4}\right)b^{2}\sqrt{x(cx+b)}\,\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)}{4}+\left(-\frac{B\,b^{2}c^{2}e^{3}x^{3}}{8}-\frac{c\,e^{2}b^{2}\left((Ae+3Bd)c-\right.}{4}\right.\right.}{\sqrt{x(cx+b)}\,c^{\frac{7}{2}}b}$
risch	$\frac{(cx+b)\left(2B\,b^{2}c\,e^{3}x^{2}+4A\,b^{2}c\,e^{3}x-7B\,e^{3}b^{3}x+12B\,b^{2}cd\,e^{2}x-8A\,c^{3}d^{3}\right)}{4b^{2}\sqrt{x(cx+b)}\,c^{3}}-\frac{2\left(-8A\,b^{3}c\,e^{3}+24A\,b^{2}c^{2}d\,e^{2}-24Ab\,c^{3}d^{2}e+8A\,c^{4}d^{3}+\right.}{}$
default	$-\frac{2A\,d^{3}(2cx+b)}{b^{2}\sqrt{c\,x^{2}+bx}}+e^{2}(Ae+3Bd)\left(\frac{x^{2}}{c\sqrt{c\,x^{2}+bx}}-\frac{3b\left(-\frac{x}{c\sqrt{c\,x^{2}+bx}}-\frac{b\left(-\frac{1}{c\sqrt{c\,x^{2}+bx}}+\frac{2cx+b}{bc\sqrt{c\,x^{2}+bx}}\right)}{2c}+\frac{\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\right.}{c}\right.}{2c}\right.$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-4*(3/4*e*((-2*A*d*e-2*B*d^2)*c^2+b*e*(A*e+3*B*d)*c-5/4*B*e^2*b^2)*b^2*(x*
(c*x+b))^(1/2)*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))+(-1/8*B*b^2*c^2*e^3*x^
3-1/4*c*e^2*b^2*((A*e+3*B*d)*c-5/4*B*b*e)*x^2+(A*c^4*d^3-3/2*d^2*(A*e+1/3*
B*d)*b*c^3+3/2*b^2*c^2*d*e*(A*e+B*d)-3/4*b^3*c*e^2*(A*e+3*B*d)+15/16*b^4*B
*e^3)*x+1/2*A*b*c^3*d^3)*c^(1/2))/(x*(c*x+b))^(1/2)/c^(7/2)/b^2
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 695, normalized size of antiderivative = 3.46

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx = \left[-\frac{3\left((8\,Bb^2c^3d^2e-4\,(3\,Bb^3c^2-2\,Ab^2c^3)de^2+(5\,Bb^4c-4\,Ab^3c^2)e^3)x^2+(8\,B\right.}{}\right.$$

$$-\frac{3\left((8\,Bb^2c^3d^2e-4\,(3\,Bb^3c^2-2\,Ab^2c^3)de^2+(5\,Bb^4c-4\,Ab^3c^2)e^3)x^2+(8\,Bb^3c^2d^2e-4\,(3\,Bb^4c-2\,Ab^3c\right.}{}$$

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

output
```
[-1/8*(3*((8*B*b^2*c^3*d^2*e - 4*(3*B*b^3*c^2 - 2*A*b^2*c^3)*d*e^2 + (5*B*
b^4*c - 4*A*b^3*c^2)*e^3)*x^2 + (8*B*b^3*c^2*d^2*e - 4*(3*B*b^4*c - 2*A*b^
3*c^2)*d*e^2 + (5*B*b^5 - 4*A*b^4*c)*e^3)*x)*sqrt(c)*log(2*c*x + b - 2*sqr
t(c*x^2 + b*x)*sqrt(c)) - 2*(2*B*b^2*c^3*e^3*x^3 - 8*A*b*c^4*d^3 + (12*B*b
^2*c^3*d*e^2 - (5*B*b^3*c^2 - 4*A*b^2*c^3)*e^3)*x^2 + (8*(B*b*c^4 - 2*A*c^
5)*d^3 - 24*(B*b^2*c^3 - A*b*c^4)*d^2*e + 12*(3*B*b^3*c^2 - 2*A*b^2*c^3)*d
*e^2 - 3*(5*B*b^4*c - 4*A*b^3*c^2)*e^3)*x)*sqrt(c*x^2 + b*x))/(b^2*c^5*x^2
 + b^3*c^4*x), -1/4*(3*((8*B*b^2*c^3*d^2*e - 4*(3*B*b^3*c^2 - 2*A*b^2*c^3)
*d*e^2 + (5*B*b^4*c - 4*A*b^3*c^2)*e^3)*x^2 + (8*B*b^3*c^2*d^2*e - 4*(3*B*
b^4*c - 2*A*b^3*c^2)*d*e^2 + (5*B*b^5 - 4*A*b^4*c)*e^3)*x)*sqrt(-c)*arctan
(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) - (2*B*b^2*c^3*e^3*x^3 - 8*A*b*c^4*
d^3 + (12*B*b^2*c^3*d*e^2 - (5*B*b^3*c^2 - 4*A*b^2*c^3)*e^3)*x^2 + (8*(B*b
*c^4 - 2*A*c^5)*d^3 - 24*(B*b^2*c^3 - A*b*c^4)*d^2*e + 12*(3*B*b^3*c^2 - 2
*A*b^2*c^3)*d*e^2 - 3*(5*B*b^4*c - 4*A*b^3*c^2)*e^3)*x)*sqrt(c*x^2 + b*x))
/(b^2*c^5*x^2 + b^3*c^4*x)]
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx = \int \frac{(A+Bx)\,(d+ex)^3}{(x\,(b+cx))^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**3/(c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)**3/(x*(b + c*x))**(3/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 367 vs. 2(181) = 362.

Time = 0.04 (sec) , antiderivative size = 367, normalized size of antiderivative = 1.83

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx = \frac{Be^3x^3}{2\sqrt{cx^2+bx}c} - \frac{5\,Bbe^3x^2}{4\sqrt{cx^2+bx}c^2} + \frac{2\,Bd^3x}{\sqrt{cx^2+bx}b} - \frac{4\,Acd^3x}{\sqrt{cx^2+bx}b^2} + \frac{6\,Ad^2ex}{\sqrt{cx^2+bx}b} - \frac{15\,Bb^2e^3x}{4\sqrt{cx^2+bx}c^3} + \frac{15\,Bb^2e^3\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{8\,c^{\frac{7}{2}}} - \frac{2\,Ad^3}{\sqrt{cx^2+bx}b} + \frac{(3\,Bde^2+Ae^3)x^2}{\sqrt{cx^2+bx}c} + \frac{3\,(3\,Bde^2+Ae^3)bx}{\sqrt{cx^2+bx}c^2} - \frac{6\,(Bd^2e+Ade^2)x}{\sqrt{cx^2+bx}c} - \frac{3\,(3\,Bde^2+Ae^3)b\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{2\,c^{\frac{5}{2}}} + \frac{3\,(Bd^2e+Ade^2)\log\left(2\,cx+b+2\sqrt{cx^2+bx}\sqrt{c}\right)}{c^{\frac{3}{2}}}$$

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

output
```
1/2*B*e^3*x^3/(sqrt(c*x^2 + b*x)*c) - 5/4*B*b*e^3*x^2/(sqrt(c*x^2 + b*x)*c
^2) + 2*B*d^3*x/(sqrt(c*x^2 + b*x)*b) - 4*A*c*d^3*x/(sqrt(c*x^2 + b*x)*b^2
) + 6*A*d^2*e*x/(sqrt(c*x^2 + b*x)*b) - 15/4*B*b^2*e^3*x/(sqrt(c*x^2 + b*x
)*c^3) + 15/8*B*b^2*e^3*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(7/
2) - 2*A*d^3/(sqrt(c*x^2 + b*x)*b) + (3*B*d*e^2 + A*e^3)*x^2/(sqrt(c*x^2 +
 b*x)*c) + 3*(3*B*d*e^2 + A*e^3)*b*x/(sqrt(c*x^2 + b*x)*c^2) - 6*(B*d^2*e
+ A*d*e^2)*x/(sqrt(c*x^2 + b*x)*c) - 3/2*(3*B*d*e^2 + A*e^3)*b*log(2*c*x +
 b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(5/2) + 3*(B*d^2*e + A*d*e^2)*log(2*c*
x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(3/2)
```

Giac [A] (verification not implemented)

Time = 0.13 (sec) , antiderivative size = 258, normalized size of antiderivative = 1.28

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx =$$

$$-\frac{\frac{8\,Ad^3}{b} - \left(\left(\frac{2\,Be^3x}{c} + \frac{12\,Bb^2c^2de^2-5\,Bb^3ce^3+4\,Ab^2c^2e^3}{b^2c^3}\right)x + \frac{8\,Bbc^3d^3-16\,Ac^4d^3-24\,Bb^2c^2d^2e+24\,Abc^3d^2e+36\,Bb^3cde^2-24\,Ab^2c^2de}{b^2c^3}\right.}{4\sqrt{cx^2+bx}}$$

$$-\frac{3\left(8\,Bc^2d^2e-12\,Bbcde^2+8\,Ac^2de^2+5\,Bb^2e^3-4\,Abce^3\right)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{c}+b\right|\right)}{8\,c^{\frac{7}{2}}}$$

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

output
```
-1/4*(8*A*d^3/b - ((2*B*e^3*x/c + (12*B*b^2*c^2*d*e^2 - 5*B*b^3*c*e^3 + 4*
A*b^2*c^2*e^3)/(b^2*c^3))*x + (8*B*b*c^3*d^3 - 16*A*c^4*d^3 - 24*B*b^2*c^2
*d^2*e + 24*A*b*c^3*d^2*e + 36*B*b^3*c*d*e^2 - 24*A*b^2*c^2*d*e^2 - 15*B*b
^4*e^3 + 12*A*b^3*c*e^3)/(b^2*c^3))*x)/sqrt(c*x^2 + b*x) - 3/8*(8*B*c^2*d^
2*e - 12*B*b*c*d*e^2 + 8*A*c^2*d*e^2 + 5*B*b^2*e^3 - 4*A*b*c*e^3)*log(abs(
2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) + b))/c^(7/2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^3}{(c\,x^2+b\,x)^{3/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(3/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(3/2), x)
```

Reduce [B] (verification not implemented)

Time = 0.33 (sec) , antiderivative size = 555, normalized size of antiderivative = 2.76

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{3/2}}\,dx = \frac{-96\sqrt{c}\,\sqrt{cx+b}\log\left(\frac{\sqrt{cx+b}+\sqrt{x}\,\sqrt{c}}{\sqrt{b}}\right)a\,b^3c\,e^3x-288\sqrt{c}\,\sqrt{cx+b}\log\left(\frac{\sqrt{cx+b}+\sqrt{x}\,\sqrt{c}}{\sqrt{b}}\right.}{}$$

input

```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(3/2),x)
```

output

```
( - 96*sqrt(c)*sqrt(b + c*x)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b)
)*a*b**3*c*e**3*x + 192*sqrt(c)*sqrt(b + c*x)*log((sqrt(b + c*x) + sqrt(x)
*sqrt(c))/sqrt(b))*a*b**2*c**2*d*e**2*x + 120*sqrt(c)*sqrt(b + c*x)*log((s
qrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**5*e**3*x - 288*sqrt(c)*sqrt(b
+ c*x)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**4*c*d*e**2*x + 19
2*sqrt(c)*sqrt(b + c*x)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b**
3*c**2*d**2*e*x + 64*sqrt(c)*sqrt(b + c*x)*a*b**3*c*e**3*x - 192*sqrt(c)*s
qrt(b + c*x)*a*b**2*c**2*d*e**2*x + 192*sqrt(c)*sqrt(b + c*x)*a*b*c**3*d**
2*e*x - 128*sqrt(c)*sqrt(b + c*x)*a*c**4*d**3*x - 65*sqrt(c)*sqrt(b + c*x)
*b**5*e**3*x + 192*sqrt(c)*sqrt(b + c*x)*b**4*c*d*e**2*x - 192*sqrt(c)*sqr
t(b + c*x)*b**3*c**2*d**2*e*x + 64*sqrt(c)*sqrt(b + c*x)*b**2*c**3*d**3*x
 + 96*sqrt(x)*a*b**3*c**2*e**3*x - 192*sqrt(x)*a*b**2*c**3*d*e**2*x + 32*sq
rt(x)*a*b**2*c**3*e**3*x**2 - 64*sqrt(x)*a*b*c**4*d**3 + 192*sqrt(x)*a*b*c
**4*d**2*e*x - 128*sqrt(x)*a*c**5*d**3*x - 120*sqrt(x)*b**5*c*e**3*x + 288
*sqrt(x)*b**4*c**2*d*e**2*x - 40*sqrt(x)*b**4*c**2*e**3*x**2 - 192*sqrt(x)
*b**3*c**3*d**2*e*x + 96*sqrt(x)*b**3*c**3*d*e**2*x**2 + 16*sqrt(x)*b**3*c
**3*e**3*x**3 + 64*sqrt(x)*b**2*c**4*d**3*x)/(32*sqrt(b + c*x)*b**2*c**4*x
)
```

3.127 $\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}} dx$

Optimal result

Integrand size = 26, antiderivative size = 131

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}} dx = \frac{2(bB-Ac)(cd-be)^2x}{b^2c^2\sqrt{bx+cx^2}} + \frac{Be^2\sqrt{bx+cx^2}}{c^2} - \frac{2Ad^2\sqrt{bx+cx^2}}{b^2x} + \frac{e(4Bcd-3bBe+2Ace)\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{c^{5/2}}$$

output
```
2*(-A*c+B*b)*(-b*e+c*d)^2*x/b^2/c^2/(c*x^2+b*x)^(1/2)+B*e^2*(c*x^2+b*x)^(1
/2)/c^2-2*A*d^2*(c*x^2+b*x)^(1/2)/b^2/x+e*(2*A*c*e-3*B*b*e+4*B*c*d)*arctan
h(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(5/2)
```

Mathematica [A] (verified)

Time = 0.88 (sec) , antiderivative size = 162, normalized size of antiderivative = 1.24

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}} dx = \frac{x\left(\frac{\sqrt{c}(b+cx)\left(-2Ac\left(2c^2d^2x+b^2e^2x+bcd(d-2ex)\right)+bBx\left(2c^2d^2+3b^2e^2+bce(-4d+ex)\right)\right)}{b^2} + 2e(4Bcd -}{c^{5/2}(x(b+cx))^{3/2}}$$

input
```
Integrate[((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^(3/2),x]
```

output
```
(x*((Sqrt[c]*(b + c*x)*(-2*A*c*(2*c^2*d^2*x + b^2*e^2*x + b*c*d*(d - 2*e*x
)) + b*B*x*(2*c^2*d^2 + 3*b^2*e^2 + b*c*e*(-4*d + e*x))))/b^2 + 2*e*(4*B*c
*d - 3*b*B*e + 2*A*c*e)*Sqrt[x]*(b + c*x)^(3/2)*ArcTanh[(Sqrt[c]*Sqrt[x])/
(-Sqrt[b] + Sqrt[b + c*x])]))/(c^(5/2)*(x*(b + c*x))^(3/2))
```

Rubi [A] (verified)

Time = 0.63 (sec) , antiderivative size = 158, normalized size of antiderivative = 1.21, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {1233, 27, 1160, 1091, 219}

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

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}}dx$$

$$\Big\downarrow \text{1233}$$

$$\frac{2\int \frac{e\left(b(bB+2Ac)d+\left(3Beb^2-2c(Bd+Ae)b+4Ac^2d\right)x\right)}{2\sqrt{cx^2+bx}}dx}{b^2c}-\frac{2(d+ex)\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

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

$$\frac{e\int \frac{b(bB+2Ac)d+\left(3Beb^2-2c(Bd+Ae)b+4Ac^2d\right)x}{\sqrt{cx^2+bx}}dx}{b^2c}-\frac{2(d+ex)\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

$$\Big\downarrow \text{1160}$$

$$\frac{e\left(\frac{b^2(2Ace-3bBe+4Bcd)\int \frac{1}{\sqrt{cx^2+bx}}dx}{2c}+\frac{\sqrt{bx+cx^2}\left(-2bc(Ae+Bd)+4Ac^2d+3b^2Be\right)}{c}\right)}{b^2c}-\frac{2(d+ex)\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

$$\Big\downarrow \text{1091}$$

$$\frac{e\left(\frac{b^2(2Ace-3bBe+4Bcd)\int \frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{c}+\frac{\sqrt{bx+cx^2}(-2bc(Ae+Bd)+4Ac^2d+3b^2Be)}{c}\right)}{b^2c}-\frac{2(d+ex)\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

$$\Big\downarrow \text{ 219}$$

$$\frac{e\left(\frac{b^2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)(2Ace-3bBe+4Bcd)}{c^{3/2}}+\frac{\sqrt{bx+cx^2}(-2bc(Ae+Bd)+4Ac^2d+3b^2Be)}{c}\right)}{b^2c}-\frac{2(d+ex)\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

input
```
Int[((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^(3/2),x]
```

output
```
(-2*(d + e*x)*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/(b^2*
c*Sqrt[b*x + c*x^2]) + (e*(((4*A*c^2*d + 3*b^2*B*e - 2*b*c*(B*d + A*e))*Sq
rt[b*x + c*x^2])/c + (b^2*(4*B*c*d - 3*b*B*e + 2*A*c*e)*ArcTanh[(Sqrt[c]*x
)/Sqrt[b*x + c*x^2]])/c^(3/2)))/(b^2*c)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1160
```
Int[((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol
] :> Simp[e*((a + b*x + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Simp[(2*c*d - b
*e)/(2*c)   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x]
 && NeQ[p, -1]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

Maple [A] (verified)

Time = 1.05 (sec) , antiderivative size = 145, normalized size of antiderivative = 1.11

method	result
pseudoelliptic	$-\frac{4\left(-\frac{e\,b^{2}\sqrt{x(cx+b)}\left((Ae+2Bd)c-\frac{3Bbe}{2}\right)\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)}{2}+\sqrt{c}\left(-\frac{B\,e^{2}x^{2}b^{2}c}{4}+\left(A\,c^{3}d^{2}-c^{2}d\left(Ae+\frac{Bd}{2}\right)b+\frac{b^{2}ce(Ae+2Bd}{2}\right.\right.\right.}{\sqrt{x(cx+b)}\,c^{\frac{5}{2}}b^{2}}$
risch	$-\frac{(cx+b)\left(-B\,e^{2}b^{2}x+2A\,c^{2}d^{2}\right)}{b^{2}\sqrt{x(cx+b)}\,c^{2}}+\frac{\frac{2\left(-2A\,b^{2}e^{2}c+4Ab\,c^{2}de-2A\,c^{3}d^{2}+2b^{3}B\,e^{2}-4B\,b^{2}cde+2Bb\,c^{2}d^{2}\right)\sqrt{c\left(\frac{b}{c}+x\right)^{2}-\left(\frac{b}{c}+x\right)b}}{cb\left(\frac{b}{c}+x\right)}-\frac{3B}{}}{}$
default	$-\frac{2A\,d^{2}(2cx+b)}{b^{2}\sqrt{c\,x^{2}+bx}}+e(Ae+2Bd)\left(-\frac{x}{c\sqrt{c\,x^{2}+bx}}-\frac{b\left(-\frac{1}{c\sqrt{c\,x^{2}+bx}}+\frac{2cx+b}{bc\sqrt{c\,x^{2}+bx}}\right)}{2c}+\frac{\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^{2}+bx}\right)}{c^{\frac{3}{2}}}\right)$

input
```
int((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-4*(-1/2*e*b^2*(x*(c*x+b))^(1/2)*((A*e+2*B*d)*c-3/2*B*b*e)*arctanh((x*(c*x
+b))^(1/2)/x/c^(1/2))+c^(1/2)*(-1/4*B*e^2*x^2*b^2*c+(A*c^3*d^2-c^2*d*(A*e+
1/2*B*d)*b+1/2*b^2*c*e*(A*e+2*B*d)-3/4*b^3*B*e^2)*x+1/2*A*d^2*b*c^2))/(x*(
c*x+b))^(1/2)/c^(5/2)/b^2
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 447, normalized size of antiderivative = 3.41

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}}\,dx = \left[\frac{((4\,Bb^2c^2de-(3\,Bb^3c-2\,Ab^2c^2)e^2)x^2+(4\,Bb^3cde-(3\,Bb^4-2\,Ab^3c)e^2)x)\cdots}{\cdots}\right.$$

$$-\frac{((4\,Bb^2c^2de-(3\,Bb^3c-2\,Ab^2c^2)e^2)x^2+(4\,Bb^3cde-(3\,Bb^4-2\,Ab^3c)e^2)x)\sqrt{-c}\arctan\left(\frac{\sqrt{cx^2+bx}\sqrt{-c}}{cx+b}\right)-\cdots}{b^2c^4x^2\cdots}$$

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

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

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}}\,dx = \int \frac{(A+Bx)\,(d+ex)^2}{(x\,(b+cx))^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**2/(c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)**2/(x*(b + c*x))**(3/2), x)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 227, normalized size of antiderivative = 1.73

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}}\,dx = {} & \frac{Be^2x^2}{\sqrt{cx^2+bx}c} + \frac{2\,Bd^2x}{\sqrt{cx^2+bx}b} \\ & - \frac{4\,Acd^2x}{\sqrt{cx^2+bx}b^2} + \frac{4\,Adex}{\sqrt{cx^2+bx}b} + \frac{3\,Bbe^2x}{\sqrt{cx^2+bx}c^2} \\ & - \frac{3\,Bbe^2\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{2\,c^{\frac{5}{2}}} - \frac{2\,Ad^2}{\sqrt{cx^2+bx}b} \\ & - \frac{2\,(2\,Bde+Ae^2)x}{\sqrt{cx^2+bx}c} + \frac{(2\,Bde+Ae^2)\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{c^{\frac{3}{2}}}\end{aligned}$$

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

output
```
B*e^2*x^2/(sqrt(c*x^2 + b*x)*c) + 2*B*d^2*x/(sqrt(c*x^2 + b*x)*b) - 4*A*c*
d^2*x/(sqrt(c*x^2 + b*x)*b^2) + 4*A*d*e*x/(sqrt(c*x^2 + b*x)*b) + 3*B*b*e^
2*x/(sqrt(c*x^2 + b*x)*c^2) - 3/2*B*b*e^2*log(2*c*x + b + 2*sqrt(c*x^2 + b
*x)*sqrt(c))/c^(5/2) - 2*A*d^2/(sqrt(c*x^2 + b*x)*b) - 2*(2*B*d*e + A*e^2)
*x/(sqrt(c*x^2 + b*x)*c) + (2*B*d*e + A*e^2)*log(2*c*x + b + 2*sqrt(c*x^2
+ b*x)*sqrt(c))/c^(3/2)
```

Giac [A] (verification not implemented)

Time = 0.23 (sec) , antiderivative size = 155, normalized size of antiderivative = 1.18

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}}\,dx = -\frac{\frac{2\,Ad^2}{b}-\left(\frac{Be^2x}{c}+\frac{2\,Bbc^2d^2-4\,Ac^3d^2-4\,Bb^2cde+4\,Abc^2de+3\,Bb^3e^2-2\,Ab^2ce^2}{b^2c^2}\right)x}{\sqrt{cx^2+bx}} - \frac{(4\,Bcde-3\,Bbe^2+2\,Ace^2)\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{c}+b\right|\right)}{2\,c^{\frac{5}{2}}}$$

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

output
```
-(2*A*d^2/b - (B*e^2*x/c + (2*B*b*c^2*d^2 - 4*A*c^3*d^2 - 4*B*b^2*c*d*e +
4*A*b*c^2*d*e + 3*B*b^3*e^2 - 2*A*b^2*c*e^2)/(b^2*c^2))*x)/sqrt(c*x^2 + b*
x) - 1/2*(4*B*c*d*e - 3*B*b*e^2 + 2*A*c*e^2)*log(abs(2*(sqrt(c)*x - sqrt(c
*x^2 + b*x))*sqrt(c) + b))/c^(5/2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^2}{(c\,x^2+b\,x)^{3/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^(3/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^(3/2), x)
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 340, normalized size of antiderivative = 2.60

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{3/2}}\,dx = \frac{2\sqrt{c}\,\sqrt{cx+b}\log\left(\frac{\sqrt{cx+b}+\sqrt{x}\,\sqrt{c}}{\sqrt{b}}\right) a\,b^2 c\,e^2 x - 3\sqrt{c}\,\sqrt{cx+b}\log\left(\frac{\sqrt{cx+b}+\sqrt{x}\,\sqrt{c}}{\sqrt{b}}\right) b^4 e^2}{}$$

input
```
int((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(3/2),x)
```

output
```
(2*sqrt(c)*sqrt(b + c*x)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*a*
b**2*c*e**2*x - 3*sqrt(c)*sqrt(b + c*x)*log((sqrt(b + c*x) + sqrt(x)*sqrt(
c))/sqrt(b))*b**4*e**2*x + 4*sqrt(c)*sqrt(b + c*x)*log((sqrt(b + c*x) + sq
rt(x)*sqrt(c))/sqrt(b))*b**3*c*d*e*x - 2*sqrt(c)*sqrt(b + c*x)*a*b**2*c*e*
*2*x + 4*sqrt(c)*sqrt(b + c*x)*a*b*c**2*d*e*x - 4*sqrt(c)*sqrt(b + c*x)*a*
c**3*d**2*x + 2*sqrt(c)*sqrt(b + c*x)*b**4*e**2*x - 4*sqrt(c)*sqrt(b + c*x
)*b**3*c*d*e*x + 2*sqrt(c)*sqrt(b + c*x)*b**2*c**2*d**2*x - 2*sqrt(x)*a*b*
*2*c**2*e**2*x - 2*sqrt(x)*a*b*c**3*d**2 + 4*sqrt(x)*a*b*c**3*d*e*x - 4*sq
rt(x)*a*c**4*d**2*x + 3*sqrt(x)*b**4*c*e**2*x - 4*sqrt(x)*b**3*c**2*d*e*x
+ sqrt(x)*b**3*c**2*e**2*x**2 + 2*sqrt(x)*b**2*c**3*d**2*x)/(sqrt(b + c*x)
*b**2*c**3*x)
```

3.128 $\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}} dx$

Optimal result

Integrand size = 24, antiderivative size = 92

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}} dx = \frac{2(bB-Ac)(cd-be)x}{b^2c\sqrt{bx+cx^2}} - \frac{2Ad\sqrt{bx+cx^2}}{b^2x} + \frac{2Be\operatorname{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{c^{3/2}}$$

output
```
2*(-A*c+B*b)*(-b*e+c*d)*x/b^2/c/(c*x^2+b*x)^(1/2)-2*A*d*(c*x^2+b*x)^(1/2)/
b^2/x+2*B*e*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(3/2)
```

Mathematica [A] (verified)

Time = 0.30 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.10

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}} dx = -\frac{2\left(\sqrt{c}(bB(-cd+be)x+Ac(bd+2cdx-bex))+b^2Be\sqrt{x}\sqrt{b+cx}\log\left(-\sqrt{c}\sqrt{x}+\sqrt{b+cx}\right)\right)}{b^2c^{3/2}\sqrt{x(b+cx)}}$$

input
```
Integrate[((A + B*x)*(d + e*x))/(b*x + c*x^2)^(3/2),x]
```

output
```
(-2*(Sqrt[c]*(b*B*(-(c*d) + b*e)*x + A*c*(b*d + 2*c*d*x - b*e*x)) + b^2*B*
e*Sqrt[x]*Sqrt[b + c*x]*Log[-(Sqrt[c]*Sqrt[x]) + Sqrt[b + c*x]]))/(b^2*c^(
3/2)*Sqrt[x*(b + c*x)])
```

Rubi [A] (verified)

Time = 0.37 (sec) , antiderivative size = 85, normalized size of antiderivative = 0.92, number of steps used = 4, number of rules used = 3, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {1224, 1091, 219}

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

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}}\,dx$$

$$\Big\downarrow \ 1224$$

$$\frac{Be\int \frac{1}{\sqrt{cx^2+bx}}dx}{c} - \frac{2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

$$\Big\downarrow \ 1091$$

$$\frac{2Be\int \frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{c} - \frac{2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

$$\Big\downarrow \ 219$$

$$\frac{2Be\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{c^{3/2}} - \frac{2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{b^2c\sqrt{bx+cx^2}}$$

input
```
Int[((A + B*x)*(d + e*x))/(b*x + c*x^2)^(3/2),x]
```

output
```
(-2*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/(b^2*c*Sqrt[b*x
 + c*x^2]) + (2*B*e*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/c^(3/2)
```

Defintions of rubi rules used

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1224
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (
b^2*e*g - b*c*(e*f + d*g) + 2*c*(c*d*f - a*e*g))*x))*((a + b*x + c*x^2)^(p
+ 1)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c
*(2*c*d*f - b*(e*f + d*g))*(2*p + 3))/(c*(p + 1)*(b^2 - 4*a*c))   Int[(a +
b*x + c*x^2)^(p + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -
1] &&  !(IntegerQ[p] && NeQ[a, 0] && NiceSqrtQ[b^2 - 4*a*c])
```

Maple [A] (verified)

Time = 0.92 (sec) , antiderivative size = 88, normalized size of antiderivative = 0.96

method	result
pseudoelliptic	$\frac{-2((-Ae-Bd)x+Ad)b\,c^{\frac{3}{2}}-4A\,c^{\frac{5}{2}}\,dx+2e\left(\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)\sqrt{x(cx+b)}-\sqrt{c}\,x\right)B\,b^{2}}{c^{\frac{3}{2}}\sqrt{x(cx+b)}\,b^{2}}$
risch	$-\frac{2Ad(cx+b)}{b^{2}\sqrt{x(cx+b)}}+\frac{\frac{2\left(Aceb-A\,c^{2}d-b^{2}Be+Bbcd\right)\sqrt{c\left(\frac{b}{c}+x\right)^{2}-\left(\frac{b}{c}+x\right)b}}{c^{2}b\left(\frac{b}{c}+x\right)}+\frac{Bbe\ln\left(\frac{\frac{b}{2}+cx}{\sqrt{c}}+\sqrt{c\,x^{2}+bx}\right)}{c^{\frac{3}{2}}}}{b}$
default	$-\frac{2Ad(2cx+b)}{b^{2}\sqrt{c\,x^{2}+bx}}+(Ae+Bd)\left(-\frac{1}{c\sqrt{c\,x^{2}+bx}}+\frac{2cx+b}{bc\sqrt{c\,x^{2}+bx}}\right)+Be\left(-\frac{x}{c\sqrt{c\,x^{2}+bx}}-\frac{b\left(-\frac{1}{c\sqrt{c\,x^{2}+bx}}+\frac{2c}{bc\sqrt{c}}\right.}{2c}\right.$

input
```
int((B*x+A)*(e*x+d)/(c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
2/c^(3/2)/(x*(c*x+b))^(1/2)*(-((-A*e-B*d)*x+A*d)*b*c^(3/2)-2*A*c^(5/2)*d*x
+e*(arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))*(x*(c*x+b))^(1/2)-c^(1/2)*x)*B*b^
2)/b^2
```

Fricas [A] (verification not implemented)

Time = 0.09 (sec) , antiderivative size = 255, normalized size of antiderivative = 2.77

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}}\,dx = \left[\frac{(Bb^2cex^2+Bb^3ex)\sqrt{c}\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)-2\,(Abc^2d-((Bbc^2-\ldots}{b^2c^3x^2+b^3c^2x}\right.$$

$$-\frac{2\left((Bb^2cex^2+Bb^3ex)\sqrt{-c}\arctan\left(\frac{\sqrt{cx^2+bx}\sqrt{-c}}{cx+b}\right)+(Abc^2d-((Bbc^2-2\,Ac^3)d-(Bb^2c-Abc^2)e)x)\sqrt{cx\ldots}\right.}{b^2c^3x^2+b^3c^2x}$$

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

output
```
[((B*b^2*c*e*x^2 + B*b^3*e*x)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*
sqrt(c)) - 2*(A*b*c^2*d - ((B*b*c^2 - 2*A*c^3)*d - (B*b^2*c - A*b*c^2)*e)*
x)*sqrt(c*x^2 + b*x))/(b^2*c^3*x^2 + b^3*c^2*x), -2*((B*b^2*c*e*x^2 + B*b^
3*e*x)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b)) + (A*b*c^2*d
- ((B*b*c^2 - 2*A*c^3)*d - (B*b^2*c - A*b*c^2)*e)*x)*sqrt(c*x^2 + b*x))/(b
^2*c^3*x^2 + b^3*c^2*x)]
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}}\,dx = \int \frac{(A+Bx)\,(d+ex)}{(x\,(b+cx))^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)/(x*(b + c*x))**(3/2), x)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 125, normalized size of antiderivative = 1.36

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}}\,dx = \frac{2\,Bdx}{\sqrt{cx^2+bx}b} - \frac{4\,Acdx}{\sqrt{cx^2+bx}b^2} + \frac{2\,Aex}{\sqrt{cx^2+bx}b} - \frac{2\,Bex}{\sqrt{cx^2+bx}c} + \frac{Be\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{c^{\frac{3}{2}}} - \frac{2\,Ad}{\sqrt{cx^2+bx}b}$$

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

output
```
2*B*d*x/(sqrt(c*x^2 + b*x)*b) - 4*A*c*d*x/(sqrt(c*x^2 + b*x)*b^2) + 2*A*e*
x/(sqrt(c*x^2 + b*x)*b) - 2*B*e*x/(sqrt(c*x^2 + b*x)*c) + B*e*log(2*c*x +
b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(3/2) - 2*A*d/(sqrt(c*x^2 + b*x)*b)
```

Giac [A] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 90, normalized size of antiderivative = 0.98

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}}\,dx = -\frac{Be\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{c}+b\right|\right)}{c^{\frac{3}{2}}} - \frac{2\left(\frac{Ad}{b}-\frac{(Bbcd-2\,Ac^2d-Bb^2e+Abce)x}{b^2c}\right)}{\sqrt{cx^2+bx}}$$

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

output
```
-B*e*log(abs(2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) + b))/c^(3/2) - 2*(
A*d/b - (B*b*c*d - 2*A*c^2*d - B*b^2*e + A*b*c*e)*x/(b^2*c))/sqrt(c*x^2 +
b*x)
```

Mupad [B] (verification not implemented)

Time = 12.54 (sec) , antiderivative size = 101, normalized size of antiderivative = 1.10

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}}\,dx = \frac{B\,e\,\ln\left(\frac{\frac{b}{2}+c\,x}{\sqrt{c}}+\sqrt{c\,x^2+b\,x}\right)}{c^{3/2}} - \frac{2\,A\,b\,d-2\,A\,b\,e\,x+4\,A\,c\,d\,x}{b^2\,\sqrt{c\,x^2+b\,x}} + \frac{2\,B\,d\,x}{b\,\sqrt{x\,(b+c\,x)}} - \frac{2\,B\,e\,x}{c\,\sqrt{c\,x^2+b\,x}}$$

input
```
int(((A + B*x)*(d + e*x))/(b*x + c*x^2)^(3/2),x)
```

output
```
(B*e*log((b/2 + c*x)/c^(1/2) + (b*x + c*x^2)^(1/2)))/c^(3/2) - (2*A*b*d -
2*A*b*e*x + 4*A*c*d*x)/(b^2*(b*x + c*x^2)^(1/2)) + (2*B*d*x)/(b*(x*(b + c*
x))^(1/2)) - (2*B*e*x)/(c*(b*x + c*x^2)^(1/2))
```

Reduce [B] (verification not implemented)

Time = 0.25 (sec) , antiderivative size = 163, normalized size of antiderivative = 1.77

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{3/2}}\,dx = \frac{2\sqrt{c}\,\sqrt{cx+b}\log\left(\frac{\sqrt{cx+b}+\sqrt{x}\,\sqrt{c}}{\sqrt{b}}\right)b^3ex+2\sqrt{c}\,\sqrt{cx+b}\,abcex-4\sqrt{c}\,\sqrt{cx+b}\,a\,c^2d}{}$$

input
```
int((B*x+A)*(e*x+d)/(c*x^2+b*x)^(3/2),x)
```

output
```
(2*(sqrt(c)*sqrt(b + c*x)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))*b
**3*e*x + sqrt(c)*sqrt(b + c*x)*a*b*c*e*x - 2*sqrt(c)*sqrt(b + c*x)*a*c**2
*d*x - sqrt(c)*sqrt(b + c*x)*b**3*e*x + sqrt(c)*sqrt(b + c*x)*b**2*c*d*x -
 sqrt(x)*a*b*c**2*d + sqrt(x)*a*b*c**2*e*x - 2*sqrt(x)*a*c**3*d*x - sqrt(x
)*b**3*c*e*x + sqrt(x)*b**2*c**2*d*x))/(sqrt(b + c*x)*b**2*c**2*x)
```

3.129 $\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 131

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{3/2}}\,dx=-\frac{2A}{bd\sqrt{bx+cx^2}}+\frac{2c(bBd-2Acd+Abe)x}{b^2d(cd-be)\sqrt{bx+cx^2}}-\frac{2e(Bd-Ae)\text{arctanh}\left(\frac{\sqrt{cd-bex}}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{d^{3/2}(cd-be)^{3/2}}$$

output
```
-2*A/b/d/(c*x^2+b*x)^(1/2)+2*c*(A*b*e-2*A*c*d+B*b*d)*x/b^2/d/(-b*e+c*d)/(c
*x^2+b*x)^(1/2)-2*e*(-A*e+B*d)*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b
*x)^(1/2))/d^(3/2)/(-b*e+c*d)^(3/2)
```

Mathematica [A] (verified)

Time = 0.70 (sec) , antiderivative size = 159, normalized size of antiderivative = 1.21

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{3/2}}\,dx=-\frac{2\left(\sqrt{d}\sqrt{-cd+be}(bBcdx+A(-bcd+b^2e-2c^2dx+bcex))+b^2e(Bd-Ae)\sqrt{x}\sqrt{b+cx}\arctan\left(\frac{-e\sqrt{x}\sqrt{b+\cdots}}{\sqrt{d}\sqrt{\cdots}}\right.\right.}{b^2d^{3/2}(-cd+be)^{3/2}\sqrt{x(b+cx)}}$$

input
```
Integrate[(A + B*x)/((d + e*x)*(b*x + c*x^2)^(3/2)),x]
```

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

Rubi [A] (verified)

Time = 0.50 (sec) , antiderivative size = 141, normalized size of antiderivative = 1.08, number of steps used = 5, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {1235, 27, 1154, 219}

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

$$\int \frac{A+Bx}{(bx+cx^2)^{3/2}(d+ex)}dx$$

$$\Big\downarrow \text{1235}$$

$$-\frac{2\int \frac{b^2e(Bd-Ae)}{2(d+ex)\sqrt{cx^2+bx}}dx}{b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(cd-be)}$$

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

$$-\frac{e(Bd-Ae)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(cd-be)}$$

$$\Big\downarrow \text{1154}$$

$$\frac{2e(Bd-Ae)\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(cd-be)}$$

$$\Big\downarrow \text{219}$$

$$-\frac{e(Bd-Ae)\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{d^{3/2}(cd-be)^{3/2}}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)*(b*x + c*x^2)^(3/2)),x]
```

output
```
(-2*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x))/(b^2*d*(c*d - b*e)*
Sqrt[b*x + c*x^2]) - (e*(B*d - A*e)*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqr
t[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(d^(3/2)*(c*d - b*e)^(3/2))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

Maple [A] (verified)

Time = 1.16 (sec) , antiderivative size = 120, normalized size of antiderivative = 0.92

method	result
pseudoelliptic	$\frac{-\frac{2A\sqrt{x(cx+b)}}{dx}+\frac{2(Ae-Bd)e\,b^2\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)}{\sqrt{d(be-cd)}\,d(be-cd)}+\frac{2c(Ac-Bb)x}{(be-cd)\sqrt{x(cx+b)}}}{b^2}$
risch	$-\frac{2A(cx+b)}{b^2d\sqrt{x(cx+b)}}-\frac{-\frac{b(Ae-Bd)\ln\left(\frac{-\frac{2d(be-cd)}{e^2}+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}+2\sqrt{-\frac{d(be-cd)}{e^2}}\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(be-cd)}{e^2}}}{x+\frac{d}{e}}\right)}{(be-cd)\sqrt{-\frac{d(be-cd)}{e^2}}}}{bd}$
default	$-\frac{2B(2cx+b)}{e\,b^2\sqrt{c\,x^2+bx}}+\frac{(Ae-Bd)\left(-\frac{e^2}{d(be-cd)\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(be-cd)}{e^2}}}+\frac{(be-2cd)e\left(2c\left(x+\cdots\right.\right.}{d(be-cd)\left(-\frac{4cd(be-cd)}{e^2}-\frac{(be-2cd)^2}{e^2}\right)\sqrt{c\cdots}}\right.}{\cdots}$

input
```
int((B*x+A)/(e*x+d)/(c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

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

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 263 vs. $2(117) = 234$.

Time = 0.09 (sec) , antiderivative size = 540, normalized size of antiderivative = 4.12

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{3/2}}\,dx = \left[\frac{\sqrt{cd^2-bde}\left(\left(Bb^2cde-Ab^2ce^2\right)x^2+\left(Bb^3de-Ab^3e^2\right)x\right)\log\left(\frac{bd+(2\,cd-be)x-\cdots}{e\cdots}\right.}{\left(b^2c^3d^4-\cdots\right.}\right.$$

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

output
```
[(sqrt(c*d^2 - b*d*e)*((B*b^2*c*d*e - A*b^2*c*e^2)*x^2 + (B*b^3*d*e - A*b^
3*e^2)*x)*log((b*d + (2*c*d - b*e)*x - 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 +
b*x))/(e*x + d)) - 2*(A*b*c^2*d^3 - 2*A*b^2*c*d^2*e + A*b^3*d*e^2 + (A*b^2
*c*d*e^2 - (B*b*c^2 - 2*A*c^3)*d^3 + (B*b^2*c - 3*A*b*c^2)*d^2*e)*x)*sqrt(
c*x^2 + b*x))/((b^2*c^3*d^4 - 2*b^3*c^2*d^3*e + b^4*c*d^2*e^2)*x^2 + (b^3*
c^2*d^4 - 2*b^4*c*d^3*e + b^5*d^2*e^2)*x), 2*(sqrt(-c*d^2 + b*d*e)*((B*b^2
*c*d*e - A*b^2*c*e^2)*x^2 + (B*b^3*d*e - A*b^3*e^2)*x)*arctan(sqrt(-c*d^2
+ b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x + b*d)) - (A*b*c^2*d^3 - 2*A*b^2*c*d^2*e
 + A*b^3*d*e^2 + (A*b^2*c*d*e^2 - (B*b*c^2 - 2*A*c^3)*d^3 + (B*b^2*c - 3*A
*b*c^2)*d^2*e)*x)*sqrt(c*x^2 + b*x))/((b^2*c^3*d^4 - 2*b^3*c^2*d^3*e + b^4
*c*d^2*e^2)*x^2 + (b^3*c^2*d^4 - 2*b^4*c*d^3*e + b^5*d^2*e^2)*x)]
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)\,(bx+cx^2)^{3/2}}\,dx = \int \frac{A+Bx}{(x\,(b+cx))^{\frac{3}{2}}\,(d+ex)}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)/((x*(b + c*x))**(3/2)*(d + e*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)\,(bx+cx^2)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

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

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((b/e-(2*c*d)/e^2)^2>0)', see `as
sume?` for
```

Giac [A] (verification not implemented)

Time = 0.16 (sec) , antiderivative size = 179, normalized size of antiderivative = 1.37

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{3/2}}\,dx = \frac{2\left(\frac{(Bbcd^2-2\,Ac^2d^2+Abcde)x}{b^2cd^3-b^3d^2e} - \frac{Abcd^2-Ab^2de}{b^2cd^3-b^3d^2e}\right)}{\sqrt{cx^2+bx}} + \frac{2\left(Bde-Ae^2\right)\arctan\left(\frac{\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)e+\sqrt{c}d}{\sqrt{-cd^2+bde}}\right)}{(cd^2-bde)\sqrt{-cd^2+bde}}$$

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

output
```
2*((B*b*c*d^2 - 2*A*c^2*d^2 + A*b*c*d*e)*x/(b^2*c*d^3 - b^3*d^2*e) - (A*b*
c*d^2 - A*b^2*d*e)/(b^2*c*d^3 - b^3*d^2*e))/sqrt(c*x^2 + b*x) + 2*(B*d*e -
 A*e^2)*arctan(((sqrt(c)*x - sqrt(c*x^2 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2
 + b*d*e))/((c*d^2 - b*d*e)*sqrt(-c*d^2 + b*d*e))
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{3/2}}\,dx = \int \frac{A+B\,x}{{\left(c\,x^2+b\,x\right)}^{3/2}\,\left(d+e\,x\right)}\,dx$$

input
```
int((A + B*x)/((b*x + c*x^2)^(3/2)*(d + e*x)),x)
```

output
```
int((A + B*x)/((b*x + c*x^2)^(3/2)*(d + e*x)), x)
```

Reduce [B] (verification not implemented)

Time = 0.37 (sec) , antiderivative size = 486, normalized size of antiderivative = 3.71

$$\int \frac{A+Bx}{(d+ex)\,(bx+cx^2)^{3/2}}\,dx = \frac{2\sqrt{d}\,\sqrt{cx+b}\,\sqrt{be-cd}\,atan\left(\frac{\sqrt{be-cd}-\sqrt{e}\,\sqrt{cx+b}-\sqrt{x}\,\sqrt{e}\,\sqrt{c}}{\sqrt{d}\,\sqrt{c}}\right)a\,b^2e^2x-2\sqrt{d}\,\sqrt{cx}$$

input
```
int((B*x+A)/(e*x+d)/(c*x^2+b*x)^(3/2),x)
```

output
```
(2*(sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*
sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**2*e**2*x
- sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sq
rt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**3*d*e*x + sqr
t(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b
+ c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**2*e**2*x - sqrt(
d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b +
c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**3*d*e*x - sqrt(c)*sq
rt(b + c*x)*a*b**2*d*e**2*x + 3*sqrt(c)*sqrt(b + c*x)*a*b*c*d**2*e*x - 2*s
qrt(c)*sqrt(b + c*x)*a*c**2*d**3*x - sqrt(c)*sqrt(b + c*x)*b**3*d**2*e*x +
 sqrt(c)*sqrt(b + c*x)*b**2*c*d**3*x - sqrt(x)*a*b**3*d*e**2 + 2*sqrt(x)*a
*b**2*c*d**2*e - sqrt(x)*a*b**2*c*d*e**2*x - sqrt(x)*a*b*c**2*d**3 + 3*sqr
t(x)*a*b*c**2*d**2*e*x - 2*sqrt(x)*a*c**3*d**3*x - sqrt(x)*b**3*c*d**2*e*x
 + sqrt(x)*b**2*c**2*d**3*x))/(sqrt(b + c*x)*b**2*d**2*x*(b**2*e**2 - 2*b*
c*d*e + c**2*d**2))
```

3.130 $\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 238

$$\begin{aligned}\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)^{3/2}}\,dx &= -\frac{bBd+2Acd-3Abe}{bd^2(cd-be)\sqrt{bx+cx^2}} \\ &- \frac{c(4Ac^2d^2-b^2e(Bd-3Ae)-2bcd(Bd+2Ae))\,x}{b^2d^2(cd-be)^2\sqrt{bx+cx^2}} \\ &+ \frac{Bd-Ae}{d(cd-be)(d+ex)\sqrt{bx+cx^2}} \\ &+ \frac{e(3Ae(2cd-be)-Bd(4cd-be))\operatorname{arctanh}\left(\frac{\sqrt{cd-bex}}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{d^{5/2}(cd-be)^{5/2}}\end{aligned}$$

output
```
-(-3*A*b*e+2*A*c*d+B*b*d)/b/d^2/(-b*e+c*d)/(c*x^2+b*x)^(1/2)-c*(4*A*c^2*d^
2-b^2*e*(-3*A*e+B*d)-2*b*c*d*(2*A*e+B*d))*x/b^2/d^2/(-b*e+c*d)^2/(c*x^2+b*
x)^(1/2)+(-A*e+B*d)/d/(-b*e+c*d)/(e*x+d)/(c*x^2+b*x)^(1/2)+e*(3*A*e*(-b*e+
2*c*d)-B*d*(-b*e+4*c*d))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1
/2))/d^(5/2)/(-b*e+c*d)^(5/2)
```

Mathematica [A] (verified)

Time = 1.75 (sec) , antiderivative size = 265, normalized size of antiderivative = 1.11

$$\int \frac{A+Bx}{(d+ex)^2 (bx+cx^2)^{3/2}}\,dx = \frac{x\left(\frac{\sqrt{d}(b+cx)(bBdx(b^2e^2+bce^2x+2c^2d(d+ex))-A(4c^3d^2x(d+ex)+b^3e^2(2d+3ex)+2bc^2d(d^2-dex-}{b^2(cd-be)^2(d+ex)}\right.}{d^5}$$

input
```
Integrate[(A + B*x)/((d + e*x)^2*(b*x + c*x^2)^(3/2)),x]
```

output
```
(x*((Sqrt[d]*(b + c*x)*(b*B*d*x*(b^2*e^2 + b*c*e^2*x + 2*c^2*d*(d + e*x))
- A*(4*c^3*d^2*x*(d + e*x) + b^3*e^2*(2*d + 3*e*x) + 2*b*c^2*d*(d^2 - d*e*
x - 2*e^2*x^2) + b^2*c*e*(-4*d^2 - 2*d*e*x + 3*e^2*x^2))))/(b^2*(c*d - b*e
)^2*(d + e*x)) + (e*(B*d*(4*c*d - b*e) + 3*A*e*(-2*c*d + b*e))*Sqrt[x]*(b
+ c*x)^(3/2)*ArcTan[(-(e*Sqrt[x]*Sqrt[b + c*x]) + Sqrt[c]*(d + e*x))/(Sqrt
[d]*Sqrt[-(c*d) + b*e])])/(-(c*d) + b*e)^(5/2)))/(d^(5/2)*(x*(b + c*x))^(3
/2))
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 262, normalized size of antiderivative = 1.10, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {1235, 27, 1228, 1154, 219}

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

$$\int \frac{A+Bx}{(bx+cx^2)^{3/2}(d+ex)^2}\,dx$$

$$\Big\downarrow \text{ 1235}$$

$$-\frac{2\int \frac{e(b(bBd+2Acd-3Abe)-2c(bBd-2Acd+Abe)x)}{2(d+ex)^2\sqrt{cx^2+bx}}dx}{b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)(cd-be)}$$

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

$$-\frac{e\int \frac{b(bBd+2Acd-3Abe)-2c(bBd-2Acd+Abe)x}{(d+ex)^2\sqrt{cx^2+bx}}dx}{b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)(cd-be)}$$

$$\Big\downarrow \ 1228$$

$$-\frac{e\left(\frac{\sqrt{bx+cx^2}\left(b^2(-e)(Bd-3Ae)-2bcd(2Ae+Bd)+4Ac^2d^2\right)}{d(d+ex)(cd-be)}-\frac{b^2(3Ae(2cd-be)-Bd(4cd-be))\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{2d(cd-be)}\right)}{b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)(cd-be)}$$

$$\Big\downarrow \ 1154$$

$$-\frac{e\left(\frac{b^2(3Ae(2cd-be)-Bd(4cd-be))\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{d(cd-be)}+\frac{\sqrt{bx+cx^2}\left(b^2(-e)(Bd-3Ae)-2bcd(2Ae+Bd)+4Ac^2\right.}{d(d+ex)(cd-be)}\right.}{b^2d(cd-be)}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)(cd-be)}$$

$$\Big\downarrow \ 219$$

$$-\frac{e\left(\frac{\sqrt{bx+cx^2}\left(b^2(-e)(Bd-3Ae)-2bcd(2Ae+Bd)+4Ac^2d^2\right)}{d(d+ex)(cd-be)}-\frac{b^2(3Ae(2cd-be)-Bd(4cd-be))\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{2d^{3/2}(cd-be)^{3/2}}\right)}{b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^2*(b*x + c*x^2)^(3/2)),x]
```

output
```
(-2*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x))/(b^2*d*(c*d - b*e)*
(d + e*x)*Sqrt[b*x + c*x^2]) - (e*(((4*A*c^2*d^2 - b^2*e*(B*d - 3*A*e) - 2
*b*c*d*(B*d + 2*A*e))*Sqrt[b*x + c*x^2])/(d*(c*d - b*e)*(d + e*x)) - (b^2*
(3*A*e*(2*c*d - b*e) - B*d*(4*c*d - b*e))*ArcTanh[(b*d + (2*c*d - b*e)*x)/
(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(2*d^(3/2)*(c*d - b*e)^(3/
2))))/(b^2*d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

Maple [A] (verified)

Time = 1.25 (sec) , antiderivative size = 228, normalized size of antiderivative = 0.96

method	result
pseudoelliptic	$-\frac{2\left(-\frac{3\left(\frac{4Bc\,d^2}{3}-2e\left(Ac+\frac{Bb}{6}\right)d+Ab\,e^2\right)e(ex+d)b^2\sqrt{x(cx+b)}\,\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)}{2}+\sqrt{d(be-cd)}\left(c^2(2Acx+b(-Bx+A))d^3-\cdots\right.\right.}{\sqrt{x(cx+b)}\,\sqrt{d(be-cd)}\,d^2(ex+d)(be\cdots}$
risch	$-\frac{2A(cx+b)}{b^2d^2\sqrt{x(cx+b)}}-\frac{-\frac{b\left(Ab\,e^2-2Acde+Bc\,d^2\right)\ln\left(\frac{-\frac{2d(be-cd)}{e^2}+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}+2\sqrt{-\frac{d(be-cd)}{e^2}}\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}\cdots}}{x+\frac{d}{e}}\right)}{(be-cd)^2\sqrt{-\frac{d(be-cd)}{e^2}}}\cdots}{\cdots}$
default	$\frac{B\left(-\frac{e^2}{d(be-cd)\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(be-cd)}{e^2}}}+\frac{(be-2cd)e\left(2c\left(x+\frac{d}{e}\right)+\frac{be-2cd}{e}\right)}{d(be-cd)\left(-\frac{4cd(be-cd)}{e^2}-\frac{(be-2cd)^2}{e^2}\right)\sqrt{c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(\cdots}{\cdots}}}\cdots\right)}{e^2}$

input
```
int((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-2/(x*(c*x+b))^(1/2)*(-3/2*(4/3*B*c*d^2-2*e*(A*c+1/6*B*b)*d+A*b*e^2)*e*(e*
x+d)*b^2*(x*(c*x+b))^(1/2)*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2
))+(d*(b*e-c*d))^(1/2)*(c^2*(2*A*c*x+b*(-B*x+A))*d^3-2*c*(b^2*A+1/2*c*x*(B
*x+A)*b-A*c^2*x^2)*e*d^2+e^2*(c*x+b)*b*((-1/2*B*x+A)*b-2*A*c*x)*d+3/2*A*b^
2*e^3*x*(c*x+b)))/(d*(b*e-c*d))^(1/2)/d^2/(e*x+d)/(b*e-c*d)^2/b^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 610 vs. $2(222) = 444$.

Time = 0.12 (sec) , antiderivative size = 1236, normalized size of antiderivative = 5.19

$$\int \frac{A + Bx}{(d + ex)^2 (bx + cx^2)^{3/2}} \, dx = \text{Too large to display}$$

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

output
```
[1/2*(((4*B*b^2*c^2*d^2*e^2 + 3*A*b^3*c*e^4 - (B*b^3*c + 6*A*b^2*c^2)*d*e^
3)*x^3 + (4*B*b^2*c^2*d^3*e + 3*A*b^4*e^4 + 3*(B*b^3*c - 2*A*b^2*c^2)*d^2*
e^2 - (B*b^4 + 3*A*b^3*c)*d*e^3)*x^2 + (4*B*b^3*c*d^3*e + 3*A*b^4*d*e^3 -
(B*b^4 + 6*A*b^3*c)*d^2*e^2)*x)*sqrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*
e)*x - 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d)) - 2*(2*A*b*c^3*
d^5 - 6*A*b^2*c^2*d^4*e + 6*A*b^3*c*d^3*e^2 - 2*A*b^4*d^2*e^3 - (3*A*b^3*c
*d*e^4 + 2*(B*b*c^3 - 2*A*c^4)*d^4*e - (B*b^2*c^2 - 8*A*b*c^3)*d^3*e^2 - (
B*b^3*c + 7*A*b^2*c^2)*d^2*e^3)*x^2 - (B*b^3*c*d^3*e^2 + 3*A*b^4*d*e^4 + 2
*(B*b*c^3 - 2*A*c^4)*d^5 - 2*(B*b^2*c^2 - 3*A*b*c^3)*d^4*e - (B*b^4 + 5*A*
b^3*c)*d^2*e^3)*x)*sqrt(c*x^2 + b*x))/((b^2*c^4*d^6*e - 3*b^3*c^3*d^5*e^2
+ 3*b^4*c^2*d^4*e^3 - b^5*c*d^3*e^4)*x^3 + (b^2*c^4*d^7 - 2*b^3*c^3*d^6*e
+ 2*b^5*c*d^4*e^3 - b^6*d^3*e^4)*x^2 + (b^3*c^3*d^7 - 3*b^4*c^2*d^6*e + 3*
b^5*c*d^5*e^2 - b^6*d^4*e^3)*x), (((4*B*b^2*c^2*d^2*e^2 + 3*A*b^3*c*e^4 -
(B*b^3*c + 6*A*b^2*c^2)*d*e^3)*x^3 + (4*B*b^2*c^2*d^3*e + 3*A*b^4*e^4 + 3*
(B*b^3*c - 2*A*b^2*c^2)*d^2*e^2 - (B*b^4 + 3*A*b^3*c)*d*e^3)*x^2 + (4*B*b^
3*c*d^3*e + 3*A*b^4*d*e^3 - (B*b^4 + 6*A*b^3*c)*d^2*e^2)*x)*sqrt(-c*d^2 +
b*d*e)*arctan(sqrt(-c*d^2 + b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x + b*d)) - (2*A
*b*c^3*d^5 - 6*A*b^2*c^2*d^4*e + 6*A*b^3*c*d^3*e^2 - 2*A*b^4*d^2*e^3 - (3*
A*b^3*c*d*e^4 + 2*(B*b*c^3 - 2*A*c^4)*d^4*e - (B*b^2*c^2 - 8*A*b*c^3)*d^3*
e^2 - (B*b^3*c + 7*A*b^2*c^2)*d^2*e^3)*x^2 - (B*b^3*c*d^3*e^2 + 3*A*b^4...
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^{3/2}}\,dx=\int \frac{A+Bx}{(x\,(b+cx))^{\frac{3}{2}}\,(d+ex)^2}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**2/(c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)/((x*(b + c*x))**(3/2)*(d + e*x)**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^{3/2}}\,dx=\text{Exception raised: ValueError}$$

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

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1281 vs. 2(222) = 444.

Time = 0.44 (sec) , antiderivative size = 1281, normalized size of antiderivative = 5.38

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^{3/2}}\,dx=\text{Too large to display}$$

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

output
```
-1/2*((4*B*b^2*c*d^2*e^4*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d*e)*s
qrt(c)*abs(e))) - B*b^3*d*e^5*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d
*e)*sqrt(c)*abs(e))) - 6*A*b^2*c*d*e^5*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*
d^2 - b*d*e)*sqrt(c)*abs(e))) + 3*A*b^3*e^6*log(abs(2*c*d*e - b*e^2 - 2*sq
rt(c*d^2 - b*d*e)*sqrt(c)*abs(e))) + 4*sqrt(c*d^2 - b*d*e)*B*b*c^(3/2)*d^2
*e^2*abs(e) - 8*sqrt(c*d^2 - b*d*e)*A*c^(5/2)*d^2*e^2*abs(e) + 2*sqrt(c*d^
2 - b*d*e)*B*b^2*sqrt(c)*d*e^3*abs(e) + 8*sqrt(c*d^2 - b*d*e)*A*b*c^(3/2)*
d*e^3*abs(e) - 6*sqrt(c*d^2 - b*d*e)*A*b^2*sqrt(c)*e^4*abs(e))*sgn(1/(e*x
+ d))*sgn(e)/(sqrt(c*d^2 - b*d*e)*b^2*c^2*d^4*abs(e) - 2*sqrt(c*d^2 - b*d*
e)*b^3*c*d^3*e*abs(e) + sqrt(c*d^2 - b*d*e)*b^4*d^2*e^2*abs(e)) - 2*((2*B*
b*c^2*d^2*e^7*sgn(1/(e*x + d))*sgn(e) - 4*A*c^3*d^2*e^7*sgn(1/(e*x + d))*s
gn(e) + B*b^2*c*d*e^8*sgn(1/(e*x + d))*sgn(e) + 4*A*b*c^2*d*e^8*sgn(1/(e*x
 + d))*sgn(e) - 3*A*b^2*c*e^9*sgn(1/(e*x + d))*sgn(e))/(b^2*c^2*d^4*e^5*sg
n(1/(e*x + d))^2*sgn(e)^2 - 2*b^3*c*d^3*e^6*sgn(1/(e*x + d))^2*sgn(e)^2 +
b^4*d^2*e^7*sgn(1/(e*x + d))^2*sgn(e)^2) - ((2*B*b*c^2*d^3*e^8*sgn(1/(e*x
+ d))*sgn(e) - 4*A*c^3*d^3*e^8*sgn(1/(e*x + d))*sgn(e) + 2*B*b^2*c*d^2*e^9
*sgn(1/(e*x + d))*sgn(e) + 6*A*b*c^2*d^2*e^9*sgn(1/(e*x + d))*sgn(e) - B*b
^3*d*e^10*sgn(1/(e*x + d))*sgn(e) - 8*A*b^2*c*d*e^10*sgn(1/(e*x + d))*sgn(
e) + 3*A*b^3*e^11*sgn(1/(e*x + d))*sgn(e))/(b^2*c^2*d^4*e^5*sgn(1/(e*x + d
))^2*sgn(e)^2 - 2*b^3*c*d^3*e^6*sgn(1/(e*x + d))^2*sgn(e)^2 + b^4*d^2*e...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^2 (bx+cx^2)^{3/2}}\,dx = \int \frac{A+B\,x}{\left(c\,x^2+b\,x\right)^{3/2}\,\left(d+e\,x\right)^2}\,dx$$

input
```
int((A + B*x)/((b*x + c*x^2)^(3/2)*(d + e*x)^2),x)
```

output
```
int((A + B*x)/((b*x + c*x^2)^(3/2)*(d + e*x)^2), x)
```

Reduce [B] (verification not implemented)

Time = 0.50 (sec) , antiderivative size = 2471, normalized size of antiderivative = 10.38

$$\int \frac{A+Bx}{(d+ex)^2 (bx+cx^2)^{3/2}} \, dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(3/2),x)
```

output
```
(3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*s
qrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**4*d*e**4*x
 + 3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)
*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**4*e**5*x
**2 - 12*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqr
t(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*c*
d**2*e**3*x - 12*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*
d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a
*b**3*c*d*e**4*x**2 + 12*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(
b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqr
t(c)))*a*b**2*c**2*d**3*e**2*x + 12*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*
atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(
sqrt(d)*sqrt(c)))*a*b**2*c**2*d**2*e**3*x**2 - sqrt(d)*sqrt(b + c*x)*sqrt(
b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)
*sqrt(c))/(sqrt(d)*sqrt(c)))*b**5*d**2*e**3*x - sqrt(d)*sqrt(b + c*x)*sqrt
(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e
)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**5*d*e**4*x**2 + 6*sqrt(d)*sqrt(b + c*x)*s
qrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqr
t(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b**4*c*d**3*e**2*x + 6*sqrt(d)*sqrt(b + c
*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqr...
```

3.131 $\int \frac{A+Bx}{(d+ex)^3 \left(bx+cx^2\right)^{3/2}} \, dx$

Optimal result

Integrand size = 26, antiderivative size = 384

$$\int \frac{A+Bx}{(d+ex)^3 (bx+cx^2)^{3/2}} \, dx = -\frac{8Ac^2d^2+4bcd(2Bd-7Ae)-3b^2e(Bd-5Ae)}{4bd^3(cd-be)^2\sqrt{bx+cx^2}} - \frac{c(16Ac^3d^3-2b^2cde(5Bd-19Ae)+3b^3e^2(Bd-5Ae)-8bc^2d^2(Bd+3Ae))\,x}{4b^2d^3(cd-be)^3\sqrt{bx+cx^2}} + \frac{Bd-Ae}{2d(cd-be)(d+ex)^2\sqrt{bx+cx^2}} - \frac{5Ae(2cd-be)-Bd(6cd-be)}{4d^2(cd-be)^2(d+ex)\sqrt{bx+cx^2}} - \frac{3e(Bd(8c^2d^2-4bcde+b^2e^2)-Ae(16c^2d^2-16bcde+5b^2e^2))\,\text{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{4d^{7/2}(cd-be)^{7/2}}$$

output
```
-1/4*(8*A*c^2*d^2+4*b*c*d*(-7*A*e+2*B*d)-3*b^2*e*(-5*A*e+B*d))/b/d^3/(-b*e
+c*d)^2/(c*x^2+b*x)^(1/2)-1/4*c*(16*A*c^3*d^3-2*b^2*c*d*e*(-19*A*e+5*B*d)+
3*b^3*e^2*(-5*A*e+B*d)-8*b*c^2*d^2*(3*A*e+B*d))*x/b^2/d^3/(-b*e+c*d)^3/(c*
x^2+b*x)^(1/2)+1/2*(-A*e+B*d)/d/(-b*e+c*d)/(e*x+d)^2/(c*x^2+b*x)^(1/2)-1/4
*(5*A*e*(-b*e+2*c*d)-B*d*(-b*e+6*c*d))/d^2/(-b*e+c*d)^2/(e*x+d)/(c*x^2+b*x
)^(1/2)-3/4*e*(B*d*(b^2*e^2-4*b*c*d*e+8*c^2*d^2)-A*e*(5*b^2*e^2-16*b*c*d*e
+16*c^2*d^2))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+b*x)^(1/2))/d^(7/2
)/(-b*e+c*d)^(7/2)
```

Mathematica [A] (verified)

Time = 11.54 (sec) , antiderivative size = 377, normalized size of antiderivative = 0.98

$$\int \frac{A+Bx}{(d+ex)^3\left(bx+cx^2\right)^{3/2}}\,dx=\frac{2b^2d^{5/2}(Bd-Ae)(cd-be)^{5/2}+(d+ex)\left(b^2d^{3/2}(cd-be)^{3/2}(Bd(6cd-be\right.}{}$$

input
```
Integrate[(A + B*x)/((d + e*x)^3*(b*x + c*x^2)^(3/2)),x]
```

output
```
(2*b^2*d^(5/2)*(B*d - A*e)*(c*d - b*e)^(5/2) + (d + e*x)*(b^2*d^(3/2)*(c*d
 - b*e)^(3/2)*(B*d*(6*c*d - b*e) + 5*A*e*(-2*c*d + b*e)) - (d + e*x)*(b*Sq
rt[d]*(c*d - b*e)^(3/2)*(8*A*c^2*d^2 + 4*b*c*d*(2*B*d - 7*A*e) + 3*b^2*e*(
-(B*d) + 5*A*e)) + c*Sqrt[d]*Sqrt[c*d - b*e]*(16*A*c^3*d^3 + 3*b^3*e^2*(B*
d - 5*A*e) - 8*b*c^2*d^2*(B*d + 3*A*e) + 2*b^2*c*d*e*(-5*B*d + 19*A*e))*x
+ 3*b^2*e*(A*e*(-16*c^2*d^2 + 16*b*c*d*e - 5*b^2*e^2) + B*d*(8*c^2*d^2 - 4
*b*c*d*e + b^2*e^2))*Sqrt[x]*Sqrt[b + c*x]*ArcTanh[(Sqrt[c*d - b*e]*Sqrt[x
])/(Sqrt[d]*Sqrt[b + c*x])])))/(4*b^2*d^(7/2)*(c*d - b*e)^(7/2)*Sqrt[x*(b
+ c*x)]*(d + e*x)^2)
```

Rubi [A] (verified)

Time = 1.23 (sec) , antiderivative size = 403, normalized size of antiderivative = 1.05, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}=0.269$, Rules used = {1235, 27, 1237, 27, 1228, 1154, 219}

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

$$\int \frac{A+Bx}{\left(bx+cx^2\right)^{3/2}(d+ex)^3}\,dx$$

$$\Big\downarrow \text{1235}$$

$$-\frac{2\int \frac{e(b(bBd+4Acd-5Abe)-4c(bBd-2Acd+Abe)x)}{2(d+ex)^3\sqrt{cx^2+bx}}dx}{b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)^2(cd-be)}$$

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

$$-\frac{e\int \frac{b(bBd+4Acd-5Abe)-4c(bBd-2Acd+Abe)x}{(d+ex)^3\sqrt{cx^2+bx}}dx}{b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)^2(cd-be)}$$

$\big\downarrow$ 1237

$$-\frac{e\left(\frac{\sqrt{bx+cx^2}\left(b^2(-e)(Bd-5Ae)-4bcd(2Ae+Bd)+8Ac^2d^2\right)}{2d(d+ex)^2(cd-be)}-\frac{\int -\frac{b\left(-3e(Bd-5Ae)b^2+4cd(2Bd-7Ae)b+8Ac^2d^2\right)+2c\left(-e(Bd-5Ae)b^2-4cd(Bd+2A\right.}{2(d+ex)^2\sqrt{cx^2+bx}}}{2d(cd-be)}\right.}{b^2d(cd-be)}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)^2(cd-be)}$$

$\big\downarrow$ 27

$$-\frac{e\left(\frac{\int \frac{b\left(-3e(Bd-5Ae)b^2+4cd(2Bd-7Ae)b+8Ac^2d^2\right)+2c\left(-e(Bd-5Ae)b^2-4cd(Bd+2Ae)b+8Ac^2d^2\right)x}{(d+ex)^2\sqrt{cx^2+bx}}dx}{4d(cd-be)}+\frac{\sqrt{bx+cx^2}\left(b^2(-e)(Bd-5Ae)-4bcd(2Ae+\right.}{2d(d+ex)^2(cd-be)}\right.}{b^2d(cd-be)}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)^2(cd-be)}$$

$\big\downarrow$ 1228

$$-\frac{e\left(\frac{\frac{3b^2\left(Bd\left(b^2e^2-4bcde+8c^2d^2\right)-Ae\left(5b^2e^2-16bcde+16c^2d^2\right)\right)\int\frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{2d(cd-be)}+\frac{\sqrt{bx+cx^2}\left(3b^3e^2(Bd-5Ae)-2b^2cde(5Bd-19Ae)-8bc^2d^2(3Ae+Bd\right.}{d(d+ex)(cd-be)}}{4d(cd-be)}\right.}{b^2d(cd-be)}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)^2(cd-be)}$$

$\big\downarrow$ 1154

$$-\frac{e\left(\frac{\frac{\sqrt{bx+cx^2}\left(3b^3e^2(Bd-5Ae)-2b^2cde(5Bd-19Ae)-8bc^2d^2(3Ae+Bd)+16Ac^3d^3\right)}{d(d+ex)(cd-be)}-\frac{3b^2\left(Bd\left(b^2e^2-4bcde+8c^2d^2\right)-Ae\left(5b^2e^2-16bcde+16c^2d^2\right)\right)\int\frac{}{4d(cd-}}{d(cd-be)}}{4d(cd-be)}\right.}{b^2d(cd-be)}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)^2(cd-be)}$$

$\big\downarrow$ 219

$$-\frac{e\left(\frac{\frac{3b^2\left(Bd\left(b^2e^2-4bcde+8c^2d^2\right)-Ae\left(5b^2e^2-16bcde+16c^2d^2\right)\right)\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{2d^{3/2}(cd-be)^{3/2}}+\frac{\sqrt{bx+cx^2}\left(3b^3e^2(Bd-5Ae)-2b^2cde(5Bd-19Ae)-8\right.}{d(d+ex)(cd-be)}}{4d(cd-be)}\right.}{b^2d(cd-be)}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\sqrt{bx+cx^2}(d+ex)^2(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^3*(b*x + c*x^2)^(3/2)),x]
```

output
```
(-2*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x))/(b^2*d*(c*d - b*e)*
(d + e*x)^2*Sqrt[b*x + c*x^2]) - (e*(((8*A*c^2*d^2 - b^2*e*(B*d - 5*A*e) -
 4*b*c*d*(B*d + 2*A*e))*Sqrt[b*x + c*x^2])/(2*d*(c*d - b*e)*(d + e*x)^2) +
 (((16*A*c^3*d^3 - 2*b^2*c*d*e*(5*B*d - 19*A*e) + 3*b^3*e^2*(B*d - 5*A*e)
- 8*b*c^2*d^2*(B*d + 3*A*e))*Sqrt[b*x + c*x^2])/(d*(c*d - b*e)*(d + e*x))
+ (3*b^2*(B*d*(8*c^2*d^2 - 4*b*c*d*e + b^2*e^2) - A*e*(16*c^2*d^2 - 16*b*c
*d*e + 5*b^2*e^2))*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b
*e]*Sqrt[b*x + c*x^2])])/(2*d^(3/2)*(c*d - b*e)^(3/2)))/(4*d*(c*d - b*e)))
)/(b^2*d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Maple [A] (verified)

Time = 1.40 (sec) , antiderivative size = 363, normalized size of antiderivative = 0.95

method	result
pseudoelliptic	$-\frac{2\left(-\frac{15e(ex+d)^2b^2\left(-\frac{8Bc^2d^3}{5}+\frac{16c\left(Ac+\frac{Bb}{4}\right)ed^2}{5}-\frac{16e^2b\left(Ac+\frac{Bb}{16}\right)d}{5}+Ab^2e^3\right)\sqrt{x(cx+b)}\,\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)}{8}+\sqrt{d(be-cd)}\right.}{}$
risch	Expression too large to display
default	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^3/(c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
-2/(x*(c*x+b))^(1/2)*(-15/8*e*(e*x+d)^2*b^2*(-8/5*B*c^2*d^3+16/5*c*(A*c+1/
4*B*b)*e*d^2-16/5*e^2*b*(A*c+1/16*B*b)*d+A*b^2*e^3)*(x*(c*x+b))^(1/2)*arct
an((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))+(d*(b*e-c*d))^(1/2)*(-c^3*(2
*A*c*x+b*(-B*x+A))*d^5+3*(b^2*A+1/3*c*x*(2*B*x+A)*b-4/3*A*c^2*x^2)*c^2*e*d
^4-3*c*e^2*((-1/2*B*x+A)*b^3-c*x*(1/2*B*x+A)*b^2-5/3*c^2*x^2*(1/5*B*x+A)*b
+2/3*A*c^3*x^3)*d^3+e^3*(c*x+b)*b*((-5/8*B*x+A)*b^2-8*c*(-5/32*B*x+A)*x*b+
3*A*c^2*x^2)*d^2+25/8*e^4*((-3/25*B*x+A)*b-38/25*A*c*x)*x*(c*x+b)*b^2*d+15
/8*A*b^3*e^5*x^2*(c*x+b)))/(d*(b*e-c*d))^(1/2)/d^3/(e*x+d)^2/(b*e-c*d)^3/b
^2
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1132 vs. $2(355) = 710$.

Time = 0.24 (sec) , antiderivative size = 2279, normalized size of antiderivative = 5.93

$$\int \frac{A+Bx}{(d+ex)^3\left(bx+cx^2\right)^{3/2}}\,dx = \text{Too large to display}$$

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

output
```
[1/8*(3*((8*B*b^2*c^3*d^3*e^3 - 5*A*b^4*c*e^6 - 4*(B*b^3*c^2 + 4*A*b^2*c^3
)*d^2*e^4 + (B*b^4*c + 16*A*b^3*c^2)*d*e^5)*x^4 + (16*B*b^2*c^3*d^4*e^2 -
32*A*b^2*c^3*d^3*e^3 - 5*A*b^5*e^6 - 2*(B*b^4*c - 8*A*b^3*c^2)*d^2*e^4 + (
B*b^5 + 6*A*b^4*c)*d*e^5)*x^3 + (8*B*b^2*c^3*d^5*e - 10*A*b^5*d*e^5 + 4*(3
*B*b^3*c^2 - 4*A*b^2*c^3)*d^4*e^2 - (7*B*b^4*c + 16*A*b^3*c^2)*d^3*e^3 + (
2*B*b^5 + 27*A*b^4*c)*d^2*e^4)*x^2 + (8*B*b^3*c^2*d^5*e - 5*A*b^5*d^2*e^4
- 4*(B*b^4*c + 4*A*b^3*c^2)*d^4*e^2 + (B*b^5 + 16*A*b^4*c)*d^3*e^3)*x)*sqr
t(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x - 2*sqrt(c*d^2 - b*d*e)*sqrt(c
*x^2 + b*x))/(e*x + d)) - 2*(8*A*b*c^4*d^7 - 32*A*b^2*c^3*d^6*e + 48*A*b^3
*c^2*d^5*e^2 - 32*A*b^4*c*d^4*e^3 + 8*A*b^5*d^3*e^4 + (15*A*b^4*c*d*e^6 -
8*(B*b*c^4 - 2*A*c^5)*d^5*e^2 - 2*(B*b^2*c^3 + 20*A*b*c^4)*d^4*e^3 + (13*B
*b^3*c^2 + 62*A*b^2*c^3)*d^3*e^4 - (3*B*b^4*c + 53*A*b^3*c^2)*d^2*e^5)*x^3
 + (15*A*b^5*d*e^6 - 16*(B*b*c^4 - 2*A*c^5)*d^6*e + 4*(B*b^2*c^3 - 18*A*b*
c^4)*d^5*e^2 + (7*B*b^3*c^2 + 80*A*b^2*c^3)*d^4*e^3 + (8*B*b^4*c - 27*A*b^
3*c^2)*d^3*e^4 - (3*B*b^5 + 28*A*b^4*c)*d^2*e^5)*x^2 + (25*A*b^5*d^2*e^5 -
 8*(B*b*c^4 - 2*A*c^5)*d^7 + 8*(B*b^2*c^3 - 3*A*b*c^4)*d^6*e - 4*(3*B*b^3*
c^2 + 4*A*b^2*c^3)*d^5*e^2 + (17*B*b^4*c + 80*A*b^3*c^2)*d^4*e^3 - (5*B*b^
5 + 81*A*b^4*c)*d^3*e^4)*x)*sqrt(c*x^2 + b*x))/((b^2*c^5*d^8*e^2 - 4*b^3*c
^4*d^7*e^3 + 6*b^4*c^3*d^6*e^4 - 4*b^5*c^2*d^5*e^5 + b^6*c*d^4*e^6)*x^4 +
(2*b^2*c^5*d^9*e - 7*b^3*c^4*d^8*e^2 + 8*b^4*c^3*d^7*e^3 - 2*b^5*c^2*d^...
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^3\left(bx+cx^2\right)^{3/2}}\,dx = \int \frac{A+Bx}{\left(x\left(b+cx\right)\right)^{\frac{3}{2}}\left(d+ex\right)^{3}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**3/(c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)/((x*(b + c*x))**(3/2)*(d + e*x)**3), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^3 (bx+cx^2)^{3/2}}\,dx = \text{Exception raised: ValueError}$$

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

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1117 vs. $2(355) = 710$.

Time = 0.15 (sec) , antiderivative size = 1117, normalized size of antiderivative = 2.91

$$\int \frac{A+Bx}{(d+ex)^3 (bx+cx^2)^{3/2}}\,dx = \text{Too large to display}$$

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

output
```
2*((B*b*c^3*d^6 - 2*A*c^4*d^6 + 3*A*b*c^3*d^5*e - 3*A*b^2*c^2*d^4*e^2 + A*
b^3*c*d^3*e^3)*x/(b^2*c^3*d^9 - 3*b^3*c^2*d^8*e + 3*b^4*c*d^7*e^2 - b^5*d^
6*e^3) - (A*b*c^3*d^6 - 3*A*b^2*c^2*d^5*e + 3*A*b^3*c*d^4*e^2 - A*b^4*d^3*
e^3)/(b^2*c^3*d^9 - 3*b^3*c^2*d^8*e + 3*b^4*c*d^7*e^2 - b^5*d^6*e^3))/sqrt
(c*x^2 + b*x) - 3/4*(8*B*c^2*d^3*e - 4*B*b*c*d^2*e^2 - 16*A*c^2*d^2*e^2 +
B*b^2*d*e^3 + 16*A*b*c*d*e^3 - 5*A*b^2*e^4)*arctan(-((sqrt(c)*x - sqrt(c*x
^2 + b*x))*e + sqrt(c)*d)/sqrt(-c*d^2 + b*d*e))/((c^3*d^6 - 3*b*c^2*d^5*e
+ 3*b^2*c*d^4*e^2 - b^3*d^3*e^3)*sqrt(-c*d^2 + b*d*e)) + 1/4*(16*(sqrt(c)*
x - sqrt(c*x^2 + b*x))^3*B*c^2*d^3*e^2 - 12*(sqrt(c)*x - sqrt(c*x^2 + b*x)
)^3*B*b*c*d^2*e^3 - 24*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*c^2*d^2*e^3 + 3
*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*B*b^2*d*e^4 + 24*(sqrt(c)*x - sqrt(c*x^
2 + b*x))^3*A*b*c*d*e^4 - 7*(sqrt(c)*x - sqrt(c*x^2 + b*x))^3*A*b^2*e^5 +
40*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*B*c^(5/2)*d^4*e - 28*(sqrt(c)*x - sqr
t(c*x^2 + b*x))^2*B*b*c^(3/2)*d^3*e^2 - 56*(sqrt(c)*x - sqrt(c*x^2 + b*x))
^2*A*c^(5/2)*d^3*e^2 + 9*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*B*b^2*sqrt(c)*d
^2*e^3 + 48*(sqrt(c)*x - sqrt(c*x^2 + b*x))^2*A*b*c^(3/2)*d^2*e^3 - 13*(sq
rt(c)*x - sqrt(c*x^2 + b*x))^2*A*b^2*sqrt(c)*d*e^4 + 40*(sqrt(c)*x - sqrt(
c*x^2 + b*x))*B*b*c^2*d^4*e - 24*(sqrt(c)*x - sqrt(c*x^2 + b*x))*B*b^2*c*d
^3*e^2 - 56*(sqrt(c)*x - sqrt(c*x^2 + b*x))*A*b*c^2*d^3*e^2 + 5*(sqrt(c)*x
 - sqrt(c*x^2 + b*x))*B*b^3*d^2*e^3 + 44*(sqrt(c)*x - sqrt(c*x^2 + b*x)...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^3 (bx+cx^2)^{3/2}} \, dx = \int \frac{A+B\,x}{\left(c\,x^2+b\,x\right)^{3/2}\,\left(d+e\,x\right)^3} \, dx$$

input
```
int((A + B*x)/((b*x + c*x^2)^(3/2)*(d + e*x)^3),x)
```

output
```
int((A + B*x)/((b*x + c*x^2)^(3/2)*(d + e*x)^3), x)
```

Reduce [B] (verification not implemented)

Time = 0.98 (sec) , antiderivative size = 5061, normalized size of antiderivative = 13.18

$$\int \frac{A + Bx}{(d + ex)^3 (bx + cx^2)^{3/2}} \, dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)^3/(c*x^2+b*x)^(3/2),x)
```

output
```
(30*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*
sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**5*d**2*e*
*5*x + 60*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sq
rt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**5*d
*e**6*x**2 + 30*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d
) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*
b**5*e**7*x**3 - 156*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e
- c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)
))*a*b**4*c*d**3*e**4*x - 312*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((
sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d
)*sqrt(c)))*a*b**4*c*d**2*e**5*x**2 - 156*sqrt(d)*sqrt(b + c*x)*sqrt(b*e -
 c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt
(c))/(sqrt(d)*sqrt(c)))*a*b**4*c*d*e**6*x**3 + 288*sqrt(d)*sqrt(b + c*x)*s
qrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqr
t(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*c**2*d**4*e**3*x + 576*sqrt(d)*sqr
t(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*sqrt(b + c*x) -
 sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*c**2*d**3*e**4*x**2 +
288*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqrt(e)*
sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**3*c**2*d*
*2*e**5*x**3 - 192*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e...
```

3.132 $\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}} dx$

Optimal result

Integrand size = 26, antiderivative size = 298

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}} dx = -\frac{2(bB-Ac)(cd-be)^4x^2}{3b^3c^3(bx+cx^2)^{3/2}}$$
$$+\frac{2d^3(7Acd-3b(Bd+4Ae))}{3b^3\sqrt{bx+cx^2}}-\frac{2Ad^4}{3b^2x\sqrt{bx+cx^2}}$$
$$+\frac{2(16Ac^5d^4+7b^5Be^4-4b^4ce^3(4Bd+Ae)+2b^3c^2de^2(3Bd+2Ae)+4b^2c^3d^2e(2Bd+3Ae)-8bc^4d^3(Bd}{3b^4c^3\sqrt{bx+cx^2}}$$
$$+\frac{Be^4\sqrt{bx+cx^2}}{c^3}+\frac{e^3(8Bcd-5bBe+2Ace)\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{c^{7/2}}$$

output
```
-2/3*(-A*c+B*b)*(-b*e+c*d)^4*x^2/b^3/c^3/(c*x^2+b*x)^(3/2)+2/3*d^3*(7*A*c*
d-3*b*(4*A*e+B*d))/b^3/(c*x^2+b*x)^(1/2)-2/3*A*d^4/b^2/x/(c*x^2+b*x)^(1/2)
+2/3*(16*A*c^5*d^4+7*b^5*B*e^4-4*b^4*c*e^3*(A*e+4*B*d)+2*b^3*c^2*d*e^2*(2*
A*e+3*B*d)+4*b^2*c^3*d^2*e*(3*A*e+2*B*d)-8*b*c^4*d^3*(4*A*e+B*d))*x/b^4/c^
3/(c*x^2+b*x)^(1/2)+B*e^4*(c*x^2+b*x)^(1/2)/c^3+e^3*(2*A*c*e-5*B*b*e+8*B*c
*d)*arctanh(c^(1/2)*x/(c*x^2+b*x)^(1/2))/c^(7/2)
```

Mathematica [A] (verified)

Time = 1.30 (sec) , antiderivative size = 326, normalized size of antiderivative = 1.09

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}}\,dx = \frac{\sqrt{c}(bBx(15b^5e^4x-16c^5d^4x^2+8bc^4d^3x(-3d+2ex)+b^3c^2e^3x^2(-32d+3ex)+\cdots}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^(5/2),x]
```

output
```
(Sqrt[c]*(b*B*x*(15*b^5*e^4*x - 16*c^5*d^4*x^2 + 8*b*c^4*d^3*x*(-3*d + 2*e
*x) + b^3*c^2*e^3*x^2*(-32*d + 3*e*x) + 4*b^4*c*e^3*x*(-6*d + 5*e*x) - 6*b
^2*c^3*d^2*(d^2 - 4*d*e*x - 2*e^2*x^2)) - 2*A*c*(3*b^5*e^4*x^2 - 16*c^5*d^
4*x^3 + 4*b^4*c*e^4*x^3 + 8*b*c^4*d^3*x^2*(-3*d + 4*e*x) - 6*b^2*c^3*d^2*x
*(d^2 - 8*d*e*x + 2*e^2*x^2) + b^3*c^2*d*(d^3 + 12*d^2*e*x - 18*d*e^2*x^2
- 4*e^3*x^3))) + 3*b^4*e^3*(-8*B*c*d + 5*b*B*e - 2*A*c*e)*x^(3/2)*(b + c*x
)^(3/2)*Log[-(Sqrt[c]*Sqrt[x]) + Sqrt[b + c*x]])/(3*b^4*c^(7/2)*(x*(b + c*
x))^(3/2))
```

Rubi [A] (verified)

Time = 1.28 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.20, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.269$, Rules used = {1233, 27, 1233, 27, 1160, 1091, 219}

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

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}}\,dx$$

$$\Big\downarrow \text{1233}$$

$$\frac{2\int \frac{(d+ex)^2\left(d\left(-Beb^2+4Bcdb+10Aceb-8Ac^2d\right)+e\left(5Beb^2-2c(Bd+Ae)b+4Ac^2d\right)x\right)}{2(cx^2+bx)^{3/2}}dx}{3b^2c}-\frac{2(d+ex)^3\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

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

$$\frac{\int \frac{(d+ex)^2(d(-Beb^2+4Bcdb+10Aceb-8Ac^2d)+e(5Beb^2-2c(Bd+Ae)b+4Ac^2d)x)}{(cx^2+bx)^{3/2}}dx}{3b^2c}-\frac{2(d+ex)^3\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

$\big\downarrow$ 1233

$$\frac{\frac{2\int -\frac{e\left(bd\left(-5Be^2b^3+2ce(2Bd+Ae)b^2-8c^2d(Bd+3Ae)b+16Ac^3d^2\right)+\left(-15Be^3b^4+2ce^2(7Bd+3Ae)b^3+4c^2de(2Bd+Ae)b^2-16c^3d^2(Bd+3Ae)b+32Ac^4d^3\right)x\right)}{2\sqrt{cx^2+bx}}dx}{b^2c}}{3b^2c}-\frac{2(d+ex)^3\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

$\big\downarrow$ 27

$$\frac{-\frac{e\int \frac{bd\left(-5Be^2b^3+2ce(2Bd+Ae)b^2-8c^2d(Bd+3Ae)b+16Ac^3d^2\right)+\left(-15Be^3b^4+2ce^2(7Bd+3Ae)b^3+4c^2de(2Bd+Ae)b^2-16c^3d^2(Bd+3Ae)b+32Ac^4d^3\right)x}{\sqrt{cx^2+bx}}dx}{b^2c}-}{3b^2c}$$

$$\frac{2(d+ex)^3\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

$\big\downarrow$ 1160

$$\frac{-\frac{e\left(\frac{\sqrt{bx+cx^2}\left(2b^3ce^2(3Ae+7Bd)+4b^2c^2de(Ae+2Bd)-16bc^3d^2(3Ae+Bd)+32Ac^4d^3-15b^4Be^3\right)}{c}-\frac{3b^4e^2(2Ace-5bBe+8Bcd)\int\frac{1}{\sqrt{cx^2+bx}}dx}{2c}\right)}{b^2c}-\frac{2(d+ex)}{}}{3b^2c}$$

$$\frac{2(d+ex)^3\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

$\big\downarrow$ 1091

$$\frac{-\frac{e\left(\frac{\sqrt{bx+cx^2}\left(2b^3ce^2(3Ae+7Bd)+4b^2c^2de(Ae+2Bd)-16bc^3d^2(3Ae+Bd)+32Ac^4d^3-15b^4Be^3\right)}{c}-\frac{3b^4e^2(2Ace-5bBe+8Bcd)\int\frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{c}\right)}{b^2c}-}{3b^2c}$$

$$\frac{2(d+ex)^3\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

$\big\downarrow$ 219

$$\frac{-\frac{e\left(\frac{\sqrt{bx+cx^2}\left(2b^3ce^2(3Ae+7Bd)+4b^2c^2de(Ae+2Bd)-16bc^3d^2(3Ae+Bd)+32Ac^4d^3-15b^4Be^3\right)}{c}-\frac{3b^4e^2\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)(2Ace-5bBe+8Bcd)}{c^{3/2}}\right)}{b^2c}-}{3b^2c}$$

$$\frac{2(d+ex)^3\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

input
```
Int[((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^(5/2),x]
```

output
```
(-2*(d + e*x)^3*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/(3*
b^2*c*(b*x + c*x^2)^(3/2)) + ((-2*(d + e*x)*(b*c*d^2*(4*b*B*c*d - 8*A*c^2*
d - b^2*B*e + 10*A*b*c*e) - (16*A*c^4*d^3 - 5*b^4*B*e^3 + 4*b^2*c^2*d*e*(B
*d + A*e) + 2*b^3*c*e^2*(3*B*d + A*e) - 8*b*c^3*d^2*(B*d + 3*A*e))*x))/(b^
2*c*Sqrt[b*x + c*x^2]) - (e*(((32*A*c^4*d^3 - 15*b^4*B*e^3 + 4*b^2*c^2*d*e
*(2*B*d + A*e) - 16*b*c^3*d^2*(B*d + 3*A*e) + 2*b^3*c*e^2*(7*B*d + 3*A*e))
*Sqrt[b*x + c*x^2])/c - (3*b^4*e^2*(8*B*c*d - 5*b*B*e + 2*A*c*e)*ArcTanh[(
Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/c^(3/2)))/(b^2*c))/(3*b^2*c)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1160
```
Int[((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol
] :> Simp[e*((a + b*x + c*x^2)^(p + 1)/(2*c*(p + 1))), x] + Simp[(2*c*d - b
*e)/(2*c)   Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x]
 && NeQ[p, -1]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

Maple [A] (verified)

Time = 1.20 (sec) , antiderivative size = 300, normalized size of antiderivative = 1.01

method	result
pseudoelliptic	$-\frac{2\left(-\sqrt{x(cx+b)}\,e^{3}x\left(-\frac{5Bbe}{2}+(Ae+4Bd)c\right)(cx+b)b^{4}\operatorname{arctanh}\left(\frac{\sqrt{x(cx+b)}}{x\sqrt{c}}\right)+\frac{d\left(\left(-4A\,e^{3}-6Bd\,e^{2}\right)x^{3}+\left(-18Ad\,e^{2}-12eB\,d^{2}\right)\right.}{3}\right.}{}$
risch	$-\frac{(cx+b)\left(-3b^{4}x^{2}B\,e^{4}+24Ab\,c^{3}d^{3}ex-16A\,c^{4}d^{4}x+6Bb\,c^{3}d^{4}x+2Ab\,c^{3}d^{4}\right)}{3b^{4}\sqrt{x(cx+b)}\,x\,c^{3}}+\frac{2\left(-4A\,b^{4}c\,e^{4}+8A\,b^{3}c^{2}d\,e^{3}-8Ab\,c^{4}d^{3}e+4A\,c^{5}d\right.}{}$
default	$A\,d^{4}\left(-\frac{2(2cx+b)}{3b^{2}(c\,x^{2}+bx)^{\frac{3}{2}}}+\frac{16c(2cx+b)}{3b^{4}\sqrt{c\,x^{2}+bx}}\right)+e^{3}(Ae+4Bd)\left(-\frac{x^{3}}{3c(c\,x^{2}+bx)^{\frac{3}{2}}}-\frac{b\left(-\frac{x^{2}}{c\left(c\,x^{2}+bx\right)^{\frac{3}{2}}}+\frac{b\left(-\frac{}{2c}\right.}{}\right.}{}\right.$

input
```
int((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-2/c^(7/2)*(-(x*(c*x+b))^(1/2)*e^3*x*(-5/2*B*b*e+(A*e+4*B*d)*c)*(c*x+b)*b^
4*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))+1/3*d*((-4*A*e^3-6*B*d*e^2)*x^3+(-1
8*A*d*e^2-12*B*d^2*e)*x^2+(12*A*d^2*e+3*B*d^3)*x+A*d^3)*b^3*c^(7/2)+(-2*d^
2*b^2*((2*A*e^2+4/3*B*d*e)*x^2+(-8*A*d*e-2*B*d^2)*x+A*d^2)*c^(9/2)+(-8*((-
1/3*B*d-4/3*A*e)*x+A*d)*d^3*b*c^(11/2)+b^5*e^3*(4*B*d-10/3*B*e*x+A*e)*c^(3
/2)+4/3*e^3*(-3/8*B*e*x+A*e+4*B*d)*x*b^4*c^(5/2)-5/2*B*c^(1/2)*b^6*e^4-16/
3*A*c^(13/2)*d^4*x)*x)*x)/(x*(c*x+b))^(1/2)/x/(c*x+b)/b^4
```

Fricas [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 975, normalized size of antiderivative = 3.27

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
[1/6*(3*((8*B*b^4*c^3*d*e^3 - (5*B*b^5*c^2 - 2*A*b^4*c^3)*e^4)*x^4 + 2*(8*
B*b^5*c^2*d*e^3 - (5*B*b^6*c - 2*A*b^5*c^2)*e^4)*x^3 + (8*B*b^6*c*d*e^3 -
(5*B*b^7 - 2*A*b^6*c)*e^4)*x^2)*sqrt(c)*log(2*c*x + b + 2*sqrt(c*x^2 + b*x
)*sqrt(c)) + 2*(3*B*b^4*c^3*e^4*x^4 - 2*A*b^3*c^4*d^4 - 4*(4*(B*b*c^6 - 2*
A*c^7)*d^4 - 4*(B*b^2*c^5 - 4*A*b*c^6)*d^3*e - 3*(B*b^3*c^4 + 2*A*b^2*c^5)
*d^2*e^2 + 2*(4*B*b^4*c^3 - A*b^3*c^4)*d*e^3 - (5*B*b^5*c^2 - 2*A*b^4*c^3)
*e^4)*x^3 + 3*(12*A*b^3*c^4*d^2*e^2 - 8*B*b^5*c^2*d*e^3 - 8*(B*b^2*c^5 - 2
*A*b*c^6)*d^4 + 8*(B*b^3*c^4 - 4*A*b^2*c^5)*d^3*e + (5*B*b^6*c - 2*A*b^5*c
^2)*e^4)*x^2 - 6*(4*A*b^3*c^4*d^3*e + (B*b^3*c^4 - 2*A*b^2*c^5)*d^4)*x)*sq
rt(c*x^2 + b*x))/(b^4*c^6*x^4 + 2*b^5*c^5*x^3 + b^6*c^4*x^2), -1/3*(3*((8*
B*b^4*c^3*d*e^3 - (5*B*b^5*c^2 - 2*A*b^4*c^3)*e^4)*x^4 + 2*(8*B*b^5*c^2*d*
e^3 - (5*B*b^6*c - 2*A*b^5*c^2)*e^4)*x^3 + (8*B*b^6*c*d*e^3 - (5*B*b^7 - 2
*A*b^6*c)*e^4)*x^2)*sqrt(-c)*arctan(sqrt(c*x^2 + b*x)*sqrt(-c)/(c*x + b))
- (3*B*b^4*c^3*e^4*x^4 - 2*A*b^3*c^4*d^4 - 4*(4*(B*b*c^6 - 2*A*c^7)*d^4 -
4*(B*b^2*c^5 - 4*A*b*c^6)*d^3*e - 3*(B*b^3*c^4 + 2*A*b^2*c^5)*d^2*e^2 + 2*
(4*B*b^4*c^3 - A*b^3*c^4)*d*e^3 - (5*B*b^5*c^2 - 2*A*b^4*c^3)*e^4)*x^3 + 3
*(12*A*b^3*c^4*d^2*e^2 - 8*B*b^5*c^2*d*e^3 - 8*(B*b^2*c^5 - 2*A*b*c^6)*d^4
 + 8*(B*b^3*c^4 - 4*A*b^2*c^5)*d^3*e + (5*B*b^6*c - 2*A*b^5*c^2)*e^4)*x^2
- 6*(4*A*b^3*c^4*d^3*e + (B*b^3*c^4 - 2*A*b^2*c^5)*d^4)*x)*sqrt(c*x^2 + b*
x))/(b^4*c^6*x^4 + 2*b^5*c^5*x^3 + b^6*c^4*x^2)]
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}}\,dx = \int \frac{(A+Bx)\,(d+ex)^4}{(x\,(b+cx))^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**4/(c*x**2+b*x)**(5/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)**4/(x*(b + c*x))**(5/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 795 vs. $2(274) = 548$.

Time = 0.06 (sec) , antiderivative size = 795, normalized size of antiderivative = 2.67

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
5/6*B*b*e^4*x*(3*x^2/((c*x^2 + b*x)^(3/2)*c) + b*x/((c*x^2 + b*x)^(3/2)*c^
2) - 2*x/(sqrt(c*x^2 + b*x)*b*c) - 1/(sqrt(c*x^2 + b*x)*c^2))/c + B*e^4*x^
4/((c*x^2 + b*x)^(3/2)*c) - 4/3*A*c*d^4*x/((c*x^2 + b*x)^(3/2)*b^2) + 32/3
*A*c^2*d^4*x/(sqrt(c*x^2 + b*x)*b^4) + 10/3*B*b*e^4*x/(sqrt(c*x^2 + b*x)*c
^3) - 5/2*B*b*e^4*log(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(7/2) - 1
/3*(4*B*d*e^3 + A*e^4)*x*(3*x^2/((c*x^2 + b*x)^(3/2)*c) + b*x/((c*x^2 + b*
x)^(3/2)*c^2) - 2*x/(sqrt(c*x^2 + b*x)*b*c) - 1/(sqrt(c*x^2 + b*x)*c^2)) -
 2/3*A*d^4/((c*x^2 + b*x)^(3/2)*b) + 16/3*A*c*d^4/(sqrt(c*x^2 + b*x)*b^3)
+ 5/3*sqrt(c*x^2 + b*x)*B*e^4/c^3 - 2*(3*B*d^2*e^2 + 2*A*d*e^3)*x^2/((c*x^
2 + b*x)^(3/2)*c) + 8/3*(2*B*d^3*e + 3*A*d^2*e^2)*x/(sqrt(c*x^2 + b*x)*b^2
) + 2/3*(B*d^4 + 4*A*d^3*e)*x/((c*x^2 + b*x)^(3/2)*b) - 4/3*(4*B*d*e^3 + A
*e^4)*x/(sqrt(c*x^2 + b*x)*c^2) - 2/3*(3*B*d^2*e^2 + 2*A*d*e^3)*b*x/((c*x^
2 + b*x)^(3/2)*c^2) - 4/3*(2*B*d^3*e + 3*A*d^2*e^2)*x/((c*x^2 + b*x)^(3/2)
*c) + 4/3*(3*B*d^2*e^2 + 2*A*d*e^3)*x/(sqrt(c*x^2 + b*x)*b*c) - 16/3*(B*d^
4 + 4*A*d^3*e)*c*x/(sqrt(c*x^2 + b*x)*b^3) + (4*B*d*e^3 + A*e^4)*log(2*c*x
 + b + 2*sqrt(c*x^2 + b*x)*sqrt(c))/c^(5/2) - 8/3*(B*d^4 + 4*A*d^3*e)/(sqr
t(c*x^2 + b*x)*b^2) + 2/3*(3*B*d^2*e^2 + 2*A*d*e^3)/(sqrt(c*x^2 + b*x)*c^2
) - 2/3*(4*B*d*e^3 + A*e^4)*sqrt(c*x^2 + b*x)/(b*c^2) + 4/3*(2*B*d^3*e + 3
*A*d^2*e^2)/(sqrt(c*x^2 + b*x)*b*c)
```

Giac [A] (verification not implemented)

Time = 0.18 (sec) , antiderivative size = 377, normalized size of antiderivative = 1.27

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}}\,dx =$$

$$-\frac{\frac{2\,Ad^4}{b} - \left(\left(\left(\frac{3\,Be^4x}{c} - \frac{4\,(4\,Bbc^5d^4 - 8\,Ac^6d^4 - 4\,Bb^2c^4d^3e + 16\,Abc^5d^3e - 3\,Bb^3c^3d^2e^2 - 6\,Ab^2c^4d^2e^2 + 8\,Bb^4c^2de^3 - 2\,Ab^3c^3de^3 - 5\,Bb^5ce^4 + 2}{b^4c^3}}{}$$

$$-\frac{(8\,Bcde^3 - 5\,Bbe^4 + 2\,Ace^4)\log\left(\left|2\,\left(\sqrt{c}x - \sqrt{cx^2+bx}\right)\sqrt{c} + b\right|\right)}{2\,c^{\frac{7}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
-1/3*(2*A*d^4/b - (((3*B*e^4*x/c - 4*(4*B*b*c^5*d^4 - 8*A*c^6*d^4 - 4*B*b^
2*c^4*d^3*e + 16*A*b*c^5*d^3*e - 3*B*b^3*c^3*d^2*e^2 - 6*A*b^2*c^4*d^2*e^2
 + 8*B*b^4*c^2*d*e^3 - 2*A*b^3*c^3*d*e^3 - 5*B*b^5*c*e^4 + 2*A*b^4*c^2*e^4
)/(b^4*c^3))*x - 3*(8*B*b^2*c^4*d^4 - 16*A*b*c^5*d^4 - 8*B*b^3*c^3*d^3*e +
 32*A*b^2*c^4*d^3*e - 12*A*b^3*c^3*d^2*e^2 + 8*B*b^5*c*d*e^3 - 5*B*b^6*e^4
 + 2*A*b^5*c*e^4)/(b^4*c^3))*x - 6*(B*b^3*c^3*d^4 - 2*A*b^2*c^4*d^4 + 4*A*
b^3*c^3*d^3*e)/(b^4*c^3))*x)/(c*x^2 + b*x)^(3/2) - 1/2*(8*B*c*d*e^3 - 5*B*
b*e^4 + 2*A*c*e^4)*log(abs(2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) + b))
/c^(7/2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^4}{(c\,x^2+b\,x)^{5/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^(5/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^4)/(b*x + c*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^4}{(bx+cx^2)^{5/2}}\,dx = \int \frac{(Bx+A)\,(ex+d)^4}{(c\,x^2+bx)^{\frac{5}{2}}}dx$$

input
```
int((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^(5/2),x)
```

output
```
int((B*x+A)*(e*x+d)^4/(c*x^2+b*x)^(5/2),x)
```

3.133 $\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 237

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx = -\frac{2(bB-Ac)(cd-be)^3x^2}{3b^3c^2(bx+cx^2)^{3/2}} + \frac{2d^2(7Acd-3b(Bd+3Ae))}{3b^3\sqrt{bx+cx^2}} - \frac{2Ad^3}{3b^2x\sqrt{bx+cx^2}} + \frac{2(16Ac^4d^3-4b^4Be^3+6b^2c^2de(Bd+Ae)+b^3ce^2(3Bd+Ae)-8bc^3d^2(Bd+3Ae))\,x}{3b^4c^2\sqrt{bx+cx^2}} + \frac{2Be^3\text{arctanh}\left(\frac{\sqrt{c}x}{\sqrt{bx+cx^2}}\right)}{c^{5/2}}$$

output
```
-2/3*(-A*c+B*b)*(-b*e+c*d)^3*x^2/b^3/c^2/(c*x^2+b*x)^(3/2)+2/3*d^2*(7*A*c*
d-3*b*(3*A*e+B*d))/b^3/(c*x^2+b*x)^(1/2)-2/3*A*d^3/b^2/x/(c*x^2+b*x)^(1/2)
+2/3*(16*A*c^4*d^3-4*b^4*B*e^3+6*b^2*c^2*d*e*(A*e+B*d)+b^3*c*e^2*(A*e+3*B*
d)-8*b*c^3*d^2*(3*A*e+B*d))*x/b^4/c^2/(c*x^2+b*x)^(1/2)+2*B*e^3*arctanh(c^
(1/2)*x/(c*x^2+b*x)^(1/2))/c^(5/2)
```

Mathematica [A] (verified)

Time = 0.97 (sec) , antiderivative size = 251, normalized size of antiderivative = 1.06

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx =$$
$$-\frac{2\left(\sqrt{c}(bBx(3b^4e^3x+8c^4d^3x^2+4b^3ce^3x^2+6bc^3d^2x(2d-ex)+3b^2c^2d(d^2-3dex-e^2x^2))-Ac^2(16c^3d^3\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(5/2),x]
```

output
```
(-2*(Sqrt[c]*(b*B*x*(3*b^4*e^3*x + 8*c^4*d^3*x^2 + 4*b^3*c*e^3*x^2 + 6*b*c
^3*d^2*x*(2*d - e*x) + 3*b^2*c^2*d*(d^2 - 3*d*e*x - e^2*x^2)) - A*c^2*(16*
c^3*d^3*x^3 + 24*b*c^2*d^2*x^2*(d - e*x) + 6*b^2*c*d*x*(d^2 - 6*d*e*x + e^
2*x^2) + b^3*(-d^3 - 9*d^2*e*x + 9*d*e^2*x^2 + e^3*x^3))) + 3*b^4*B*e^3*x^
(3/2)*(b + c*x)^(3/2)*Log[-(Sqrt[c]*Sqrt[x]) + Sqrt[b + c*x]]))/(3*b^4*c^(
5/2)*(x*(b + c*x))^(3/2))
```

Rubi [A] (verified)

Time = 0.75 (sec) , antiderivative size = 232, normalized size of antiderivative = 0.98, number of steps used = 6, number of rules used = 5, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {1233, 27, 1224, 1091, 219}

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

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx$$

$$\Big\downarrow \text{1233}$$

$$\frac{2\int -\frac{(d+ex)\left(d\left(Beb^2-4c(Bd+2Ae)b+8Ac^2d\right)-3b^2Be^2x\right)}{2(cx^2+bx)^{3/2}}dx}{3b^2c}-\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

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

$$-\frac{\int \frac{(d+ex)\left(d\left(Beb^2-4c(Bd+2Ae)b+8Ac^2d\right)-3b^2Be^2x\right)}{\left(cx^2+bx\right)^{3/2}}dx}{3b^2c}-\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

$\Big\downarrow$ 1224

$$-\frac{-\frac{3b^2Be^3\int \frac{1}{\sqrt{cx^2+bx}}dx}{c}-\frac{2\left(bcd^2\left(-4bc(2Ae+Bd)+8Ac^2d+b^2Be\right)+x\left(2b^2c^2de(4Ae+3Bd)-8bc^3d^2(3Ae+Bd)+16Ac^4d^3-3b^4Be^3+2b^3Bcde\right.\right.}{b^2c\sqrt{bx+cx^2}}}{3b^2c}-\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

$\Big\downarrow$ 1091

$$-\frac{-\frac{6b^2Be^3\int \frac{1}{1-\frac{cx^2}{cx^2+bx}}d\frac{x}{\sqrt{cx^2+bx}}}{c}-\frac{2\left(bcd^2\left(-4bc(2Ae+Bd)+8Ac^2d+b^2Be\right)+x\left(2b^2c^2de(4Ae+3Bd)-8bc^3d^2(3Ae+Bd)+16Ac^4d^3-3b^4Be^3\right.\right.}{b^2c\sqrt{bx+cx^2}}}{3b^2c}-\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

$\Big\downarrow$ 219

$$-\frac{-\frac{2\left(bcd^2\left(-4bc(2Ae+Bd)+8Ac^2d+b^2Be\right)+x\left(2b^2c^2de(4Ae+3Bd)-8bc^3d^2(3Ae+Bd)+16Ac^4d^3-3b^4Be^3+2b^3Bcde^2\right)\right)}{b^2c\sqrt{bx+cx^2}}-\frac{6b^2Be^3\text{arctanh}(}{c^{3/2}}}{3b^2c}-\frac{2(d+ex)^2\left(x\left(-bc(Ae+Bd)+2Ac^2d+b^2Be\right)+Abcd\right)}{3b^2c\left(bx+cx^2\right)^{3/2}}$$

input
```
Int[((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(5/2),x]
```

output
```
(-2*(d + e*x)^2*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/(3*
b^2*c*(b*x + c*x^2)^(3/2)) - ((-2*(b*c*d^2*(8*A*c^2*d + b^2*B*e - 4*b*c*(B
*d + 2*A*e)) + (16*A*c^4*d^3 + 2*b^3*B*c*d*e^2 - 3*b^4*B*e^3 - 8*b*c^3*d^2
*(B*d + 3*A*e) + 2*b^2*c^2*d*e*(3*B*d + 4*A*e))*x))/(b^2*c*Sqrt[b*x + c*x^
2]) - (6*b^2*B*e^3*ArcTanh[(Sqrt[c]*x)/Sqrt[b*x + c*x^2]])/c^(3/2))/(3*b^2
*c)
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1091
```
Int[1/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Simp[2   Subst[Int[1/(1
 - c*x^2), x], x, x/Sqrt[b*x + c*x^2]], x] /; FreeQ[{b, c}, x]
```

rule 1224
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (
b^2*e*g - b*c*(e*f + d*g) + 2*c*(c*d*f - a*e*g))*x))*((a + b*x + c*x^2)^(p
+ 1)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c
*(2*c*d*f - b*(e*f + d*g))*(2*p + 3))/(c*(p + 1)*(b^2 - 4*a*c))   Int[(a +
b*x + c*x^2)^(p + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -
1] &&  !(IntegerQ[p] && NeQ[a, 0] && NiceSqrtQ[b^2 - 4*a*c])
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

Maple [A] (verified)

Time = 1.06 (sec) , antiderivative size = 235, normalized size of antiderivative = 0.99

method	result
pseudoelliptic	$-\frac{-\frac{2\left(\left(-A\,e^{3}-3Bd\,e^{2}\right)x^{3}+\left(-9Ad\,e^{2}-9eB\,d^{2}\right)x^{2}+\left(9A\,d^{2}e+3B\,d^{3}\right)x+A\,d^{3}\right)b^{3}c^{\frac{5}{2}}}{3}+2\left(2d\,b^{2}\left(\left(A\,e^{2}+Bde\right)x^{2}+\left(-6Ade-2B\,d^{2}\right)x+\right.\right.}{c^{\frac{5}{2}}x(cx+}$
risch	$-\frac{2d^{2}(cx+b)(9Abex-8cxAd+3Bbdx+Abd)}{3b^{4}x\sqrt{x(cx+b)}}+\frac{\frac{2\left(A\,b^{3}c\,e^{3}-3Ab\,c^{3}d^{2}e+2A\,c^{4}d^{3}-2b^{4}B\,e^{3}+3B\,b^{3}cd\,e^{2}-Bb\,d^{3}c^{3}\right)\sqrt{c\left(\frac{b}{c}+x\right)^{2}-(}}{c^{3}b\left(\frac{b}{c}+x\right)}}{}$
default	$A\,d^{3}\left(-\frac{2(2cx+b)}{3b^{2}(c\,x^{2}+bx)^{\frac{3}{2}}}+\frac{16c(2cx+b)}{3b^{4}\sqrt{c\,x^{2}+bx}}\right)+e^{2}(Ae+3Bd)\left(-\frac{x^{2}}{c(c\,x^{2}+bx)^{\frac{3}{2}}}+\frac{b\left(-\frac{x}{2c\left(c\,x^{2}+bx\right)^{\frac{3}{2}}}-\frac{b\left(-\frac{}{3c}\right.}{}\right.}{}\right.$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
2/c^(5/2)/(x*(c*x+b))^(1/2)*(-1/3*((-A*e^3-3*B*d*e^2)*x^3+(-9*A*d*e^2-9*B*
d^2*e)*x^2+(9*A*d^2*e+3*B*d^3)*x+A*d^3)*b^3*c^(5/2)+(2*d*b^2*((A*e^2+B*d*e
)*x^2+(-6*A*d*e-2*B*d^2)*x+A*d^2)*c^(7/2)+8*((-A*e-1/3*B*d)*x+A*d)*d^2*x*b
*c^(9/2)+16/3*A*c^(11/2)*d^3*x^2+e^3*B*(-4/3*c^(3/2)*x^2-b*x*c^(1/2)+(x*(c
*x+b))^(1/2)*arctanh((x*(c*x+b))^(1/2)/x/c^(1/2))*(c*x+b))*b^4)*x)/x/(c*x+
b)/b^4
```

Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 672, normalized size of antiderivative = 2.84

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx = \Bigg[\frac{3\left(Bb^4c^2e^3x^4+2\,Bb^5ce^3x^3+Bb^6e^3x^2\right)\sqrt{c}\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)-}{}$$

$$-\frac{2\left(3\left(Bb^4c^2e^3x^4+2\,Bb^5ce^3x^3+Bb^6e^3x^2\right)\sqrt{-c}\arctan\left(\frac{\sqrt{cx^2+bx}\sqrt{-c}}{cx+b}\right)+\left(Ab^3c^3d^3+\left(8\left(Bbc^5-2\,Ac^6\right)d^3-\right.\right.\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
[1/3*(3*(B*b^4*c^2*e^3*x^4 + 2*B*b^5*c*e^3*x^3 + B*b^6*e^3*x^2)*sqrt(c)*lo
g(2*c*x + b + 2*sqrt(c*x^2 + b*x)*sqrt(c)) - 2*(A*b^3*c^3*d^3 + (8*(B*b*c^
5 - 2*A*c^6)*d^3 - 6*(B*b^2*c^4 - 4*A*b*c^5)*d^2*e - 3*(B*b^3*c^3 + 2*A*b^
2*c^4)*d*e^2 + (4*B*b^4*c^2 - A*b^3*c^3)*e^3)*x^3 - 3*(3*A*b^3*c^3*d*e^2 -
 B*b^5*c*e^3 - 4*(B*b^2*c^4 - 2*A*b*c^5)*d^3 + 3*(B*b^3*c^3 - 4*A*b^2*c^4)
*d^2*e)*x^2 + 3*(3*A*b^3*c^3*d^2*e + (B*b^3*c^3 - 2*A*b^2*c^4)*d^3)*x)*sqr
t(c*x^2 + b*x))/(b^4*c^5*x^4 + 2*b^5*c^4*x^3 + b^6*c^3*x^2), -2/3*(3*(B*b^
4*c^2*e^3*x^4 + 2*B*b^5*c*e^3*x^3 + B*b^6*e^3*x^2)*sqrt(-c)*arctan(sqrt(c*
x^2 + b*x)*sqrt(-c)/(c*x + b)) + (A*b^3*c^3*d^3 + (8*(B*b*c^5 - 2*A*c^6)*d
^3 - 6*(B*b^2*c^4 - 4*A*b*c^5)*d^2*e - 3*(B*b^3*c^3 + 2*A*b^2*c^4)*d*e^2 +
 (4*B*b^4*c^2 - A*b^3*c^3)*e^3)*x^3 - 3*(3*A*b^3*c^3*d*e^2 - B*b^5*c*e^3 -
 4*(B*b^2*c^4 - 2*A*b*c^5)*d^3 + 3*(B*b^3*c^3 - 4*A*b^2*c^4)*d^2*e)*x^2 +
3*(3*A*b^3*c^3*d^2*e + (B*b^3*c^3 - 2*A*b^2*c^4)*d^3)*x)*sqrt(c*x^2 + b*x)
)/(b^4*c^5*x^4 + 2*b^5*c^4*x^3 + b^6*c^3*x^2)]
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx = \int \frac{(A+Bx)\,(d+ex)^3}{(x\,(b+cx))^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**3/(c*x**2+b*x)**(5/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)**3/(x*(b + c*x))**(5/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 550 vs. 2(215) = 430.

Time = 0.05 (sec) , antiderivative size = 550, normalized size of antiderivative = 2.32

$$\begin{aligned}
\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx &= \\
&-\frac{1}{3}\,Be^3x\left(\frac{3\,x^2}{(cx^2+bx)^{\frac{3}{2}}c}+\frac{bx}{(cx^2+bx)^{\frac{3}{2}}c^2}-\frac{2\,x}{\sqrt{cx^2+bx}bc}-\frac{1}{\sqrt{cx^2+bx}c^2}\right) \\
&-\frac{4\,Acd^3x}{3\,(cx^2+bx)^{\frac{3}{2}}b^2}+\frac{32\,Ac^2d^3x}{3\,\sqrt{cx^2+bx}b^4}-\frac{4\,Be^3x}{3\,\sqrt{cx^2+bx}c^2} \\
&+\frac{Be^3\log\left(2\,cx+b+2\,\sqrt{cx^2+bx}\sqrt{c}\right)}{c^{\frac{5}{2}}}-\frac{2\,Ad^3}{3\,(cx^2+bx)^{\frac{3}{2}}b} \\
&+\frac{16\,Acd^3}{3\,\sqrt{cx^2+bx}b^3}-\frac{2\,\sqrt{cx^2+bx}Be^3}{3\,bc^2}-\frac{(3\,Bde^2+Ae^3)x^2}{(cx^2+bx)^{\frac{3}{2}}c} \\
&+\frac{4\,(Bd^2e+Ade^2)x}{\sqrt{cx^2+bx}b^2}+\frac{2\,(Bd^3+3\,Ad^2e)x}{3\,(cx^2+bx)^{\frac{3}{2}}b}-\frac{(3\,Bde^2+Ae^3)bx}{3\,(cx^2+bx)^{\frac{3}{2}}c^2} \\
&-\frac{2\,(Bd^2e+Ade^2)x}{(cx^2+bx)^{\frac{3}{2}}c}+\frac{2\,(3\,Bde^2+Ae^3)x}{3\,\sqrt{cx^2+bx}bc}-\frac{16\,(Bd^3+3\,Ad^2e)cx}{3\,\sqrt{cx^2+bx}b^3} \\
&-\frac{8\,(Bd^3+3\,Ad^2e)}{3\,\sqrt{cx^2+bx}b^2}+\frac{3\,Bde^2+Ae^3}{3\,\sqrt{cx^2+bx}c^2}+\frac{2\,(Bd^2e+Ade^2)}{\sqrt{cx^2+bx}bc}
\end{aligned}$$

input
```
integrate((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
-1/3*B*e^3*x*(3*x^2/((c*x^2 + b*x)^(3/2)*c) + b*x/((c*x^2 + b*x)^(3/2)*c^2
) - 2*x/(sqrt(c*x^2 + b*x)*b*c) - 1/(sqrt(c*x^2 + b*x)*c^2)) - 4/3*A*c*d^3
*x/((c*x^2 + b*x)^(3/2)*b^2) + 32/3*A*c^2*d^3*x/(sqrt(c*x^2 + b*x)*b^4) -
4/3*B*e^3*x/(sqrt(c*x^2 + b*x)*c^2) + B*e^3*log(2*c*x + b + 2*sqrt(c*x^2 +
 b*x)*sqrt(c))/c^(5/2) - 2/3*A*d^3/((c*x^2 + b*x)^(3/2)*b) + 16/3*A*c*d^3/
(sqrt(c*x^2 + b*x)*b^3) - 2/3*sqrt(c*x^2 + b*x)*B*e^3/(b*c^2) - (3*B*d*e^2
 + A*e^3)*x^2/((c*x^2 + b*x)^(3/2)*c) + 4*(B*d^2*e + A*d*e^2)*x/(sqrt(c*x^
2 + b*x)*b^2) + 2/3*(B*d^3 + 3*A*d^2*e)*x/((c*x^2 + b*x)^(3/2)*b) - 1/3*(3
*B*d*e^2 + A*e^3)*b*x/((c*x^2 + b*x)^(3/2)*c^2) - 2*(B*d^2*e + A*d*e^2)*x/
((c*x^2 + b*x)^(3/2)*c) + 2/3*(3*B*d*e^2 + A*e^3)*x/(sqrt(c*x^2 + b*x)*b*c
) - 16/3*(B*d^3 + 3*A*d^2*e)*c*x/(sqrt(c*x^2 + b*x)*b^3) - 8/3*(B*d^3 + 3*
A*d^2*e)/(sqrt(c*x^2 + b*x)*b^2) + 1/3*(3*B*d*e^2 + A*e^3)/(sqrt(c*x^2 + b
*x)*c^2) + 2*(B*d^2*e + A*d*e^2)/(sqrt(c*x^2 + b*x)*b*c)
```

Giac [A] (verification not implemented)

Time = 0.19 (sec) , antiderivative size = 289, normalized size of antiderivative = 1.22

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx = -\frac{Be^3\log\left(\left|2\left(\sqrt{c}x-\sqrt{cx^2+bx}\right)\sqrt{c}+b\right|\right)}{c^{\frac{5}{2}}} - \frac{2\left(\frac{Ad^3}{b}+\left(x\left(\frac{(8\,Bbc^4d^3-16\,Ac^5d^3-6\,Bb^2c^3d^2e+24\,Abc^4d^2e-3\,Bb^3c^2de^2-6\,Ab^2c^3de^2+4\,Bb^4ce^3-Ab^3c^2e^3)x}{b^4c^2}+\frac{3\,(4\,Bb^2c^3d^3-8\,Abc^4d^3}{}\right.\right.\right.}{3\,(cx^2+bx)^{\frac{3}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
-B*e^3*log(abs(2*(sqrt(c)*x - sqrt(c*x^2 + b*x))*sqrt(c) + b))/c^(5/2) - 2
/3*(A*d^3/b + (x*((8*B*b*c^4*d^3 - 16*A*c^5*d^3 - 6*B*b^2*c^3*d^2*e + 24*A
*b*c^4*d^2*e - 3*B*b^3*c^2*d*e^2 - 6*A*b^2*c^3*d*e^2 + 4*B*b^4*c*e^3 - A*b
^3*c^2*e^3)*x/(b^4*c^2) + 3*(4*B*b^2*c^3*d^3 - 8*A*b*c^4*d^3 - 3*B*b^3*c^2
*d^2*e + 12*A*b^2*c^3*d^2*e - 3*A*b^3*c^2*d*e^2 + B*b^5*e^3)/(b^4*c^2)) +
3*(B*b^3*c^2*d^3 - 2*A*b^2*c^3*d^3 + 3*A*b^3*c^2*d^2*e)/(b^4*c^2))*x)/(c*x
^2 + b*x)^(3/2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^3}{(c\,x^2+b\,x)^{5/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(5/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^3)/(b*x + c*x^2)^(5/2), x)
```

Reduce [B] (verification not implemented)

Time = 2.18 (sec) , antiderivative size = 741, normalized size of antiderivative = 3.13

$$\int \frac{(A+Bx)(d+ex)^3}{(bx+cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^3/(c*x^2+b*x)^(5/2),x)
```

output
```
(2*(3*sqrt(c)*sqrt(b + c*x)*log((sqrt(b + c*x) + sqrt(x)*sqrt(c))/sqrt(b))
*b**6*e**3*x**2 + 3*sqrt(c)*sqrt(b + c*x)*log((sqrt(b + c*x) + sqrt(x)*sqr
t(c))/sqrt(b))*b**5*c*e**3*x**3 + 5*sqrt(c)*sqrt(b + c*x)*a*b**4*c*e**3*x*
*2 - 18*sqrt(c)*sqrt(b + c*x)*a*b**3*c**2*d*e**2*x**2 + 5*sqrt(c)*sqrt(b +
 c*x)*a*b**3*c**2*e**3*x**3 + 24*sqrt(c)*sqrt(b + c*x)*a*b**2*c**3*d**2*e*
x**2 - 18*sqrt(c)*sqrt(b + c*x)*a*b**2*c**3*d*e**2*x**3 - 16*sqrt(c)*sqrt(
b + c*x)*a*b*c**4*d**3*x**2 + 24*sqrt(c)*sqrt(b + c*x)*a*b*c**4*d**2*e*x**
3 - 16*sqrt(c)*sqrt(b + c*x)*a*c**5*d**3*x**3 - 4*sqrt(c)*sqrt(b + c*x)*b*
*6*e**3*x**2 + 15*sqrt(c)*sqrt(b + c*x)*b**5*c*d*e**2*x**2 - 4*sqrt(c)*sqr
t(b + c*x)*b**5*c*e**3*x**3 - 18*sqrt(c)*sqrt(b + c*x)*b**4*c**2*d**2*e*x*
*2 + 15*sqrt(c)*sqrt(b + c*x)*b**4*c**2*d*e**2*x**3 + 8*sqrt(c)*sqrt(b + c
*x)*b**3*c**3*d**3*x**2 - 18*sqrt(c)*sqrt(b + c*x)*b**3*c**3*d**2*e*x**3 +
 8*sqrt(c)*sqrt(b + c*x)*b**2*c**4*d**3*x**3 - sqrt(x)*a*b**3*c**3*d**3 -
9*sqrt(x)*a*b**3*c**3*d**2*e*x + 9*sqrt(x)*a*b**3*c**3*d*e**2*x**2 + sqrt(
x)*a*b**3*c**3*e**3*x**3 + 6*sqrt(x)*a*b**2*c**4*d**3*x - 36*sqrt(x)*a*b**
2*c**4*d**2*e*x**2 + 6*sqrt(x)*a*b**2*c**4*d*e**2*x**3 + 24*sqrt(x)*a*b*c*
*5*d**3*x**2 - 24*sqrt(x)*a*b*c**5*d**2*e*x**3 + 16*sqrt(x)*a*c**6*d**3*x*
*3 - 3*sqrt(x)*b**6*c*e**3*x**2 - 4*sqrt(x)*b**5*c**2*e**3*x**3 - 3*sqrt(x
)*b**4*c**3*d**3*x + 9*sqrt(x)*b**4*c**3*d**2*e*x**2 + 3*sqrt(x)*b**4*c**3
*d*e**2*x**3 - 12*sqrt(x)*b**3*c**4*d**3*x**2 + 6*sqrt(x)*b**3*c**4*d**...
```

3.134 $\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 181

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx = -\frac{2(bB-Ac)(cd-be)^2x^2}{3b^3c\,(bx+cx^2)^{3/2}} - \frac{2d(3bBd-7Acd+6Abe)}{3b^3\sqrt{bx+cx^2}} - \frac{2Ad^2}{3b^2x\sqrt{bx+cx^2}} + \frac{2(16Ac^3d^2+b^3Be^2+2b^2ce(2Bd+Ae)-8bc^2d(Bd+2Ae))\,x}{3b^4c\sqrt{bx+cx^2}}$$

output
```
-2/3*(-A*c+B*b)*(-b*e+c*d)^2*x^2/b^3/c/(c*x^2+b*x)^(3/2)-2/3*d*(6*A*b*e-7*
A*c*d+3*B*b*d)/b^3/(c*x^2+b*x)^(1/2)-2/3*A*d^2/b^2/x/(c*x^2+b*x)^(1/2)+2/3
*(16*A*c^3*d^2+b^3*B*e^2+2*b^2*c*e*(A*e+2*B*d)-8*b*c^2*d*(2*A*e+B*d))*x/b^
4/c/(c*x^2+b*x)^(1/2)
```

Mathematica [A] (verified)

Time = 0.78 (sec) , antiderivative size = 149, normalized size of antiderivative = 0.82

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx = \frac{2(A(16c^3d^2x^3+8bc^2dx^2(3d-2ex)-b^3(d^2+6dex-3e^2x^2)+2b^2cx(3d^2-12}{3b^4(x(b}$$

input
```
Integrate[((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^(5/2),x]
```

output
```
(2*(A*(16*c^3*d^2*x^3 + 8*b*c^2*d*x^2*(3*d - 2*e*x) - b^3*(d^2 + 6*d*e*x -
 3*e^2*x^2) + 2*b^2*c*x*(3*d^2 - 12*d*e*x + e^2*x^2)) + b*B*x*(-8*c^2*d^2*
x^2 + 4*b*c*d*x*(-3*d + e*x) + b^2*(-3*d^2 + 6*d*e*x + e^2*x^2))))/(3*b^4*
(x*(b + c*x))^(3/2))
```

Rubi [A] (verified)

Time = 0.39 (sec) , antiderivative size = 92, normalized size of antiderivative = 0.51, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {1227, 1158}

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

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx$$

$$\Big\downarrow \text{1227}$$

$$\frac{4(Abe-2Acd+bBd)\int \frac{d+ex}{(cx^2+bx)^{3/2}}dx}{3b^2}-\frac{2(d+ex)^2(Ab-x(bB-2Ac))}{3b^2\,(bx+cx^2)^{3/2}}$$

$$\Big\downarrow \text{1158}$$

$$-\frac{8(x(2cd-be)+bd)(Abe-2Acd+bBd)}{3b^4\sqrt{bx+cx^2}}-\frac{2(d+ex)^2(Ab-x(bB-2Ac))}{3b^2\,(bx+cx^2)^{3/2}}$$

input
```
Int[((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^(5/2),x]
```

output
```
(-2*(A*b - (b*B - 2*A*c)*x)*(d + e*x)^2)/(3*b^2*(b*x + c*x^2)^(3/2)) - (8*
(b*B*d - 2*A*c*d + A*b*e)*(b*d + (2*c*d - b*e)*x))/(3*b^4*Sqrt[b*x + c*x^2
])
```

Defintions of rubi rules used

rule 1158
```
Int[((d_.) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[-2*((b*d - 2*a*e + (2*c*d - b*e)*x)/((b^2 - 4*a*c)*Sqrt[a + b*x
+ c*x^2])), x] /; FreeQ[{a, b, c, d, e}, x]
```

rule 1227
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^m*(a + b*x + c*x^2)^(p + 1)*(
(b*f - 2*a*g + (2*c*f - b*g)*x)/((p + 1)*(b^2 - 4*a*c))), x] - Simp[m*((b*(
e*f + d*g) - 2*(c*d*f + a*e*g))/((p + 1)*(b^2 - 4*a*c)))   Int[(d + e*x)^(m
 - 1)*(a + b*x + c*x^2)^(p + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x]
&& EqQ[Simplify[m + 2*p + 3], 0] && LtQ[p, -1]
```

Maple [A] (verified)

Time = 0.94 (sec) , antiderivative size = 128, normalized size of antiderivative = 0.71

method	result
risch	$-\frac{2d(cx+b)(6Abex-8cxAd+3Bbdx+Abd)}{3b^4x\sqrt{x(cx+b)}}+\frac{2x(2Abcex-8A\,c^2dx+B\,b^2ex+5Bbcdx+3A\,b^2e-9Abcd+6B\,b^2d)(be-cd)}{3\sqrt{x(cx+b)}\,(cx+b)b^4}$
pseudoelliptic	$-\frac{2\left((-B\,e^2x^3+(-3A\,e^2-6Bde)x^2+(6Ade+3B\,d^2)x+A\,d^2)b^3-6c\left(\frac{e(Ae+2Bd)x^2}{3}+(-4Ade-2B\,d^2)x+A\,d^2\right)x\,b^2-24c^2\right.}{3\sqrt{x(cx+b)}\,x(cx+b)b^4}$
gosper	$-\frac{2x(cx+b)(-2A\,b^2c\,e^2x^3+16Ab\,c^2de\,x^3-16A\,c^3d^2x^3-B\,b^3e^2x^3-4B\,b^2cde\,x^3+8Bb\,c^2d^2x^3-3A\,b^3e^2x^2+24A\,b^2cde\,x^2-}{3b^4(c\,x^2+bx)^{\frac{5}{2}}}$
orering	$-\frac{2x(cx+b)(-2A\,b^2c\,e^2x^3+16Ab\,c^2de\,x^3-16A\,c^3d^2x^3-B\,b^3e^2x^3-4B\,b^2cde\,x^3+8Bb\,c^2d^2x^3-3A\,b^3e^2x^2+24A\,b^2cde\,x^2-}{3b^4(c\,x^2+bx)^{\frac{5}{2}}}$
trager	$-\frac{2(-2A\,b^2c\,e^2x^3+16Ab\,c^2de\,x^3-16A\,c^3d^2x^3-B\,b^3e^2x^3-4B\,b^2cde\,x^3+8Bb\,c^2d^2x^3-3A\,b^3e^2x^2+24A\,b^2cde\,x^2-24Ab\,c^2d}{3b^4x^2(cx+b)^2}$
default	$A\,d^2\left(-\frac{2(2cx+b)}{3b^2(c\,x^2+bx)^{\frac{3}{2}}}+\frac{16c(2cx+b)}{3b^4\sqrt{c\,x^2+bx}}\right)+e(Ae+2Bd)\left(-\frac{x}{2c(c\,x^2+bx)^{\frac{3}{2}}}-\frac{b\left(-\frac{1}{3c\left(c\,x^2+bx\right)^{\frac{3}{2}}}-\frac{b\left(-\frac{}{3b}\right.}{}\right.}{}\right.$

input

```
int((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output

```
-2/3*d*(c*x+b)*(6*A*b*e*x-8*A*c*d*x+3*B*b*d*x+A*b*d)/b^4/x/(x*(c*x+b))^(1/
2)+2/3*x*(2*A*b*c*e*x-8*A*c^2*d*x+B*b^2*e*x+5*B*b*c*d*x+3*A*b^2*e-9*A*b*c*
d+6*B*b^2*d)*(b*e-c*d)/(x*(c*x+b))^(1/2)/(c*x+b)/b^4
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 189, normalized size of antiderivative = 1.04

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx =$$
$$-\frac{2\,(Ab^3d^2+(8\,(Bbc^2-2\,Ac^3)d^2-4\,(Bb^2c-4\,Abc^2)de-(Bb^3+2\,Ab^2c)e^2)x^3-3\,(Ab^3e^2-4\,(Bb^2c-2\,A}{3\,(b^4c^2x^4+2\,b^5cx^3+b^6x^2}$$

input
```
integrate((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
-2/3*(A*b^3*d^2 + (8*(B*b*c^2 - 2*A*c^3)*d^2 - 4*(B*b^2*c - 4*A*b*c^2)*d*e
 - (B*b^3 + 2*A*b^2*c)*e^2)*x^3 - 3*(A*b^3*e^2 - 4*(B*b^2*c - 2*A*b*c^2)*d
^2 + 2*(B*b^3 - 4*A*b^2*c)*d*e)*x^2 + 3*(2*A*b^3*d*e + (B*b^3 - 2*A*b^2*c)
*d^2)*x)*sqrt(c*x^2 + b*x)/(b^4*c^2*x^4 + 2*b^5*c*x^3 + b^6*x^2)
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx = \int \frac{(A+Bx)\,(d+ex)^2}{(x\,(b+cx))^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**2/(c*x**2+b*x)**(5/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)**2/(x*(b + c*x))**(5/2), x)
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 347 vs. 2(165) = 330.

Time = 0.04 (sec) , antiderivative size = 347, normalized size of antiderivative = 1.92

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx = -\frac{Be^2x^2}{(cx^2+bx)^{\frac{3}{2}}c} - \frac{4\,Acd^2x}{3\,(cx^2+bx)^{\frac{3}{2}}b^2} + \frac{32\,Ac^2d^2x}{3\,\sqrt{cx^2+bx}b^4} - \frac{Bbe^2x}{3\,(cx^2+bx)^{\frac{3}{2}}c^2} + \frac{2\,Be^2x}{3\,\sqrt{cx^2+bx}bc} - \frac{2\,Ad^2}{3\,(cx^2+bx)^{\frac{3}{2}}b} + \frac{16\,Acd^2}{3\,\sqrt{cx^2+bx}b^3} + \frac{Be^2}{3\,\sqrt{cx^2+bx}c^2} + \frac{4\,(2\,Bde+Ae^2)x}{3\,\sqrt{cx^2+bx}b^2} + \frac{2\,(Bd^2+2\,Ade)x}{3\,(cx^2+bx)^{\frac{3}{2}}b} - \frac{2\,(2\,Bde+Ae^2)x}{3\,(cx^2+bx)^{\frac{3}{2}}c} - \frac{16\,(Bd^2+2\,Ade)cx}{3\,\sqrt{cx^2+bx}b^3} - \frac{8\,(Bd^2+2\,Ade)}{3\,\sqrt{cx^2+bx}b^2} + \frac{2\,(2\,Bde+Ae^2)}{3\,\sqrt{cx^2+bx}bc}$$

input
```
integrate((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
-B*e^2*x^2/((c*x^2 + b*x)^(3/2)*c) - 4/3*A*c*d^2*x/((c*x^2 + b*x)^(3/2)*b^
2) + 32/3*A*c^2*d^2*x/(sqrt(c*x^2 + b*x)*b^4) - 1/3*B*b*e^2*x/((c*x^2 + b*
x)^(3/2)*c^2) + 2/3*B*e^2*x/(sqrt(c*x^2 + b*x)*b*c) - 2/3*A*d^2/((c*x^2 +
b*x)^(3/2)*b) + 16/3*A*c*d^2/(sqrt(c*x^2 + b*x)*b^3) + 1/3*B*e^2/(sqrt(c*x
^2 + b*x)*c^2) + 4/3*(2*B*d*e + A*e^2)*x/(sqrt(c*x^2 + b*x)*b^2) + 2/3*(B*
d^2 + 2*A*d*e)*x/((c*x^2 + b*x)^(3/2)*b) - 2/3*(2*B*d*e + A*e^2)*x/((c*x^2
 + b*x)^(3/2)*c) - 16/3*(B*d^2 + 2*A*d*e)*c*x/(sqrt(c*x^2 + b*x)*b^3) - 8/
3*(B*d^2 + 2*A*d*e)/(sqrt(c*x^2 + b*x)*b^2) + 2/3*(2*B*d*e + A*e^2)/(sqrt(
c*x^2 + b*x)*b*c)
```

Giac [A] (verification not implemented)

Time = 0.17 (sec) , antiderivative size = 174, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx = -\frac{2\left(\frac{Ad^2}{b} + \left(x\left(\frac{(8\,Bbc^2d^2-16\,Ac^3d^2-4\,Bb^2cde+16\,Abc^2de-Bb^3e^2-2\,Ab^2ce^2)x}{b^4} + \frac{3\,(4\,Bb^2cd^2-8\,Abc^2d^2-2\,Bb^3de+8\,Ab^2cde-Ab^3e^2)}{b^4}\right)\right.\right.}{3\,(cx^2+bx)^{\frac{3}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
-2/3*(A*d^2/b + (x*((8*B*b*c^2*d^2 - 16*A*c^3*d^2 - 4*B*b^2*c*d*e + 16*A*b
*c^2*d*e - B*b^3*e^2 - 2*A*b^2*c*e^2)*x/b^4 + 3*(4*B*b^2*c*d^2 - 8*A*b*c^2
*d^2 - 2*B*b^3*d*e + 8*A*b^2*c*d*e - A*b^3*e^2)/b^4) + 3*(B*b^3*d^2 - 2*A*
b^2*c*d^2 + 2*A*b^3*d*e)/b^4)*x)/(c*x^2 + b*x)^(3/2)
```

Mupad [B] (verification not implemented)

Time = 11.24 (sec) , antiderivative size = 190, normalized size of antiderivative = 1.05

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx = \frac{2\left(-3\,B\,b^3\,d^2\,x - A\,b^3\,d^2 + 6\,B\,b^3\,d\,e\,x^2 - 6\,A\,b^3\,d\,e\,x + B\,b^3\,e^2\,x^3 + 3\,A\,b^3\,e^2\,x^2\right.}{}$$

input
```
int(((A + B*x)*(d + e*x)^2)/(b*x + c*x^2)^(5/2),x)
```

output
```
(2*(3*A*b^3*e^2*x^2 - 3*B*b^3*d^2*x - A*b^3*d^2 + 16*A*c^3*d^2*x^3 + B*b^3
*e^2*x^3 + 6*A*b^2*c*d^2*x + 6*B*b^3*d*e*x^2 + 24*A*b*c^2*d^2*x^2 - 12*B*b
^2*c*d^2*x^2 + 2*A*b^2*c*e^2*x^3 - 8*B*b*c^2*d^2*x^3 - 6*A*b^3*d*e*x - 24*
A*b^2*c*d*e*x^2 - 16*A*b*c^2*d*e*x^3 + 4*B*b^2*c*d*e*x^3))/(3*b^4*(b*x + c
*x^2)^(3/2))
```

Reduce [B] (verification not implemented)

Time = 0.30 (sec) , antiderivative size = 504, normalized size of antiderivative = 2.78

$$\int \frac{(A+Bx)(d+ex)^2}{(bx+cx^2)^{5/2}}\,dx = \frac{-\frac{2\sqrt{x}\,a\,b^3c^2d^2}{3} + \frac{2\sqrt{x}\,b^4c^2e^2x^3}{3} - \frac{32\sqrt{c}\,\sqrt{cx+b}\,a\,c^4d^2x^3}{3} + \frac{32\sqrt{c}\,\sqrt{cx+b}\,a\,b^2c^2d\,e\,x^2}{3} + \frac{32\sqrt{c}\,\sqrt{cx+}}{3}}{}$$

input
```
int((B*x+A)*(e*x+d)^2/(c*x^2+b*x)^(5/2),x)
```

output
```
(2*( - 6*sqrt(c)*sqrt(b + c*x)*a*b**3*c*e**2*x**2 + 16*sqrt(c)*sqrt(b + c*
x)*a*b**2*c**2*d*e*x**2 - 6*sqrt(c)*sqrt(b + c*x)*a*b**2*c**2*e**2*x**3 -
16*sqrt(c)*sqrt(b + c*x)*a*b*c**3*d**2*x**2 + 16*sqrt(c)*sqrt(b + c*x)*a*b
*c**3*d*e*x**3 - 16*sqrt(c)*sqrt(b + c*x)*a*c**4*d**2*x**3 + 5*sqrt(c)*sqr
t(b + c*x)*b**5*e**2*x**2 - 12*sqrt(c)*sqrt(b + c*x)*b**4*c*d*e*x**2 + 5*s
qrt(c)*sqrt(b + c*x)*b**4*c*e**2*x**3 + 8*sqrt(c)*sqrt(b + c*x)*b**3*c**2*
d**2*x**2 - 12*sqrt(c)*sqrt(b + c*x)*b**3*c**2*d*e*x**3 + 8*sqrt(c)*sqrt(b
 + c*x)*b**2*c**3*d**2*x**3 - sqrt(x)*a*b**3*c**2*d**2 - 6*sqrt(x)*a*b**3*
c**2*d*e*x + 3*sqrt(x)*a*b**3*c**2*e**2*x**2 + 6*sqrt(x)*a*b**2*c**3*d**2*
x - 24*sqrt(x)*a*b**2*c**3*d*e*x**2 + 2*sqrt(x)*a*b**2*c**3*e**2*x**3 + 24
*sqrt(x)*a*b*c**4*d**2*x**2 - 16*sqrt(x)*a*b*c**4*d*e*x**3 + 16*sqrt(x)*a*
c**5*d**2*x**3 - 3*sqrt(x)*b**4*c**2*d**2*x + 6*sqrt(x)*b**4*c**2*d*e*x**2
 + sqrt(x)*b**4*c**2*e**2*x**3 - 12*sqrt(x)*b**3*c**3*d**2*x**2 + 4*sqrt(x
)*b**3*c**3*d*e*x**3 - 8*sqrt(x)*b**2*c**4*d**2*x**3))/(3*sqrt(b + c*x)*b*
*4*c**2*x**2*(b + c*x))
```

3.135 $\int \frac{(A+Bx)(d+ex)}{\left(bx+cx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 157

$$\int \frac{(A+Bx)(d+ex)}{\left(bx+cx^2\right)^{5/2}}\,dx = \frac{2(7Acd-3b(Bd+Ae))x}{3b^2\left(bx+cx^2\right)^{3/2}} + \frac{2\left(8Ac^2d+b^2Be-4bc(Bd+Ae)\right)x^2}{3b^3\left(bx+cx^2\right)^{3/2}} - \frac{2Ad}{3b^2x\sqrt{bx+cx^2}} + \frac{4\left(8Ac^2d+b^2Be-4bc(Bd+Ae)\right)x}{3b^4\sqrt{bx+cx^2}}$$

output
```
2/3*(7*A*c*d-3*b*(A*e+B*d))*x/b^2/(c*x^2+b*x)^(3/2)+2/3*(8*A*c^2*d+b^2*B*e
-4*b*c*(A*e+B*d))*x^2/b^3/(c*x^2+b*x)^(3/2)-2/3*A*d/b^2/x/(c*x^2+b*x)^(1/2
)+4/3*(8*A*c^2*d+b^2*B*e-4*b*c*(A*e+B*d))*x/b^4/(c*x^2+b*x)^(1/2)
```

Mathematica [A] (verified)

Time = 0.39 (sec) , antiderivative size = 107, normalized size of antiderivative = 0.68

$$\int \frac{(A+Bx)(d+ex)}{\left(bx+cx^2\right)^{5/2}}\,dx = -\frac{2\left(bBx\left(8c^2dx^2+3b^2(d-ex)-2bcx(-6d+ex)\right)+A\left(-16c^3dx^3-6b^2cx(d-2ex)+8bc^2x^2(-3d+ex)\right.\right.}{3b^4(x(b+cx))^{3/2}}$$

input
```
Integrate[((A + B*x)*(d + e*x))/(b*x + c*x^2)^(5/2),x]
```

output
```
(-2*(b*B*x*(8*c^2*d*x^2 + 3*b^2*(d - e*x) - 2*b*c*x*(-6*d + e*x)) + A*(-16
*c^3*d*x^3 - 6*b^2*c*x*(d - 2*e*x) + 8*b*c^2*x^2*(-3*d + e*x) + b^3*(d + 3
*e*x))))/(3*b^4*(x*(b + c*x))^(3/2))
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 111, normalized size of antiderivative = 0.71, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1224, 1088}

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

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{5/2}}dx$$

$$\Big\downarrow \text{1224}$$

$$-\frac{(-4bc(Ae+Bd)+8Ac^2d+b^2Be)\int \frac{1}{(cx^2+bx)^{3/2}}dx}{3b^2c}-\frac{2(x(-bc(Ae+Bd)+2Ac^2d+b^2Be)+Abcd)}{3b^2c(bx+cx^2)^{3/2}}$$

$$\Big\downarrow \text{1088}$$

$$\frac{2(b+2cx)(-4bc(Ae+Bd)+8Ac^2d+b^2Be)}{3b^4c\sqrt{bx+cx^2}}-\frac{2(x(-bc(Ae+Bd)+2Ac^2d+b^2Be)+Abcd)}{3b^2c(bx+cx^2)^{3/2}}$$

input
```
Int[((A + B*x)*(d + e*x))/(b*x + c*x^2)^(5/2),x]
```

output
```
(-2*(A*b*c*d + (2*A*c^2*d + b^2*B*e - b*c*(B*d + A*e))*x))/(3*b^2*c*(b*x +
 c*x^2)^(3/2)) + (2*(8*A*c^2*d + b^2*B*e - 4*b*c*(B*d + A*e))*(b + 2*c*x))
/(3*b^4*c*Sqrt[b*x + c*x^2])
```

Defintions of rubi rules used

rule 1088
```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-3/2), x_Symbol] :> Simp[-2*((b +
2*c*x)/((b^2 - 4*a*c)*Sqrt[a + b*x + c*x^2])), x] /; FreeQ[{a, b, c}, x] &&
 NeQ[b^2 - 4*a*c, 0]
```

rule 1224
```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(
x_)^2)^(p_), x_Symbol] :> Simp[(-(2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (
b^2*e*g - b*c*(e*f + d*g) + 2*c*(c*d*f - a*e*g))*x))*((a + b*x + c*x^2)^(p
+ 1)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[(b^2*e*g*(p + 2) - 2*a*c*e*g + c
*(2*c*d*f - b*(e*f + d*g))*(2*p + 3))/(c*(p + 1)*(b^2 - 4*a*c))   Int[(a +
b*x + c*x^2)^(p + 1), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -
1] &&  !(IntegerQ[p] && NeQ[a, 0] && NiceSqrtQ[b^2 - 4*a*c])
```

Maple [A] (verified)

Time = 0.92 (sec) , antiderivative size = 116, normalized size of antiderivative = 0.74

method	result
pseudoelliptic	$-\frac{2\left(\left(-3Bex^2+3(Ae+Bd)x+Ad\right)b^3-6c\left(\frac{Bex^2}{3}+2(-Ae-Bd)x+Ad\right)xb^2-24\left(\frac{(-Ae-Bd)x}{3}+Ad\right)c^2x^2b-16Ac^3dx^3\right)}{3\sqrt{x(cx+b)}\,x(cx+b)b^4}$
risch	$-\frac{2(cx+b)(3Abex-8cxAd+3Bbdx+Abd)}{3b^4x\sqrt{x(cx+b)}}-\frac{2(5Abc^2ex-8Ac^3dx-2Bb^2cex+5Bbc^2dx+6Ab^2ce-9Abc^2d-3Beb^3+6B\cdots)}{3\sqrt{x(cx+b)}\,(cx+b)b^4}$
gosper	$-\frac{2x(cx+b)(8Abc^2ex^3-16Ac^3dx^3-2Bb^2cex^3+8Bbc^2dx^3+12Ab^2cex^2-24Abc^2dx^2-3Bb^3ex^2+12Bb^2cdx^2+3Ab^3\cdots)}{3b^4(cx^2+bx)^{\frac{5}{2}}}$
orering	$-\frac{2x(cx+b)(8Abc^2ex^3-16Ac^3dx^3-2Bb^2cex^3+8Bbc^2dx^3+12Ab^2cex^2-24Abc^2dx^2-3Bb^3ex^2+12Bb^2cdx^2+3Ab^3\cdots)}{3b^4(cx^2+bx)^{\frac{5}{2}}}$
trager	$-\frac{2(8Abc^2ex^3-16Ac^3dx^3-2Bb^2cex^3+8Bbc^2dx^3+12Ab^2cex^2-24Abc^2dx^2-3Bb^3ex^2+12Bb^2cdx^2+3Ab^3ex-6Ab\cdots)}{3b^4x^2(cx+b)^2}$
default	$Ad\left(-\frac{2(2cx+b)}{3b^2(cx^2+bx)^{\frac{3}{2}}}+\frac{16c(2cx+b)}{3b^4\sqrt{cx^2+bx}}\right)+(Ae+Bd)\left(-\frac{1}{3c(cx^2+bx)^{\frac{3}{2}}}-\frac{b\left(-\frac{2(2cx+b)}{3b^2\left(cx^2+bx\right)^{\frac{3}{2}}}+\frac{16c(2cx+b\cdots}{3b^4\sqrt{cx^2+\cdots}}\right)}{2c}\right)$

input
```
int((B*x+A)*(e*x+d)/(c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-2/3/(x*(c*x+b))^(1/2)*((-3*B*e*x^2+3*(A*e+B*d)*x+A*d)*b^3-6*c*(1/3*B*e*x^
2+2*(-A*e-B*d)*x+A*d)*x*b^2-24*(1/3*(-A*e-B*d)*x+A*d)*c^2*x^2*b-16*A*c^3*d
*x^3)/x/(c*x+b)/b^4
```

Fricas [A] (verification not implemented)

Time = 0.08 (sec) , antiderivative size = 152, normalized size of antiderivative = 0.97

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{5/2}}\,dx =$$
$$-\frac{2\,(Ab^3d+2\,(4\,(Bbc^2-2\,Ac^3)d-(Bb^2c-4\,Abc^2)e)x^3+3\,(4\,(Bb^2c-2\,Abc^2)d-(Bb^3-4\,Ab^2c)e)x^2+3}{3\,(b^4c^2x^4+2\,b^5cx^3+b^6x^2)}$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
-2/3*(A*b^3*d + 2*(4*(B*b*c^2 - 2*A*c^3)*d - (B*b^2*c - 4*A*b*c^2)*e)*x^3
+ 3*(4*(B*b^2*c - 2*A*b*c^2)*d - (B*b^3 - 4*A*b^2*c)*e)*x^2 + 3*(A*b^3*e +
 (B*b^3 - 2*A*b^2*c)*d)*x)*sqrt(c*x^2 + b*x)/(b^4*c^2*x^4 + 2*b^5*c*x^3 +
b^6*x^2)
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{5/2}}\,dx = \int \frac{(A+Bx)\,(d+ex)}{(x\,(b+cx))^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x**2+b*x)**(5/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)/(x*(b + c*x))**(5/2), x)
```

Maxima [A] (verification not implemented)

Time = 0.04 (sec) , antiderivative size = 211, normalized size of antiderivative = 1.34

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{5/2}}\,dx = -\frac{4\,Acdx}{3\,(cx^2+bx)^{\frac{3}{2}}b^2} + \frac{32\,Ac^2dx}{3\,\sqrt{cx^2+bx}b^4} + \frac{4\,Bex}{3\,\sqrt{cx^2+bx}b^2} - \frac{2\,Bex}{3\,(cx^2+bx)^{\frac{3}{2}}c} - \frac{2\,Ad}{3\,(cx^2+bx)^{\frac{3}{2}}b} + \frac{16\,Acd}{3\,\sqrt{cx^2+bx}b^3} + \frac{2\,Be}{3\,\sqrt{cx^2+bx}bc} + \frac{2\,(Bd+Ae)x}{3\,(cx^2+bx)^{\frac{3}{2}}b} - \frac{16\,(Bd+Ae)cx}{3\,\sqrt{cx^2+bx}b^3} - \frac{8\,(Bd+Ae)}{3\,\sqrt{cx^2+bx}b^2}$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
-4/3*A*c*d*x/((c*x^2 + b*x)^(3/2)*b^2) + 32/3*A*c^2*d*x/(sqrt(c*x^2 + b*x)
*b^4) + 4/3*B*e*x/(sqrt(c*x^2 + b*x)*b^2) - 2/3*B*e*x/((c*x^2 + b*x)^(3/2)
*c) - 2/3*A*d/((c*x^2 + b*x)^(3/2)*b) + 16/3*A*c*d/(sqrt(c*x^2 + b*x)*b^3)
 + 2/3*B*e/(sqrt(c*x^2 + b*x)*b*c) + 2/3*(B*d + A*e)*x/((c*x^2 + b*x)^(3/2
)*b) - 16/3*(B*d + A*e)*c*x/(sqrt(c*x^2 + b*x)*b^3) - 8/3*(B*d + A*e)/(sqr
t(c*x^2 + b*x)*b^2)
```

Giac [A] (verification not implemented)

Time = 0.17 (sec) , antiderivative size = 127, normalized size of antiderivative = 0.81

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{5/2}}\,dx = -\frac{2\left(\left(x\left(\frac{2\,(4\,Bbc^2d-8\,Ac^3d-Bb^2ce+4\,Abc^2e)x}{b^4}+\frac{3\,(4\,Bb^2cd-8\,Abc^2d-Bb^3e+4\,Ab^2ce)}{b^4}\right)+\frac{3\,(Bb^3d-2\,Ab^2cd+Ab^3e)}{b^4}\right)x+\frac{Ad}{b}\right)}{3\,(cx^2+bx)^{\frac{3}{2}}}$$

input
```
integrate((B*x+A)*(e*x+d)/(c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
-2/3*((x*(2*(4*B*b*c^2*d - 8*A*c^3*d - B*b^2*c*e + 4*A*b*c^2*e)*x/b^4 + 3*
(4*B*b^2*c*d - 8*A*b*c^2*d - B*b^3*e + 4*A*b^2*c*e)/b^4) + 3*(B*b^3*d - 2*
A*b^2*c*d + A*b^3*e)/b^4)*x + A*d/b)/(c*x^2 + b*x)^(3/2)
```

Mupad [B] (verification not implemented)

Time = 11.07 (sec) , antiderivative size = 134, normalized size of antiderivative = 0.85

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{5/2}}\,dx = -\frac{2\,(A\,b^3\,d+3\,A\,b^3\,e\,x+3\,B\,b^3\,d\,x-16\,A\,c^3\,d\,x^3-3\,B\,b^3\,e\,x^2-24\,A\,b\,c^2\,d\,x^2+12\,A\,b^2\,c\,e\,x^2+12\,B\,b^2\,c\,d \cdots}{3\,b^4\,(c\,x^2+b\,x)^{3/2}}$$

input
```
int(((A + B*x)*(d + e*x))/(b*x + c*x^2)^(5/2),x)
```

output
```
-(2*(A*b^3*d + 3*A*b^3*e*x + 3*B*b^3*d*x - 16*A*c^3*d*x^3 - 3*B*b^3*e*x^2
- 24*A*b*c^2*d*x^2 + 12*A*b^2*c*e*x^2 + 12*B*b^2*c*d*x^2 + 8*A*b*c^2*e*x^3
 + 8*B*b*c^2*d*x^3 - 2*B*b^2*c*e*x^3 - 6*A*b^2*c*d*x))/(3*b^4*(b*x + c*x^2
)^(3/2))
```

Reduce [B] (verification not implemented)

Time = 0.26 (sec) , antiderivative size = 326, normalized size of antiderivative = 2.08

$$\int \frac{(A+Bx)(d+ex)}{(bx+cx^2)^{5/2}}\,dx = \frac{\frac{16\sqrt{c}\,\sqrt{cx+b}\,a\,b^2ce\,x^2}{3}-\frac{32\sqrt{c}\,\sqrt{cx+b}\,ab\,c^2d\,x^2}{3}+\frac{16\sqrt{c}\,\sqrt{cx+b}\,ab\,c^2e\,x^3}{3}-\frac{32\sqrt{c}\,\sqrt{cx+b}\,a\,c^3d\,x^3}{3}-4 \cdots}{\cdots}$$

input
```
int((B*x+A)*(e*x+d)/(c*x^2+b*x)^(5/2),x)
```

output
```
(2*(8*sqrt(c)*sqrt(b + c*x)*a*b**2*c*e*x**2 - 16*sqrt(c)*sqrt(b + c*x)*a*b
*c**2*d*x**2 + 8*sqrt(c)*sqrt(b + c*x)*a*b*c**2*e*x**3 - 16*sqrt(c)*sqrt(b
 + c*x)*a*c**3*d*x**3 - 6*sqrt(c)*sqrt(b + c*x)*b**4*e*x**2 + 8*sqrt(c)*sq
rt(b + c*x)*b**3*c*d*x**2 - 6*sqrt(c)*sqrt(b + c*x)*b**3*c*e*x**3 + 8*sqrt
(c)*sqrt(b + c*x)*b**2*c**2*d*x**3 - sqrt(x)*a*b**3*c*d - 3*sqrt(x)*a*b**3
*c*e*x + 6*sqrt(x)*a*b**2*c**2*d*x - 12*sqrt(x)*a*b**2*c**2*e*x**2 + 24*sq
rt(x)*a*b*c**3*d*x**2 - 8*sqrt(x)*a*b*c**3*e*x**3 + 16*sqrt(x)*a*c**4*d*x*
*3 - 3*sqrt(x)*b**4*c*d*x + 3*sqrt(x)*b**4*c*e*x**2 - 12*sqrt(x)*b**3*c**2
*d*x**2 + 2*sqrt(x)*b**3*c**2*e*x**3 - 8*sqrt(x)*b**2*c**3*d*x**3))/(3*sqr
t(b + c*x)*b**4*c*x**2*(b + c*x))
```

3.136 $\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 292

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{5/2}}\,dx = -\frac{2A}{3bd\left(bx+cx^2\right)^{3/2}} - \frac{2(bBd-2Acd-Abe)x}{b^2d^2\left(bx+cx^2\right)^{3/2}} + \frac{2c(8Ac^2d^2+3b^2e(Bd-Ae)-4bcd(Bd+Ae))\,x^2}{3b^3d^2(cd-be)\left(bx+cx^2\right)^{3/2}} + \frac{2c(16Ac^3d^3-3b^3e^2(Bd-Ae)+2b^2cde(7Bd+Ae)-8bc^2d^2(Bd+3Ae))\,x}{3b^4d^2(cd-be)^2\sqrt{bx+cx^2}} - \frac{2e^3(Bd-Ae)\text{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{d^{5/2}(cd-be)^{5/2}}$$

output
```
-2/3*A/b/d/(c*x^2+b*x)^(3/2)-2*(-A*b*e-2*A*c*d+B*b*d)*x/b^2/d^2/(c*x^2+b*x
)^(3/2)+2/3*c*(8*A*c^2*d^2+3*b^2*e*(-A*e+B*d)-4*b*c*d*(A*e+B*d))*x^2/b^3/d
^2/(-b*e+c*d)/(c*x^2+b*x)^(3/2)+2/3*c*(16*A*c^3*d^3-3*b^3*e^2*(-A*e+B*d)+2
*b^2*c*d*e*(A*e+7*B*d)-8*b*c^2*d^2*(3*A*e+B*d))*x/b^4/d^2/(-b*e+c*d)^2/(c*
x^2+b*x)^(1/2)-2*e^3*(-A*e+B*d)*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+
b*x)^(1/2))/d^(5/2)/(-b*e+c*d)^(5/2)
```

Mathematica [A] (verified)

Time = 1.93 (sec) , antiderivative size = 341, normalized size of antiderivative = 1.17

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{5/2}}\,dx = \frac{2x\left(-\frac{\sqrt{d}(b+cx)\left(bBdx\left(3b^4e^2+8c^4d^2x^2+2bc^3dx(6d-7ex)+6b^3ce(-d+ex)+3b^2c^2\left(d^2-7dex+e^2x^2\right)\right)\cdots}{\cdots}\cdots\right)}{\cdots}$$

input
```
Integrate[(A + B*x)/((d + e*x)*(b*x + c*x^2)^(5/2)),x]
```

output
```
(2*x*(-((Sqrt[d]*(b + c*x)*(b*B*d*x*(3*b^4*e^2 + 8*c^4*d^2*x^2 + 2*b*c^3*d
*x*(6*d - 7*e*x) + 6*b^3*c*e*(-d + e*x) + 3*b^2*c^2*(d^2 - 7*d*e*x + e^2*x
^2)) + A*(-16*c^5*d^3*x^3 + b^5*e^2*(d - 3*e*x) - 24*b*c^4*d^2*x^2*(d - e*
x) - 2*b^2*c^3*d*x*(3*d^2 - 18*d*e*x + e^2*x^2) - 2*b^4*c*e*(d^2 + 3*e^2*x
^2) + b^3*c^2*(d^3 + 9*d^2*e*x - 3*d*e^2*x^2 - 3*e^3*x^3))))/(b^4*(c*d - b
*e)^2)) + (3*e^3*(B*d - A*e)*x^(3/2)*(b + c*x)^(5/2)*ArcTan[(-(e*Sqrt[x]*S
qrt[b + c*x]) + Sqrt[c]*(d + e*x))/(Sqrt[d]*Sqrt[-(c*d) + b*e])])/(-(c*d)
+ b*e)^(5/2)))/(3*d^(5/2)*(x*(b + c*x))^(5/2))
```

Rubi [A] (verified)

Time = 0.96 (sec) , antiderivative size = 309, normalized size of antiderivative = 1.06, number of steps used = 7, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {1235, 27, 1235, 27, 1154, 219}

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

$$\int \frac{A+Bx}{\left(bx+cx^2\right)^{5/2}(d+ex)}dx$$

$$\Big\downarrow \ 1235$$

$$-\frac{2\int \frac{3e(Bd-Ae)b^2-4cd(Bd+Ae)b+8Ac^2d^2-4ce(bBd-2Acd+Abe)x}{2(d+ex)\left(cx^2+bx\right)^{3/2}}dx}{3b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d\left(bx+cx^2\right)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 27$$

$$-\frac{\int \frac{3e(Bd-Ae)b^2-4cd(Bd+Ae)b+8Ac^2d^2-4ce(bBd-2Acd+Abe)x}{(d+ex)(cx^2+bx)^{3/2}}dx}{3b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d\left(bx+cx^2\right)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 1235$$

$$-\frac{-\frac{2\int -\frac{3b^4e^3(Bd-Ae)}{2(d+ex)\sqrt{cx^2+bx}}dx}{b^2d(cd-be)}-\frac{2\left(b(cd-be)\left(3b^2e(Bd-Ae)-4bcd(Ae+Bd)+8Ac^2d^2\right)+cx\left(-3b^3e^2(Bd-Ae)+2b^2cde(Ae+7Bd)-8bc^2d^2(3Ae+\right.\right.}{b^2d\sqrt{bx+cx^2}(cd-be)}}{3b^2d(cd-be)}$$

$$-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d\left(bx+cx^2\right)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 27$$

$$-\frac{\frac{3b^2e^3(Bd-Ae)\int \frac{1}{(d+ex)\sqrt{cx^2+bx}}dx}{d(cd-be)}-\frac{2\left(b(cd-be)\left(3b^2e(Bd-Ae)-4bcd(Ae+Bd)+8Ac^2d^2\right)+cx\left(-3b^3e^2(Bd-Ae)+2b^2cde(Ae+7Bd)-8bc^2d\right.\right.}{b^2d\sqrt{bx+cx^2}(cd-be)}}{3b^2d(cd-be)}$$

$$-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d\left(bx+cx^2\right)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 1154$$

$$-\frac{-\frac{6b^2e^3(Bd-Ae)\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{d(cd-be)}-\frac{2\left(b(cd-be)\left(3b^2e(Bd-Ae)-4bcd(Ae+Bd)+8Ac^2d^2\right)+cx\left(-3b^3e^2(Bd\right.\right.}{b^2d\sqrt{bx+cx^2}(cd-}}{3b^2d(cd-be)}$$

$$-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d\left(bx+cx^2\right)^{3/2}(cd-be)}$$

$$\Big\downarrow \; 219$$

$$-\frac{\frac{3b^2e^3(Bd-Ae)\text{arctanh}\left(\frac{x(2cd-be)+bd}{2\sqrt{d}\sqrt{bx+cx^2}\sqrt{cd-be}}\right)}{d^{3/2}(cd-be)^{3/2}}-\frac{2\left(b(cd-be)\left(3b^2e(Bd-Ae)-4bcd(Ae+Bd)+8Ac^2d^2\right)+cx\left(-3b^3e^2(Bd-Ae)+2b^2cde(Ae-\right.\right.}{b^2d\sqrt{bx+cx^2}(cd-be)}}{3b^2d(cd-be)}$$

$$-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d\left(bx+cx^2\right)^{3/2}(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)*(b*x + c*x^2)^(5/2)),x]
```

output
```
(-2*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x))/(3*b^2*d*(c*d - b*e
)*(b*x + c*x^2)^(3/2)) - ((-2*(b*(c*d - b*e)*(8*A*c^2*d^2 + 3*b^2*e*(B*d -
 A*e) - 4*b*c*d*(B*d + A*e)) + c*(16*A*c^3*d^3 - 3*b^3*e^2*(B*d - A*e) + 2
*b^2*c*d*e*(7*B*d + A*e) - 8*b*c^2*d^2*(B*d + 3*A*e))*x))/(b^2*d*(c*d - b*
e)*Sqrt[b*x + c*x^2]) + (3*b^2*e^3*(B*d - A*e)*ArcTanh[(b*d + (2*c*d - b*e
)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x^2])])/(d^(3/2)*(c*d - b*e)^
(3/2)))/(3*b^2*d*(c*d - b*e))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

Maple [A] (verified)

Time = 1.22 (sec) , antiderivative size = 280, normalized size of antiderivative = 0.96

method	result
pseudoelliptic	$-\frac{2\left(3b^4e^3x\sqrt{x(cx+b)}\,(cx+b)(Ae-Bd)\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)+\left(c^2\left((3Bx+A)b^3-6cx(-2Bx+A)b^2-24c^2x^2\left(-\frac{Bx}{3}+A\right)\cdots\right.\right.\right.}{3\cdots}$
risch	$-\frac{2(cx+b)(-3Abex-8cxAd+3Bbdx+Abd)}{3b^4d^2\sqrt{x(cx+b)}\,x}+\frac{-\frac{e^2b^3(Ae-Bd)\ln\left(\frac{-\frac{2d(be-cd)}{e^2}+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}+2\sqrt{-\frac{d(be-cd)}{e^2}}\sqrt{c\left(x+\frac{d}{e}\right)^2\cdots}}{x+\frac{d}{e}}\right)}{(be-cd)^2\sqrt{-\frac{d(be-cd)}{e^2}}}\cdots}{\cdots}$
default	$\frac{B\left(-\frac{2(2cx+b)}{3b^2\left(cx^2+bx\right)^{\frac{3}{2}}}+\frac{16c(2cx+b)}{3b^4\sqrt{cx^2+bx}}\right)}{e}+\frac{(Ae-Bd)\left(-\frac{e^2}{3d(be-cd)\left(c\left(x+\frac{d}{e}\right)^2+\frac{(be-2cd)\left(x+\frac{d}{e}\right)}{e}-\frac{d(be-cd)}{e^2}\right)^{\frac{3}{2}}}+\frac{(be-2cd)e\left(\cdots\right)}{\cdots}\cdots\right)}{\cdots}$

input
```
int((B*x+A)/(e*x+d)/(c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-2/3*(3*b^4*e^3*x*(x*(c*x+b))^(1/2)*(c*x+b)*(A*e-B*d)*arctan((x*(c*x+b))^(
1/2)/x*d/(d*(b*e-c*d))^(1/2))+(c^2*((3*B*x+A)*b^3-6*c*x*(-2*B*x+A)*b^2-24*
c^2*x^2*(-1/3*B*x+A)*b-16*A*c^3*x^3)*d^3-2*c*e*((3*B*x+A)*b^3-9/2*c*x*(-7/
3*B*x+A)*b^2-18*c^2*(-7/18*B*x+A)*x^2*b-12*A*c^3*x^3)*b*d^2+((3*B*x+A)*b-2
*A*c*x)*e^2*(c*x+b)^2*b^2*d-3*A*b^3*e^3*x*(c*x+b)^2)*(d*(b*e-c*d))^(1/2))/
(x*(c*x+b))^(1/2)/(d*(b*e-c*d))^(1/2)/x/d^2/(b*e-c*d)^2/(c*x+b)/b^4
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 686 vs. $2(268) = 536$.

Time = 0.13 (sec) , antiderivative size = 1387, normalized size of antiderivative = 4.75

$$\int \frac{A + Bx}{(d + ex)(bx + cx^2)^{5/2}} \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
[-1/3*(3*((B*b^4*c^2*d*e^3 - A*b^4*c^2*e^4)*x^4 + 2*(B*b^5*c*d*e^3 - A*b^5
*c*e^4)*x^3 + (B*b^6*d*e^3 - A*b^6*e^4)*x^2)*sqrt(c*d^2 - b*d*e)*log((b*d
+ (2*c*d - b*e)*x + 2*sqrt(c*d^2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d)) +
2*(A*b^3*c^3*d^5 - 3*A*b^4*c^2*d^4*e + 3*A*b^5*c*d^3*e^2 - A*b^6*d^2*e^3 +
 (3*A*b^4*c^2*d*e^4 + 8*(B*b*c^5 - 2*A*c^6)*d^5 - 2*(11*B*b^2*c^4 - 20*A*b
*c^5)*d^4*e + (17*B*b^3*c^3 - 26*A*b^2*c^4)*d^3*e^2 - (3*B*b^4*c^2 + A*b^3
*c^3)*d^2*e^3)*x^3 + 3*(2*A*b^5*c*d*e^4 + 4*(B*b^2*c^4 - 2*A*b*c^5)*d^5 -
(11*B*b^3*c^3 - 20*A*b^2*c^4)*d^4*e + (9*B*b^4*c^2 - 13*A*b^3*c^3)*d^3*e^2
 - (2*B*b^5*c + A*b^4*c^2)*d^2*e^3)*x^2 + 3*(A*b^6*d*e^4 + (B*b^3*c^3 - 2*
A*b^2*c^4)*d^5 - (3*B*b^4*c^2 - 5*A*b^3*c^3)*d^4*e + 3*(B*b^5*c - A*b^4*c^
2)*d^3*e^2 - (B*b^6 + A*b^5*c)*d^2*e^3)*x)*sqrt(c*x^2 + b*x))/((b^4*c^5*d^
6 - 3*b^5*c^4*d^5*e + 3*b^6*c^3*d^4*e^2 - b^7*c^2*d^3*e^3)*x^4 + 2*(b^5*c^
4*d^6 - 3*b^6*c^3*d^5*e + 3*b^7*c^2*d^4*e^2 - b^8*c*d^3*e^3)*x^3 + (b^6*c^
3*d^6 - 3*b^7*c^2*d^5*e + 3*b^8*c*d^4*e^2 - b^9*d^3*e^3)*x^2), 2/3*(3*((B*
b^4*c^2*d*e^3 - A*b^4*c^2*e^4)*x^4 + 2*(B*b^5*c*d*e^3 - A*b^5*c*e^4)*x^3 +
 (B*b^6*d*e^3 - A*b^6*e^4)*x^2)*sqrt(-c*d^2 + b*d*e)*arctan(sqrt(-c*d^2 +
b*d*e)*sqrt(c*x^2 + b*x)/(c*d*x + b*d)) - (A*b^3*c^3*d^5 - 3*A*b^4*c^2*d^4
*e + 3*A*b^5*c*d^3*e^2 - A*b^6*d^2*e^3 + (3*A*b^4*c^2*d*e^4 + 8*(B*b*c^5 -
 2*A*c^6)*d^5 - 2*(11*B*b^2*c^4 - 20*A*b*c^5)*d^4*e + (17*B*b^3*c^3 - 26*A
*b^2*c^4)*d^3*e^2 - (3*B*b^4*c^2 + A*b^3*c^3)*d^2*e^3)*x^3 + 3*(2*A*b^5...
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{5/2}}\,dx = \int \frac{A+Bx}{\left(x\left(b+cx\right)\right)^{\frac{5}{2}}\left(d+ex\right)}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x**2+b*x)**(5/2),x)
```

output
```
Integral((A + B*x)/((x*(b + c*x))**(5/2)*(d + e*x)), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
Exception raised: ValueError >> Computation failed since Maxima requested
additional constraints; using the 'assume' command before evaluation *may*
 help (example of legal syntax is 'assume((b/e-(2*c*d)/e^2)^2>0)', see `as
sume?` for
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 877 vs. $2(268) = 536$.

Time = 0.16 (sec) , antiderivative size = 877, normalized size of antiderivative = 3.00

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)/(c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
2*(B*d*e^3 - A*e^4)*arctan(((sqrt(c)*x - sqrt(c*x^2 + b*x))*e + sqrt(c)*d)
/sqrt(-c*d^2 + b*d*e))/((c^2*d^4 - 2*b*c*d^3*e + b^2*d^2*e^2)*sqrt(-c*d^2
+ b*d*e)) - 2/3*((((8*B*b*c^6*d^10 - 16*A*c^7*d^10 - 30*B*b^2*c^5*d^9*e +
56*A*b*c^6*d^9*e + 39*B*b^3*c^4*d^8*e^2 - 66*A*b^2*c^5*d^8*e^2 - 20*B*b^4*
c^3*d^7*e^3 + 25*A*b^3*c^4*d^7*e^3 + 3*B*b^5*c^2*d^6*e^4 + 4*A*b^4*c^3*d^6
*e^4 - 3*A*b^5*c^2*d^5*e^5)*x/(b^4*c^4*d^11 - 4*b^5*c^3*d^10*e + 6*b^6*c^2
*d^9*e^2 - 4*b^7*c*d^8*e^3 + b^8*d^7*e^4) + 3*(4*B*b^2*c^5*d^10 - 8*A*b*c^
6*d^10 - 15*B*b^3*c^4*d^9*e + 28*A*b^2*c^5*d^9*e + 20*B*b^4*c^3*d^8*e^2 -
33*A*b^3*c^4*d^8*e^2 - 11*B*b^5*c^2*d^7*e^3 + 12*A*b^4*c^3*d^7*e^3 + 2*B*b
^6*c*d^6*e^4 + 3*A*b^5*c^2*d^6*e^4 - 2*A*b^6*c*d^5*e^5)/(b^4*c^4*d^11 - 4*
b^5*c^3*d^10*e + 6*b^6*c^2*d^9*e^2 - 4*b^7*c*d^8*e^3 + b^8*d^7*e^4))*x + 3
*(B*b^3*c^4*d^10 - 2*A*b^2*c^5*d^10 - 4*B*b^4*c^3*d^9*e + 7*A*b^3*c^4*d^9*
e + 6*B*b^5*c^2*d^8*e^2 - 8*A*b^4*c^3*d^8*e^2 - 4*B*b^6*c*d^7*e^3 + 2*A*b^
5*c^2*d^7*e^3 + B*b^7*d^6*e^4 + 2*A*b^6*c*d^6*e^4 - A*b^7*d^5*e^5)/(b^4*c^
4*d^11 - 4*b^5*c^3*d^10*e + 6*b^6*c^2*d^9*e^2 - 4*b^7*c*d^8*e^3 + b^8*d^7*
e^4))*x + (A*b^3*c^4*d^10 - 4*A*b^4*c^3*d^9*e + 6*A*b^5*c^2*d^8*e^2 - 4*A*
b^6*c*d^7*e^3 + A*b^7*d^6*e^4)/(b^4*c^4*d^11 - 4*b^5*c^3*d^10*e + 6*b^6*c^
2*d^9*e^2 - 4*b^7*c*d^8*e^3 + b^8*d^7*e^4))/(c*x^2 + b*x)^(3/2)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{5/2}}\,dx=\int \frac{A+B\,x}{\left(c\,x^2+b\,x\right)^{5/2}\,\left(d+e\,x\right)}\,dx$$

input
```
int((A + B*x)/((b*x + c*x^2)^(5/2)*(d + e*x)),x)
```

output
```
int((A + B*x)/((b*x + c*x^2)^(5/2)*(d + e*x)), x)
```

Reduce [B] (verification not implemented)

Time = 0.51 (sec) , antiderivative size = 1558, normalized size of antiderivative = 5.34

$$\int \frac{A+Bx}{(d+ex)\left(bx+cx^2\right)^{5/2}}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)/(e*x+d)/(c*x^2+b*x)^(5/2),x)
```

output
```
(2*( - 3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) - sqr
t(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**5*e*
*4*x**2 - 3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*d) -
sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*a*b**4
*c*e**4*x**3 + 3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e - c*
d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c)))*b
**6*d*e**3*x**2 + 3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(b*e -
 c*d) - sqrt(e)*sqrt(b + c*x) - sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqrt(c))
)*b**5*c*d*e**3*x**3 - 3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sqrt(
b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*sqr
t(c)))*a*b**5*e**4*x**2 - 3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*atan((sq
rt(b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqrt(d)*
sqrt(c)))*a*b**4*c*e**4*x**3 + 3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*ata
n((sqrt(b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(sqr
t(d)*sqrt(c)))*b**6*d*e**3*x**2 + 3*sqrt(d)*sqrt(b + c*x)*sqrt(b*e - c*d)*
atan((sqrt(b*e - c*d) + sqrt(e)*sqrt(b + c*x) + sqrt(x)*sqrt(e)*sqrt(c))/(
sqrt(d)*sqrt(c)))*b**5*c*d*e**3*x**3 - sqrt(c)*sqrt(b + c*x)*a*b**5*d*e**4
*x**2 - 5*sqrt(c)*sqrt(b + c*x)*a*b**4*c*d**2*e**3*x**2 - sqrt(c)*sqrt(b +
 c*x)*a*b**4*c*d*e**4*x**3 + 30*sqrt(c)*sqrt(b + c*x)*a*b**3*c**2*d**3*e**
2*x**2 - 5*sqrt(c)*sqrt(b + c*x)*a*b**3*c**2*d**2*e**3*x**3 - 40*sqrt(c...
```

3.137 $\int \frac{A+Bx}{(d+ex)^2\left(bx+cx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 26, antiderivative size = 451

$$\int \frac{A+Bx}{(d+ex)^2\left(bx+cx^2\right)^{5/2}}\,dx =$$

$$-\frac{3bBd+2Acd-5Abe}{3bd^2(cd-be)\left(bx+cx^2\right)^{3/2}}-\frac{\left(\frac{2Bc}{b}-\frac{4Ac^2}{b^2}-\frac{e(3Bd-5Ae)}{d^2}\right)x}{d(cd-be)\left(bx+cx^2\right)^{3/2}}$$

$$+\frac{c\left(16Ac^3d^3-3b^3e^2(3Bd-5Ae)+2b^2cde(6Bd-5Ae)-8bc^2d^2(Bd+2Ae)\right)x^2}{3b^3d^3(cd-be)^2\left(bx+cx^2\right)^{3/2}}$$

$$+\frac{Bd-Ae}{d(cd-be)(d+ex)\left(bx+cx^2\right)^{3/2}}$$

$$+\frac{c(32Ac^4d^4-2b^3cde^2(9Bd-10Ae)+3b^4e^3(3Bd-5Ae)+4b^2c^2d^2e(10Bd+3Ae)-16bc^3d^3(Bd+4Ae)}{3b^4d^3(cd-be)^3\sqrt{bx+cx^2}}$$

$$-\frac{e^3(Bd(8cd-3be)-5Ae(2cd-be))\operatorname{arctanh}\left(\frac{\sqrt{cd-be}\,x}{\sqrt{d}\sqrt{bx+cx^2}}\right)}{d^{7/2}(cd-be)^{7/2}}$$

output
```
-1/3*(-5*A*b*e+2*A*c*d+3*B*b*d)/b/d^2/(-b*e+c*d)/(c*x^2+b*x)^(3/2)-(2*B*c/
b-4*A*c^2/b^2-e*(-5*A*e+3*B*d)/d^2)*x/d/(-b*e+c*d)/(c*x^2+b*x)^(3/2)+1/3*c
*(16*A*c^3*d^3-3*b^3*e^2*(-5*A*e+3*B*d)+2*b^2*c*d*e*(-5*A*e+6*B*d)-8*b*c^2
*d^2*(2*A*e+B*d))*x^2/b^3/d^3/(-b*e+c*d)^2/(c*x^2+b*x)^(3/2)+(-A*e+B*d)/d/
(-b*e+c*d)/(e*x+d)/(c*x^2+b*x)^(3/2)+1/3*c*(32*A*c^4*d^4-2*b^3*c*d*e^2*(-1
0*A*e+9*B*d)+3*b^4*e^3*(-5*A*e+3*B*d)+4*b^2*c^2*d^2*e*(3*A*e+10*B*d)-16*b*
c^3*d^3*(4*A*e+B*d))*x/b^4/d^3/(-b*e+c*d)^3/(c*x^2+b*x)^(1/2)-e^3*(B*d*(-3
*b*e+8*c*d)-5*A*e*(-b*e+2*c*d))*arctanh((-b*e+c*d)^(1/2)*x/d^(1/2)/(c*x^2+
b*x)^(1/2))/d^(7/2)/(-b*e+c*d)^(7/2)
```

Mathematica [A] (verified)

Time = 3.75 (sec) , antiderivative size = 568, normalized size of antiderivative = 1.26

$$\int \frac{A+Bx}{(d+ex)^2\,(bx+cx^2)^{5/2}}\,dx = \frac{x\left(\frac{\sqrt{d}(b+cx)\left(bBdx\left(16c^5d^3x^2(d+ex)-3b^5e^3(2d+3ex)+8bc^4d^2x\left(3d^2-2dex-5e^2x^2\right)+6b^4ce^2\left(3d^2+d\right.\right.\right.}{}\right.}{}$$

input
```
Integrate[(A + B*x)/((d + e*x)^2*(b*x + c*x^2)^(5/2)),x]
```

output
```
(x*((Sqrt[d]*(b + c*x)*(b*B*d*x*(16*c^5*d^3*x^2*(d + e*x) - 3*b^5*e^3*(2*d
 + 3*e*x) + 8*b*c^4*d^2*x*(3*d^2 - 2*d*e*x - 5*e^2*x^2) + 6*b^4*c*e^2*(3*d
^2 + d*e*x - 3*e^2*x^2) - 3*b^3*c^2*e*(6*d^3 - 6*d^2*e*x - 10*d*e^2*x^2 +
3*e^3*x^3) + 6*b^2*c^3*d*(d^3 - 9*d^2*e*x - 7*d*e^2*x^2 + 3*e^3*x^3)) + A*
(-32*c^6*d^4*x^3*(d + e*x) + 16*b*c^5*d^3*x^2*(-3*d^2 + d*e*x + 4*e^2*x^2)
 + b^6*e^3*(-2*d^2 + 10*d*e*x + 15*e^2*x^2) - 12*b^2*c^4*d^2*x*(d^3 - 7*d^
2*e*x - 7*d*e^2*x^2 + e^3*x^3) + 6*b^5*c*e^2*(d^3 - 3*d^2*e*x + 5*e^3*x^3)
 + 2*b^3*c^3*d*(d^4 + 13*d^3*e*x + 3*d^2*e^2*x^2 - 19*d*e^3*x^3 - 10*e^4*x
^4) - 3*b^4*c^2*e*(2*d^4 + 2*d^3*e*x + 14*d^2*e^2*x^2 + 10*d*e^3*x^3 - 5*e
^4*x^4))))/(b^4*(-(c*d) + b*e)^3*(d + e*x)) - (3*e^3*(B*d*(8*c*d - 3*b*e)
+ 5*A*e*(-2*c*d + b*e))*x^(3/2)*(b + c*x)^(5/2)*ArcTan[(-(e*Sqrt[x]*Sqrt[b
 + c*x]) + Sqrt[c]*(d + e*x))/(Sqrt[d]*Sqrt[-(c*d) + b*e])])/(-(c*d) + b*e
)^(7/2)))/(3*d^(7/2)*(x*(b + c*x))^(5/2))
```

Rubi [A] (verified)

Time = 1.60 (sec) , antiderivative size = 484, normalized size of antiderivative = 1.07, number of steps used = 8, number of rules used = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {1235, 27, 1235, 27, 1228, 1154, 219}

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

$$\int \frac{A+Bx}{(bx+cx^2)^{5/2}(d+ex)^2}dx$$

$$\Big\downarrow \text{1235}$$

$$-\frac{2\int \frac{e(3Bd-5Ae)b^2-2cd(2Bd+Ae)b+8Ac^2d^2-6ce(bBd-2Acd+Abe)x}{2(d+ex)^2(cx^2+bx)^{3/2}}dx}{3b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d(bx+cx^2)^{3/2}(d+ex)(cd-be)}$$

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

$$-\frac{\int \frac{e(3Bd-5Ae)b^2-2cd(2Bd+Ae)b+8Ac^2d^2-6ce(bBd-2Acd+Abe)x}{(d+ex)^2(cx^2+bx)^{3/2}}dx}{3b^2d(cd-be)}-\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d(bx+cx^2)^{3/2}(d+ex)(cd-be)}$$

$$\Big\downarrow \text{1235}$$

$$-\frac{-\frac{2\int \frac{e\left(b\left(-3e^2(3Bd-5Ae)b^3+2cde(6Bd-5Ae)b^2-8c^2d^2(Bd+2Ae)b+16Ac^3d^3\right)+2c\left(-e^2(3Bd-5Ae)b^3+2cde(8Bd-Ae)b^2-8c^2d^2(Bd+3Ae)b+16Ac^3d^3\right)x\right)}{2(d+ex)^2\sqrt{cx^2+bx}}}{b^2d(cd-be)}}{3b^2d(cd}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d(bx+cx^2)^{3/2}(d+ex)(cd-be)}$$

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

$$-\frac{-\frac{e\int \frac{b\left(-3e^2(3Bd-5Ae)b^3+2cde(6Bd-5Ae)b^2-8c^2d^2(Bd+2Ae)b+16Ac^3d^3\right)+2c\left(-e^2(3Bd-5Ae)b^3+2cde(8Bd-Ae)b^2-8c^2d^2(Bd+3Ae)b+16Ac^3d^3\right)x}{(d+ex)^2\sqrt{cx^2+bx}}dx}{b^2d(cd-be)}}{3b^2d(cd-}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d(bx+cx^2)^{3/2}(d+ex)(cd-be)}$$

$$\Big\downarrow \text{1228}$$

$$-\frac{-\frac{e\left(\frac{\sqrt{bx+cx^2}\left(3b^4e^3(3Bd-5Ae)-2b^3cde^2(9Bd-10Ae)+4b^2c^2d^2e(3Ae+10Bd)-16bc^3d^3(4Ae+Bd)+32Ac^4d^4\right)}{d(d+ex)(cd-be)}-\frac{3b^4e^2(Bd(8cd-3be)-5Ae(2cd-be))\int \frac{}{(d+}}{2d(cd-be)}\right.}{b^2d(cd-be)}}{3b}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d\left(bx+cx^2\right)^{3/2}(d+ex)(cd-be)}$$

$$\Big\downarrow \ 1154$$

$$-\frac{-\frac{e\left(\frac{3b^4e^2(Bd(8cd-3be)-5Ae(2cd-be))\int \frac{1}{4d(cd-be)-\frac{(bd+(2cd-be)x)^2}{cx^2+bx}}d\left(-\frac{bd+(2cd-be)x}{\sqrt{cx^2+bx}}\right)}{d(cd-be)}+\frac{\sqrt{bx+cx^2}\left(3b^4e^3(3Bd-5Ae)-2b^3cde^2(9Bd-10Ae)+4b^2c^2\right.}{d(d+ex)(cd-}\right.}{b^2d(cd-be)}}{}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d\left(bx+cx^2\right)^{3/2}(d+ex)(cd-be)}$$

$$\Big\downarrow \ 219$$

$$-\frac{-\frac{e\left(\frac{\sqrt{bx+cx^2}\left(3b^4e^3(3Bd-5Ae)-2b^3cde^2(9Bd-10Ae)+4b^2c^2d^2e(3Ae+10Bd)-16bc^3d^3(4Ae+Bd)+32Ac^4d^4\right)}{d(d+ex)(cd-be)}-\frac{3b^4e^2(Bd(8cd-3be)-5Ae(2cd-be))\text{arct}}{2d^{3/2}(cd-be)}\right.}{b^2d(cd-be)}}{}$$

$$\frac{2(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{3b^2d\left(bx+cx^2\right)^{3/2}(d+ex)(cd-be)}$$

input
```
Int[(A + B*x)/((d + e*x)^2*(b*x + c*x^2)^(5/2)),x]
```

output
```
(-2*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x))/(3*b^2*d*(c*d - b*e
)*(d + e*x)*(b*x + c*x^2)^(3/2)) - ((-2*(b*(c*d - b*e)*(8*A*c^2*d^2 + b^2*
e*(3*B*d - 5*A*e) - 2*b*c*d*(2*B*d + A*e)) + c*(16*A*c^3*d^3 - b^3*e^2*(3*
B*d - 5*A*e) + 2*b^2*c*d*e*(8*B*d - A*e) - 8*b*c^2*d^2*(B*d + 3*A*e))*x))/
(b^2*d*(c*d - b*e)*(d + e*x)*Sqrt[b*x + c*x^2]) - (e*(((32*A*c^4*d^4 - 2*b
^3*c*d*e^2*(9*B*d - 10*A*e) + 3*b^4*e^3*(3*B*d - 5*A*e) + 4*b^2*c^2*d^2*e*
(10*B*d + 3*A*e) - 16*b*c^3*d^3*(B*d + 4*A*e))*Sqrt[b*x + c*x^2])/(d*(c*d
- b*e)*(d + e*x)) - (3*b^4*e^2*(B*d*(8*c*d - 3*b*e) - 5*A*e*(2*c*d - b*e))
*ArcTanh[(b*d + (2*c*d - b*e)*x)/(2*Sqrt[d]*Sqrt[c*d - b*e]*Sqrt[b*x + c*x
^2])])/(2*d^(3/2)*(c*d - b*e)^(3/2))))/(b^2*d*(c*d - b*e)))/(3*b^2*d*(c*d
- b*e))
```

Defintions of rubi rules used

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

rule 219
```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1/(Rt[a, 2]*Rt[-b, 2]))*
ArcTanh[Rt[-b, 2]*(x/Rt[a, 2])], x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

rule 1154
```
Int[1/(((d_.) + (e_.)*(x_))*Sqrt[(a_.) + (b_.)*(x_) + (c_.)*(x_)^2]), x_Sym
bol] :> Simp[-2   Subst[Int[1/(4*c*d^2 - 4*b*d*e + 4*a*e^2 - x^2), x], x, (
2*a*e - b*d - (2*c*d - b*e)*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a, b, c
, d, e}, x]
```

rule 1228
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(e*f - d*g))*(d + e*x)^(m + 1)*((a +
 b*x + c*x^2)^(p + 1)/(2*(p + 1)*(c*d^2 - b*d*e + a*e^2))), x] - Simp[(b*(e
*f + d*g) - 2*(c*d*f + a*e*g))/(2*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^
(m + 1)*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x
] && EqQ[Simplify[m + 2*p + 3], 0]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

Maple [A] (verified)

Time = 1.44 (sec) , antiderivative size = 454, normalized size of antiderivative = 1.01

method	result
pseudoelliptic	$-\frac{5\left(\left(\frac{8Bc\,d^2}{5}-2\left(Ac+\frac{3Bb}{10}\right)ed+Ab\,e^2\right)e^3(ex+d)x(cx+b)b^4\arctan\left(\frac{\sqrt{x(cx+b)}\,d}{x\sqrt{d(be-cd)}}\right)\sqrt{x(cx+b)}+\frac{2\sqrt{d(be-cd)}\left(-c^3\left((3Bx+A)\right.\right.}{}\right.}{}$
risch	$-\frac{2(cx+b)(-6Abex-8cxAd+3Bbdx+Abd)}{3b^4d^3\sqrt{x(cx+b)}\,x}+\frac{\frac{2d^3c^2\left(4Aceb-2A\,c^2d-3b^2Be+Bbcd\right)\sqrt{c\left(\frac{b}{c}+x\right)^2-\left(\frac{b}{c}+x\right)b}}{(be-cd)^3b\left(\frac{b}{c}+x\right)}-\frac{e^2b^3\left(2Ab\,e^2-4Ac\right.}{}}{}$
default	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
-5/(x*(c*x+b))^(1/2)*((8/5*B*c*d^2-2*(A*c+3/10*B*b)*e*d+A*b*e^2)*e^3*(e*x+
d)*x*(c*x+b)*b^4*arctan((x*(c*x+b))^(1/2)/x*d/(d*(b*e-c*d))^(1/2))*(x*(c*x
+b))^(1/2)+2/15*(d*(b*e-c*d))^(1/2)*(-c^3*((3*B*x+A)*b^3-6*c*x*(-2*B*x+A)*
b^2-24*c^2*x^2*(-1/3*B*x+A)*b-16*A*c^3*x^3)*d^5+3*((3*B*x+A)*b^4-13/3*c*x*
(-27/13*B*x+A)*b^3-14*c^2*(-4/21*B*x+A)*x^2*b^2-8/3*c^3*x^3*(B*x+A)*b+16/3
*A*c^4*x^4)*c^2*e*d^4-3*c*e^2*b*((3*B*x+A)*b^4-c*x*(-3*B*x+A)*b^3+c^2*x^2*
(-7*B*x+A)*b^2+14*c^3*(-10/21*B*x+A)*x^3*b+32/3*A*c^4*x^4)*d^3+e^3*(c*x+b)
^2*((3*B*x+A)*b^2+7*c*x*(-9/7*B*x+A)*b+6*A*c^2*x^2)*b^2*d^2-5*e^4*x*(c*x+b
)^2*b^3*((-9/10*B*x+A)*b-2*A*c*x)*d-15/2*A*b^4*e^5*x^2*(c*x+b)^2))/(d*(b*e
-c*d))^(1/2)/x/d^3/(e*x+d)/(b*e-c*d)^3/(c*x+b)/b^4
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1282 vs. $2(425) = 850$.

Time = 0.26 (sec) , antiderivative size = 2579, normalized size of antiderivative = 5.72

$$\int \frac{A+Bx}{(d+ex)^2 (bx+cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
[-1/6*(3*((8*B*b^4*c^3*d^2*e^4 + 5*A*b^5*c^2*e^6 - (3*B*b^5*c^2 + 10*A*b^4
*c^3)*d*e^5)*x^5 + (8*B*b^4*c^3*d^3*e^3 + 10*A*b^6*c*e^6 + (13*B*b^5*c^2 -
 10*A*b^4*c^3)*d^2*e^4 - 3*(2*B*b^6*c + 5*A*b^5*c^2)*d*e^5)*x^4 + (16*B*b^
5*c^2*d^3*e^3 - 3*B*b^7*d*e^5 + 5*A*b^7*e^6 + 2*(B*b^6*c - 10*A*b^5*c^2)*d
^2*e^4)*x^3 + (8*B*b^6*c*d^3*e^3 + 5*A*b^7*d*e^5 - (3*B*b^7 + 10*A*b^6*c)*
d^2*e^4)*x^2)*sqrt(c*d^2 - b*d*e)*log((b*d + (2*c*d - b*e)*x + 2*sqrt(c*d^
2 - b*d*e)*sqrt(c*x^2 + b*x))/(e*x + d)) + 2*(2*A*b^3*c^4*d^7 - 8*A*b^4*c^
3*d^6*e + 12*A*b^5*c^2*d^5*e^2 - 8*A*b^6*c*d^4*e^3 + 2*A*b^7*d^3*e^4 - (15
*A*b^5*c^2*d*e^6 - 16*(B*b*c^6 - 2*A*c^7)*d^6*e + 8*(7*B*b^2*c^5 - 12*A*b*
c^6)*d^5*e^2 - 2*(29*B*b^3*c^4 - 38*A*b^2*c^5)*d^4*e^3 + (27*B*b^4*c^3 + 8
*A*b^3*c^4)*d^3*e^4 - (9*B*b^5*c^2 + 35*A*b^4*c^3)*d^2*e^5)*x^4 - 2*(15*A*
b^6*c*d*e^6 - 8*(B*b*c^6 - 2*A*c^7)*d^7 + 8*(2*B*b^2*c^5 - 3*A*b*c^6)*d^6*
e + (13*B*b^3*c^4 - 34*A*b^2*c^5)*d^5*e^2 - (36*B*b^4*c^3 - 61*A*b^3*c^4)*
d^4*e^3 + 4*(6*B*b^5*c^2 - A*b^4*c^3)*d^3*e^4 - 3*(3*B*b^6*c + 10*A*b^5*c^
2)*d^2*e^5)*x^3 - 3*(5*A*b^7*d*e^6 - 8*(B*b^2*c^5 - 2*A*b*c^6)*d^7 + 2*(13
*B*b^3*c^4 - 22*A*b^2*c^5)*d^6*e - 2*(12*B*b^4*c^3 - 13*A*b^3*c^4)*d^5*e^2
 + 4*(B*b^5*c^2 + 4*A*b^4*c^3)*d^4*e^3 + (5*B*b^6*c - 14*A*b^5*c^2)*d^3*e^
4 - (3*B*b^7 + 5*A*b^6*c)*d^2*e^5)*x^2 - 2*(5*A*b^7*d^2*e^5 - 3*(B*b^3*c^4
 - 2*A*b^2*c^5)*d^7 + (12*B*b^4*c^3 - 19*A*b^3*c^4)*d^6*e - 2*(9*B*b^5*c^2
 - 8*A*b^4*c^3)*d^5*e^2 + 6*(2*B*b^6*c + A*b^5*c^2)*d^4*e^3 - (3*B*b^7 ...
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)^{5/2}}\,dx = \int \frac{A+Bx}{(x(b+cx))^{\frac{5}{2}}(d+ex)^2}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**2/(c*x**2+b*x)**(5/2),x)
```

output
```
Integral((A + B*x)/((x*(b + c*x))**(5/2)*(d + e*x)**2), x)
```

Maxima [F(-2)]

Exception generated.

$$\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)^{5/2}}\,dx = \text{Exception raised: ValueError}$$

input
```
integrate((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

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

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2640 vs. $2(425) = 850$.

Time = 0.48 (sec) , antiderivative size = 2640, normalized size of antiderivative = 5.85

$$\int \frac{A+Bx}{(d+ex)^2(bx+cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
-1/6*((24*B*b^4*c^(3/2)*d^2*e^6*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*d^2 - b
*d*e)*sqrt(c)*abs(e))) - 9*B*b^5*sqrt(c)*d*e^7*log(abs(2*c*d*e - b*e^2 - 2
*sqrt(c*d^2 - b*d*e)*sqrt(c)*abs(e))) - 30*A*b^4*c^(3/2)*d*e^7*log(abs(2*c
*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d*e)*sqrt(c)*abs(e))) + 15*A*b^5*sqrt(c)*e
^8*log(abs(2*c*d*e - b*e^2 - 2*sqrt(c*d^2 - b*d*e)*sqrt(c)*abs(e))) - 32*s
qrt(c*d^2 - b*d*e)*B*b*c^4*d^4*e^2*abs(e) + 64*sqrt(c*d^2 - b*d*e)*A*c^5*d
^4*e^2*abs(e) + 80*sqrt(c*d^2 - b*d*e)*B*b^2*c^3*d^3*e^3*abs(e) - 128*sqrt
(c*d^2 - b*d*e)*A*b*c^4*d^3*e^3*abs(e) - 36*sqrt(c*d^2 - b*d*e)*B*b^3*c^2*
d^2*e^4*abs(e) + 24*sqrt(c*d^2 - b*d*e)*A*b^2*c^3*d^2*e^4*abs(e) + 18*sqrt
(c*d^2 - b*d*e)*B*b^4*c*d*e^5*abs(e) + 40*sqrt(c*d^2 - b*d*e)*A*b^3*c^2*d*
e^5*abs(e) - 30*sqrt(c*d^2 - b*d*e)*A*b^4*c*e^6*abs(e))*sgn(1/(e*x + d))*s
gn(e)/(sqrt(c*d^2 - b*d*e)*b^4*c^(7/2)*d^6*abs(e) - 3*sqrt(c*d^2 - b*d*e)*
b^5*c^(5/2)*d^5*e*abs(e) + 3*sqrt(c*d^2 - b*d*e)*b^6*c^(3/2)*d^4*e^2*abs(e
) - sqrt(c*d^2 - b*d*e)*b^7*sqrt(c)*d^3*e^3*abs(e)) + 2*((16*B*b*c^5*d^4*e
^13*sgn(1/(e*x + d))*sgn(e) - 32*A*c^6*d^4*e^13*sgn(1/(e*x + d))*sgn(e) -
40*B*b^2*c^4*d^3*e^14*sgn(1/(e*x + d))*sgn(e) + 64*A*b*c^5*d^3*e^14*sgn(1/
(e*x + d))*sgn(e) + 18*B*b^3*c^3*d^2*e^15*sgn(1/(e*x + d))*sgn(e) - 12*A*b
^2*c^4*d^2*e^15*sgn(1/(e*x + d))*sgn(e) - 9*B*b^4*c^2*d*e^16*sgn(1/(e*x +
d))*sgn(e) - 20*A*b^3*c^3*d*e^16*sgn(1/(e*x + d))*sgn(e) + 15*A*b^4*c^2*e^
17*sgn(1/(e*x + d))*sgn(e))/(b^4*c^3*d^6*e^11*sgn(1/(e*x + d))^2*sgn(e)...
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^2 (bx+cx^2)^{5/2}}\,dx = \int \frac{A+B\,x}{\left(c\,x^2+b\,x\right)^{5/2}\,\left(d+e\,x\right)^2}\,dx$$

input
```
int((A + B*x)/((b*x + c*x^2)^(5/2)*(d + e*x)^2),x)
```

output
```
int((A + B*x)/((b*x + c*x^2)^(5/2)*(d + e*x)^2), x)
```

Reduce [F]

$$\int \frac{A+Bx}{(d+ex)^2 (bx+cx^2)^{5/2}}\,dx = \int \frac{Bx+A}{(ex+d)^2 \left(c\,x^2+bx\right)^{\frac{5}{2}}}dx$$

input
```
int((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(5/2),x)
```

output
```
int((B*x+A)/(e*x+d)^2/(c*x^2+b*x)^(5/2),x)
```

3.138 $\int (A+Bx)\sqrt{d+ex}\sqrt{bx-cx^2}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 462

$$\int (A+Bx)\sqrt{d+ex}\sqrt{bx-cx^2}\,dx = \frac{2(7Ace(cd-be)-2B(2c^2d^2+bcde+2b^2e^2))\sqrt{d+ex}\sqrt{bx-cx^2}}{105c^2e^2} + \frac{2(Bcd+4bBe+7Ace)x\sqrt{d+ex}\sqrt{bx-cx^2}}{35ce} - \frac{2B\sqrt{d+ex}(bx-cx^2)^{3/2}}{7c} + \frac{2\sqrt{b}(14Ace(c^2d^2+bcde+b^2e^2)-B(8c^3d^3+5bc^2d^2e-5b^2cde^2-8b^3e^3))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\Big(\arcs}{105c^{5/2}e^3\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} - \frac{2\sqrt{b}d(cd+be)(7Ace(2cd+be)-B(8c^2d^2+bcde-4b^2e^2))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\operatorname{EllipticF}\Big(\arcsin\Big(}{105c^{5/2}e^3\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
2/105*(7*A*c*e*(-b*e+c*d)-2*B*(2*b^2*e^2+b*c*d*e+2*c^2*d^2))*(e*x+d)^(1/2)
*(-c*x^2+b*x)^(1/2)/c^2/e^2+2/35*(7*A*c*e+4*B*b*e+B*c*d)*x*(e*x+d)^(1/2)*(
-c*x^2+b*x)^(1/2)/c/e-2/7*B*(e*x+d)^(1/2)*(-c*x^2+b*x)^(3/2)/c+2/105*b^(1/
2)*(14*A*c*e*(b^2*e^2+b*c*d*e+c^2*d^2)-B*(-8*b^3*e^3-5*b^2*c*d*e^2+5*b*c^2
*d^2*e+8*c^3*d^3))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)
*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(5/2)/e^3/(1+e*x/d)^(1/2)/(-c*x^2+b*x
)^(1/2)-2/105*b^(1/2)*d*(b*e+c*d)*(7*A*c*e*(b*e+2*c*d)-B*(-4*b^2*e^2+b*c*d
*e+8*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x
^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(5/2)/e^3/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1
/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 18.03 (sec) , antiderivative size = 473, normalized size of antiderivative = 1.02

$$\int (A+Bx)\sqrt{d+ex}\sqrt{bx-cx^2}\,dx =$$

$$-\frac{2\left(\sqrt{-\frac{b}{c}}(14Ace(c^2d^2+bcde+b^2e^2)+B(-8c^3d^3-5bc^2d^2e+5b^2cde^2+8b^3e^3))\,(b-cx)(d+ex)+\sqrt{\cdots}\right.}{}$$

input
```
Integrate[(A + B*x)*Sqrt[d + e*x]*Sqrt[b*x - c*x^2],x]
```

output
```
(-2*(Sqrt[-(b/c)]*(14*A*c*e*(c^2*d^2 + b*c*d*e + b^2*e^2) + B*(-8*c^3*d^3
- 5*b*c^2*d^2*e + 5*b^2*c*d*e^2 + 8*b^3*e^3))*(b - c*x)*(d + e*x) + Sqrt[-
(b/c)]*c*e*x*(b - c*x)*(d + e*x)*(-7*A*c*e*(-(b*e) + c*(d + 3*e*x)) + B*(4
*b^2*e^2 + b*c*e*(2*d + 3*e*x) + c^2*(4*d^2 - 3*d*e*x - 15*e^2*x^2))) + I*
b*e*(14*A*c*e*(c^2*d^2 + b*c*d*e + b^2*e^2) + B*(-8*c^3*d^3 - 5*b*c^2*d^2*
e + 5*b^2*c*d*e^2 + 8*b^3*e^3))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2
)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*e*(c*d
+ b*e)*(7*A*c*e*(c*d + 2*b*e) + B*(-4*c^2*d^2 + b*c*d*e + 8*b^2*e^2))*Sqrt
[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/S
qrt[x]], -((c*d)/(b*e))]))/(105*Sqrt[-(b/c)]*c^3*e^3*Sqrt[x*(b - c*x)]*Sqr
t[d + e*x])
```

Rubi [A] (verified)

Time = 1.29 (sec) , antiderivative size = 445, normalized size of antiderivative = 0.96, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {1236, 27, 1231, 27, 1269, 1169, 122, 120, 127, 126}

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

$$\int (A+Bx)\sqrt{bx-cx^2}\sqrt{d+ex}\,dx$$

$$\Big\downarrow \ \color{blue}{1236}$$

$$-\frac{2\int -\frac{((3bB+7Ac)d+(Bcd+4bBe+7Ace)x)\sqrt{bx-cx^2}}{2\sqrt{d+ex}}dx}{7c}-\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

$$\Big\downarrow \ \color{blue}{27}$$

$$\frac{\int \frac{((3bB+7Ac)d+(Bcd+4bBe+7Ace)x)\sqrt{bx-cx^2}}{\sqrt{d+ex}}dx}{7c}-\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

$$\Big\downarrow \ \color{blue}{1231}$$

$$\frac{\frac{2\int -\frac{bd\left(7Ace(cd-be)-2B\left(2c^2d^2+bced+2b^2e^2\right)\right)-\left(5c(3bB+7Ac)de(2cd+be)-(Bcd+4bBe+7Ace)\left(8c^2d^2+3bced-2b^2e^2\right)\right)x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{15ce^2}+\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(3cex \cdots}{\cdots}}{7c}$$

$$\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

$$\Big\downarrow \ \color{blue}{27}$$

$$\frac{\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}\left(3cex(7Ace+4bBe+Bcd)+7Ace(cd-be)-2B\left(2b^2e^2+bcde+2c^2d^2\right)\right)}{15ce^2}-\frac{\int \frac{bd\left(7Ace(cd-be)-2B\left(2c^2d^2+bced+2b^2e^2\right)\right)-\left(5c(3bB+7 \cdots\right.}{\sqrt{d+e \cdots}}}{\cdots}}{7c}$$

$$\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

$$\Big\downarrow \ \color{blue}{1269}$$

$$\frac{\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}\left(3cex(7Ace+4bBe+Bcd)+7Ace(cd-be)-2B\left(2b^2e^2+bcde+2c^2d^2\right)\right)}{15ce^2}-\frac{\frac{d(be+cd)\left(7Ace(be+2cd)-B\left(-4b^2e^2+bcde+8c^2d^2\right)\right)\int\frac{}{\sqrt{d\cdots}}}{e}\cdots}{\cdots}}{7c}$$

$$\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

$\downarrow$ 1169

$$\frac{\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}\left(3cex(7Ace+4bBe+Bcd)+7Ace(cd-be)-2B\left(2b^2e^2+bcde+2c^2d^2\right)\right)}{15ce^2}-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(7Ace(be+2cd)-B\left(-4b^2e^2+bcde+8c^2d\cdots\right.\right.}{e\sqrt{bx-cx^2}}\cdots}{\cdots}}{7c}$$

$$\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

$\downarrow$ 122

$$\frac{\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}\left(3cex(7Ace+4bBe+Bcd)+7Ace(cd-be)-2B\left(2b^2e^2+bcde+2c^2d^2\right)\right)}{15ce^2}-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(7Ace(be+2cd)-B\left(-4b^2e^2+bcde+8c^2d\cdots\right.\right.}{e\sqrt{bx-cx^2}}\cdots}{\cdots}}{7c}$$

$$\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

$\downarrow$ 120

$$\frac{\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}\left(3cex(7Ace+4bBe+Bcd)+7Ace(cd-be)-2B\left(2b^2e^2+bcde+2c^2d^2\right)\right)}{15ce^2}-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(7Ace(be+2cd)-B\left(-4b^2e^2+bcde+8c^2d\cdots\right.\right.}{e\sqrt{bx-cx^2}}\cdots}{\cdots}}{7c}$$

$$\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

$\downarrow$ 127

$$\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}\left(3cex(7Ace+4bBe+Bcd)+7Ace(cd-be)-2B\left(2b^2e^2+bcde+2c^2d^2\right)\right)}{15ce^2}-\frac{\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(7Ace(be+2cd)-B\left(-4b^2e^2+b\cdots\right.\right.}{e\sqrt{bx-cx^2}\sqrt{d+ex}}\cdots}{\cdots}$$

$$\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

$\downarrow$ 126

$$\frac{\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}\left(3cex(7Ace+4bBe+Bcd)+7Ace(cd-be)-2B\left(2b^2e^2+bcde+2c^2d^2\right)\right)}{15ce^2}-\frac{\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(7Ace(be+2cd)-B\left(-4b^2e^2 \cdots\right.\right.}{\sqrt{c}e\sqrt{bx-cx^2}\cdots}}{\cdots}}{\cdots}$$

$$\frac{2B\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}}{7c}$$

input

```
Int[(A + B*x)*Sqrt[d + e*x]*Sqrt[b*x - c*x^2],x]
```

output

```
(-2*B*Sqrt[d + e*x]*(b*x - c*x^2)^(3/2))/(7*c) + ((2*Sqrt[d + e*x]*(7*A*c*
e*(c*d - b*e) - 2*B*(2*c^2*d^2 + b*c*d*e + 2*b^2*e^2) + 3*c*e*(B*c*d + 4*b
*B*e + 7*A*c*e)*x)*Sqrt[b*x - c*x^2])/(15*c*e^2) - ((-2*Sqrt[b]*(5*c*(3*b*
B + 7*A*c)*d*e*(2*c*d + b*e) - (B*c*d + 4*b*B*e + 7*A*c*e)*(8*c^2*d^2 + 3*
b*c*d*e - 2*b^2*e^2))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[Ar
cSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x
)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(7*A*c*e*(2*c*d + b*e)
- B*(8*c^2*d^2 + b*c*d*e - 4*b^2*e^2))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 +
(e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sq
rt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2]))/(15*c*e^2))/(7*c)
```

Defintions of rubi rules used

rule 27

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

rule 120

```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122

```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] && !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.25 (sec) , antiderivative size = 716, normalized size of antiderivative = 1.55

method	result
elliptic	$\sqrt{x(-cx+b)}\,\sqrt{(-cx+b)x(ex+d)}\left(\frac{2B\,x^2\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{7}-\frac{2\left(-Ace+Bbe-Bcd-\frac{2(3be-3cd)B}{7}\right)x\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{5ce}-\right.$
default	Expression too large to display

input
```
int((B*x+A)*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/x/(-c*x+b)*(
2/7*B*x^2*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/5*(-A*c*e+B*b*e-B*c*d-2
/7*(3*b*e-3*c*d)*B)/c/e*x*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/3*(A*b*
e-A*c*d+2/7*B*b*d+2/5*(-A*c*e+B*b*e-B*c*d-2/7*(3*b*e-3*c*d)*B)/c/e*(2*b*e-
2*c*d))/c/e*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2/3*(A*b*e-A*c*d+2/7*B*
b*d+2/5*(-A*c*e+B*b*e-B*c*d-2/7*(3*b*e-3*c*d)*B)/c/e*(2*b*e-2*c*d))/c/e^2*
b*d^2*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*
x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e
-b/c))^(1/2))+2*(A*b*d+3/5*(-A*c*e+B*b*e-B*c*d-2/7*(3*b*e-3*c*d)*B)/c/e*b*
d+2/3*(A*b*e-A*c*d+2/7*B*b*d+2/5*(-A*c*e+B*b*e-B*c*d-2/7*(3*b*e-3*c*d)*B)/
c/e*(2*b*e-2*c*d))/c/e*(b*e-c*d))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b
/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/
c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((
x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 580, normalized size of antiderivative = 1.26

$$\int (A+Bx)\sqrt{d+ex}\sqrt{bx-cx^2}\,dx =$$

$$-\frac{2\left((8\,Bc^4d^4+(9\,Bbc^3-14\,Ac^4)d^3e-(4\,Bb^2c^2+21\,Abc^3)d^2e^2+3\,(3\,Bb^3c+7\,Ab^2c^2)de^3+2\,(4\,Bb^4+\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
-2/315*((8*B*c^4*d^4 + (9*B*b*c^3 - 14*A*c^4)*d^3*e - (4*B*b^2*c^2 + 21*A*
b*c^3)*d^2*e^2 + 3*(3*B*b^3*c + 7*A*b^2*c^2)*d*e^3 + 2*(4*B*b^4 + 7*A*b^3*
c)*e^4)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(
c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c
^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*(8*B*c^4*d^3*e + (5*B*b*c^3
- 14*A*c^4)*d^2*e^2 - (5*B*b^2*c^2 + 14*A*b*c^3)*d*e^3 - 2*(4*B*b^3*c + 7*
A*b^2*c^2)*e^4)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^
2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3
)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^
2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3
), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) - 3*(15*B*c^4*e^4*x^2 - 4*B*c^4*d^2*e
^2 - (2*B*b*c^3 - 7*A*c^4)*d*e^3 - (4*B*b^2*c^2 + 7*A*b*c^3)*e^4 + 3*(B*c^
4*d*e^3 - (B*b*c^3 - 7*A*c^4)*e^4)*x)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/(c
^4*e^4)
```

Sympy [F]

$$\int (A+Bx)\sqrt{d+ex}\sqrt{bx-cx^2}\,dx = \int \sqrt{-x\,(-b+cx)}(A+Bx)\,\sqrt{d+ex}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**(1/2)*(-c*x**2+b*x)**(1/2),x)
```

output
```
Integral(sqrt(-x*(-b + c*x))*(A + B*x)*sqrt(d + e*x), x)
```

Maxima [F]

$$\int (A+Bx)\sqrt{d+ex}\sqrt{bx-cx^2}\,dx = \int \sqrt{-cx^2+bx}(Bx+A)\sqrt{ex+d}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)*sqrt(e*x + d), x)
```

Giac [F]

$$\int (A+Bx)\sqrt{d+ex}\sqrt{bx-cx^2}\,dx = \int \sqrt{-cx^2+bx}(Bx+A)\sqrt{ex+d}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)*sqrt(e*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int (A+Bx)\sqrt{d+ex}\sqrt{bx-cx^2}\,dx = \int \sqrt{b\,x-c\,x^2}\,(A+B\,x)\,\sqrt{d+e\,x}\,dx$$

input
```
int((b*x - c*x^2)^(1/2)*(A + B*x)*(d + e*x)^(1/2),x)
```

output
```
int((b*x - c*x^2)^(1/2)*(A + B*x)*(d + e*x)^(1/2), x)
```

Reduce [F]

$$\int (A+Bx)\sqrt{d+ex}\sqrt{bx-cx^2}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2),x)
```

output
```
(28*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c*d*e + 28*sqrt(x)*sqrt(d + e*
x)*sqrt(b - c*x)*a*b*c*e**2*x - 28*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*c
**2*d*e*x + 6*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**3*d*e - 4*sqrt(x)*sqr
t(d + e*x)*sqrt(b - c*x)*b**3*e**2*x - 6*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*
x)*b**2*c*d**2 + 8*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c*d*e*x + 20*s
qrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c*e**2*x**2 - 4*sqrt(x)*sqrt(d + e
*x)*sqrt(b - c*x)*b*c**2*d**2*x - 20*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b
*c**2*d*e*x**2 + 14*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e
 + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**
2*d*e*x**2),x)*a*b**3*c*e**4 - 14*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)
*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**
2*d**2*x + c**2*d*e*x**2),x)*a*c**4*d**3*e + 8*int((sqrt(x)*sqrt(d + e*x)*
sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e*
*2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b**5*e**4 - 3*int((sqrt(x)*sqrt(
d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x
 - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b**4*c*d*e**3 - 10*int(
(sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2
 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b**3*c**2
*d**2*e**2 - 3*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**
2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*...
```

3.139 $\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 341

$$\begin{aligned}\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}\,dx &= -\frac{2(4Bcd+bBe-5Ace)\sqrt{d+ex}\sqrt{bx-cx^2}}{15ce^2}+\frac{2Bx\sqrt{d+ex}\sqrt{bx-cx^2}}{5e}\\ &+\frac{2\sqrt{b}(5Ace(2cd+be)-B(8c^2d^2+3bcde-2b^2e^2))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{15c^{3/2}e^3\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}\\ &+\frac{2\sqrt{b}d(cd+be)(8Bcd-bBe-10Ace)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{15c^{3/2}e^3\sqrt{d+ex}\sqrt{bx-cx^2}}\end{aligned}$$

output

```
-2/15*(-5*A*c*e+B*b*e+4*B*c*d)*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/c/e^2+2/5*
B*x*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/e+2/15*b^(1/2)*(5*A*c*e*(b*e+2*c*d)-B
*(-2*b^2*e^2+3*b*c*d*e+8*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*E
llipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(3/2)/e^3/(1+e*x/d)^(
1/2)/(-c*x^2+b*x)^(1/2)+2/15*b^(1/2)*d*(b*e+c*d)*(-10*A*c*e-B*b*e+8*B*c*d)
*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2)
,(-b*e/c/d)^(1/2))/c^(3/2)/e^3/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 17.97 (sec) , antiderivative size = 355, normalized size of antiderivative = 1.04

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}\,dx =$$
$$-\frac{2\left(\sqrt{-\frac{b}{c}}(5Ace(2cd+be)+B(-8c^2d^2-3bcde+2b^2e^2))\,(b-cx)(d+ex)+\sqrt{-\frac{b}{c}}cex(b-cx)(d+ex)\right.}{}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x - c*x^2])/Sqrt[d + e*x],x]
```

output
```
(-2*(Sqrt[-(b/c)]*(5*A*c*e*(2*c*d + b*e) + B*(-8*c^2*d^2 - 3*b*c*d*e + 2*b
^2*e^2))*(b - c*x)*(d + e*x) + Sqrt[-(b/c)]*c*e*x*(b - c*x)*(d + e*x)*(-5*
A*c*e + B*(4*c*d + b*e - 3*c*e*x)) + I*b*e*(5*A*c*e*(2*c*d + b*e) + B*(-8*
c^2*d^2 - 3*b*c*d*e + 2*b^2*e^2))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3
/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] + I*b*e*(c*
d + b*e)*(4*B*c*d - 2*b*B*e - 5*A*c*e)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]
*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))]))/(15*
Sqrt[-(b/c)]*c^2*e^3*Sqrt[x*(b - c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.92 (sec) , antiderivative size = 322, normalized size of antiderivative = 0.94, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {1231, 27, 1269, 1169, 122, 120, 127, 126}

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

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}dx$$
$$\Big\downarrow \; 1231$$

$$\frac{2\int \frac{bd(4Bcd+bBe-5Ace)+\left(5Ace(2cd+be)-B\left(8c^2d^2+3bced-2b^2e^2\right)\right)x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{15ce^2}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(-5Ace+bBe+4Bcd-3Bcex)}{15ce^2}$$

$\Big\downarrow$ 27

$$\frac{\int \frac{bd(4Bcd+bBe-5Ace)+\left(5Ace(2cd+be)-B\left(8c^2d^2+3bced-2b^2e^2\right)\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{15ce^2}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(-5Ace+bBe+4Bcd-3Bcex)}{15ce^2}$$

$\Big\downarrow$ 1269

$$\frac{\frac{\left(5Ace(be+2cd)-B\left(-2b^2e^2+3bcde+8c^2d^2\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}+\frac{d(be+cd)(-10Ace-bBe+8Bcd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}}{15ce^2}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(-5Ace+bBe+4Bcd-3Bcex)}{15ce^2}$$

$\Big\downarrow$ 1169

$$\frac{\frac{\sqrt{x}\sqrt{b-cx}\left(5Ace(be+2cd)-B\left(-2b^2e^2+3bcde+8c^2d^2\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}+\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(-10Ace-bBe+8Bcd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}}{15ce^2}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(-5Ace+bBe+4Bcd-3Bcex)}{15ce^2}$$

$\Big\downarrow$ 122

$$\frac{\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(5Ace(be+2cd)-B\left(-2b^2e^2+3bcde+8c^2d^2\right)\right)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}+\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(-10Ace-bBe+8Bcd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}}{e\sqrt{bx-cx^2}}}{15ce^2}$$

$$\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(-5Ace+bBe+4Bcd-3Bcex)}{15ce^2}$$

$\Big\downarrow$ 120

$$\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(-10Ace-bBe+8Bcd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}+\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(5Ace(be+2cd)-B\left(-2b^2e^2+3bcde+8c^2d^2\right)\right)E\left(\arcsin\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{15ce^2}$$

$$\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(-5Ace+bBe+4Bcd-3Bcex)}{15ce^2}$$

$\Big\downarrow$ 127

$$\frac{\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(-10Ace-bBe+8Bcd)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}+\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(5Ace(be+2cd)-B(-2b^2e^2+3bcde+8c^2d^2}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{15ce^2}$$

$$\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(-5Ace+bBe+4Bcd-3Bcex)}{15ce^2}$$

$$\Big\downarrow \; 126$$

$$\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(5Ace(be+2cd)-B(-2b^2e^2+3bcde+8c^2d^2))E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}+\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(-10Ace-bBe}{\sqrt{c}e\sqrt{bx-cx^2}}}{15ce^2}$$

$$\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(-5Ace+bBe+4Bcd-3Bcex)}{15ce^2}$$

input
```
Int[((A + B*x)*Sqrt[b*x - c*x^2])/Sqrt[d + e*x],x]
```

output
```
(-2*Sqrt[d + e*x]*(4*B*c*d + b*B*e - 5*A*c*e - 3*B*c*e*x)*Sqrt[b*x - c*x^2
])/(15*c*e^2) + ((2*Sqrt[b]*(5*A*c*e*(2*c*d + b*e) - B*(8*c^2*d^2 + 3*b*c*
d*e - 2*b^2*e^2))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin
[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]
*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(8*B*c*d - b*B*e - 10*A*c*e
)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sq
rt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^
2]))/(15*c*e^2)
```

Defintions of rubi rules used

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

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.21 (sec) , antiderivative size = 516, normalized size of antiderivative = 1.51

method	result
elliptic	$\frac{\sqrt{x(-cx+b)}\,\sqrt{(-cx+b)x(ex+d)}\left(\frac{2Bx\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{5e}-\frac{2\left(-Ac+Bb-\frac{2B(2be-2cd)}{5e}\right)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{3ce}+\frac{2\left(-Ac+B\right.}{}\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/x/(-c*x+b)*(
2/5*B/e*x*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/3*(-A*c+B*b-2/5*B/e*(2*
b*e-2*c*d))/c/e*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2/3*(-A*c+B*b-2/5*B
/e*(2*b*e-2*c*d))/c/e^2*b*d^2*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/
2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e
)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(A*b-3/5*B/e*b*d+2/3*(-A*c+B*b-2/5
*B/e*(2*b*e-2*c*d))/c/e*(b*e-c*d))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-
b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b
/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF((
(x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 465, normalized size of antiderivative = 1.36

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}\,dx =$$
$$-\frac{2\left(\left(8\,Bc^3d^3+\left(7\,Bbc^2-10\,Ac^3\right)d^2e-2\left(Bb^2c+5\,Abc^2\right)de^2+\left(2\,Bb^3+5\,Ab^2c\right)e^3\right)\sqrt{-ce}\,\text{weierstrassPI}}{}$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(1/2),x, algorithm="fricas")
```

output
```
-2/45*((8*B*c^3*d^3 + (7*B*b*c^2 - 10*A*c^3)*d^2*e - 2*(B*b^2*c + 5*A*b*c^
2)*d*e^2 + (2*B*b^3 + 5*A*b^2*c)*e^3)*sqrt(-c*e)*weierstrassPInverse(4/3*(
c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e -
 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) +
3*(8*B*c^3*d^2*e + (3*B*b*c^2 - 10*A*c^3)*d*e^2 - (2*B*b^2*c + 5*A*b*c^2)*
e^3)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2
), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3)
, weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(
2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c
*e*x + c*d - b*e)/(c*e))) - 3*(3*B*c^3*e^3*x - 4*B*c^3*d*e^2 - (B*b*c^2 -
5*A*c^3)*e^3)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/(c^3*e^4)
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}\,dx = \int \frac{\sqrt{-x\,(-b+cx)}\,(A+Bx)}{\sqrt{d+ex}}\,dx$$

input
```
integrate((B*x+A)*(-c*x**2+b*x)**(1/2)/(e*x+d)**(1/2),x)
```

output
```
Integral(sqrt(-x*(-b + c*x))*(A + B*x)/sqrt(d + e*x), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}\,dx = \int \frac{\sqrt{-cx^2+bx}(Bx+A)}{\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(1/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)/sqrt(e*x + d), x)
```

Giac [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}\,dx = \int \frac{\sqrt{-cx^2+bx}(Bx+A)}{\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(1/2),x, algorithm="giac")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)/sqrt(e*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}\,dx = \int \frac{\sqrt{b\,x-c\,x^2}\,(A+B\,x)}{\sqrt{d+e\,x}}\,dx$$

input
```
int(((b*x - c*x^2)^(1/2)*(A + B*x))/(d + e*x)^(1/2),x)
```

output
```
int(((b*x - c*x^2)^(1/2)*(A + B*x))/(d + e*x)^(1/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{\sqrt{d+ex}}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(1/2),x)
```

output
```
(10*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*e - 6*sqrt(x)*sqrt(d + e*x)*sq
rt(b - c*x)*b**2*d + 4*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*e*x - 4*sq
rt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c*d*x + 5*int((sqrt(x)*sqrt(d + e*x)*s
qrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**
2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*a*b**2*c*e**3 + 5*int((sqrt(x)*sq
rt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*
e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*a*b*c**2*d*e**2 - 10
*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c
*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*a*c*
*3*d**2*e + 2*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2
*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*
x**2),x)*b**4*e**3 - 5*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d
*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x +
c**2*d*e*x**2),x)*b**3*c*d*e**2 - 5*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*
x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c
**2*d**2*x + c**2*d*e*x**2),x)*b**2*c**2*d**2*e + 8*int((sqrt(x)*sqrt(d +
e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b
*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b*c**3*d**3 - 5*int((sqrt(x
)*sqrt(d + e*x)*sqrt(b - c*x))/(b**2*d*e*x + b**2*e**2*x**2 - b*c*d**2*x -
 2*b*c*d*e*x**2 - b*c*e**2*x**3 + c**2*d**2*x**2 + c**2*d*e*x**3),x)*a*...
```

3.140 $\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 320

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx = -\frac{2(Bd-Ae)x\sqrt{bx-cx^2}}{de\sqrt{d+ex}} + \frac{2(4Bd-3Ae)\sqrt{d+ex}\sqrt{bx-cx^2}}{3de^2} + \frac{2\sqrt{b}(8Bcd+bBe-6Ace)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{3\sqrt{c}e^3\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} + \frac{2\sqrt{b}(3Ae(2cd+be)-Bd(8cd+5be))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{3\sqrt{c}e^3\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2*(-A*e+B*d)*x*(-c*x^2+b*x)^(1/2)/d/e/(e*x+d)^(1/2)+2/3*(-3*A*e+4*B*d)*(e
*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/d/e^2+2/3*b^(1/2)*(-6*A*c*e+B*b*e+8*B*c*d)*
x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-
b*e/c/d)^(1/2))/c^(1/2)/e^3/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/3*b^(1/2)
*(3*A*e*(b*e+2*c*d)-B*d*(5*b*e+8*c*d))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(
1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(1/2)/e^3/(e*x+
d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 18.34 (sec) , antiderivative size = 287, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx = \frac{2\left(-\sqrt{-\frac{b}{c}}(8Bcd+bBe-6Ace)(b-cx)(d+ex)+\sqrt{-\frac{b}{c}}cex(b-cx)(4Bd-\right.}{}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x - c*x^2])/(d + e*x)^(3/2),x]
```

output
```
(2*(-(Sqrt[-(b/c)]*(8*B*c*d + b*B*e - 6*A*c*e)*(b - c*x)*(d + e*x)) + Sqrt
[-(b/c)]*c*e*x*(b - c*x)*(4*B*d - 3*A*e + B*e*x) - I*b*e*(8*B*c*d + b*B*e
- 6*A*c*e)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*ArcSinh
[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] + I*b*e*(4*B*c*d + b*B*e - 3*A*c*e
)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b
/c)]/Sqrt[x]], -((c*d)/(b*e))]))/(3*Sqrt[-(b/c)]*c*e^3*Sqrt[x*(b - c*x)]*S
qrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.80 (sec) , antiderivative size = 285, normalized size of antiderivative = 0.89, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {1230, 27, 1269, 1169, 122, 120, 127, 126}

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

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx$$

$$\Big\downarrow \text{1230}$$

$$\frac{2\sqrt{bx-cx^2}(-3Ae+4Bd+Bex)}{3e^2\sqrt{d+ex}}-\frac{2\int \frac{b(4Bd-3Ae)-(8Bcd+bBe-6Ace)x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3e^2}$$

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

$$\frac{2\sqrt{bx-cx^2}(-3Ae+4Bd+Bex)}{3e^2\sqrt{d+ex}}-\frac{\int \frac{b(4Bd-3Ae)-(8Bcd+bBe-6Ace)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3e^2}$$

$\big\downarrow$ 1269

$$\frac{2\sqrt{bx-cx^2}(-3Ae+4Bd+Bex)}{3e^2\sqrt{d+ex}}-\frac{-\frac{(3Ae(be+2cd)-Bd(5be+8cd))\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{(-6Ace+bBe+8Bcd)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}}{3e^2}$$

$\big\downarrow$ 1169

$$\frac{2\sqrt{bx-cx^2}(-3Ae+4Bd+Bex)}{3e^2\sqrt{d+ex}}-\frac{-\frac{\sqrt{x}\sqrt{b-cx}(3Ae(be+2cd)-Bd(5be+8cd))\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}(-6Ace+bBe+8Bcd)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}}{3e^2}$$

$\big\downarrow$ 122

$$\frac{2\sqrt{bx-cx^2}(-3Ae+4Bd+Bex)}{3e^2\sqrt{d+ex}}-\frac{-\frac{\sqrt{x}\sqrt{b-cx}(3Ae(be+2cd)-Bd(5be+8cd))\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(-6Ace+bBe+8Bcd)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{3e^2}$$

$\big\downarrow$ 120

$$\frac{2\sqrt{bx-cx^2}(-3Ae+4Bd+Bex)}{3e^2\sqrt{d+ex}}-\frac{-\frac{\sqrt{x}\sqrt{b-cx}(3Ae(be+2cd)-Bd(5be+8cd))\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(-6Ace+bBe+8Bcd)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{3e^2}$$

$\big\downarrow$ 127

$$\frac{2\sqrt{bx-cx^2}(-3Ae+4Bd+Bex)}{3e^2\sqrt{d+ex}}-\frac{-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(3Ae(be+2cd)-Bd(5be+8cd))\int \frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(-6Ace+bBe+8Bcd)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{3e^2}$$

$\big\downarrow$ 126

$$\frac{2\sqrt{bx-cx^2}(-3Ae+4Bd+Bex)}{3e^2\sqrt{d+ex}} - \frac{-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(3Ae(be+2cd)-Bd(5be+8cd))\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}} - \frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(-6Ace+bBe+8Bcd)E\left(\text{arc}\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{3e^2}$$

input
```
Int[((A + B*x)*Sqrt[b*x - c*x^2])/(d + e*x)^(3/2),x]
```

output
```
(2*(4*B*d - 3*A*e + B*e*x)*Sqrt[b*x - c*x^2])/(3*e^2*Sqrt[d + e*x]) - ((-2
*Sqrt[b]*(8*B*c*d + b*B*e - 6*A*c*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*
x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*
e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) - (2*Sqrt[b]*(3*A*e*(2*c*d + b*e) -
 B*d*(8*c*d + 5*b*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*Elliptic
F[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d +
e*x]*Sqrt[b*x - c*x^2]))/(3*e^2)
```

Defintions of rubi rules used

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

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126

```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127

```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169

```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1230

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269

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

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 543 vs. $2(268) = 536$.

Time = 1.75 (sec) , antiderivative size = 544, normalized size of antiderivative = 1.70

method	result
elliptic	$\frac{\sqrt{x(-cx+b)}\,\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2\left(-ce\,x^2+bex\right)(Ae-Bd)}{e^3\sqrt{\left(x+\frac{d}{e}\right)\left(-ce\,x^2+bex\right)}}+\frac{2B\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{3e^2}+\frac{2\left(\frac{Ab\,e^2+Acde-Bbde-Bc\,d^2}{e^3}-\frac{(Ae-Bc}{\cdots}\right.}{\cdots}\right.}{\cdots}$
default	$-\frac{2\sqrt{x(-cx+b)}\,\sqrt{ex+d}\left(3A\sqrt{\frac{ex+d}{d}}\,\sqrt{\frac{(-cx+b)e}{be+cd}}\,\sqrt{-\frac{ex}{d}}\,\text{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)bcd\,e^2-6A\sqrt{\frac{ex+d}{d}}\,\sqrt{\frac{(-cx+b)e}{be+cd}}\,\sqrt{-\frac{ex}{d}}\,\text{Ellip}\cdots\right.}{\cdots}$

input
```
int((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/x/(-c*x+b)*(
-2*(-c*e*x^2+b*e*x)*(A*e-B*d)/e^3/((x+d/e)*(-c*e*x^2+b*e*x))^(1/2)+2/3*B/e
^2*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2*((A*b*e^2+A*c*d*e-B*b*d*e-B*c*
d^2)/e^3-(A*e-B*d)/e^3*(b*e+c*d)+b/e^2*(A*e-B*d)-1/3*B/e^2*b*d)*d/e*((x+d/
e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-
c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2)
)+2*(-1/e^2*(A*c*e-B*b*e-B*c*d)-(A*e-B*d)*c/e^2-2/3*B/e^2*(b*e-c*d))*d/e*(
(x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e
*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/
(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/
2))))
```

Fricas [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 496, normalized size of antiderivative = 1.55

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx = \frac{2\left((8\,Bc^2d^3+(5\,Bbc-6\,Ac^2)d^2e-(Bb^2+3\,Abc)de^2+(8\,Bc^2d^2e+(5\,Bbc\right.}{}$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(3/2),x, algorithm="fricas")
```

output
```
2/9*((8*B*c^2*d^3 + (5*B*b*c - 6*A*c^2)*d^2*e - (B*b^2 + 3*A*b*c)*d*e^2 +
(8*B*c^2*d^2*e + (5*B*b*c - 6*A*c^2)*d*e^2 - (B*b^2 + 3*A*b*c)*e^3)*x)*sqr
t(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -
4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/
3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*(8*B*c^2*d^2*e + (B*b*c - 6*A*c^2)*d*e^
2 + (8*B*c^2*d*e^2 + (B*b*c - 6*A*c^2)*e^3)*x)*sqrt(-c*e)*weierstrassZeta(
4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^
2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d
^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^
2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) + 3*(B
*c^2*e^3*x + 4*B*c^2*d*e^2 - 3*A*c^2*e^3)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d)
)/(c^2*e^5*x + c^2*d*e^4)
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx = \int \frac{\sqrt{-x\,(-b+cx)}\,(A+Bx)}{(d+ex)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x**2+b*x)**(1/2)/(e*x+d)**(3/2),x)
```

output
```
Integral(sqrt(-x*(-b + c*x))*(A + B*x)/(d + e*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx = \int \frac{\sqrt{-cx^2+bx}(Bx+A)}{(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(3/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)/(e*x + d)^(3/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx = \int \frac{\sqrt{-cx^2+bx}(Bx+A)}{(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(3/2),x, algorithm="giac")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)/(e*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx = \int \frac{\sqrt{b\,x-c\,x^2}\,(A+B\,x)}{(d+e\,x)^{3/2}}\,dx$$

input
```
int(((b*x - c*x^2)^(1/2)*(A + B*x))/(d + e*x)^(3/2),x)
```

output
```
int(((b*x - c*x^2)^(1/2)*(A + B*x))/(d + e*x)^(3/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(3/2),x)
```

output
```
( - 6*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*e + 6*sqrt(x)*sqrt(d + e*x)*
sqrt(b - c*x)*b**2*d + 4*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c*d*x + 3*i
nt((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b*d**2 + 2*sqrt(x)*b*d*e*x + sqr
t(x)*b*e**2*x**2 - sqrt(x)*c*d**2*x - 2*sqrt(x)*c*d*e*x**2 - sqrt(x)*c*e**
2*x**3),x)*a*b**2*d**2*e + 3*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b*
d**2 + 2*sqrt(x)*b*d*e*x + sqrt(x)*b*e**2*x**2 - sqrt(x)*c*d**2*x - 2*sqrt
(x)*c*d*e*x**2 - sqrt(x)*c*e**2*x**3),x)*a*b**2*d*e**2*x - 3*int((sqrt(d +
 e*x)*sqrt(b - c*x))/(sqrt(x)*b*d**2 + 2*sqrt(x)*b*d*e*x + sqrt(x)*b*e**2*
x**2 - sqrt(x)*c*d**2*x - 2*sqrt(x)*c*d*e*x**2 - sqrt(x)*c*e**2*x**3),x)*b
**3*d**3 - 3*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b*d**2 + 2*sqrt(x)
*b*d*e*x + sqrt(x)*b*e**2*x**2 - sqrt(x)*c*d**2*x - 2*sqrt(x)*c*d*e*x**2 -
 sqrt(x)*c*e**2*x**3),x)*b**3*d**2*e*x - 3*int((sqrt(x)*sqrt(d + e*x)*sqrt
(b - c*x)*x)/(b*d**2 + 2*b*d*e*x + b*e**2*x**2 - c*d**2*x - 2*c*d*e*x**2 -
 c*e**2*x**3),x)*a*b*c*d*e**2 - 3*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)
*x)/(b*d**2 + 2*b*d*e*x + b*e**2*x**2 - c*d**2*x - 2*c*d*e*x**2 - c*e**2*x
**3),x)*a*b*c*e**3*x - 6*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b*d*
*2 + 2*b*d*e*x + b*e**2*x**2 - c*d**2*x - 2*c*d*e*x**2 - c*e**2*x**3),x)*a
*c**2*d**2*e - 6*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b*d**2 + 2*b
*d*e*x + b*e**2*x**2 - c*d**2*x - 2*c*d*e*x**2 - c*e**2*x**3),x)*a*c**2*d*
e**2*x + 5*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b*d**2 + 2*b*d*...
```

3.141 $\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 347

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{5/2}}\,dx=-\frac{2(Bd-Ae)x\sqrt{bx-cx^2}}{3de(d+ex)^{3/2}}-\frac{2(4Bcd+3bBe-Ace)\sqrt{bx-cx^2}}{3e^2(cd+be)\sqrt{d+ex}}+\frac{2\sqrt{b}\sqrt{c}(Ae(2cd+be)-Bd(8cd+7be))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{3de^3(cd+be)\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}+\frac{2\sqrt{b}(8Bcd+3bBe-2Ace)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{3\sqrt{c}e^3\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2/3*(-A*e+B*d)*x*(-c*x^2+b*x)^(1/2)/d/e/(e*x+d)^(3/2)-2/3*(-A*c*e+3*B*b*e
+4*B*c*d)*(-c*x^2+b*x)^(1/2)/e^2/(b*e+c*d)/(e*x+d)^(1/2)+2/3*b^(1/2)*c^(1/
2)*(A*e*(b*e+2*c*d)-B*d*(7*b*e+8*c*d))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/
2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/d/e^3/(b*e+c*d)/(1+
e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/3*b^(1/2)*(-2*A*c*e+3*B*b*e+8*B*c*d)*x^(
1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b
*e/c/d)^(1/2))/c^(1/2)/e^3/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 21.78 (sec) , antiderivative size = 357, normalized size of antiderivative = 1.03

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{5/2}}\,dx = \frac{2\left(\sqrt{-\frac{b}{c}}ex(b-cx)\left(Ae(be^2x+cd(d+2ex))-Bd(be(3d+4ex)+cd(4d+5\right.\right.}{}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x - c*x^2])/(d + e*x)^(5/2),x]
```

output
```
(2*(Sqrt[-(b/c)]*e*x*(b - c*x)*(A*e*(b*e^2*x + c*d*(d + 2*e*x)) - B*d*(b*e
*(3*d + 4*e*x) + c*d*(4*d + 5*e*x))) - (d + e*x)*(Sqrt[-(b/c)]*(A*e*(2*c*d
 + b*e) - B*d*(8*c*d + 7*b*e))*(b - c*x)*(d + e*x) + I*b*e*(A*e*(2*c*d + b
*e) - B*d*(8*c*d + 7*b*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*Ell
ipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] + I*b*e*(4*B*d - A
*e)*(c*d + b*e)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*Ar
cSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])))/(3*Sqrt[-(b/c)]*d*e^3*(c*d
 + b*e)*Sqrt[x*(b - c*x)]*(d + e*x)^(3/2))
```

Rubi [A] (verified)

Time = 1.00 (sec) , antiderivative size = 354, normalized size of antiderivative = 1.02, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {1229, 27, 1269, 1169, 122, 120, 127, 126}

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

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{5/2}}\,dx$$

$$\Big\downarrow \; 1229$$

$$\frac{2\int \frac{bd(4Bcd+3bBe-Ace)+c(Ae(2cd+be)-Bd(8cd+7be))x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(d^2(-Ace+3bBe+4Bcd)-ex(Ae(be+2cd)-Bd(4be+5cd))\right)}{3de^2(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \; 27$$

$$\frac{\int \frac{bd(4Bcd+3bBe-Ace)+c(Ae(2cd+be)-Bd(8cd+7be))x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(d^2(-Ace+3bBe+4Bcd)-ex(Ae(be+2cd)-Bd(4be+5cd))\right)}{3de^2(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \; 1269$$

$$\frac{\frac{d(be+cd)(-2Ace+3bBe+8Bcd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}+\frac{c(Ae(be+2cd)-Bd(7be+8cd))\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}}{3de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(d^2(-Ace+3bBe+4Bcd)-ex(Ae(be+2cd)-Bd(4be+5cd))\right)}{3de^2(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \; 1169$$

$$\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(-2Ace+3bBe+8Bcd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}+\frac{c\sqrt{x}\sqrt{b-cx}(Ae(be+2cd)-Bd(7be+8cd))\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}}{3de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(d^2(-Ace+3bBe+4Bcd)-ex(Ae(be+2cd)-Bd(4be+5cd))\right)}{3de^2(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \; 122$$

$$\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(-2Ace+3bBe+8Bcd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}+\frac{c\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Ae(be+2cd)-Bd(7be+8cd))\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{3de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(d^2(-Ace+3bBe+4Bcd)-ex(Ae(be+2cd)-Bd(4be+5cd))\right)}{3de^2(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \; 120$$

$$\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(-2Ace+3bBe+8Bcd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}+\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Ae(be+2cd)-Bd(7be+8cd))E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\right.}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{3de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(d^2(-Ace+3bBe+4Bcd)-ex(Ae(be+2cd)-Bd(4be+5cd))\right)}{3de^2(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \text{127}$$

$$\frac{\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(-2Ace+3bBe+8Bcd)\int \frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}+\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Ae(be+2cd)-Bd(7be+8cd))E\left(\arcsin\right.}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{3de^2(be+cd)}$$

$$\frac{2\sqrt{bx-cx^2}\left(d^2(-Ace+3bBe+4Bcd)-ex(Ae(be+2cd)-Bd(4be+5cd))\right)}{3de^2(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \text{126}$$

$$\frac{\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(-2Ace+3bBe+8Bcd)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}+\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Ae(be+2cd)-Bd(7be+8c}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{3de^2(be+cd)}$$

$$\frac{2\sqrt{bx-cx^2}\left(d^2(-Ace+3bBe+4Bcd)-ex(Ae(be+2cd)-Bd(4be+5cd))\right)}{3de^2(d+ex)^{3/2}(be+cd)}$$

input

```
Int[((A + B*x)*Sqrt[b*x - c*x^2])/(d + e*x)^(5/2),x]
```

output

```
(-2*(d^2*(4*B*c*d + 3*b*B*e - A*c*e) - e*(A*e*(2*c*d + b*e) - B*d*(5*c*d +
 4*b*e))*x)*Sqrt[b*x - c*x^2])/(3*d*e^2*(c*d + b*e)*(d + e*x)^(3/2)) + ((2
*Sqrt[b]*Sqrt[c]*(A*e*(2*c*d + b*e) - B*d*(8*c*d + 7*b*e))*Sqrt[x]*Sqrt[1
- (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b
*e)/(c*d))])/(e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d +
 b*e)*(8*B*c*d + 3*b*B*e - 2*A*c*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*
x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[
c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2]))/(3*d*e^2*(c*d + b*e))
```

Defintions of rubi rules used

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

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1229
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m + 1))*((a + b*x + c*x^2
)^p/(e^2*(m + 1)*(m + 2)*(c*d^2 - b*d*e + a*e^2)))*((d*g - e*f*(m + 2))*(c*
d^2 - b*d*e + a*e^2) - d*p*(2*c*d - b*e)*(e*f - d*g) - e*(g*(m + 1)*(c*d^2
- b*d*e + a*e^2) + p*(2*c*d - b*e)*(e*f - d*g))*x), x] - Simp[p/(e^2*(m + 1
)*(m + 2)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 2)*(a + b*x + c*x^2
)^(p - 1)*Simp[2*a*c*e*(e*f - d*g)*(m + 2) + b^2*e*(d*g*(p + 1) - e*f*(m +
p + 2)) + b*(a*e^2*g*(m + 1) - c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2))) - c
*(2*c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2)) - e*(2*a*e*g*(m + 1) - b*(d*g*(
m - 2*p) + e*f*(m + 2*p + 2))))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g
}, x] && GtQ[p, 0] && LtQ[m, -2] && LtQ[m + 2*p, 0] &&  !ILtQ[m + 2*p + 3,
0]
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 634 vs. $2(293) = 586$.

Time = 2.25 (sec) , antiderivative size = 635, normalized size of antiderivative = 1.83

method	result
elliptic	$\frac{\sqrt{x(-cx+b)}\,\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2(Ae-Bd)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{3e^4\left(x+\frac{d}{e}\right)^2}+\frac{2\left(-ce\,x^2+bex\right)\left(Ab\,e^2+2Acde-4Bbde-5Bc\,d^2\right)}{3d(be+cd)e^3\sqrt{\left(x+\frac{d}{e}\right)\left(-ce\,x^2+bex\right)}}+\frac{2\left(-\frac{Ace-}{}\right.}{}\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/x/(-c*x+b)*(
-2/3*(A*e-B*d)/e^4*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x+d/e)^2+2/3*(-
c*e*x^2+b*e*x)/d/(b*e+c*d)/e^3*(A*b*e^2+2*A*c*d*e-4*B*b*d*e-5*B*c*d^2)/((x
+d/e)*(-c*e*x^2+b*e*x))^(1/2)+2*(-(A*c*e-B*b*e-2*B*c*d)/e^3+1/3*(A*e-B*d)*
c/e^3+1/3/e^3*(A*b*e^2+2*A*c*d*e-4*B*b*d*e-5*B*c*d^2)/d-1/3*b/e^2/d/(b*e+c
*d)*(A*b*e^2+2*A*c*d*e-4*B*b*d*e-5*B*c*d^2))*d/e*((x+d/e)/d*e)^(1/2)*((x-b
/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2
)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(-B*c/e^2+1/3*c
/e^2*(A*b*e^2+2*A*c*d*e-4*B*b*d*e-5*B*c*d^2)/d/(b*e+c*d))*d/e*((x+d/e)/d*e
)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^
2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))
^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 749 vs. $2(293) = 586$.

Time = 0.14 (sec) , antiderivative size = 749, normalized size of antiderivative = 2.16

$$\int \frac{(A + Bx)\sqrt{bx - cx^2}}{(d + ex)^{5/2}}\, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(5/2),x, algorithm="fricas")
```

output
```
-2/9*((8*B*c^2*d^5 + A*b^2*d^2*e^3 + (11*B*b*c - 2*A*c^2)*d^4*e + 2*(B*b^2
 - A*b*c)*d^3*e^2 + (8*B*c^2*d^3*e^2 + A*b^2*e^5 + (11*B*b*c - 2*A*c^2)*d^
2*e^3 + 2*(B*b^2 - A*b*c)*d*e^4)*x^2 + 2*(8*B*c^2*d^4*e + A*b^2*d*e^4 + (1
1*B*b*c - 2*A*c^2)*d^3*e^2 + 2*(B*b^2 - A*b*c)*d^2*e^3)*x)*sqrt(-c*e)*weie
rstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*
d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x +
 c*d - b*e)/(c*e)) + 3*(8*B*c^2*d^4*e - A*b*c*d^2*e^3 + (7*B*b*c - 2*A*c^2
)*d^3*e^2 + (8*B*c^2*d^2*e^3 - A*b*c*e^5 + (7*B*b*c - 2*A*c^2)*d*e^4)*x^2
+ 2*(8*B*c^2*d^3*e^2 - A*b*c*d*e^4 + (7*B*b*c - 2*A*c^2)*d^2*e^3)*x)*sqrt(
-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(
2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstr
assPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3
+ 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d
 - b*e)/(c*e))) + 3*(4*B*c^2*d^3*e^2 + (3*B*b*c - A*c^2)*d^2*e^3 + (5*B*c^
2*d^2*e^3 - A*b*c*e^5 + 2*(2*B*b*c - A*c^2)*d*e^4)*x)*sqrt(-c*x^2 + b*x)*s
qrt(e*x + d))/(c^2*d^4*e^4 + b*c*d^3*e^5 + (c^2*d^2*e^6 + b*c*d*e^7)*x^2 +
 2*(c^2*d^3*e^5 + b*c*d^2*e^6)*x)
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{5/2}}\,dx = \int \frac{\sqrt{-x\,(-b+cx)}(A+Bx)}{(d+ex)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x**2+b*x)**(1/2)/(e*x+d)**(5/2),x)
```

output
```
Integral(sqrt(-x*(-b + c*x))*(A + B*x)/(d + e*x)**(5/2), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{5/2}}\,dx = \int \frac{\sqrt{-cx^2+bx}(Bx+A)}{(ex+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(5/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)/(e*x + d)^(5/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{5/2}}\,dx=\int \frac{\sqrt{-cx^2+bx}(Bx+A)}{(ex+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(5/2),x, algorithm="giac")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)/(e*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{5/2}}\,dx=\int \frac{\sqrt{b\,x-c\,x^2}\,(A+B\,x)}{(d+e\,x)^{5/2}}\,dx$$

input
```
int(((b*x - c*x^2)^(1/2)*(A + B*x))/(d + e*x)^(5/2),x)
```

output
```
int(((b*x - c*x^2)^(1/2)*(A + B*x))/(d + e*x)^(5/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{5/2}}\,dx=\text{too large to display}$$

input
```
int((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(5/2),x)
```

output

```
( - 2*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*e + 6*sqrt(x)*sqrt(d + e*x)*
sqrt(b - c*x)*b**2*d + 4*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*e*x + 4*
sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c*d*x + int((sqrt(d + e*x)*sqrt(b -
c*x))/(sqrt(x)*b**2*d**3*e + 3*sqrt(x)*b**2*d**2*e**2*x + 3*sqrt(x)*b**2*d
*e**3*x**2 + sqrt(x)*b**2*e**4*x**3 + sqrt(x)*b*c*d**4 + 2*sqrt(x)*b*c*d**
3*e*x - 2*sqrt(x)*b*c*d*e**3*x**3 - sqrt(x)*b*c*e**4*x**4 - sqrt(x)*c**2*d
**4*x - 3*sqrt(x)*c**2*d**3*e*x**2 - 3*sqrt(x)*c**2*d**2*e**2*x**3 - sqrt(
x)*c**2*d*e**3*x**4),x)*a*b**3*d**3*e**2 + 2*int((sqrt(d + e*x)*sqrt(b - c
*x))/(sqrt(x)*b**2*d**3*e + 3*sqrt(x)*b**2*d**2*e**2*x + 3*sqrt(x)*b**2*d*
e**3*x**2 + sqrt(x)*b**2*e**4*x**3 + sqrt(x)*b*c*d**4 + 2*sqrt(x)*b*c*d**3
*e*x - 2*sqrt(x)*b*c*d*e**3*x**3 - sqrt(x)*b*c*e**4*x**4 - sqrt(x)*c**2*d*
*4*x - 3*sqrt(x)*c**2*d**3*e*x**2 - 3*sqrt(x)*c**2*d**2*e**2*x**3 - sqrt(x
)*c**2*d*e**3*x**4),x)*a*b**3*d**2*e**3*x + int((sqrt(d + e*x)*sqrt(b - c*
x))/(sqrt(x)*b**2*d**3*e + 3*sqrt(x)*b**2*d**2*e**2*x + 3*sqrt(x)*b**2*d*e
**3*x**2 + sqrt(x)*b**2*e**4*x**3 + sqrt(x)*b*c*d**4 + 2*sqrt(x)*b*c*d**3*
e*x - 2*sqrt(x)*b*c*d*e**3*x**3 - sqrt(x)*b*c*e**4*x**4 - sqrt(x)*c**2*d**
4*x - 3*sqrt(x)*c**2*d**3*e*x**2 - 3*sqrt(x)*c**2*d**2*e**2*x**3 - sqrt(x)
*c**2*d*e**3*x**4),x)*a*b**3*d*e**4*x**2 + int((sqrt(d + e*x)*sqrt(b - c*x
))/(sqrt(x)*b**2*d**3*e + 3*sqrt(x)*b**2*d**2*e**2*x + 3*sqrt(x)*b**2*d*e*
*3*x**2 + sqrt(x)*b**2*e**4*x**3 + sqrt(x)*b*c*d**4 + 2*sqrt(x)*b*c*d**...
```

3.142 $\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 497

$$\begin{aligned}
\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}\,dx &= -\frac{2(Bd-Ae)x\sqrt{bx-cx^2}}{5de(d+ex)^{5/2}} \\
&- \frac{2(Ae(cd+2be)+Bd(4cd+3be))\sqrt{bx-cx^2}}{15de^2(cd+be)(d+ex)^{3/2}} \\
&+ \frac{2\left(2Ae(c^2d^2+bcde+b^2e^2)+Bd(8c^2d^2+13bcde+3b^2e^2)\right)\sqrt{bx-cx^2}}{15d^2e^2(cd+be)^2\sqrt{d+ex}} \\
&+ \frac{2\sqrt{b}\sqrt{c}\left(2Ae(c^2d^2+bcde+b^2e^2)+Bd(8c^2d^2+13bcde+3b^2e^2)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\,E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|\right.}{15d^2e^3(cd+be)^2\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} \\
&- \frac{2\sqrt{b}\sqrt{c}(Ae(2cd+be)+Bd(8cd+9be))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{15de^3(cd+be)\sqrt{d+ex}\sqrt{bx-cx^2}}
\end{aligned}$$

output
```
-2/5*(-A*e+B*d)*x*(-c*x^2+b*x)^(1/2)/d/e/(e*x+d)^(5/2)-2/15*(A*e*(2*b*e+c*
d)+B*d*(3*b*e+4*c*d))*(-c*x^2+b*x)^(1/2)/d/e^2/(b*e+c*d)/(e*x+d)^(3/2)+2/1
5*(2*A*e*(b^2*e^2+b*c*d*e+c^2*d^2)+B*d*(3*b^2*e^2+13*b*c*d*e+8*c^2*d^2))*(
-c*x^2+b*x)^(1/2)/d^2/e^2/(b*e+c*d)^2/(e*x+d)^(1/2)+2/15*b^(1/2)*c^(1/2)*(
2*A*e*(b^2*e^2+b*c*d*e+c^2*d^2)+B*d*(3*b^2*e^2+13*b*c*d*e+8*c^2*d^2))*x^(1
/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/
c/d)^(1/2))/d^2/e^3/(b*e+c*d)^2/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)-2/15*b^
(1/2)*c^(1/2)*(A*e*(b*e+2*c*d)+B*d*(9*b*e+8*c*d))*x^(1/2)*(1-c*x/b)^(1/2)*
(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/d/e^3/
(b*e+c*d)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 23.12 (sec) , antiderivative size = 501, normalized size of antiderivative = 1.01

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}\,dx = \frac{2\left(\sqrt{-\frac{b}{c}}ex(b-cx)\left(3d^2(Bd-Ae)(cd+be)^2-d(cd+be)(-Ae(2cd+be)+\right.\right.}{}$$

input
```
Integrate[((A + B*x)*Sqrt[b*x - c*x^2])/(d + e*x)^(7/2),x]
```

output
```
(2*(Sqrt[-(b/c)]*e*x*(b - c*x)*(3*d^2*(B*d - A*e)*(c*d + b*e)^2 - d*(c*d +
 b*e)*(-(A*e*(2*c*d + b*e)) + B*d*(7*c*d + 6*b*e))*(d + e*x) + (2*A*e*(c^2
*d^2 + b*c*d*e + b^2*e^2) + B*d*(8*c^2*d^2 + 13*b*c*d*e + 3*b^2*e^2))*(d +
 e*x)^2) - (d + e*x)^2*(Sqrt[-(b/c)]*(2*A*e*(c^2*d^2 + b*c*d*e + b^2*e^2)
+ B*d*(8*c^2*d^2 + 13*b*c*d*e + 3*b^2*e^2))*(b - c*x)*(d + e*x) + I*b*e*(2
*A*e*(c^2*d^2 + b*c*d*e + b^2*e^2) + B*d*(8*c^2*d^2 + 13*b*c*d*e + 3*b^2*e
^2))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[
-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*e*(c*d + b*e)*(A*e*(c*d + 2*b*e) +
 B*d*(4*c*d + 3*b*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*Elliptic
F[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])))/(15*Sqrt[-(b/c)]*d^2
*e^3*(c*d + b*e)^2*Sqrt[x*(b - c*x)]*(d + e*x)^(5/2))
```

Rubi [A] (verified)

Time = 1.49 (sec) , antiderivative size = 498, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {1229, 27, 1237, 27, 1269, 1169, 122, 120, 127, 126}

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

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}dx$$

$$\Big\downarrow \text{1229}$$

$$\frac{2\int \frac{b(Ae(cd+2be)+Bd(4cd+3be))-c(Ae(2cd+be)+Bd(8cd+9be))x}{2(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{15de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

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

$$\frac{\int \frac{b(Ae(cd+2be)+Bd(4cd+3be))-c(Ae(2cd+be)+Bd(8cd+9be))x}{(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{15de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \text{1237}$$

$$\frac{\frac{2\int -\frac{c\left(bd(Ae(cd-be)+2Bd(2cd+3be))-\left(2Ae\left(c^2d^2+bced+b^2e^2\right)+Bd\left(8c^2d^2+13bced+3b^2e^2\right)\right)x\right)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}+\frac{2\sqrt{bx-cx^2}\left(2Ae\left(b^2e^2+bcde+c^2d^2\right)+Bd\left(3b^2e^2+\cdots\right)\right)}{d\sqrt{d+ex}(be+cd)}}{15de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

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

$$\frac{\frac{2\sqrt{bx-cx^2}\left(2Ae\left(b^2e^2+bcde+c^2d^2\right)+Bd\left(3b^2e^2+13bcde+8c^2d^2\right)\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\int \frac{bd(Ae(cd-be)+2Bd(2cd+3be))-\left(2Ae\left(c^2d^2+bced+b^2e^2\right)+Bd\left(8c^2d^2+13bced+\cdots\right)\right)}{\sqrt{d+ex}\sqrt{bx-cx^2}}}{d(be+cd)}}{15de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \text{1269}$$

$$\frac{\frac{2\sqrt{bx-cx^2}\left(2Ae\left(b^2e^2+bcde+c^2d^2\right)+Bd\left(3b^2e^2+13bcde+8c^2d^2\right)\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d(be+cd)(Ae(be+2cd)+Bd(9be+8cd))\int\frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{\left(2Ae\left(b^2e^2+bcde\cdots\right.\right.}{\cdots}\right)}{d(be+cd)}}{15de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \; 1169$$

$$\frac{\frac{2\sqrt{bx-cx^2}\left(2Ae\left(b^2e^2+bcde+c^2d^2\right)+Bd\left(3b^2e^2+13bcde+8c^2d^2\right)\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(Ae(be+2cd)+Bd(9be+8cd))\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b\cdots}}{\cdots}\right)}{d(be+c\cdots}}{15de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \; 122$$

$$\frac{\frac{2\sqrt{bx-cx^2}\left(2Ae\left(b^2e^2+bcde+c^2d^2\right)+Bd\left(3b^2e^2+13bcde+8c^2d^2\right)\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(Ae(be+2cd)+Bd(9be+8cd))\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1\cdots}}{\cdots}\right)}{d(b\cdots}}{15de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \; 120$$

$$\frac{\frac{2\sqrt{bx-cx^2}\left(2Ae\left(b^2e^2+bcde+c^2d^2\right)+Bd\left(3b^2e^2+13bcde+8c^2d^2\right)\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(Ae(be+2cd)+Bd(9be+8cd))\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{\cdots}}{\cdots}\right)}{\cdots}}{15de^2(be+cd)}-\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \; 127$$

$$\frac{\frac{2\sqrt{bx-cx^2}(2Ae(b^2e^2+bcde+c^2d^2)+Bd(3b^2e^2+13bcde+8c^2d^2))}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(Ae(be+2cd)+Bd(9be+8cd))\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}}{e\sqrt{bx-cx^2}\sqrt{d+ex}}\right.}{}}{15de^2(be+cd)}$$

$$\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

$\downarrow$ 126

$$\frac{\frac{2\sqrt{bx-cx^2}(2Ae(b^2e^2+bcde+c^2d^2)+Bd(3b^2e^2+13bcde+8c^2d^2))}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(Ae(be+2cd)+Bd(9be+8cd))\text{EllipticF}\left(\arcsin\left(\right.\right.}{\sqrt{ce}\sqrt{bx-cx^2}\sqrt{d+ex}}\right.}{}}{15de^2(be+cd)}$$

$$\frac{2\sqrt{bx-cx^2}(d(Ae(2be+cd)+Bd(3be+4cd))-ex(Ae(be+2cd)-Bd(6be+7cd)))}{15de^2(d+ex)^{5/2}(be+cd)}$$

input
```
Int[((A + B*x)*Sqrt[b*x - c*x^2])/(d + e*x)^(7/2),x]
```

output
```
(-2*(d*(A*e*(c*d + 2*b*e) + B*d*(4*c*d + 3*b*e)) - e*(A*e*(2*c*d + b*e) -
B*d*(7*c*d + 6*b*e))*x)*Sqrt[b*x - c*x^2])/(15*d*e^2*(c*d + b*e)*(d + e*x)
^(5/2)) + ((2*(2*A*e*(c^2*d^2 + b*c*d*e + b^2*e^2) + B*d*(8*c^2*d^2 + 13*b
*c*d*e + 3*b^2*e^2))*Sqrt[b*x - c*x^2])/(d*(c*d + b*e)*Sqrt[d + e*x]) - (c
*((-2*Sqrt[b]*(2*A*e*(c^2*d^2 + b*c*d*e + b^2*e^2) + B*d*(8*c^2*d^2 + 13*b
*c*d*e + 3*b^2*e^2))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[Arc
Sin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)
/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(A*e*(2*c*d + b*e) + B*d
*(8*c*d + 9*b*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[Ar
cSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]
*Sqrt[b*x - c*x^2])))/(d*(c*d + b*e)))/(15*d*e^2*(c*d + b*e))
```

Defintions of rubi rules used

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

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1229
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m + 1))*((a + b*x + c*x^2
)^p/(e^2*(m + 1)*(m + 2)*(c*d^2 - b*d*e + a*e^2)))*((d*g - e*f*(m + 2))*(c*
d^2 - b*d*e + a*e^2) - d*p*(2*c*d - b*e)*(e*f - d*g) - e*(g*(m + 1)*(c*d^2
- b*d*e + a*e^2) + p*(2*c*d - b*e)*(e*f - d*g))*x), x] - Simp[p/(e^2*(m + 1
)*(m + 2)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 2)*(a + b*x + c*x^2
)^(p - 1)*Simp[2*a*c*e*(e*f - d*g)*(m + 2) + b^2*e*(d*g*(p + 1) - e*f*(m +
p + 2)) + b*(a*e^2*g*(m + 1) - c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2))) - c
*(2*c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2)) - e*(2*a*e*g*(m + 1) - b*(d*g*(
m - 2*p) + e*f*(m + 2*p + 2))))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g
}, x] && GtQ[p, 0] && LtQ[m, -2] && LtQ[m + 2*p, 0] &&  !ILtQ[m + 2*p + 3,
0]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 3.43 (sec) , antiderivative size = 850, normalized size of antiderivative = 1.71

method	result
elliptic	$\frac{\sqrt{x(-cx+b)}\,\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2(Ae-Bd)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{5e^5\left(x+\frac{d}{e}\right)^3}+\frac{2\left(Ab\,e^2+2Acde-6Bbde-7Bc\,d^2\right)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{15d(be+cd)e^4\left(x+\frac{d}{e}\right)^2}\right.}{}$
default	Expression too large to display

input

```
int((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(7/2),x,method=_RETURNVERBOSE)
```

output

```
1/(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/x/(-c*x+b)*(
-2/5*(A*e-B*d)/e^5*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x+d/e)^3+2/15*(
A*b*e^2+2*A*c*d*e-6*B*b*d*e-7*B*c*d^2)/d/(b*e+c*d)/e^4*(-c*e*x^3+b*e*x^2-c
*d*x^2+b*d*x)^(1/2)/(x+d/e)^2+2/15*(-c*e*x^2+b*e*x)/d^2/(b*e+c*d)^2/e^3*(2
*A*b^2*e^3+2*A*b*c*d*e^2+2*A*c^2*d^2*e+3*B*b^2*d*e^2+13*B*b*c*d^2*e+8*B*c^
2*d^3)/((x+d/e)*(-c*e*x^2+b*e*x))^(1/2)+2*(-B*c/e^3-1/15*c*(A*b*e^2+2*A*c*
d*e-6*B*b*d*e-7*B*c*d^2)/e^3/d/(b*e+c*d)+1/15/e^3/(b*e+c*d)*(2*A*b^2*e^3+2
*A*b*c*d*e^2+2*A*c^2*d^2*e+3*B*b^2*d*e^2+13*B*b*c*d^2*e+8*B*c^2*d^3)/d^2-1
/15*b/e^2/d^2/(b*e+c*d)^2*(2*A*b^2*e^3+2*A*b*c*d*e^2+2*A*c^2*d^2*e+3*B*b^2
*d*e^2+13*B*b*c*d^2*e+8*B*c^2*d^3))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e
-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*Ellipti
cF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2/15*c/e^3*(2*A*b^2*e^3+2*
A*b*c*d*e^2+2*A*c^2*d^2*e+3*B*b^2*d*e^2+13*B*b*c*d^2*e+8*B*c^2*d^3)/d/(b*e
+c*d)^2*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*
e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/
2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-
b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1256 vs. $2(437) = 874$.

Time = 0.11 (sec) , antiderivative size = 1256, normalized size of antiderivative = 2.53

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(7/2),x, algorithm="fricas")
```

output
```
2/45*((8*B*c^3*d^7 - 2*A*b^3*d^3*e^4 + (17*B*b*c^2 + 2*A*c^3)*d^6*e + (8*B
*b^2*c + 3*A*b*c^2)*d^5*e^2 - 3*(B*b^3 + A*b^2*c)*d^4*e^3 + (8*B*c^3*d^4*e
^3 - 2*A*b^3*e^7 + (17*B*b*c^2 + 2*A*c^3)*d^3*e^4 + (8*B*b^2*c + 3*A*b*c^2
)*d^2*e^5 - 3*(B*b^3 + A*b^2*c)*d*e^6)*x^3 + 3*(8*B*c^3*d^5*e^2 - 2*A*b^3*
d*e^6 + (17*B*b*c^2 + 2*A*c^3)*d^4*e^3 + (8*B*b^2*c + 3*A*b*c^2)*d^3*e^4 -
 3*(B*b^3 + A*b^2*c)*d^2*e^5)*x^2 + 3*(8*B*c^3*d^6*e - 2*A*b^3*d^2*e^5 + (
17*B*b*c^2 + 2*A*c^3)*d^5*e^2 + (8*B*b^2*c + 3*A*b*c^2)*d^4*e^3 - 3*(B*b^3
 + A*b^2*c)*d^3*e^4)*x)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*
d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2
 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*(8*B*c^3*d^6
*e + 2*A*b^2*c*d^3*e^4 + (13*B*b*c^2 + 2*A*c^3)*d^5*e^2 + (3*B*b^2*c + 2*A
*b*c^2)*d^4*e^3 + (8*B*c^3*d^3*e^4 + 2*A*b^2*c*e^7 + (13*B*b*c^2 + 2*A*c^3
)*d^2*e^5 + (3*B*b^2*c + 2*A*b*c^2)*d*e^6)*x^3 + 3*(8*B*c^3*d^4*e^3 + 2*A*
b^2*c*d*e^6 + (13*B*b*c^2 + 2*A*c^3)*d^3*e^4 + (3*B*b^2*c + 2*A*b*c^2)*d^2
*e^5)*x^2 + 3*(8*B*c^3*d^5*e^2 + 2*A*b^2*c*d^2*e^5 + (13*B*b*c^2 + 2*A*c^3
)*d^4*e^3 + (3*B*b^2*c + 2*A*b*c^2)*d^3*e^4)*x)*sqrt(-c*e)*weierstrassZeta
(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d
^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*
d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b
^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) + ...
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}\,dx = \int \frac{\sqrt{-x\,(-b+cx)}(A+Bx)}{(d+ex)^{\frac{7}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x**2+b*x)**(1/2)/(e*x+d)**(7/2),x)
```

output
```
Integral(sqrt(-x*(-b + c*x))*(A + B*x)/(d + e*x)**(7/2), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}\,dx = \int \frac{\sqrt{-cx^2+bx}(Bx+A)}{(ex+d)^{\frac{7}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(7/2),x, algorithm="maxima")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)/(e*x + d)^(7/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}\,dx = \int \frac{\sqrt{-cx^2+bx}(Bx+A)}{(ex+d)^{\frac{7}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(7/2),x, algorithm="giac")
```

output
```
integrate(sqrt(-c*x^2 + b*x)*(B*x + A)/(e*x + d)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}\,dx=\int \frac{\sqrt{b\,x-c\,x^2}\,(A+B\,x)}{(d+e\,x)^{7/2}}\,dx$$

input
```
int(((b*x - c*x^2)^(1/2)*(A + B*x))/(d + e*x)^(7/2),x)
```

output
```
int(((b*x - c*x^2)^(1/2)*(A + B*x))/(d + e*x)^(7/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\sqrt{bx-cx^2}}{(d+ex)^{7/2}}\,dx=\text{too large to display}$$

input
```
int((B*x+A)*(-c*x^2+b*x)^(1/2)/(e*x+d)^(7/2),x)
```

output

```
( - 2*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*e - 6*sqrt(x)*sqrt(d + e*x)*
sqrt(b - c*x)*b**2*d - 8*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*e*x - 4*
sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c*d*x + 2*int((sqrt(d + e*x)*sqrt(b
 - c*x))/(2*sqrt(x)*b**2*d**4*e + 8*sqrt(x)*b**2*d**3*e**2*x + 12*sqrt(x)*b
**2*d**2*e**3*x**2 + 8*sqrt(x)*b**2*d*e**4*x**3 + 2*sqrt(x)*b**2*e**5*x**4
 + sqrt(x)*b*c*d**5 + 2*sqrt(x)*b*c*d**4*e*x - 2*sqrt(x)*b*c*d**3*e**2*x**
2 - 8*sqrt(x)*b*c*d**2*e**3*x**3 - 7*sqrt(x)*b*c*d*e**4*x**4 - 2*sqrt(x)*b
*c*e**5*x**5 - sqrt(x)*c**2*d**5*x - 4*sqrt(x)*c**2*d**4*e*x**2 - 6*sqrt(x
)*c**2*d**3*e**2*x**3 - 4*sqrt(x)*c**2*d**2*e**3*x**4 - sqrt(x)*c**2*d*e**
4*x**5),x)*a*b**3*d**4*e**2 + 6*int((sqrt(d + e*x)*sqrt(b - c*x))/(2*sqrt(
x)*b**2*d**4*e + 8*sqrt(x)*b**2*d**3*e**2*x + 12*sqrt(x)*b**2*d**2*e**3*x*
*2 + 8*sqrt(x)*b**2*d*e**4*x**3 + 2*sqrt(x)*b**2*e**5*x**4 + sqrt(x)*b*c*d
**5 + 2*sqrt(x)*b*c*d**4*e*x - 2*sqrt(x)*b*c*d**3*e**2*x**2 - 8*sqrt(x)*b*
c*d**2*e**3*x**3 - 7*sqrt(x)*b*c*d*e**4*x**4 - 2*sqrt(x)*b*c*e**5*x**5 - s
qrt(x)*c**2*d**5*x - 4*sqrt(x)*c**2*d**4*e*x**2 - 6*sqrt(x)*c**2*d**3*e**2
*x**3 - 4*sqrt(x)*c**2*d**2*e**3*x**4 - sqrt(x)*c**2*d*e**4*x**5),x)*a*b**
3*d**3*e**3*x + 6*int((sqrt(d + e*x)*sqrt(b - c*x))/(2*sqrt(x)*b**2*d**4*e
 + 8*sqrt(x)*b**2*d**3*e**2*x + 12*sqrt(x)*b**2*d**2*e**3*x**2 + 8*sqrt(x)
*b**2*d*e**4*x**3 + 2*sqrt(x)*b**2*e**5*x**4 + sqrt(x)*b*c*d**5 + 2*sqrt(x
)*b*c*d**4*e*x - 2*sqrt(x)*b*c*d**3*e**2*x**2 - 8*sqrt(x)*b*c*d**2*e**3...
```

3.143 $\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{\sqrt{d+ex}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 627

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{\sqrt{d+ex}}\,dx = -\frac{2(9Ace(8c^2d^2+11bcde+b^2e^2)-2B(32c^3d^3+42bc^2d^2e+3b^2cde^2-2b^3e^3))\sqrt{d+ex}\sqrt{bx-cx^2}}{315c^2e^4} - \frac{2(7bce(5Bd-9Ae)+(6cd+be)(8Bcd+3bBe-9Ace))x\sqrt{d+ex}\sqrt{bx-cx^2}}{315ce^3} + \frac{2(8Bcd+3bBe-9Ace)x^2\sqrt{d+ex}\sqrt{bx-cx^2}}{63e^2} + \frac{2Bx\sqrt{d+ex}\left(bx-cx^2\right)^{3/2}}{9e} - \frac{2\sqrt{b}(18Ace(8c^3d^3+12bc^2d^2e+2b^2cde^2-b^3e^3)-B(128c^4d^4+184bc^3d^3e+27b^2c^2d^2e^2-11b^3cde^3+8b}{315c^{5/2}e^5\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} + \frac{2\sqrt{b}d(cd+be)\left(9Ace(16c^2d^2+16bcde-b^2e^2)-B(128c^3d^3+120bc^2d^2e-9b^2cde^2+4b^3e^3)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}}{315c^{5/2}e^5\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2/315*(9*A*c*e*(b^2*e^2+11*b*c*d*e+8*c^2*d^2)-2*B*(-2*b^3*e^3+3*b^2*c*d*e
^2+42*b*c^2*d^2*e+32*c^3*d^3))*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/c^2/e^4-2/
315*(7*b*c*e*(-9*A*e+5*B*d)+(b*e+6*c*d)*(-9*A*c*e+3*B*b*e+8*B*c*d))*x*(e*x
+d)^(1/2)*(-c*x^2+b*x)^(1/2)/c/e^3+2/63*(-9*A*c*e+3*B*b*e+8*B*c*d)*x^2*(e*
x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/e^2+2/9*B*x*(e*x+d)^(1/2)*(-c*x^2+b*x)^(3/2)
/e-2/315*b^(1/2)*(18*A*c*e*(-b^3*e^3+2*b^2*c*d*e^2+12*b*c^2*d^2*e+8*c^3*d^
3)-B*(8*b^4*e^4-11*b^3*c*d*e^3+27*b^2*c^2*d^2*e^2+184*b*c^3*d^3*e+128*c^4*
d^4))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1
/2),(-b*e/c/d)^(1/2))/c^(5/2)/e^5/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/315
*b^(1/2)*d*(b*e+c*d)*(9*A*c*e*(-b^2*e^2+16*b*c*d*e+16*c^2*d^2)-B*(4*b^3*e^
3-9*b^2*c*d*e^2+120*b*c^2*d^2*e+128*c^3*d^3))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e
*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(5/2)/e^
5/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 26.04 (sec) , antiderivative size = 637, normalized size of antiderivative = 1.02

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{\sqrt{d+ex}}\,dx = \frac{2\sqrt{x(b-cx)}\left(\frac{(18Ace(8c^3d^3+12bc^2d^2e+2b^2cde^2-b^3e^3)-B(128c^4d^4+184bc^3d^3e+27b^2c^2d^2e^2\cdots}{\sqrt{x}}\cdots\right.}{\cdots}$$

input
```
Integrate[((A + B*x)*(b*x - c*x^2)^(3/2))/Sqrt[d + e*x],x]
```

output
```
(2*Sqrt[x*(b - c*x)]*(((18*A*c*e*(8*c^3*d^3 + 12*b*c^2*d^2*e + 2*b^2*c*d*e
^2 - b^3*e^3) - B*(128*c^4*d^4 + 184*b*c^3*d^3*e + 27*b^2*c^2*d^2*e^2 - 11
*b^3*c*d*e^3 + 8*b^4*e^4))*(d + e*x))/Sqrt[x] + c*e*Sqrt[x]*(d + e*x)*(-9*
A*c*e*(b^2*e^2 + b*c*e*(11*d - 8*e*x) + c^2*(8*d^2 - 6*d*e*x + 5*e^2*x^2))
 + B*(-4*b^3*e^3 - 3*b^2*c*e^2*(-2*d + e*x) + b*c^2*e*(84*d^2 - 61*d*e*x +
 50*e^2*x^2) + c^3*(64*d^3 - 48*d^2*e*x + 40*d*e^2*x^2 - 35*e^3*x^3))) + (
I*b*e*(18*A*c*e*(8*c^3*d^3 + 12*b*c^2*d^2*e + 2*b^2*c*d*e^2 - b^3*e^3) - B
*(128*c^4*d^4 + 184*b*c^3*d^3*e + 27*b^2*c^2*d^2*e^2 - 11*b^3*c*d*e^3 + 8*
b^4*e^4))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x*EllipticE[I*ArcSinh[Sqrt[-
(b/c)]/Sqrt[x]], -((c*d)/(b*e))])/(Sqrt[-(b/c)]*(b - c*x)) + (I*b*e*(c*d +
 b*e)*(-9*A*c*e*(8*c^2*d^2 + 5*b*c*d*e - 2*b^2*e^2) + B*(64*c^3*d^3 + 36*b
*c^2*d^2*e - 15*b^2*c*d*e^2 + 8*b^3*e^3))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*
x)]*x*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])/(Sqrt[-(
b/c)]*(b - c*x))))/(315*c^3*e^5*Sqrt[x]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.68 (sec) , antiderivative size = 589, normalized size of antiderivative = 0.94, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {1231, 27, 1231, 27, 1269, 1169, 122, 120, 127, 126}

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

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{\sqrt{d+ex}}dx$$

$$\Big\downarrow \text{1231}$$

$$\frac{2\int \frac{\left(bd(8Bcd+3bBe-9Ace)+\left(9Ace(2cd+be)-B\left(16c^2d^2+7bced-4b^2e^2\right)\right)x\right)\sqrt{bx-cx^2}}{2\sqrt{d+ex}}dx}{21ce^2}-\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

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

$$\frac{\int \frac{\left(bd(8Bcd+3bBe-9Ace)+\left(9Ace(2cd+be)-B\left(16c^2d^2+7bced-4b^2e^2\right)\right)x\right)\sqrt{bx-cx^2}}{\sqrt{d+ex}}dx}{21ce^2}-\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

$$\Big\downarrow \text{1231}$$

$$\frac{2\int \frac{bd\left(9Ace\left(8c^2d^2+11bced+b^2e^2\right)-2B\left(32c^3d^3+42bc^2ed^2+3b^2ce^2d-2b^3e^3\right)\right)+\left(5bcde(2cd+be)(8Bcd+3bBe-9Ace)-\left(8c^2d^2+3bced-2b^2e^2\right)\left(9Ace(2cd+be)-\cdots\right.\right.}{2\sqrt{d+ex}\sqrt{bx-cx^2}}\cdots}{15ce^2}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

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

$$\frac{\int \frac{bd\left(9Ace\left(8c^2d^2+11bced+b^2e^2\right)-2B\left(32c^3d^3+42bc^2ed^2+3b^2ce^2d-2b^3e^3\right)\right)+\left(5bcde(2cd+be)(8Bcd+3bBe-9Ace)-\left(8c^2d^2+3bced-2b^2e^2\right)\left(9Ace(2cd+be)-B\cdots\right.\right.}{\sqrt{d+ex}\sqrt{bx-cx^2}}\cdots}{15ce^2}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

$$\Big\downarrow \text{1269}$$

$$\frac{\frac{\left(5bcde(be+2cd)(-9Ace+3bBe+8Bcd)-\left(-2b^2e^2+3bcde+8c^2d^2\right)\left(9Ace(be+2cd)-B\left(-4b^2e^2+7bcde+16c^2d^2\right)\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}+\frac{d(be+cd)\left(9Ace\left(-b^2e^2+16bc\cdots\right.\right.}{\cdots}}{15ce^2}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

$$\Big\downarrow \text{1169}$$

$$\frac{\frac{\sqrt{x}\sqrt{b-cx}\left(5bcde(be+2cd)(-9Ace+3bBe+8Bcd)-\left(-2b^2e^2+3bcde+8c^2d^2\right)\left(9Ace(be+2cd)-B\left(-4b^2e^2+7bcde+16c^2d^2\right)\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}+\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\cdots}{\cdots}}{15ce^2}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

$$\Big\downarrow \text{122}$$

$$\frac{\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(5bcde(be+2cd)(-9Ace+3bBe+8Bcd)-\left(-2b^2e^2+3bcde+8c^2d^2\right)\left(9Ace(be+2cd)-B\left(-4b^2e^2+7bcde+16c^2d^2\right)\right)\right)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}+\frac{d\sqrt{x}\sqrt{b-c\cdots}}{\cdots}}{15ce^2}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

$$\Big\downarrow \text{120}$$

$$\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(9Ace\left(-b^2e^2+16bcde+16c^2d^2\right)-B\left(4b^3e^3-9b^2cde^2+120bc^2d^2e+128c^3d^3\right)\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}+\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(5bcde(be+2cd)\right.}{}}{15ce^2}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

$$\Big\downarrow 127$$

$$\frac{\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(9Ace\left(-b^2e^2+16bcde+16c^2d^2\right)-B\left(4b^3e^3-9b^2cde^2+120bc^2d^2e+128c^3d^3\right)\right)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}+\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(5bc\right.}{}}{15ce^2}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

$$\Big\downarrow 126$$

$$\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(5bcde(be+2cd)(-9Ace+3bBe+8Bcd)-\left(-2b^2e^2+3bcde+8c^2d^2\right)\left(9Ace(be+2cd)-B\left(-4b^2e^2+7bcde+16c^2d^2\right)\right)\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{15ce^2}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(-9Ace+3bBe+8Bcd-7Bcex)}{63ce^2}$$

input
```
Int[((A + B*x)*(b*x - c*x^2)^(3/2))/Sqrt[d + e*x],x]
```

output
```
(-2*Sqrt[d + e*x]*(8*B*c*d + 3*b*B*e - 9*A*c*e - 7*B*c*e*x)*(b*x - c*x^2)^
(3/2))/(63*c*e^2) + ((-2*Sqrt[d + e*x]*(9*A*c*e*(8*c^2*d^2 + 11*b*c*d*e +
b^2*e^2) - 2*B*(32*c^3*d^3 + 42*b*c^2*d^2*e + 3*b^2*c*d*e^2 - 2*b^3*e^3) -
 3*c*e*(9*A*c*e*(2*c*d + b*e) - B*(16*c^2*d^2 + 7*b*c*d*e - 4*b^2*e^2))*x)
*Sqrt[b*x - c*x^2])/(15*c*e^2) + ((2*Sqrt[b]*(5*b*c*d*e*(2*c*d + b*e)*(8*B
*c*d + 3*b*B*e - 9*A*c*e) - (8*c^2*d^2 + 3*b*c*d*e - 2*b^2*e^2)*(9*A*c*e*(
2*c*d + b*e) - B*(16*c^2*d^2 + 7*b*c*d*e - 4*b^2*e^2)))*Sqrt[x]*Sqrt[1 - (
c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)
/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(
c*d + b*e)*(9*A*c*e*(16*c^2*d^2 + 16*b*c*d*e - b^2*e^2) - B*(128*c^3*d^3 +
 120*b*c^2*d^2*e - 9*b^2*c*d*e^2 + 4*b^3*e^3))*Sqrt[x]*Sqrt[1 - (c*x)/b]*S
qrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d
))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2]))/(15*c*e^2))/(21*c*e^2)
```

Defintions of rubi rules used

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

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 2.90 (sec) , antiderivative size = 1050, normalized size of antiderivative = 1.67

method	result	size
elliptic	Expression too large to display	1050
default	Expression too large to display	2075

input
```
int((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/x/(-c*x+b)*(
-2/9*B/e*c*x^3*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/7*(A*c^2-2*B*b*c+2
/9*B/e*c*(4*b*e-4*c*d))/c/e*x^2*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/5
*(-2*A*b*c+B*b^2+7/9*B/e*c*b*d+2/7*(A*c^2-2*B*b*c+2/9*B/e*c*(4*b*e-4*c*d))
/c/e*(3*b*e-3*c*d))/c/e*x*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/3*(b^2*
A+5/7*(A*c^2-2*B*b*c+2/9*B/e*c*(4*b*e-4*c*d))/c/e*b*d+2/5*(-2*A*b*c+B*b^2+
7/9*B/e*c*b*d+2/7*(A*c^2-2*B*b*c+2/9*B/e*c*(4*b*e-4*c*d))/c/e*(3*b*e-3*c*d
))/c/e*(2*b*e-2*c*d))/c/e*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2/3*(b^2*
A+5/7*(A*c^2-2*B*b*c+2/9*B/e*c*(4*b*e-4*c*d))/c/e*b*d+2/5*(-2*A*b*c+B*b^2+
7/9*B/e*c*b*d+2/7*(A*c^2-2*B*b*c+2/9*B/e*c*(4*b*e-4*c*d))/c/e*(3*b*e-3*c*d
))/c/e*(2*b*e-2*c*d))/c/e^2*b*d^2*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))
^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x
+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(3/5*(-2*A*b*c+B*b^2+7/9*B/e*c
*b*d+2/7*(A*c^2-2*B*b*c+2/9*B/e*c*(4*b*e-4*c*d))/c/e*(3*b*e-3*c*d))/c/e*b*
d+2/3*(b^2*A+5/7*(A*c^2-2*B*b*c+2/9*B/e*c*(4*b*e-4*c*d))/c/e*b*d+2/5*(-2*A
*b*c+B*b^2+7/9*B/e*c*b*d+2/7*(A*c^2-2*B*b*c+2/9*B/e*c*(4*b*e-4*c*d))/c/e*(
3*b*e-3*c*d))/c/e*(2*b*e-2*c*d))/c/e*(b*e-c*d))*d/e*((x+d/e)/d*e)^(1/2)*((
x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(
1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/
c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 717, normalized size of antiderivative = 1.14

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{\sqrt{d+ex}}\,dx=\text{Too large to display}$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(1/2),x, algorithm="fricas")
```

output
```
2/945*((128*B*c^5*d^5 + 8*(31*B*b*c^4 - 18*A*c^5)*d^4*e + (95*B*b^2*c^3 -
288*A*b*c^4)*d^3*e^2 - (20*B*b^3*c^2 + 117*A*b^2*c^3)*d^2*e^3 + (7*B*b^4*c
 + 27*A*b^3*c^2)*d*e^4 - 2*(4*B*b^5 + 9*A*b^4*c)*e^5)*sqrt(-c*e)*weierstra
ssPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 +
 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d
- b*e)/(c*e)) + 3*(128*B*c^5*d^4*e + 8*(23*B*b*c^4 - 18*A*c^5)*d^3*e^2 + 2
7*(B*b^2*c^3 - 8*A*b*c^4)*d^2*e^3 - (11*B*b^3*c^2 + 36*A*b^2*c^3)*d*e^4 +
2*(4*B*b^4*c + 9*A*b^3*c^2)*e^5)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 +
 b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*
d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e +
 b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*
b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) - 3*(35*B*c^5*e^5*x^
3 - 64*B*c^5*d^3*e^2 - 12*(7*B*b*c^4 - 6*A*c^5)*d^2*e^3 - 3*(2*B*b^2*c^3 -
 33*A*b*c^4)*d*e^4 + (4*B*b^3*c^2 + 9*A*b^2*c^3)*e^5 - 5*(8*B*c^5*d*e^4 +
(10*B*b*c^4 - 9*A*c^5)*e^5)*x^2 + (48*B*c^5*d^2*e^3 + (61*B*b*c^4 - 54*A*c
^5)*d*e^4 + 3*(B*b^2*c^3 - 24*A*b*c^4)*e^5)*x)*sqrt(-c*x^2 + b*x)*sqrt(e*x
 + d))/(c^4*e^6)
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{\sqrt{d+ex}}\,dx=\int \frac{\left(-x(-b+cx)\right)^{\frac{3}{2}}(A+Bx)}{\sqrt{d+ex}}\,dx$$

input
```
integrate((B*x+A)*(-c*x**2+b*x)**(3/2)/(e*x+d)**(1/2),x)
```

output
```
Integral((-x*(-b + c*x))**(3/2)*(A + B*x)/sqrt(d + e*x), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{\sqrt{d+ex}}\,dx=\int \frac{\left(-cx^2+bx\right)^{\frac{3}{2}}(Bx+A)}{\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(1/2),x, algorithm="maxima")
```

output
```
integrate((-c*x^2 + b*x)^(3/2)*(B*x + A)/sqrt(e*x + d), x)
```

Giac [F]

$$\int \frac{(A+Bx)\,(bx-cx^2)^{3/2}}{\sqrt{d+ex}}\,dx = \int \frac{(-cx^2+bx)^{\frac{3}{2}}(Bx+A)}{\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(1/2),x, algorithm="giac")
```

output
```
integrate((-c*x^2 + b*x)^(3/2)*(B*x + A)/sqrt(e*x + d), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\,(bx-cx^2)^{3/2}}{\sqrt{d+ex}}\,dx = \int \frac{(b\,x-c\,x^2)^{3/2}\,(A+B\,x)}{\sqrt{d+e\,x}}\,dx$$

input
```
int(((b*x - c*x^2)^(3/2)*(A + B*x))/(d + e*x)^(1/2),x)
```

output
```
int(((b*x - c*x^2)^(3/2)*(A + B*x))/(d + e*x)^(1/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\,(bx-cx^2)^{3/2}}{\sqrt{d+ex}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(1/2),x)
```

output

```
( - 432*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b**2*c*d*e**2 + 288*sqrt(x)*
sqrt(d + e*x)*sqrt(b - c*x)*a*b**2*c*e**3*x - 324*sqrt(x)*sqrt(d + e*x)*sq
rt(b - c*x)*a*b*c**2*d**2*e - 72*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c
**2*d*e**2*x - 180*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c**2*e**3*x**2
- 216*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*c**3*d**2*e*x + 180*sqrt(x)*sq
rt(d + e*x)*sqrt(b - c*x)*a*c**3*d*e**2*x**2 + 18*sqrt(x)*sqrt(d + e*x)*sq
rt(b - c*x)*b**4*d*e**2 - 12*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**4*e**3
*x + 366*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**3*c*d**2*e - 232*sqrt(x)*s
qrt(d + e*x)*sqrt(b - c*x)*b**3*c*d*e**2*x + 200*sqrt(x)*sqrt(d + e*x)*sqr
t(b - c*x)*b**3*c*e**3*x**2 + 288*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2
*c**2*d**3 + 52*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*d**2*e*x - 4
0*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*d*e**2*x**2 - 140*sqrt(x)*
sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*e**3*x**3 + 192*sqrt(x)*sqrt(d + e*x
)*sqrt(b - c*x)*b*c**3*d**3*x - 160*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*
c**3*d**2*e*x**2 + 140*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c**3*d*e**2*x
**3 + 54*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2
*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2)
,x)*a*b**4*c*e**5 - 162*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*
d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x +
 c**2*d*e*x**2),x)*a*b**3*c**2*d*e**4 - 540*int((sqrt(x)*sqrt(d + e*x)*...
```

3.144 $\int \frac{(A+Bx)(bx-cx^2)^{3/2}}{(d+ex)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 533

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{3/2}}\,dx=\frac{2(7Ace(8cd+7be)-B(64c^2d^2+60bcde+b^2e^2))\sqrt{d+ex}\sqrt{bx-cx^2}}{35ce^4}$$
$$-\frac{2(7Ae(6cd+5be)-Bd(48cd+43be))x\sqrt{d+ex}\sqrt{bx-cx^2}}{35de^3}$$
$$-\frac{2c(8Bd-7Ae)x^2\sqrt{d+ex}\sqrt{bx-cx^2}}{7de^2}-\frac{2(Bd-Ae)x\left(bx-cx^2\right)^{3/2}}{de\sqrt{d+ex}}$$
$$+\frac{2\sqrt{b}(7Ace(16c^2d^2+16bcde+b^2e^2)-B(128c^3d^3+136bc^2d^2e+11b^2cde^2-2b^3e^3))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\,\mathrm{I}}{35c^{3/2}e^5\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$
$$-\frac{2\sqrt{b}d(cd+be)\left(56Ace(2cd+be)-B(128c^2d^2+72bcde-b^2e^2)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\mathrm{EllipticF}\left(\arcsin\left(\right.\right.}{35c^{3/2}e^5\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
2/35*(7*A*c*e*(7*b*e+8*c*d)-B*(b^2*e^2+60*b*c*d*e+64*c^2*d^2))*(e*x+d)^(1/
2)*(-c*x^2+b*x)^(1/2)/c/e^4-2/35*(7*A*e*(5*b*e+6*c*d)-B*d*(43*b*e+48*c*d))
*x*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/d/e^3-2/7*c*(-7*A*e+8*B*d)*x^2*(e*x+d)
^(1/2)*(-c*x^2+b*x)^(1/2)/d/e^2-2*(-A*e+B*d)*x*(-c*x^2+b*x)^(3/2)/d/e/(e*x
+d)^(1/2)+2/35*b^(1/2)*(7*A*c*e*(b^2*e^2+16*b*c*d*e+16*c^2*d^2)-B*(-2*b^3*
e^3+11*b^2*c*d*e^2+136*b*c^2*d^2*e+128*c^3*d^3))*x^(1/2)*(1-c*x/b)^(1/2)*(
e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(3/2)/e
^5/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)-2/35*b^(1/2)*d*(b*e+c*d)*(56*A*c*e*(
b*e+2*c*d)-B*(-b^2*e^2+72*b*c*d*e+128*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(1
+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(3/2)/
e^5/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 27.08 (sec) , antiderivative size = 518, normalized size of antiderivative = 0.97

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{3/2}}\,dx = \frac{2\sqrt{x(b-cx)}\left(\frac{\left(-7Ace\left(16c^2d^2+16bcde+b^2e^2\right)+B\left(128c^3d^3+136bc^2d^2e+11b^2cde^2-2b^3e^3\right)\right)(d+\cdots}{\sqrt{x}}\cdots\right.}{\cdots}$$

input
```
Integrate[((A + B*x)*(b*x - c*x^2)^(3/2))/(d + e*x)^(3/2),x]
```

output
```
(2*Sqrt[x*(b - c*x)]*(((-7*A*c*e*(16*c^2*d^2 + 16*b*c*d*e + b^2*e^2) + B*(
128*c^3*d^3 + 136*b*c^2*d^2*e + 11*b^2*c*d*e^2 - 2*b^3*e^3))*(d + e*x))/Sq
rt[x] - c*e*Sqrt[x]*(35*c*d*(B*d - A*e)*(c*d + b*e) + (-7*A*c*e*(3*c*d + 2
*b*e) + B*(29*c^2*d^2 + 25*b*c*d*e + b^2*e^2))*(d + e*x) + c*e*(-13*B*c*d
- 8*b*B*e + 7*A*c*e)*x*(d + e*x) + 5*B*c^2*e^2*x^2*(d + e*x)) + (I*Sqrt[-(
b/c)]*c*e*(7*A*c*e*(16*c^2*d^2 + 16*b*c*d*e + b^2*e^2) - B*(128*c^3*d^3 +
136*b*c^2*d^2*e + 11*b^2*c*d*e^2 - 2*b^3*e^3))*Sqrt[1 - b/(c*x)]*Sqrt[1 +
d/(e*x)]*x*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])/(b
- c*x) + (I*b*e*(c*d + b*e)*(7*A*c*e*(8*c*d + b*e) - 2*B*(32*c^2*d^2 + 6*b
*c*d*e - b^2*e^2))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x*EllipticF[I*ArcSi
nh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])/(Sqrt[-(b/c)]*(b - c*x))))/(35*
c^2*e^5*Sqrt[x]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.32 (sec) , antiderivative size = 458, normalized size of antiderivative = 0.86, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {1230, 27, 1231, 27, 1269, 1169, 122, 120, 127, 126}

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

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{3/2}}dx$$

$$\Big\downarrow \text{1230}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-\frac{6\int \frac{(b(8Bd-7Ae)-(16Bcd+bBe-14Ace)x)\sqrt{bx-cx^2}}{2\sqrt{d+ex}}dx}{7e^2}$$

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

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-\frac{3\int \frac{(b(8Bd-7Ae)-(16Bcd+bBe-14Ace)x)\sqrt{bx-cx^2}}{\sqrt{d+ex}}dx}{7e^2}$$

$$\Big\downarrow \text{1231}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-$$
$$\frac{3\left(\frac{2\int \frac{bd\left(7Ace(8cd+7be)-B\left(64c^2d^2+60bced+b^2e^2\right)\right)+\left(5bce(8Bd-7Ae)(2cd+be)+(16Bcd+bBe-14Ace)\left(8c^2d^2+3bced-2b^2e^2\right)\right)x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{15ce^2}-\frac{2\sqrt{bx-cx^2}\sqrt{d+e}\cdots\right.}{7e^2}$$

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

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-$$
$$\frac{3\left(\frac{\int \frac{bd\left(7Ace(8cd+7be)-B\left(64c^2d^2+60bced+b^2e^2\right)\right)+\left(5bce(8Bd-7Ae)(2cd+be)+(16Bcd+bBe-14Ace)\left(8c^2d^2+3bced-2b^2e^2\right)\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{15ce^2}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}\cdots\right.}{7e^2}$$

$$\Big\downarrow \text{1269}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-\frac{3\left(\frac{\frac{d(be+cd)\left(56Ace(be+2cd)-B\left(-b^2e^2+72bcde+128c^2d^2\right)\right)\int\frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}+\frac{\left(\left(-2b^2e^2+3bcde+8c^2d^2\right)(-14Ace+bBe+16Bcd)+5bce(8Bd-7Ae)(be+2\cdots\right.}{e}}{15ce^2}\cdots\right)}{7e^2}$$

$\downarrow$ 1169

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-\frac{3\left(\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(56Ace(be+2cd)-B\left(-b^2e^2+72bcde+128c^2d^2\right)\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}+\frac{\sqrt{x}\sqrt{b-cx}\left(\left(-2b^2e^2+3bcde+8c^2d^2\right)(-14Ace+bBe+16Bcd)+5\cdots\right.}{e\sqrt{bx-cx^2}}}{15ce^2}\cdots\right)}{7e^2}$$

$\downarrow$ 122

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-\frac{3\left(\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(56Ace(be+2cd)-B\left(-b^2e^2+72bcde+128c^2d^2\right)\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}+\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(\left(-2b^2e^2+3bcde+8c^2d^2\right)(-14Ace+bBe+1\cdots\right.}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}\cdots}}}{15ce^2}\cdots\right)}{7\cdots}$$

$\downarrow$ 120

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-\frac{3\left(\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(56Ace(be+2cd)-B\left(-b^2e^2+72bcde+128c^2d^2\right)\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}+\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(\left(-2b^2e^2+3bcde+8c^2d^2\right)(-14Ace+bB\cdots\right.}{\sqrt{ce}\sqrt{bx-\cdots}}}{15ce^2}\cdots\right)}{\cdots}$$

$\downarrow$ 127

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-\frac{3\left(\frac{\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(56Ace(be+2cd)-B\left(-b^2e^2+72bcde+128c^2d^2\right)\right)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}+\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(\left(-2b^2e^2+3bcde+8c^2d^2\right)(-\cdots\right.}{\cdots}}{15ce^2}\cdots\right)}{\cdots}$$

$$\Big\downarrow \ 126$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-7Ae+8Bd+Bex)}{7e^2\sqrt{d+ex}}-$$

$$3\left(\frac{\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(56Ace(be+2cd)-B\left(-b^2e^2+72bcde+128c^2d^2\right)\right)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}+\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(\left(-2b^2e^2+3bcd\right.\right.}{}}{15ce^2}\right.$$

input
```
Int[((A + B*x)*(b*x - c*x^2)^(3/2))/(d + e*x)^(3/2),x]
```

output
```
(2*(8*B*d - 7*A*e + B*e*x)*(b*x - c*x^2)^(3/2))/(7*e^2*Sqrt[d + e*x]) - (3
*((-2*Sqrt[d + e*x]*(7*A*c*e*(8*c*d + 7*b*e) - B*(64*c^2*d^2 + 60*b*c*d*e
+ b^2*e^2) + 3*c*e*(16*B*c*d + b*B*e - 14*A*c*e)*x)*Sqrt[b*x - c*x^2])/(15
*c*e^2) + ((2*Sqrt[b]*(5*b*c*e*(8*B*d - 7*A*e)*(2*c*d + b*e) + (16*B*c*d +
 b*B*e - 14*A*c*e)*(8*c^2*d^2 + 3*b*c*d*e - 2*b^2*e^2))*Sqrt[x]*Sqrt[1 - (
c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)
/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(
c*d + b*e)*(56*A*c*e*(2*c*d + b*e) - B*(128*c^2*d^2 + 72*b*c*d*e - b^2*e^2
))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*S
qrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x
^2]))/(15*c*e^2)))/(7*e^2)
```

Defintions of rubi rules used

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

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1231
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2)
 - g*(c*d + 2*c*d*p - b*e*p) + g*c*e*(m + 2*p + 1)*x)*((a + b*x + c*x^2)^p/
(c*e^2*(m + 2*p + 1)*(m + 2*p + 2))), x] - Simp[p/(c*e^2*(m + 2*p + 1)*(m +
 2*p + 2))   Int[(d + e*x)^m*(a + b*x + c*x^2)^(p - 1)*Simp[c*e*f*(b*d - 2*
a*e)*(m + 2*p + 2) + g*(a*e*(b*e - 2*c*d*m + b*e*m) + b*d*(b*e*p - c*d - 2*
c*d*p)) + (c*e*f*(2*c*d - b*e)*(m + 2*p + 2) + g*(b^2*e^2*(p + m + 1) - 2*c
^2*d^2*(1 + 2*p) - c*e*(b*d*(m - 2*p) + 2*a*e*(m + 2*p + 1))))*x, x], x], x
] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (IntegerQ[p] ||  !R
ationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILtQ[m + 2*p, 0] && (Integer
Q[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1178 vs. $2(469) = 938$.

Time = 2.57 (sec) , antiderivative size = 1179, normalized size of antiderivative = 2.21

method	result	size
elliptic	Expression too large to display	1179
default	Expression too large to display	1581

input
```
int((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/x/(-c*x+b)*(
2*(-c*e*x^2+b*e*x)*d*(A*b*e^2+A*c*d*e-B*b*d*e-B*c*d^2)/e^5/((x+d/e)*(-c*e*
x^2+b*e*x))^(1/2)-2/7*B*c/e^2*x^2*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2
/5*(1/e^2*c*(A*c*e-2*B*b*e-B*c*d)+2/7*B*c/e^2*(3*b*e-3*c*d))/c/e*x*(-c*e*x
^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/3*(-1/e^3*(2*A*b*c*e^2+A*c^2*d*e-B*b^2*e
^2-2*B*b*c*d*e-B*c^2*d^2)+5/7*B*c/e^2*b*d+2/5*(1/e^2*c*(A*c*e-2*B*b*e-B*c*
d)+2/7*B*c/e^2*(3*b*e-3*c*d))/c/e*(2*b*e-2*c*d))/c/e*(-c*e*x^3+b*e*x^2-c*d
*x^2+b*d*x)^(1/2)+2*(-d*(A*b^2*e^3+2*A*b*c*d*e^2+A*c^2*d^2*e-B*b^2*d*e^2-2
*B*b*c*d^2*e-B*c^2*d^3)/e^5+d*(A*b*e^2+A*c*d*e-B*b*d*e-B*c*d^2)/e^5*(b*e+c
*d)-b/e^4*d*(A*b*e^2+A*c*d*e-B*b*d*e-B*c*d^2)+1/3*(-1/e^3*(2*A*b*c*e^2+A*c
^2*d*e-B*b^2*e^2-2*B*b*c*d*e-B*c^2*d^2)+5/7*B*c/e^2*b*d+2/5*(1/e^2*c*(A*c*
e-2*B*b*e-B*c*d)+2/7*B*c/e^2*(3*b*e-3*c*d))/c/e*(2*b*e-2*c*d))/c/e*b*d)*d/
e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+
b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c
))^(1/2))+2*(1/e^4*(A*b^2*e^3+2*A*b*c*d*e^2+A*c^2*d^2*e-B*b^2*d*e^2-2*B*b*
c*d^2*e-B*c^2*d^3)+d*(A*b*e^2+A*c*d*e-B*b*d*e-B*c*d^2)/e^4*c+3/5*(1/e^2*c*
(A*c*e-2*B*b*e-B*c*d)+2/7*B*c/e^2*(3*b*e-3*c*d))/c/e*b*d+2/3*(-1/e^3*(2*A*
b*c*e^2+A*c^2*d*e-B*b^2*e^2-2*B*b*c*d*e-B*c^2*d^2)+5/7*B*c/e^2*b*d+2/5*(1/
e^2*c*(A*c*e-2*B*b*e-B*c*d)+2/7*B*c/e^2*(3*b*e-3*c*d))/c/e*(2*b*e-2*c*d))/
c/e*(b*e-c*d))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x...
```

Fricas [A] (verification not implemented)

Time = 0.14 (sec) , antiderivative size = 837, normalized size of antiderivative = 1.57

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{3/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(3/2),x, algorithm="fricas")
```

output
```
-2/105*((128*B*c^4*d^5 + 8*(25*B*b*c^3 - 14*A*c^4)*d^4*e + (55*B*b^2*c^2 -
 168*A*b*c^3)*d^3*e^2 - 2*(5*B*b^3*c + 21*A*b^2*c^2)*d^2*e^3 + (2*B*b^4 +
7*A*b^3*c)*d*e^4 + (128*B*c^4*d^4*e + 8*(25*B*b*c^3 - 14*A*c^4)*d^3*e^2 +
(55*B*b^2*c^2 - 168*A*b*c^3)*d^2*e^3 - 2*(5*B*b^3*c + 21*A*b^2*c^2)*d*e^4
+ (2*B*b^4 + 7*A*b^3*c)*e^5)*x)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^
2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2
*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*(128
*B*c^4*d^4*e + 8*(17*B*b*c^3 - 14*A*c^4)*d^3*e^2 + (11*B*b^2*c^2 - 112*A*b
*c^3)*d^2*e^3 - (2*B*b^3*c + 7*A*b^2*c^2)*d*e^4 + (128*B*c^4*d^3*e^2 + 8*(
17*B*b*c^3 - 14*A*c^4)*d^2*e^3 + (11*B*b^2*c^2 - 112*A*b*c^3)*d*e^4 - (2*B
*b^3*c + 7*A*b^2*c^2)*e^5)*x)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*
c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e
^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^
2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3
*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) + 3*(5*B*c^4*e^5*x^3 +
64*B*c^4*d^3*e^2 + 4*(15*B*b*c^3 - 14*A*c^4)*d^2*e^3 + (B*b^2*c^2 - 49*A*b
*c^3)*d*e^4 - (8*B*c^4*d*e^4 + (8*B*b*c^3 - 7*A*c^4)*e^5)*x^2 + (16*B*c^4*
d^2*e^3 + (17*B*b*c^3 - 14*A*c^4)*d*e^4 + (B*b^2*c^2 - 14*A*b*c^3)*e^5)*x)
*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/(c^3*e^7*x + c^3*d*e^6)
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{3/2}}\,dx = \int \frac{\left(-x(-b+cx)\right)^{\frac{3}{2}}(A+Bx)}{(d+ex)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x**2+b*x)**(3/2)/(e*x+d)**(3/2),x)
```

output
```
Integral((-x*(-b + c*x))**(3/2)*(A + B*x)/(d + e*x)**(3/2), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\,(bx-cx^2)^{3/2}}{(d+ex)^{3/2}}\,dx=\int \frac{(-cx^2+bx)^{\frac{3}{2}}(Bx+A)}{(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(3/2),x, algorithm="maxima")
```

output
```
integrate((-c*x^2 + b*x)^(3/2)*(B*x + A)/(e*x + d)^(3/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)\,(bx-cx^2)^{3/2}}{(d+ex)^{3/2}}\,dx=\int \frac{(-cx^2+bx)^{\frac{3}{2}}(Bx+A)}{(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(3/2),x, algorithm="giac")
```

output
```
integrate((-c*x^2 + b*x)^(3/2)*(B*x + A)/(e*x + d)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\,(bx-cx^2)^{3/2}}{(d+ex)^{3/2}}\,dx=\int \frac{(b\,x-c\,x^2)^{3/2}\,(A+B\,x)}{(d+e\,x)^{3/2}}\,dx$$

input
```
int(((b*x - c*x^2)^(3/2)*(A + B*x))/(d + e*x)^(3/2),x)
```

output
```
int(((b*x - c*x^2)^(3/2)*(A + B*x))/(d + e*x)^(3/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(bx-cx^2)^{3/2}}{(d+ex)^{3/2}}\,dx = \text{too large to display}$$

input

```
int((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(3/2),x)
```

output

```
(84*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b**2*c*e**2 + 84*sqrt(x)*sqrt(d
+ e*x)*sqrt(b - c*x)*a*b*c**2*d*e + 56*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)
*a*b*c**2*e**2*x + 56*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*c**3*d*e*x - 2
8*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*c**3*e**2*x**2 - 6*sqrt(x)*sqrt(d
+ e*x)*sqrt(b - c*x)*b**4*e**2 - 102*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b
**3*c*d*e - 4*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**3*c*e**2*x - 96*sqrt(
x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*d**2 - 68*sqrt(x)*sqrt(d + e*x)*s
qrt(b - c*x)*b**2*c**2*d*e*x + 32*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2
*c**2*e**2*x**2 - 64*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c**3*d**2*x + 3
2*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c**3*d*e*x**2 - 20*sqrt(x)*sqrt(d
+ e*x)*sqrt(b - c*x)*b*c**3*e**2*x**3 - 42*int((sqrt(d + e*x)*sqrt(b - c*x
))/(sqrt(x)*b*d**2 + 2*sqrt(x)*b*d*e*x + sqrt(x)*b*e**2*x**2 - sqrt(x)*c*d
**2*x - 2*sqrt(x)*c*d*e*x**2 - sqrt(x)*c*e**2*x**3),x)*a*b**3*c*d**2*e**2
- 42*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b*d**2 + 2*sqrt(x)*b*d*e*x
 + sqrt(x)*b*e**2*x**2 - sqrt(x)*c*d**2*x - 2*sqrt(x)*c*d*e*x**2 - sqrt(x)
*c*e**2*x**3),x)*a*b**3*c*d*e**3*x - 42*int((sqrt(d + e*x)*sqrt(b - c*x))/
(sqrt(x)*b*d**2 + 2*sqrt(x)*b*d*e*x + sqrt(x)*b*e**2*x**2 - sqrt(x)*c*d**2
*x - 2*sqrt(x)*c*d*e*x**2 - sqrt(x)*c*e**2*x**3),x)*a*b**2*c**2*d**3*e - 4
2*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b*d**2 + 2*sqrt(x)*b*d*e*x +
sqrt(x)*b*e**2*x**2 - sqrt(x)*c*d**2*x - 2*sqrt(x)*c*d*e*x**2 - sqrt(x)...
```

3.145 $\int \frac{(A+Bx)(bx-cx^2)^{3/2}}{(d+ex)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 516

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{5/2}}\,dx = -\frac{2(Ae(5cd+2be)-Bd(8cd+5be))x^2\sqrt{bx-cx^2}}{3d^2e^2\sqrt{d+ex}}$$
$$-\frac{2(5Ae(8cd+3be)-4Bd(16cd+9be))\sqrt{d+ex}\sqrt{bx-cx^2}}{15de^4}$$
$$+\frac{2(10Ae(3cd+be)-Bd(48cd+25be))x\sqrt{d+ex}\sqrt{bx-cx^2}}{15d^2e^3}$$
$$-\frac{2(Bd-Ae)x(bx-cx^2)^{3/2}}{3de(d+ex)^{3/2}}$$
$$-\frac{2\sqrt{b}(40Ace(2cd+be)-B(128c^2d^2+88bcde+3b^2e^2))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{15\sqrt{c}e^5\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$
$$+\frac{2\sqrt{b}(5Ae(16c^2d^2+16bcde+3b^2e^2)-Bd(128c^2d^2+152bcde+39b^2e^2))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\operatorname{EllipticF}\left(\right.}{15\sqrt{c}e^5\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2/3*(A*e*(2*b*e+5*c*d)-B*d*(5*b*e+8*c*d))*x^2*(-c*x^2+b*x)^(1/2)/d^2/e^2/
(e*x+d)^(1/2)-2/15*(5*A*e*(3*b*e+8*c*d)-4*B*d*(9*b*e+16*c*d))*(e*x+d)^(1/2
)*(-c*x^2+b*x)^(1/2)/d/e^4+2/15*(10*A*e*(b*e+3*c*d)-B*d*(25*b*e+48*c*d))*x
*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/d^2/e^3-2/3*(-A*e+B*d)*x*(-c*x^2+b*x)^(3
/2)/d/e/(e*x+d)^(3/2)-2/15*b^(1/2)*(40*A*c*e*(b*e+2*c*d)-B*(3*b^2*e^2+88*b
*c*d*e+128*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/
2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(1/2)/e^5/(1+e*x/d)^(1/2)/(-c*x^2+b
*x)^(1/2)+2/15*b^(1/2)*(5*A*e*(3*b^2*e^2+16*b*c*d*e+16*c^2*d^2)-B*d*(39*b^
2*e^2+152*b*c*d*e+128*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*El
lipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(1/2)/e^5/(e*x+d)^(1/2
)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 26.12 (sec) , antiderivative size = 454, normalized size of antiderivative = 0.88

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{5/2}}\,dx = \frac{2(x(b-cx))^{3/2}\left(\frac{ex(-b+cx)(5Ae(be(3d+4ex)+c(8d^2+10dex+e^2x^2))-B(be(36d^2+47dex+6}{d+ex}\right.}{}$$

input
```
Integrate[((A + B*x)*(b*x - c*x^2)^(3/2))/(d + e*x)^(5/2),x]
```

output
```
(2*(x*(b - c*x))^(3/2)*((e*x*(-b + c*x)*(5*A*e*(b*e*(3*d + 4*e*x) + c*(8*d
^2 + 10*d*e*x + e^2*x^2)) - B*(b*e*(36*d^2 + 47*d*e*x + 6*e^2*x^2) + c*(64
*d^3 + 80*d^2*e*x + 8*d*e^2*x^2 - 3*e^3*x^3))))/(d + e*x) + (Sqrt[-(b/c)]*
(40*A*c*e*(2*c*d + b*e) - B*(128*c^2*d^2 + 88*b*c*d*e + 3*b^2*e^2))*(b - c
*x)*(d + e*x) + I*b*e*(40*A*c*e*(2*c*d + b*e) - B*(128*c^2*d^2 + 88*b*c*d*
e + 3*b^2*e^2))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*Ar
cSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*e*(5*A*c*e*(8*c*d + 5*b
*e) - B*(64*c^2*d^2 + 52*b*c*d*e + 3*b^2*e^2))*Sqrt[1 - b/(c*x)]*Sqrt[1 +
d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))
])/(Sqrt[-(b/c)]*c)))/(15*e^5*x^2*(b - c*x)^2*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.22 (sec) , antiderivative size = 425, normalized size of antiderivative = 0.82, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {1230, 27, 1230, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{5/2}}dx$$

$$\Big\downarrow \text{ 1230}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{2\int \frac{(b(8Bd-5Ae)-(16Bcd+3bBe-10Ace)x)\sqrt{bx-cx^2}}{2(d+ex)^{3/2}}dx}{5e^2}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{\int \frac{(b(8Bd-5Ae)-(16Bcd+3bBe-10Ace)x)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}dx}{5e^2}$$

$$\Big\downarrow \text{ 1230}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{\frac{2\sqrt{bx-cx^2}(-ex(-10Ace+3bBe+16Bcd)+5Ae(3be+8cd)-4Bd(9be+16cd))}{3e^2\sqrt{d+ex}}-\frac{2\int \frac{b(5Ae(8cd+3be)-4Bd(16cd+9be))-\left(40Ace(2cd+be)-B\left(128c^2d^2+\right.\right.}{2\sqrt{d+ex}\sqrt{bx-cx^2}}}{3e^2}}{5e^2}$$

$$\Big\downarrow \text{ 27}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{\frac{2\sqrt{bx-cx^2}(-ex(-10Ace+3bBe+16Bcd)+5Ae(3be+8cd)-4Bd(9be+16cd))}{3e^2\sqrt{d+ex}}-\frac{\int \frac{b(5Ae(8cd+3be)-4Bd(16cd+9be))-\left(40Ace(2cd+be)-B\left(128c^2d^2+8\right.\right.}{\sqrt{d+ex}\sqrt{bx-cx^2}}}{3e^2}}{5e^2}$$

$$\Big\downarrow \text{ 1269}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{\frac{2\sqrt{bx-cx^2}(-ex(-10Ace+3bBe+16Bcd)+5Ae(3be+8cd)-4Bd(9be+16cd))}{3e^2\sqrt{d+ex}}-\frac{\left(5Ae\left(3b^2e^2+16bcde+16c^2d^2\right)-Bd\left(39b^2e^2+152bcde+128c^2d^2\right)\right)\int \frac{}{\sqrt{}}}{e}}{5e^2}$$

$$\Big\downarrow \text{1169}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{\frac{2\sqrt{bx-cx^2}(-ex(-10Ace+3bBe+16Bcd)+5Ae(3be+8cd)-4Bd(9be+16cd))}{3e^2\sqrt{d+ex}}-\frac{\frac{\sqrt{x}\sqrt{b-cx}\left(5Ae\left(3b^2e^2+16bcde+16c^2d^2\right)-Bd\left(39b^2e^2+152bcde+128c^2\right.\right.}{e\sqrt{bx-cx^2}}}{}}{5e^2}$$

$$\Big\downarrow \text{122}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{\frac{2\sqrt{bx-cx^2}(-ex(-10Ace+3bBe+16Bcd)+5Ae(3be+8cd)-4Bd(9be+16cd))}{3e^2\sqrt{d+ex}}-\frac{\frac{\sqrt{x}\sqrt{b-cx}\left(5Ae\left(3b^2e^2+16bcde+16c^2d^2\right)-Bd\left(39b^2e^2+152bcde+128c^2\right.\right.}{e\sqrt{bx-cx^2}}}{}}{5e^2}$$

$$\Big\downarrow \text{120}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{\frac{2\sqrt{bx-cx^2}(-ex(-10Ace+3bBe+16Bcd)+5Ae(3be+8cd)-4Bd(9be+16cd))}{3e^2\sqrt{d+ex}}-\frac{\frac{\sqrt{x}\sqrt{b-cx}\left(5Ae\left(3b^2e^2+16bcde+16c^2d^2\right)-Bd\left(39b^2e^2+152bcde+128c^2\right.\right.}{e\sqrt{bx-cx^2}}}{}}{5e^2}$$

$$\Big\downarrow \text{127}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{\frac{2\sqrt{bx-cx^2}(-ex(-10Ace+3bBe+16Bcd)+5Ae(3be+8cd)-4Bd(9be+16cd))}{3e^2\sqrt{d+ex}}-\frac{\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}\left(5Ae\left(3b^2e^2+16bcde+16c^2d^2\right)-Bd\left(39b^2e^2+152bc\right.\right.}{e\sqrt{bx-cx^2}\sqrt{d+ex}}}{}}{5e^2}$$

$$\Big\downarrow \text{126}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}(-5Ae+8Bd+3Bex)}{15e^2(d+ex)^{3/2}}-\frac{\frac{2\sqrt{bx-cx^2}(-ex(-10Ace+3bBe+16Bcd)+5Ae(3be+8cd)-4Bd(9be+16cd))}{3e^2\sqrt{d+ex}}-\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}\left(5Ae\left(3b^2e^2+16bcde+16c^2d^2\right)-Bd\left(39b^2e^2+15\right.\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+e}}}{}}{5e^2}$$

input
```
Int[((A + B*x)*(b*x - c*x^2)^(3/2))/(d + e*x)^(5/2),x]
```

output
```
(2*(8*B*d - 5*A*e + 3*B*e*x)*(b*x - c*x^2)^(3/2))/(15*e^2*(d + e*x)^(3/2))
 - ((2*(5*A*e*(8*c*d + 3*b*e) - 4*B*d*(16*c*d + 9*b*e) - e*(16*B*c*d + 3*b
*B*e - 10*A*c*e)*x)*Sqrt[b*x - c*x^2])/(3*e^2*Sqrt[d + e*x]) - ((-2*Sqrt[b
]*(40*A*c*e*(2*c*d + b*e) - B*(128*c^2*d^2 + 88*b*c*d*e + 3*b^2*e^2))*Sqrt
[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqr
t[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) +
(2*Sqrt[b]*(5*A*e*(16*c^2*d^2 + 16*b*c*d*e + 3*b^2*e^2) - B*d*(128*c^2*d^2
 + 152*b*c*d*e + 39*b^2*e^2))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*
EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*S
qrt[d + e*x]*Sqrt[b*x - c*x^2]))/(3*e^2))/(5*e^2)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 938 vs. $2(450) = 900$.

Time = 3.00 (sec) , antiderivative size = 939, normalized size of antiderivative = 1.82

method	result
elliptic	$\frac{\sqrt{x(-cx+b)}\,\sqrt{(-cx+b)x(ex+d)}\left(\frac{2d\left(Ab\,e^{2}+Acde-Bbde-Bc\,d^{2}\right)\sqrt{-ce\,x^{3}+be\,x^{2}-cd\,x^{2}+bdx}}{3e^{6}\left(x+\frac{d}{e}\right)^{2}}-\frac{2\left(-ce\,x^{2}+bex\right)\left(4Ab\,e^{2}+8Acde-7Bbde-1\right.}{3e^{5}\sqrt{\left(x+\frac{d}{e}\right)\left(-ce\,x^{2}+bex\right)}}\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/x/(-c*x+b)*(
2/3*d*(A*b*e^2+A*c*d*e-B*b*d*e-B*c*d^2)/e^6*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*
x)^(1/2)/(x+d/e)^2-2/3*(-c*e*x^2+b*e*x)*(4*A*b*e^2+8*A*c*d*e-7*B*b*d*e-11*
B*c*d^2)/e^5/((x+d/e)*(-c*e*x^2+b*e*x))^(1/2)-2/5*B*c/e^3*x*(-c*e*x^3+b*e*
x^2-c*d*x^2+b*d*x)^(1/2)-2/3*(c/e^3*(A*c*e-2*B*b*e-2*B*c*d)+2/5*B*c/e^3*(2
*b*e-2*c*d))/c/e*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2*((A*b^2*e^3+4*A*
b*c*d*e^2+3*A*c^2*d^2*e-2*B*b^2*d*e^2-6*B*b*c*d^2*e-4*B*c^2*d^3)/e^5-1/3*d
*(A*b*e^2+A*c*d*e-B*b*d*e-B*c*d^2)/e^5*c-1/3*(4*A*b*e^2+8*A*c*d*e-7*B*b*d*
e-11*B*c*d^2)/e^5*(b*e+c*d)+1/3*b/e^4*(4*A*b*e^2+8*A*c*d*e-7*B*b*d*e-11*B*
c*d^2)+1/3*(c/e^3*(A*c*e-2*B*b*e-2*B*c*d)+2/5*B*c/e^3*(2*b*e-2*c*d))/c/e*b
*d)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*
e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d
/e-b/c))^(1/2))+2*(-1/e^4*(2*A*b*c*e^2+2*A*c^2*d*e-B*b^2*e^2-4*B*b*c*d*e-3
*B*c^2*d^2)-1/3*(4*A*b*e^2+8*A*c*d*e-7*B*b*d*e-11*B*c*d^2)/e^4*c+3/5*B*c/e
^3*b*d+2/3*(c/e^3*(A*c*e-2*B*b*e-2*B*c*d)+2/5*B*c/e^3*(2*b*e-2*c*d))/c/e*(
b*e-c*d))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2
)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*
e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/
(-d/e-b/c))^(1/2))))
```

Fricas [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 872, normalized size of antiderivative = 1.69

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(5/2),x, algorithm="fricas")
```

output
```
2/45*((128*B*c^3*d^5 + 8*(19*B*b*c^2 - 10*A*c^3)*d^4*e + (23*B*b^2*c - 80*
A*b*c^2)*d^3*e^2 - (3*B*b^3 + 5*A*b^2*c)*d^2*e^3 + (128*B*c^3*d^3*e^2 + 8*
(19*B*b*c^2 - 10*A*c^3)*d^2*e^3 + (23*B*b^2*c - 80*A*b*c^2)*d*e^4 - (3*B*b
^3 + 5*A*b^2*c)*e^5)*x^2 + 2*(128*B*c^3*d^4*e + 8*(19*B*b*c^2 - 10*A*c^3)*
d^3*e^2 + (23*B*b^2*c - 80*A*b*c^2)*d^2*e^3 - (3*B*b^3 + 5*A*b^2*c)*d*e^4)
*x)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*
e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e
^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*(128*B*c^3*d^4*e + 8*(11*B*b*c^2
 - 10*A*c^3)*d^3*e^2 + (3*B*b^2*c - 40*A*b*c^2)*d^2*e^3 + (128*B*c^3*d^2*e
^3 + 8*(11*B*b*c^2 - 10*A*c^3)*d*e^4 + (3*B*b^2*c - 40*A*b*c^2)*e^5)*x^2 +
 2*(128*B*c^3*d^3*e^2 + 8*(11*B*b*c^2 - 10*A*c^3)*d^2*e^3 + (3*B*b^2*c - 4
0*A*b*c^2)*d*e^4)*x)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b
^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^
3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c
^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^
3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) - 3*(3*B*c^3*e^5*x^3 - 64*B*c^3*
d^3*e^2 + 15*A*b*c^2*d*e^4 - 4*(9*B*b*c^2 - 10*A*c^3)*d^2*e^3 - (8*B*c^3*d
*e^4 + (6*B*b*c^2 - 5*A*c^3)*e^5)*x^2 - (80*B*c^3*d^2*e^3 - 20*A*b*c^2*e^5
 + (47*B*b*c^2 - 50*A*c^3)*d*e^4)*x)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/(c^
2*e^8*x^2 + 2*c^2*d*e^7*x + c^2*d^2*e^6)
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{5/2}}\,dx = \int \frac{\left(-x(-b+cx)\right)^{\frac{3}{2}}(A+Bx)}{(d+ex)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x**2+b*x)**(3/2)/(e*x+d)**(5/2),x)
```

output
```
Integral((-x*(-b + c*x))**(3/2)*(A + B*x)/(d + e*x)**(5/2), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{5/2}}\,dx=\int \frac{(-cx^2+bx)^{\frac{3}{2}}(Bx+A)}{(ex+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(5/2),x, algorithm="maxima")
```

output
```
integrate((-c*x^2 + b*x)^(3/2)*(B*x + A)/(e*x + d)^(5/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{5/2}}\,dx=\int \frac{(-cx^2+bx)^{\frac{3}{2}}(Bx+A)}{(ex+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(5/2),x, algorithm="giac")
```

output
```
integrate((-c*x^2 + b*x)^(3/2)*(B*x + A)/(e*x + d)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{5/2}}\,dx=\int \frac{\left(b\,x-c\,x^2\right)^{3/2}\,\left(A+B\,x\right)}{\left(d+e\,x\right)^{5/2}}\,dx$$

input
```
int(((b*x - c*x^2)^(3/2)*(A + B*x))/(d + e*x)^(5/2),x)
```

output
```
int(((b*x - c*x^2)^(3/2)*(A + B*x))/(d + e*x)^(5/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{5/2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(5/2),x)
```

output
```
(120*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b**2*c*d*e**2 + 80*sqrt(x)*sqrt
(d + e*x)*sqrt(b - c*x)*a*b**2*c*e**3*x + 180*sqrt(x)*sqrt(d + e*x)*sqrt(b
 - c*x)*a*b*c**2*d**2*e + 200*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c**2
*d*e**2*x - 20*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c**2*e**3*x**2 + 12
0*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*c**3*d**2*e*x - 20*sqrt(x)*sqrt(d
+ e*x)*sqrt(b - c*x)*a*c**3*d*e**2*x**2 - 18*sqrt(x)*sqrt(d + e*x)*sqrt(b
- c*x)*b**4*d*e**2 - 12*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**4*e**3*x -
246*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**3*c*d**2*e - 176*sqrt(x)*sqrt(d
 + e*x)*sqrt(b - c*x)*b**3*c*d*e**2*x + 24*sqrt(x)*sqrt(d + e*x)*sqrt(b -
c*x)*b**3*c*e**3*x**2 - 288*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*
d**3 - 356*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*d**2*e*x + 56*sqr
t(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*d*e**2*x**2 - 12*sqrt(x)*sqrt(d
 + e*x)*sqrt(b - c*x)*b**2*c**2*e**3*x**3 - 192*sqrt(x)*sqrt(d + e*x)*sqrt
(b - c*x)*b*c**3*d**3*x + 32*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c**3*d*
*2*e*x**2 - 12*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c**3*d*e**2*x**3 - 60
*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**2*d**3*e + 3*sqrt(x)*b**2*d
**2*e**2*x + 3*sqrt(x)*b**2*d*e**3*x**2 + sqrt(x)*b**2*e**4*x**3 + sqrt(x)
*b*c*d**4 + 2*sqrt(x)*b*c*d**3*e*x - 2*sqrt(x)*b*c*d*e**3*x**3 - sqrt(x)*b
*c*e**4*x**4 - sqrt(x)*c**2*d**4*x - 3*sqrt(x)*c**2*d**3*e*x**2 - 3*sqrt(x
)*c**2*d**2*e**2*x**3 - sqrt(x)*c**2*d*e**3*x**4),x)*a*b**4*c*d**4*e**3...
```

3.146 $\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 564

$$
\begin{aligned}
\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}\,dx &= \frac{2(8Bcd+5bBe-3Ace)x^2\sqrt{bx-cx^2}}{15de^2(d+ex)^{3/2}} \\
&- \frac{2\left(3Ace(6cd+5be)-B\left(48c^2d^2+55bcde+10b^2e^2\right)\right)x\sqrt{bx-cx^2}}{15de^3(cd+be)\sqrt{d+ex}} \\
&+ \frac{2\left(3Ace(8cd+7be)-B\left(64c^2d^2+76bcde+15b^2e^2\right)\right)\sqrt{d+ex}\sqrt{bx-cx^2}}{15de^4(cd+be)} \\
&- \frac{2(Bd-Ae)x\left(bx-cx^2\right)^{3/2}}{5de(d+ex)^{5/2}} \\
&+ \frac{2\sqrt{b}\sqrt{c}\left(3Ae\left(16c^2d^2+16bcde+b^2e^2\right)-Bd\left(128c^2d^2+168bcde+43b^2e^2\right)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\Big(\arcsin}{15de^5(cd+be)\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} \\
&- \frac{2\sqrt{b}\left(24Ace(2cd+be)-B\left(128c^2d^2+104bcde+15b^2e^2\right)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)\right.}{15\sqrt{c}e^5\sqrt{d+ex}\sqrt{bx-cx^2}}
\end{aligned}
$$

output
```
2/15*(-3*A*c*e+5*B*b*e+8*B*c*d)*x^2*(-c*x^2+b*x)^(1/2)/d/e^2/(e*x+d)^(3/2)
-2/15*(3*A*c*e*(5*b*e+6*c*d)-B*(10*b^2*e^2+55*b*c*d*e+48*c^2*d^2))*x*(-c*x
^2+b*x)^(1/2)/d/e^3/(b*e+c*d)/(e*x+d)^(1/2)+2/15*(3*A*c*e*(7*b*e+8*c*d)-B*
(15*b^2*e^2+76*b*c*d*e+64*c^2*d^2))*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/d/e^4
/(b*e+c*d)-2/5*(-A*e+B*d)*x*(-c*x^2+b*x)^(3/2)/d/e/(e*x+d)^(5/2)+2/15*b^(1
/2)*c^(1/2)*(3*A*e*(b^2*e^2+16*b*c*d*e+16*c^2*d^2)-B*d*(43*b^2*e^2+168*b*c
*d*e+128*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)
*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/d/e^5/(b*e+c*d)/(1+e*x/d)^(1/2)/(-c*x^2
+b*x)^(1/2)-2/15*b^(1/2)*(24*A*c*e*(b*e+2*c*d)-B*(15*b^2*e^2+104*b*c*d*e+1
28*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(
1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(1/2)/e^5/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2
)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 27.87 (sec) , antiderivative size = 540, normalized size of antiderivative = 0.96

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}\,dx =$$

$$-\frac{2(x(b-cx))^{3/2}\left(\sqrt{-\frac{b}{c}}ex(b-cx)\left(3d^2(Bd-Ae)(cd+be)^2-d(cd+be)(-6Ae(2cd+be)+Bd(17cd+\right.\right.}{}$$

input
```
Integrate[((A + B*x)*(b*x - c*x^2)^(3/2))/(d + e*x)^(7/2),x]
```

output
```
(-2*(x*(b - c*x))^(3/2)*(Sqrt[-(b/c)]*e*x*(b - c*x)*(3*d^2*(B*d - A*e)*(c*
d + b*e)^2 - d*(c*d + b*e)*(-6*A*e*(2*c*d + b*e) + B*d*(17*c*d + 11*b*e))*
(d + e*x) + (-3*A*e*(11*c^2*d^2 + 11*b*c*d*e + b^2*e^2) + B*d*(73*c^2*d^2
+ 93*b*c*d*e + 23*b^2*e^2))*(d + e*x)^2 + 5*B*c*d*(c*d + b*e)*(d + e*x)^3)
 + (d + e*x)^2*(Sqrt[-(b/c)]*(3*A*e*(16*c^2*d^2 + 16*b*c*d*e + b^2*e^2) -
B*d*(128*c^2*d^2 + 168*b*c*d*e + 43*b^2*e^2))*(b - c*x)*(d + e*x) + I*b*e*
(3*A*e*(16*c^2*d^2 + 16*b*c*d*e + b^2*e^2) - B*d*(128*c^2*d^2 + 168*b*c*d*
e + 43*b^2*e^2))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*A
rcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*e*(c*d + b*e)*(3*A*e*(
8*c*d + b*e) - 4*B*d*(16*c*d + 7*b*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]
*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])))/(15
*Sqrt[-(b/c)]*d*e^5*(c*d + b*e)*x^2*(b - c*x)^2*(d + e*x)^(5/2))
```

Rubi [A] (verified)

Time = 1.54 (sec) , antiderivative size = 520, normalized size of antiderivative = 0.92, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {1229, 27, 1230, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}dx$$

$$\Big\downarrow \text{1229}$$

$$\frac{2\int \frac{(bd(8Bcd+5bBe-3Ace)+c(3Ae(2cd+be)-Bd(16cd+13be))x)\sqrt{bx-cx^2}}{2(d+ex)^{3/2}}dx}{5de^2(be+cd)}-\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(bd(8Bcd+5bBe-3Ace)+c(3Ae(2cd+be)-Bd(16cd+13be))x)\sqrt{bx-cx^2}}{(d+ex)^{3/2}}dx}{5de^2(be+cd)}-\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \text{1230}$$

$$\frac{\frac{2\sqrt{bx-cx^2}\left(d\left(3Ace(7be+8cd)-B\left(15b^2e^2+76bcde+64c^2d^2\right)\right)+cex(3Ae(be+2cd)-Bd(13be+16cd))\right)}{3e^2\sqrt{d+ex}}-\frac{2\int \frac{bd\left(3Ace(8cd+7be)-B\left(64c^2d^2+76bced+\cdots\right.\right.}{\cdots}}{\cdots}}{5de^2(be+cd)}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

$\Big\downarrow$ 27

$$\frac{\frac{2\sqrt{bx-cx^2}\left(d\left(3Ace(7be+8cd)-B\left(15b^2e^2+76bcde+64c^2d^2\right)\right)+cex(3Ae(be+2cd)-Bd(13be+16cd))\right)}{3e^2\sqrt{d+ex}}-\frac{\int \frac{bd\left(3Ace(8cd+7be)-B\left(64c^2d^2+76bced+1\cdots\right.\right.}{\cdots}}{\cdots}}{5de^2(be+cd)}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

$\Big\downarrow$ 1269

$$\frac{\frac{2\sqrt{bx-cx^2}\left(d\left(3Ace(7be+8cd)-B\left(15b^2e^2+76bcde+64c^2d^2\right)\right)+cex(3Ae(be+2cd)-Bd(13be+16cd))\right)}{3e^2\sqrt{d+ex}}-\frac{\frac{d(be+cd)\left(24Ace(be+2cd)-B\left(15b^2e^2+104bc\cdots\right.\right.}{e}}{\cdots}}{5de^2(be+cd)}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

$\Big\downarrow$ 1169

$$\frac{\frac{2\sqrt{bx-cx^2}\left(d\left(3Ace(7be+8cd)-B\left(15b^2e^2+76bcde+64c^2d^2\right)\right)+cex(3Ae(be+2cd)-Bd(13be+16cd))\right)}{3e^2\sqrt{d+ex}}-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(24Ace(be+2cd)-B\left(15b^2\cdots\right.\right.}{e\sqrt{\cdots}}}{\cdots}}{5de^2(be+cd)}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

$\Big\downarrow$ 122

$$\frac{\frac{2\sqrt{bx-cx^2}\left(d\left(3Ace(7be+8cd)-B\left(15b^2e^2+76bcde+64c^2d^2\right)\right)+cex(3Ae(be+2cd)-Bd(13be+16cd))\right)}{3e^2\sqrt{d+ex}}-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(24Ace(be+2cd)-B\left(15b^2\cdots\right.\right.}{e\sqrt{\cdots}}}{\cdots}}{5de^2(be+\cdots}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

$\Big\downarrow$ 120

$$\frac{\frac{2\sqrt{bx-cx^2}\left(d\left(3Ace(7be+8cd)-B\left(15b^2e^2+76bcde+64c^2d^2\right)\right)+cex(3Ae(be+2cd)-Bd(13be+16cd))\right)}{3e^2\sqrt{d+ex}}-\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(24Ace(be+2cd)-B\left(15b^2\cdots\right.\right.}{e\sqrt{\cdots}}}{5de^2\cdots}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

$\Big\downarrow$ 127

$$\frac{\frac{2\sqrt{bx-cx^2}\left(d\left(3Ace(7be+8cd)-B\left(15b^2e^2+76bcde+64c^2d^2\right)\right)+cex(3Ae(be+2cd)-Bd(13be+16cd))\right)}{3e^2\sqrt{d+ex}}-\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(24Ace(be+2cd)\cdots\right.}{e\cdots}}{5\cdots}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

$\Big\downarrow$ 126

$$\frac{\frac{2\sqrt{bx-cx^2}\left(d\left(3Ace(7be+8cd)-B\left(15b^2e^2+76bcde+64c^2d^2\right)\right)+cex(3Ae(be+2cd)-Bd(13be+16cd))\right)}{3e^2\sqrt{d+ex}}-\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(24Ace(be+\cdots\right.}{\cdots}}{\cdots}$$

$$\frac{2\left(bx-cx^2\right)^{3/2}\left(d^2(-3Ace+5bBe+8Bcd)-ex(3Ae(be+2cd)-Bd(8be+11cd))\right)}{15de^2(d+ex)^{5/2}(be+cd)}$$

input
```
Int[((A + B*x)*(b*x - c*x^2)^(3/2))/(d + e*x)^(7/2),x]
```

output
```
(-2*(d^2*(8*B*c*d + 5*b*B*e - 3*A*c*e) - e*(3*A*e*(2*c*d + b*e) - B*d*(11*
c*d + 8*b*e))*x)*(b*x - c*x^2)^(3/2))/(15*d*e^2*(c*d + b*e)*(d + e*x)^(5/2
)) + ((2*(d*(3*A*c*e*(8*c*d + 7*b*e) - B*(64*c^2*d^2 + 76*b*c*d*e + 15*b^2
*e^2)) + c*e*(3*A*e*(2*c*d + b*e) - B*d*(16*c*d + 13*b*e))*x)*Sqrt[b*x - c
*x^2])/(3*e^2*Sqrt[d + e*x]) - ((-2*Sqrt[b]*Sqrt[c]*(3*A*e*(16*c^2*d^2 + 1
6*b*c*d*e + b^2*e^2) - B*d*(128*c^2*d^2 + 168*b*c*d*e + 43*b^2*e^2))*Sqrt[
x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt
[b]], -((b*e)/(c*d))])/(e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b
]*d*(c*d + b*e)*(24*A*c*e*(2*c*d + b*e) - B*(128*c^2*d^2 + 104*b*c*d*e + 1
5*b^2*e^2))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(
Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[
b*x - c*x^2]))/(3*e^2))/(5*d*e^2*(c*d + b*e))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1229
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m + 1))*((a + b*x + c*x^2
)^p/(e^2*(m + 1)*(m + 2)*(c*d^2 - b*d*e + a*e^2)))*((d*g - e*f*(m + 2))*(c*
d^2 - b*d*e + a*e^2) - d*p*(2*c*d - b*e)*(e*f - d*g) - e*(g*(m + 1)*(c*d^2
- b*d*e + a*e^2) + p*(2*c*d - b*e)*(e*f - d*g))*x), x] - Simp[p/(e^2*(m + 1
)*(m + 2)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 2)*(a + b*x + c*x^2
)^(p - 1)*Simp[2*a*c*e*(e*f - d*g)*(m + 2) + b^2*e*(d*g*(p + 1) - e*f*(m +
p + 2)) + b*(a*e^2*g*(m + 1) - c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2))) - c
*(2*c*d*(d*g*(2*p + 1) - e*f*(m + 2*p + 2)) - e*(2*a*e*g*(m + 1) - b*(d*g*(
m - 2*p) + e*f*(m + 2*p + 2))))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g
}, x] && GtQ[p, 0] && LtQ[m, -2] && LtQ[m + 2*p, 0] &&  !ILtQ[m + 2*p + 3,
0]
```

rule 1230
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) -
 d*g*(2*p + 1) + e*g*(m + 1)*x)*((a + b*x + c*x^2)^p/(e^2*(m + 1)*(m + 2*p
+ 2))), x] + Simp[p/(e^2*(m + 1)*(m + 2*p + 2))   Int[(d + e*x)^(m + 1)*(a
+ b*x + c*x^2)^(p - 1)*Simp[g*(b*d + 2*a*e + 2*a*e*m + 2*b*d*p) - f*b*e*(m
+ 2*p + 2) + (g*(2*c*d + b*e + b*e*m + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x,
 x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && GtQ[p, 0] && (LtQ[m, -
1] || EqQ[p, 1] || (IntegerQ[p] &&  !RationalQ[m])) && NeQ[m, -1] &&  !ILtQ
[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 4.59 (sec) , antiderivative size = 962, normalized size of antiderivative = 1.71

method	result
elliptic	$\frac{\sqrt{x(-cx+b)}\,\sqrt{(-cx+b)x(ex+d)}\left(\frac{2d\left(Ab\,e^2+Acde-Bbde-Bc\,d^2\right)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{5e^7\left(x+\frac{d}{e}\right)^3}-\frac{2\left(6Ab\,e^2+12Acde-11Bbde-17Bc\,d^2\right)\sqrt{-c}}{15e^6\left(x+\frac{d}{e}\right)^2}\right.}{}$
default	Expression too large to display

input

```
int((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(7/2),x,method=_RETURNVERBOSE)
```

output

```
1/(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/x/(-c*x+b)*(
2/5*d*(A*b*e^2+A*c*d*e-B*b*d*e-B*c*d^2)/e^7*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*
x)^(1/2)/(x+d/e)^3-2/15*(6*A*b*e^2+12*A*c*d*e-11*B*b*d*e-17*B*c*d^2)/e^6*(
-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x+d/e)^2+2/15*(-c*e*x^2+b*e*x)/d/(b
*e+c*d)/e^5*(3*A*b^2*e^3+33*A*b*c*d*e^2+33*A*c^2*d^2*e-23*B*b^2*d*e^2-93*B
*b*c*d^2*e-73*B*c^2*d^3)/((x+d/e)*(-c*e*x^2+b*e*x))^(1/2)-2/3*B*c/e^4*(-c*
e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2*(-(2*A*b*c*e^2+3*A*c^2*d*e-B*b^2*e^2-
6*B*b*c*d*e-6*B*c^2*d^2)/e^5+1/15*c*(6*A*b*e^2+12*A*c*d*e-11*B*b*d*e-17*B*
c*d^2)/e^5+1/15/e^5*(3*A*b^2*e^3+33*A*b*c*d*e^2+33*A*c^2*d^2*e-23*B*b^2*d*
e^2-93*B*b*c*d^2*e-73*B*c^2*d^3)/d-1/15*b/e^4/d/(b*e+c*d)*(3*A*b^2*e^3+33*
A*b*c*d*e^2+33*A*c^2*d^2*e-23*B*b^2*d*e^2-93*B*b*c*d^2*e-73*B*c^2*d^3)+1/3
*B*c/e^4*b*d)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^
(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2)
,(-d/e/(-d/e-b/c))^(1/2))+2*(c/e^4*(A*c*e-2*B*b*e-3*B*c*d)+1/15/e^4*c*(3*A
*b^2*e^3+33*A*b*c*d*e^2+33*A*c^2*d^2*e-23*B*b^2*d*e^2-93*B*b*c*d^2*e-73*B*
c^2*d^3)/d/(b*e+c*d)+2/3*B*c/e^4*(b*e-c*d))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/
c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)
*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*El
lipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1248 vs. $2(497) = 994$.

Time = 0.19 (sec) , antiderivative size = 1248, normalized size of antiderivative = 2.21

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(7/2),x, algorithm="fricas")
```

output
```
-2/45*((128*B*c^3*d^7 + 3*A*b^3*d^3*e^4 + 8*(29*B*b*c^2 - 6*A*c^3)*d^6*e +
 (103*B*b^2*c - 72*A*b*c^2)*d^5*e^2 + 2*(B*b^3 - 9*A*b^2*c)*d^4*e^3 + (128
*B*c^3*d^4*e^3 + 3*A*b^3*e^7 + 8*(29*B*b*c^2 - 6*A*c^3)*d^3*e^4 + (103*B*b
^2*c - 72*A*b*c^2)*d^2*e^5 + 2*(B*b^3 - 9*A*b^2*c)*d*e^6)*x^3 + 3*(128*B*c
^3*d^5*e^2 + 3*A*b^3*d*e^6 + 8*(29*B*b*c^2 - 6*A*c^3)*d^4*e^3 + (103*B*b^2
*c - 72*A*b*c^2)*d^3*e^4 + 2*(B*b^3 - 9*A*b^2*c)*d^2*e^5)*x^2 + 3*(128*B*c
^3*d^6*e + 3*A*b^3*d^2*e^5 + 8*(29*B*b*c^2 - 6*A*c^3)*d^5*e^2 + (103*B*b^2
*c - 72*A*b*c^2)*d^4*e^3 + 2*(B*b^3 - 9*A*b^2*c)*d^3*e^4)*x)*sqrt(-c*e)*we
ierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^
3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x
 + c*d - b*e)/(c*e)) + 3*(128*B*c^3*d^6*e - 3*A*b^2*c*d^3*e^4 + 24*(7*B*b*
c^2 - 2*A*c^3)*d^5*e^2 + (43*B*b^2*c - 48*A*b*c^2)*d^4*e^3 + (128*B*c^3*d^
3*e^4 - 3*A*b^2*c*e^7 + 24*(7*B*b*c^2 - 2*A*c^3)*d^2*e^5 + (43*B*b^2*c - 4
8*A*b*c^2)*d*e^6)*x^3 + 3*(128*B*c^3*d^4*e^3 - 3*A*b^2*c*d*e^6 + 24*(7*B*b
*c^2 - 2*A*c^3)*d^3*e^4 + (43*B*b^2*c - 48*A*b*c^2)*d^2*e^5)*x^2 + 3*(128*
B*c^3*d^5*e^2 - 3*A*b^2*c*d^2*e^5 + 24*(7*B*b*c^2 - 2*A*c^3)*d^4*e^3 + (43
*B*b^2*c - 48*A*b*c^2)*d^3*e^4)*x)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2
 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*
c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e
 + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2...
```

Sympy [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}\,dx=\int \frac{\left(-x(-b+cx)\right)^{\frac{3}{2}}(A+Bx)}{(d+ex)^{\frac{7}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x**2+b*x)**(3/2)/(e*x+d)**(7/2),x)
```

output
```
Integral((-x*(-b + c*x))**(3/2)*(A + B*x)/(d + e*x)**(7/2), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}\,dx=\int \frac{\left(-cx^2+bx\right)^{\frac{3}{2}}(Bx+A)}{(ex+d)^{\frac{7}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(7/2),x, algorithm="maxima")
```

output
```
integrate((-c*x^2 + b*x)^(3/2)*(B*x + A)/(e*x + d)^(7/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}\,dx=\int \frac{\left(-cx^2+bx\right)^{\frac{3}{2}}(Bx+A)}{(ex+d)^{\frac{7}{2}}}\,dx$$

input
```
integrate((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(7/2),x, algorithm="giac")
```

output
```
integrate((-c*x^2 + b*x)^(3/2)*(B*x + A)/(e*x + d)^(7/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}\,dx=\int \frac{{\left(b\,x-c\,x^2\right)}^{3/2}\,\left(A+B\,x\right)}{{\left(d+e\,x\right)}^{7/2}} \,d x$$

input
```
int(((b*x - c*x^2)^(3/2)*(A + B*x))/(d + e*x)^(7/2),x)
```

output
```
int(((b*x - c*x^2)^(3/2)*(A + B*x))/(d + e*x)^(7/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\left(bx-cx^2\right)^{3/2}}{(d+ex)^{7/2}}\,dx=\text{too large to display}$$

input
```
int((B*x+A)*(-c*x^2+b*x)^(3/2)/(e*x+d)^(7/2),x)
```

output
```
( - 36*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b**2*c*d*e**2 - 48*sqrt(x)*sq
rt(d + e*x)*sqrt(b - c*x)*a*b**2*c*e**3*x - 108*sqrt(x)*sqrt(d + e*x)*sqrt
(b - c*x)*a*b*c**2*d**2*e - 168*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c*
*2*d*e**2*x - 24*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c**2*e**3*x**2 -
72*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*c**3*d**2*e*x - 12*sqrt(x)*sqrt(d
 + e*x)*sqrt(b - c*x)*a*c**3*d*e**2*x**2 + 18*sqrt(x)*sqrt(d + e*x)*sqrt(b
 - c*x)*b**4*d*e**2 + 24*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**4*e**3*x +
 186*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**3*c*d**2*e + 260*sqrt(x)*sqrt(
d + e*x)*sqrt(b - c*x)*b**3*c*d*e**2*x + 32*sqrt(x)*sqrt(d + e*x)*sqrt(b -
 c*x)*b**3*c*e**3*x**2 + 288*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2
*d**3 + 508*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*d**2*e*x + 80*sq
rt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*d*e**2*x**2 - 8*sqrt(x)*sqrt(d
 + e*x)*sqrt(b - c*x)*b**2*c**2*e**3*x**3 + 192*sqrt(x)*sqrt(d + e*x)*sqrt
(b - c*x)*b*c**3*d**3*x + 32*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c**3*d*
*2*e*x**2 - 4*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c**3*d*e**2*x**3 + 36*
int((sqrt(d + e*x)*sqrt(b - c*x))/(2*sqrt(x)*b**2*d**4*e + 8*sqrt(x)*b**2*
d**3*e**2*x + 12*sqrt(x)*b**2*d**2*e**3*x**2 + 8*sqrt(x)*b**2*d*e**4*x**3
+ 2*sqrt(x)*b**2*e**5*x**4 + sqrt(x)*b*c*d**5 + 2*sqrt(x)*b*c*d**4*e*x - 2
*sqrt(x)*b*c*d**3*e**2*x**2 - 8*sqrt(x)*b*c*d**2*e**3*x**3 - 7*sqrt(x)*b*c
*d*e**4*x**4 - 2*sqrt(x)*b*c*e**5*x**5 - sqrt(x)*c**2*d**5*x - 4*sqrt(x...
```

3.147 $\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 459

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx = -\frac{2(5c(bB+7Ac)de+(3cd+4be)(5Bcd+6bBe+7Ace))\sqrt{d+ex}\sqrt{bx-cx^2}}{105c^3}$$

$$-\frac{2(5Bcd+6bBe+7Ace)(d+ex)^{3/2}\sqrt{bx-cx^2}}{35c^2}-\frac{2B(d+ex)^{5/2}\sqrt{bx-cx^2}}{7c}$$

$$+\frac{2\sqrt{b}(7Ace(23c^2d^2+23bcde+8b^2e^2)+B(15c^3d^3+103bc^2d^2e+128b^2cde^2+48b^3e^3))\,\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+e}}{105c^{7/2}e\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$

$$-\frac{2\sqrt{b}d(cd+be)\left(28Ace(2cd+be)+B(15c^2d^2+43bcde+24b^2e^2)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\text{arcsin}\right.}{105c^{7/2}e\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2/105*(5*c*(7*A*c+B*b)*d*e+(4*b*e+3*c*d)*(7*A*c*e+6*B*b*e+5*B*c*d))*(e*x+
d)^(1/2)*(-c*x^2+b*x)^(1/2)/c^3-2/35*(7*A*c*e+6*B*b*e+5*B*c*d)*(e*x+d)^(3/
2)*(-c*x^2+b*x)^(1/2)/c^2-2/7*B*(e*x+d)^(5/2)*(-c*x^2+b*x)^(1/2)/c+2/105*b
^(1/2)*(7*A*c*e*(8*b^2*e^2+23*b*c*d*e+23*c^2*d^2)+B*(48*b^3*e^3+128*b^2*c*
d*e^2+103*b*c^2*d^2*e+15*c^3*d^3))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*E
llipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(7/2)/e/(1+e*x/d)^(1/
2)/(-c*x^2+b*x)^(1/2)-2/105*b^(1/2)*d*(b*e+c*d)*(28*A*c*e*(b*e+2*c*d)+B*(2
4*b^2*e^2+43*b*c*d*e+15*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*
EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(7/2)/e/(e*x+d)^(1/2
)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 24.06 (sec) , antiderivative size = 490, normalized size of antiderivative = 1.07

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx = \frac{2\sqrt{x(b-cx)}\left(-\frac{(7Ace(23c^2d^2+23bcde+8b^2e^2)+B(15c^3d^3+103bc^2d^2e+128b^2cde^2+48b^3e^3))(d+\cdots}{e\sqrt{x}}\cdots\right.}{\cdots}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(5/2))/Sqrt[b*x - c*x^2],x]
```

output
```
(2*Sqrt[x*(b - c*x)]*(-(((7*A*c*e*(23*c^2*d^2 + 23*b*c*d*e + 8*b^2*e^2) +
B*(15*c^3*d^3 + 103*b*c^2*d^2*e + 128*b^2*c*d*e^2 + 48*b^3*e^3))*(d + e*x)
)/(e*Sqrt[x])) - c*Sqrt[x]*(d + e*x)*(7*A*c*e*(11*c*d + 4*b*e + 3*c*e*x) +
 B*(24*b^2*e^2 + b*c*e*(61*d + 18*e*x) + 15*c^2*(3*d^2 + 3*d*e*x + e^2*x^2
))) + (I*Sqrt[-(b/c)]*c*(7*A*c*e*(23*c^2*d^2 + 23*b*c*d*e + 8*b^2*e^2) + B
*(15*c^3*d^3 + 103*b*c^2*d^2*e + 128*b^2*c*d*e^2 + 48*b^3*e^3))*Sqrt[1 - b
/(c*x)]*Sqrt[1 + d/(e*x)]*x*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((
c*d)/(b*e))])/(b - c*x) + (I*(c*d + b*e)*(105*A*c^3*d^2 + 48*b^3*B*e^2 + 8
*b^2*c*e*(13*B*d + 7*A*e) + b*c^2*d*(60*B*d + 133*A*e))*Sqrt[1 - b/(c*x)]*
Sqrt[1 + d/(e*x)]*x*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*
e))])/(Sqrt[-(b/c)]*(b - c*x))))/(105*c^4*Sqrt[x]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.56 (sec) , antiderivative size = 478, normalized size of antiderivative = 1.04, number of steps used = 12, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {1236, 27, 1236, 27, 1236, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx$$

$$\Big\downarrow \text{1236}$$

$$-\frac{2\int -\frac{(d+ex)^{3/2}((bB+7Ac)d+(5Bcd+6bBe+7Ace)x)}{2\sqrt{bx-cx^2}}dx}{7c}-\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(d+ex)^{3/2}((bB+7Ac)d+(5Bcd+6bBe+7Ace)x)}{\sqrt{bx-cx^2}}dx}{7c}-\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$$\Big\downarrow \text{1236}$$

$$\frac{-\frac{2\int -\frac{\sqrt{d+ex}\left(d\left(6Beb^2+c(10Bd+7Ae)b+35Ac^2d\right)+\left(28Ace(2cd+be)+B\left(15c^2d^2+43bced+24b^2e^2\right)\right)x\right)}{2\sqrt{bx-cx^2}}dx}{5c}-\frac{2\sqrt{bx-cx^2}(d+ex)^{3/2}(7Ace+6bBe+5Bcd)}{5c}}{7c}$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$$\Big\downarrow \text{27}$$

$$\frac{\frac{\int \frac{\sqrt{d+ex}\left(d\left(6Beb^2+c(10Bd+7Ae)b+35Ac^2d\right)+\left(28Ace(2cd+be)+B\left(15c^2d^2+43bced+24b^2e^2\right)\right)x\right)}{\sqrt{bx-cx^2}}dx}{5c}-\frac{2\sqrt{bx-cx^2}(d+ex)^{3/2}(7Ace+6bBe+5Bcd)}{5c}}{7c}-$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$$\Big\downarrow \text{1236}$$

$$\frac{\frac{-\frac{2\int -\frac{d\left(24Be^2b^3+ce(61Bd+28Ae)b^2+c^2d(45Bd+77Ae)b+105Ac^3d^2\right)+\left(7Ace\left(23c^2d^2+23bced+8b^2e^2\right)+B\left(15c^3d^3+103bc^2ed^2+128b^2ce^2d+48b^3e^3\right)\right)x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3c}-}{5c}}{7c}$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$\downarrow$ 27

$$\int \frac{d\left(24Be^2b^3+ce(61Bd+28Ae)b^2+c^2d(45Bd+77Ae)b+105Ac^3d^2\right)+\left(7Ace\left(23c^2d^2+23bced+8b^2e^2\right)+B\left(15c^3d^3+103bc^2ed^2+128b^2ce^2d+48b^3e^3\right)\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx - \frac{2\sqrt{bx\cdots}}{\cdots} \quad 3c \quad 5c \quad 7c$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$\downarrow$ 1269

$$\frac{\left(7Ace\left(8b^2e^2+23bcde+23c^2d^2\right)+B\left(48b^3e^3+128b^2cde^2+103bc^2d^2e+15c^3d^3\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e} - \frac{d(be+cd)\left(28Ace(be+2cd)+B\left(24b^2e^2+43bcde+15c^2d^2\right)\right)\int \frac{\cdots}{\sqrt{d\cdots}}}{e} \quad 3c \quad 5c \quad 7c$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$\downarrow$ 1169

$$\frac{\sqrt{x}\sqrt{b-cx}\left(7Ace\left(8b^2e^2+23bcde+23c^2d^2\right)+B\left(48b^3e^3+128b^2cde^2+103bc^2d^2e+15c^3d^3\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}} - \frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(28Ace(be+2cd)+B\left(24b^2e^2+43b\cdots\right.\right.}{e\sqrt{bx-cx^2}} \quad 3c \quad 5c \quad 7c$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$\downarrow$ 122

$$\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(7Ace\left(8b^2e^2+23bcde+23c^2d^2\right)+B\left(48b^3e^3+128b^2cde^2+103bc^2d^2e+15c^3d^3\right)\right)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}} - \frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(28Ace(be+2cd)+B\left(24\cdots\right.\right.}{e\sqrt{\cdots}} \quad 3c \quad 5c$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$\downarrow$ 120

$$\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(7Ace\left(8b^2e^2+23bcde+23c^2d^2\right)+B\left(48b^3e^3+128b^2cde^2+103bc^2d^2e+15c^3d^3\right)\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}} - \frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(28Ace(be\cdots\right.}{\cdots} \quad 3c \quad 5c$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$\downarrow$ 127

$$\frac{\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(7Ace\left(8b^2e^2+23bcde+23c^2d^2\right)+B\left(48b^3e^3+128b^2cde^2+103bc^2d^2e+15c^3d^3\right)\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(}{}}{3c}}{5c}$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

$\downarrow$ 126

$$\frac{\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(7Ace\left(8b^2e^2+23bcde+23c^2d^2\right)+B\left(48b^3e^3+128b^2cde^2+103bc^2d^2e+15c^3d^3\right)\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+c}{}}{3c}}{5c}$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{5/2}}{7c}$$

input

```
Int[((A + B*x)*(d + e*x)^(5/2))/Sqrt[b*x - c*x^2],x]
```

output

```
(-2*B*(d + e*x)^(5/2)*Sqrt[b*x - c*x^2])/(7*c) + ((-2*(5*B*c*d + 6*b*B*e +
 7*A*c*e)*(d + e*x)^(3/2)*Sqrt[b*x - c*x^2])/(5*c) + ((-2*(28*A*c*e*(2*c*d
 + b*e) + B*(15*c^2*d^2 + 43*b*c*d*e + 24*b^2*e^2))*Sqrt[d + e*x]*Sqrt[b*x
 - c*x^2])/(3*c) + ((2*Sqrt[b]*(7*A*c*e*(23*c^2*d^2 + 23*b*c*d*e + 8*b^2*e
^2) + B*(15*c^3*d^3 + 103*b*c^2*d^2*e + 128*b^2*c*d*e^2 + 48*b^3*e^3))*Sqr
t[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sq
rt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) -
 (2*Sqrt[b]*d*(c*d + b*e)*(28*A*c*e*(2*c*d + b*e) + B*(15*c^2*d^2 + 43*b*c
*d*e + 24*b^2*e^2))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[
ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*
x]*Sqrt[b*x - c*x^2]))/(3*c))/(5*c))/(7*c)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 2.40 (sec) , antiderivative size = 782, normalized size of antiderivative = 1.70

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2B\,e^2x^2\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{7c}-\frac{2\left(A\,e^3+3Bd\,e^2+\frac{2B\,e^2(3be-3cd)}{7c}\right)x\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{5ce}-\frac{2\left(3Ad\,e^2 \ldots\right.}{\ldots}\right.}{\ldots}$
default	Expression too large to display

input
```
int((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(-2/7*B*e^2/
c*x^2*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/5*(A*e^3+3*B*d*e^2+2/7*B*e^
2/c*(3*b*e-3*c*d))/c/e*x*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/3*(3*A*d
*e^2+3*e*B*d^2+5/7*B*e^2/c*b*d+2/5*(A*e^3+3*B*d*e^2+2/7*B*e^2/c*(3*b*e-3*c
*d))/c/e*(2*b*e-2*c*d))/c/e*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2*(A*d^
3+1/3*(3*A*d*e^2+3*e*B*d^2+5/7*B*e^2/c*b*d+2/5*(A*e^3+3*B*d*e^2+2/7*B*e^2/
c*(3*b*e-3*c*d))/c/e*(2*b*e-2*c*d))/c/e*b*d)*d/e*((x+d/e)/d*e)^(1/2)*((x-b
/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2
)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(3*A*d^2*e+B*d^
3+3/5*(A*e^3+3*B*d*e^2+2/7*B*e^2/c*(3*b*e-3*c*d))/c/e*b*d+2/3*(3*A*d*e^2+3
*e*B*d^2+5/7*B*e^2/c*b*d+2/5*(A*e^3+3*B*d*e^2+2/7*B*e^2/c*(3*b*e-3*c*d))/c
/e*(2*b*e-2*c*d))/c/e*(b*e-c*d))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/
c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c
)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x
+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [A] (verification not implemented)

Time = 0.12 (sec) , antiderivative size = 580, normalized size of antiderivative = 1.26

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx = \frac{2\left((15\,Bc^4d^4-(47\,Bbc^3+154\,Ac^4)d^3e-(158\,Bb^2c^2+231\,Abc^3)d^2e^2-(15\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
2/315*((15*B*c^4*d^4 - (47*B*b*c^3 + 154*A*c^4)*d^3*e - (158*B*b^2*c^2 + 2
31*A*b*c^3)*d^2*e^2 - (152*B*b^3*c + 189*A*b^2*c^2)*d*e^3 - 8*(6*B*b^4 + 7
*A*b^3*c)*e^4)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2
*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*
e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*(15*B*c^4*d^3*e + (10
3*B*b*c^3 + 161*A*c^4)*d^2*e^2 + (128*B*b^2*c^2 + 161*A*b*c^3)*d*e^3 + 8*(
6*B*b^3*c + 7*A*b^2*c^2)*e^4)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*
c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e
^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^
2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3
*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) - 3*(15*B*c^4*e^4*x^2 +
 45*B*c^4*d^2*e^2 + (61*B*b*c^3 + 77*A*c^4)*d*e^3 + 4*(6*B*b^2*c^2 + 7*A*b
*c^3)*e^4 + 3*(15*B*c^4*d*e^3 + (6*B*b*c^3 + 7*A*c^4)*e^4)*x)*sqrt(-c*x^2
+ b*x)*sqrt(e*x + d))/(c^5*e^2)
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(A+Bx)\,(d+ex)^{\frac{5}{2}}}{\sqrt{-x\,(-b+cx)}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**(5/2)/(-c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)**(5/2)/sqrt(-x*(-b + c*x)), x)
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{5}{2}}}{\sqrt{-cx^2+bx}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^(5/2)/sqrt(-c*x^2 + b*x), x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{5}{2}}}{\sqrt{-cx^2+bx}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^(5/2)/sqrt(-c*x^2 + b*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^{5/2}}{\sqrt{b\,x-c\,x^2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(1/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{\sqrt{bx-cx^2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x)
```

output

```
(42*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c*d*e**2 - 28*sqrt(x)*sqrt(d +
 e*x)*sqrt(b - c*x)*a*b*c*e**3*x + 210*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)
*a*c**2*d**2*e + 28*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*c**2*d*e**2*x +
36*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**3*d*e**2 - 24*sqrt(x)*sqrt(d + e
*x)*sqrt(b - c*x)*b**3*e**3*x + 90*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**
2*c*d**2*e - 36*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c*d*e**2*x - 20*s
qrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c*e**3*x**2 + 70*sqrt(x)*sqrt(d +
e*x)*sqrt(b - c*x)*b*c**2*d**3 + 60*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*
c**2*d**2*e*x + 20*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c**2*d*e**2*x**2
+ 56*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x -
 b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*
a*b**3*c*e**5 + 105*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e
+ b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**
2*d*e*x**2),x)*a*b**2*c**2*d*e**4 - 161*int((sqrt(x)*sqrt(d + e*x)*sqrt(b
- c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2
 + c**2*d**2*x + c**2*d*e*x**2),x)*a*c**4*d**3*e**2 + 48*int((sqrt(x)*sqrt
(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*
x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b**5*e**5 + 80*int((sq
rt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 -
2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b**4*c*d*...
```

3.148 $\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}} dx$

Optimal result

Integrand size = 29, antiderivative size = 337

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}} dx = -\frac{2(3Bcd+4bBe+5Ace)\sqrt{d+ex}\sqrt{bx-cx^2}}{15c^2} - \frac{2B(d+ex)^{3/2}\sqrt{bx-cx^2}}{5c} + \frac{2\sqrt{b}(10Ace(2cd+be)+B(3c^2d^2+13bcde+8b^2e^2))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{15c^{5/2}e\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} - \frac{2\sqrt{b}d(cd+be)(3Bcd+4bBe+5Ace)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{15c^{5/2}e\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2/15*(5*A*c*e+4*B*b*e+3*B*c*d)*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/c^2-2/5*B
*(e*x+d)^(3/2)*(-c*x^2+b*x)^(1/2)/c+2/15*b^(1/2)*(10*A*c*e*(b*e+2*c*d)+B*(
8*b^2*e^2+13*b*c*d*e+3*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*Ell
ipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(5/2)/e/(1+e*x/d)^(1/2)
/(-c*x^2+b*x)^(1/2)-2/15*b^(1/2)*d*(b*e+c*d)*(5*A*c*e+4*B*b*e+3*B*c*d)*x^(
1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b
*e/c/d)^(1/2))/c^(5/2)/e/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 21.45 (sec) , antiderivative size = 365, normalized size of antiderivative = 1.08

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}}\,dx = \frac{2\sqrt{x(b-cx)}\left(-\frac{(10Ace(2cd+be)+B(3c^2d^2+13bcde+8b^2e^2))(d+ex)}{e\sqrt{x}} - c\sqrt{x}(d+ex)(5Ac\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(3/2))/Sqrt[b*x - c*x^2],x]
```

output
```
(2*Sqrt[x*(b - c*x)]*(-((((10*A*c*e*(2*c*d + b*e) + B*(3*c^2*d^2 + 13*b*c*d
*e + 8*b^2*e^2))*(d + e*x))/(e*Sqrt[x])) - c*Sqrt[x]*(d + e*x)*(5*A*c*e +
B*(6*c*d + 4*b*e + 3*c*e*x)) + (I*Sqrt[-(b/c)]*c*(10*A*c*e*(2*c*d + b*e) +
 B*(3*c^2*d^2 + 13*b*c*d*e + 8*b^2*e^2))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x
)]*x*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])/(b - c*x)
 + (I*(c*d + b*e)*(15*A*c^2*d + 8*b^2*B*e + b*c*(9*B*d + 10*A*e))*Sqrt[1 -
 b/(c*x)]*Sqrt[1 + d/(e*x)]*x*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -
((c*d)/(b*e))])/(Sqrt[-(b/c)]*(b - c*x))))/(15*c^3*Sqrt[x]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.12 (sec) , antiderivative size = 349, normalized size of antiderivative = 1.04, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {1236, 27, 1236, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}}dx$$

$$\Big\downarrow \ 1236$$

$$-\frac{2\int -\frac{\sqrt{d+ex}((bB+5Ac)d+(3Bcd+4bBe+5Ace)x)}{2\sqrt{bx-cx^2}}dx}{5c} - \frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

$\downarrow$ 27

$$\frac{\int \frac{\sqrt{d+ex}((bB+5Ac)d+(3Bcd+4bBe+5Ace)x)}{\sqrt{bx-cx^2}}dx}{5c}-\frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

$\downarrow$ 1236

$$\frac{-\frac{2\int -\frac{d\left(4Beb^2+c(6Bd+5Ae)b+15Ac^2d\right)+\left(10Ace(2cd+be)+B\left(3c^2d^2+13bced+8b^2e^2\right)\right)x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3c}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(5Ace+4bBe+3Bcd)}{3c}}{5c}-\frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

$\downarrow$ 27

$$\frac{\frac{\int \frac{d\left(4Beb^2+c(6Bd+5Ae)b+15Ac^2d\right)+\left(10Ace(2cd+be)+B\left(3c^2d^2+13bced+8b^2e^2\right)\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3c}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(5Ace+4bBe+3Bcd)}{3c}}{5c}-\frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

$\downarrow$ 1269

$$\frac{\frac{\frac{\left(10Ace(be+2cd)+B\left(8b^2e^2+13bcde+3c^2d^2\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}-\frac{d(be+cd)(5Ace+4bBe+3Bcd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}}{3c}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(5Ace+4bBe+3B}{3c}}{5c}-\frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

$\downarrow$ 1169

$$\frac{\frac{\frac{\sqrt{x}\sqrt{b-cx}\left(10Ace(be+2cd)+B\left(8b^2e^2+13bcde+3c^2d^2\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}-\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(5Ace+4bBe+3Bcd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}}{3c}-2\sqrt{bx-cx^2}\sqrt{d+e}{5c}-\frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

$\downarrow$ 122

$$\frac{\frac{\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(10Ace(be+2cd)+B\left(8b^2e^2+13bcde+3c^2d^2\right)\right)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(5Ace+4bBe+3Bcd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}}{3c}-2\sqrt{bx-c}{5c}-\frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

$\Big\downarrow$ 120

$$\frac{\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(10Ace(be+2cd)+B\left(8b^2e^2+13bcde+3c^2d^2\right)\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(5Ace+4bBe+3Bcd)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}}{3c}}{5c}$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

$\Big\downarrow$ 127

$$\frac{\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(10Ace(be+2cd)+B\left(8b^2e^2+13bcde+3c^2d^2\right)\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(5Ace+4bBe+3Bcd)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\cdots}}{e\sqrt{bx-cx^2}\sqrt{d+ex}}}{3c}}{5c}$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

$\Big\downarrow$ 126

$$\frac{\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(10Ace(be+2cd)+B\left(8b^2e^2+13bcde+3c^2d^2\right)\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(5Ace+4bBe+3Bcd)\text{EllipticF}\left(\cdots\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}}{3c}}{5c}$$

$$\frac{2B\sqrt{bx-cx^2}(d+ex)^{3/2}}{5c}$$

input

```
Int[((A + B*x)*(d + e*x)^(3/2))/Sqrt[b*x - c*x^2],x]
```

output

```
(-2*B*(d + e*x)^(3/2)*Sqrt[b*x - c*x^2])/(5*c) + ((-2*(3*B*c*d + 4*b*B*e +
 5*A*c*e)*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])/(3*c) + ((2*Sqrt[b]*(10*A*c*e*(
2*c*d + b*e) + B*(3*c^2*d^2 + 13*b*c*d*e + 8*b^2*e^2))*Sqrt[x]*Sqrt[1 - (c
*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/
(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) - (2*Sqrt[b]*d*(c
*d + b*e)*(3*B*c*d + 4*b*B*e + 5*A*c*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 +
 (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(S
qrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2]))/(3*c))/(5*c)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.60 (sec) , antiderivative size = 536, normalized size of antiderivative = 1.59

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2Bex\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{5c}-\frac{2\left(A\,e^2+2Bde+\frac{2Be(2be-2cd)}{5c}\right)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{3ce}+\frac{2\left(A\,d^2+\frac{\left(A\,e^2+2\right.}{}\right.}{}\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(-2/5*B*e/c*
x*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2/3*(A*e^2+2*B*d*e+2/5*B*e/c*(2*b
*e-2*c*d))/c/e*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2*(A*d^2+1/3*(A*e^2+
2*B*d*e+2/5*B*e/c*(2*b*e-2*c*d))/c/e*b*d)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)
/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*E
llipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(2*A*d*e+B*d^2+3/5
*B*e/c*b*d+2/3*(A*e^2+2*B*d*e+2/5*B*e/c*(2*b*e-2*c*d))/c/e*(b*e-c*d))*d/e*
((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*
e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e
/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1
/2))))
```

Fricas [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 468, normalized size of antiderivative = 1.39

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}}\,dx = \frac{2\left((3\,Bc^3d^3-(8\,Bbc^2+25\,Ac^3)d^2e-(17\,Bb^2c+25\,Abc^2)de^2-2\,(4\,Bb^3+5\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
2/45*((3*B*c^3*d^3 - (8*B*b*c^2 + 25*A*c^3)*d^2*e - (17*B*b^2*c + 25*A*b*c
^2)*d*e^2 - 2*(4*B*b^3 + 5*A*b^2*c)*e^3)*sqrt(-c*e)*weierstrassPInverse(4/
3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*
e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))
 + 3*(3*B*c^3*d^2*e + (13*B*b*c^2 + 20*A*c^3)*d*e^2 + 2*(4*B*b^2*c + 5*A*b
*c^2)*e^3)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c
^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^
3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -
4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/
3*(3*c*e*x + c*d - b*e)/(c*e))) - 3*(3*B*c^3*e^3*x + 6*B*c^3*d*e^2 + (4*B*
b*c^2 + 5*A*c^3)*e^3)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/(c^4*e^2)
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(A+Bx)\,(d+ex)^{\frac{3}{2}}}{\sqrt{-x\,(-b+cx)}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**(3/2)/(-c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)**(3/2)/sqrt(-x*(-b + c*x)), x)
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{3}{2}}}{\sqrt{-cx^2+bx}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^(3/2)/sqrt(-c*x^2 + b*x), x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{3}{2}}}{\sqrt{-cx^2+bx}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^(3/2)/sqrt(-c*x^2 + b*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}}\,dx=\int \frac{(A+B\,x)\,\left(d+e\,x\right)^{3/2}}{\sqrt{b\,x-c\,x^2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(1/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{\sqrt{bx-cx^2}}\,dx=\text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x)
```

output
```
(20*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*c*d*e + 6*sqrt(x)*sqrt(d + e*x)*
sqrt(b - c*x)*b**2*d*e - 4*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b**2*e**2*x
 + 10*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*b*c*d**2 + 4*sqrt(x)*sqrt(d + e*
x)*sqrt(b - c*x)*b*c*d*e*x + 10*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x
)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*
d**2*x + c**2*d*e*x**2),x)*a*b**2*c*e**4 + 10*int((sqrt(x)*sqrt(d + e*x)*s
qrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**
2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*a*b*c**2*d*e**3 - 20*int((sqrt(x)
*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c
*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*a*c**3*d**2*e**2
+ 8*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x -
b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b
**4*e**4 + 5*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*
e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x
**2),x)*b**3*c*d*e**3 - 10*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b*
*2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*
x + c**2*d*e*x**2),x)*b**2*c**2*d**2*e**2 - 3*int((sqrt(x)*sqrt(d + e*x)*s
qrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**
2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b*c**3*d**3*e - 10*int((sqrt(x)*s
qrt(d + e*x)*sqrt(b - c*x))/(b**2*d*e*x + b**2*e**2*x**2 - b*c*d**2*x -...
```

3.149 $\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 252

$$\begin{aligned}\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx &= -\frac{2B\sqrt{d+ex}\sqrt{bx-cx^2}}{3c} \\ &\quad + \frac{2\sqrt{b}(Bcd+2bBe+3Ace)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\,E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{3c^{3/2}e\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} \\ &\quad - \frac{2\sqrt{b}Bd(cd+be)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{3c^{3/2}e\sqrt{d+ex}\sqrt{bx-cx^2}}\end{aligned}$$

output
```
-2/3*B*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/c+2/3*b^(1/2)*(3*A*c*e+2*B*b*e+B*c
*d)*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2
),(-b*e/c/d)^(1/2))/c^(3/2)/e/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)-2/3*b^(1/
2)*B*d*(b*e+c*d)*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)
*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(3/2)/e/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1
/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 16.00 (sec) , antiderivative size = 276, normalized size of antiderivative = 1.10

$$\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx = \frac{2\sqrt{x(b-cx)}\left(-Bc(d+ex)-\frac{\sqrt{-\frac{b}{c}}(Bcd+2bBe+3Ace)(b-cx)(d+ex)+ibe(Bcd+2bBe+3Ace)\sqrt{1-\frac{b}{cx}}\sqrt{1+\frac{d}{ex}}x^{3/2}E\left(i\text{arcsinh}\right.}{\sqrt{-\frac{b}{c}}e}\right.}{3c^2\sqrt{d+ex}}$$

input
```
Integrate[((A + B*x)*Sqrt[d + e*x])/Sqrt[b*x - c*x^2],x]
```

output
```
(2*Sqrt[x*(b - c*x)]*(-(B*c*(d + e*x)) - (Sqrt[-(b/c)]*(B*c*d + 2*b*B*e +
3*A*c*e)*(b - c*x)*(d + e*x) + I*b*e*(B*c*d + 2*b*B*e + 3*A*c*e)*Sqrt[1 -
b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x
]], -((c*d)/(b*e))] - I*(2*b*B + 3*A*c)*e*(c*d + b*e)*Sqrt[1 - b/(c*x)]*Sq
rt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)
/(b*e))])/(Sqrt[-(b/c)]*e*x*(b - c*x))))/(3*c^2*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.75 (sec) , antiderivative size = 256, normalized size of antiderivative = 1.02, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {1236, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx$$

$$\Big\downarrow \; 1236$$

$$-\frac{2\int -\frac{(bB+3Ac)d+(Bcd+2bBe+3Ace)x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3c}-\frac{2B\sqrt{bx-cx^2}\sqrt{d+ex}}{3c}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(bB+3Ac)d+(Bcd+2bBe+3Ace)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3c}-\frac{2B\sqrt{bx-cx^2}\sqrt{d+ex}}{3c}$$

$$\Big\downarrow \text{1269}$$

$$\frac{\frac{(3Ace+2bBe+Bcd)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}-\frac{Bd(be+cd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}}{3c}-\frac{2B\sqrt{bx-cx^2}\sqrt{d+ex}}{3c}$$

$$\Big\downarrow \text{1169}$$

$$\frac{\frac{\sqrt{x}\sqrt{b-cx}(3Ace+2bBe+Bcd)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}-\frac{Bd\sqrt{x}\sqrt{b-cx}(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}}{3c}-\frac{2B\sqrt{bx-cx^2}\sqrt{d+ex}}{3c}$$

$$\Big\downarrow \text{122}$$

$$\frac{\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(3Ace+2bBe+Bcd)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{Bd\sqrt{x}\sqrt{b-cx}(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}}{3c}-\frac{2B\sqrt{bx-cx^2}\sqrt{d+ex}}{3c}$$

$$\Big\downarrow \text{120}$$

$$\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(3Ace+2bBe+Bcd)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{Bd\sqrt{x}\sqrt{b-cx}(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}}{3c}-\frac{2B\sqrt{bx-cx^2}\sqrt{d+ex}}{3c}$$

$$\Big\downarrow \text{127}$$

$$\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(3Ace+2bBe+Bcd)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{Bd\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\int \frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}}{3c}-\frac{2B\sqrt{bx-cx^2}\sqrt{d+ex}}{3c}$$

$$\Big\downarrow \text{126}$$

$$\frac{\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(3Ace+2bBe+Bcd)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{2\sqrt{b}Bd\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}}{3c}-\frac{2B\sqrt{bx-cx^2}\sqrt{d+ex}}{3c}}{}$$

input
```
Int[((A + B*x)*Sqrt[d + e*x])/Sqrt[b*x - c*x^2],x]
```

output
```
(-2*B*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])/(3*c) + ((2*Sqrt[b]*(B*c*d + 2*b*B*
e + 3*A*c*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqr
t[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt
[b*x - c*x^2]) - (2*Sqrt[b]*B*d*(c*d + b*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt
[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))]
)/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2]))/(3*c)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.39 (sec) , antiderivative size = 399, normalized size of antiderivative = 1.58

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2B\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{3c}+\frac{2\left(Ad+\frac{Bbd}{3c}\right)d\sqrt{\frac{\left(x+\frac{d}{e}\right)e}{d}}\sqrt{\frac{x-\frac{b}{c}}{-\frac{d}{e}-\frac{b}{c}}}\sqrt{-\frac{ex}{d}}\,\mathrm{EllipticF}\left(\sqrt{\frac{\left(x+\frac{d}{e}\right)e}{d}},\sqrt{-\frac{d}{e\left(-\frac{d}{e}-\frac{b}{c}\right)}}\right)}{e\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}\right.}{\sqrt{e}}$
default	$\frac{2\sqrt{ex+d}\,\sqrt{x(-cx+b)}\left(3A\sqrt{\frac{ex+d}{d}}\sqrt{\frac{(-cx+b)e}{be+cd}}\sqrt{-\frac{ex}{d}}\,\mathrm{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)bcd\,e^2+3A\sqrt{\frac{ex+d}{d}}\sqrt{\frac{(-cx+b)e}{be+cd}}\sqrt{-\frac{ex}{d}}\,\mathrm{Elliptic}\right.}{}$

input
```
int((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(-2/3*B/c*(-
c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2*(A*d+1/3*B/c*b*d)*d/e*((x+d/e)/d*e)
^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2
+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(A*
e+B*d+2/3*B/c*(b*e-c*d))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2
)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*Ellipt
icE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*
e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [A] (verification not implemented)

Time = 0.11 (sec) , antiderivative size = 382, normalized size of antiderivative = 1.52

$$\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx =$$

$$-\frac{2\left(3\sqrt{-cx^2+bx}\sqrt{ex+d}Bc^2e^2-(Bc^2d^2-2\,(Bbc+3\,Ac^2)de-(2\,Bb^2+3\,Abc)e^2)\sqrt{-ce}\mathrm{weierstrass}\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
-2/9*(3*sqrt(-c*x^2 + b*x)*sqrt(e*x + d)*B*c^2*e^2 - (B*c^2*d^2 - 2*(B*b*c
 + 3*A*c^2)*d*e - (2*B*b^2 + 3*A*b*c)*e^2)*sqrt(-c*e)*weierstrassPInverse(
4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^
2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e
)) - 3*(B*c^2*d*e + (2*B*b*c + 3*A*c^2)*e^2)*sqrt(-c*e)*weierstrassZeta(4/
3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*
e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2
 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*
c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))))/(c^3*e^
2)
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{-x\,(-b+cx)}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**(1/2)/(-c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)*sqrt(d + e*x)/sqrt(-x*(-b + c*x)), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(Bx+A)\sqrt{ex+d}}{\sqrt{-cx^2+bx}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*sqrt(e*x + d)/sqrt(-c*x^2 + b*x), x)
```

Giac [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(Bx+A)\sqrt{ex+d}}{\sqrt{-cx^2+bx}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*sqrt(e*x + d)/sqrt(-c*x^2 + b*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx = \int \frac{(A+B\,x)\,\sqrt{d+e\,x}}{\sqrt{b\,x-c\,x^2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(1/2))/(b*x - c*x^2)^(1/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(1/2))/(b*x - c*x^2)^(1/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{\sqrt{bx-cx^2}}\,dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x)
```

output

```
(2*sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*a*e + 2*sqrt(x)*sqrt(d + e*x)*sqrt(
b - c*x)*b*d + 3*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b
**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d
*e*x**2),x)*a*b*c*e**3 - 3*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x)*x)/(b*
*2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2 + c**2*d**2*
x + c**2*d*e*x**2),x)*a*c**2*d*e**2 + 2*int((sqrt(x)*sqrt(d + e*x)*sqrt(b
- c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e**2*x**2
 + c**2*d**2*x + c**2*d*e*x**2),x)*b**3*e**3 - int((sqrt(x)*sqrt(d + e*x)*
sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e*x - b*c*e*
*2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b**2*c*d*e**2 - int((sqrt(x)*sqr
t(d + e*x)*sqrt(b - c*x)*x)/(b**2*d*e + b**2*e**2*x - b*c*d**2 - 2*b*c*d*e
*x - b*c*e**2*x**2 + c**2*d**2*x + c**2*d*e*x**2),x)*b*c**2*d**2*e + int((
sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x))/(b**2*d*e*x + b**2*e**2*x**2 - b*c*d*
*2*x - 2*b*c*d*e*x**2 - b*c*e**2*x**3 + c**2*d**2*x**2 + c**2*d*e*x**3),x)
*a*b**2*d*e**2 - 3*int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x))/(b**2*d*e*x +
 b**2*e**2*x**2 - b*c*d**2*x - 2*b*c*d*e*x**2 - b*c*e**2*x**3 + c**2*d**2*
x**2 + c**2*d*e*x**3),x)*a*b*c*d**2*e + 2*int((sqrt(x)*sqrt(d + e*x)*sqrt(
b - c*x))/(b**2*d*e*x + b**2*e**2*x**2 - b*c*d**2*x - 2*b*c*d*e*x**2 - b*c
*e**2*x**3 + c**2*d**2*x**2 + c**2*d*e*x**3),x)*a*c**2*d**3 - int((sqrt(x)
*sqrt(d + e*x)*sqrt(b - c*x))/(b**2*d*e*x + b**2*e**2*x**2 - b*c*d**2*x...
```

3.150 $\int \frac{A+Bx}{\sqrt{d+ex}\sqrt{bx-cx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 202

$$\int \frac{A+Bx}{\sqrt{d+ex}\sqrt{bx-cx^2}}\,dx = \frac{2\sqrt{b}B\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{ce}\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} - \frac{2\sqrt{b}(Bd-Ae)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{ce}\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output

```
2*b^(1/2)*B*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2
)/b^(1/2),(-b*e/c/d)^(1/2))/c^(1/2)/e/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)-2
*b^(1/2)*(-A*e+B*d)*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1
/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(1/2)/e/(e*x+d)^(1/2)/(-c*x^2+b*x)
^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 17.02 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.06

$$\int \frac{A+Bx}{\sqrt{d+ex}\sqrt{bx-cx^2}}\,dx$$
$$= \frac{-2B\sqrt{-\frac{b}{c}}(b-cx)(d+ex)-2ibBe\sqrt{1-\frac{b}{cx}}\sqrt{1+\frac{d}{ex}}x^{3/2}E\left(i\text{arcsinh}\left(\frac{\sqrt{-\frac{b}{c}}}{\sqrt{x}}\right)|-\frac{cd}{be}\right)+2i(bB+Ac)e\sqrt{1}}{\sqrt{-\frac{b}{c}}ce\sqrt{x(b-cx)}\sqrt{d+ex}}$$

input
```
Integrate[(A + B*x)/(Sqrt[d + e*x]*Sqrt[b*x - c*x^2]),x]
```

output
```
(-2*B*Sqrt[-(b/c)]*(b - c*x)*(d + e*x) - (2*I)*b*B*e*Sqrt[1 - b/(c*x)]*Sqr
t[1 + d/(e*x)]*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/
(b*e))] + (2*I)*(b*B + A*c)*e*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*
EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])/(Sqrt[-(b/c)]*
c*e*Sqrt[x*(b - c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.55 (sec) , antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, $\frac{\text{number of rules}}{\text{integrand size}} = 0.207$, Rules used = {1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{A+Bx}{\sqrt{bx-cx^2}\sqrt{d+ex}}\,dx$$
$$\Big\downarrow \text{1269}$$
$$\frac{B\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}-\frac{(Bd-Ae)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}$$
$$\Big\downarrow \text{1169}$$

$$\frac{B\sqrt{x}\sqrt{b-cx}\int\frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}(Bd-Ae)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}$$

$$\Big\downarrow \textbf{122}$$

$$\frac{B\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\int\frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{\sqrt{x}\sqrt{b-cx}(Bd-Ae)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}$$

$$\Big\downarrow \textbf{120}$$

$$\frac{2\sqrt{b}B\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{\sqrt{x}\sqrt{b-cx}(Bd-Ae)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}$$

$$\Big\downarrow \textbf{127}$$

$$\frac{2\sqrt{b}B\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(Bd-Ae)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}$$

$$\Big\downarrow \textbf{126}$$

$$\frac{2\sqrt{b}B\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(Bd-Ae)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}$$

input
```
Int[(A + B*x)/(Sqrt[d + e*x]*Sqrt[b*x - c*x^2]),x]
```

output
```
(2*Sqrt[b]*B*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqr
t[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt
[b*x - c*x^2]) - (2*Sqrt[b]*(B*d - A*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 +
 (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(S
qrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])
```

Defintions of rubi rules used

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 1.77 (sec) , antiderivative size = 214, normalized size of antiderivative = 1.06

method	result
default	$\frac{2\left(A\,\mathrm{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)ce+B\,\mathrm{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)be-B\,\mathrm{EllipticE}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)be-B\,\mathrm{EllipticE}\left(\sqrt{\frac{ex+d}{d}}\right.\right.}{e^{2}cx\left(-ce\,x^{2}+bex-cdx+bd\right)}$
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(\frac{2Ad\sqrt{\frac{\left(x+\frac{d}{e}\right)e}{d}}\sqrt{\frac{x-\frac{b}{c}}{-\frac{d}{e}-\frac{b}{c}}}\sqrt{-\frac{ex}{d}}\,\mathrm{EllipticF}\left(\sqrt{\frac{\left(x+\frac{d}{e}\right)e}{d}},\sqrt{-\frac{d}{e\left(-\frac{d}{e}-\frac{b}{c}\right)}}\right)}{e\sqrt{-ce\,x^{3}+be\,x^{2}-cd\,x^{2}+bdx}}+\frac{2Bd\sqrt{\frac{\left(x+\frac{d}{e}\right)e}{d}}\sqrt{\frac{x-\frac{b}{c}}{-\frac{d}{e}-\frac{b}{c}}}\sqrt{-\frac{ex}{d}}\left(\left(-\frac{d}{e}-\right.\right.}{}\right.}{\sqrt{ex+d}\,\sqrt{x(-cx+b)}}$

input
```
int((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
2*(A*EllipticF(((e*x+d)/d)^(1/2),(d*c/(b*e+c*d))^(1/2))*c*e+B*EllipticF(((
e*x+d)/d)^(1/2),(d*c/(b*e+c*d))^(1/2))*b*e-B*EllipticE(((e*x+d)/d)^(1/2),(
d*c/(b*e+c*d))^(1/2))*b*e-B*EllipticE(((e*x+d)/d)^(1/2),(d*c/(b*e+c*d))^(1
/2))*c*d)*d*(-e*x/d)^(1/2)*((-c*x+b)*e/(b*e+c*d))^(1/2)*((e*x+d)/d)^(1/2)*
(e*x+d)^(1/2)*(x*(-c*x+b))^(1/2)/e^2/c/x/(-c*e*x^2+b*e*x-c*d*x+b*d)
```

Fricas [A] (verification not implemented)

Time = 0.10 (sec) , antiderivative size = 307, normalized size of antiderivative = 1.52

$$\int \frac{A+Bx}{\sqrt{d+ex}\sqrt{bx-cx^2}}\,dx = \frac{2\left(3\sqrt{-ce}Bce\mathrm{weierstrassZeta}\left(\frac{4\left(c^2d^2+bcde+b^2e^2\right)}{3\,c^2e^2},-\frac{4\left(2\,c^3d^3+3\,bc^2d^2e-3\,b^2cde^2-2\,b^3e^3\right)}{27\,c^3e^3},\mathrm{weierstrassPInverse}\left(\frac{4\left(c\right.}{}\right.\right.\right.}{}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
2/3*(3*sqrt(-c*e)*B*c*e*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/
(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(
c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2),
 -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3),
1/3*(3*c*e*x + c*d - b*e)/(c*e))) + (B*c*d - (B*b + 3*A*c)*e)*sqrt(-c*e)*w
eierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c
^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*
x + c*d - b*e)/(c*e)))/(c^2*e^2)
```

Sympy [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\sqrt{bx-cx^2}}\,dx = \int \frac{A+Bx}{\sqrt{-x\left(-b+cx\right)}\sqrt{d+ex}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**(1/2)/(-c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)/(sqrt(-x*(-b + c*x))*sqrt(d + e*x)), x)
```

Maxima [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\sqrt{bx-cx^2}}\,dx = \int \frac{Bx+A}{\sqrt{-cx^2+bx}\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)/(sqrt(-c*x^2 + b*x)*sqrt(e*x + d)), x)
```

Giac [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\sqrt{bx-cx^2}}\,dx=\int \frac{Bx+A}{\sqrt{-cx^2+bx}\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)/(sqrt(-c*x^2 + b*x)*sqrt(e*x + d)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{\sqrt{d+ex}\sqrt{bx-cx^2}}\,dx=\int \frac{A+B\,x}{\sqrt{b\,x-c\,x^2}\,\sqrt{d+e\,x}}\,dx$$

input
```
int((A + B*x)/((b*x - c*x^2)^(1/2)*(d + e*x)^(1/2)),x)
```

output
```
int((A + B*x)/((b*x - c*x^2)^(1/2)*(d + e*x)^(1/2)), x)
```

Reduce [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\sqrt{bx-cx^2}}\,dx=\left(\int \frac{\sqrt{x}\,\sqrt{ex+d}\,\sqrt{-cx+b}}{-ce\,x^3+be\,x^2-cd\,x^2+bdx}dx\right)a+\left(\int \frac{\sqrt{x}\,\sqrt{ex+d}\,\sqrt{-cx+b}}{-ce\,x^2+bex-cdx+bd}dx\right)b$$

input
```
int((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2),x)
```

output
```
int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x))/(b*d*x + b*e*x**2 - c*d*x**2 - c
*e*x**3),x)*a + int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x))/(b*d + b*e*x - c
*d*x - c*e*x**2),x)*b
```

3.151 $\int \frac{A+Bx}{(d+ex)^{3/2}\sqrt{bx-cx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 259

$$\int \frac{A+Bx}{(d+ex)^{3/2}\sqrt{bx-cx^2}}\,dx = -\frac{2(Bd-Ae)\sqrt{bx-cx^2}}{d(cd+be)\sqrt{d+ex}} - \frac{2\sqrt{b}\sqrt{c}(Bd-Ae)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{de(cd+be)\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} + \frac{2\sqrt{b}B\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2*(-A*e+B*d)*(-c*x^2+b*x)^(1/2)/d/(b*e+c*d)/(e*x+d)^(1/2)-2*b^(1/2)*c^(1/
2)*(-A*e+B*d)*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1
/2)/b^(1/2),(-b*e/c/d)^(1/2))/d/e/(b*e+c*d)/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(
1/2)+2*b^(1/2)*B*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)
*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/c^(1/2)/e/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1
/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 19.59 (sec) , antiderivative size = 234, normalized size of antiderivative = 0.90

$$\int \frac{A+Bx}{(d+ex)^{3/2}\sqrt{bx-cx^2}}\,dx = \frac{2\sqrt{-\frac{b}{c}}d(Bd-Ae)(b-cx)-2ibe(-Bd+Ae)\sqrt{1-\frac{b}{cx}}\sqrt{1+\frac{d}{ex}}x^{3/2}E\Big(i\mathrm{arc}}{\sqrt{-\frac{b}{c}}de(c}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(3/2)*Sqrt[b*x - c*x^2]),x]
```

output
```
(2*Sqrt[-(b/c)]*d*(B*d - A*e)*(b - c*x) - (2*I)*b*e*(-(B*d) + A*e)*Sqrt[1
 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt
[x]], -((c*d)/(b*e))] + (2*I)*A*e*(c*d + b*e)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d
/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))]
)/(Sqrt[-(b/c)]*d*e*(c*d + b*e)*Sqrt[x*(b - c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.77 (sec) , antiderivative size = 269, normalized size of antiderivative = 1.04, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {1237, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{A+Bx}{\sqrt{bx-cx^2}(d+ex)^{3/2}}dx$$

$$\Big\downarrow \ 1237$$

$$\frac{2\int \frac{(bB+Ac)d-c(Bd-Ae)x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{d\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \ 27$$

$$\frac{\int \frac{(bB+Ac)d-c(Bd-Ae)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{d\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{1269}$$

$$\frac{\frac{Bd(be+cd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{c(Bd-Ae)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{d\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{1169}$$

$$\frac{\frac{Bd\sqrt{x}\sqrt{b-cx}(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{c\sqrt{x}\sqrt{b-cx}(Bd-Ae)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{d\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{122}$$

$$\frac{\frac{Bd\sqrt{x}\sqrt{b-cx}(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{c\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Bd-Ae)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{d\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{120}$$

$$\frac{\frac{Bd\sqrt{x}\sqrt{b-cx}(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Bd-Ae)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{d\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{127}$$

$$\frac{\frac{Bd\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\int \frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Bd-Ae)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{d\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{126}$$

$$\frac{\frac{2\sqrt{b}Bd\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Bd-Ae)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{d\sqrt{d+ex}(be+cd)}$$

input
```
Int[(A + B*x)/((d + e*x)^(3/2)*Sqrt[b*x - c*x^2]),x]
```

output
```
(-2*(B*d - A*e)*Sqrt[b*x - c*x^2])/(d*(c*d + b*e)*Sqrt[d + e*x]) + ((-2*Sq
rt[b]*Sqrt[c]*(B*d - A*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*Elliptic
E[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(e*Sqrt[1 + (e*x)/d]
*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*B*d*(c*d + b*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]
*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c
*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2]))/(d*(c*d + b*e))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 452 vs. $2(217) = 434$.

Time = 2.72 (sec) , antiderivative size = 453, normalized size of antiderivative = 1.75

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(\frac{2\left(-ce\,x^2+bex\right)(Ae-Bd)}{(be+cd)ed\sqrt{\left(x+\frac{d}{e}\right)\left(-ce\,x^2+bex\right)}}+\frac{2\left(\frac{B}{e}+\frac{Ae-Bd}{ed}-\frac{b(Ae-Bd)}{(be+cd)d}\right)d\sqrt{\frac{\left(x+\frac{d}{e}\right)e}{d}}\sqrt{\frac{x-\frac{b}{c}}{-\frac{d}{e}-\frac{b}{c}}}\sqrt{-\frac{ex}{d}}\operatorname{EllipticF}\left(\sqrt{\frac{\left(x+\frac{d}{e}\right)e}{d}}\right.}{e\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}\right.}{\sqrt{}}$
default	$2\left(A\sqrt{\frac{ex+d}{d}}\sqrt{\frac{(-cx+b)e}{be+cd}}\sqrt{-\frac{ex}{d}}\operatorname{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)bd\,e^2+A\sqrt{\frac{ex+d}{d}}\sqrt{\frac{(-cx+b)e}{be+cd}}\sqrt{-\frac{ex}{d}}\operatorname{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)c\right.$

input
```
int((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2*(-c*e*x^2
+b*e*x)/(b*e+c*d)/e/d*(A*e-B*d)/((x+d/e)*(-c*e*x^2+b*e*x))^(1/2)+2*(B/e+1/
e*(A*e-B*d)/d-b/(b*e+c*d)/d*(A*e-B*d))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-
d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*Elli
pticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(A*e-B*d)*c/(b*e+c*d)
/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3
+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-
d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))
^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 449 vs. $2(217) = 434$.

Time = 0.09 (sec) , antiderivative size = 449, normalized size of antiderivative = 1.73

$$\int \frac{A+Bx}{(d+ex)^{3/2}\sqrt{bx-cx^2}}\,dx = -\frac{2\left(\left(Bcd^3+Abde^2+2\,(Bb+Ac)d^2e+\left(Bcd^2e+Abe^3+2\,(Bb+Ac)de^2\right)x\right)\sqrt{-ce}\,\mathrm{weierstrassPInverse}\left(\frac{4}{\cdots}\right.\right.}{\cdots}$$

input
```
integrate((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
-2/3*((B*c*d^3 + A*b*d*e^2 + 2*(B*b + A*c)*d^2*e + (B*c*d^2*e + A*b*e^3 +
2*(B*b + A*c)*d*e^2)*x)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*
d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2
 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*(B*c*d^2*e -
 A*c*d*e^2 + (B*c*d*e^2 - A*c*e^3)*x)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*
d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b
^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*
d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2
 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) + 3*(B*c*d*e^2
- A*c*e^3)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/(c^2*d^3*e^2 + b*c*d^2*e^3 +
(c^2*d^2*e^3 + b*c*d*e^4)*x)
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\sqrt{bx-cx^2}}\,dx=\int \frac{A+Bx}{\sqrt{-x\,(-b+cx)}\,(d+ex)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**(3/2)/(-c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)/(sqrt(-x*(-b + c*x))*(d + e*x)**(3/2)), x)
```

Maxima [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\sqrt{bx-cx^2}}\,dx=\int \frac{Bx+A}{\sqrt{-cx^2+bx}(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)/(sqrt(-c*x^2 + b*x)*(e*x + d)^(3/2)), x)
```

Giac [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\sqrt{bx-cx^2}}\,dx=\int \frac{Bx+A}{\sqrt{-cx^2+bx}(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)/(sqrt(-c*x^2 + b*x)*(e*x + d)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{3/2}\sqrt{bx-cx^2}}\,dx=\int \frac{A+B\,x}{\sqrt{b\,x-c\,x^2}\,{\left(d+e\,x\right)}^{3/2}}\,dx$$

input
```
int((A + B*x)/((b*x - c*x^2)^(1/2)*(d + e*x)^(3/2)),x)
```

output
```
int((A + B*x)/((b*x - c*x^2)^(1/2)*(d + e*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\sqrt{bx-cx^2}}\,dx=\left(\int \frac{\sqrt{ex+d}\,\sqrt{-cx+b}}{\sqrt{x}\,b\,d^2+2\sqrt{x}\,bdex+\sqrt{x}\,b\,e^2x^2-\sqrt{x}\,c\,d^2x-2\sqrt{x}\,cde\,x^2-\sqrt{x}\,c\,e^2x^3}\right.$$
$$+\left(\int \frac{\sqrt{x}\,\sqrt{ex+d}\,\sqrt{-cx+b}}{-c\,e^2x^3+b\,e^2x^2-2cde\,x^2+2bdex-c\,d^2x+b\,d^2}dx\right)b$$

input
```
int((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2),x)
```

output
```
int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b*d**2 + 2*sqrt(x)*b*d*e*x + sq
rt(x)*b*e**2*x**2 - sqrt(x)*c*d**2*x - 2*sqrt(x)*c*d*e*x**2 - sqrt(x)*c*e*
*2*x**3),x)*a + int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x))/(b*d**2 + 2*b*d*
e*x + b*e**2*x**2 - c*d**2*x - 2*c*d*e*x**2 - c*e**2*x**3),x)*b
```

3.152 $\int \frac{A+Bx}{(d+ex)^{5/2}\sqrt{bx-cx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 363

$$\int \frac{A+Bx}{(d+ex)^{5/2}\sqrt{bx-cx^2}}\,dx = -\frac{2(Bd-Ae)\sqrt{bx-cx^2}}{3d(cd+be)(d+ex)^{3/2}} - \frac{2(Bd(cd-be)-2Ae(2cd+be))\sqrt{bx-cx^2}}{3d^2(cd+be)^2\sqrt{d+ex}} - \frac{2\sqrt{b}\sqrt{c}(Bd(cd-be)-2Ae(2cd+be))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{3d^2e(cd+be)^2\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} + \frac{2\sqrt{b}\sqrt{c}(Bd-Ae)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\operatorname{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{3de(cd+be)\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2/3*(-A*e+B*d)*(-c*x^2+b*x)^(1/2)/d/(b*e+c*d)/(e*x+d)^(3/2)-2/3*(B*d*(-b*
e+c*d)-2*A*e*(b*e+2*c*d))*(-c*x^2+b*x)^(1/2)/d^2/(b*e+c*d)^2/(e*x+d)^(1/2)
-2/3*b^(1/2)*c^(1/2)*(B*d*(-b*e+c*d)-2*A*e*(b*e+2*c*d))*x^(1/2)*(1-c*x/b)^
(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/d^
2/e/(b*e+c*d)^2/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/3*b^(1/2)*c^(1/2)*(-A
*e+B*d)*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/
b^(1/2),(-b*e/c/d)^(1/2))/d/e/(b*e+c*d)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 24.87 (sec) , antiderivative size = 361, normalized size of antiderivative = 0.99

$$\int \frac{A+Bx}{(d+ex)^{5/2}\sqrt{bx-cx^2}}\,dx =$$
$$-\frac{2\left(\sqrt{-\frac{b}{c}}ex(b-cx)\left(Bd(-be^2x+cd(2d+ex))-Ae(be(3d+2ex)+cd(5d+4ex))\right)+(d+ex)\left(\sqrt{-\frac{b}{c}}(\ldots\right.\right.}{\ldots}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(5/2)*Sqrt[b*x - c*x^2]),x]
```

output
```
(-2*(Sqrt[-(b/c)]*e*x*(b - c*x)*(B*d*(-(b*e^2*x) + c*d*(2*d + e*x)) - A*e*
(b*e*(3*d + 2*e*x) + c*d*(5*d + 4*e*x))) + (d + e*x)*(Sqrt[-(b/c)]*(B*d*(-
(c*d) + b*e) + 2*A*e*(2*c*d + b*e))*(b - c*x)*(d + e*x) + I*b*e*(B*d*(-(c*
d) + b*e) + 2*A*e*(2*c*d + b*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/
2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*e*(c*d +
 b*e)*(b*B*d + 3*A*c*d + 2*A*b*e)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3
/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])))/(3*Sqrt[
-(b/c)]*d^2*e*(c*d + b*e)^2*Sqrt[x*(b - c*x)]*(d + e*x)^(3/2))
```

Rubi [A] (verified)

Time = 1.17 (sec) , antiderivative size = 373, normalized size of antiderivative = 1.03, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {1237, 27, 1237, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{A+Bx}{\sqrt{bx-cx^2}(d+ex)^{5/2}}\,dx$$
$$\Big\downarrow \text{ 1237}$$

$$\frac{2\int \frac{bBd+3Acd+2Abe+c(Bd-Ae)x}{2(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 27

$$\frac{\int \frac{bBd+3Acd+2Abe+c(Bd-Ae)x}{(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 1237

$$\frac{\frac{2\int \frac{c(d(2bBd+3Acd+Abe)-(Bd(cd-be)-2Ae(2cd+be))x)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd(cd-be)-2Ae(be+2cd))}{d\sqrt{d+ex}(be+cd)}}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 27

$$\frac{\frac{c\int \frac{d(2bBd+3Acd+Abe)-(Bd(cd-be)-2Ae(2cd+be))x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd(cd-be)-2Ae(be+2cd))}{d\sqrt{d+ex}(be+cd)}}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 1269

$$\frac{\frac{c\left(\frac{d(Bd-Ae)(be+cd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{(Bd(cd-be)-2Ae(be+2cd))\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}\right)}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd(cd-be)-2Ae(be+2cd))}{d\sqrt{d+ex}(be+cd)}}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 1169

$$\frac{\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(Bd-Ae)(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}(Bd(cd-be)-2Ae(be+2cd))\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}\right)}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd(cd-be)-2Ae(be+2cd)}{d\sqrt{d+ex}(be+cd)}}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 122

$$\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(Bd-Ae)(be+cd)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Bd(cd-be)-2Ae(be+2cd))\int\frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd(cd-be)-2Ae(}{d\sqrt{d+ex}(be+cd)}$$

$$3d(be+cd)$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 120

$$\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(Bd-Ae)(be+cd)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Bd(cd-be)-2Ae(be+2cd))E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd(c}{d\sqrt{d+}}$$

$$3d(be+cd)$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 127

$$\frac{c\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(Bd-Ae)(be+cd)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Bd(cd-be)-2Ae(be+2cd))E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{d(be+cd)}-2\sqrt{bx-}$$

$$3d(be+cd)$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 126

$$\frac{c\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(Bd-Ae)(be+cd)\text{ EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Bd(cd-be)-2Ae(be+2cd))E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{d(be+cd)}$$

$$3d(be+cd)$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{3d(d+ex)^{3/2}(be+cd)}$$

input
```
Int[(A + B*x)/((d + e*x)^(5/2)*Sqrt[b*x - c*x^2]),x]
```

output
```
(-2*(B*d - A*e)*Sqrt[b*x - c*x^2])/(3*d*(c*d + b*e)*(d + e*x)^(3/2)) + ((-
2*(B*d*(c*d - b*e) - 2*A*e*(2*c*d + b*e))*Sqrt[b*x - c*x^2])/(d*(c*d + b*e
)*Sqrt[d + e*x]) + (c*((-2*Sqrt[b]*(B*d*(c*d - b*e) - 2*A*e*(2*c*d + b*e))
*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x]
)/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2
]) + (2*Sqrt[b]*d*(B*d - A*e)*(c*d + b*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1
 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/
(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/(d*(c*d + b*e)))/(3*d*(c*d +
 b*e))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 619 vs. $2(309) = 618$.

Time = 4.07 (sec) , antiderivative size = 620, normalized size of antiderivative = 1.71

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(\frac{2(Ae-Bd)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{3d(be+cd)e^2\left(x+\frac{d}{e}\right)^2}+\frac{2\left(-ce\,x^2+bex\right)\left(2Ab\,e^2+4Acde+Bbde-Bc\,d^2\right)}{3d^2(be+cd)^2e\sqrt{\left(x+\frac{d}{e}\right)\left(-ce\,x^2+bex\right)}}+\frac{2\left(-\frac{c(Ae-Bd)}{3ed(be+cd)}+\frac{2Ab\,e^2+4\cdots}{3\cdots}\right.}{\cdots}\right.}{\cdots}$
default	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2/3/d/(b*e+
c*d)/e^2*(A*e-B*d)*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x+d/e)^2+2/3*(-
c*e*x^2+b*e*x)/d^2/(b*e+c*d)^2/e*(2*A*b*e^2+4*A*c*d*e+B*b*d*e-B*c*d^2)/((x
+d/e)*(-c*e*x^2+b*e*x))^(1/2)+2*(-1/3*c/e*(A*e-B*d)/d/(b*e+c*d)+1/3/e/(b*e
+c*d)*(2*A*b*e^2+4*A*c*d*e+B*b*d*e-B*c*d^2)/d^2-1/3*b/d^2/(b*e+c*d)^2*(2*A
*b*e^2+4*A*c*d*e+B*b*d*e-B*c*d^2))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-
b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*Elliptic
F(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2/3*c*(2*A*b*e^2+4*A*c*d*e+
B*b*d*e-B*c*d^2)/d/(b*e+c*d)^2/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^
(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*El
lipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e
)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 787 vs. $2(309) = 618$.

Time = 0.11 (sec) , antiderivative size = 787, normalized size of antiderivative = 2.17

$$\int \frac{A + Bx}{(d + ex)^{5/2}\sqrt{bx - cx^2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
-2/9*((B*c^2*d^5 + 2*A*b^2*d^2*e^3 + (4*B*b*c + 5*A*c^2)*d^4*e + (B*b^2 +
5*A*b*c)*d^3*e^2 + (B*c^2*d^3*e^2 + 2*A*b^2*e^5 + (4*B*b*c + 5*A*c^2)*d^2*
e^3 + (B*b^2 + 5*A*b*c)*d*e^4)*x^2 + 2*(B*c^2*d^4*e + 2*A*b^2*d*e^4 + (4*B
*b*c + 5*A*c^2)*d^3*e^2 + (B*b^2 + 5*A*b*c)*d^2*e^3)*x)*sqrt(-c*e)*weierst
rassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3
 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*
d - b*e)/(c*e)) + 3*(B*c^2*d^4*e - 2*A*b*c*d^2*e^3 - (B*b*c + 4*A*c^2)*d^3
*e^2 + (B*c^2*d^2*e^3 - 2*A*b*c*e^5 - (B*b*c + 4*A*c^2)*d*e^4)*x^2 + 2*(B*
c^2*d^3*e^2 - 2*A*b*c*d*e^4 - (B*b*c + 4*A*c^2)*d^2*e^3)*x)*sqrt(-c*e)*wei
erstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3
 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInver
se(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2
*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(
c*e))) + 3*(2*B*c^2*d^3*e^2 - 5*A*c^2*d^2*e^3 - 3*A*b*c*d*e^4 + (B*c^2*d^2
*e^3 - 2*A*b*c*e^5 - (B*b*c + 4*A*c^2)*d*e^4)*x)*sqrt(-c*x^2 + b*x)*sqrt(e
*x + d))/(c^3*d^6*e^2 + 2*b*c^2*d^5*e^3 + b^2*c*d^4*e^4 + (c^3*d^4*e^4 + 2
*b*c^2*d^3*e^5 + b^2*c*d^2*e^6)*x^2 + 2*(c^3*d^5*e^3 + 2*b*c^2*d^4*e^4 + b
^2*c*d^3*e^5)*x)
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^{5/2}\sqrt{bx-cx^2}}\,dx=\int \frac{A+Bx}{\sqrt{-x\left(-b+cx\right)}\left(d+ex\right)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**(5/2)/(-c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)/(sqrt(-x*(-b + c*x))*(d + e*x)**(5/2)), x)
```

Maxima [F]

$$\int \frac{A+Bx}{(d+ex)^{5/2}\sqrt{bx-cx^2}}\,dx=\int \frac{Bx+A}{\sqrt{-cx^2+bx}(ex+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)/(sqrt(-c*x^2 + b*x)*(e*x + d)^(5/2)), x)
```

Giac [F]

$$\int \frac{A+Bx}{(d+ex)^{5/2}\sqrt{bx-cx^2}}\,dx=\int \frac{Bx+A}{\sqrt{-cx^2+bx}(ex+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)/(sqrt(-c*x^2 + b*x)*(e*x + d)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{5/2}\sqrt{bx-cx^2}}\,dx=\int \frac{A+B\,x}{\sqrt{b\,x-c\,x^2}\,{\left(d+e\,x\right)}^{5/2}}\,dx$$

input
```
int((A + B*x)/((b*x - c*x^2)^(1/2)*(d + e*x)^(5/2)),x)
```

output
```
int((A + B*x)/((b*x - c*x^2)^(1/2)*(d + e*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{A+Bx}{(d+ex)^{5/2}\sqrt{bx-cx^2}}\,dx = \left(\int \frac{\sqrt{ex+d}\,\sqrt{-cx+b}}{\sqrt{x}\,b\,d^3+3\sqrt{x}\,b\,d^2ex+3\sqrt{x}\,bd\,e^2x^2+\sqrt{x}\,b\,e^3x^3-\sqrt{x}\,c\,d^3x-3\sqrt{x}\,c\,d}\right.$$
$$+\left(\int \frac{\sqrt{x}\,\sqrt{ex+d}\,\sqrt{-cx+b}}{-c\,e^3x^4+b\,e^3x^3-3cd\,e^2x^3+3bd\,e^2x^2-3c\,d^2e\,x^2+3b\,d^2ex-c\,d^3x+b\,d^3}dx\right)b$$

input
```
int((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(1/2),x)
```

output
```
int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b*d**3 + 3*sqrt(x)*b*d**2*e*x +
 3*sqrt(x)*b*d*e**2*x**2 + sqrt(x)*b*e**3*x**3 - sqrt(x)*c*d**3*x - 3*sqrt
(x)*c*d**2*e*x**2 - 3*sqrt(x)*c*d*e**2*x**3 - sqrt(x)*c*e**3*x**4),x)*a +
int((sqrt(x)*sqrt(d + e*x)*sqrt(b - c*x))/(b*d**3 + 3*b*d**2*e*x + 3*b*d*e
**2*x**2 + b*e**3*x**3 - c*d**3*x - 3*c*d**2*e*x**2 - 3*c*d*e**2*x**3 - c*
e**3*x**4),x)*b
```

3.153 $\int \frac{A+Bx}{(d+ex)^{7/2}\sqrt{bx-cx^2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 504

$$\begin{aligned}
\int \frac{A+Bx}{(d+ex)^{7/2}\sqrt{bx-cx^2}}\,dx &= -\frac{2(Bd-Ae)\sqrt{bx-cx^2}}{5d(cd+be)(d+ex)^{5/2}} \\
&- \frac{2(Bd(3cd-be)-4Ae(2cd+be))\sqrt{bx-cx^2}}{15d^2(cd+be)^2(d+ex)^{3/2}} \\
&- \frac{2(Bd(3c^2d^2-7bcde-2b^2e^2)-Ae(23c^2d^2+23bcde+8b^2e^2))\sqrt{bx-cx^2}}{15d^3(cd+be)^3\sqrt{d+ex}} \\
&- \frac{2\sqrt{b}\sqrt{c}(Bd(3c^2d^2-7bcde-2b^2e^2)-Ae(23c^2d^2+23bcde+8b^2e^2))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{}}{\sqrt{b}}\right.\right.}{15d^3e(cd+be)^3\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} \\
&+ \frac{2\sqrt{b}\sqrt{c}(Bd(3cd-be)-4Ae(2cd+be))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{15d^2e(cd+be)^2\sqrt{d+ex}\sqrt{bx-cx^2}}
\end{aligned}$$

output
```
-2/5*(-A*e+B*d)*(-c*x^2+b*x)^(1/2)/d/(b*e+c*d)/(e*x+d)^(5/2)-2/15*(B*d*(-b
*e+3*c*d)-4*A*e*(b*e+2*c*d))*(-c*x^2+b*x)^(1/2)/d^2/(b*e+c*d)^2/(e*x+d)^(3
/2)-2/15*(B*d*(-2*b^2*e^2-7*b*c*d*e+3*c^2*d^2)-A*e*(8*b^2*e^2+23*b*c*d*e+2
3*c^2*d^2))*(-c*x^2+b*x)^(1/2)/d^3/(b*e+c*d)^3/(e*x+d)^(1/2)-2/15*b^(1/2)*
c^(1/2)*(B*d*(-2*b^2*e^2-7*b*c*d*e+3*c^2*d^2)-A*e*(8*b^2*e^2+23*b*c*d*e+23
*c^2*d^2))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)
/b^(1/2),(-b*e/c/d)^(1/2))/d^3/e/(b*e+c*d)^3/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^
(1/2)+2/15*b^(1/2)*c^(1/2)*(B*d*(-b*e+3*c*d)-4*A*e*(b*e+2*c*d))*x^(1/2)*(1
-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)
^(1/2))/d^2/e/(b*e+c*d)^2/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 26.28 (sec) , antiderivative size = 518, normalized size of antiderivative = 1.03

$$\int \frac{A+Bx}{(d+ex)^{7/2}\sqrt{bx-cx^2}}\,dx = -\frac{2\left(\sqrt{-\frac{b}{c}}ex(b-cx)\left(3d^2(Bd-Ae)(cd+be)^2+d(cd+be)(Bd(3cd-be)-4Ae(2cd+be))(d+ex)+(B\right.\right.}{}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(7/2)*Sqrt[b*x - c*x^2]),x]
```

output
```
(-2*(Sqrt[-(b/c)]*e*x*(b - c*x)*(3*d^2*(B*d - A*e)*(c*d + b*e)^2 + d*(c*d
+ b*e)*(B*d*(3*c*d - b*e) - 4*A*e*(2*c*d + b*e))*(d + e*x) + (B*d*(3*c^2*d
^2 - 7*b*c*d*e - 2*b^2*e^2) - A*e*(23*c^2*d^2 + 23*b*c*d*e + 8*b^2*e^2))*(
d + e*x)^2) + (d + e*x)^2*(Sqrt[-(b/c)]*(B*d*(-3*c^2*d^2 + 7*b*c*d*e + 2*b
^2*e^2) + A*e*(23*c^2*d^2 + 23*b*c*d*e + 8*b^2*e^2))*(b - c*x)*(d + e*x) +
 I*b*e*(B*d*(-3*c^2*d^2 + 7*b*c*d*e + 2*b^2*e^2) + A*e*(23*c^2*d^2 + 23*b*
c*d*e + 8*b^2*e^2))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[
I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*e*(c*d + b*e)*(15*A*c
^2*d^2 + 2*b^2*e*(B*d + 4*A*e) + b*c*d*(6*B*d + 19*A*e))*Sqrt[1 - b/(c*x)]
*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c
*d)/(b*e))])))/(15*Sqrt[-(b/c)]*d^3*e*(c*d + b*e)^3*Sqrt[x*(b - c*x)]*(d +
 e*x)^(5/2))
```

Rubi [A] (verified)

Time = 1.60 (sec) , antiderivative size = 531, normalized size of antiderivative = 1.05, number of steps used = 12, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {1237, 27, 1237, 27, 1237, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{A+Bx}{\sqrt{bx-cx^2}(d+ex)^{7/2}}dx$$

$$\Big\downarrow \text{1237}$$

$$\frac{2\int \frac{bBd+5Acd+4Abe+3c(Bd-Ae)x}{2(d+ex)^{5/2}\sqrt{bx-cx^2}}dx}{5d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{bBd+5Acd+4Abe+3c(Bd-Ae)x}{(d+ex)^{5/2}\sqrt{bx-cx^2}}dx}{5d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \text{1237}$$

$$\frac{\frac{2\int \frac{2e(Bd+4Ae)b^2+cd(6Bd+19Ae)b+15Ac^2d^2+c(Bd(3cd-be)-4Ae(2cd+be))x}{2(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd(3cd-be)-4Ae(be+2cd))}{3d(d+ex)^{3/2}(be+cd)}}{5d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \text{27}$$

$$\frac{\frac{\int \frac{2e(Bd+4Ae)b^2+cd(6Bd+19Ae)b+15Ac^2d^2+c(Bd(3cd-be)-4Ae(2cd+be))x}{(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd(3cd-be)-4Ae(be+2cd))}{3d(d+ex)^{3/2}(be+cd)}}{5d(be+cd)}-\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \text{1237}$$

$$\frac{\frac{\frac{2\int \frac{c\left(d\left(e(Bd+4Ae)b^2+cd(9Bd+11Ae)b+15Ac^2d^2\right)-\left(Bd\left(3c^2d^2-7bced-2b^2e^2\right)-Ae\left(23c^2d^2+23bced+8b^2e^2\right)\right)x\right)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(Bd\left(-2b^2e^2-7bcde+3c^2d^2\right.\right.}{d\sqrt{d+ex}(be}}{3d(be+cd)}}{5d(be+cd)}$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow 27$$

$$\frac{\frac{\frac{c\int \frac{d\left(e(Bd+4Ae)b^2+cd(9Bd+11Ae)b+15Ac^2d^2\right)-\left(Bd\left(3c^2d^2-7bced-2b^2e^2\right)-Ae\left(23c^2d^2+23bced+8b^2e^2\right)\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(Bd\left(-2b^2e^2-7bcde+3c^2d^2\right)-\right.}{d\sqrt{d+ex}(be+cd}}{3d(be+cd)}}{5d(be+cd)}$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow 1269$$

$$\frac{\frac{c\left(\frac{d(be+cd)(Bd(3cd-be)-4Ae(be+2cd))\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{\left(Bd\left(-2b^2e^2-7bcde+3c^2d^2\right)-Ae\left(8b^2e^2+23bcde+23c^2d^2\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}\right)}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(B\right.}{}}{3d(be+cd)}\Bigg/5d(be+cd)$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow 1169$$

$$\frac{\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(Bd(3cd-be)-4Ae(be+2cd))\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}\left(Bd\left(-2b^2e^2-7bcde+3c^2d^2\right)-Ae\left(8b^2e^2+23bcde+23c^2d^2\right)\right)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}}{e\sqrt{bx-cx^2}}\right.}{d(be+cd)}}{3d(be+cd)}\Bigg/5d(be+cd)$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow 122$$

$$c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(Bd(3cd-be)-4Ae(be+2cd))\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(Bd\left(-2b^2e^2-7bcde+3c^2d^2\right)-Ae\left(8b^2e^2+23bcde+23c^2d^2\right)\right)\int\frac{}{\sqrt{}}}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.$$

$$\frac{\qquad}{d(be+cd)} \qquad \frac{\qquad}{3d(be+cd)} \qquad \frac{\qquad}{5d(be+cd)}$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \; 120$$

$$c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(Bd(3cd-be)-4Ae(be+2cd))\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(Bd\left(-2b^2e^2-7bcde+3c^2d^2\right)-Ae\left(8b^2e^2+23bcde+23c^2d^2\right)\right)E}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.$$

$$\frac{\qquad}{d(be+cd)} \qquad \frac{\qquad}{3d(be+cd)} \qquad \frac{\qquad}{5d(be+}$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \; 127$$

$$c\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(Bd(3cd-be)-4Ae(be+2cd))\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(Bd\left(-2b^2e^2-7bcde+3c^2d^2\right)-Ae\left(8b^2e^2+23bcde+\right.\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.$$

$$\frac{\qquad}{d(be+cd)} \qquad \frac{\qquad}{3d(be+cd)} \qquad \frac{\qquad}{5d(be}$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

$$\Big\downarrow \; 126$$

$$c\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(Bd(3cd-be)-4Ae(be+2cd))\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(Bd\left(-2b^2e^2-7bcde+3c^2d^2\right)-Ae\left(8b\right.\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{}}\right.$$

$$\frac{\qquad}{d(be+cd)} \qquad \frac{\qquad}{3d(be+cd)}$$

$$\frac{2\sqrt{bx-cx^2}(Bd-Ae)}{5d(d+ex)^{5/2}(be+cd)}$$

input

```
Int[(A + B*x)/((d + e*x)^(7/2)*Sqrt[b*x - c*x^2]),x]
```

output
```
(-2*(B*d - A*e)*Sqrt[b*x - c*x^2])/(5*d*(c*d + b*e)*(d + e*x)^(5/2)) + ((-
2*(B*d*(3*c*d - b*e) - 4*A*e*(2*c*d + b*e))*Sqrt[b*x - c*x^2])/(3*d*(c*d +
 b*e)*(d + e*x)^(3/2)) + ((-2*(B*d*(3*c^2*d^2 - 7*b*c*d*e - 2*b^2*e^2) - A
*e*(23*c^2*d^2 + 23*b*c*d*e + 8*b^2*e^2))*Sqrt[b*x - c*x^2])/(d*(c*d + b*e
)*Sqrt[d + e*x]) + (c*((-2*Sqrt[b]*(B*d*(3*c^2*d^2 - 7*b*c*d*e - 2*b^2*e^2
) - A*e*(23*c^2*d^2 + 23*b*c*d*e + 8*b^2*e^2))*Sqrt[x]*Sqrt[1 - (c*x)/b]*S
qrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])
/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e
)*(B*d*(3*c*d - b*e) - 4*A*e*(2*c*d + b*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt
[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))]
)/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/(d*(c*d + b*e)))/(3*d*(c*d
 + b*e)))/(5*d*(c*d + b*e))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 5.44 (sec) , antiderivative size = 841, normalized size of antiderivative = 1.67

method	result
elliptic	$\sqrt{(-cx+b)x(ex+d)}\left(\frac{2(Ae-Bd)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{5d(be+cd)e^3\left(x+\frac{d}{e}\right)^3}+\frac{2\left(4Ab\,e^2+8Acde+Bbde-3Bc\,d^2\right)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{15d^2e^2(be+cd)^2\left(x+\frac{d}{e}\right)^2}+\frac{2\left(-ce\,x^2+bex\right.}{}\right.$
default	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^(7/2)/(-c*x^2+b*x)^(1/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2/5/d/(b*e+
c*d)/e^3*(A*e-B*d)*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x+d/e)^3+2/15*(
4*A*b*e^2+8*A*c*d*e+B*b*d*e-3*B*c*d^2)/d^2/e^2/(b*e+c*d)^2*(-c*e*x^3+b*e*x
^2-c*d*x^2+b*d*x)^(1/2)/(x+d/e)^2+2/15*(-c*e*x^2+b*e*x)/d^3/(b*e+c*d)^3/e*
(8*A*b^2*e^3+23*A*b*c*d*e^2+23*A*c^2*d^2*e+2*B*b^2*d*e^2+7*B*b*c*d^2*e-3*B
*c^2*d^3)/((x+d/e)*(-c*e*x^2+b*e*x))^(1/2)+2*(-1/15*c*(4*A*b*e^2+8*A*c*d*e
+B*b*d*e-3*B*c*d^2)/e/d^2/(b*e+c*d)^2+1/15/e/(b*e+c*d)^2*(8*A*b^2*e^3+23*A
*b*c*d*e^2+23*A*c^2*d^2*e+2*B*b^2*d*e^2+7*B*b*c*d^2*e-3*B*c^2*d^3)/d^3-1/1
5*b/d^3/(b*e+c*d)^3*(8*A*b^2*e^3+23*A*b*c*d*e^2+23*A*c^2*d^2*e+2*B*b^2*d*e
^2+7*B*b*c*d^2*e-3*B*c^2*d^3))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c)
)^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((
x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2/15*c*(8*A*b^2*e^3+23*A*b*c*d*
e^2+23*A*c^2*d^2*e+2*B*b^2*d*e^2+7*B*b*c*d^2*e-3*B*c^2*d^3)/d^2/(b*e+c*d)^
3/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^
3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(
-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c)
)^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1350 vs. $2(444) = 888$.

Time = 0.13 (sec) , antiderivative size = 1350, normalized size of antiderivative = 2.68

$$\int \frac{A + Bx}{(d + ex)^{7/2}\sqrt{bx - cx^2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(7/2)/(-c*x^2+b*x)^(1/2),x, algorithm="fricas")
```

output
```
-2/45*((3*B*c^3*d^7 + 8*A*b^3*d^3*e^4 + (17*B*b*c^2 + 22*A*c^3)*d^6*e + (8
*B*b^2*c + 33*A*b*c^2)*d^5*e^2 + (2*B*b^3 + 27*A*b^2*c)*d^4*e^3 + (3*B*c^3
*d^4*e^3 + 8*A*b^3*e^7 + (17*B*b*c^2 + 22*A*c^3)*d^3*e^4 + (8*B*b^2*c + 33
*A*b*c^2)*d^2*e^5 + (2*B*b^3 + 27*A*b^2*c)*d*e^6)*x^3 + 3*(3*B*c^3*d^5*e^2
 + 8*A*b^3*d*e^6 + (17*B*b*c^2 + 22*A*c^3)*d^4*e^3 + (8*B*b^2*c + 33*A*b*c
^2)*d^3*e^4 + (2*B*b^3 + 27*A*b^2*c)*d^2*e^5)*x^2 + 3*(3*B*c^3*d^6*e + 8*A
*b^3*d^2*e^5 + (17*B*b*c^2 + 22*A*c^3)*d^5*e^2 + (8*B*b^2*c + 33*A*b*c^2)*
d^4*e^3 + (2*B*b^3 + 27*A*b^2*c)*d^3*e^4)*x)*sqrt(-c*e)*weierstrassPInvers
e(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*
d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c
*e)) + 3*(3*B*c^3*d^6*e - 8*A*b^2*c*d^3*e^4 - (7*B*b*c^2 + 23*A*c^3)*d^5*e
^2 - (2*B*b^2*c + 23*A*b*c^2)*d^4*e^3 + (3*B*c^3*d^3*e^4 - 8*A*b^2*c*e^7 -
 (7*B*b*c^2 + 23*A*c^3)*d^2*e^5 - (2*B*b^2*c + 23*A*b*c^2)*d*e^6)*x^3 + 3*
(3*B*c^3*d^4*e^3 - 8*A*b^2*c*d*e^6 - (7*B*b*c^2 + 23*A*c^3)*d^3*e^4 - (2*B
*b^2*c + 23*A*b*c^2)*d^2*e^5)*x^2 + 3*(3*B*c^3*d^5*e^2 - 8*A*b^2*c*d^2*e^5
 - (7*B*b*c^2 + 23*A*c^3)*d^4*e^3 - (2*B*b^2*c + 23*A*b*c^2)*d^3*e^4)*x)*s
qrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/
27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weie
rstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*
d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*...
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^{7/2}\sqrt{bx-cx^2}}\,dx = \int \frac{A+Bx}{\sqrt{-x\left(-b+cx\right)}\left(d+ex\right)^{\frac{7}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**(7/2)/(-c*x**2+b*x)**(1/2),x)
```

output
```
Integral((A + B*x)/(sqrt(-x*(-b + c*x))*(d + e*x)**(7/2)), x)
```

Maxima [F]

$$\int \frac{A+Bx}{(d+ex)^{7/2}\sqrt{bx-cx^2}}\,dx = \int \frac{Bx+A}{\sqrt{-cx^2+bx}(ex+d)^{\frac{7}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(7/2)/(-c*x^2+b*x)^(1/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)/(sqrt(-c*x^2 + b*x)*(e*x + d)^(7/2)), x)
```

Giac [F]

$$\int \frac{A+Bx}{(d+ex)^{7/2}\sqrt{bx-cx^2}}\,dx = \int \frac{Bx+A}{\sqrt{-cx^2+bx}(ex+d)^{\frac{7}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(7/2)/(-c*x^2+b*x)^(1/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)/(sqrt(-c*x^2 + b*x)*(e*x + d)^(7/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{7/2}\sqrt{bx-cx^2}}\,dx=\int \frac{A+B\,x}{\sqrt{b\,x-c\,x^2}\,(d+e\,x)^{7/2}}\,dx$$

input
```
int((A + B*x)/((b*x - c*x^2)^(1/2)*(d + e*x)^(7/2)),x)
```

output
```
int((A + B*x)/((b*x - c*x^2)^(1/2)*(d + e*x)^(7/2)), x)
```

Reduce [F]

$$\int \frac{A+Bx}{(d+ex)^{7/2}\sqrt{bx-cx^2}}\,dx=\left(\int \frac{\sqrt{ex+d}\,\sqrt{-\cdots}}{\sqrt{x}\,b\,d^4+4\sqrt{x}\,b\,d^3ex+6\sqrt{x}\,b\,d^2e^2x^2+4\sqrt{x}\,bd\,e^3x^3+\sqrt{x}\,b\,e^4x^4-\sqrt{x}\cdots}\right.$$
$$+\left(\int \frac{\sqrt{x}\,\sqrt{ex+d}\,\sqrt{-cx+b}}{-c\,e^4x^5+b\,e^4x^4-4cd\,e^3x^4+4bd\,e^3x^3-6c\,d^2e^2x^3+6b\,d^2e^2x^2-4c\,d^3e\,x^2+4b\,d^3ex-c\,d^4x+b\,d^4}\,d\cdots\right.$$

input
```
int((B*x+A)/(e*x+d)^(7/2)/(-c*x^2+b*x)^(1/2),x)
```

output
```
int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b*d**4 + 4*sqrt(x)*b*d**3*e*x +
 6*sqrt(x)*b*d**2*e**2*x**2 + 4*sqrt(x)*b*d*e**3*x**3 + sqrt(x)*b*e**4*x**
4 - sqrt(x)*c*d**4*x - 4*sqrt(x)*c*d**3*e*x**2 - 6*sqrt(x)*c*d**2*e**2*x**
3 - 4*sqrt(x)*c*d*e**3*x**4 - sqrt(x)*c*e**4*x**5),x)*a + int((sqrt(x)*sqr
t(d + e*x)*sqrt(b - c*x))/(b*d**4 + 4*b*d**3*e*x + 6*b*d**2*e**2*x**2 + 4*
b*d*e**3*x**3 + b*e**4*x**4 - c*d**4*x - 4*c*d**3*e*x**2 - 6*c*d**2*e**2*x
**3 - 4*c*d*e**3*x**4 - c*e**4*x**5),x)*b
```

3.154 $\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 541

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}\,dx = \frac{2(bB+2Ac)(cd+be)x(d+ex)^{5/2}}{b^2c\sqrt{bx-cx^2}} - \frac{2A(d+ex)^{7/2}}{b\sqrt{bx-cx^2}}$$
$$+\frac{2e(5bc(bB-5Ac)de+(3cd+4be)\left(10Ac^2d+6b^2Be+5bc(Bd+Ae)\right))\sqrt{d+ex}\sqrt{bx-cx^2}}{15b^2c^3}$$
$$+\frac{2e\left(10Ac^2d+6b^2Be+5bc(Bd+Ae)\right)(d+ex)^{3/2}\sqrt{bx-cx^2}}{5b^2c^2}$$
$$-\frac{2(30Ac^4d^3+48b^4Be^3+15bc^3d^2(Bd+3Ae)+8b^3ce^2(16Bd+5Ae)+b^2c^2de(103Bd+95Ae))\sqrt{x}\sqrt{1-}}{15b^{3/2}c^{7/2}\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$
$$+\frac{2d(cd+be)\left(30Ac^3d^2+24b^3Be^2+15bc^2d(Bd+2Ae)+b^2ce(43Bd+20Ae)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\ \text{Ellipt}}{15b^{3/2}c^{7/2}\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
2*(2*A*c+B*b)*(b*e+c*d)*x*(e*x+d)^(5/2)/b^2/c/(-c*x^2+b*x)^(1/2)-2*A*(e*x+
d)^(7/2)/b/(-c*x^2+b*x)^(1/2)+2/15*e*(5*b*c*(-5*A*c+B*b)*d*e+(4*b*e+3*c*d)
*(10*A*c^2*d+6*b^2*B*e+5*b*c*(A*e+B*d)))*(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/
b^2/c^3+2/5*e*(10*A*c^2*d+6*b^2*B*e+5*b*c*(A*e+B*d))*(e*x+d)^(3/2)*(-c*x^2
+b*x)^(1/2)/b^2/c^2-2/15*(30*A*c^4*d^3+48*b^4*B*e^3+15*b*c^3*d^2*(3*A*e+B*
d)+8*b^3*c*e^2*(5*A*e+16*B*d)+b^2*c^2*d*e*(95*A*e+103*B*d))*x^(1/2)*(1-c*x
/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2)
)/b^(3/2)/c^(7/2)/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/15*d*(b*e+c*d)*(30*
A*c^3*d^2+24*b^3*B*e^2+15*b*c^2*d*(2*A*e+B*d)+b^2*c*e*(20*A*e+43*B*d))*x^(
1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b
*e/c/d)^(1/2))/b^(3/2)/c^(7/2)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 26.48 (sec) , antiderivative size = 512, normalized size of antiderivative = 0.95

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}\,dx = \frac{2\left(\sqrt{-\frac{b}{c}}(30Ac^4d^3+48b^4Be^3+15bc^3d^2(Bd+3Ae)+8b^3ce^2(16Bd+5Ae)+\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(7/2))/(b*x - c*x^2)^(3/2),x]
```

output
```
(2*(Sqrt[-(b/c)]*(30*A*c^4*d^3 + 48*b^4*B*e^3 + 15*b*c^3*d^2*(B*d + 3*A*e)
 + 8*b^3*c*e^2*(16*B*d + 5*A*e) + b^2*c^2*d*e*(103*B*d + 95*A*e))*(b - c*x
)*(d + e*x) + Sqrt[-(b/c)]*c*(d + e*x)*(15*(b*B + A*c)*(c*d + b*e)^3*x + b
^2*e^2*(16*B*c*d + 9*b*B*e + 5*A*c*e)*x*(b - c*x) + 3*b^2*B*c*e^3*x^2*(b -
 c*x) + 15*A*c^3*d^3*(-b + c*x)) + I*b*e*(30*A*c^4*d^3 + 48*b^4*B*e^3 + 15
*b*c^3*d^2*(B*d + 3*A*e) + 8*b^3*c*e^2*(16*B*d + 5*A*e) + b^2*c^2*d*e*(103
*B*d + 95*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*Ar
cSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*e*(c*d + b*e)*(15*A*c^3
*d^2 + 48*b^3*B*e^2 + 15*b*c^2*d*(4*B*d + 5*A*e) + 8*b^2*c*e*(13*B*d + 5*A
*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[
-(b/c)]/Sqrt[x]], -((c*d)/(b*e))]))/(15*b^2*Sqrt[-(b/c)]*c^4*Sqrt[x*(b - c
*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.88 (sec) , antiderivative size = 547, normalized size of antiderivative = 1.01, number of steps used = 12, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {1233, 27, 1236, 27, 1236, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}dx$$

$$\Big\downarrow \text{ 1233}$$

$$-\frac{2\int \frac{e(d+ex)^{3/2}\left(b(bB-5Ac)d+\left(6Beb^2+5c(Bd+Ae)b+10Ac^2d\right)x\right)}{2\sqrt{bx-cx^2}}dx}{b^2c}-\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{e\int \frac{(d+ex)^{3/2}\left(b(bB-5Ac)d+\left(6Beb^2+5c(Bd+Ae)b+10Ac^2d\right)x\right)}{\sqrt{bx-cx^2}}dx}{b^2c}-\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \text{ 1236}$$

$$-\frac{e\left(-\frac{2\int \frac{\sqrt{d+ex}\left(bd\left(-6Beb^2-5c(2Bd+Ae)b+15Ac^2d\right)-\left(24Be^2b^3+ce(43Bd+20Ae)b^2+15c^2d(Bd+2Ae)b+30Ac^3d^2\right)x\right)}{2\sqrt{bx-cx^2}}dx}{5c}-\frac{2\sqrt{bx-cx^2}(d+ex)^{3/2}(5b\cdots}{\cdots}\right)}{b^2c}-\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \text{ 27}$$

$$-\frac{e\left(-\frac{\int \frac{\sqrt{d+ex}\left(bd\left(-6Beb^2-5c(2Bd+Ae)b+15Ac^2d\right)-\left(24Be^2b^3+ce(43Bd+20Ae)b^2+15c^2d(Bd+2Ae)b+30Ac^3d^2\right)x\right)}{\sqrt{bx-cx^2}}dx}{5c}-\frac{2\sqrt{bx-cx^2}(d+ex)^{3/2}(5bc\cdots}{\cdots}\right)}{b^2c}-\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 1236

$$-\frac{e\left(-\frac{\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}\left(b^2ce(20Ae+43Bd)+15bc^2d(2Ae+Bd)+30Ac^3d^2+24b^3Be^2\right)}{3c}-\frac{2\int -\frac{bd\left(-24Be^2b^3-ce(61Bd+20Ae)b^2-45c^2d(Bd+Ae)b+15Ac^3d^2\right)\ldots}{\ldots}}{\ldots}}{5c}\ldots\right)}{\ldots}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 27

$$-\frac{e\left(-\frac{\frac{\int \frac{bd\left(-24Be^2b^3-ce(61Bd+20Ae)b^2-45c^2d(Bd+Ae)b+15Ac^3d^2\right)-\left(48Be^3b^4+8ce^2(16Bd+5Ae)b^3+c^2de(103Bd+95Ae)b^2+15c^3d^2(Bd+3Ae)b+30Ac^{\ldots}\right.\ldots}{\sqrt{d+ex}\sqrt{bx-cx^2}}}{3c}\ldots}{5c}\ldots\right)}{b^{\ldots}}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 1269

$$-\frac{e\left(-\frac{\frac{\frac{d(be+cd)\left(b^2ce(20Ae+43Bd)+15bc^2d(2Ae+Bd)+30Ac^3d^2+24b^3Be^2\right)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{\left(8b^3ce^2(5Ae+16Bd)+b^2c^2de(95Ae+103Bd)+15bc^3d^2(\ldots\right.}{e}\ldots}{3c}\ldots}{5c}\ldots\right)}{\ldots}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 1169

$$-\frac{e\left(-\frac{\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2ce(20Ae+43Bd)+15bc^2d(2Ae+Bd)+30Ac^3d^2+24b^3Be^2\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}\left(8b^3ce^2(5Ae+16Bd)+b^2c^2de(95A\ldots\right.}{\ldots}}{3c}\ldots}{5\ldots}\ldots\right)}{\ldots}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 122

$$-\frac{e\left(-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2ce(20Ae+43Bd)+15bc^2d(2Ae+Bd)+30Ac^3d^2+24b^3Be^2\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(8b^3ce^2(5Ae+16Bd)+b^2c^{\cdots}\right.}{\cdots}}{3c}\cdots\right.}{\cdots}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\big\downarrow$ 120

$$-\frac{e\left(-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2ce(20Ae+43Bd)+15bc^2d(2Ae+Bd)+30Ac^3d^2+24b^3Be^2\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(8b^3ce^2(5Ae+16Bd)+\cdots\right.}{\cdots}}{3c}\cdots\right.}{\cdots}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\big\downarrow$ 127

$$-\frac{e\left(-\frac{\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^2ce(20Ae+43Bd)+15bc^2d(2Ae+Bd)+30Ac^3d^2+24b^3Be^2\right)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(8b^3ce^2(5\cdots\right.}{\cdots}}{3c}\cdots\right.}{\cdots}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\big\downarrow$ 126

$$-\frac{e\left(-\frac{\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^2ce(20Ae+43Bd)+15bc^2d(2Ae+Bd)+30Ac^3d^2+24b^3Be^2\right)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+e\cdots}}{\cdots}}{3c}\cdots\right.}{\cdots}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

input
```
Int[((A + B*x)*(d + e*x)^(7/2))/(b*x - c*x^2)^(3/2),x]
```

output
```
(-2*(d + e*x)^(5/2)*(A*b*c*d - (2*A*c^2*d + b^2*B*e + b*c*(B*d + A*e))*x))
/(b^2*c*Sqrt[b*x - c*x^2]) - (e*((-2*(10*A*c^2*d + 6*b^2*B*e + 5*b*c*(B*d
+ A*e))*(d + e*x)^(3/2)*Sqrt[b*x - c*x^2])/(5*c) - ((2*(30*A*c^3*d^2 + 24*
b^3*B*e^2 + 15*b*c^2*d*(B*d + 2*A*e) + b^2*c*e*(43*B*d + 20*A*e))*Sqrt[d +
 e*x]*Sqrt[b*x - c*x^2])/(3*c) + ((-2*Sqrt[b]*(30*A*c^4*d^3 + 48*b^4*B*e^3
 + 15*b*c^3*d^2*(B*d + 3*A*e) + 8*b^3*c*e^2*(16*B*d + 5*A*e) + b^2*c^2*d*e
*(103*B*d + 95*A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[Arc
Sin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)
/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(30*A*c^3*d^2 + 24*b^3*B
*e^2 + 15*b*c^2*d*(B*d + 2*A*e) + b^2*c*e*(43*B*d + 20*A*e))*Sqrt[x]*Sqrt[
1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]]
, -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2]))/(3*c))/(5*
c)))/(b^2*c)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1163 vs. $2(479) = 958$.

Time = 3.19 (sec) , antiderivative size = 1164, normalized size of antiderivative = 2.15

method	result	size
elliptic	Expression too large to display	1164
default	Expression too large to display	1744

input
```
int((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(-2*(-c*e*x^
2-c*d*x)*(A*b^3*c*e^3+3*A*b^2*c^2*d*e^2+3*A*b*c^3*d^2*e+A*c^4*d^3+B*b^4*e^
3+3*B*b^3*c*d*e^2+3*B*b^2*c^2*d^2*e+B*b*c^3*d^3)/b^2/c^4/((x-b/c)*(-c*e*x^
2-c*d*x))^(1/2)-2*(-c*e*x^2+b*e*x-c*d*x+b*d)*A*d^3/b^2/(x*(-c*e*x^2+b*e*x-
c*d*x+b*d))^(1/2)+2/5*B*e^3/c^2*x*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)-2
/3*(-1/c^2*e^3*(A*c*e+B*b*e+4*B*c*d)-2/5*B*e^3/c^2*(2*b*e-2*c*d))/c/e*(-c*
e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2*(-e*(A*b^2*c*e^3+4*A*b*c^2*d*e^2+6*A*
c^3*d^2*e+B*b^3*e^3+4*B*b^2*c*d*e^2+6*B*b*c^2*d^2*e+4*B*c^3*d^3)/c^4+(A*b^
3*c*e^3+3*A*b^2*c^2*d*e^2+3*A*b*c^3*d^2*e+A*c^4*d^3+B*b^4*e^3+3*B*b^3*c*d*
e^2+3*B*b^2*c^2*d^2*e+B*b*c^3*d^3)/c^4*(b*e+c*d)/b^2-1/c^3*d*(A*b^3*c*e^3+
3*A*b^2*c^2*d*e^2+3*A*b*c^3*d^2*e+A*c^4*d^3+B*b^4*e^3+3*B*b^3*c*d*e^2+3*B*
b^2*c^2*d^2*e+B*b*c^3*d^3)/b^2+1/3*(-1/c^2*e^3*(A*c*e+B*b*e+4*B*c*d)-2/5*B
*e^3/c^2*(2*b*e-2*c*d))/c/e*b*d)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/
c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(
((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(-1/c^3*e^2*(A*b*c*e^2+4*A*
c^2*d*e+B*b^2*e^2+4*B*b*c*d*e+6*B*c^2*d^2)-(A*b^3*c*e^3+3*A*b^2*c^2*d*e^2+
3*A*b*c^3*d^2*e+A*c^4*d^3+B*b^4*e^3+3*B*b^3*c*d*e^2+3*B*b^2*c^2*d^2*e+B*b*
c^3*d^3)/c^3*e/b^2-A*c*d^3*e/b^2-3/5*B*e^3/c^2*b*d+2/3*(-1/c^2*e^3*(A*c*e+
B*b*e+4*B*c*d)-2/5*B*e^3/c^2*(2*b*e-2*c*d))/c/e*(b*e-c*d))*d/e*((x+d/e)/d*
e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*...
```

Fricas [A] (verification not implemented)

Time = 0.15 (sec) , antiderivative size = 924, normalized size of antiderivative = 1.71

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(3/2),x, algorithm="fricas")
```

output
```
-2/45*(((15*(B*b*c^5 + 2*A*c^6)*d^4 - (47*B*b^2*c^4 - 60*A*b*c^5)*d^3*e -
(158*B*b^3*c^3 + 85*A*b^2*c^4)*d^2*e^2 - (152*B*b^4*c^2 + 115*A*b^3*c^3)*d
*e^3 - 8*(6*B*b^5*c + 5*A*b^4*c^2)*e^4)*x^2 - (15*(B*b^2*c^4 + 2*A*b*c^5)*
d^4 - (47*B*b^3*c^3 - 60*A*b^2*c^4)*d^3*e - (158*B*b^4*c^2 + 85*A*b^3*c^3)
*d^2*e^2 - (152*B*b^5*c + 115*A*b^4*c^2)*d*e^3 - 8*(6*B*b^6 + 5*A*b^5*c)*e
^4)*x)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c
^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^
3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*((15*(B*b*c^5 + 2*A*c^6)*d^3*
e + (103*B*b^2*c^4 + 45*A*b*c^5)*d^2*e^2 + (128*B*b^3*c^3 + 95*A*b^2*c^4)*
d*e^3 + 8*(6*B*b^4*c^2 + 5*A*b^3*c^3)*e^4)*x^2 - (15*(B*b^2*c^4 + 2*A*b*c^
5)*d^3*e + (103*B*b^3*c^3 + 45*A*b^2*c^4)*d^2*e^2 + (128*B*b^4*c^2 + 95*A*
b^3*c^3)*d*e^3 + 8*(6*B*b^5*c + 5*A*b^4*c^2)*e^4)*x)*sqrt(-c*e)*weierstras
sZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*
c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*
(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e
- 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)))
- 3*(3*B*b^2*c^4*e^4*x^3 + 15*A*b*c^5*d^3*e + (16*B*b^2*c^4*d*e^3 + (6*B*b
^3*c^3 + 5*A*b^2*c^4)*e^4)*x^2 - (15*(B*b*c^5 + 2*A*c^6)*d^3*e + 45*(B*b^2
*c^4 + A*b*c^5)*d^2*e^2 + (61*B*b^3*c^3 + 45*A*b^2*c^4)*d*e^3 + 4*(6*B*b^4
*c^2 + 5*A*b^3*c^3)*e^4)*x)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/(b^2*c^6*...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(7/2)/(-c*x**2+b*x)**(3/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{7}{2}}}{(-cx^2+bx)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(3/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^(7/2)/(-c*x^2 + b*x)^(3/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{7}{2}}}{(-cx^2+bx)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(3/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^(7/2)/(-c*x^2 + b*x)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^{7/2}}{(b\,x-c\,x^2)^{3/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(7/2))/(b*x - c*x^2)^(3/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(7/2))/(b*x - c*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{3/2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(3/2),x)
```

output
```
( - 80*sqrt(d + e*x)*sqrt(b - c*x)*a*b**2*c*e**3*x - 200*sqrt(d + e*x)*sqr
t(b - c*x)*a*b*c**2*d*e**2*x - 20*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c**2*e**
3*x**2 - 60*sqrt(d + e*x)*sqrt(b - c*x)*a*c**3*d**3 - 96*sqrt(d + e*x)*sqr
t(b - c*x)*b**4*e**3*x - 268*sqrt(d + e*x)*sqrt(b - c*x)*b**3*c*d*e**2*x -
 24*sqrt(d + e*x)*sqrt(b - c*x)*b**3*c*e**3*x**2 - 232*sqrt(d + e*x)*sqrt(
b - c*x)*b**2*c**2*d**2*e*x - 64*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*d*e
**2*x**2 - 12*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*e**3*x**3 + 20*sqrt(x)
*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x -
2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c
**2*e*x**3),x)*a*b**4*c*e**4 + 50*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)
*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c
*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b**3*c**2*d*e**3
 - 20*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x
)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**
2 + sqrt(x)*c**2*e*x**3),x)*a*b**3*c**2*e**4*x + 60*sqrt(x)*int((sqrt(d +
e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d
*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*
a*b**2*c**3*d**2*e**2 - 50*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sq
rt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2
 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b**2*c**3*d*e**3*x +...
```

3.155 $\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}} \, dx$

Optimal result

Integrand size = 29, antiderivative size = 410

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}} \, dx = \frac{2(bB+2Ac)(cd+be)x(d+ex)^{3/2}}{b^2c\sqrt{bx-cx^2}}$$
$$-\frac{2A(d+ex)^{5/2}}{b\sqrt{bx-cx^2}} + \frac{2e(6Ac^2d+4b^2Be+3bc(Bd+Ae))\sqrt{d+ex}\sqrt{bx-cx^2}}{3b^2c^2}$$
$$-\frac{2(6Ac^3d^2+8b^3Be^2+3bc^2d(Bd+2Ae)+b^2ce(13Bd+6Ae))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\,E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\right.}{3b^{3/2}c^{5/2}\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$
$$+\frac{2d(cd+be)\left(6Ac^2d+4b^2Be+3bc(Bd+Ae)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{3b^{3/2}c^{5/2}\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
2*(2*A*c+B*b)*(b*e+c*d)*x*(e*x+d)^(3/2)/b^2/c/(-c*x^2+b*x)^(1/2)-2*A*(e*x+
d)^(5/2)/b/(-c*x^2+b*x)^(1/2)+2/3*e*(6*A*c^2*d+4*b^2*B*e+3*b*c*(A*e+B*d))*
(e*x+d)^(1/2)*(-c*x^2+b*x)^(1/2)/b^2/c^2-2/3*(6*A*c^3*d^2+8*b^3*B*e^2+3*b*
c^2*d*(2*A*e+B*d)+b^2*c*e*(6*A*e+13*B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^
(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(3/2)/c^(5/2)/
(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/3*d*(b*e+c*d)*(6*A*c^2*d+4*b^2*B*e+3*
b*c*(A*e+B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x
^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(3/2)/c^(5/2)/(e*x+d)^(1/2)/(-c*x^2+b*x
)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 25.10 (sec) , antiderivative size = 408, normalized size of antiderivative = 1.00

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}}\,dx = \frac{2\left(\sqrt{-\frac{b}{c}}(6Ac^3d^2+8b^3Be^2+3bc^2d(Bd+2Ae)+b^2ce(13Bd+6Ae))\,(b-cx\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(3/2),x]
```

output
```
(2*(Sqrt[-(b/c)]*(6*A*c^3*d^2 + 8*b^3*B*e^2 + 3*b*c^2*d*(B*d + 2*A*e) + b^
2*c*e*(13*B*d + 6*A*e))*(b - c*x)*(d + e*x) + Sqrt[-(b/c)]*c*(d + e*x)*(3*
(b*B + A*c)*(c*d + b*e)^2*x + b^2*B*e^2*x*(b - c*x) + 3*A*c^2*d^2*(-b + c*
x)) + I*b*e*(6*A*c^3*d^2 + 8*b^3*B*e^2 + 3*b*c^2*d*(B*d + 2*A*e) + b^2*c*e
*(13*B*d + 6*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I
*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*e*(c*d + b*e)*(9*b*B
*c*d + 3*A*c^2*d + 8*b^2*B*e + 6*A*b*c*e)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*
x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))]))/(
3*b^2*Sqrt[-(b/c)]*c^3*Sqrt[x*(b - c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.33 (sec) , antiderivative size = 414, normalized size of antiderivative = 1.01, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {1233, 27, 1236, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}}\,dx$$

$$\Big\downarrow \; 1233$$

$$-\frac{2\int \frac{e\sqrt{d+ex}(b(bB-3Ac)d+(4Beb^2+3c(Bd+Ae)b+6Ac^2d)x)}{2\sqrt{bx-cx^2}}dx}{b^2c}-\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 27

$$-\frac{e\int \frac{\sqrt{d+ex}(b(bB-3Ac)d+(4Beb^2+3c(Bd+Ae)b+6Ac^2d)x)}{\sqrt{bx-cx^2}}dx}{b^2c}-\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 1236

$$-\frac{e\left(-\frac{2\int \frac{bd\left(-4Beb^2-3c(2Bd+Ae)b+3Ac^2d\right)-\left(8Be^2b^3+ce(13Bd+6Ae)b^2+3c^2d(Bd+2Ae)b+6Ac^3d^2\right)x}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3c}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(3bc(Ae+Bd)+6Ac}{3c}\right.}{b^2c}$$
$$-\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 27

$$-\frac{e\left(-\frac{\int \frac{bd\left(-4Beb^2-3c(2Bd+Ae)b+3Ac^2d\right)-\left(8Be^2b^3+ce(13Bd+6Ae)b^2+3c^2d(Bd+2Ae)b+6Ac^3d^2\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{3c}-\frac{2\sqrt{bx-cx^2}\sqrt{d+ex}(3bc(Ae+Bd)+6Ac^2d}{3c}\right.}{b^2c}$$
$$-\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 1269

$$-\frac{e\left(-\frac{\frac{d(be+cd)\left(3bc(Ae+Bd)+6Ac^2d+4b^2Be\right)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{\left(b^2ce(6Ae+13Bd)+3bc^2d(2Ae+Bd)+6Ac^3d^2+8b^3Be^2\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}}{3c}-\frac{2\sqrt{bx-}}{}\right.}{b^2c}$$
$$-\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\Big\downarrow$ 1169

$$-\frac{e\left(-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(3bc(Ae+Bd)+6Ac^2d+4b^2Be\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}\left(b^2ce(6Ae+13Bd)+3bc^2d(2Ae+Bd)+6Ac^3d^2+8b^3Be^2\right)\int\frac{\sqrt{d\cdots}}{\sqrt{x}\sqrt{\cdots}}\cdots}{e\sqrt{bx-cx^2}}}{3c}\cdots\right.}{b^2c}\cdots$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 122$$

$$-\frac{e\left(-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(3bc(Ae+Bd)+6Ac^2d+4b^2Be\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2ce(6Ae+13Bd)+3bc^2d(2Ae+Bd)+6Ac^3d^2+8b^3Be^2\right)\cdots}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}\cdots}}{3c}\cdots\right.}{b^2c}\cdots$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 120$$

$$-\frac{e\left(-\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(3bc(Ae+Bd)+6Ac^2d+4b^2Be\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2ce(6Ae+13Bd)+3bc^2d(2Ae+Bd)+6Ac^3d^2+8b^3B\cdots\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}\cdots}}{3c}\cdots\right.}{b^2c}\cdots$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 127$$

$$-\frac{e\left(-\frac{\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(3bc(Ae+Bd)+6Ac^2d+4b^2Be\right)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2ce(6Ae+13Bd)+3bc^2d(2Ae+Bd)+6A\cdots\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}\cdots}}{3c}\cdots\right.}{b^2c}\cdots$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 126$$

$$-\frac{e\left(-\frac{\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(3bc(Ae+Bd)+6Ac^2d+4b^2Be\right)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2ce(6Ae+13Bd)+3bc^2d(2\cdots\right.}{\sqrt{c}e\sqrt{bx-\cdots}}}{3c}\cdots\right)}{b^2c}$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

input
```
Int[((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(3/2),x]
```

output
```
(-2*(d + e*x)^(3/2)*(A*b*c*d - (2*A*c^2*d + b^2*B*e + b*c*(B*d + A*e))*x))
/(b^2*c*Sqrt[b*x - c*x^2]) - (e*((-2*(6*A*c^2*d + 4*b^2*B*e + 3*b*c*(B*d +
 A*e))*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])/(3*c) - ((-2*Sqrt[b]*(6*A*c^3*d^2
+ 8*b^3*B*e^2 + 3*b*c^2*d*(B*d + 2*A*e) + b^2*c*e*(13*B*d + 6*A*e))*Sqrt[x
]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[
b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) + (2
*Sqrt[b]*d*(c*d + b*e)*(6*A*c^2*d + 4*b^2*B*e + 3*b*c*(B*d + A*e))*Sqrt[x]
*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sq
rt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2]))/(3*c
)))/(b^2*c)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1236
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g*(d + e*x)^m*((a + b*x + c*x^2)^(p +
1)/(c*(m + 2*p + 2))), x] + Simp[1/(c*(m + 2*p + 2))   Int[(d + e*x)^(m - 1
)*(a + b*x + c*x^2)^p*Simp[m*(c*d*f - a*e*g) + d*(2*c*f - b*g)*(p + 1) + (m
*(c*e*f + c*d*g - b*e*g) + e*(p + 1)*(2*c*f - b*g))*x, x], x], x] /; FreeQ[
{a, b, c, d, e, f, g, p}, x] && GtQ[m, 0] && NeQ[m + 2*p + 2, 0] && (Intege
rQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]) &&  !(IGtQ[m, 0] && EqQ[f, 0])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 819 vs. $2(354) = 708$.

Time = 2.92 (sec) , antiderivative size = 820, normalized size of antiderivative = 2.00

method	result
elliptic	$\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2\left(-ce\,x^2-cdx\right)\left(A\,b^2e^2c+2Ab\,c^2de+A\,c^3d^2+b^3B\,e^2+2B\,b^2cde+Bb\,c^2d^2\right)}{c^3b^2\sqrt{\left(x-\frac{b}{c}\right)\left(-ce\,x^2-cdx\right)}}-\frac{2\left(-ce\,x^2+bex-cdx+bd\right)A\,d^2}{b^2\sqrt{x\left(-ce\,x^2+bex-cdx+bd\right)}}+\frac{2B\,e^2\sqrt{}}{}\right.$
default	Expression too large to display

input
```
int((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(-2*(-c*e*x^
2-c*d*x)*(A*b^2*c*e^2+2*A*b*c^2*d*e+A*c^3*d^2+B*b^3*e^2+2*B*b^2*c*d*e+B*b*
c^2*d^2)/c^3/b^2/((x-b/c)*(-c*e*x^2-c*d*x))^(1/2)-2*(-c*e*x^2+b*e*x-c*d*x+
b*d)*A*d^2/b^2/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2/3*B*e^2/c^2*(-c*e*x^
3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)+2*(-e*(A*b*c*e^2+3*A*c^2*d*e+B*b^2*e^2+3*B*
b*c*d*e+3*B*c^2*d^2)/c^3+(A*b^2*c*e^2+2*A*b*c^2*d*e+A*c^3*d^2+B*b^3*e^2+2*
B*b^2*c*d*e+B*b*c^2*d^2)/c^3*(b*e+c*d)/b^2-1/c^2*d*(A*b^2*c*e^2+2*A*b*c^2*
d*e+A*c^3*d^2+B*b^3*e^2+2*B*b^2*c*d*e+B*b*c^2*d^2)/b^2-1/3*B*e^2/c^2*b*d)*
d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^
3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b
/c))^(1/2))+2*(-1/c^2*e^2*(A*c*e+B*b*e+3*B*c*d)-(A*b^2*c*e^2+2*A*b*c^2*d*e
+A*c^3*d^2+B*b^3*e^2+2*B*b^2*c*d*e+B*b*c^2*d^2)/c^2*e/b^2-A*c*d^2*e/b^2-2/
3*B*e^2/c^2*(b*e-c*d))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*
(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*Elliptic
E(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)
^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 749 vs. $2(354) = 708$.

Time = 0.13 (sec) , antiderivative size = 749, normalized size of antiderivative = 1.83

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x, algorithm="fricas")
```

output
```
-2/9*(((3*(B*b*c^4 + 2*A*c^5)*d^3 - (8*B*b^2*c^3 - 9*A*b*c^4)*d^2*e - (17*
B*b^3*c^2 + 9*A*b^2*c^3)*d*e^2 - 2*(4*B*b^4*c + 3*A*b^3*c^2)*e^3)*x^2 - (3
*(B*b^2*c^3 + 2*A*b*c^4)*d^3 - (8*B*b^3*c^2 - 9*A*b^2*c^3)*d^2*e - (17*B*b
^4*c + 9*A*b^3*c^2)*d*e^2 - 2*(4*B*b^5 + 3*A*b^4*c)*e^3)*x)*sqrt(-c*e)*wei
erstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3
*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x
+ c*d - b*e)/(c*e)) + 3*((3*(B*b*c^4 + 2*A*c^5)*d^2*e + (13*B*b^2*c^3 + 6*
A*b*c^4)*d*e^2 + 2*(4*B*b^3*c^2 + 3*A*b^2*c^3)*e^3)*x^2 - (3*(B*b^2*c^3 +
2*A*b*c^4)*d^2*e + (13*B*b^3*c^2 + 6*A*b^2*c^3)*d*e^2 + 2*(4*B*b^4*c + 3*A
*b^3*c^2)*e^3)*x)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*
e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e
^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*
e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e
^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) - 3*(B*b^2*c^3*e^3*x^2 + 3*A*b*c^4*
d^2*e - (3*(B*b*c^4 + 2*A*c^5)*d^2*e + 6*(B*b^2*c^3 + A*b*c^4)*d*e^2 + (4*
B*b^3*c^2 + 3*A*b^2*c^3)*e^3)*x)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/(b^2*c^
5*e*x^2 - b^3*c^4*e*x)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(5/2)/(-c*x**2+b*x)**(3/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{5}{2}}}{(-cx^2+bx)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^(5/2)/(-c*x^2 + b*x)^(3/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}}\,dx=\int \frac{(Bx+A)(ex+d)^{\frac{5}{2}}}{(-cx^2+bx)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^(5/2)/(-c*x^2 + b*x)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}}\,dx=\int \frac{(A+B\,x)\,(d+e\,x)^{5/2}}{(b\,x-c\,x^2)^{3/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(3/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{3/2}}\,dx=\text{too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x)
```

output
```
( - 12*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c*e**2*x - 12*sqrt(d + e*x)*sqrt(b
- c*x)*a*c**2*d**2 - 16*sqrt(d + e*x)*sqrt(b - c*x)*b**3*e**2*x - 28*sqrt(
d + e*x)*sqrt(b - c*x)*b**2*c*d*e*x - 4*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c
*e**2*x**2 + 3*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d
 + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c
**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b**3*c*e**3 + 9*sqrt(x)*int((sqrt(d
 + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*
c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),
x)*a*b**2*c**2*d*e**2 - 3*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqr
t(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2
+ sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b**2*c**2*e**3*x + 6*sqr
t(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*
x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(
x)*c**2*e*x**3),x)*a*b*c**3*d**2*e - 9*sqrt(x)*int((sqrt(d + e*x)*sqrt(b -
 c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x
)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b*c**3*d*e*
*2*x - 6*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqr
t(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*
x**2 + sqrt(x)*c**2*e*x**3),x)*a*c**4*d**2*e*x + 4*sqrt(x)*int((sqrt(d + e
*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c...
```

3.156 $\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 304

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx = \frac{2(bB+2Ac)(cd+be)x\sqrt{d+ex}}{b^2c\sqrt{bx-cx^2}} - \frac{2A(d+ex)^{3/2}}{b\sqrt{bx-cx^2}} - \frac{2(2Ac^2d+2b^2Be+bc(Bd+Ae))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{b^{3/2}c^{3/2}\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} + \frac{2(bB+2Ac)d(cd+be)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{b^{3/2}c^{3/2}\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
2*(2*A*c+B*b)*(b*e+c*d)*x*(e*x+d)^(1/2)/b^2/c/(-c*x^2+b*x)^(1/2)-2*A*(e*x+
d)^(3/2)/b/(-c*x^2+b*x)^(1/2)-2*(2*A*c^2*d+2*b^2*B*e+b*c*(A*e+B*d))*x^(1/2
)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/
d)^(1/2))/b^(3/2)/c^(3/2)/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2*(2*A*c+B*b)
*d*(b*e+c*d)*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(
1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(3/2)/c^(3/2)/(e*x+d)^(1/2)/(-c*x^2+b*x)^
(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 24.51 (sec) , antiderivative size = 316, normalized size of antiderivative = 1.04

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx = \frac{2\left(\sqrt{-\frac{b}{c}}(2Ac^2d+2b^2Be+bc(Bd+Ae))\,(b-cx)(d+ex)+\sqrt{-\frac{b}{c}}c(d+ex)\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(3/2),x]
```

output
```
(2*(Sqrt[-(b/c)]*(2*A*c^2*d + 2*b^2*B*e + b*c*(B*d + A*e))*(b - c*x)*(d +
e*x) + Sqrt[-(b/c)]*c*(d + e*x)*((b*B + A*c)*(c*d + b*e)*x + A*c*d*(-b + c
*x)) + I*b*e*(2*A*c^2*d + 2*b^2*B*e + b*c*(B*d + A*e))*Sqrt[1 - b/(c*x)]*S
qrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d
)/(b*e))] - I*b*(2*b*B + A*c)*e*(c*d + b*e)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(
e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))]))
/(b^2*Sqrt[-(b/c)]*c^2*Sqrt[x*(b - c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.90 (sec) , antiderivative size = 308, normalized size of antiderivative = 1.01, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {1233, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx$$

$$\Big\downarrow \; 1233$$

$$-\frac{2\int \frac{e(b(bB-Ac)d+(2Beb^2+c(Bd+Ae)b+2Ac^2d)x)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2c}-\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 27$$

$$-\frac{e\int \frac{b(bB-Ac)d+\left(2Beb^2+c(Bd+Ae)b+2Ac^2d\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2c}-\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 1269$$

$$-\frac{e\left(\frac{\left(bc(Ae+Bd)+2Ac^2d+2b^2Be\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}-\frac{d(2Ac+bB)(be+cd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}\right)}{b^2c}-\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 1169$$

$$-\frac{e\left(\frac{\sqrt{x}\sqrt{b-cx}\left(bc(Ae+Bd)+2Ac^2d+2b^2Be\right)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}-\frac{d\sqrt{x}\sqrt{b-cx}(2Ac+bB)(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}\right)}{b^2c}-\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 122$$

$$-\frac{e\left(\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(bc(Ae+Bd)+2Ac^2d+2b^2Be\right)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{d\sqrt{x}\sqrt{b-cx}(2Ac+bB)(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}\right)}{b^2c}-\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 120$$

$$-\frac{e\left(\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(bc(Ae+Bd)+2Ac^2d+2b^2Be\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{d\sqrt{x}\sqrt{b-cx}(2Ac+bB)(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}\right)}{b^2c}-\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 127$$

$$-\frac{e\left(\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(bc(Ae+Bd)+2Ac^2d+2b^2Be)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(2Ac+bB)(be+cd)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{e}{c}}}}{e\sqrt{bx-cx^2}\sqrt{d+ex}}\right.}{b^2c}$$

$$\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

$\downarrow$ 126

$$-\frac{e\left(\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(bc(Ae+Bd)+2Ac^2d+2b^2Be)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}-\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(2Ac+bB)(be+cd)\,\text{EllipticF}\left(a\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}\right.}{b^2c}$$

$$\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{b^2c\sqrt{bx-cx^2}}$$

input
```
Int[((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(3/2),x]
```

output
```
(-2*Sqrt[d + e*x]*(A*b*c*d - (2*A*c^2*d + b^2*B*e + b*c*(B*d + A*e))*x))/(
b^2*c*Sqrt[b*x - c*x^2]) - (e*((2*Sqrt[b]*(2*A*c^2*d + 2*b^2*B*e + b*c*(B*
d + A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c
]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*
x - c*x^2]) - (2*Sqrt[b]*(b*B + 2*A*c)*d*(c*d + b*e)*Sqrt[x]*Sqrt[1 - (c*x
)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e
)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/(b^2*c)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 592 vs. $2(258) = 516$.

Time = 2.63 (sec) , antiderivative size = 593, normalized size of antiderivative = 1.95

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2\left(-ce\,x^2-cdx\right)\left(Aceb+A\,c^2d+b^2Be+Bbcd\right)}{b^2c^2\sqrt{\left(x-\frac{b}{c}\right)\left(-ce\,x^2-cdx\right)}}-\frac{2\left(-ce\,x^2+bex-cdx+bd\right)dA}{b^2\sqrt{x\left(-ce\,x^2+bex-cdx+bd\right)}}+\frac{2\left(-\frac{e(Ace+Bbe+2Bcd)}{c^2}+\frac{(Aceb+A\,c\cdots}{\cdots}\right.\cdots}{\cdots}\right.\cdots}{\cdots}$
default	$-\frac{2\left(A\sqrt{\frac{ex+d}{d}}\sqrt{\frac{(-cx+b)e}{be+cd}}\sqrt{-\frac{ex}{d}}\,\operatorname{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)b^2cd\,e^2+A\sqrt{\frac{ex+d}{d}}\sqrt{\frac{(-cx+b)e}{be+cd}}\sqrt{-\frac{ex}{d}}\,\operatorname{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+c\cdots}}\right.\cdots\right.}{\cdots}$

input
```
int((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(-2*(-c*e*x^
2-c*d*x)*(A*b*c*e+A*c^2*d+B*b^2*e+B*b*c*d)/b^2/c^2/((x-b/c)*(-c*e*x^2-c*d*
x))^(1/2)-2*(-c*e*x^2+b*e*x-c*d*x+b*d)*d/b^2*A/(x*(-c*e*x^2+b*e*x-c*d*x+b*
d))^(1/2)+2*(-e*(A*c*e+B*b*e+2*B*c*d)/c^2+(A*b*c*e+A*c^2*d+B*b^2*e+B*b*c*d
)/c^2*(b*e+c*d)/b^2-1/c*d*(A*b*c*e+A*c^2*d+B*b^2*e+B*b*c*d)/b^2)*d/e*((x+d
/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2
-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2
))+2*(-B*e^2/c-(A*b*c*e+A*c^2*d+B*b^2*e+B*b*c*d)/c*e/b^2-A*c*d*e/b^2)*d/e*
((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*
e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e
/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1
/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 586 vs. $2(258) = 516$.

Time = 0.13 (sec) , antiderivative size = 586, normalized size of antiderivative = 1.93

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx =$$

$$-\frac{2\left((((Bbc^3+2\,Ac^4)d^2-2\,(Bb^2c^2-Abc^3)de-(2\,Bb^3c+Ab^2c^2)e^2)x^2-((Bb^2c^2+2\,Abc^3)d^2-2\,(Bb^3c-\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x, algorithm="fricas")
```

output
```
-2/3*((((B*b*c^3 + 2*A*c^4)*d^2 - 2*(B*b^2*c^2 - A*b*c^3)*d*e - (2*B*b^3*c
 + A*b^2*c^2)*e^2)*x^2 - ((B*b^2*c^2 + 2*A*b*c^3)*d^2 - 2*(B*b^3*c - A*b^2
*c^2)*d*e - (2*B*b^4 + A*b^3*c)*e^2)*x)*sqrt(-c*e)*weierstrassPInverse(4/3
*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e
 - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))
+ 3*(((B*b*c^3 + 2*A*c^4)*d*e + (2*B*b^2*c^2 + A*b*c^3)*e^2)*x^2 - ((B*b^2
*c^2 + 2*A*b*c^3)*d*e + (2*B*b^3*c + A*b^2*c^2)*e^2)*x)*sqrt(-c*e)*weierst
rassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3
*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4
/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2
*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)
)) - 3*(A*b*c^3*d*e - ((B*b*c^3 + 2*A*c^4)*d*e + (B*b^2*c^2 + A*b*c^3)*e^2
)*x)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/(b^2*c^4*e*x^2 - b^3*c^3*e*x)
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(A+Bx)\,(d+ex)^{\frac{3}{2}}}{(-x\,(-b+cx))^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**(3/2)/(-c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)*(d + e*x)**(3/2)/(-x*(-b + c*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{3}{2}}}{(-cx^2+bx)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^(3/2)/(-c*x^2 + b*x)^(3/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{3}{2}}}{(-cx^2+bx)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^(3/2)/(-c*x^2 + b*x)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^{3/2}}{(b\,x-c\,x^2)^{3/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(3/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{3/2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x)
```

output
```
( - 4*sqrt(d + e*x)*sqrt(b - c*x)*a*c*d - 4*sqrt(d + e*x)*sqrt(b - c*x)*b*
*2*e*x + 2*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + s
qrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*
d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b**2*c*e**2 + 2*sqrt(x)*int((sqrt(d + e
*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*
x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a
*b*c**2*d*e - 2*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*
d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*
c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b*c**2*e**2*x - 2*sqrt(x)*int((sqr
t(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)
*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**
3),x)*a*c**3*d*e*x + sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*
b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqr
t(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*b**4*e**2 + sqrt(x)*int((sqrt(d
 + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*
c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),
x)*b**3*c*d*e - sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*
d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*
c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*b**3*c*e**2*x - sqrt(x)*int((sqrt(d
+ e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*...
```

3.157 $\int \frac{(A+Bx)\sqrt{d+ex}}{\left(bx-cx^2\right)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 275

$$\begin{aligned}\int \frac{(A+Bx)\sqrt{d+ex}}{\left(bx-cx^2\right)^{3/2}}\,dx &= -\frac{2A\sqrt{d+ex}}{b\sqrt{bx-cx^2}}+\frac{2(bB+2Ac)x\sqrt{d+ex}}{b^2\sqrt{bx-cx^2}}\\ &\quad-\frac{2(bB+2Ac)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{b^{3/2}\sqrt{c}\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}\\ &\quad+\frac{2(bBd+2Acd+Abe)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{b^{3/2}\sqrt{c}\sqrt{d+ex}\sqrt{bx-cx^2}}\end{aligned}$$

output
```
-2*A*(e*x+d)^(1/2)/b/(-c*x^2+b*x)^(1/2)+2*(2*A*c+B*b)*x*(e*x+d)^(1/2)/b^2/
(-c*x^2+b*x)^(1/2)-2*(2*A*c+B*b)*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*Ell
ipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(3/2)/c^(1/2)/(1+e*x/d)
^(1/2)/(-c*x^2+b*x)^(1/2)+2*(A*b*e+2*A*c*d+B*b*d)*x^(1/2)*(1-c*x/b)^(1/2)*
(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(3/2
)/c^(1/2)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 15.67 (sec) , antiderivative size = 213, normalized size of antiderivative = 0.77

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{3/2}}\,dx = \frac{b\left(2i(bB+2Ac)e\sqrt{1-\frac{b}{cx}}\sqrt{1+\frac{d}{ex}}x^{3/2}E\left(i\text{arcsinh}\left(\frac{\sqrt{-\frac{b}{c}}}{\sqrt{x}}\right)|-\frac{cd}{be}\right)+2(bB+A\right.}{\left(-\frac{b}{c}\right)^{5/2}c^3\sqrt{}}$$

input
```
Integrate[((A + B*x)*Sqrt[d + e*x])/(b*x - c*x^2)^(3/2),x]
```

output
```
(b*((2*I)*(b*B + 2*A*c)*e*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*Elli
pticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] + 2*(b*B + A*c)*(Sq
rt[-(b/c)]*(d + e*x) - I*e*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*Ell
ipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])))/((-(b/c))^(5/2)
*c^3*Sqrt[x*(b - c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.73 (sec) , antiderivative size = 264, normalized size of antiderivative = 0.96, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {1234, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{3/2}}dx$$

$$\Big\downarrow \text{1234}$$

$$-\frac{2\int -\frac{e(Ab-(bB+2Ac)x)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2}-\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{b^2\sqrt{bx-cx^2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\int \frac{Ab-(bB+2Ac)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2}-\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{b^2\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 1269$$

$$\frac{e\left(\frac{(Abe+2Acd+bBd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{(2Ac+bB)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}\right)}{b^2}-\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{b^2\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 1169$$

$$\frac{e\left(\frac{\sqrt{x}\sqrt{b-cx}(Abe+2Acd+bBd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}(2Ac+bB)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}\right)}{b^2}-\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{b^2\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 122$$

$$\frac{e\left(\frac{\sqrt{x}\sqrt{b-cx}(Abe+2Acd+bBd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(2Ac+bB)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{b^2}-\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{b^2\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 120$$

$$\frac{e\left(\frac{\sqrt{x}\sqrt{b-cx}(Abe+2Acd+bBd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(2Ac+bB)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{b^2}-\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{b^2\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 127$$

$$\frac{e\left(\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(Abe+2Acd+bBd)\int \frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(2Ac+bB)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{b^2}-\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{b^2\sqrt{bx-cx^2}}$$

$$\Big\downarrow \ 126$$

$$\frac{e\left(\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(Abe+2Acd+bBd)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(2Ac+bB)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{b^2}$$
$$\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{b^2\sqrt{bx-cx^2}}$$

input
```
Int[((A + B*x)*Sqrt[d + e*x])/(b*x - c*x^2)^(3/2),x]
```

output
```
(-2*(A*b - (b*B + 2*A*c)*x)*Sqrt[d + e*x])/(b^2*Sqrt[b*x - c*x^2]) + (e*((
-2*Sqrt[b]*(b*B + 2*A*c)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE
[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (
e*x)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*(b*B*d + 2*A*c*d + A*b*e)*Sqrt[x]*
Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqr
t[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/b^2
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1234
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^m*(a + b*x + c*x^2)^(p + 1)*(
(f*b - 2*a*g + (2*c*f - b*g)*x)/((p + 1)*(b^2 - 4*a*c))), x] + Simp[1/((p +
 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 1)*(a + b*x + c*x^2)^(p + 1)*Simp[g
*(2*a*e*m + b*d*(2*p + 3)) - f*(b*e*m + 2*c*d*(2*p + 3)) - e*(2*c*f - b*g)*
(m + 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1
] && GtQ[m, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 498 vs. $2(229) = 458$.

Time = 2.47 (sec) , antiderivative size = 499, normalized size of antiderivative = 1.81

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2\left(-ce\,x^2-cdx\right)(Ac+Bb)}{b^2c\sqrt{\left(x-\frac{b}{c}\right)\left(-ce\,x^2-cdx\right)}}-\frac{2\left(-ce\,x^2+bex-cdx+bd\right)A}{b^2\sqrt{x\left(-ce\,x^2+bex-cdx+bd\right)}}+\frac{2\left(-\frac{Be}{c}+\frac{(Ac+Bb)(be+cd)}{c\,b^2}-\frac{d(Ac+Bb)}{b^2}\right)d\sqrt{\frac{\left(x+\frac{d}{e}\right)e}{d}}}{e\sqrt{-ce\,x^3+b}}\right.}{}$
default	$-\frac{2\left(A\sqrt{\frac{ex+d}{d}}\sqrt{\frac{(-cx+b)e}{be+cd}}\sqrt{-\frac{ex}{d}}\,\text{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)bcde-2A\sqrt{\frac{ex+d}{d}}\sqrt{\frac{(-cx+b)e}{be+cd}}\sqrt{-\frac{ex}{d}}\,\text{EllipticE}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right.\right.}{}$

input
```
int((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(-2*(-c*e*x^
2-c*d*x)*(A*c+B*b)/b^2/c/((x-b/c)*(-c*e*x^2-c*d*x))^(1/2)-2*(-c*e*x^2+b*e*
x-c*d*x+b*d)/b^2*A/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2*(-B*e/c+(A*c+B*b
)/c*(b*e+c*d)/b^2-d*(A*c+B*b)/b^2)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-
b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*Elliptic
F(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(-(A*c+B*b)*e/b^2-A*c*e/b
^2)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*
e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/
2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-
b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 463 vs. $2(229) = 458$.

Time = 0.09 (sec) , antiderivative size = 463, normalized size of antiderivative = 1.68

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{3/2}}\,dx = -\frac{2\left(\left(\left((Bbc^2+2\,Ac^3)d-(Bb^2c-Abc^2)e\right)x^2-\left((Bb^2c+2\,Abc^2)d-(Bb^3-Ab^2c)e\right)x\right)\sqrt{-ce}\text{weierstrassPI}\right.}{}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x, algorithm="fricas")
```

output
```
-2/3*((((B*b*c^2 + 2*A*c^3)*d - (B*b^2*c - A*b*c^2)*e)*x^2 - ((B*b^2*c + 2
*A*b*c^2)*d - (B*b^3 - A*b^2*c)*e)*x)*sqrt(-c*e)*weierstrassPInverse(4/3*(
c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e -
 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) +
3*((B*b*c^2 + 2*A*c^3)*e*x^2 - (B*b^2*c + 2*A*b*c^2)*e*x)*sqrt(-c*e)*weier
strassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 +
 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse
(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d
^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*
e))) - 3*(A*b*c^2*e - (B*b*c^2 + 2*A*c^3)*e*x)*sqrt(-c*x^2 + b*x)*sqrt(e*x
 + d))/(b^2*c^3*e*x^2 - b^3*c^2*e*x)
```

Sympy [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(A+Bx)\sqrt{d+ex}}{(-x(-b+cx))^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**(1/2)/(-c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)*sqrt(d + e*x)/(-x*(-b + c*x))**(3/2), x)
```

Maxima [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(Bx+A)\sqrt{ex+d}}{(-cx^2+bx)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*sqrt(e*x + d)/(-c*x^2 + b*x)^(3/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(Bx+A)\sqrt{ex+d}}{(-cx^2+bx)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*sqrt(e*x + d)/(-c*x^2 + b*x)^(3/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{3/2}}\,dx = \int \frac{(A+B\,x)\,\sqrt{d+e\,x}}{(b\,x-c\,x^2)^{3/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(1/2))/(b*x - c*x^2)^(3/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(1/2))/(b*x - c*x^2)^(3/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{3/2}}\,dx = \text{Too large to display}$$

input

```
int((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x)
```

output

```
( - 4*sqrt(d + e*x)*sqrt(b - c*x)*a*d + sqrt(x)*int((sqrt(d + e*x)*sqrt(b
- c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(
x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b**2*e**2
+ 2*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*
b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2
+ sqrt(x)*c**2*e*x**3),x)*a*b*c*d*e - sqrt(x)*int((sqrt(d + e*x)*sqrt(b -
c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)
*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b*c*e**2*x -
 2*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b
**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 +
 sqrt(x)*c**2*e*x**3),x)*a*c**2*d*e*x + sqrt(x)*int((sqrt(d + e*x)*sqrt(b
- c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(
x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*b**3*d*e - s
qrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*
e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqr
t(x)*c**2*e*x**3),x)*b**2*c*d*e*x + 2*sqrt(x)*int((sqrt(d + e*x)*sqrt(b -
c*x))/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b
*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b**2*d*e + 4*s
qrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*
x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sq...
```

3.158 $\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 309

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{3/2}}\,dx = -\frac{2A\sqrt{d+ex}}{bd\sqrt{bx-cx^2}}+\frac{2c(bBd+2Acd+Abe)x\sqrt{d+ex}}{b^2d(cd+be)\sqrt{bx-cx^2}} - \frac{2\sqrt{c}(bBd+2Acd+Abe)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{b^{3/2}d(cd+be)\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} + \frac{2(bB+2Ac)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{b^{3/2}\sqrt{c}\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output

```
-2*A*(e*x+d)^(1/2)/b/d/(-c*x^2+b*x)^(1/2)+2*c*(A*b*e+2*A*c*d+B*b*d)*x*(e*x
+d)^(1/2)/b^2/d/(b*e+c*d)/(-c*x^2+b*x)^(1/2)-2*c^(1/2)*(A*b*e+2*A*c*d+B*b*
d)*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2)
,(-b*e/c/d)^(1/2))/b^(3/2)/d/(b*e+c*d)/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+
2*(2*A*c+B*b)*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^
(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(3/2)/c^(1/2)/(e*x+d)^(1/2)/(-c*x^2+b*x)
^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 17.62 (sec) , antiderivative size = 237, normalized size of antiderivative = 0.77

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{3/2}}\,dx = \frac{2\sqrt{-\frac{b}{c}}(bB+Ac)d(d+ex)+2ie(bBd+2Acd+Abe)\sqrt{1-\frac{b}{cx}}\sqrt{1+\frac{d}{ex}}x^{3/2}}{b\sqrt{-}}$$

input
```
Integrate[(A + B*x)/(Sqrt[d + e*x]*(b*x - c*x^2)^(3/2)),x]
```

output
```
(2*Sqrt[-(b/c)]*(b*B + A*c)*d*(d + e*x) + (2*I)*e*(b*B*d + 2*A*c*d + A*b*e
)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b
/c)]/Sqrt[x]], -((c*d)/(b*e))] - (2*I)*A*e*(c*d + b*e)*Sqrt[1 - b/(c*x)]*S
qrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d
)/(b*e))])/(b*Sqrt[-(b/c)]*d*(c*d + b*e)*Sqrt[x*(b - c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 0.86 (sec) , antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, $\frac{\text{number of rules}}{\text{integrand size}} = 0.276$, Rules used = {1235, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{A+Bx}{(bx-cx^2)^{3/2}\sqrt{d+ex}}dx$$

$$\Big\downarrow \; 1235$$

$$\frac{2\int \frac{e(b(bB+Ac)d-c(bBd+2Acd+Abe)x)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(be+cd)}$$

$$\Big\downarrow \; 27$$

$$\frac{e\int \frac{b(bB+Ac)d-c(bBd+2Acd+Abe)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(be+cd)}$$

$$\Big\downarrow \; 1269$$

$$\frac{e\left(\frac{d(2Ac+bB)(be+cd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{c(Abe+2Acd+bBd)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}\right)}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(be+cd)}$$

$$\Big\downarrow \; 1169$$

$$\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(2Ac+bB)(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{c\sqrt{x}\sqrt{b-cx}(Abe+2Acd+bBd)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}\right)}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(be+cd)}$$

$$\Big\downarrow \; 122$$

$$\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(2Ac+bB)(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{c\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Abe+2Acd+bBd)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(be+cd)}$$

$$\Big\downarrow \; 120$$

$$\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(2Ac+bB)(be+cd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Abe+2Acd+bBd)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(be+cd)}$$

$$\Big\downarrow \; 127$$

$$\frac{e\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(2Ac+bB)(be+cd)\int \frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Abe+2Acd+bBd)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(be+cd)}$$

$$\Big\downarrow \; 126$$

$$\frac{e\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(2Ac+bB)(be+cd)\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}(Abe+2Acd+bBd)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{}}{\sqrt{b}}\right.\right.}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.}{b^2d(be+cd)}$$

$$\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(be+cd)}$$

input
```
Int[(A + B*x)/(Sqrt[d + e*x]*(b*x - c*x^2)^(3/2)),x]
```

output
```
(-2*Sqrt[d + e*x]*(A*b*(c*d + b*e) - c*(b*B*d + 2*A*c*d + A*b*e)*x))/(b^2*
d*(c*d + b*e)*Sqrt[b*x - c*x^2]) + (e*((-2*Sqrt[b]*Sqrt[c]*(b*B*d + 2*A*c*
d + A*b*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[
c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x
^2]) + (2*Sqrt[b]*(b*B + 2*A*c)*d*(c*d + b*e)*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sq
rt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d)
)])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/(b^2*d*(c*d + b*e))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 3.48 (sec) , antiderivative size = 514, normalized size of antiderivative = 1.66

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2\left(-ce\,x^2-cdx\right)(Ac+Bb)}{(be+cd)b^2\sqrt{\left(x-\frac{b}{c}\right)\left(-ce\,x^2-cdx\right)}}-\frac{2\left(-ce\,x^2+bex-cdx+bd\right)A}{d\,b^2\sqrt{x\left(-ce\,x^2+bex-cdx+bd\right)}}+\frac{2\left(\frac{Ac+Bb}{b^2}-\frac{cd(Ac+Bb)}{(be+cd)b^2}\right)d\sqrt{\frac{\left(x+\frac{d}{e}\right)e}{d}}\sqrt{\frac{x-}{-\frac{d}{e}-}}}{e\sqrt{-ce\,x^3+}}\right.}{}$
default	$-\frac{2\left(A\sqrt{\frac{ex+d}{d}}\,\sqrt{\frac{(-cx+b)e}{be+cd}}\,\sqrt{-\frac{ex}{d}}\,\mathrm{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right)b^2d\,e^2+A\sqrt{\frac{ex+d}{d}}\,\sqrt{\frac{(-cx+b)e}{be+cd}}\,\sqrt{-\frac{ex}{d}}\,\mathrm{EllipticF}\left(\sqrt{\frac{ex+d}{d}},\sqrt{\frac{dc}{be+cd}}\right.\right.}{}$

input
```
int((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(-2*(-c*e*x^
2-c*d*x)/(b*e+c*d)/b^2*(A*c+B*b)/((x-b/c)*(-c*e*x^2-c*d*x))^(1/2)-2*(-c*e*
x^2+b*e*x-c*d*x+b*d)*A/d/b^2/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2*((A*c+
B*b)/b^2-c*d/(b*e+c*d)/b^2*(A*c+B*b))*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d
/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*Ellip
ticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(-c*e*(A*c+B*b)/(b*e+c
*d)/b^2-A*c*e/b^2/d)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-
e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(
((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(
1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 562 vs. $2(263) = 526$.

Time = 0.09 (sec) , antiderivative size = 562, normalized size of antiderivative = 1.82

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{3/2}}\,dx = \frac{2\left(((Ab^2ce^2-(Bbc^2+2\,Ac^3)d^2-2\,(Bb^2c+Abc^2)de)x^2-(Ab^3e^2-(Bb^2c\right.}{}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x, algorithm="fricas")
```

output
```
2/3*(((A*b^2*c*e^2 - (B*b*c^2 + 2*A*c^3)*d^2 - 2*(B*b^2*c + A*b*c^2)*d*e)*
x^2 - (A*b^3*e^2 - (B*b^2*c + 2*A*b*c^2)*d^2 - 2*(B*b^3 + A*b^2*c)*d*e)*x)
*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2
), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3)
, 1/3*(3*c*e*x + c*d - b*e)/(c*e)) - 3*((A*b*c^2*e^2 + (B*b*c^2 + 2*A*c^3)
*d*e)*x^2 - (A*b^2*c*e^2 + (B*b^2*c + 2*A*b*c^2)*d*e)*x)*sqrt(-c*e)*weiers
trassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 +
3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(
4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^
2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e
))) + 3*(A*b*c^2*d*e + A*b^2*c*e^2 - (A*b*c^2*e^2 + (B*b*c^2 + 2*A*c^3)*d*
e)*x)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d))/((b^2*c^3*d^2*e + b^3*c^2*d*e^2)*x
^2 - (b^3*c^2*d^2*e + b^4*c*d*e^2)*x)
```

Sympy [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{3/2}}\,dx=\int \frac{A+Bx}{(-x(-b+cx))^{\frac{3}{2}}\sqrt{d+ex}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**(1/2)/(-c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)/((-x*(-b + c*x))**(3/2)*sqrt(d + e*x)), x)
```

Maxima [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{3/2}}\,dx=\int \frac{Bx+A}{(-cx^2+bx)^{\frac{3}{2}}\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(3/2)*sqrt(e*x + d)), x)
```

Giac [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{3/2}}\,dx = \int \frac{Bx+A}{(-cx^2+bx)^{\frac{3}{2}}\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(3/2)*sqrt(e*x + d)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{3/2}}\,dx = \int \frac{A+B\,x}{(b\,x-c\,x^2)^{3/2}\,\sqrt{d+e\,x}}\,dx$$

input
```
int((A + B*x)/((b*x - c*x^2)^(3/2)*(d + e*x)^(1/2)),x)
```

output
```
int((A + B*x)/((b*x - c*x^2)^(3/2)*(d + e*x)^(1/2)), x)
```

Reduce [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{3/2}}\,dx = \frac{-2\sqrt{ex+d}\,\sqrt{-cx+b}\,a+\sqrt{x}\left(\int \frac{\sqrt{ex+d}\,\sqrt{-cx+b}\,x}{\sqrt{x}\,b^2d+\sqrt{x}\,b^2ex-2\sqrt{x}\,bcdx-2\sqrt{x}\,bce\,x^2+\sqrt{x}\,c^2d\,x^2+\sqrt{}}\right.}{}$$

input
```
int((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2),x)
```

output
```
( - 2*sqrt(d + e*x)*sqrt(b - c*x)*a + sqrt(x)*int((sqrt(d + e*x)*sqrt(b -
c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)
*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b*c*e - sqrt
(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x
 - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x
)*c**2*e*x**3),x)*a*c**2*e*x + 2*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x))
/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*
x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*a*b*c*d - 2*sqrt(x)*i
nt((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sq
rt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*
e*x**3),x)*a*c**2*d*x + sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)
*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*x - 2*sqrt(x)*b*c*e*x**2 + sq
rt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*b**3*d - sqrt(x)*int((sqrt(d +
 e*x)*sqrt(b - c*x))/(sqrt(x)*b**2*d + sqrt(x)*b**2*e*x - 2*sqrt(x)*b*c*d*
x - 2*sqrt(x)*b*c*e*x**2 + sqrt(x)*c**2*d*x**2 + sqrt(x)*c**2*e*x**3),x)*b
**2*c*d*x)/(sqrt(x)*b*d*(b - c*x))
```

3.159 $\int \frac{A+Bx}{(d+ex)^{3/2}(bx-cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 426

$$\begin{aligned}\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{3/2}}\,dx &= -\frac{2A}{bd\sqrt{d+ex}\sqrt{bx-cx^2}} \\ &+ \frac{2c(bBd+2Acd+Abe)x}{b^2d(cd+be)\sqrt{d+ex}\sqrt{bx-cx^2}} \\ &- \frac{2e(2Ac^2d^2-b^2e(Bd-2Ae)+bcd(Bd+2Ae))\sqrt{bx-cx^2}}{b^2d^2(cd+be)^2\sqrt{d+ex}} \\ &- \frac{2\sqrt{c}(2Ac^2d^2-b^2e(Bd-2Ae)+bcd(Bd+2Ae))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\,E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{b^{3/2}d^2(cd+be)^2\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} \\ &+ \frac{2\sqrt{c}(bBd+2Acd+Abe)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{b^{3/2}d(cd+be)\sqrt{d+ex}\sqrt{bx-cx^2}}\end{aligned}$$

output
```
-2*A/b/d/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)+2*c*(A*b*e+2*A*c*d+B*b*d)*x/b^2/
d/(b*e+c*d)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)-2*e*(2*A*c^2*d^2-b^2*e*(-2*A*
e+B*d)+b*c*d*(2*A*e+B*d))*(-c*x^2+b*x)^(1/2)/b^2/d^2/(b*e+c*d)^2/(e*x+d)^(
1/2)-2*c^(1/2)*(2*A*c^2*d^2-b^2*e*(-2*A*e+B*d)+b*c*d*(2*A*e+B*d))*x^(1/2)*
(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)
^(1/2))/b^(3/2)/d^2/(b*e+c*d)^2/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2*c^(1/
2)*(A*b*e+2*A*c*d+B*b*d)*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF
(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(3/2)/d/(b*e+c*d)/(e*x+d)^(1/
2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 25.92 (sec) , antiderivative size = 386, normalized size of antiderivative = 0.91

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{3/2}}\,dx = \frac{2\left(\sqrt{-\frac{b}{c}}(2Ac^2d^2+b^2e(-Bd+2Ae)+bcd(Bd+2Ae))\,(b-cx)(d+ex)\right.}{}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(3/2)*(b*x - c*x^2)^(3/2)),x]
```

output
```
(2*(Sqrt[-(b/c)]*(2*A*c^2*d^2 + b^2*e*(-(B*d) + 2*A*e) + b*c*d*(B*d + 2*A*
e))*(b - c*x)*(d + e*x) + Sqrt[-(b/c)]*(b^2*e^2*(B*d - A*e)*x*(b - c*x) +
c^2*(b*B + A*c)*d^2*x*(d + e*x) + A*(c*d + b*e)^2*(-b + c*x)*(d + e*x)) +
I*b*e*(2*A*c^2*d^2 + b^2*e*(-(B*d) + 2*A*e) + b*c*d*(B*d + 2*A*e))*Sqrt[1
- b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt
[x]], -((c*d)/(b*e))] - I*b*e*(c*d + b*e)*(-(b*B*d) + A*c*d + 2*A*b*e)*Sqr
t[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/
Sqrt[x]], -((c*d)/(b*e))]))/(b^2*Sqrt[-(b/c)]*d^2*(c*d + b*e)^2*Sqrt[x*(b
- c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.20 (sec) , antiderivative size = 426, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {1235, 27, 1237, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{A+Bx}{(bx-cx^2)^{3/2}(d+ex)^{3/2}}dx$$

$$\Big\downarrow \text{1235}$$

$$\frac{2\int \frac{e(b(bBd-Acd-2Abe)+c(bBd+2Acd+Abe)x)}{2(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\int \frac{b(bBd-Acd-2Abe)+c(bBd+2Acd+Abe)x}{(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{1237}$$

$$\frac{e\left(\frac{2\int \frac{c\left(bd(2bBd+Acd-Abe)-\left(-e(Bd-2Ae)b^2+cd(Bd+2Ae)b+2Ac^2d^2\right)x\right)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(b^2(-e)(Bd-2Ae)+bcd(2Ae+Bd)+2Ac^2d^2)}{d\sqrt{d+ex}(be+cd)}\right)}{b^2d(be+cd)}-\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{27}$$

$$\frac{e\left(\frac{c\int \frac{bd(2bBd+Acd-Abe)-\left(-e(Bd-2Ae)b^2+cd(Bd+2Ae)b+2Ac^2d^2\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}(b^2(-e)(Bd-2Ae)+bcd(2Ae+Bd)+2Ac^2d^2)}{d\sqrt{d+ex}(be+cd)}\right)}{b^2d(be+cd)}-\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{1269}$$

$$\frac{e\left(\frac{c\left(\frac{d(be+cd)(Abe+2Acd+bBd)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{\left(b^2(-e)(Bd-2Ae)+bcd(2Ae+Bd)+2Ac^2d^2\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}\right)}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}\left(b^2(-e)(Bd-2Ae\cdots}{d\sqrt{d+ex}(\cdots}\right.}{b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

$\downarrow$ 1169

$$\frac{e\left(\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(Abe+2Acd+bBd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}\left(b^2(-e)(Bd-2Ae)+bcd(2Ae+Bd)+2Ac^2d^2\right)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}\right)}{d(be+cd)}-\frac{2\sqrt{bx-cx^2}\cdots}{\cdots}\right.}{b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

$\downarrow$ 122

$$\frac{e\left(\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(Abe+2Acd+bBd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2(-e)(Bd-2Ae)+bcd(2Ae+Bd)+2Ac^2d^2\right)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{d(be+cd)}-\frac{2\cdots}{\cdots}\right.}{b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

$\downarrow$ 120

$$\frac{e\left(\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)(Abe+2Acd+bBd)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2(-e)(Bd-2Ae)+bcd(2Ae+Bd)+2Ac^2d^2\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\cdots\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\cdots\right.}{d(be+cd)}\cdots\right.}{b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

$\downarrow$ 127

$$e\left(\frac{c\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(Abe+2Acd+bBd)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2(-e)(Bd-2Ae)+bcd(2Ae+Bd)+2Ac^2d^2\right)E\left(\arcsin\left(\right.\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.}{d(be+cd)}\right.$$

$$b^2d(be+cd)$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{126}$$

$$e\left(\frac{c\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)(Abe+2Acd+bBd)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2(-e)(Bd-2Ae)+bcd(2Ae+Bd)+2Ac^2d^2\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.}{d(be+cd)}\right.$$

$$b^2d(be+cd)$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}\sqrt{d+ex}(be+cd)}$$

input

```
Int[(A + B*x)/((d + e*x)^(3/2)*(b*x - c*x^2)^(3/2)),x]
```

output

```
(-2*(A*b*(c*d + b*e) - c*(b*B*d + 2*A*c*d + A*b*e)*x))/(b^2*d*(c*d + b*e)*
Sqrt[d + e*x]*Sqrt[b*x - c*x^2]) + (e*((-2*(2*A*c^2*d^2 - b^2*e*(B*d - 2*A
*e) + b*c*d*(B*d + 2*A*e))*Sqrt[b*x - c*x^2])/(d*(c*d + b*e)*Sqrt[d + e*x]
) + (c*((-2*Sqrt[b]*(2*A*c^2*d^2 - b^2*e*(B*d - 2*A*e) + b*c*d*(B*d + 2*A*
e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt
[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*
x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(b*B*d + 2*A*c*d + A*b*e)*Sqrt[x]*Sqrt[1
- (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]],
-((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/(d*(c*d + b
*e))))/(b^2*d*(c*d + b*e))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 4.20 (sec) , antiderivative size = 737, normalized size of antiderivative = 1.73

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(\frac{2cex\left(\frac{\left(A\,b^2e^2+A\,c^2d^2-B\,b^2de+Bbc\,d^2\right)x}{b^2\left(b^2e^2+2bcde+c^2d^2\right)d^2}-\frac{A\,b^3e^3-A\,c^3d^3-B\,b^3d\,e^2-Bb\,c^2d^3}{\left(b^2e^2+2bcde+c^2d^2\right)d^2b^2ec}\right)}{\sqrt{-\left(x^2-\frac{(be-cd)x}{ce}-\frac{db}{ce}\right)cex}}-\frac{2\left(-ce\,x^2+bex-cdx+bd\right)A}{d^2b^2\sqrt{x\left(-ce\,x^2+bex-cdx+bd\right)}}+\cdots\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2*c*e*x*((A
*b^2*e^2+A*c^2*d^2-B*b^2*d*e+B*b*c*d^2)/b^2/(b^2*e^2+2*b*c*d*e+c^2*d^2)/d^
2*x-(A*b^3*e^3-A*c^3*d^3-B*b^3*d*e^2-B*b*c^2*d^3)/(b^2*e^2+2*b*c*d*e+c^2*d
^2)/d^2/b^2/e/c)/(-(x^2-(b*e-c*d)/c/e*x-1/c*d*b/e)*c*e*x)^(1/2)-2*(-c*e*x^
2+b*e*x-c*d*x+b*d)*A/d^2/b^2/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2*(-(A*b
*e-A*c*d-B*b*d)/d^2/b^2+(A*b^3*e^3-A*c^3*d^3-B*b^3*d*e^2-B*b*c^2*d^3)/(b^2
*e^2+2*b*c*d*e+c^2*d^2)/d^2/b^2)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/
c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(
((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(-c*e*(A*b^2*e^2+A*c^2*d^2-
B*b^2*d*e+B*b*c*d^2)/b^2/(b^2*e^2+2*b*c*d*e+c^2*d^2)/d^2-A*c*e/b^2/d^2)*d/
e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+
b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d
/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^
(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1045 vs. $2(376) = 752$.

Time = 0.10 (sec) , antiderivative size = 1045, normalized size of antiderivative = 2.45

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{3/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x, algorithm="fricas")
```

output
```
2/3*(((2*A*b^3*c*e^4 - (B*b*c^3 + 2*A*c^4)*d^3*e - (4*B*b^2*c^2 + 3*A*b*c^
3)*d^2*e^2 - (B*b^3*c - 3*A*b^2*c^2)*d*e^3)*x^3 - (2*A*b^4*e^4 + (B*b*c^3
+ 2*A*c^4)*d^4 + (3*B*b^2*c^2 + A*b*c^3)*d^3*e - 3*(B*b^3*c + 2*A*b^2*c^2)
*d^2*e^2 - (B*b^4 - A*b^3*c)*d*e^3)*x^2 - (2*A*b^4*d*e^3 - (B*b^2*c^2 + 2*
A*b*c^3)*d^4 - (4*B*b^3*c + 3*A*b^2*c^2)*d^3*e - (B*b^4 - 3*A*b^3*c)*d^2*e
^2)*x)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c
^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^
3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) - 3*((2*A*b^2*c^2*e^4 + (B*b*c^3
+ 2*A*c^4)*d^2*e^2 - (B*b^2*c^2 - 2*A*b*c^3)*d*e^3)*x^3 - (2*B*b^2*c^2*d^2
*e^2 - B*b^3*c*d*e^3 + 2*A*b^3*c*e^4 - (B*b*c^3 + 2*A*c^4)*d^3*e)*x^2 - (2
*A*b^3*c*d*e^3 + (B*b^2*c^2 + 2*A*b*c^3)*d^3*e - (B*b^3*c - 2*A*b^2*c^2)*d
^2*e^2)*x)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c
^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^
3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -
4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/
3*(3*c*e*x + c*d - b*e)/(c*e))) + 3*(A*b*c^3*d^3*e + 2*A*b^2*c^2*d^2*e^2 +
 A*b^3*c*d*e^3 - (2*A*b^2*c^2*e^4 + (B*b*c^3 + 2*A*c^4)*d^2*e^2 - (B*b^2*c
^2 - 2*A*b*c^3)*d*e^3)*x^2 - (A*b*c^3*d^2*e^2 - 2*A*b^3*c*e^4 + (B*b*c^3 +
 2*A*c^4)*d^3*e + (B*b^3*c - A*b^2*c^2)*d*e^3)*x)*sqrt(-c*x^2 + b*x)*sqrt(
e*x + d))/((b^2*c^4*d^4*e^2 + 2*b^3*c^3*d^3*e^3 + b^4*c^2*d^2*e^4)*x^3 ...
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{3/2}}\,dx=\int \frac{A+Bx}{\left(-x\left(-b+cx\right)\right)^{\frac{3}{2}}\left(d+ex\right)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**(3/2)/(-c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)/((-x*(-b + c*x))**(3/2)*(d + e*x)**(3/2)), x)
```

Maxima [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{3/2}}\,dx=\int \frac{Bx+A}{\left(-cx^2+bx\right)^{\frac{3}{2}}(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(3/2)*(e*x + d)^(3/2)), x)
```

Giac [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{3/2}}\,dx=\int \frac{Bx+A}{\left(-cx^2+bx\right)^{\frac{3}{2}}(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(3/2)*(e*x + d)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{3/2}}\,dx=\int \frac{A+B\,x}{\left(b\,x-c\,x^2\right)^{3/2}\,\left(d+e\,x\right)^{3/2}}\,dx$$

input
```
int((A + B*x)/((b*x - c*x^2)^(3/2)*(d + e*x)^(3/2)),x)
```

output
```
int((A + B*x)/((b*x - c*x^2)^(3/2)*(d + e*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{3/2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(3/2),x)
```

output
```
( - 4*sqrt(d + e*x)*sqrt(b - c*x)*a*b*e + 4*sqrt(d + e*x)*sqrt(b - c*x)*a*
c*d + 4*sqrt(d + e*x)*sqrt(b - c*x)*b**2*e*x - 4*sqrt(d + e*x)*sqrt(b - c*
x)*b*c*d*x - 2*sqrt(d + e*x)*sqrt(b - c*x)*b*c*e*x**2 + 6*sqrt(x)*int((sqr
t(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d**2 + 2*sqrt(x)*b**2*d*e*x + sq
rt(x)*b**2*e**2*x**2 - 2*sqrt(x)*b*c*d**2*x - 4*sqrt(x)*b*c*d*e*x**2 - 2*s
qrt(x)*b*c*e**2*x**3 + sqrt(x)*c**2*d**2*x**2 + 2*sqrt(x)*c**2*d*e*x**3 +
sqrt(x)*c**2*e**2*x**4),x)*a*b**2*c*d*e**2 + 6*sqrt(x)*int((sqrt(d + e*x)*
sqrt(b - c*x)*x)/(sqrt(x)*b**2*d**2 + 2*sqrt(x)*b**2*d*e*x + sqrt(x)*b**2*
e**2*x**2 - 2*sqrt(x)*b*c*d**2*x - 4*sqrt(x)*b*c*d*e*x**2 - 2*sqrt(x)*b*c*
e**2*x**3 + sqrt(x)*c**2*d**2*x**2 + 2*sqrt(x)*c**2*d*e*x**3 + sqrt(x)*c**
2*e**2*x**4),x)*a*b**2*c*e**3*x - 6*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*
x)*x)/(sqrt(x)*b**2*d**2 + 2*sqrt(x)*b**2*d*e*x + sqrt(x)*b**2*e**2*x**2 -
 2*sqrt(x)*b*c*d**2*x - 4*sqrt(x)*b*c*d*e*x**2 - 2*sqrt(x)*b*c*e**2*x**3 +
 sqrt(x)*c**2*d**2*x**2 + 2*sqrt(x)*c**2*d*e*x**3 + sqrt(x)*c**2*e**2*x**4
),x)*a*b*c**2*d**2*e - 12*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqr
t(x)*b**2*d**2 + 2*sqrt(x)*b**2*d*e*x + sqrt(x)*b**2*e**2*x**2 - 2*sqrt(x)
*b*c*d**2*x - 4*sqrt(x)*b*c*d*e*x**2 - 2*sqrt(x)*b*c*e**2*x**3 + sqrt(x)*c
**2*d**2*x**2 + 2*sqrt(x)*c**2*d*e*x**3 + sqrt(x)*c**2*e**2*x**4),x)*a*b*c
**2*d*e**2*x - 6*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2
*d**2 + 2*sqrt(x)*b**2*d*e*x + sqrt(x)*b**2*e**2*x**2 - 2*sqrt(x)*b*c*d...
```

3.160 $\int \frac{A+Bx}{(d+ex)^{5/2}(bx-cx^2)^{3/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 583

$$\int \frac{A+Bx}{(d+ex)^{5/2}(bx-cx^2)^{3/2}}\,dx = -\frac{2A}{bd(d+ex)^{3/2}\sqrt{bx-cx^2}}$$
$$+\frac{2c(bBd+2Acd+Abe)x}{b^2d(cd+be)(d+ex)^{3/2}\sqrt{bx-cx^2}}$$
$$-\frac{2e(6Ac^2d^2-b^2e(Bd-4Ae)+3bcd(Bd+2Ae))\sqrt{bx-cx^2}}{3b^2d^2(cd+be)^2(d+ex)^{3/2}}$$
$$-\frac{2e(6Ac^3d^3-b^2cde(7Bd-19Ae)-2b^3e^2(Bd-4Ae)+3bc^2d^2(Bd+3Ae))\sqrt{bx-cx^2}}{3b^2d^3(cd+be)^3\sqrt{d+ex}}$$
$$-\frac{2\sqrt{c}(6Ac^3d^3-b^2cde(7Bd-19Ae)-2b^3e^2(Bd-4Ae)+3bc^2d^2(Bd+3Ae))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}E\left(\mathrm{arc}\right.}{3b^{3/2}d^3(cd+be)^3\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$
$$+\frac{2\sqrt{c}(6Ac^2d^2-b^2e(Bd-4Ae)+3bcd(Bd+2Ae))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{3b^{3/2}d^2(cd+be)^2\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2*A/b/d/(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2)+2*c*(A*b*e+2*A*c*d+B*b*d)*x/b^2/
d/(b*e+c*d)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(1/2)-2/3*e*(6*A*c^2*d^2-b^2*e*(-4*
A*e+B*d)+3*b*c*d*(2*A*e+B*d))*(-c*x^2+b*x)^(1/2)/b^2/d^2/(b*e+c*d)^2/(e*x+
d)^(3/2)-2/3*e*(6*A*c^3*d^3-b^2*c*d*e*(-19*A*e+7*B*d)-2*b^3*e^2*(-4*A*e+B*
d)+3*b*c^2*d^2*(3*A*e+B*d))*(-c*x^2+b*x)^(1/2)/b^2/d^3/(b*e+c*d)^3/(e*x+d)
^(1/2)-2/3*c^(1/2)*(6*A*c^3*d^3-b^2*c*d*e*(-19*A*e+7*B*d)-2*b^3*e^2*(-4*A*
e+B*d)+3*b*c^2*d^2*(3*A*e+B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*Elli
pticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(3/2)/d^3/(b*e+c*d)^3/(1
+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/3*c^(1/2)*(6*A*c^2*d^2-b^2*e*(-4*A*e+B*
d)+3*b*c*d*(2*A*e+B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(
c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(3/2)/d^2/(b*e+c*d)^2/(e*x+d)^
(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 28.44 (sec) , antiderivative size = 525, normalized size of antiderivative = 0.90

$$\int \frac{A+Bx}{(d+ex)^{5/2}\,(bx-cx^2)^{3/2}}\,dx = \frac{2\left(\sqrt{-\frac{b}{c}}(b^2de^2(Bd-Ae)(cd+be)x(b-cx)+b^2e^2(-5Ae(2cd+be)+B\right.}{}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(5/2)*(b*x - c*x^2)^(3/2)),x]
```

output
```
(2*(Sqrt[-(b/c)]*(b^2*d*e^2*(B*d - A*e)*(c*d + b*e)*x*(b - c*x) + b^2*e^2*
(-5*A*e*(2*c*d + b*e) + B*d*(7*c*d + 2*b*e))*x*(b - c*x)*(d + e*x) + 3*c^3
*(b*B + A*c)*d^3*x*(d + e*x)^2 + 3*A*(c*d + b*e)^3*(-b + c*x)*(d + e*x)^2)
 + (d + e*x)*(Sqrt[-(b/c)]*(6*A*c^3*d^3 + 3*b*c^2*d^2*(B*d + 3*A*e) + 2*b^
3*e^2*(-(B*d) + 4*A*e) + b^2*c*d*e*(-7*B*d + 19*A*e))*(b - c*x)*(d + e*x)
+ I*b*e*(6*A*c^3*d^3 + 3*b*c^2*d^2*(B*d + 3*A*e) + 2*b^3*e^2*(-(B*d) + 4*A
*e) + b^2*c*d*e*(-7*B*d + 19*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(
3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*e*(c
*d + b*e)*(3*A*c^2*d^2 + 2*b^2*e*(-(B*d) + 4*A*e) + 3*b*c*d*(-2*B*d + 5*A*
e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-
(b/c)]/Sqrt[x]], -((c*d)/(b*e))])))/(3*b^2*Sqrt[-(b/c)]*d^3*(c*d + b*e)^3*
Sqrt[x*(b - c*x)]*(d + e*x)^(3/2))
```

Rubi [A] (verified)

Time = 1.83 (sec) , antiderivative size = 591, normalized size of antiderivative = 1.01, number of steps used = 12, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {1235, 27, 1237, 27, 1237, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{A+Bx}{(bx-cx^2)^{3/2}(d+ex)^{5/2}}dx$$

$$\Big\downarrow \ 1235$$

$$\frac{2\int \frac{e(b(bBd-3Acd-4Abe)+3c(bBd+2Acd+Abe)x)}{2(d+ex)^{5/2}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \ 27$$

$$\frac{e\int \frac{b(bBd-3Acd-4Abe)+3c(bBd+2Acd+Abe)x}{(d+ex)^{5/2}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \ 1237$$

$$\frac{e\left(\frac{2\int -\frac{b\left(-2e(Bd-4Ae)b^2-3cd(2Bd-5Ae)b+3Ac^2d^2\right)-c\left(-e(Bd-4Ae)b^2+3cd(Bd+2Ae)b+6Ac^2d^2\right)x}{2(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(b^2(-e)(Bd-4Ae)+3bcd(2Ae}{3d(d+ex)^{3/2}(be+cd)}\right.}{b^2d(be+cd)}$$
$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \ 27$$

$$\frac{e\left(-\frac{\int \frac{b\left(-2e(Bd-4Ae)b^2-3cd(2Bd-5Ae)b+3Ac^2d^2\right)-c\left(-e(Bd-4Ae)b^2+3cd(Bd+2Ae)b+6Ac^2d^2\right)x}{(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{3d(be+cd)}-\frac{2\sqrt{bx-cx^2}(b^2(-e)(Bd-4Ae)+3bcd(2Ae+}{3d(d+ex)^{3/2}(be+cd)}\right.}{b^2d(be+cd)}$$
$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$$\Big\downarrow \ 1237$$

$$\frac{e\left(-\frac{\frac{2\int -\frac{c\left(bd\left(e(Bd-4Ae)b^2+9cd(Bd-Ae)b+3Ac^2d^2\right)-\left(-2e^2(Bd-4Ae)b^3-cde(7Bd-19Ae)b^2+3c^2d^2(Bd+3Ae)b+6Ac^3d^3\right)x\right)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{d(be+cd)}+\frac{2\sqrt{bx-cx^2}\left(-2b^3e^2(B\right.}{}}{3d(be+cd)}\right.}{b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 27

$$\frac{e\left(-\frac{\frac{2\sqrt{bx-cx^2}\left(-2b^3e^2(Bd-4Ae)-b^2cde(7Bd-19Ae)+3bc^2d^2(3Ae+Bd)+6Ac^3d^3\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\int\frac{bd\left(e(Bd-4Ae)b^2+9cd(Bd-Ae)b+3Ac^2d^2\right)-\left(-2e^2(Bd-4Ae)b^3-\right.}{\sqrt{d+ex}\sqrt{bx-cx^2}}}{d(be+cd)}}{3d(be+cd)}\right.}{b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 1269

$$\frac{e\left(-\frac{\frac{2\sqrt{bx-cx^2}\left(-2b^3e^2(Bd-4Ae)-b^2cde(7Bd-19Ae)+3bc^2d^2(3Ae+Bd)+6Ac^3d^3\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d(be+cd)\left(b^2(-e)(Bd-4Ae)+3bcd(2Ae+Bd)+6Ac^2d^2\right)\int\frac{1}{\sqrt{d+ex}\sqrt{}}}{e}\right.}{}}{3d(be+cd)}\right.}{b^2}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 1169

$$e\left(-\frac{\frac{2\sqrt{bx-cx^2}\left(-2b^3e^2(Bd-4Ae)-b^2cde(7Bd-19Ae)+3bc^2d^2(3Ae+Bd)+6Ac^3d^3\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2(-e)(Bd-4Ae)+3bcd(2Ae+Bd)+6Ac^2d^2\right)\int}{e\sqrt{bx-cx^2}}\right.}{}}{3d(be+cd)}\right.$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$\downarrow$ 122

$$e\left(-\frac{\frac{2\sqrt{bx-cx^2}\left(-2b^3e^2(Bd-4Ae)-b^2cde(7Bd-19Ae)+3bc^2d^2(3Ae+Bd)+6Ac^3d^3\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2(-e)(Bd-4Ae)+3bcd(2Ae+Bd)+6Ac^2d^2\right)\int \cdots}{e\sqrt{bx-cx^2}}\cdots\right)}{\cdots}}{3d(be+cd)}\cdots\right)$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$\Big\downarrow$ 120

$$e\left(-\frac{\frac{2\sqrt{bx-cx^2}\left(-2b^3e^2(Bd-4Ae)-b^2cde(7Bd-19Ae)+3bc^2d^2(3Ae+Bd)+6Ac^3d^3\right)}{d\sqrt{d+ex}(be+cd)}-c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2(-e)(Bd-4Ae)+3bcd(2Ae+Bd)+6Ac^2d^2\right)\int \cdots}{e\sqrt{bx-cx^2}}\cdots\right)}{3d(be+cd)}\cdots\right)$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$\Big\downarrow$ 127

$$e\left(-\frac{\frac{2\sqrt{bx-cx^2}\left(-2b^3e^2(Bd-4Ae)-b^2cde(7Bd-19Ae)+3bc^2d^2(3Ae+Bd)+6Ac^3d^3\right)}{d\sqrt{d+ex}(be+cd)}-c\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^2(-e)(Bd-4Ae)+3bcd(2Ae+Bd)+6\cdots\right)\cdots}{e\sqrt{bx-cx^2}\sqrt{d+ex}}\cdots\right)}{3d(b\cdots)}\cdots\right)$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

$\Big\downarrow$ 126

$$e\left(-\frac{\frac{2\sqrt{bx-cx^2}\left(-2b^3e^2(Bd-4Ae)-b^2cde(7Bd-19Ae)+3bc^2d^2(3Ae+Bd)+6Ac^3d^3\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^2(-e)(Bd-4Ae)+3bcd(2Ae+Bd\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}\right.}{}}{}\right.$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{b^2d\sqrt{bx-cx^2}(d+ex)^{3/2}(be+cd)}$$

input

```
Int[(A + B*x)/((d + e*x)^(5/2)*(b*x - c*x^2)^(3/2)),x]
```

output

```
(-2*(A*b*(c*d + b*e) - c*(b*B*d + 2*A*c*d + A*b*e)*x))/(b^2*d*(c*d + b*e)*
(d + e*x)^(3/2)*Sqrt[b*x - c*x^2]) + (e*((-2*(6*A*c^2*d^2 - b^2*e*(B*d - 4
*A*e) + 3*b*c*d*(B*d + 2*A*e))*Sqrt[b*x - c*x^2])/(3*d*(c*d + b*e)*(d + e*
x)^(3/2)) - ((2*(6*A*c^3*d^3 - b^2*c*d*e*(7*B*d - 19*A*e) - 2*b^3*e^2*(B*d
 - 4*A*e) + 3*b*c^2*d^2*(B*d + 3*A*e))*Sqrt[b*x - c*x^2])/(d*(c*d + b*e)*S
qrt[d + e*x]) - (c*((-2*Sqrt[b]*(6*A*c^3*d^3 - b^2*c*d*e*(7*B*d - 19*A*e)
- 2*b^3*e^2*(B*d - 4*A*e) + 3*b*c^2*d^2*(B*d + 3*A*e))*Sqrt[x]*Sqrt[1 - (c
*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/
(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c
*d + b*e)*(6*A*c^2*d^2 - b^2*e*(B*d - 4*A*e) + 3*b*c*d*(B*d + 2*A*e))*Sqrt
[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])
/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/
(d*(c*d + b*e)))/(3*d*(c*d + b*e))))/(b^2*d*(c*d + b*e))
```

Defintions of rubi rules used

rule 27

```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120

```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 5.51 (sec) , antiderivative size = 823, normalized size of antiderivative = 1.41

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(-\frac{2\left(-ce\,x^{2}-cdx\right)c^{2}(Ac+Bb)}{(be+cd)^{3}b^{2}\sqrt{\left(x-\frac{b}{c}\right)\left(-ce\,x^{2}-cdx\right)}}-\frac{2(Ae-Bd)\sqrt{-ce\,x^{3}+be\,x^{2}-cd\,x^{2}+bdx}}{3d^{2}(be+cd)^{2}\left(x+\frac{d}{e}\right)^{2}}-\frac{2\left(-ce\,x^{2}+bex\right)e\left(5Ab\,e^{2}+10Acde-2B\right.}{3d^{3}(be+cd)^{3}\sqrt{\left(x+\frac{d}{e}\right)\left(-ce\,x^{2}\right.}}\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(-2*(-c*e*x^
2-c*d*x)/(b*e+c*d)^3*c^2/b^2*(A*c+B*b)/((x-b/c)*(-c*e*x^2-c*d*x))^(1/2)-2/
3/d^2/(b*e+c*d)^2*(A*e-B*d)*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x+d/e)
^2-2/3*(-c*e*x^2+b*e*x)/d^3/(b*e+c*d)^3*e*(5*A*b*e^2+10*A*c*d*e-2*B*b*d*e-
7*B*c*d^2)/((x+d/e)*(-c*e*x^2+b*e*x))^(1/2)-2*(-c*e*x^2+b*e*x-c*d*x+b*d)*A
/d^3/b^2/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2*(c^2/(b*e+c*d)^2*(A*c+B*b)
/b^2-c^3*d/(b*e+c*d)^3/b^2*(A*c+B*b)+1/3*(A*e-B*d)*e*c/d^2/(b*e+c*d)^2-1/3
*e/(b*e+c*d)^2*(5*A*b*e^2+10*A*c*d*e-2*B*b*d*e-7*B*c*d^2)/d^3+1/3*b*e^2/d^
3/(b*e+c*d)^3*(5*A*b*e^2+10*A*c*d*e-2*B*b*d*e-7*B*c*d^2))*d/e*((x+d/e)/d*e
)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^
2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(-
c^3*e*(A*c+B*b)/(b*e+c*d)^3/b^2-1/3*c*e^2*(5*A*b*e^2+10*A*c*d*e-2*B*b*d*e-
7*B*c*d^2)/d^3/(b*e+c*d)^3-A*c*e/b^2/d^3)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)
/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*(
(-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*Elli
pticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1784 vs. $2(521) = 1042$.

Time = 0.17 (sec) , antiderivative size = 1784, normalized size of antiderivative = 3.06

$$\int \frac{A+Bx}{(d+ex)^{5/2}\left(bx-cx^2\right)^{3/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x, algorithm="fricas")
```

output
```
2/9*(((8*A*b^4*c*e^6 - 3*(B*b*c^4 + 2*A*c^5)*d^4*e^2 - (17*B*b^2*c^3 + 12*
A*b*c^4)*d^3*e^3 - (8*B*b^3*c^2 - 17*A*b^2*c^3)*d^2*e^4 - (2*B*b^4*c - 23*
A*b^3*c^2)*d*e^5)*x^4 - (8*A*b^5*e^6 + 6*(B*b*c^4 + 2*A*c^5)*d^5*e + (31*B
*b^2*c^3 + 18*A*b*c^4)*d^4*e^2 - (B*b^3*c^2 + 46*A*b^2*c^3)*d^3*e^3 - (4*B
*b^4*c + 29*A*b^3*c^2)*d^2*e^4 - (2*B*b^5 - 7*A*b^4*c)*d*e^5)*x^3 - (11*B*
b^2*c^3*d^5*e + 16*A*b^5*d*e^5 + 3*(B*b*c^4 + 2*A*c^5)*d^6 - (26*B*b^3*c^2
 + 41*A*b^2*c^3)*d^4*e^2 - (14*B*b^4*c - 11*A*b^3*c^2)*d^3*e^3 - 2*(2*B*b^
5 - 19*A*b^4*c)*d^2*e^4)*x^2 - (8*A*b^5*d^2*e^4 - 3*(B*b^2*c^3 + 2*A*b*c^4
)*d^6 - (17*B*b^3*c^2 + 12*A*b^2*c^3)*d^5*e - (8*B*b^4*c - 17*A*b^3*c^2)*d
^4*e^2 - (2*B*b^5 - 23*A*b^4*c)*d^3*e^3)*x)*sqrt(-c*e)*weierstrassPInverse
(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d
^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*
e)) - 3*((8*A*b^3*c^2*e^6 + 3*(B*b*c^4 + 2*A*c^5)*d^3*e^3 - (7*B*b^2*c^3 -
 9*A*b*c^4)*d^2*e^4 - (2*B*b^3*c^2 - 19*A*b^2*c^3)*d*e^5)*x^4 - (8*A*b^4*c
*e^6 - 6*(B*b*c^4 + 2*A*c^5)*d^4*e^2 + (17*B*b^2*c^3 - 12*A*b*c^4)*d^3*e^3
 - (3*B*b^3*c^2 + 29*A*b^2*c^3)*d^2*e^4 - (2*B*b^4*c - 3*A*b^3*c^2)*d*e^5)
*x^3 - (16*A*b^4*c*d*e^5 - 3*(B*b*c^4 + 2*A*c^5)*d^5*e + (13*B*b^2*c^3 + 3
*A*b*c^4)*d^4*e^2 - (12*B*b^3*c^2 + A*b^2*c^3)*d^3*e^3 - 2*(2*B*b^4*c - 15
*A*b^3*c^2)*d^2*e^4)*x^2 - (8*A*b^4*c*d^2*e^4 + 3*(B*b^2*c^3 + 2*A*b*c^4)*
d^5*e - (7*B*b^3*c^2 - 9*A*b^2*c^3)*d^4*e^2 - (2*B*b^4*c - 19*A*b^3*c^2...
```

Sympy [F]

$$\int \frac{A+Bx}{(d+ex)^{5/2}\left(bx-cx^2\right)^{3/2}}\,dx=\int \frac{A+Bx}{\left(-x\left(-b+cx\right)\right)^{\frac{3}{2}}\left(d+ex\right)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)**(5/2)/(-c*x**2+b*x)**(3/2),x)
```

output
```
Integral((A + B*x)/((-x*(-b + c*x))**(3/2)*(d + e*x)**(5/2)), x)
```

Maxima [F]

$$\int \frac{A+Bx}{(d+ex)^{5/2}\left(bx-cx^2\right)^{3/2}}\,dx=\int \frac{Bx+A}{\left(-cx^2+bx\right)^{\frac{3}{2}}(ex+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(3/2)*(e*x + d)^(5/2)), x)
```

Giac [F]

$$\int \frac{A+Bx}{(d+ex)^{5/2}\left(bx-cx^2\right)^{3/2}}\,dx=\int \frac{Bx+A}{\left(-cx^2+bx\right)^{\frac{3}{2}}(ex+d)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(3/2)*(e*x + d)^(5/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{5/2}\left(bx-cx^2\right)^{3/2}}\,dx=\int \frac{A+B\,x}{{\left(b\,x-c\,x^2\right)}^{3/2}\,{\left(d+e\,x\right)}^{5/2}}\,dx$$

input
```
int((A + B*x)/((b*x - c*x^2)^(3/2)*(d + e*x)^(5/2)),x)
```

output
```
int((A + B*x)/((b*x - c*x^2)^(3/2)*(d + e*x)^(5/2)), x)
```

Reduce [F]

$$\int \frac{A + Bx}{(d + ex)^{5/2} (bx - cx^2)^{3/2}} \, dx = \text{too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(5/2)/(-c*x^2+b*x)^(3/2),x)
```

output
```
( - 2*sqrt(d + e*x)*sqrt(b - c*x)*a + 5*sqrt(x)*int((sqrt(d + e*x)*sqrt(b
- c*x)*x)/(sqrt(x)*b**2*d**3 + 3*sqrt(x)*b**2*d**2*e*x + 3*sqrt(x)*b**2*d*
e**2*x**2 + sqrt(x)*b**2*e**3*x**3 - 2*sqrt(x)*b*c*d**3*x - 6*sqrt(x)*b*c*
d**2*e*x**2 - 6*sqrt(x)*b*c*d*e**2*x**3 - 2*sqrt(x)*b*c*e**3*x**4 + sqrt(x
)*c**2*d**3*x**2 + 3*sqrt(x)*c**2*d**2*e*x**3 + 3*sqrt(x)*c**2*d*e**2*x**4
 + sqrt(x)*c**2*e**3*x**5),x)*a*b*c*d**2*e + 10*sqrt(x)*int((sqrt(d + e*x)
*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d**3 + 3*sqrt(x)*b**2*d**2*e*x + 3*sqrt(x)
*b**2*d*e**2*x**2 + sqrt(x)*b**2*e**3*x**3 - 2*sqrt(x)*b*c*d**3*x - 6*sqrt
(x)*b*c*d**2*e*x**2 - 6*sqrt(x)*b*c*d*e**2*x**3 - 2*sqrt(x)*b*c*e**3*x**4
+ sqrt(x)*c**2*d**3*x**2 + 3*sqrt(x)*c**2*d**2*e*x**3 + 3*sqrt(x)*c**2*d*e
**2*x**4 + sqrt(x)*c**2*e**3*x**5),x)*a*b*c*d*e**2*x + 5*sqrt(x)*int((sqrt
(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d**3 + 3*sqrt(x)*b**2*d**2*e*x +
3*sqrt(x)*b**2*d*e**2*x**2 + sqrt(x)*b**2*e**3*x**3 - 2*sqrt(x)*b*c*d**3*x
 - 6*sqrt(x)*b*c*d**2*e*x**2 - 6*sqrt(x)*b*c*d*e**2*x**3 - 2*sqrt(x)*b*c*e
**3*x**4 + sqrt(x)*c**2*d**3*x**2 + 3*sqrt(x)*c**2*d**2*e*x**3 + 3*sqrt(x)
*c**2*d*e**2*x**4 + sqrt(x)*c**2*e**3*x**5),x)*a*b*c*e**3*x**2 - 5*sqrt(x)
*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**2*d**3 + 3*sqrt(x)*b**2*d
**2*e*x + 3*sqrt(x)*b**2*d*e**2*x**2 + sqrt(x)*b**2*e**3*x**3 - 2*sqrt(x)*
b*c*d**3*x - 6*sqrt(x)*b*c*d**2*e*x**2 - 6*sqrt(x)*b*c*d*e**2*x**3 - 2*sqr
t(x)*b*c*e**3*x**4 + sqrt(x)*c**2*d**3*x**2 + 3*sqrt(x)*c**2*d**2*e*x**...
```

3.161 $\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 555

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}\,dx = \frac{2(cd+be)\left(8Ac^2d+b^2Be+bc(4Bd+9Ae)\right)x^2(d+ex)^{3/2}}{3b^3c\left(bx-cx^2\right)^{3/2}}$$
$$-\frac{2(3bBd+6Acd+7Abe)x(d+ex)^{5/2}}{3b^2\left(bx-cx^2\right)^{3/2}}-\frac{2A(d+ex)^{7/2}}{3b\left(bx-cx^2\right)^{3/2}}$$
$$+\frac{2(cd+be)\left(16Ac^3d^2-4b^3Be^2+b^2ce(Bd-Ae)+8bc^2d(Bd+2Ae)\right)x\sqrt{d+ex}}{3b^4c^2\sqrt{bx-cx^2}}$$
$$-\frac{2\left(16Ac^4d^3-8b^4Be^3-b^3ce^2(5Bd+2Ae)+8bc^3d^2(Bd+3Ae)+b^2c^2de(5Bd+4Ae)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+}}{3b^{7/2}c^{5/2}\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$
$$+\frac{2d(cd+be)\left(16Ac^3d^2-4b^3Be^2+b^2ce(Bd-Ae)+8bc^2d(Bd+2Ae)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\text{ar}\right.}{3b^{7/2}c^{5/2}\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
2/3*(b*e+c*d)*(8*A*c^2*d+b^2*B*e+b*c*(9*A*e+4*B*d))*x^2*(e*x+d)^(3/2)/b^3/
c/(-c*x^2+b*x)^(3/2)-2/3*(7*A*b*e+6*A*c*d+3*B*b*d)*x*(e*x+d)^(5/2)/b^2/(-c
*x^2+b*x)^(3/2)-2/3*A*(e*x+d)^(7/2)/b/(-c*x^2+b*x)^(3/2)+2/3*(b*e+c*d)*(16
*A*c^3*d^2-4*b^3*B*e^2+b^2*c*e*(-A*e+B*d)+8*b*c^2*d*(2*A*e+B*d))*x*(e*x+d)
^(1/2)/b^4/c^2/(-c*x^2+b*x)^(1/2)-2/3*(16*A*c^4*d^3-8*b^4*B*e^3-b^3*c*e^2*
(2*A*e+5*B*d)+8*b*c^3*d^2*(3*A*e+B*d)+b^2*c^2*d*e*(4*A*e+5*B*d))*x^(1/2)*(
1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^
(1/2))/b^(7/2)/c^(5/2)/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/3*d*(b*e+c*d)*
(16*A*c^3*d^2-4*b^3*B*e^2+b^2*c*e*(-A*e+B*d)+8*b*c^2*d*(2*A*e+B*d))*x^(1/2
)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/
c/d)^(1/2))/b^(7/2)/c^(5/2)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 27.86 (sec) , antiderivative size = 548, normalized size of antiderivative = 0.99

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}\,dx = \frac{2\left(\frac{c(d+ex)(b(bB+Ac)(cd+be)^3x^2+(cd+be)^2(8Ac^2d-5b^2Be+bc(5Bd-2Ae))x^2(b-cx)-Abc^2d^3(b-cx)\cdots}{b-cx}\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(7/2))/(b*x - c*x^2)^(5/2),x]
```

output
```
(2*((c*(d + e*x)*(b*(b*B + A*c)*(c*d + b*e)^3*x^2 + (c*d + b*e)^2*(8*A*c^2
*d - 5*b^2*B*e + b*c*(5*B*d - 2*A*e))*x^2*(b - c*x) - A*b*c^2*d^3*(b - c*x
)^2 - c^2*d^2*(3*b*B*d + 8*A*c*d + 10*A*b*e)*x*(b - c*x)^2))/(b - c*x) + (
x*(Sqrt[-(b/c)]*(16*A*c^4*d^3 - 8*b^4*B*e^3 - b^3*c*e^2*(5*B*d + 2*A*e) +
8*b*c^3*d^2*(B*d + 3*A*e) + b^2*c^2*d*e*(5*B*d + 4*A*e))*(b - c*x)*(d + e*
x) + I*b*e*(16*A*c^4*d^3 - 8*b^4*B*e^3 - b^3*c*e^2*(5*B*d + 2*A*e) + 8*b*c
^3*d^2*(B*d + 3*A*e) + b^2*c^2*d*e*(5*B*d + 4*A*e))*Sqrt[1 - b/(c*x)]*Sqrt
[1 + d/(e*x)]*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(
b*e))] - I*b*e*(c*d + b*e)*(8*A*c^3*d^2 - 8*b^3*B*e^2 - b^2*c*e*(B*d + 2*A
*e) + b*c^2*d*(4*B*d + 5*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)
*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))]))/Sqrt[-(b/c)]
))/(3*b^4*c^3*x*Sqrt[x*(b - c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.59 (sec) , antiderivative size = 545, normalized size of antiderivative = 0.98, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {1233, 27, 1233, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}dx$$

$$\Big\downarrow \text{1233}$$

$$-\frac{2\int -\frac{(d+ex)^{3/2}\left(d\left(Beb^2+c(4Bd+9Ae)b+8Ac^2d\right)-e\left(4Beb^2+c(Bd+Ae)b+2Ac^2d\right)x\right)}{2(bx-cx^2)^{3/2}}dx}{3b^2c}-\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{(d+ex)^{3/2}\left(d\left(Beb^2+c(4Bd+9Ae)b+8Ac^2d\right)-e\left(4Beb^2+c(Bd+Ae)b+2Ac^2d\right)x\right)}{(bx-cx^2)^{3/2}}dx}{3b^2c}-\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \text{1233}$$

$$\frac{-\frac{2\int -\frac{e\left(bd\left(4Be^2b^3+ce(2Bd+Ae)b^2+c^2d(4Bd+11Ae)b+8Ac^3d^2\right)-\left(-8Be^3b^4-ce^2(5Bd+2Ae)b^3+c^2de(5Bd+4Ae)b^2+8c^3d^2(Bd+3Ae)b+16Ac^4d^3\right)x\right)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2c}-\cdots}{3b^2c}-\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{\frac{e\int \frac{bd\left(4Be^2b^3+ce(2Bd+Ae)b^2+c^2d(4Bd+11Ae)b+8Ac^3d^2\right)-\left(-8Be^3b^4-ce^2(5Bd+2Ae)b^3+c^2de(5Bd+4Ae)b^2+8c^3d^2(Bd+3Ae)b+16Ac^4d^3\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2c}-\frac{2\sqrt{d+\cdots}}{\cdots}}{3b^2c}-\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \text{1269}$$

$$\frac{e\left(\frac{d(be+cd)\left(b^2ce(Bd-Ae)+8bc^2d(2Ae+Bd)+16Ac^3d^2-4b^3Be^2\right)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{\left(-b^3ce^2(2Ae+5Bd)+b^2c^2de(4Ae+5Bd)+8bc^3d^2(3Ae+Bd)+16Ac^4 \ldots\right.}{e}\ldots\right.}{b^2c}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$\Big\downarrow$ 1169

$$\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2ce(Bd-Ae)+8bc^2d(2Ae+Bd)+16Ac^3d^2-4b^3Be^2\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}\left(-b^3ce^2(2Ae+5Bd)+b^2c^2de(4Ae+5Bd)+8bc^3 \ldots\right.}{e\sqrt{bx-cx^2}}\ldots\right.}{b^2c}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$\Big\downarrow$ 122

$$\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2ce(Bd-Ae)+8bc^2d(2Ae+Bd)+16Ac^3d^2-4b^3Be^2\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(-b^3ce^2(2Ae+5Bd)+b^2c^2de(4Ae+5B \ldots\right.}{e\sqrt{bx-c \ldots}}\ldots\right.}{b^2c}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$\Big\downarrow$ 120

$$\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2ce(Bd-Ae)+8bc^2d(2Ae+Bd)+16Ac^3d^2-4b^3Be^2\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(-b^3ce^2(2Ae+5Bd)+b^2c^2de(4Ae+ \ldots\right.}{\sqrt{ce \ldots}}\ldots\right.}{b^2c}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$\Big\downarrow$ 127

$$\frac{e\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^2ce(Bd-Ae)+8bc^2d(2Ae+Bd)+16Ac^3d^2-4b^3Be^2\right)\int \frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(-b^3ce^2(2Ae+5Bd)+b^2 \ldots\right.}{\ldots}\ldots\right.}{b^2c}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \; 126$$

$$\frac{e\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^2ce(Bd-Ae)+8bc^2d(2Ae+Bd)+16Ac^3d^2-4b^3Be^2\right)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(-b^3ce^2(2A\right.}{}\right.}{b^2c}$$

$$\frac{2(d+ex)^{5/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

input
```
Int[((A + B*x)*(d + e*x)^(7/2))/(b*x - c*x^2)^(5/2),x]
```

output
```
(-2*(d + e*x)^(5/2)*(A*b*c*d - (2*A*c^2*d + b^2*B*e + b*c*(B*d + A*e))*x))
/(3*b^2*c*(b*x - c*x^2)^(3/2)) + ((-2*Sqrt[d + e*x]*(b*c*d^2*(8*A*c^2*d +
b^2*B*e + b*c*(4*B*d + 9*A*e)) - (16*A*c^4*d^3 - 4*b^4*B*e^3 - b^3*c*e^2*(
4*B*d + A*e) + 8*b*c^3*d^2*(B*d + 3*A*e) + b^2*c^2*d*e*(5*B*d + 6*A*e))*x)
)/(b^2*c*Sqrt[b*x - c*x^2]) + (e*((-2*Sqrt[b]*(16*A*c^4*d^3 - 8*b^4*B*e^3
- b^3*c*e^2*(5*B*d + 2*A*e) + 8*b*c^3*d^2*(B*d + 3*A*e) + b^2*c^2*d*e*(5*B
*d + 4*A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqr
t[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt
[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(16*A*c^3*d^2 - 4*b^3*B*e^2 + b^
2*c*e*(B*d - A*e) + 8*b*c^2*d*(B*d + 2*A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqr
t[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))
])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/(b^2*c))/(3*b^2*c)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1154 vs. $2(489) = 978$.

Time = 4.57 (sec) , antiderivative size = 1155, normalized size of antiderivative = 2.08

method	result	size
elliptic	Expression too large to display	1155
default	Expression too large to display	3210

input
```
int((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2/3*(A*b^3*
c*e^3+3*A*b^2*c^2*d*e^2+3*A*b*c^3*d^2*e+A*c^4*d^3+B*b^4*e^3+3*B*b^3*c*d*e^
2+3*B*b^2*c^2*d^2*e+B*b*c^3*d^3)/b^3/c^4*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^
(1/2)/(x-b/c)^2+2/3*(-c*e*x^2-c*d*x)*(2*A*b^3*c*e^3-4*A*b^2*c^2*d*e^2-14*A
*b*c^3*d^2*e-8*A*c^4*d^3+5*B*b^4*e^3+5*B*b^3*c*d*e^2-5*B*b^2*c^2*d^2*e-5*B
*b*c^3*d^3)/b^4/c^3/((x-b/c)*(-c*e*x^2-c*d*x))^(1/2)-2/3*d^3*A/b^3*(-c*e*x
^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/x^2-2/3*(-c*e*x^2+b*e*x-c*d*x+b*d)*d^2/b^4
*(10*A*b*e+8*A*c*d+3*B*b*d)/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2*(e^3*(A
*c*e+2*B*b*e+4*B*c*d)/c^3-1/3*(A*b^3*c*e^3+3*A*b^2*c^2*d*e^2+3*A*b*c^3*d^2
*e+A*c^4*d^3+B*b^4*e^3+3*B*b^3*c*d*e^2+3*B*b^2*c^2*d^2*e+B*b*c^3*d^3)/c^3*
e/b^3-1/3*(2*A*b^3*c*e^3-4*A*b^2*c^2*d*e^2-14*A*b*c^3*d^2*e-8*A*c^4*d^3+5*
B*b^4*e^3+5*B*b^3*c*d*e^2-5*B*b^2*c^2*d^2*e-5*B*b*c^3*d^3)/c^3*(b*e+c*d)/b
^4+1/3/c^2*d*(2*A*b^3*c*e^3-4*A*b^2*c^2*d*e^2-14*A*b*c^3*d^2*e-8*A*c^4*d^3
+5*B*b^4*e^3+5*B*b^3*c*d*e^2-5*B*b^2*c^2*d^2*e-5*B*b*c^3*d^3)/b^4+1/3*d^3/
b^3*A*c*e)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/
2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-
d/e/(-d/e-b/c))^(1/2))+2*(B*e^4/c^2+1/3*(2*A*b^3*c*e^3-4*A*b^2*c^2*d*e^2-1
4*A*b*c^3*d^2*e-8*A*c^4*d^3+5*B*b^4*e^3+5*B*b^3*c*d*e^2-5*B*b^2*c^2*d^2*e-
5*B*b*c^3*d^3)/c^2*e/b^4-1/3*c*d^2*e*(10*A*b*e+8*A*c*d+3*B*b*d)/b^4)*d/e*(
(x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+...
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1259 vs. $2(489) = 978$.

Time = 0.18 (sec) , antiderivative size = 1259, normalized size of antiderivative = 2.27

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input

```
integrate((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output

```
-2/9*(((8*(B*b*c^6 + 2*A*c^7)*d^4 + (9*B*b^2*c^5 + 32*A*b*c^6)*d^3*e - (4*
B*b^3*c^4 - 13*A*b^2*c^5)*d^2*e^2 + 3*(3*B*b^4*c^3 - A*b^3*c^4)*d*e^3 + 2*
(4*B*b^5*c^2 + A*b^4*c^3)*e^4)*x^4 - 2*(8*(B*b^2*c^5 + 2*A*b*c^6)*d^4 + (9
*B*b^3*c^4 + 32*A*b^2*c^5)*d^3*e - (4*B*b^4*c^3 - 13*A*b^3*c^4)*d^2*e^2 +
3*(3*B*b^5*c^2 - A*b^4*c^3)*d*e^3 + 2*(4*B*b^6*c + A*b^5*c^2)*e^4)*x^3 + (
8*(B*b^3*c^4 + 2*A*b^2*c^5)*d^4 + (9*B*b^4*c^3 + 32*A*b^3*c^4)*d^3*e - (4*
B*b^5*c^2 - 13*A*b^4*c^3)*d^2*e^2 + 3*(3*B*b^6*c - A*b^5*c^2)*d*e^3 + 2*(4
*B*b^7 + A*b^6*c)*e^4)*x^2)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 +
b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d
*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*((8*(B*b
*c^6 + 2*A*c^7)*d^3*e + (5*B*b^2*c^5 + 24*A*b*c^6)*d^2*e^2 - (5*B*b^3*c^4
- 4*A*b^2*c^5)*d*e^3 - 2*(4*B*b^4*c^3 + A*b^3*c^4)*e^4)*x^4 - 2*(8*(B*b^2*
c^5 + 2*A*b*c^6)*d^3*e + (5*B*b^3*c^4 + 24*A*b^2*c^5)*d^2*e^2 - (5*B*b^4*c
^3 - 4*A*b^3*c^4)*d*e^3 - 2*(4*B*b^5*c^2 + A*b^4*c^3)*e^4)*x^3 + (8*(B*b^3
*c^4 + 2*A*b^2*c^5)*d^3*e + (5*B*b^4*c^3 + 24*A*b^3*c^4)*d^2*e^2 - (5*B*b^
5*c^2 - 4*A*b^4*c^3)*d*e^3 - 2*(4*B*b^6*c + A*b^5*c^2)*e^4)*x^2)*sqrt(-c*e
)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^
3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassP
Inverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*
b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d ...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(7/2)/(-c*x**2+b*x)**(5/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{7}{2}}}{(-cx^2+bx)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^(7/2)/(-c*x^2 + b*x)^(5/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{7}{2}}}{(-cx^2+bx)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^(7/2)/(-c*x^2 + b*x)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^{7/2}}{(b\,x-c\,x^2)^{5/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(7/2))/(b*x - c*x^2)^(5/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(7/2))/(b*x - c*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^{7/2}}{(bx-cx^2)^{5/2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(7/2)/(-c*x^2+b*x)^(5/2),x)
```

output
```
( - 4*sqrt(d + e*x)*sqrt(b - c*x)*a*b**2*c*e**3*x + 4*sqrt(d + e*x)*sqrt(b
 - c*x)*a*b*c**2*d*e**2*x + 6*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c**2*e**3*x*
*2 - 2*sqrt(d + e*x)*sqrt(b - c*x)*a*c**3*d**3 - 16*sqrt(d + e*x)*sqrt(b -
 c*x)*b**4*e**3*x - 26*sqrt(d + e*x)*sqrt(b - c*x)*b**3*c*d*e**2*x + 24*sq
rt(d + e*x)*sqrt(b - c*x)*b**3*c*e**3*x**2 - 4*sqrt(d + e*x)*sqrt(b - c*x)
*b**2*c**2*d**2*e*x + 24*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*d*e**2*x**2
 - 6*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c**2*e**3*x**3 - 2*sqrt(x)*int((sqrt
(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*e**2*x**2 - 3*
sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**3*c*d*e*x**2 - 3*sqrt(x)*b**3*c*e**2*
x**3 + 9*sqrt(x)*b**2*c**2*d**2*x**2 + 12*sqrt(x)*b**2*c**2*d*e*x**3 + 3*s
qrt(x)*b**2*c**2*e**2*x**4 - 9*sqrt(x)*b*c**3*d**2*x**3 - 10*sqrt(x)*b*c**
3*d*e*x**4 - sqrt(x)*b*c**3*e**2*x**5 + 3*sqrt(x)*c**4*d**2*x**4 + 3*sqrt(
x)*c**4*d*e*x**5),x)*a*b**6*c*d*e**4*x + 8*sqrt(x)*int((sqrt(d + e*x)*sqrt
(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*e**2*x**2 - 3*sqrt(x)*b**3*c
*d**2*x - 6*sqrt(x)*b**3*c*d*e*x**2 - 3*sqrt(x)*b**3*c*e**2*x**3 + 9*sqrt(
x)*b**2*c**2*d**2*x**2 + 12*sqrt(x)*b**2*c**2*d*e*x**3 + 3*sqrt(x)*b**2*c*
*2*e**2*x**4 - 9*sqrt(x)*b*c**3*d**2*x**3 - 10*sqrt(x)*b*c**3*d*e*x**4 - s
qrt(x)*b*c**3*e**2*x**5 + 3*sqrt(x)*c**4*d**2*x**4 + 3*sqrt(x)*c**4*d*e*x*
*5),x)*a*b**5*c**2*d**2*e**3*x + 4*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x
))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*e**2*x**2 - 3*sqrt(x)*b**3*c*d**2...
```

3.162 $\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 502

$$\begin{aligned}\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx &= \frac{2(cd+be)\left(8Ac^2d+b^2Be+bc(4Bd+7Ae)\right)x^2\sqrt{d+ex}}{3b^3c\left(bx-cx^2\right)^{3/2}} \\ &- \frac{2(3bBd+6Acd+5Abe)x(d+ex)^{3/2}}{3b^2\left(bx-cx^2\right)^{3/2}} - \frac{2A(d+ex)^{5/2}}{3b\left(bx-cx^2\right)^{3/2}} \\ &+ \frac{2\left(16Ac^3d^2-2b^3Be^2+b^2ce(3Bd+Ae)+8bc^2d(Bd+2Ae)\right)x\sqrt{d+ex}}{3b^4c\sqrt{bx-cx^2}} \\ &- \frac{2\left(16Ac^3d^2-2b^3Be^2+b^2ce(3Bd+Ae)+8bc^2d(Bd+2Ae)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\,E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{3b^{7/2}c^{3/2}\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} \\ &+ \frac{2d(cd+be)\left(16Ac^2d-b^2Be+8bc(Bd+Ae)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{3b^{7/2}c^{3/2}\sqrt{d+ex}\sqrt{bx-cx^2}}\end{aligned}$$

output
```
2/3*(b*e+c*d)*(8*A*c^2*d+b^2*B*e+b*c*(7*A*e+4*B*d))*x^2*(e*x+d)^(1/2)/b^3/
c/(-c*x^2+b*x)^(3/2)-2/3*(5*A*b*e+6*A*c*d+3*B*b*d)*x*(e*x+d)^(3/2)/b^2/(-c
*x^2+b*x)^(3/2)-2/3*A*(e*x+d)^(5/2)/b/(-c*x^2+b*x)^(3/2)+2/3*(16*A*c^3*d^2
-2*b^3*B*e^2+b^2*c*e*(A*e+3*B*d)+8*b*c^2*d*(2*A*e+B*d))*x*(e*x+d)^(1/2)/b^
4/c/(-c*x^2+b*x)^(1/2)-2/3*(16*A*c^3*d^2-2*b^3*B*e^2+b^2*c*e*(A*e+3*B*d)+8
*b*c^2*d*(2*A*e+B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1
/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(7/2)/c^(3/2)/(1+e*x/d)^(1/2)/(-c*
x^2+b*x)^(1/2)+2/3*d*(b*e+c*d)*(16*A*c^2*d-b^2*B*e+8*b*c*(A*e+B*d))*x^(1/2
)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/
c/d)^(1/2))/b^(7/2)/c^(3/2)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 27.51 (sec) , antiderivative size = 468, normalized size of antiderivative = 0.93

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx = \frac{2\left(\frac{c(d+ex)\left(b(bB+Ac)(cd+be)^2x^2+(cd+be)\left(8Ac^2d-2b^2Be+bc(5Bd+Ae)\right)x^2(b-cx)-Abcd^2(b-cx)^2-\right.}{b-cx}\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(5/2),x]
```

output
```
(2*((c*(d + e*x)*(b*(b*B + A*c)*(c*d + b*e)^2*x^2 + (c*d + b*e)*(8*A*c^2*d
 - 2*b^2*B*e + b*c*(5*B*d + A*e))*x^2*(b - c*x) - A*b*c*d^2*(b - c*x)^2 -
c*d*(3*b*B*d + 8*A*c*d + 7*A*b*e)*x*(b - c*x)^2))/(b - c*x) + (x*(Sqrt[-(b
/c)]*(16*A*c^3*d^2 - 2*b^3*B*e^2 + b^2*c*e*(3*B*d + A*e) + 8*b*c^2*d*(B*d
+ 2*A*e))*(b - c*x)*(d + e*x) + I*b*e*(16*A*c^3*d^2 - 2*b^3*B*e^2 + b^2*c*
e*(3*B*d + A*e) + 8*b*c^2*d*(B*d + 2*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e
*x)]*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] -
I*b*e*(c*d + b*e)*(8*A*c^2*d - 2*b^2*B*e + b*c*(4*B*d + A*e))*Sqrt[1 - b/(
c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]],
 -((c*d)/(b*e))]))/Sqrt[-(b/c)]))/(3*b^4*c^2*x*Sqrt[x*(b - c*x)]*Sqrt[d +
e*x])
```

Rubi [A] (verified)

Time = 1.39 (sec) , antiderivative size = 467, normalized size of antiderivative = 0.93, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.345$, Rules used = {1233, 27, 1234, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx$$

$$\Big\downarrow \ 1233$$

$$-\frac{2\int -\frac{\sqrt{d+ex}\left(d\left(Beb^2+c(4Bd+7Ae)b+8Ac^2d\right)+e\left(-2Beb^2+c(Bd+Ae)b+2Ac^2d\right)x\right)}{2(bx-cx^2)^{3/2}}dx}{3b^2c}-\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \ 27$$

$$\frac{\int \frac{\sqrt{d+ex}\left(d\left(Beb^2+c(4Bd+7Ae)b+8Ac^2d\right)+e\left(-2Beb^2+c(Bd+Ae)b+2Ac^2d\right)x\right)}{(bx-cx^2)^{3/2}}dx}{3b^2c}-\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \ 1234$$

$$\frac{-\frac{2\int -\frac{e\left(bd\left(Beb^2+c(4Bd+7Ae)b+8Ac^2d\right)-\left(-2Be^2b^3+ce(3Bd+Ae)b^2+8c^2d(Bd+2Ae)b+16Ac^3d^2\right)x\right)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2}-\frac{2\sqrt{d+ex}\left(bd\left(bc(7Ae+4Bd)+8Ac^2d+b^2Be\cdots\right.\right.}{\cdots}}{3b^2c}-\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \ 27$$

$$\frac{\frac{e\int \frac{bd\left(Beb^2+c(4Bd+7Ae)b+8Ac^2d\right)-\left(-2Be^2b^3+ce(3Bd+Ae)b^2+8c^2d(Bd+2Ae)b+16Ac^3d^2\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2}-\frac{2\sqrt{d+ex}\left(bd\left(bc(7Ae+4Bd)+8Ac^2d+b^2Be\right)-x\left(b^2\cdots\right.\right.}{b^2\sqrt{\cdots}}}{3b^2c}-\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \ 1269$$

$$\frac{\frac{e\left(\frac{d(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+b^2(-B)e\right)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{\left(b^2ce(Ae+3Bd)+8bc^2d(2Ae+Bd)+16Ac^3d^2-2b^3Be^2\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}\right)}{b^2}-2\sqrt{d+ex}}{3b^2c}$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \; 1169$$

$$\frac{\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+b^2(-B)e\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}\left(b^2ce(Ae+3Bd)+8bc^2d(2Ae+Bd)+16Ac^3d^2-2b^3Be^2\right)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-c}}}{e\sqrt{bx-cx^2}}\right.}{b^2}}{3b^2c}$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \; 122$$

$$\frac{\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+b^2(-B)e\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2ce(Ae+3Bd)+8bc^2d(2Ae+Bd)+16Ac^3d^2-2b^3Be^2\right)\int}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.}{b^2}}{3b^2c}$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \; 120$$

$$\frac{\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+b^2(-B)e\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2ce(Ae+3Bd)+8bc^2d(2Ae+Bd)+16Ac^3d^2-2b^3Be^2\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.}{b^2}}{3b^2c}$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \; 127$$

$$\frac{\frac{e\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+b^2(-B)e\right)\int \frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2ce(Ae+3Bd)+8bc^2d(2Ae+Bd)+16Ac^3d\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.}{b^2}}{3b}$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \ 126$$

$$\frac{\frac{e\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+b^2(-B)e\right)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2ce(Ae+3Bd)+8bc^2d(2Ae+\right.}{\sqrt{c}e\sqrt{bx-cx}}\right.}{b^2}}{}$$

$$\frac{2(d+ex)^{3/2}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

input
```
Int[((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(5/2),x]
```

output
```
(-2*(d + e*x)^(3/2)*(A*b*c*d - (2*A*c^2*d + b^2*B*e + b*c*(B*d + A*e))*x))
/(3*b^2*c*(b*x - c*x^2)^(3/2)) + ((-2*Sqrt[d + e*x]*(b*d*(8*A*c^2*d + b^2*
B*e + b*c*(4*B*d + 7*A*e)) - (16*A*c^3*d^2 - 2*b^3*B*e^2 + b^2*c*e*(3*B*d
+ A*e) + 8*b*c^2*d*(B*d + 2*A*e))*x))/(b^2*Sqrt[b*x - c*x^2]) + (e*((-2*Sq
rt[b]*(16*A*c^3*d^2 - 2*b^3*B*e^2 + b^2*c*e*(3*B*d + A*e) + 8*b*c^2*d*(B*d
 + 2*A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqrt[
c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt[b
*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(16*A*c^2*d - b^2*B*e + 8*b*c*(B*d
 + A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqr
t[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x
 - c*x^2])))/b^2)/(3*b^2*c)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1234
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^m*(a + b*x + c*x^2)^(p + 1)*(
(f*b - 2*a*g + (2*c*f - b*g)*x)/((p + 1)*(b^2 - 4*a*c))), x] + Simp[1/((p +
 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 1)*(a + b*x + c*x^2)^(p + 1)*Simp[g
*(2*a*e*m + b*d*(2*p + 3)) - f*(b*e*m + 2*c*d*(2*p + 3)) - e*(2*c*f - b*g)*
(m + 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1
] && GtQ[m, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 944 vs. $2(436) = 872$.

Time = 4.43 (sec) , antiderivative size = 945, normalized size of antiderivative = 1.88

method	result
elliptic	$\sqrt{(-cx+b)x(ex+d)}\left(\frac{2\left(A\,b^{2}e^{2}c+2Ab\,c^{2}de+A\,c^{3}d^{2}+b^{3}B\,e^{2}+2B\,b^{2}cde+Bb\,c^{2}d^{2}\right)\sqrt{-ce\,x^{3}+be\,x^{2}-cd\,x^{2}+bdx}}{3b^{3}c^{3}\left(x-\frac{b}{c}\right)^{2}}-\frac{2\left(-ce\,x^{2}-cdx\right)\left(A\,b^{2}e^{2}c+9A\right.}{3b^{4}c^{2}}\right.$
default	Expression too large to display

input
```
int((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2/3*(A*b^2*
c*e^2+2*A*b*c^2*d*e+A*c^3*d^2+B*b^3*e^2+2*B*b^2*c*d*e+B*b*c^2*d^2)/b^3/c^3
*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x-b/c)^2-2/3*(-c*e*x^2-c*d*x)*(A*
b^2*c*e^2+9*A*b*c^2*d*e+8*A*c^3*d^2-2*B*b^3*e^2+3*B*b^2*c*d*e+5*B*b*c^2*d^
2)/b^4/c^2/((x-b/c)*(-c*e*x^2-c*d*x))^(1/2)-2/3*A*d^2/b^3*(-c*e*x^3+b*e*x^
2-c*d*x^2+b*d*x)^(1/2)/x^2-2/3*(-c*e*x^2+b*e*x-c*d*x+b*d)*d/b^4*(7*A*b*e+8
*A*c*d+3*B*b*d)/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2*(B*e^3/c^2-1/3*(A*b
^2*c*e^2+2*A*b*c^2*d*e+A*c^3*d^2+B*b^3*e^2+2*B*b^2*c*d*e+B*b*c^2*d^2)/c^2*
e/b^3+1/3*(A*b^2*c*e^2+9*A*b*c^2*d*e+8*A*c^3*d^2-2*B*b^3*e^2+3*B*b^2*c*d*e
+5*B*b*c^2*d^2)/c^2*(b*e+c*d)/b^4-1/3/c*d*(A*b^2*c*e^2+9*A*b*c^2*d*e+8*A*c
^3*d^2-2*B*b^3*e^2+3*B*b^2*c*d*e+5*B*b*c^2*d^2)/b^4+1/3*d^2/b^3*A*c*e)*d/e
*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b
*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c)
)^(1/2))+2*(-1/3*(A*b^2*c*e^2+9*A*b*c^2*d*e+8*A*c^3*d^2-2*B*b^3*e^2+3*B*b^
2*c*d*e+5*B*b*c^2*d^2)/c*e/b^4-1/3*d*e*c*(7*A*b*e+8*A*c*d+3*B*b*d)/b^4)*d/
e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+
b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d
/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^
(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1041 vs. $2(436) = 872$.

Time = 0.12 (sec) , antiderivative size = 1041, normalized size of antiderivative = 2.07

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output

```
-2/9*(((8*(B*b*c^5 + 2*A*c^6)*d^3 + (7*B*b^2*c^4 + 24*A*b*c^5)*d^2*e - 2*(
B*b^3*c^3 - 3*A*b^2*c^4)*d*e^2 + (2*B*b^4*c^2 - A*b^3*c^3)*e^3)*x^4 - 2*(8
*(B*b^2*c^4 + 2*A*b*c^5)*d^3 + (7*B*b^3*c^3 + 24*A*b^2*c^4)*d^2*e - 2*(B*b
^4*c^2 - 3*A*b^3*c^3)*d*e^2 + (2*B*b^5*c - A*b^4*c^2)*e^3)*x^3 + (8*(B*b^3
*c^3 + 2*A*b^2*c^4)*d^3 + (7*B*b^4*c^2 + 24*A*b^3*c^3)*d^2*e - 2*(B*b^5*c
- 3*A*b^4*c^2)*d*e^2 + (2*B*b^6 - A*b^5*c)*e^3)*x^2)*sqrt(-c*e)*weierstras
sPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 +
3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d -
 b*e)/(c*e)) + 3*((8*(B*b*c^5 + 2*A*c^6)*d^2*e + (3*B*b^2*c^4 + 16*A*b*c^5
)*d*e^2 - (2*B*b^3*c^3 - A*b^2*c^4)*e^3)*x^4 - 2*(8*(B*b^2*c^4 + 2*A*b*c^5
)*d^2*e + (3*B*b^3*c^3 + 16*A*b^2*c^4)*d*e^2 - (2*B*b^4*c^2 - A*b^3*c^3)*e
^3)*x^3 + (8*(B*b^3*c^3 + 2*A*b^2*c^4)*d^2*e + (3*B*b^4*c^2 + 16*A*b^3*c^3
)*d*e^2 - (2*B*b^5*c - A*b^4*c^2)*e^3)*x^2)*sqrt(-c*e)*weierstrassZeta(4/3
*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e
 - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2
+ b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c
*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) + 3*(A*b^
3*c^3*d^2*e + (8*(B*b*c^5 + 2*A*c^6)*d^2*e + (3*B*b^2*c^4 + 16*A*b*c^5)*d*
e^2 - (2*B*b^3*c^3 - A*b^2*c^4)*e^3)*x^3 - (12*(B*b^2*c^4 + 2*A*b*c^5)*d^2
*e + 5*(B*b^3*c^3 + 5*A*b^2*c^4)*d*e^2 - (B*b^4*c^2 - 2*A*b^3*c^3)*e^3)...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx = \text{Timed out}$$

input

```
integrate((B*x+A)*(e*x+d)**(5/2)/(-c*x**2+b*x)**(5/2),x)
```

output

```
Timed out
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{5}{2}}}{(-cx^2+bx)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^(5/2)/(-c*x^2 + b*x)^(5/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{5}{2}}}{(-cx^2+bx)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^(5/2)/(-c*x^2 + b*x)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^{5/2}}{(b\,x-c\,x^2)^{5/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(5/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(5/2))/(b*x - c*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^{5/2}}{(bx-cx^2)^{5/2}}\,dx = \text{too large to display}$$

input

```
int((B*x+A)*(e*x+d)^(5/2)/(-c*x^2+b*x)^(5/2),x)
```

output

```
(2*sqrt(d + e*x)*sqrt(b - c*x)*a*b*c*e**2*x - 2*sqrt(d + e*x)*sqrt(b - c*x
)*a*c**2*d**2 - 4*sqrt(d + e*x)*sqrt(b - c*x)*b**3*e**2*x + 2*sqrt(d + e*x
)*sqrt(b - c*x)*b**2*c*d*e*x + 6*sqrt(d + e*x)*sqrt(b - c*x)*b**2*c*e**2*x
**2 + sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt
(x)*b**4*e**2*x**2 - 3*sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**3*c*d*e*x**2 -
 3*sqrt(x)*b**3*c*e**2*x**3 + 9*sqrt(x)*b**2*c**2*d**2*x**2 + 12*sqrt(x)*b
**2*c**2*d*e*x**3 + 3*sqrt(x)*b**2*c**2*e**2*x**4 - 9*sqrt(x)*b*c**3*d**2*
x**3 - 10*sqrt(x)*b*c**3*d*e*x**4 - sqrt(x)*b*c**3*e**2*x**5 + 3*sqrt(x)*c
**4*d**2*x**4 + 3*sqrt(x)*c**4*d*e*x**5),x)*a*b**5*c*d*e**3*x + 4*sqrt(x)*
int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*e**2*
x**2 - 3*sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**3*c*d*e*x**2 - 3*sqrt(x)*b**
3*c*e**2*x**3 + 9*sqrt(x)*b**2*c**2*d**2*x**2 + 12*sqrt(x)*b**2*c**2*d*e*x
**3 + 3*sqrt(x)*b**2*c**2*e**2*x**4 - 9*sqrt(x)*b*c**3*d**2*x**3 - 10*sqrt
(x)*b*c**3*d*e*x**4 - sqrt(x)*b*c**3*e**2*x**5 + 3*sqrt(x)*c**4*d**2*x**4
+ 3*sqrt(x)*c**4*d*e*x**5),x)*a*b**4*c**2*d**2*e**2*x - 2*sqrt(x)*int((sqr
t(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*e**2*x**2 - 3
*sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**3*c*d*e*x**2 - 3*sqrt(x)*b**3*c*e**2
*x**3 + 9*sqrt(x)*b**2*c**2*d**2*x**2 + 12*sqrt(x)*b**2*c**2*d*e*x**3 + 3*
sqrt(x)*b**2*c**2*e**2*x**4 - 9*sqrt(x)*b*c**3*d**2*x**3 - 10*sqrt(x)*b*c*
*3*d*e*x**4 - sqrt(x)*b*c**3*e**2*x**5 + 3*sqrt(x)*c**4*d**2*x**4 + 3*s...
```

3.163 $\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 442

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}\,dx = -\frac{2(bBd+2Acd+Abe)x\sqrt{d+ex}}{b^2(bx-cx^2)^{3/2}}$$
$$+\frac{2(8Ac^2d+b^2Be+bc(4Bd+5Ae))\,x^2\sqrt{d+ex}}{3b^3(bx-cx^2)^{3/2}}$$
$$-\frac{2A(d+ex)^{3/2}}{3b(bx-cx^2)^{3/2}}+\frac{2(16Ac^2d+b^2Be+8bc(Bd+Ae))\,x\sqrt{d+ex}}{3b^4\sqrt{bx-cx^2}}$$
$$-\frac{2(16Ac^2d+b^2Be+8bc(Bd+Ae))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\,E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{3b^{7/2}\sqrt{c}\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$
$$+\frac{2(16Ac^2d^2+8bcd(Bd+2Ae)+b^2e(5Bd+3Ae))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{3b^{7/2}\sqrt{c}\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2*(A*b*e+2*A*c*d+B*b*d)*x*(e*x+d)^(1/2)/b^2/(-c*x^2+b*x)^(3/2)+2/3*(8*A*c
^2*d+b^2*B*e+b*c*(5*A*e+4*B*d))*x^2*(e*x+d)^(1/2)/b^3/(-c*x^2+b*x)^(3/2)-2
/3*A*(e*x+d)^(3/2)/b/(-c*x^2+b*x)^(3/2)+2/3*(16*A*c^2*d+b^2*B*e+8*b*c*(A*e
+B*d))*x*(e*x+d)^(1/2)/b^4/(-c*x^2+b*x)^(1/2)-2/3*(16*A*c^2*d+b^2*B*e+8*b*
c*(A*e+B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/
2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(7/2)/c^(1/2)/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^
(1/2)+2/3*(16*A*c^2*d^2+8*b*c*d*(2*A*e+B*d)+b^2*e*(3*A*e+5*B*d))*x^(1/2)*(
1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d
)^(1/2))/b^(7/2)/c^(1/2)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 25.38 (sec) , antiderivative size = 395, normalized size of antiderivative = 0.89

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}\,dx = \frac{2\left(-\frac{(d+ex)(bBx(8c^2dx^2+b^2(3d-2ex)+bcx(-12d+ex))+A(16c^3dx^3+b^2cx(6d-13ex)+8bc^2x^2(-3d+}{b-cx}\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(5/2),x]
```

output
```
(2*(-(((d + e*x)*(b*B*x*(8*c^2*d*x^2 + b^2*(3*d - 2*e*x) + b*c*x*(-12*d +
e*x)) + A*(16*c^3*d*x^3 + b^2*c*x*(6*d - 13*e*x) + 8*b*c^2*x^2*(-3*d + e*x
) + b^3*(d + 4*e*x))))/(b - c*x)) + (x*(Sqrt[-(b/c)]*(16*A*c^2*d + b^2*B*e
 + 8*b*c*(B*d + A*e))*(b - c*x)*(d + e*x) + I*b*e*(16*A*c^2*d + b^2*B*e +
8*b*c*(B*d + A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticE[I
*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*e*(8*A*c^2*d + b^2*B
*e + b*c*(4*B*d + 5*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*Elli
pticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))]))/(Sqrt[-(b/c)]*c))
)/(3*b^4*x*Sqrt[x*(b - c*x)]*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.29 (sec) , antiderivative size = 425, normalized size of antiderivative = 0.96, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {1233, 27, 1235, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}dx$$

$$\Big\downarrow \text{1233}$$

$$-\frac{2\int -\frac{d(Beb^2+c(4Bd+5Ae)b+8Ac^2d)+3ce(bBd+2Acd+Abe)x}{2\sqrt{d+ex}(bx-cx^2)^{3/2}}dx}{3b^2c}-\frac{2\sqrt{d+ex}(Abcd-x(bc(Ae+Bd)+2Ac^2d+b^2Be))}{3b^2c(bx-cx^2)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{d(Beb^2+c(4Bd+5Ae)b+8Ac^2d)+3ce(bBd+2Acd+Abe)x}{\sqrt{d+ex}(bx-cx^2)^{3/2}}dx}{3b^2c}-\frac{2\sqrt{d+ex}(Abcd-x(bc(Ae+Bd)+2Ac^2d+b^2Be))}{3b^2c(bx-cx^2)^{3/2}}$$

$$\Big\downarrow \text{1235}$$

$$\frac{\frac{2\int \frac{cde(cd+be)(b(4bBd+8Acd+3Abe)-(Beb^2+8c(Bd+Ae)b+16Ac^2d)x)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(b(bc(5Ae+4Bd)+8Ac^2d+b^2Be)-cx(8bc(Ae+Bd)+16Ac^2d+}{b^2\sqrt{bx-cx^2}}}{3b^2c}$$
$$-\frac{2\sqrt{d+ex}(Abcd-x(bc(Ae+Bd)+2Ac^2d+b^2Be))}{3b^2c(bx-cx^2)^{3/2}}$$

$$\Big\downarrow \text{27}$$

$$\frac{\frac{ce\int \frac{b(4bBd+8Acd+3Abe)-(Beb^2+8c(Bd+Ae)b+16Ac^2d)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2}-\frac{2\sqrt{d+ex}(b(bc(5Ae+4Bd)+8Ac^2d+b^2Be)-cx(8bc(Ae+Bd)+16Ac^2d+b^2Be))}{b^2\sqrt{bx-cx^2}}}{3b^2c}-$$
$$\frac{2\sqrt{d+ex}(Abcd-x(bc(Ae+Bd)+2Ac^2d+b^2Be))}{3b^2c(bx-cx^2)^{3/2}}$$

$$\Big\downarrow \text{1269}$$

$$\frac{\frac{ce\left(\frac{\left(b^2e(3Ae+5Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int\frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{\left(8bc(Ae+Bd)+16Ac^2d+b^2Be\right)\int\frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}\right)}{b^2}-\frac{2\sqrt{d+ex}(b(bc(5Ae+4Bd)+8\cdots}{\cdots}}{3b^2c}$$
$$\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$\downarrow$ 1169

$$\frac{\frac{ce\left(\frac{\sqrt{x}\sqrt{b-cx}\left(b^2e(3Ae+5Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}\left(8bc(Ae+Bd)+16Ac^2d+b^2Be\right)\int\frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}\right)}{b^2}-\frac{2\sqrt{d+ex}(\cdots}{\cdots}}{3b^2c}$$
$$\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$\downarrow$ 122

$$\frac{\frac{ce\left(\frac{\sqrt{x}\sqrt{b-cx}\left(b^2e(3Ae+5Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(8bc(Ae+Bd)+16Ac^2d+b^2Be\right)\int\frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right)}{b^2}-\frac{2\cdots}{\cdots}}{3b^2c}$$
$$\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$\downarrow$ 120

$$\frac{\frac{ce\left(\frac{\sqrt{x}\sqrt{b-cx}\left(b^2e(3Ae+5Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int\frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(8bc(Ae+Bd)+16Ac^2d+b^2Be\right)E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\cdots}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\cdots}{b^2}\cdots}{3b^2c}$$
$$\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$\downarrow$ 127

$$\frac{\frac{ce\left(\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}\left(b^2e(3Ae+5Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(8bc(Ae+Bd)+16Ac^2d+b^2Be\right)E\left(\arcsin\left(\cdots\right.\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\cdots}{b^2}\cdots}{3b^2c}$$
$$\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \text{126}$$

$$\frac{\frac{ce\left(\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}\left(b^2e(3Ae+5Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(8bc(Ae+Bd)+16Ac^2d+b^2B\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\right.}{b^2}}{3b^2c}$$

$$\frac{2\sqrt{d+ex}\left(Abcd-x\left(bc(Ae+Bd)+2Ac^2d+b^2Be\right)\right)}{3b^2c\left(bx-cx^2\right)^{3/2}}$$

input
```
Int[((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(5/2),x]
```

output
```
(-2*Sqrt[d + e*x]*(A*b*c*d - (2*A*c^2*d + b^2*B*e + b*c*(B*d + A*e))*x))/(
3*b^2*c*(b*x - c*x^2)^(3/2)) + ((-2*Sqrt[d + e*x]*(b*(8*A*c^2*d + b^2*B*e
+ b*c*(4*B*d + 5*A*e)) - c*(16*A*c^2*d + b^2*B*e + 8*b*c*(B*d + A*e))*x))/
(b^2*Sqrt[b*x - c*x^2]) + (c*e*((-2*Sqrt[b]*(16*A*c^2*d + b^2*B*e + 8*b*c*
(B*d + A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[ArcSin[(Sqr
t[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)/d]*Sqrt
[b*x - c*x^2]) + (2*Sqrt[b]*(16*A*c^2*d^2 + 8*b*c*d*(B*d + 2*A*e) + b^2*e*
(5*B*d + 3*A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[Arc
Sin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*
Sqrt[b*x - c*x^2])))/b^2)/(3*b^2*c)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1233
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(-(d + e*x)^(m - 1))*(a + b*x + c*x^2)
^(p + 1)*((2*a*c*(e*f + d*g) - b*(c*d*f + a*e*g) - (2*c^2*d*f + b^2*e*g - c
*(b*e*f + b*d*g + 2*a*e*g))*x)/(c*(p + 1)*(b^2 - 4*a*c))), x] - Simp[1/(c*(
p + 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 2)*(a + b*x + c*x^2)^(p + 1)*Sim
p[2*c^2*d^2*f*(2*p + 3) + b*e*g*(a*e*(m - 1) + b*d*(p + 2)) - c*(2*a*e*(e*f
*(m - 1) + d*g*m) + b*d*(d*g*(2*p + 3) - e*f*(m - 2*p - 4))) + e*(b^2*e*g*(
m + p + 1) + 2*c^2*d*f*(m + 2*p + 2) - c*(2*a*e*g*m + b*(e*f + d*g)*(m + 2*
p + 2)))*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1] &&
GtQ[m, 1] && ((EqQ[m, 2] && EqQ[p, -3] && RationalQ[a, b, c, d, e, f, g]) |
|  !ILtQ[m + 2*p + 3, 0])
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 4.42 (sec) , antiderivative size = 745, normalized size of antiderivative = 1.69

method	result
elliptic	$\sqrt{(-cx+b)x(ex+d)}\left(\frac{2\left(Aceb+A\,c^{2}d+b^{2}Be+Bbcd\right)\sqrt{-ce\,x^{3}+be\,x^{2}-cd\,x^{2}+bdx}}{3b^{3}c^{2}\left(x-\frac{b}{c}\right)^{2}}-\frac{2\left(-ce\,x^{2}-cdx\right)\left(4Aceb+8A\,c^{2}d+b^{2}Be+5Bbcd\right)}{3b^{4}c\sqrt{\left(x-\frac{b}{c}\right)\left(-ce\,x^{2}-cdx\right)}}-\frac{2dA\sqrt{-c}}{}\right.$
default	Expression too large to display

input
```
int((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2/3*(A*b*c*
e+A*c^2*d+B*b^2*e+B*b*c*d)/b^3/c^2*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/
(x-b/c)^2-2/3*(-c*e*x^2-c*d*x)*(4*A*b*c*e+8*A*c^2*d+B*b^2*e+5*B*b*c*d)/b^4
/c/((x-b/c)*(-c*e*x^2-c*d*x))^(1/2)-2/3*d/b^3*A*(-c*e*x^3+b*e*x^2-c*d*x^2+
b*d*x)^(1/2)/x^2-2/3*(-c*e*x^2+b*e*x-c*d*x+b*d)/b^4*(4*A*b*e+8*A*c*d+3*B*b
*d)/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2*(-1/3*(A*b*c*e+A*c^2*d+B*b^2*e+
B*b*c*d)/c*e/b^3+1/3*(4*A*b*c*e+8*A*c^2*d+B*b^2*e+5*B*b*c*d)/c*(b*e+c*d)/b
^4-1/3*d*(4*A*b*c*e+8*A*c^2*d+B*b^2*e+5*B*b*c*d)/b^4+1/3/b^3*A*c*d*e)*d/e*
((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*
e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))
^(1/2))+2*(-1/3*(4*A*b*c*e+8*A*c^2*d+B*b^2*e+5*B*b*c*d)*e/b^4-1/3*c*e*(4*A
*b*e+8*A*c*d+3*B*b*d)/b^4)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1
/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*Elli
pticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/
d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 820 vs. $2(378) = 756$.

Time = 0.10 (sec) , antiderivative size = 820, normalized size of antiderivative = 1.86

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
-2/9*(((8*(B*b*c^4 + 2*A*c^5)*d^2 + (5*B*b^2*c^3 + 16*A*b*c^4)*d*e - (B*b^
3*c^2 - A*b^2*c^3)*e^2)*x^4 - 2*(8*(B*b^2*c^3 + 2*A*b*c^4)*d^2 + (5*B*b^3*
c^2 + 16*A*b^2*c^3)*d*e - (B*b^4*c - A*b^3*c^2)*e^2)*x^3 + (8*(B*b^3*c^2 +
 2*A*b^2*c^3)*d^2 + (5*B*b^4*c + 16*A*b^3*c^2)*d*e - (B*b^5 - A*b^4*c)*e^2
)*x^2)*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c
^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^
3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e)) + 3*((8*(B*b*c^4 + 2*A*c^5)*d*e +
 (B*b^2*c^3 + 8*A*b*c^4)*e^2)*x^4 - 2*(8*(B*b^2*c^3 + 2*A*b*c^4)*d*e + (B*
b^3*c^2 + 8*A*b^2*c^3)*e^2)*x^3 + (8*(B*b^3*c^2 + 2*A*b^2*c^3)*d*e + (B*b^
4*c + 8*A*b^3*c^2)*e^2)*x^2)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c
*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^
2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2
*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*
e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) + 3*(A*b^3*c^2*d*e + (8*
(B*b*c^4 + 2*A*c^5)*d*e + (B*b^2*c^3 + 8*A*b*c^4)*e^2)*x^3 - (12*(B*b^2*c^
3 + 2*A*b*c^4)*d*e + (2*B*b^3*c^2 + 13*A*b^2*c^3)*e^2)*x^2 + (4*A*b^3*c^2*
e^2 + 3*(B*b^3*c^2 + 2*A*b^2*c^3)*d*e)*x)*sqrt(-c*x^2 + b*x)*sqrt(e*x + d)
)/(b^4*c^4*e*x^4 - 2*b^5*c^3*e*x^3 + b^6*c^2*e*x^2)
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(3/2)/(-c*x**2+b*x)**(5/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{3}{2}}}{(-cx^2+bx)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^(3/2)/(-c*x^2 + b*x)^(5/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(Bx+A)(ex+d)^{\frac{3}{2}}}{(-cx^2+bx)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^(3/2)/(-c*x^2 + b*x)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(A+B\,x)\,\left(d+e\,x\right)^{3/2}}{\left(b\,x-c\,x^2\right)^{5/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(5/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(3/2))/(b*x - c*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^{3/2}}{(bx-cx^2)^{5/2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x)
```

output
```
( - 2*sqrt(d + e*x)*sqrt(b - c*x)*a*c*d + 2*sqrt(d + e*x)*sqrt(b - c*x)*b*
*2*e*x + 4*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x +
 sqrt(x)*b**4*e**2*x**2 - 3*sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**3*c*d*e*x
**2 - 3*sqrt(x)*b**3*c*e**2*x**3 + 9*sqrt(x)*b**2*c**2*d**2*x**2 + 12*sqrt
(x)*b**2*c**2*d*e*x**3 + 3*sqrt(x)*b**2*c**2*e**2*x**4 - 9*sqrt(x)*b*c**3*
d**2*x**3 - 10*sqrt(x)*b*c**3*d*e*x**4 - sqrt(x)*b*c**3*e**2*x**5 + 3*sqrt
(x)*c**4*d**2*x**4 + 3*sqrt(x)*c**4*d*e*x**5),x)*a*b**4*c*d*e**2*x - 6*sqr
t(x)*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*
e**2*x**2 - 3*sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**3*c*d*e*x**2 - 3*sqrt(x
)*b**3*c*e**2*x**3 + 9*sqrt(x)*b**2*c**2*d**2*x**2 + 12*sqrt(x)*b**2*c**2*
d*e*x**3 + 3*sqrt(x)*b**2*c**2*e**2*x**4 - 9*sqrt(x)*b*c**3*d**2*x**3 - 10
*sqrt(x)*b*c**3*d*e*x**4 - sqrt(x)*b*c**3*e**2*x**5 + 3*sqrt(x)*c**4*d**2*
x**4 + 3*sqrt(x)*c**4*d*e*x**5),x)*a*b**3*c**2*d**2*e*x - 8*sqrt(x)*int((s
qrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*e**2*x**2 -
 3*sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**3*c*d*e*x**2 - 3*sqrt(x)*b**3*c*e*
*2*x**3 + 9*sqrt(x)*b**2*c**2*d**2*x**2 + 12*sqrt(x)*b**2*c**2*d*e*x**3 +
3*sqrt(x)*b**2*c**2*e**2*x**4 - 9*sqrt(x)*b*c**3*d**2*x**3 - 10*sqrt(x)*b*
c**3*d*e*x**4 - sqrt(x)*b*c**3*e**2*x**5 + 3*sqrt(x)*c**4*d**2*x**4 + 3*sq
rt(x)*c**4*d*e*x**5),x)*a*b**3*c**2*d*e**2*x**2 - 18*sqrt(x)*int((sqrt(d +
 e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*e**2*x**2 - 3*s...
```

3.164 $\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 477

$$\begin{aligned}
\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx &= -\frac{2A\sqrt{d+ex}}{3b\,(bx-cx^2)^{3/2}} \\
&- \frac{2(3bBd+6Acd+Abe)x\sqrt{d+ex}}{3b^2d\,(bx-cx^2)^{3/2}} + \frac{2c(4bBd+8Acd+Abe)x^2\sqrt{d+ex}}{3b^3d\,(bx-cx^2)^{3/2}} \\
&+ \frac{2c(16Ac^2d^2+b^2e(7Bd+Ae)+8bcd(Bd+2Ae))\,x\sqrt{d+ex}}{3b^4d(cd+be)\sqrt{bx-cx^2}} \\
&- \frac{2\sqrt{c}(16Ac^2d^2+b^2e(7Bd+Ae)+8bcd(Bd+2Ae))\,\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\,E\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right)|-\frac{be}{cd}\right)}{3b^{7/2}d(cd+be)\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}} \\
&+ \frac{2(16Ac^2d+3b^2Be+8bc(Bd+Ae))\,\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{3b^{7/2}\sqrt{c}\sqrt{d+ex}\sqrt{bx-cx^2}}
\end{aligned}$$

output
```
-2/3*A*(e*x+d)^(1/2)/b/(-c*x^2+b*x)^(3/2)-2/3*(A*b*e+6*A*c*d+3*B*b*d)*x*(e
*x+d)^(1/2)/b^2/d/(-c*x^2+b*x)^(3/2)+2/3*c*(A*b*e+8*A*c*d+4*B*b*d)*x^2*(e*
x+d)^(1/2)/b^3/d/(-c*x^2+b*x)^(3/2)+2/3*c*(16*A*c^2*d^2+b^2*e*(A*e+7*B*d)+
8*b*c*d*(2*A*e+B*d))*x*(e*x+d)^(1/2)/b^4/d/(b*e+c*d)/(-c*x^2+b*x)^(1/2)-2/
3*c^(1/2)*(16*A*c^2*d^2+b^2*e*(A*e+7*B*d)+8*b*c*d*(2*A*e+B*d))*x^(1/2)*(1-
c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1
/2))/b^(7/2)/d/(b*e+c*d)/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/3*(16*A*c^2*
d+3*b^2*B*e+8*b*c*(A*e+B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*Ellip
ticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(7/2)/c^(1/2)/(e*x+d)^(1/
2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 23.95 (sec) , antiderivative size = 450, normalized size of antiderivative = 0.94

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx = \frac{2\left(\sqrt{-\frac{b}{c}}(d+ex)\left(bc(bB+Ac)d(cd+be)x^2+cd(8Ac^2d+4b^2Be+bc(5Bd+7\right.\right.}{}$$

input
```
Integrate[((A + B*x)*Sqrt[d + e*x])/(b*x - c*x^2)^(5/2),x]
```

output
```
(2*(Sqrt[-(b/c)]*(d + e*x)*(b*c*(b*B + A*c)*d*(c*d + b*e)*x^2 + c*d*(8*A*c
^2*d + 4*b^2*B*e + b*c*(5*B*d + 7*A*e))*x^2*(b - c*x) - A*b*d*(c*d + b*e)*
(b - c*x)^2 - (c*d + b*e)*(3*b*B*d + 8*A*c*d + A*b*e)*x*(b - c*x)^2) + x*(
b - c*x)*(Sqrt[-(b/c)]*(16*A*c^2*d^2 + b^2*e*(7*B*d + A*e) + 8*b*c*d*(B*d
+ 2*A*e))*(b - c*x)*(d + e*x) + I*b*e*(16*A*c^2*d^2 + b^2*e*(7*B*d + A*e)
+ 8*b*c*d*(B*d + 2*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*Ellip
ticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*e*(c*d + b*e)*
(4*b*B*d + 8*A*c*d + A*b*e)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*El
lipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])))/(3*b^4*Sqrt[-(
b/c)]*d*(c*d + b*e)*(x*(b - c*x))^(3/2)*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.30 (sec) , antiderivative size = 439, normalized size of antiderivative = 0.92, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {1234, 27, 1235, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx$$

$$\Big\downarrow \ 1234$$

$$-\frac{2\int -\frac{8Acd+b(4Bd+Ae)+3(bB+2Ac)ex}{2\sqrt{d+ex}(bx-cx^2)^{3/2}}dx}{3b^2}-\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\,(bx-cx^2)^{3/2}}$$

$$\Big\downarrow \ 27$$

$$\frac{\int \frac{4bBd+8Acd+Abe+3(bB+2Ac)ex}{\sqrt{d+ex}(bx-cx^2)^{3/2}}dx}{3b^2}-\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\,(bx-cx^2)^{3/2}}$$

$$\Big\downarrow \ 1235$$

$$\frac{\frac{2\int \frac{e\left(bd\left(3Beb^2+c(4Bd+7Ae)b+8Ac^2d\right)-c\left(e(7Bd+Ae)b^2+8cd(Bd+2Ae)b+16Ac^2d^2\right)x\right)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(b(be+cd)(Abe+8Acd+4bBd)-cx(b^2e(Ae+7B}{b^2d\sqrt{bx-cx^2}(be+cd)}}{3b^2}$$

$$\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\,(bx-cx^2)^{3/2}}$$

$$\Big\downarrow \ 27$$

$$\frac{\frac{e\int \frac{bd\left(3Beb^2+c(4Bd+7Ae)b+8Ac^2d\right)-c\left(e(7Bd+Ae)b^2+8cd(Bd+2Ae)b+16Ac^2d^2\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(b(be+cd)(Abe+8Acd+4bBd)-cx(b^2e(Ae+7Bd)+}{b^2d\sqrt{bx-cx^2}(be+cd)}}{3b^2}$$

$$\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\,(bx-cx^2)^{3/2}}$$

$$\Big\downarrow \ 1269$$

$$\frac{\frac{e\left(\frac{d(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+3b^2Be\right)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{c\left(b^2e(Ae+7Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int \frac{\sqrt{d+ex}}{\sqrt{bx-cx^2}}dx}{e}\right)}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(b(be+cd)(\ldots}{\ldots}}{3b^2}$$

$$\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\left(bx-cx^2\right)^{3/2}}$$

$\big\downarrow$ 1169

$$\frac{\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+3b^2Be\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{c\sqrt{x}\sqrt{b-cx}\left(b^2e(Ae+7Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int \frac{\sqrt{d+ex}}{\sqrt{x}\sqrt{b-cx}}dx}{e\sqrt{bx-cx^2}}\right)}{b^2d(be+cd)}-2\ldots}{3b^2}$$

$$\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\left(bx-cx^2\right)^{3/2}}$$

$\big\downarrow$ 122

$$\frac{\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+3b^2Be\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{c\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2e(Ae+7Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int \frac{\sqrt{\frac{ex}{d}+1}}{\sqrt{x}\sqrt{1-\frac{cx}{b}}}dx}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\ldots}{b^2d(be+cd)}\ldots}{3b^2}$$

$$\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\left(bx-cx^2\right)^{3/2}}$$

$\big\downarrow$ 120

$$\frac{\frac{e\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+3b^2Be\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2e(Ae+7Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)E\left(\arcsin\left(\ldots\right.\right.}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\ldots}{b^2d(be+cd)}\ldots}{3b^2}$$

$$\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\left(bx-cx^2\right)^{3/2}}$$

$\big\downarrow$ 127

$$\frac{\frac{e\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+3b^2Be\right)\int \frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2e(Ae+7Bd)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\ldots}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}\ldots}{b^2d(be+cd)}\ldots}{3b^2}$$

$$\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\left(bx-cx^2\right)^{3/2}}$$

$$\Big\downarrow \; 126$$

$$\frac{\frac{e\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(8bc(Ae+Bd)+16Ac^2d+3b^2Be\right)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{c}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^2e(Ae+7Bd)+8bcd(2Ae+Bc\cdots\right.}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+\cdots}}\cdots}{b^2d(be+cd)}\cdots}{3b^2}$$

$$\frac{2\sqrt{d+ex}(Ab-x(2Ac+bB))}{3b^2\left(bx-cx^2\right)^{3/2}}$$

input
```
Int[((A + B*x)*Sqrt[d + e*x])/(b*x - c*x^2)^(5/2),x]
```

output
```
(-2*(A*b - (b*B + 2*A*c)*x)*Sqrt[d + e*x])/(3*b^2*(b*x - c*x^2)^(3/2)) + (
(-2*Sqrt[d + e*x]*(b*(c*d + b*e)*(4*b*B*d + 8*A*c*d + A*b*e) - c*(16*A*c^2
*d^2 + b^2*e*(7*B*d + A*e) + 8*b*c*d*(B*d + 2*A*e))*x))/(b^2*d*(c*d + b*e)
*Sqrt[b*x - c*x^2]) + (e*((-2*Sqrt[b]*Sqrt[c]*(16*A*c^2*d^2 + b^2*e*(7*B*d
 + A*e) + 8*b*c*d*(B*d + 2*A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*E
llipticE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(e*Sqrt[1 + (
e*x)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(16*A*c^2*d + 3*b^2*
B*e + 8*b*c*(B*d + A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*Ellip
ticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d
 + e*x]*Sqrt[b*x - c*x^2])))/(b^2*d*(c*d + b*e)))/(3*b^2)
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1234
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^m*(a + b*x + c*x^2)^(p + 1)*(
(f*b - 2*a*g + (2*c*f - b*g)*x)/((p + 1)*(b^2 - 4*a*c))), x] + Simp[1/((p +
 1)*(b^2 - 4*a*c))   Int[(d + e*x)^(m - 1)*(a + b*x + c*x^2)^(p + 1)*Simp[g
*(2*a*e*m + b*d*(2*p + 3)) - f*(b*e*m + 2*c*d*(2*p + 3)) - e*(2*c*f - b*g)*
(m + 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && LtQ[p, -1
] && GtQ[m, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 4.30 (sec) , antiderivative size = 732, normalized size of antiderivative = 1.53

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(\frac{2(Ac+Bb)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{3b^3c\left(x-\frac{b}{c}\right)^2}-\frac{2\left(-ce\,x^2-cdx\right)\left(7Aceb+8A\,c^2d+4b^2Be+5Bbcd\right)}{3b^4(be+cd)\sqrt{\left(x-\frac{b}{c}\right)\left(-ce\,x^2-cdx\right)}}-\frac{2A\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+}}{3b^3x^2}\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2/3*(A*c+B*
b)/b^3/c*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x-b/c)^2-2/3*(-c*e*x^2-c*
d*x)/b^4/(b*e+c*d)*(7*A*b*c*e+8*A*c^2*d+4*B*b^2*e+5*B*b*c*d)/((x-b/c)*(-c*
e*x^2-c*d*x))^(1/2)-2/3*A/b^3*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/x^2-2
/3*(-c*e*x^2+b*e*x-c*d*x+b*d)/d/b^4*(A*b*e+8*A*c*d+3*B*b*d)/(x*(-c*e*x^2+b
*e*x-c*d*x+b*d))^(1/2)+2*(-1/3*(A*c+B*b)*e/b^3+1/3*(7*A*b*c*e+8*A*c^2*d+4*
B*b^2*e+5*B*b*c*d)/b^4-1/3*c*d/b^4/(b*e+c*d)*(7*A*b*c*e+8*A*c^2*d+4*B*b^2*
e+5*B*b*c*d)+1/3/b^3*A*c*e)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(
1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d
/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(-1/3*c*e*(7*A*b*c*e+8*A*c^2*d+4
*B*b^2*e+5*B*b*c*d)/b^4/(b*e+c*d)-1/3*c*e*(A*b*e+8*A*c*d+3*B*b*d)/b^4/d)*d
/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3
+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-
d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))
^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1012 vs. $2(411) = 822$.

Time = 0.11 (sec) , antiderivative size = 1012, normalized size of antiderivative = 2.12

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
2/9*(((A*b^3*c^2*e^3 - 8*(B*b*c^4 + 2*A*c^5)*d^3 - (11*B*b^2*c^3 + 24*A*b*
c^4)*d^2*e - 2*(B*b^3*c^2 + 3*A*b^2*c^3)*d*e^2)*x^4 - 2*(A*b^4*c*e^3 - 8*(
B*b^2*c^3 + 2*A*b*c^4)*d^3 - (11*B*b^3*c^2 + 24*A*b^2*c^3)*d^2*e - 2*(B*b^
4*c + 3*A*b^3*c^2)*d*e^2)*x^3 + (A*b^5*e^3 - 8*(B*b^3*c^2 + 2*A*b^2*c^3)*d
^3 - (11*B*b^4*c + 24*A*b^3*c^2)*d^2*e - 2*(B*b^5 + 3*A*b^4*c)*d*e^2)*x^2)
*sqrt(-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2
), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3)
, 1/3*(3*c*e*x + c*d - b*e)/(c*e)) - 3*((A*b^2*c^3*e^3 + 8*(B*b*c^4 + 2*A*
c^5)*d^2*e + (7*B*b^2*c^3 + 16*A*b*c^4)*d*e^2)*x^4 - 2*(A*b^3*c^2*e^3 + 8*
(B*b^2*c^3 + 2*A*b*c^4)*d^2*e + (7*B*b^3*c^2 + 16*A*b^2*c^3)*d*e^2)*x^3 +
(A*b^4*c*e^3 + 8*(B*b^3*c^2 + 2*A*b^2*c^3)*d^2*e + (7*B*b^4*c + 16*A*b^3*c
^2)*d*e^2)*x^2)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2 + b*c*d*e + b^2*e^
2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3
)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^
2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3
), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) - 3*(A*b^3*c^2*d^2*e + A*b^4*c*d*e^2
+ (A*b^2*c^3*e^3 + 8*(B*b*c^4 + 2*A*c^5)*d^2*e + (7*B*b^2*c^3 + 16*A*b*c^4
)*d*e^2)*x^3 - (2*A*b^3*c^2*e^3 + 12*(B*b^2*c^3 + 2*A*b*c^4)*d^2*e + (11*B
*b^3*c^2 + 25*A*b^2*c^3)*d*e^2)*x^2 + (A*b^4*c*e^3 + 3*(B*b^3*c^2 + 2*A*b^
2*c^3)*d^2*e + (3*B*b^4*c + 7*A*b^3*c^2)*d*e^2)*x)*sqrt(-c*x^2 + b*x)*s...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)*(e*x+d)**(1/2)/(-c*x**2+b*x)**(5/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(Bx+A)\sqrt{ex+d}}{(-cx^2+bx)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*sqrt(e*x + d)/(-c*x^2 + b*x)^(5/2), x)
```

Giac [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(Bx+A)\sqrt{ex+d}}{(-cx^2+bx)^{\frac{5}{2}}}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)*sqrt(e*x + d)/(-c*x^2 + b*x)^(5/2), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx = \int \frac{(A+B\,x)\,\sqrt{d+e\,x}}{(b\,x-c\,x^2)^{5/2}}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^(1/2))/(b*x - c*x^2)^(5/2),x)
```

output
```
int(((A + B*x)*(d + e*x)^(1/2))/(b*x - c*x^2)^(5/2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)\sqrt{d+ex}}{(bx-cx^2)^{5/2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x)
```

output
```
( - 2*sqrt(d + e*x)*sqrt(b - c*x)*a + sqrt(x)*int((sqrt(d + e*x)*sqrt(b -
c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*e**2*x**2 - 3*sqrt(x)*b**3*c*d**2
*x - 6*sqrt(x)*b**3*c*d*e*x**2 - 3*sqrt(x)*b**3*c*e**2*x**3 + 9*sqrt(x)*b*
*2*c**2*d**2*x**2 + 12*sqrt(x)*b**2*c**2*d*e*x**3 + 3*sqrt(x)*b**2*c**2*e*
*2*x**4 - 9*sqrt(x)*b*c**3*d**2*x**3 - 10*sqrt(x)*b*c**3*d*e*x**4 - sqrt(x
)*b*c**3*e**2*x**5 + 3*sqrt(x)*c**4*d**2*x**4 + 3*sqrt(x)*c**4*d*e*x**5),x
)*a*b**4*e**2*x + 3*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**
4*d*e*x + sqrt(x)*b**4*e**2*x**2 - 3*sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**
3*c*d*e*x**2 - 3*sqrt(x)*b**3*c*e**2*x**3 + 9*sqrt(x)*b**2*c**2*d**2*x**2
+ 12*sqrt(x)*b**2*c**2*d*e*x**3 + 3*sqrt(x)*b**2*c**2*e**2*x**4 - 9*sqrt(x
)*b*c**3*d**2*x**3 - 10*sqrt(x)*b*c**3*d*e*x**4 - sqrt(x)*b*c**3*e**2*x**5
 + 3*sqrt(x)*c**4*d**2*x**4 + 3*sqrt(x)*c**4*d*e*x**5),x)*a*b**3*c*d*e*x -
 2*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)
*b**4*e**2*x**2 - 3*sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**3*c*d*e*x**2 - 3*
sqrt(x)*b**3*c*e**2*x**3 + 9*sqrt(x)*b**2*c**2*d**2*x**2 + 12*sqrt(x)*b**2
*c**2*d*e*x**3 + 3*sqrt(x)*b**2*c**2*e**2*x**4 - 9*sqrt(x)*b*c**3*d**2*x**
3 - 10*sqrt(x)*b*c**3*d*e*x**4 - sqrt(x)*b*c**3*e**2*x**5 + 3*sqrt(x)*c**4
*d**2*x**4 + 3*sqrt(x)*c**4*d*e*x**5),x)*a*b**3*c*e**2*x**2 - 18*sqrt(x)*i
nt((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**4*d*e*x + sqrt(x)*b**4*e**2*x
**2 - 3*sqrt(x)*b**3*c*d**2*x - 6*sqrt(x)*b**3*c*d*e*x**2 - 3*sqrt(x)*b...
```

3.165 $\int \frac{A+Bx}{\sqrt{d+ex}\left(bx-cx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 581

$$\int \frac{A+Bx}{\sqrt{d+ex}\left(bx-cx^2\right)^{5/2}}\,dx = -\frac{2A\sqrt{d+ex}}{3bd\left(bx-cx^2\right)^{3/2}} - \frac{2(3bBd+6Acd-2Abe)x\sqrt{d+ex}}{3b^2d^2\left(bx-cx^2\right)^{3/2}}$$
$$+\frac{2c\left(8Ac^2d^2+b^2e(3Bd-2Ae)+bcd(4Bd+5Ae)\right)x^2\sqrt{d+ex}}{3b^3d^2(cd+be)\left(bx-cx^2\right)^{3/2}}$$
$$+\frac{2c\left(16Ac^3d^3+b^3e^2(3Bd-2Ae)+8bc^2d^2(Bd+3Ae)+b^2cde(13Bd+4Ae)\right)x\sqrt{d+ex}}{3b^4d^2(cd+be)^2\sqrt{bx-cx^2}}$$
$$-\frac{2\sqrt{c}\left(16Ac^3d^3+b^3e^2(3Bd-2Ae)+8bc^2d^2(Bd+3Ae)+b^2cde(13Bd+4Ae)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\,E\Big(\mathrm{a}}{3b^{7/2}d^2(cd+be)^2\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$
$$+\frac{2\sqrt{c}\left(16Ac^2d^2+b^2e(9Bd-Ae)+8bcd(Bd+2Ae)\right)\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\mathrm{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right.}{3b^{7/2}d(cd+be)\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2/3*A*(e*x+d)^(1/2)/b/d/(-c*x^2+b*x)^(3/2)-2/3*(-2*A*b*e+6*A*c*d+3*B*b*d)
*x*(e*x+d)^(1/2)/b^2/d^2/(-c*x^2+b*x)^(3/2)+2/3*c*(8*A*c^2*d^2+b^2*e*(-2*A
*e+3*B*d)+b*c*d*(5*A*e+4*B*d))*x^2*(e*x+d)^(1/2)/b^3/d^2/(b*e+c*d)/(-c*x^2
+b*x)^(3/2)+2/3*c*(16*A*c^3*d^3+b^3*e^2*(-2*A*e+3*B*d)+8*b*c^2*d^2*(3*A*e+
B*d)+b^2*c*d*e*(4*A*e+13*B*d))*x*(e*x+d)^(1/2)/b^4/d^2/(b*e+c*d)^2/(-c*x^2
+b*x)^(1/2)-2/3*c^(1/2)*(16*A*c^3*d^3+b^3*e^2*(-2*A*e+3*B*d)+8*b*c^2*d^2*(
3*A*e+B*d)+b^2*c*d*e*(4*A*e+13*B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)
*EllipticE(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(7/2)/d^2/(b*e+c*d)
^2/(1+e*x/d)^(1/2)/(-c*x^2+b*x)^(1/2)+2/3*c^(1/2)*(16*A*c^2*d^2+b^2*e*(-A*
e+9*B*d)+8*b*c*d*(2*A*e+B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/2)*Elli
pticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(7/2)/d/(b*e+c*d)/(e*x+d
)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 28.64 (sec) , antiderivative size = 531, normalized size of antiderivative = 0.91

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{5/2}}\,dx = \frac{2\left(\sqrt{-\frac{b}{c}}(d+ex)\left(bc^2(bB+Ac)d^2(cd+be)x^2+c^2d^2(8Ac^2d+7b^2Be+5bc\right.\right.}{}$$

input
```
Integrate[(A + B*x)/(Sqrt[d + e*x]*(b*x - c*x^2)^(5/2)),x]
```

output
```
(2*(Sqrt[-(b/c)]*(d + e*x)*(b*c^2*(b*B + A*c)*d^2*(c*d + b*e)*x^2 + c^2*d^
2*(8*A*c^2*d + 7*b^2*B*e + 5*b*c*(B*d + 2*A*e))*x^2*(b - c*x) - A*b*d*(c*d
 + b*e)^2*(b - c*x)^2 - (c*d + b*e)^2*(3*b*B*d + 8*A*c*d - 2*A*b*e)*x*(b -
 c*x)^2) + x*(b - c*x)*(Sqrt[-(b/c)]*(16*A*c^3*d^3 + b^3*e^2*(3*B*d - 2*A*
e) + 8*b*c^2*d^2*(B*d + 3*A*e) + b^2*c*d*e*(13*B*d + 4*A*e))*(b - c*x)*(d
+ e*x) + I*b*e*(16*A*c^3*d^3 + b^3*e^2*(3*B*d - 2*A*e) + 8*b*c^2*d^2*(B*d
+ 3*A*e) + b^2*c*d*e*(13*B*d + 4*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]
*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*
e*(c*d + b*e)*(8*A*c^2*d^2 + b^2*e*(3*B*d - 2*A*e) + b*c*d*(4*B*d + 5*A*e)
)*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b
/c)]/Sqrt[x]], -((c*d)/(b*e))])))/(3*b^4*Sqrt[-(b/c)]*d^2*(c*d + b*e)^2*(x
*(b - c*x))^(3/2)*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 1.61 (sec) , antiderivative size = 557, normalized size of antiderivative = 0.96, number of steps used = 10, number of rules used = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {1235, 27, 1235, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{A+Bx}{(bx-cx^2)^{5/2}\sqrt{d+ex}}dx$$

$$\Big\downarrow \text{1235}$$

$$\frac{2\int \frac{e(3Bd-2Ae)b^2+cd(4Bd+5Ae)b+8Ac^2d^2+3ce(bBd+2Acd+Abe)x}{2\sqrt{d+ex}(bx-cx^2)^{3/2}}dx}{3b^2d(be+cd)}-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\,(bx-cx^2)^{3/2}\,(be+cd)}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{e(3Bd-2Ae)b^2+cd(4Bd+5Ae)b+8Ac^2d^2+3ce(bBd+2Acd+Abe)x}{\sqrt{d+ex}(bx-cx^2)^{3/2}}dx}{3b^2d(be+cd)}-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\,(bx-cx^2)^{3/2}\,(be+cd)}$$

$$\Big\downarrow \text{1235}$$

$$\frac{\frac{2\int \frac{ce\left(bd\left(e(6Bd+Ae)b^2+cd(4Bd+11Ae)b+8Ac^2d^2\right)-\left(e^2(3Bd-2Ae)b^3+cde(13Bd+4Ae)b^2+8c^2d^2(Bd+3Ae)b+16Ac^3d^3\right)x\right)}{2\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(b(be+cd)(b^2e\cdots}{\cdots}}{3b^2d(be+cd)}$$

$$-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\,(bx-cx^2)^{3/2}\,(be+cd)}$$

$$\Big\downarrow \text{27}$$

$$\frac{\frac{ce\int \frac{bd\left(e(6Bd+Ae)b^2+cd(4Bd+11Ae)b+8Ac^2d^2\right)-\left(e^2(3Bd-2Ae)b^3+cde(13Bd+4Ae)b^2+8c^2d^2(Bd+3Ae)b+16Ac^3d^3\right)x}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)}-\frac{2\sqrt{d+ex}(b(be+cd)(b^2e(3B\cdots}{\cdots}}{3b^2d(be+cd)}$$

$$-\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\,(bx-cx^2)^{3/2}\,(be+cd)}$$

$$\Big\downarrow \; 1269$$

$$\frac{ce\left(\frac{\frac{d(be+cd)\left(b^2e(9Bd-Ae)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int \frac{1}{\sqrt{d+ex}\sqrt{bx-cx^2}}dx}{e}-\frac{\left(b^3e^2(3Bd-2Ae)+b^2cde(4Ae+13Bd)+8bc^2d^2(3Ae+Bd)+16Ac^3d^3\right)\int \frac{\sqrt{d+\cdots}}{\sqrt{bx-\cdots}}}{e}}{b^2d(be+cd)}\cdots\right)}{3b^2d(\cdots}$$

$$\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}(be+cd)}$$

$$\Big\downarrow \; 1169$$

$$\frac{ce\left(\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2e(9Bd-Ae)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{b-cx}\left(b^3e^2(3Bd-2Ae)+b^2cde(4Ae+13Bd)+8bc^2d^2(3Ae+Bd)\cdots\right.}{e\sqrt{bx-cx^2}}}{b^2d(be+cd)}\cdots\right)}{\cdots}$$

$$\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}(be+cd)}$$

$$\Big\downarrow \; 122$$

$$\frac{ce\left(\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2e(9Bd-Ae)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^3e^2(3Bd-2Ae)+b^2cde(4Ae+13Bd)+8bc^2d^2(3\cdots\right.}{e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}+1}}}{b^2d(be+cd)}\cdots\right)}{\cdots}$$

$$\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}(be+cd)}$$

$$\Big\downarrow \; 120$$

$$\frac{ce\left(\frac{\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^2e(9Bd-Ae)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int \frac{1}{\sqrt{x}\sqrt{b-cx}\sqrt{d+ex}}dx}{e\sqrt{bx-cx^2}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^3e^2(3Bd-2Ae)+b^2cde(4Ae+13Bd)+8bc^2d\cdots\right.}{\sqrt{c}e\sqrt{bx-cx^2}\sqrt{\frac{ex}{d}\cdots}}}{b^2d(be+cd)}\cdots\right)}{\cdots}$$

$$\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}(be+cd)}$$

$$\Big\downarrow \; 127$$

$$\frac{ce\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^2e(9Bd-Ae)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\int\frac{1}{\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}}dx}{e\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^3e^2(3Bd-2Ae)+b^2cde(4Ae+13\right.}{\sqrt{ce}\sqrt{bx}}\right.}{b^2d(be+cd)}$$

$$\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}(be+cd)}$$

$$\Big\downarrow \text{126}$$

$$\frac{ce\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^2e(9Bd-Ae)+8bcd(2Ae+Bd)+16Ac^2d^2\right)\text{EllipticF}\left(\arcsin\left(\frac{\sqrt{c}\sqrt{x}}{\sqrt{b}}\right),-\frac{be}{cd}\right)}{\sqrt{ce}\sqrt{bx-cx^2}\sqrt{d+ex}}-\frac{2\sqrt{b}\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{d+ex}\left(b^3e^2(3Bd-2Ae)+b^2\right.}{}\right.}{b^2d(be+cd)}$$

$$\frac{2\sqrt{d+ex}(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}(be+cd)}$$

input

```
Int[(A + B*x)/(Sqrt[d + e*x]*(b*x - c*x^2)^(5/2)),x]
```

output

```
(-2*Sqrt[d + e*x]*(A*b*(c*d + b*e) - c*(b*B*d + 2*A*c*d + A*b*e)*x))/(3*b^
2*d*(c*d + b*e)*(b*x - c*x^2)^(3/2)) + ((-2*Sqrt[d + e*x]*(b*(c*d + b*e)*(
8*A*c^2*d^2 + b^2*e*(3*B*d - 2*A*e) + b*c*d*(4*B*d + 5*A*e)) - c*(16*A*c^3
*d^3 + b^3*e^2*(3*B*d - 2*A*e) + 8*b*c^2*d^2*(B*d + 3*A*e) + b^2*c*d*e*(13
*B*d + 4*A*e))*x))/(b^2*d*(c*d + b*e)*Sqrt[b*x - c*x^2]) + (c*e*((-2*Sqrt[
b]*(16*A*c^3*d^3 + b^3*e^2*(3*B*d - 2*A*e) + 8*b*c^2*d^2*(B*d + 3*A*e) + b
^2*c*d*e*(13*B*d + 4*A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*Ellipti
cE[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 +
 (e*x)/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(16*A*c^2*d^2 + b^
2*e*(9*B*d - A*e) + 8*b*c*d*(B*d + 2*A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[
1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])
/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/(b^2*d*(c*d + b*e)))/(3*b^2
*d*(c*d + b*e))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 5.30 (sec) , antiderivative size = 771, normalized size of antiderivative = 1.33

method	result
elliptic	$\frac{\sqrt{(-cx+b)x(ex+d)}\left(\frac{2(Ac+Bb)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{3b^3(be+cd)\left(x-\frac{b}{c}\right)^2}-\frac{2\left(-ce\,x^2-cdx\right)c\left(10Aceb+8A\,c^2d+7b^2Be+5Bbcd\right)}{3b^4(be+cd)^2\sqrt{\left(x-\frac{b}{c}\right)\left(-ce\,x^2-cdx\right)}}-\frac{2A\sqrt{-ce\,x^3+be\,x^2-cd\,x^2}}{3d\,b^3x^2}\right.}{}$
default	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2/3/b^3/(b*
e+c*d)*(A*c+B*b)*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x-b/c)^2-2/3*(-c*
e*x^2-c*d*x)/b^4/(b*e+c*d)^2*c*(10*A*b*c*e+8*A*c^2*d+7*B*b^2*e+5*B*b*c*d)/
((x-b/c)*(-c*e*x^2-c*d*x))^(1/2)-2/3*A/d/b^3*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d
*x)^(1/2)/x^2+2/3*(-c*e*x^2+b*e*x-c*d*x+b*d)/d^2/b^4*(2*A*b*e-8*A*c*d-3*B*
b*d)/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2*(-1/3*c*e*(A*c+B*b)/(b*e+c*d)/
b^3+1/3*c/(b*e+c*d)*(10*A*b*c*e+8*A*c^2*d+7*B*b^2*e+5*B*b*c*d)/b^4-1/3*c^2
*d/b^4/(b*e+c*d)^2*(10*A*b*c*e+8*A*c^2*d+7*B*b^2*e+5*B*b*c*d)+1/3/b^3/d*A*
c*e)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c
*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-
d/e-b/c))^(1/2))+2*(-1/3*e*c^2*(10*A*b*c*e+8*A*c^2*d+7*B*b^2*e+5*B*b*c*d)/
(b*e+c*d)^2/b^4+1/3*c*e*(2*A*b*e-8*A*c*d-3*B*b*d)/b^4/d^2)*d/e*((x+d/e)/d*
e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x
^2+b*d*x)^(1/2)*((-d/e-b/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c)
)^(1/2))+b/c*EllipticF(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1324 vs. $2(515) = 1030$.

Time = 0.12 (sec) , antiderivative size = 1324, normalized size of antiderivative = 2.28

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
-2/9*(((2*A*b^4*c^2*e^4 + 8*(B*b*c^5 + 2*A*c^6)*d^4 + (17*B*b^2*c^4 + 32*A
*b*c^5)*d^3*e + (8*B*b^3*c^3 + 13*A*b^2*c^4)*d^2*e^2 - 3*(B*b^4*c^2 + A*b^
3*c^3)*d*e^3)*x^4 - 2*(2*A*b^5*c*e^4 + 8*(B*b^2*c^4 + 2*A*b*c^5)*d^4 + (17
*B*b^3*c^3 + 32*A*b^2*c^4)*d^3*e + (8*B*b^4*c^2 + 13*A*b^3*c^3)*d^2*e^2 -
3*(B*b^5*c + A*b^4*c^2)*d*e^3)*x^3 + (2*A*b^6*e^4 + 8*(B*b^3*c^3 + 2*A*b^2
*c^4)*d^4 + (17*B*b^4*c^2 + 32*A*b^3*c^3)*d^3*e + (8*B*b^5*c + 13*A*b^4*c^
2)*d^2*e^2 - 3*(B*b^6 + A*b^5*c)*d*e^3)*x^2)*sqrt(-c*e)*weierstrassPInvers
e(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*
d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c
*e)) - 3*((2*A*b^3*c^3*e^4 - 8*(B*b*c^5 + 2*A*c^6)*d^3*e - (13*B*b^2*c^4 +
 24*A*b*c^5)*d^2*e^2 - (3*B*b^3*c^3 + 4*A*b^2*c^4)*d*e^3)*x^4 - 2*(2*A*b^4
*c^2*e^4 - 8*(B*b^2*c^4 + 2*A*b*c^5)*d^3*e - (13*B*b^3*c^3 + 24*A*b^2*c^4)
*d^2*e^2 - (3*B*b^4*c^2 + 4*A*b^3*c^3)*d*e^3)*x^3 + (2*A*b^5*c*e^4 - 8*(B*
b^3*c^3 + 2*A*b^2*c^4)*d^3*e - (13*B*b^4*c^2 + 24*A*b^3*c^3)*d^2*e^2 - (3*
B*b^5*c + 4*A*b^4*c^2)*d*e^3)*x^2)*sqrt(-c*e)*weierstrassZeta(4/3*(c^2*d^2
 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*
c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e
 + b^2*e^2)/(c^2*e^2), -4/27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 -
2*b^3*e^3)/(c^3*e^3), 1/3*(3*c*e*x + c*d - b*e)/(c*e))) + 3*(A*b^3*c^3*d^3
*e + 2*A*b^4*c^2*d^2*e^2 + A*b^5*c*d*e^3 - (2*A*b^3*c^3*e^4 - 8*(B*b*c^...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{5/2}}\,dx=\text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**(1/2)/(-c*x**2+b*x)**(5/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{5/2}}\,dx=\int \frac{Bx+A}{(-cx^2+bx)^{\frac{5}{2}}\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(5/2)*sqrt(e*x + d)), x)
```

Giac [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{5/2}}\,dx=\int \frac{Bx+A}{(-cx^2+bx)^{\frac{5}{2}}\sqrt{ex+d}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(5/2)*sqrt(e*x + d)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{5/2}}\,dx=\int \frac{A+B\,x}{(b\,x-c\,x^2)^{5/2}\,\sqrt{d+e\,x}}\,dx$$

input
```
int((A + B*x)/((b*x - c*x^2)^(5/2)*(d + e*x)^(1/2)),x)
```

output
```
int((A + B*x)/((b*x - c*x^2)^(5/2)*(d + e*x)^(1/2)), x)
```

Reduce [F]

$$\int \frac{A+Bx}{\sqrt{d+ex}\,(bx-cx^2)^{5/2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(1/2)/(-c*x^2+b*x)^(5/2),x)
```

output
```
( - 2*sqrt(d + e*x)*sqrt(b - c*x)*a - 6*sqrt(d + e*x)*sqrt(b - c*x)*b*x +
9*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**3*d + sqrt(x)*b*
*3*e*x - 3*sqrt(x)*b**2*c*d*x - 3*sqrt(x)*b**2*c*e*x**2 + 3*sqrt(x)*b*c**2
*d*x**2 + 3*sqrt(x)*b*c**2*e*x**3 - sqrt(x)*c**3*d*x**3 - sqrt(x)*c**3*e*x
**4),x)*b**3*c*e*x - 18*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(
x)*b**3*d + sqrt(x)*b**3*e*x - 3*sqrt(x)*b**2*c*d*x - 3*sqrt(x)*b**2*c*e*x
**2 + 3*sqrt(x)*b*c**2*d*x**2 + 3*sqrt(x)*b*c**2*e*x**3 - sqrt(x)*c**3*d*x
**3 - sqrt(x)*c**3*e*x**4),x)*b**2*c**2*e*x**2 + 9*sqrt(x)*int((sqrt(d + e
*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**3*d + sqrt(x)*b**3*e*x - 3*sqrt(x)*b**2*c
*d*x - 3*sqrt(x)*b**2*c*e*x**2 + 3*sqrt(x)*b*c**2*d*x**2 + 3*sqrt(x)*b*c**
2*e*x**3 - sqrt(x)*c**3*d*x**3 - sqrt(x)*c**3*e*x**4),x)*b*c**3*e*x**3 - 2
*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**3*d*x + sqrt(x)*b**
3*e*x**2 - 3*sqrt(x)*b**2*c*d*x**2 - 3*sqrt(x)*b**2*c*e*x**3 + 3*sqrt(x)*b
*c**2*d*x**3 + 3*sqrt(x)*b*c**2*e*x**4 - sqrt(x)*c**3*d*x**4 - sqrt(x)*c**
3*e*x**5),x)*a*b**3*e*x + 6*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x))/(sqr
t(x)*b**3*d*x + sqrt(x)*b**3*e*x**2 - 3*sqrt(x)*b**2*c*d*x**2 - 3*sqrt(x)*
b**2*c*e*x**3 + 3*sqrt(x)*b*c**2*d*x**3 + 3*sqrt(x)*b*c**2*e*x**4 - sqrt(x
)*c**3*d*x**4 - sqrt(x)*c**3*e*x**5),x)*a*b**2*c*d*x + 4*sqrt(x)*int((sqrt
(d + e*x)*sqrt(b - c*x))/(sqrt(x)*b**3*d*x + sqrt(x)*b**3*e*x**2 - 3*sqrt(
x)*b**2*c*d*x**2 - 3*sqrt(x)*b**2*c*e*x**3 + 3*sqrt(x)*b*c**2*d*x**3 + ...
```

3.166 $\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{5/2}}\,dx$

Optimal result

Integrand size = 29, antiderivative size = 741

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{5/2}}\,dx = -\frac{2A}{3bd\sqrt{d+ex}\left(bx-cx^2\right)^{3/2}}$$
$$-\frac{2(3bBd+6Acd-4Abe)x}{3b^2d^2\sqrt{d+ex}\left(bx-cx^2\right)^{3/2}}+\frac{2c(8Ac^2d^2+b^2e(3Bd-4Ae)+bcd(4Bd+3Ae))\,x^2}{3b^3d^2(cd+be)\sqrt{d+ex}\left(bx-cx^2\right)^{3/2}}$$
$$+\frac{2c(16Ac^3d^3+15b^2Bcd^2e+b^3e^2(3Bd-4Ae)+8bc^2d^2(Bd+3Ae))\,x}{3b^4d^2(cd+be)^2\sqrt{d+ex}\sqrt{bx-cx^2}}$$
$$-\frac{2e(16Ac^4d^4+b^3cde^2(9Bd-7Ae)+2b^4e^3(3Bd-4Ae)+8bc^3d^3(Bd+4Ae)+b^2c^2d^2e(19Bd+9Ae))\sqrt{}}{3b^4d^3(cd+be)^3\sqrt{d+ex}}$$
$$-\frac{2\sqrt{c}(16Ac^4d^4+b^3cde^2(9Bd-7Ae)+2b^4e^3(3Bd-4Ae)+8bc^3d^3(Bd+4Ae)+b^2c^2d^2e(19Bd+9Ae))}{3b^{7/2}d^3(cd+be)^3\sqrt{1+\frac{ex}{d}}\sqrt{bx-cx^2}}$$
$$+\frac{2\sqrt{c}(16Ac^3d^3+15b^2Bcd^2e+b^3e^2(3Bd-4Ae)+8bc^2d^2(Bd+3Ae))\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{1+\frac{ex}{d}}\,\text{EllipticF}\left(\text{arc}\right.}{3b^{7/2}d^2(cd+be)^2\sqrt{d+ex}\sqrt{bx-cx^2}}$$

output
```
-2/3*A/b/d/(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2)-2/3*(-4*A*b*e+6*A*c*d+3*B*b*d)
*x/b^2/d^2/(e*x+d)^(1/2)/(-c*x^2+b*x)^(3/2)+2/3*c*(8*A*c^2*d^2+b^2*e*(-4*A
*e+3*B*d)+b*c*d*(3*A*e+4*B*d))*x^2/b^3/d^2/(b*e+c*d)/(e*x+d)^(1/2)/(-c*x^2
+b*x)^(3/2)+2/3*c*(16*A*c^3*d^3+15*b^2*B*c*d^2*e+b^3*e^2*(-4*A*e+3*B*d)+8*
b*c^2*d^2*(3*A*e+B*d))*x/b^4/d^2/(b*e+c*d)^2/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1
/2)-2/3*e*(16*A*c^4*d^4+b^3*c*d*e^2*(-7*A*e+9*B*d)+2*b^4*e^3*(-4*A*e+3*B*d
)+8*b*c^3*d^3*(4*A*e+B*d)+b^2*c^2*d^2*e*(9*A*e+19*B*d))*(-c*x^2+b*x)^(1/2)
/b^4/d^3/(b*e+c*d)^3/(e*x+d)^(1/2)-2/3*c^(1/2)*(16*A*c^4*d^4+b^3*c*d*e^2*(
-7*A*e+9*B*d)+2*b^4*e^3*(-4*A*e+3*B*d)+8*b*c^3*d^3*(4*A*e+B*d)+b^2*c^2*d^2
*e*(9*A*e+19*B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(e*x+d)^(1/2)*EllipticE(c^(1/2)
*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(7/2)/d^3/(b*e+c*d)^3/(1+e*x/d)^(1/2)
/(-c*x^2+b*x)^(1/2)+2/3*c^(1/2)*(16*A*c^3*d^3+15*b^2*B*c*d^2*e+b^3*e^2*(-4
*A*e+3*B*d)+8*b*c^2*d^2*(3*A*e+B*d))*x^(1/2)*(1-c*x/b)^(1/2)*(1+e*x/d)^(1/
2)*EllipticF(c^(1/2)*x^(1/2)/b^(1/2),(-b*e/c/d)^(1/2))/b^(7/2)/d^2/(b*e+c*
d)^2/(e*x+d)^(1/2)/(-c*x^2+b*x)^(1/2)
```

Mathematica [C] (verified)

Result contains complex when optimal does not.

Time = 30.66 (sec) , antiderivative size = 644, normalized size of antiderivative = 0.87

$$\int \frac{A+Bx}{(d+ex)^{3/2}\,(bx-cx^2)^{5/2}}\,dx = \frac{2\left(-\sqrt{-\frac{b}{c}}(3b^4e^4(Bd-Ae)x^2(b-cx)^2 - bc^3(bB+Ac)d^3(cd+be)x^2(d+\right.}{}$$

input
```
Integrate[(A + B*x)/((d + e*x)^(3/2)*(b*x - c*x^2)^(5/2)),x]
```

output
```
(2*(-(Sqrt[-(b/c)]*(3*b^4*e^4*(B*d - A*e)*x^2*(b - c*x)^2 - b*c^3*(b*B + A
*c)*d^3*(c*d + b*e)*x^2*(d + e*x) + A*b*d*(c*d + b*e)^3*(b - c*x)^2*(d + e
*x) + (c*d + b*e)^3*(3*b*B*d + 8*A*c*d - 5*A*b*e)*x*(b - c*x)^2*(d + e*x)
+ c^3*d^3*(8*A*c^2*d + 10*b^2*B*e + b*c*(5*B*d + 13*A*e))*x^2*(-b + c*x)*(
d + e*x))) + x*(b - c*x)*(Sqrt[-(b/c)]*(16*A*c^4*d^4 + b^3*c*d*e^2*(9*B*d
- 7*A*e) + 2*b^4*e^3*(3*B*d - 4*A*e) + 8*b*c^3*d^3*(B*d + 4*A*e) + b^2*c^2
*d^2*e*(19*B*d + 9*A*e))*(b - c*x)*(d + e*x) + I*b*e*(16*A*c^4*d^4 + b^3*c
*d*e^2*(9*B*d - 7*A*e) + 2*b^4*e^3*(3*B*d - 4*A*e) + 8*b*c^3*d^3*(B*d + 4*
A*e) + b^2*c^2*d^2*e*(19*B*d + 9*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]
*x^(3/2)*EllipticE[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))] - I*b*
e*(c*d + b*e)*(8*A*c^3*d^3 + 2*b^3*e^2*(3*B*d - 4*A*e) + 3*b^2*c*d*e*(2*B*
d - A*e) + b*c^2*d^2*(4*B*d + 9*A*e))*Sqrt[1 - b/(c*x)]*Sqrt[1 + d/(e*x)]*
x^(3/2)*EllipticF[I*ArcSinh[Sqrt[-(b/c)]/Sqrt[x]], -((c*d)/(b*e))])))/(3*b
^4*Sqrt[-(b/c)]*d^3*(c*d + b*e)^3*(x*(b - c*x))^(3/2)*Sqrt[d + e*x])
```

Rubi [A] (verified)

Time = 2.35 (sec) , antiderivative size = 727, normalized size of antiderivative = 0.98, number of steps used = 12, number of rules used = 12, $\frac{\text{number of rules}}{\text{integrand size}} = 0.414$, Rules used = {1235, 27, 1235, 27, 1237, 27, 1269, 1169, 122, 120, 127, 126}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{A+Bx}{(bx-cx^2)^{5/2}(d+ex)^{3/2}}dx$$

$$\Big\downarrow \text{1235}$$

$$\frac{2\int \frac{e(3Bd-4Ae)b^2+cd(4Bd+3Ae)b+8Ac^2d^2+5ce(bBd+2Acd+Abe)x}{2(d+ex)^{3/2}(bx-cx^2)^{3/2}}dx}{3b^2d(be+cd)}-\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d(bx-cx^2)^{3/2}\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \text{27}$$

$$\frac{\int \frac{e(3Bd-4Ae)b^2+cd(4Bd+3Ae)b+8Ac^2d^2+5ce(bBd+2Acd+Abe)x}{(d+ex)^{3/2}(bx-cx^2)^{3/2}}dx}{3b^2d(be+cd)}-\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d(bx-cx^2)^{3/2}\sqrt{d+ex}(be+cd)}$$

$\Big\downarrow$ 1235

$$\frac{2\int -\frac{e\left(b\left(2e^2(3Bd-4Ae)b^3+3cde(2Bd-Ae)b^2+c^2d^2(4Bd+9Ae)b+8Ac^3d^3\right)-c\left(e^2(3Bd-4Ae)b^3+15Bcd^2eb^2+8c^2d^2(Bd+3Ae)b+16Ac^3d^3\right)x\right)}{2(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)} - \frac{2(b(be+}{3b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

$\Big\downarrow$ 27

$$-\frac{e\int \frac{b\left(2e^2(3Bd-4Ae)b^3+3cde(2Bd-Ae)b^2+c^2d^2(4Bd+9Ae)b+8Ac^3d^3\right)-c\left(e^2(3Bd-4Ae)b^3+15Bcd^2eb^2+8c^2d^2(Bd+3Ae)b+16Ac^3d^3\right)x}{(d+ex)^{3/2}\sqrt{bx-cx^2}}dx}{b^2d(be+cd)} - \frac{2(b(be+cd}{3b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

$\Big\downarrow$ 1237

$$-\frac{e\left(\frac{2\int -\frac{c\left(bd\left(-e^2(3Bd-4Ae)b^3+3cde(3Bd+Ae)b^2+c^2d^2(4Bd+15Ae)b+8Ac^3d^3\right)-\left(2e^3(3Bd-4Ae)b^4+cde^2(9Bd-7Ae)b^3+c^2d^2e(19Bd+9Ae)b^2+8c^3d^3(Bd\right.\right.}{2\sqrt{d+ex}\sqrt{bx-cx^2}}}{d(be+cd)}\right.}{b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

$\Big\downarrow$ 27

$$-\frac{e\left(\frac{2\sqrt{bx-cx^2}\left(2b^4e^3(3Bd-4Ae)+b^3cde^2(9Bd-7Ae)+b^2c^2d^2e(9Ae+19Bd)+8bc^3d^3(4Ae+Bd)+16Ac^4d^4\right)}{d\sqrt{d+ex}(be+cd)} - \frac{c\int \frac{bd\left(-e^2(3Bd-4Ae)b^3+3cde(3Bd+Ae)b^2+c^2\right.}{}}{}\right.}{b^2d(be+cd)}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

$\Big\downarrow$ 1269

$$-\frac{e\left(\frac{2\sqrt{bx-cx^2}\left(2b^4e^3(3Bd-4Ae)+b^3cde^2(9Bd-7Ae)+b^2c^2d^2e(9Ae+19Bd)+8bc^3d^3(4Ae+Bd)+16Ac^4d^4\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d(be+cd)\left(b^3e^2(3Bd-4Ae)+8bc^2d^2(3Ae+Bc\ldots\right.}{\ldots}\right.}{\ldots}\right.}{b^2d\ldots}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

$\Big\downarrow$ 1169

$$-\frac{e\left(\frac{2\sqrt{bx-cx^2}\left(2b^4e^3(3Bd-4Ae)+b^3cde^2(9Bd-7Ae)+b^2c^2d^2e(9Ae+19Bd)+8bc^3d^3(4Ae+Bd)+16Ac^4d^4\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^3e^2(3Bd-4Ae)+8bc^2d\ldots\right.}{\ldots}\right.}{\ldots}\right.}{\ldots}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

$\Big\downarrow$ 122

$$-\frac{e\left(\frac{2\sqrt{bx-cx^2}\left(2b^4e^3(3Bd-4Ae)+b^3cde^2(9Bd-7Ae)+b^2c^2d^2e(9Ae+19Bd)+8bc^3d^3(4Ae+Bd)+16Ac^4d^4\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^3e^2(3Bd-4Ae)+8bc^2d\ldots\right.}{\ldots}\right.}{\ldots}\right.}{\ldots}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

$\Big\downarrow$ 120

$$-\frac{e\left(\frac{2\sqrt{bx-cx^2}\left(2b^4e^3(3Bd-4Ae)+b^3cde^2(9Bd-7Ae)+b^2c^2d^2e(9Ae+19Bd)+8bc^3d^3(4Ae+Bd)+16Ac^4d^4\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{b-cx}(be+cd)\left(b^3e^2(3Bd-4Ae)+8bc^2d\right.}{}\right.}{}\right.}{}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \; 127$$

$$-\frac{e\left(\frac{2\sqrt{bx-cx^2}\left(2b^4e^3(3Bd-4Ae)+b^3cde^2(9Bd-7Ae)+b^2c^2d^2e(9Ae+19Bd)+8bc^3d^3(4Ae+Bd)+16Ac^4d^4\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^3e^2(3Bd-4Ae\right.}{}\right.}{}\right.}{}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

$$\Big\downarrow \; 126$$

$$-\frac{e\left(\frac{2\sqrt{bx-cx^2}\left(2b^4e^3(3Bd-4Ae)+b^3cde^2(9Bd-7Ae)+b^2c^2d^2e(9Ae+19Bd)+8bc^3d^3(4Ae+Bd)+16Ac^4d^4\right)}{d\sqrt{d+ex}(be+cd)}-\frac{c\left(\frac{2\sqrt{b}d\sqrt{x}\sqrt{1-\frac{cx}{b}}\sqrt{\frac{ex}{d}+1}(be+cd)\left(b^3e^2(3Bd-\right.}{}\right.}{}\right.}{}$$

$$\frac{2(Ab(be+cd)-cx(Abe+2Acd+bBd))}{3b^2d\left(bx-cx^2\right)^{3/2}\sqrt{d+ex}(be+cd)}$$

input

```
Int[(A + B*x)/((d + e*x)^(3/2)*(b*x - c*x^2)^(5/2)),x]
```

output
```
(-2*(A*b*(c*d + b*e) - c*(b*B*d + 2*A*c*d + A*b*e)*x))/(3*b^2*d*(c*d + b*e
)*Sqrt[d + e*x]*(b*x - c*x^2)^(3/2)) + ((-2*(b*(c*d + b*e)*(8*A*c^2*d^2 +
b^2*e*(3*B*d - 4*A*e) + b*c*d*(4*B*d + 3*A*e)) - c*(16*A*c^3*d^3 + 15*b^2*
B*c*d^2*e + b^3*e^2*(3*B*d - 4*A*e) + 8*b*c^2*d^2*(B*d + 3*A*e))*x))/(b^2*
d*(c*d + b*e)*Sqrt[d + e*x]*Sqrt[b*x - c*x^2]) - (e*((2*(16*A*c^4*d^4 + b^
3*c*d*e^2*(9*B*d - 7*A*e) + 2*b^4*e^3*(3*B*d - 4*A*e) + 8*b*c^3*d^3*(B*d +
 4*A*e) + b^2*c^2*d^2*e*(19*B*d + 9*A*e))*Sqrt[b*x - c*x^2])/(d*(c*d + b*e
)*Sqrt[d + e*x]) - (c*((-2*Sqrt[b]*(16*A*c^4*d^4 + b^3*c*d*e^2*(9*B*d - 7*
A*e) + 2*b^4*e^3*(3*B*d - 4*A*e) + 8*b*c^3*d^3*(B*d + 4*A*e) + b^2*c^2*d^2
*e*(19*B*d + 9*A*e))*Sqrt[x]*Sqrt[1 - (c*x)/b]*Sqrt[d + e*x]*EllipticE[Arc
Sin[(Sqrt[c]*Sqrt[x])/Sqrt[b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[1 + (e*x)
/d]*Sqrt[b*x - c*x^2]) + (2*Sqrt[b]*d*(c*d + b*e)*(16*A*c^3*d^3 + 15*b^2*B
*c*d^2*e + b^3*e^2*(3*B*d - 4*A*e) + 8*b*c^2*d^2*(B*d + 3*A*e))*Sqrt[x]*Sq
rt[1 - (c*x)/b]*Sqrt[1 + (e*x)/d]*EllipticF[ArcSin[(Sqrt[c]*Sqrt[x])/Sqrt[
b]], -((b*e)/(c*d))])/(Sqrt[c]*e*Sqrt[d + e*x]*Sqrt[b*x - c*x^2])))/(d*(c*
d + b*e))))/(b^2*d*(c*d + b*e)))/(3*b^2*d*(c*d + b*e))
```

Defintions of rubi rules used

rule 27
```
Int[(a_)*(Fx_), x_Symbol] :> Simp[a   Int[Fx, x], x] /; FreeQ[a, x] &&  !Ma
tchQ[Fx, (b_)*(Gx_) /; FreeQ[b, x]]
```

rule 120
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[2*(Sqrt[e]/b)*Rt[-b/d, 2]*EllipticE[ArcSin[Sqrt[b*x]/(Sqrt[c]*Rt[-
b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] && Gt
Q[e, 0] &&  !LtQ[-b/d, 0]
```

rule 122
```
Int[Sqrt[(e_) + (f_.)*(x_)]/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]), x_]
 :> Simp[Sqrt[e + f*x]*(Sqrt[1 + d*(x/c)]/(Sqrt[c + d*x]*Sqrt[1 + f*(x/e)])
)   Int[Sqrt[1 + f*(x/e)]/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]), x], x] /; FreeQ[{b
, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 126
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[(2/(b*Sqrt[e]))*Rt[-b/d, 2]*EllipticF[ArcSin[Sqrt[b*x]/(Sqrt[c]*
Rt[-b/d, 2])], c*(f/(d*e))], x] /; FreeQ[{b, c, d, e, f}, x] && GtQ[c, 0] &
& GtQ[e, 0] && (PosQ[-b/d] || NegQ[-b/f])
```

rule 127
```
Int[1/(Sqrt[(b_.)*(x_)]*Sqrt[(c_) + (d_.)*(x_)]*Sqrt[(e_) + (f_.)*(x_)]), x
_] :> Simp[Sqrt[1 + d*(x/c)]*(Sqrt[1 + f*(x/e)]/(Sqrt[c + d*x]*Sqrt[e + f*x
]))   Int[1/(Sqrt[b*x]*Sqrt[1 + d*(x/c)]*Sqrt[1 + f*(x/e)]), x], x] /; Free
Q[{b, c, d, e, f}, x] &&  !(GtQ[c, 0] && GtQ[e, 0])
```

rule 1169
```
Int[((d_.) + (e_.)*(x_))^(m_)/Sqrt[(b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :>
 Simp[Sqrt[x]*(Sqrt[b + c*x]/Sqrt[b*x + c*x^2])   Int[(d + e*x)^m/(Sqrt[x]*
Sqrt[b + c*x]), x], x] /; FreeQ[{b, c, d, e}, x] && NeQ[c*d - b*e, 0] && Eq
Q[m^2, 1/4]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 1237
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[(e*f - d*g)*(d + e*x)^(m + 1)*((a + b*
x + c*x^2)^(p + 1)/((m + 1)*(c*d^2 - b*d*e + a*e^2))), x] + Simp[1/((m + 1)
*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^(m + 1)*(a + b*x + c*x^2)^p*Simp[
(c*d*f - f*b*e + a*e*g)*(m + 1) + b*(d*g - e*f)*(p + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, p}, x] && LtQ[m, -1
] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

rule 1269
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_.), x_Symbol] :> Simp[g/e   Int[(d + e*x)^(m + 1)*(a + b*x +
 c*x^2)^p, x], x] + Simp[(e*f - d*g)/e   Int[(d + e*x)^m*(a + b*x + c*x^2)^
p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, p}, x] &&  !IGtQ[m, 0]
```

Maple [A] (verified)

Time = 6.10 (sec) , antiderivative size = 912, normalized size of antiderivative = 1.23

method	result
elliptic	$\sqrt{(-cx+b)x(ex+d)}\left(\frac{2c(Ac+Bb)\sqrt{-ce\,x^3+be\,x^2-cd\,x^2+bdx}}{3b^3(be+cd)^2\left(x-\frac{b}{c}\right)^2}-\frac{2\left(-ce\,x^2-cdx\right)c^2\left(13Aceb+8A\,c^2d+10b^2Be+5Bbcd\right)}{3b^4(be+cd)^3\sqrt{\left(x-\frac{b}{c}\right)\left(-ce\,x^2-cdx\right)}}+\frac{2\left(-ce\,x^2+bex\right)e^{}}{(be+cd)^3d^3\sqrt{\left(x+\frac{d}{e}\right)}}\right.$
default	Expression too large to display

input
```
int((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x,method=_RETURNVERBOSE)
```

output
```
1/(e*x+d)^(1/2)*((-c*x+b)*x*(e*x+d))^(1/2)/(x*(-c*x+b))^(1/2)*(2/3/b^3/(b*
e+c*d)^2*c*(A*c+B*b)*(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)/(x-b/c)^2-2/3*
(-c*e*x^2-c*d*x)/b^4/(b*e+c*d)^3*c^2*(13*A*b*c*e+8*A*c^2*d+10*B*b^2*e+5*B*
b*c*d)/((x-b/c)*(-c*e*x^2-c*d*x))^(1/2)+2*(-c*e*x^2+b*e*x)/(b*e+c*d)^3*e^3
/d^3*(A*e-B*d)/((x+d/e)*(-c*e*x^2+b*e*x))^(1/2)-2/3*A/d^2/b^3*(-c*e*x^3+b*
e*x^2-c*d*x^2+b*d*x)^(1/2)/x^2+2/3*(-c*e*x^2+b*e*x-c*d*x+b*d)/d^3/b^4*(5*A
*b*e-8*A*c*d-3*B*b*d)/(x*(-c*e*x^2+b*e*x-c*d*x+b*d))^(1/2)+2*(-1/3*(A*c+B*
b)*c^2*e/(b*e+c*d)^2/b^3+1/3*c^2/(b*e+c*d)^2*(13*A*b*c*e+8*A*c^2*d+10*B*b^
2*e+5*B*b*c*d)/b^4-1/3*c^3*d/b^4/(b*e+c*d)^3*(13*A*b*c*e+8*A*c^2*d+10*B*b^
2*e+5*B*b*c*d)+e^3/(b*e+c*d)^2*(A*e-B*d)/d^3-b*e^4/(b*e+c*d)^3/d^3*(A*e-B*
d)+1/3/b^3/d^2*A*c*e)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-b/c))^(1/2)*(
-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*EllipticF(((x+d/e)/d*
e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+2*(-1/3*c^3*e*(13*A*b*c*e+8*A*c^2*d+10*B
*b^2*e+5*B*b*c*d)/(b*e+c*d)^3/b^4+c*e^4*(A*e-B*d)/d^3/(b*e+c*d)^3+1/3*c*e*
(5*A*b*e-8*A*c*d-3*B*b*d)/b^4/d^3)*d/e*((x+d/e)/d*e)^(1/2)*((x-b/c)/(-d/e-
b/c))^(1/2)*(-e*x/d)^(1/2)/(-c*e*x^3+b*e*x^2-c*d*x^2+b*d*x)^(1/2)*((-d/e-b
/c)*EllipticE(((x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))+b/c*EllipticF((
(x+d/e)/d*e)^(1/2),(-d/e/(-d/e-b/c))^(1/2))))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2207 vs. $2(669) = 1338$.

Time = 0.21 (sec) , antiderivative size = 2207, normalized size of antiderivative = 2.98

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{5/2}}\,dx = \text{Too large to display}$$

input
```
integrate((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x, algorithm="fricas")
```

output
```
-2/9*(((8*A*b^5*c^2*e^6 + 8*(B*b*c^6 + 2*A*c^7)*d^5*e + (23*B*b^2*c^5 + 40
*A*b*c^6)*d^4*e^2 + (17*B*b^3*c^4 + 22*A*b^2*c^5)*d^3*e^3 - (12*B*b^4*c^3
+ 7*A*b^3*c^4)*d^2*e^4 - (6*B*b^5*c^2 - 11*A*b^4*c^3)*d*e^5)*x^5 - (16*A*b
^6*c*e^6 - 8*(B*b*c^6 + 2*A*c^7)*d^6 - (7*B*b^2*c^5 + 8*A*b*c^6)*d^5*e + 2
9*(B*b^3*c^4 + 2*A*b^2*c^5)*d^4*e^2 + (46*B*b^4*c^3 + 51*A*b^3*c^4)*d^3*e^
3 - (18*B*b^5*c^2 + 25*A*b^4*c^3)*d^2*e^4 - 2*(6*B*b^6*c - 7*A*b^5*c^2)*d*
e^5)*x^4 - (29*A*b^5*c^2*d^2*e^4 - 8*A*b^7*e^6 + 16*(B*b^2*c^5 + 2*A*b*c^6
)*d^6 + 2*(19*B*b^3*c^4 + 32*A*b^2*c^5)*d^5*e + (11*B*b^4*c^3 + 4*A*b^3*c^
4)*d^4*e^2 - (41*B*b^5*c^2 + 36*A*b^4*c^3)*d^3*e^3 + (6*B*b^7 + 5*A*b^6*c)
*d*e^5)*x^3 + (8*A*b^7*d*e^5 + 8*(B*b^3*c^4 + 2*A*b^2*c^5)*d^6 + (23*B*b^4
*c^3 + 40*A*b^3*c^4)*d^5*e + (17*B*b^5*c^2 + 22*A*b^4*c^3)*d^4*e^2 - (12*B
*b^6*c + 7*A*b^5*c^2)*d^3*e^3 - (6*B*b^7 - 11*A*b^6*c)*d^2*e^4)*x^2)*sqrt(
-c*e)*weierstrassPInverse(4/3*(c^2*d^2 + b*c*d*e + b^2*e^2)/(c^2*e^2), -4/
27*(2*c^3*d^3 + 3*b*c^2*d^2*e - 3*b^2*c*d*e^2 - 2*b^3*e^3)/(c^3*e^3), 1/3*
(3*c*e*x + c*d - b*e)/(c*e)) - 3*((8*A*b^4*c^3*e^6 - 8*(B*b*c^6 + 2*A*c^7)
*d^4*e^2 - (19*B*b^2*c^5 + 32*A*b*c^6)*d^3*e^3 - 9*(B*b^3*c^4 + A*b^2*c^5)
*d^2*e^4 - (6*B*b^4*c^3 - 7*A*b^3*c^4)*d*e^5)*x^5 - (3*B*b^2*c^5*d^4*e^2 +
 16*A*b^5*c^2*e^6 + 8*(B*b*c^6 + 2*A*c^7)*d^5*e - (29*B*b^3*c^4 + 55*A*b^2
*c^5)*d^3*e^3 - (12*B*b^4*c^3 + 25*A*b^3*c^4)*d^2*e^4 - 6*(2*B*b^5*c^2 - A
*b^4*c^3)*d*e^5)*x^4 + (8*A*b^6*c*e^6 + 16*(B*b^2*c^5 + 2*A*b*c^6)*d^5*...
```

Sympy [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{3/2}(bx-cx^2)^{5/2}}\,dx = \text{Timed out}$$

input
```
integrate((B*x+A)/(e*x+d)**(3/2)/(-c*x**2+b*x)**(5/2),x)
```

output
```
Timed out
```

Maxima [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{5/2}}\,dx=\int \frac{Bx+A}{\left(-cx^2+bx\right)^{\frac{5}{2}}(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x, algorithm="maxima")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(5/2)*(e*x + d)^(3/2)), x)
```

Giac [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{5/2}}\,dx=\int \frac{Bx+A}{\left(-cx^2+bx\right)^{\frac{5}{2}}(ex+d)^{\frac{3}{2}}}\,dx$$

input
```
integrate((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x, algorithm="giac")
```

output
```
integrate((B*x + A)/((-c*x^2 + b*x)^(5/2)*(e*x + d)^(3/2)), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{5/2}}\,dx=\int \frac{A+B\,x}{\left(b\,x-c\,x^2\right)^{5/2}\,\left(d+e\,x\right)^{3/2}}\,dx$$

input
```
int((A + B*x)/((b*x - c*x^2)^(5/2)*(d + e*x)^(3/2)),x)
```

output
```
int((A + B*x)/((b*x - c*x^2)^(5/2)*(d + e*x)^(3/2)), x)
```

Reduce [F]

$$\int \frac{A+Bx}{(d+ex)^{3/2}\left(bx-cx^2\right)^{5/2}}\,dx = \text{too large to display}$$

input
```
int((B*x+A)/(e*x+d)^(3/2)/(-c*x^2+b*x)^(5/2),x)
```

output
```
( - 2*sqrt(d + e*x)*sqrt(b - c*x)*a - 6*sqrt(d + e*x)*sqrt(b - c*x)*b*x +
15*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**3*d**2 + 2*sqrt
(x)*b**3*d*e*x + sqrt(x)*b**3*e**2*x**2 - 3*sqrt(x)*b**2*c*d**2*x - 6*sqrt
(x)*b**2*c*d*e*x**2 - 3*sqrt(x)*b**2*c*e**2*x**3 + 3*sqrt(x)*b*c**2*d**2*x
**2 + 6*sqrt(x)*b*c**2*d*e*x**3 + 3*sqrt(x)*b*c**2*e**2*x**4 - sqrt(x)*c**
3*d**2*x**3 - 2*sqrt(x)*c**3*d*e*x**4 - sqrt(x)*c**3*e**2*x**5),x)*b**3*c*
d*e*x + 15*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x)*b**3*d**2
+ 2*sqrt(x)*b**3*d*e*x + sqrt(x)*b**3*e**2*x**2 - 3*sqrt(x)*b**2*c*d**2*x
- 6*sqrt(x)*b**2*c*d*e*x**2 - 3*sqrt(x)*b**2*c*e**2*x**3 + 3*sqrt(x)*b*c**
2*d**2*x**2 + 6*sqrt(x)*b*c**2*d*e*x**3 + 3*sqrt(x)*b*c**2*e**2*x**4 - sqr
t(x)*c**3*d**2*x**3 - 2*sqrt(x)*c**3*d*e*x**4 - sqrt(x)*c**3*e**2*x**5),x)
*b**3*c*e**2*x**2 - 30*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c*x)*x)/(sqrt(x
)*b**3*d**2 + 2*sqrt(x)*b**3*d*e*x + sqrt(x)*b**3*e**2*x**2 - 3*sqrt(x)*b*
*2*c*d**2*x - 6*sqrt(x)*b**2*c*d*e*x**2 - 3*sqrt(x)*b**2*c*e**2*x**3 + 3*s
qrt(x)*b*c**2*d**2*x**2 + 6*sqrt(x)*b*c**2*d*e*x**3 + 3*sqrt(x)*b*c**2*e**
2*x**4 - sqrt(x)*c**3*d**2*x**3 - 2*sqrt(x)*c**3*d*e*x**4 - sqrt(x)*c**3*e
**2*x**5),x)*b**2*c**2*d*e*x**2 - 30*sqrt(x)*int((sqrt(d + e*x)*sqrt(b - c
*x)*x)/(sqrt(x)*b**3*d**2 + 2*sqrt(x)*b**3*d*e*x + sqrt(x)*b**3*e**2*x**2
- 3*sqrt(x)*b**2*c*d**2*x - 6*sqrt(x)*b**2*c*d*e*x**2 - 3*sqrt(x)*b**2*c*e
**2*x**3 + 3*sqrt(x)*b*c**2*d**2*x**2 + 6*sqrt(x)*b*c**2*d*e*x**3 + 3*s...
```

3.167 $\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^3 \, dx$

Optimal result

Integrand size = 24, antiderivative size = 484

$$\begin{aligned}
\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^3 \, dx = &-\frac{d^3(Bd-Ae)(cd-be)^3(d+ex)^{1+m}}{e^8(1+m)} \\
&+\frac{d^2(cd-be)^2(Bd(7cd-4be)-3Ae(2cd-be))(d+ex)^{2+m}}{e^8(2+m)} \\
&+\frac{3d(cd-be)\left(Ae(5c^2d^2-5bcde+b^2e^2)-Bd(7c^2d^2-8bcde+2b^2e^2)\right)(d+ex)^{3+m}}{e^8(3+m)} \\
&+\frac{\left(Bd(35c^3d^3-60bc^2d^2e+30b^2cde^2-4b^3e^3)-Ae(20c^3d^3-30bc^2d^2e+12b^2cde^2-b^3e^3)\right)(d+ex)^{4+m}}{e^8(4+m)} \\
&+\frac{\left(3Ace(5c^2d^2-5bcde+b^2e^2)-B(35c^3d^3-45bc^2d^2e+15b^2cde^2-b^3e^3)\right)(d+ex)^{5+m}}{e^8(5+m)} \\
&-\frac{3c\left(Ace(2cd-be)-B(7c^2d^2-6bcde+b^2e^2)\right)(d+ex)^{6+m}}{e^8(6+m)} \\
&-\frac{c^2(7Bcd-3bBe-Ace)(d+ex)^{7+m}}{e^8(7+m)}+\frac{Bc^3(d+ex)^{8+m}}{e^8(8+m)}
\end{aligned}$$

output
```
-d^3*(-A*e+B*d)*(-b*e+c*d)^3*(e*x+d)^(1+m)/e^8/(1+m)+d^2*(-b*e+c*d)^2*(B*d
*(-4*b*e+7*c*d)-3*A*e*(-b*e+2*c*d))*(e*x+d)^(2+m)/e^8/(2+m)+3*d*(-b*e+c*d)
*(A*e*(b^2*e^2-5*b*c*d*e+5*c^2*d^2)-B*d*(2*b^2*e^2-8*b*c*d*e+7*c^2*d^2))*(
e*x+d)^(3+m)/e^8/(3+m)+(B*d*(-4*b^3*e^3+30*b^2*c*d*e^2-60*b*c^2*d^2*e+35*c
^3*d^3)-A*e*(-b^3*e^3+12*b^2*c*d*e^2-30*b*c^2*d^2*e+20*c^3*d^3))*(e*x+d)^(
4+m)/e^8/(4+m)+(3*A*c*e*(b^2*e^2-5*b*c*d*e+5*c^2*d^2)-B*(-b^3*e^3+15*b^2*c
*d*e^2-45*b*c^2*d^2*e+35*c^3*d^3))*(e*x+d)^(5+m)/e^8/(5+m)-3*c*(A*c*e*(-b*
e+2*c*d)-B*(b^2*e^2-6*b*c*d*e+7*c^2*d^2))*(e*x+d)^(6+m)/e^8/(6+m)-c^2*(-A*
c*e-3*B*b*e+7*B*c*d)*(e*x+d)^(7+m)/e^8/(7+m)+B*c^3*(e*x+d)^(8+m)/e^8/(8+m)
```

Mathematica [A] (verified)

Time = 1.60 (sec) , antiderivative size = 525, normalized size of antiderivative = 1.08

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^3 \, dx = \frac{(d+ex)^{1+m} \left(Ae\left(\frac{d^3(cd-be)^3}{1+m} - \frac{3d^2(cd-be)^2(2cd-be)(d+ex)}{2+m} + \frac{3d(cd-be)\left(5c^2d^2-5bcde+b^2e^2\right)(d+ex)^2}{3+m} - \frac{(2cd-be)\left(10c^2d^2-10b\right.}{4+m}\right.\right.}{}$$

input
```
Integrate[(A + B*x)*(d + e*x)^m*(b*x + c*x^2)^3,x]
```

output
```
((d + e*x)^(1 + m)*(A*e*((d^3*(c*d - b*e)^3)/(1 + m) - (3*d^2*(c*d - b*e)^
2*(2*c*d - b*e)*(d + e*x))/(2 + m) + (3*d*(c*d - b*e)*(5*c^2*d^2 - 5*b*c*d
*e + b^2*e^2)*(d + e*x)^2)/(3 + m) - ((2*c*d - b*e)*(10*c^2*d^2 - 10*b*c*d
*e + b^2*e^2)*(d + e*x)^3)/(4 + m) + (3*c*(5*c^2*d^2 - 5*b*c*d*e + b^2*e^2
)*(d + e*x)^4)/(5 + m) - (3*c^2*(2*c*d - b*e)*(d + e*x)^5)/(6 + m) + (c^3*
(d + e*x)^6)/(7 + m)) + B*(-((d^4*(c*d - b*e)^3)/(1 + m)) + (d^3*(7*c*d -
4*b*e)*(c*d - b*e)^2*(d + e*x))/(2 + m) - (3*d^2*(c*d - b*e)*(7*c^2*d^2 -
8*b*c*d*e + 2*b^2*e^2)*(d + e*x)^2)/(3 + m) + (d*(35*c^3*d^3 - 60*b*c^2*d^
2*e + 30*b^2*c*d*e^2 - 4*b^3*e^3)*(d + e*x)^3)/(4 + m) - ((35*c^3*d^3 - 45
*b*c^2*d^2*e + 15*b^2*c*d*e^2 - b^3*e^3)*(d + e*x)^4)/(5 + m) + (3*c*(7*c^
2*d^2 - 6*b*c*d*e + b^2*e^2)*(d + e*x)^5)/(6 + m) - (c^2*(7*c*d - 3*b*e)*(
d + e*x)^6)/(7 + m) + (c^3*(d + e*x)^7)/(8 + m))))/e^8
```

Rubi [A] (verified)

Time = 1.36 (sec) , antiderivative size = 484, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (A+Bx)\left(bx+cx^2\right)^3 (d+ex)^m\,dx$$

$$\Big\downarrow \text{ 1195}$$

$$\int \left(\frac{3d(cd-be)(d+ex)^{m+2}\left(Ae\left(b^2e^2-5bcde+5c^2d^2\right)-Bd\left(2b^2e^2-8bcde+7c^2d^2\right)\right)}{e^7}+\frac{3c(d+ex)^{m+5}\left(B\left(b^2\right.\right.}{}\right.$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{3d(cd-be)(d+ex)^{m+3}\left(Ae\left(b^2e^2-5bcde+5c^2d^2\right)-Bd\left(2b^2e^2-8bcde+7c^2d^2\right)\right)}{e^8(m+3)}-\frac{3c(d+ex)^{m+6}\left(Ace(2cd-be)-B\left(b^2e^2-6bcde+7c^2d^2\right)\right)}{e^8(m+6)}+\frac{(d+ex)^{m+4}\left(Bd\left(-4b^3e^3+30b^2cde^2-60bc^2d^2e+35c^3d^3\right)-Ae\left(-b^3e^3+12b^2cde^2-30bc^2d^2e+20c^3d^3\right)\right)}{e^8(m+4)}+\frac{(d+ex)^{m+5}\left(3Ace\left(b^2e^2-5bcde+5c^2d^2\right)-B\left(-b^3e^3+15b^2cde^2-45bc^2d^2e+35c^3d^3\right)\right)}{e^8(m+5)}-\frac{c^2(d+ex)^{m+7}(-Ace-3bBe+7Bcd)}{e^8(m+7)}-\frac{d^3(Bd-Ae)(cd-be)^3(d+ex)^{m+1}}{e^8(m+1)}+\frac{d^2(cd-be)^2(d+ex)^{m+2}(Bd(7cd-4be)-3Ae(2cd-be))}{e^8(m+2)}+\frac{Bc^3(d+ex)^{m+8}}{e^8(m+8)}$$

input
```
Int[(A + B*x)*(d + e*x)^m*(b*x + c*x^2)^3,x]
```

output
```
-((d^3*(B*d - A*e)*(c*d - b*e)^3*(d + e*x)^(1 + m))/(e^8*(1 + m))) + (d^2*
(c*d - b*e)^2*(B*d*(7*c*d - 4*b*e) - 3*A*e*(2*c*d - b*e))*(d + e*x)^(2 + m
))/(e^8*(2 + m)) + (3*d*(c*d - b*e)*(A*e*(5*c^2*d^2 - 5*b*c*d*e + b^2*e^2)
 - B*d*(7*c^2*d^2 - 8*b*c*d*e + 2*b^2*e^2))*(d + e*x)^(3 + m))/(e^8*(3 + m
)) + ((B*d*(35*c^3*d^3 - 60*b*c^2*d^2*e + 30*b^2*c*d*e^2 - 4*b^3*e^3) - A*
e*(20*c^3*d^3 - 30*b*c^2*d^2*e + 12*b^2*c*d*e^2 - b^3*e^3))*(d + e*x)^(4 +
 m))/(e^8*(4 + m)) + ((3*A*c*e*(5*c^2*d^2 - 5*b*c*d*e + b^2*e^2) - B*(35*c
^3*d^3 - 45*b*c^2*d^2*e + 15*b^2*c*d*e^2 - b^3*e^3))*(d + e*x)^(5 + m))/(e
^8*(5 + m)) - (3*c*(A*c*e*(2*c*d - b*e) - B*(7*c^2*d^2 - 6*b*c*d*e + b^2*e
^2))*(d + e*x)^(6 + m))/(e^8*(6 + m)) - (c^2*(7*B*c*d - 3*b*B*e - A*c*e)*(
d + e*x)^(7 + m))/(e^8*(7 + m)) + (B*c^3*(d + e*x)^(8 + m))/(e^8*(8 + m))
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 2223 vs. $2(484) = 968$.

Time = 1.03 (sec) , antiderivative size = 2224, normalized size of antiderivative = 4.60

method	result	size
norman	Expression too large to display	2224
gosper	Expression too large to display	4138
orering	Expression too large to display	4162
risch	Expression too large to display	4678
parallelrisch	Expression too large to display	6636

input
```
int((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^3,x,method=_RETURNVERBOSE)
```

output
```
B*c^3/(8+m)*x^8*exp(m*ln(e*x+d))+(3*A*b^2*c*e^3*m^3+3*A*b*c^2*d*e^2*m^3+B*
b^3*e^3*m^3+3*B*b^2*c*d*e^2*m^3+63*A*b^2*c*e^3*m^2+45*A*b*c^2*d*e^2*m^2-6*
A*c^3*d^2*e*m^2+21*B*b^3*e^3*m^2+45*B*b^2*c*d*e^2*m^2-18*B*b*c^2*d^2*e*m^2
+438*A*b^2*c*e^3*m+168*A*b*c^2*d*e^2*m-48*A*c^3*d^2*e*m+146*B*b^3*e^3*m+16
8*B*b^2*c*d*e^2*m-144*B*b*c^2*d^2*e*m+42*B*c^3*d^3*m+1008*A*b^2*c*e^3+336*
B*b^3*e^3)/e^3/(m^4+26*m^3+251*m^2+1066*m+1680)*x^5*exp(m*ln(e*x+d))+(A*b^
3*e^4*m^4+3*A*b^2*c*d*e^3*m^4+B*b^3*d*e^3*m^4+26*A*b^3*e^4*m^3+63*A*b^2*c*
d*e^3*m^3-15*A*b*c^2*d^2*e^2*m^3+21*B*b^3*d*e^3*m^3-15*B*b^2*c*d^2*e^2*m^3
+251*A*b^3*e^4*m^2+438*A*b^2*c*d*e^3*m^2-225*A*b*c^2*d^2*e^2*m^2+30*A*c^3*
d^3*e*m^2+146*B*b^3*d*e^3*m^2-225*B*b^2*c*d^2*e^2*m^2+90*B*b*c^2*d^3*e*m^2
+1066*A*b^3*e^4*m+1008*A*b^2*c*d*e^3*m-840*A*b*c^2*d^2*e^2*m+240*A*c^3*d^3
*e*m+336*B*b^3*d*e^3*m-840*B*b^2*c*d^2*e^2*m+720*B*b*c^2*d^3*e*m-210*B*c^3
*d^4*m+1680*A*b^3*e^4)/e^4/(m^5+30*m^4+355*m^3+2070*m^2+5944*m+6720)*x^4*e
xp(m*ln(e*x+d))+(A*c*e*m+3*B*b*e*m+B*c*d*m+8*A*c*e+24*B*b*e)*c^2/e/(m^2+15
*m+56)*x^7*exp(m*ln(e*x+d))+(3*A*b*c*e^2*m^2+A*c^2*d*e*m^2+3*B*b^2*e^2*m^2
+3*B*b*c*d*e*m^2+45*A*b*c*e^2*m+8*A*c^2*d*e*m+45*B*b^2*e^2*m+24*B*b*c*d*e*
m-7*B*c^2*d^2*m+168*A*b*c*e^2+168*B*b^2*e^2)*c/e^2/(m^3+21*m^2+146*m+336)*
x^6*exp(m*ln(e*x+d))+m*d*(A*b^3*e^4*m^4+26*A*b^3*e^4*m^3-12*A*b^2*c*d*e^3*
m^3-4*B*b^3*d*e^3*m^3+251*A*b^3*e^4*m^2-252*A*b^2*c*d*e^3*m^2+60*A*b*c^2*d
^2*e^2*m^2-84*B*b^3*d*e^3*m^2+60*B*b^2*c*d^2*e^2*m^2+1066*A*b^3*e^4*m-1...
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 3254 vs. $2(484) = 968$.

Time = 0.13 (sec) , antiderivative size = 3254, normalized size of antiderivative = 6.72

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^3 \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
Too large to include
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 59148 vs. $2(473) = 946$.

Time = 12.90 (sec) , antiderivative size = 59148, normalized size of antiderivative = 122.21

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^3 \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)**m*(c*x**2+b*x)**3,x)
```

output
```
Piecewise((d**m*(A*b**3*x**4/4 + 3*A*b**2*c*x**5/5 + A*b*c**2*x**6/2 + A*c
**3*x**7/7 + B*b**3*x**5/5 + B*b**2*c*x**6/2 + 3*B*b*c**2*x**7/7 + B*c**3*
x**8/8), Eq(e, 0)), (-3*A*b**3*d**3*e**4/(420*d**7*e**8 + 2940*d**6*e**9*x
 + 8820*d**5*e**10*x**2 + 14700*d**4*e**11*x**3 + 14700*d**3*e**12*x**4 +
8820*d**2*e**13*x**5 + 2940*d*e**14*x**6 + 420*e**15*x**7) - 21*A*b**3*d**
2*e**5*x/(420*d**7*e**8 + 2940*d**6*e**9*x + 8820*d**5*e**10*x**2 + 14700*
d**4*e**11*x**3 + 14700*d**3*e**12*x**4 + 8820*d**2*e**13*x**5 + 2940*d*e*
*14*x**6 + 420*e**15*x**7) - 63*A*b**3*d*e**6*x**2/(420*d**7*e**8 + 2940*d
**6*e**9*x + 8820*d**5*e**10*x**2 + 14700*d**4*e**11*x**3 + 14700*d**3*e**
12*x**4 + 8820*d**2*e**13*x**5 + 2940*d*e**14*x**6 + 420*e**15*x**7) - 105
*A*b**3*e**7*x**3/(420*d**7*e**8 + 2940*d**6*e**9*x + 8820*d**5*e**10*x**2
 + 14700*d**4*e**11*x**3 + 14700*d**3*e**12*x**4 + 8820*d**2*e**13*x**5 +
2940*d*e**14*x**6 + 420*e**15*x**7) - 12*A*b**2*c*d**4*e**3/(420*d**7*e**8
 + 2940*d**6*e**9*x + 8820*d**5*e**10*x**2 + 14700*d**4*e**11*x**3 + 14700
*d**3*e**12*x**4 + 8820*d**2*e**13*x**5 + 2940*d*e**14*x**6 + 420*e**15*x*
*7) - 84*A*b**2*c*d**3*e**4*x/(420*d**7*e**8 + 2940*d**6*e**9*x + 8820*d**
5*e**10*x**2 + 14700*d**4*e**11*x**3 + 14700*d**3*e**12*x**4 + 8820*d**2*e
**13*x**5 + 2940*d*e**14*x**6 + 420*e**15*x**7) - 252*A*b**2*c*d**2*e**5*x
**2/(420*d**7*e**8 + 2940*d**6*e**9*x + 8820*d**5*e**10*x**2 + 14700*d**4*
e**11*x**3 + 14700*d**3*e**12*x**4 + 8820*d**2*e**13*x**5 + 2940*d*e**1...
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1527 vs. $2(484) = 968$.

Time = 0.09 (sec) , antiderivative size = 1527, normalized size of antiderivative = 3.15

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^3 \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^3,x, algorithm="maxima")
```

output
```
((m^3 + 6*m^2 + 11*m + 6)*e^4*x^4 + (m^3 + 3*m^2 + 2*m)*d*e^3*x^3 - 3*(m^2
 + m)*d^2*e^2*x^2 + 6*d^3*e*m*x - 6*d^4)*(e*x + d)^m*A*b^3/((m^4 + 10*m^3
+ 35*m^2 + 50*m + 24)*e^4) + ((m^4 + 10*m^3 + 35*m^2 + 50*m + 24)*e^5*x^5
+ (m^4 + 6*m^3 + 11*m^2 + 6*m)*d*e^4*x^4 - 4*(m^3 + 3*m^2 + 2*m)*d^2*e^3*x
^3 + 12*(m^2 + m)*d^3*e^2*x^2 - 24*d^4*e*m*x + 24*d^5)*(e*x + d)^m*B*b^3/(
(m^5 + 15*m^4 + 85*m^3 + 225*m^2 + 274*m + 120)*e^5) + 3*((m^4 + 10*m^3 +
35*m^2 + 50*m + 24)*e^5*x^5 + (m^4 + 6*m^3 + 11*m^2 + 6*m)*d*e^4*x^4 - 4*(
m^3 + 3*m^2 + 2*m)*d^2*e^3*x^3 + 12*(m^2 + m)*d^3*e^2*x^2 - 24*d^4*e*m*x +
 24*d^5)*(e*x + d)^m*A*b^2*c/((m^5 + 15*m^4 + 85*m^3 + 225*m^2 + 274*m + 1
20)*e^5) + 3*((m^5 + 15*m^4 + 85*m^3 + 225*m^2 + 274*m + 120)*e^6*x^6 + (m
^5 + 10*m^4 + 35*m^3 + 50*m^2 + 24*m)*d*e^5*x^5 - 5*(m^4 + 6*m^3 + 11*m^2
+ 6*m)*d^2*e^4*x^4 + 20*(m^3 + 3*m^2 + 2*m)*d^3*e^3*x^3 - 60*(m^2 + m)*d^4
*e^2*x^2 + 120*d^5*e*m*x - 120*d^6)*(e*x + d)^m*B*b^2*c/((m^6 + 21*m^5 + 1
75*m^4 + 735*m^3 + 1624*m^2 + 1764*m + 720)*e^6) + 3*((m^5 + 15*m^4 + 85*m
^3 + 225*m^2 + 274*m + 120)*e^6*x^6 + (m^5 + 10*m^4 + 35*m^3 + 50*m^2 + 24
*m)*d*e^5*x^5 - 5*(m^4 + 6*m^3 + 11*m^2 + 6*m)*d^2*e^4*x^4 + 20*(m^3 + 3*m
^2 + 2*m)*d^3*e^3*x^3 - 60*(m^2 + m)*d^4*e^2*x^2 + 120*d^5*e*m*x - 120*d^6
)*(e*x + d)^m*A*b*c^2/((m^6 + 21*m^5 + 175*m^4 + 735*m^3 + 1624*m^2 + 1764
*m + 720)*e^6) + 3*((m^6 + 21*m^5 + 175*m^4 + 735*m^3 + 1624*m^2 + 1764*m
+ 720)*e^7*x^7 + (m^6 + 15*m^5 + 85*m^4 + 225*m^3 + 274*m^2 + 120*m)*d*...
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 6661 vs. $2(484) = 968$.

Time = 0.21 (sec) , antiderivative size = 6661, normalized size of antiderivative = 13.76

$$\int (A + Bx)(d + ex)^m \left(bx + cx^2\right)^3 \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
((e*x + d)^m*B*c^3*e^8*m^7*x^8 + (e*x + d)^m*B*c^3*d*e^7*m^7*x^7 + 3*(e*x
+ d)^m*B*b*c^2*e^8*m^7*x^7 + (e*x + d)^m*A*c^3*e^8*m^7*x^7 + 28*(e*x + d)^
m*B*c^3*e^8*m^6*x^8 + 3*(e*x + d)^m*B*b*c^2*d*e^7*m^7*x^6 + (e*x + d)^m*A*
c^3*d*e^7*m^7*x^6 + 3*(e*x + d)^m*B*b^2*c*e^8*m^7*x^6 + 3*(e*x + d)^m*A*b*
c^2*e^8*m^7*x^6 + 21*(e*x + d)^m*B*c^3*d*e^7*m^6*x^7 + 87*(e*x + d)^m*B*b*
c^2*e^8*m^6*x^7 + 29*(e*x + d)^m*A*c^3*e^8*m^6*x^7 + 322*(e*x + d)^m*B*c^3
*e^8*m^5*x^8 + 3*(e*x + d)^m*B*b^2*c*d*e^7*m^7*x^5 + 3*(e*x + d)^m*A*b*c^2
*d*e^7*m^7*x^5 + (e*x + d)^m*B*b^3*e^8*m^7*x^5 + 3*(e*x + d)^m*A*b^2*c*e^8
*m^7*x^5 - 7*(e*x + d)^m*B*c^3*d^2*e^6*m^6*x^6 + 69*(e*x + d)^m*B*b*c^2*d*
e^7*m^6*x^6 + 23*(e*x + d)^m*A*c^3*d*e^7*m^6*x^6 + 90*(e*x + d)^m*B*b^2*c*
e^8*m^6*x^6 + 90*(e*x + d)^m*A*b*c^2*e^8*m^6*x^6 + 175*(e*x + d)^m*B*c^3*d
*e^7*m^5*x^7 + 1029*(e*x + d)^m*B*b*c^2*e^8*m^5*x^7 + 343*(e*x + d)^m*A*c^
3*e^8*m^5*x^7 + 1960*(e*x + d)^m*B*c^3*e^8*m^4*x^8 + (e*x + d)^m*B*b^3*d*e
^7*m^7*x^4 + 3*(e*x + d)^m*A*b^2*c*d*e^7*m^7*x^4 + (e*x + d)^m*A*b^3*e^8*m
^7*x^4 - 18*(e*x + d)^m*B*b*c^2*d^2*e^6*m^6*x^5 - 6*(e*x + d)^m*A*c^3*d^2*
e^6*m^6*x^5 + 75*(e*x + d)^m*B*b^2*c*d*e^7*m^6*x^5 + 75*(e*x + d)^m*A*b*c^
2*d*e^7*m^6*x^5 + 31*(e*x + d)^m*B*b^3*e^8*m^6*x^5 + 93*(e*x + d)^m*A*b^2*
c*e^8*m^6*x^5 - 105*(e*x + d)^m*B*c^3*d^2*e^6*m^5*x^6 + 615*(e*x + d)^m*B*
b*c^2*d*e^7*m^5*x^6 + 205*(e*x + d)^m*A*c^3*d*e^7*m^5*x^6 + 1098*(e*x + d)
^m*B*b^2*c*e^8*m^5*x^6 + 1098*(e*x + d)^m*A*b*c^2*e^8*m^5*x^6 + 735*(e*...
```

Mupad [B] (verification not implemented)

Time = 13.06 (sec) , antiderivative size = 2500, normalized size of antiderivative = 5.17

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^3 \, dx = \text{Too large to display}$$

input
```
int((b*x + c*x^2)^3*(A + B*x)*(d + e*x)^m,x)
```

output
```
(B*c^3*x^8*(d + e*x)^m*(13068*m + 13132*m^2 + 6769*m^3 + 1960*m^4 + 322*m^
5 + 28*m^6 + m^7 + 5040))/(109584*m + 118124*m^2 + 67284*m^3 + 22449*m^4 +
 4536*m^5 + 546*m^6 + 36*m^7 + m^8 + 40320) - ((d + e*x)^m*(5040*B*c^3*d^8
 - 5760*A*c^3*d^7*e + 10080*A*b^3*d^4*e^4 - 8064*B*b^3*d^5*e^3 + 20160*A*b
*c^2*d^6*e^2 - 24192*A*b^2*c*d^5*e^3 + 20160*B*b^2*c*d^6*e^2 + 6396*A*b^3*
d^4*e^4*m - 3504*B*b^3*d^5*e^3*m + 1506*A*b^3*d^4*e^4*m^2 + 156*A*b^3*d^4*
e^4*m^3 + 6*A*b^3*d^4*e^4*m^4 - 504*B*b^3*d^5*e^3*m^2 - 24*B*b^3*d^5*e^3*m
^3 - 17280*B*b*c^2*d^7*e - 720*A*c^3*d^7*e*m + 360*A*b*c^2*d^6*e^2*m^2 - 1
512*A*b^2*c*d^5*e^3*m^2 - 72*A*b^2*c*d^5*e^3*m^3 + 360*B*b^2*c*d^6*e^2*m^2
 - 2160*B*b*c^2*d^7*e*m + 5400*A*b*c^2*d^6*e^2*m - 10512*A*b^2*c*d^5*e^3*m
 + 5400*B*b^2*c*d^6*e^2*m))/(e^8*(109584*m + 118124*m^2 + 67284*m^3 + 2244
9*m^4 + 4536*m^5 + 546*m^6 + 36*m^7 + m^8 + 40320)) + (x^5*(d + e*x)^m*(50
*m + 35*m^2 + 10*m^3 + m^4 + 24)*(336*B*b^3*e^3 + 1008*A*b^2*c*e^3 + 146*B
*b^3*e^3*m + 42*B*c^3*d^3*m + 21*B*b^3*e^3*m^2 + B*b^3*e^3*m^3 + 63*A*b^2*
c*e^3*m^2 + 3*A*b^2*c*e^3*m^3 - 6*A*c^3*d^2*e*m^2 + 438*A*b^2*c*e^3*m - 48
*A*c^3*d^2*e*m + 168*A*b*c^2*d*e^2*m - 144*B*b*c^2*d^2*e*m + 168*B*b^2*c*d
*e^2*m + 45*A*b*c^2*d*e^2*m^2 + 3*A*b*c^2*d*e^2*m^3 - 18*B*b*c^2*d^2*e*m^2
 + 45*B*b^2*c*d*e^2*m^2 + 3*B*b^2*c*d*e^2*m^3))/(e^3*(109584*m + 118124*m^
2 + 67284*m^3 + 22449*m^4 + 4536*m^5 + 546*m^6 + 36*m^7 + m^8 + 40320)) +
(x^4*(d + e*x)^m*(11*m + 6*m^2 + m^3 + 6)*(1680*A*b^3*e^4 + 1066*A*b^3*...
```

Reduce [B] (verification not implemented)

Time = 0.84 (sec) , antiderivative size = 4635, normalized size of antiderivative = 9.58

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^3 \, dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^3,x)
```

output

```
((d + e*x)**m*( - 6*a*b**3*d**4*e**4*m**4 - 156*a*b**3*d**4*e**4*m**3 - 15
06*a*b**3*d**4*e**4*m**2 - 6396*a*b**3*d**4*e**4*m - 10080*a*b**3*d**4*e**
4 + 6*a*b**3*d**3*e**5*m**5*x + 156*a*b**3*d**3*e**5*m**4*x + 1506*a*b**3*
d**3*e**5*m**3*x + 6396*a*b**3*d**3*e**5*m**2*x + 10080*a*b**3*d**3*e**5*m
*x - 3*a*b**3*d**2*e**6*m**6*x**2 - 81*a*b**3*d**2*e**6*m**5*x**2 - 831*a*
b**3*d**2*e**6*m**4*x**2 - 3951*a*b**3*d**2*e**6*m**3*x**2 - 8238*a*b**3*d
**2*e**6*m**2*x**2 - 5040*a*b**3*d**2*e**6*m*x**2 + a*b**3*d*e**7*m**7*x**
3 + 29*a*b**3*d*e**7*m**6*x**3 + 331*a*b**3*d*e**7*m**5*x**3 + 1871*a*b**3
*d*e**7*m**4*x**3 + 5380*a*b**3*d*e**7*m**3*x**3 + 7172*a*b**3*d*e**7*m**2
*x**3 + 3360*a*b**3*d*e**7*m*x**3 + a*b**3*e**8*m**7*x**4 + 32*a*b**3*e**8
*m**6*x**4 + 418*a*b**3*e**8*m**5*x**4 + 2864*a*b**3*e**8*m**4*x**4 + 1099
3*a*b**3*e**8*m**3*x**4 + 23312*a*b**3*e**8*m**2*x**4 + 24876*a*b**3*e**8*
m*x**4 + 10080*a*b**3*e**8*x**4 + 72*a*b**2*c*d**5*e**3*m**3 + 1512*a*b**2
*c*d**5*e**3*m**2 + 10512*a*b**2*c*d**5*e**3*m + 24192*a*b**2*c*d**5*e**3
- 72*a*b**2*c*d**4*e**4*m**4*x - 1512*a*b**2*c*d**4*e**4*m**3*x - 10512*a*
b**2*c*d**4*e**4*m**2*x - 24192*a*b**2*c*d**4*e**4*m*x + 36*a*b**2*c*d**3*
e**5*m**5*x**2 + 792*a*b**2*c*d**3*e**5*m**4*x**2 + 6012*a*b**2*c*d**3*e**
5*m**3*x**2 + 17352*a*b**2*c*d**3*e**5*m**2*x**2 + 12096*a*b**2*c*d**3*e**
5*m*x**2 - 12*a*b**2*c*d**2*e**6*m**6*x**3 - 288*a*b**2*c*d**2*e**6*m**5*x
**3 - 2532*a*b**2*c*d**2*e**6*m**4*x**3 - 9792*a*b**2*c*d**2*e**6*m**3*...
```

3.168 $\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^2 \, dx$

Optimal result

Integrand size = 24, antiderivative size = 282

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^2 \, dx = -\frac{d^2(Bd-Ae)(cd-be)^2(d+ex)^{1+m}}{e^6(1+m)} + \frac{d(cd-be)(Bd(5cd-3be)-2Ae(2cd-be))(d+ex)^{2+m}}{e^6(2+m)} + \frac{(Ae(6c^2d^2-6bcde+b^2e^2)-Bd(10c^2d^2-12bcde+3b^2e^2))\,(d+ex)^{3+m}}{e^6(3+m)} - \frac{(2Ace(2cd-be)-B(10c^2d^2-8bcde+b^2e^2))\,(d+ex)^{4+m}}{e^6(4+m)} - \frac{c(5Bcd-2bBe-Ace)(d+ex)^{5+m}}{e^6(5+m)} + \frac{Bc^2(d+ex)^{6+m}}{e^6(6+m)}$$

output
```
-d^2*(-A*e+B*d)*(-b*e+c*d)^2*(e*x+d)^(1+m)/e^6/(1+m)+d*(-b*e+c*d)*(B*d*(-3
*b*e+5*c*d)-2*A*e*(-b*e+2*c*d))*(e*x+d)^(2+m)/e^6/(2+m)+(A*e*(b^2*e^2-6*b*
c*d*e+6*c^2*d^2)-B*d*(3*b^2*e^2-12*b*c*d*e+10*c^2*d^2))*(e*x+d)^(3+m)/e^6/
(3+m)-(2*A*c*e*(-b*e+2*c*d)-B*(b^2*e^2-8*b*c*d*e+10*c^2*d^2))*(e*x+d)^(4+m
)/e^6/(4+m)-c*(-A*c*e-2*B*b*e+5*B*c*d)*(e*x+d)^(5+m)/e^6/(5+m)+B*c^2*(e*x+
d)^(6+m)/e^6/(6+m)
```

Mathematica [A] (verified)

Time = 0.67 (sec) , antiderivative size = 309, normalized size of antiderivative = 1.10

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^2 \, dx$$
$$= \frac{(d+ex)^{1+m} \left(Ae\left(\frac{d^2(cd-be)^2}{1+m} - \frac{2d(cd-be)(2cd-be)(d+ex)}{2+m} + \frac{(6c^2d^2-6bcde+b^2e^2)(d+ex)^2}{3+m} - \frac{2c(2cd-be)(d+ex)^3}{4+m} + \frac{c^2(d+ex)^4}{5+m}\right.\right.}{}$$

input
```
Integrate[(A + B*x)*(d + e*x)^m*(b*x + c*x^2)^2,x]
```

output
```
((d + e*x)^(1 + m)*(A*e*((d^2*(c*d - b*e)^2)/(1 + m) - (2*d*(c*d - b*e)*(2
*c*d - b*e)*(d + e*x))/(2 + m) + ((6*c^2*d^2 - 6*b*c*d*e + b^2*e^2)*(d + e
*x)^2)/(3 + m) - (2*c*(2*c*d - b*e)*(d + e*x)^3)/(4 + m) + (c^2*(d + e*x)^
4)/(5 + m)) + B*(-((d^3*(c*d - b*e)^2)/(1 + m)) + (d^2*(5*c*d - 3*b*e)*(c*
d - b*e)*(d + e*x))/(2 + m) - (d*(10*c^2*d^2 - 12*b*c*d*e + 3*b^2*e^2)*(d
+ e*x)^2)/(3 + m) + ((10*c^2*d^2 - 8*b*c*d*e + b^2*e^2)*(d + e*x)^3)/(4 +
m) - (c*(5*c*d - 2*b*e)*(d + e*x)^4)/(5 + m) + (c^2*(d + e*x)^5)/(6 + m)))
)/e^6
```

Rubi [A] (verified)

Time = 0.88 (sec) , antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {1195, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (A+Bx)\left(bx+cx^2\right)^2 (d+ex)^m \, dx$$

$$\Big\downarrow \ 1195$$

$$\int \left(\frac{(d+ex)^{m+2}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{e^5} + \frac{(d+ex)^{m+3}\left(B\left(b^2e^2-8bcde\right.\right.}{e^5}\right.$$

$$\Big\downarrow \ 2009$$

$$\frac{(d+ex)^{m+3}\left(Ae\left(b^2e^2-6bcde+6c^2d^2\right)-Bd\left(3b^2e^2-12bcde+10c^2d^2\right)\right)}{e^6(m+3)}-\frac{(d+ex)^{m+4}\left(2Ace(2cd-be)-B\left(b^2e^2-8bcde+10c^2d^2\right)\right)}{e^6(m+4)}-\frac{d^2(Bd-Ae)(cd-be)^2(d+ex)^{m+1}}{e^6(m+1)}+\frac{d(cd-be)(d+ex)^{m+2}(Bd(5cd-3be)-2Ae(2cd-be))}{e^6(m+2)}-\frac{c(d+ex)^{m+5}(-Ace-2bBe+5Bcd)}{e^6(m+5)}+\frac{Bc^2(d+ex)^{m+6}}{e^6(m+6)}$$

input
```
Int[(A + B*x)*(d + e*x)^m*(b*x + c*x^2)^2,x]
```

output
```
-((d^2*(B*d - A*e)*(c*d - b*e)^2*(d + e*x)^(1 + m))/(e^6*(1 + m))) + (d*(c
*d - b*e)*(B*d*(5*c*d - 3*b*e) - 2*A*e*(2*c*d - b*e))*(d + e*x)^(2 + m))/(
e^6*(2 + m)) + ((A*e*(6*c^2*d^2 - 6*b*c*d*e + b^2*e^2) - B*d*(10*c^2*d^2 -
 12*b*c*d*e + 3*b^2*e^2))*(d + e*x)^(3 + m))/(e^6*(3 + m)) - ((2*A*c*e*(2*
c*d - b*e) - B*(10*c^2*d^2 - 8*b*c*d*e + b^2*e^2))*(d + e*x)^(4 + m))/(e^6
*(4 + m)) - (c*(5*B*c*d - 2*b*B*e - A*c*e)*(d + e*x)^(5 + m))/(e^6*(5 + m)
) + (B*c^2*(d + e*x)^(6 + m))/(e^6*(6 + m))
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 1029 vs. $2(282) = 564$.

Time = 0.94 (sec) , antiderivative size = 1030, normalized size of antiderivative = 3.65

method	result	size
norman	Expression too large to display	1030
gosper	Expression too large to display	1616
orering	Expression too large to display	1640
risch	Expression too large to display	1922
parallelrisch	Expression too large to display	2903

input
```
int((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^2,x,method=_RETURNVERBOSE)
```

output
```
B*c^2/(6+m)*x^6*exp(m*ln(e*x+d))+(2*A*b*c*e^2*m^2+A*c^2*d*e*m^2+B*b^2*e^2*
m^2+2*B*b*c*d*e*m^2+22*A*b*c*e^2*m+6*A*c^2*d*e*m+11*B*b^2*e^2*m+12*B*b*c*d
*e*m-5*B*c^2*d^2*m+60*A*b*c*e^2+30*B*b^2*e^2)/e^2/(m^3+15*m^2+74*m+120)*x^
4*exp(m*ln(e*x+d))+(A*b^2*e^3*m^3+2*A*b*c*d*e^2*m^3+B*b^2*d*e^2*m^3+15*A*b
^2*e^3*m^2+22*A*b*c*d*e^2*m^2-4*A*c^2*d^2*e*m^2+11*B*b^2*d*e^2*m^2-8*B*b*c
*d^2*e*m^2+74*A*b^2*e^3*m+60*A*b*c*d*e^2*m-24*A*c^2*d^2*e*m+30*B*b^2*d*e^2
*m-48*B*b*c*d^2*e*m+20*B*c^2*d^3*m+120*A*b^2*e^3)/e^3/(m^4+18*m^3+119*m^2+
342*m+360)*x^3*exp(m*ln(e*x+d))+(A*c*e*m+2*B*b*e*m+B*c*d*m+6*A*c*e+12*B*b*
e)/e*c/(m^2+11*m+30)*x^5*exp(m*ln(e*x+d))+(A*b^2*e^3*m^3+15*A*b^2*e^3*m^2-
6*A*b*c*d*e^2*m^2-3*B*b^2*d*e^2*m^2+74*A*b^2*e^3*m-66*A*b*c*d*e^2*m+12*A*c
^2*d^2*e*m-33*B*b^2*d*e^2*m+24*B*b*c*d^2*e*m+120*A*b^2*e^3-180*A*b*c*d*e^2
+72*A*c^2*d^2*e-90*B*b^2*d*e^2+144*B*b*c*d^2*e-60*B*c^2*d^3)*d/e^4*m/(m^5+
20*m^4+155*m^3+580*m^2+1044*m+720)*x^2*exp(m*ln(e*x+d))+2*d^3*(A*b^2*e^3*m
^3+15*A*b^2*e^3*m^2-6*A*b*c*d*e^2*m^2-3*B*b^2*d*e^2*m^2+74*A*b^2*e^3*m-66*
A*b*c*d*e^2*m+12*A*c^2*d^2*e*m-33*B*b^2*d*e^2*m+24*B*b*c*d^2*e*m+120*A*b^2
*e^3-180*A*b*c*d*e^2+72*A*c^2*d^2*e-90*B*b^2*d*e^2+144*B*b*c*d^2*e-60*B*c^
2*d^3)/e^6/(m^6+21*m^5+175*m^4+735*m^3+1624*m^2+1764*m+720)*exp(m*ln(e*x+d
))-2/e^5*m*d^2*(A*b^2*e^3*m^3+15*A*b^2*e^3*m^2-6*A*b*c*d*e^2*m^2-3*B*b^2*d
*e^2*m^2+74*A*b^2*e^3*m-66*A*b*c*d*e^2*m+12*A*c^2*d^2*e*m-33*B*b^2*d*e^2*m
+24*B*b*c*d^2*e*m+120*A*b^2*e^3-180*A*b*c*d*e^2+72*A*c^2*d^2*e-90*B*b^2...
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 1417 vs. $2(283) = 566$.

Time = 0.10 (sec) , antiderivative size = 1417, normalized size of antiderivative = 5.02

$$\int (A + Bx)(d + ex)^m (bx + cx^2)^2 \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
(2*A*b^2*d^3*e^3*m^3 - 120*B*c^2*d^6 + 240*A*b^2*d^3*e^3 + 144*(2*B*b*c +
A*c^2)*d^5*e - 180*(B*b^2 + 2*A*b*c)*d^4*e^2 + (B*c^2*e^6*m^5 + 15*B*c^2*e
^6*m^4 + 85*B*c^2*e^6*m^3 + 225*B*c^2*e^6*m^2 + 274*B*c^2*e^6*m + 120*B*c^
2*e^6)*x^6 + (144*(2*B*b*c + A*c^2)*e^6 + (B*c^2*d*e^5 + (2*B*b*c + A*c^2)
*e^6)*m^5 + 2*(5*B*c^2*d*e^5 + 8*(2*B*b*c + A*c^2)*e^6)*m^4 + 5*(7*B*c^2*d
*e^5 + 19*(2*B*b*c + A*c^2)*e^6)*m^3 + 10*(5*B*c^2*d*e^5 + 26*(2*B*b*c + A
*c^2)*e^6)*m^2 + 12*(2*B*c^2*d*e^5 + 27*(2*B*b*c + A*c^2)*e^6)*m)*x^5 + (1
80*(B*b^2 + 2*A*b*c)*e^6 + ((2*B*b*c + A*c^2)*d*e^5 + (B*b^2 + 2*A*b*c)*e^
6)*m^5 - (5*B*c^2*d^2*e^4 - 12*(2*B*b*c + A*c^2)*d*e^5 - 17*(B*b^2 + 2*A*b
*c)*e^6)*m^4 - (30*B*c^2*d^2*e^4 - 47*(2*B*b*c + A*c^2)*d*e^5 - 107*(B*b^2
 + 2*A*b*c)*e^6)*m^3 - (55*B*c^2*d^2*e^4 - 72*(2*B*b*c + A*c^2)*d*e^5 - 30
7*(B*b^2 + 2*A*b*c)*e^6)*m^2 - 6*(5*B*c^2*d^2*e^4 - 6*(2*B*b*c + A*c^2)*d*
e^5 - 66*(B*b^2 + 2*A*b*c)*e^6)*m)*x^4 + (240*A*b^2*e^6 + (A*b^2*e^6 + (B*
b^2 + 2*A*b*c)*d*e^5)*m^5 + 2*(9*A*b^2*e^6 - 2*(2*B*b*c + A*c^2)*d^2*e^4 +
 7*(B*b^2 + 2*A*b*c)*d*e^5)*m^4 + (20*B*c^2*d^3*e^3 + 121*A*b^2*e^6 - 36*(
2*B*b*c + A*c^2)*d^2*e^4 + 65*(B*b^2 + 2*A*b*c)*d*e^5)*m^3 + 4*(15*B*c^2*d
^3*e^3 + 93*A*b^2*e^6 - 20*(2*B*b*c + A*c^2)*d^2*e^4 + 28*(B*b^2 + 2*A*b*c
)*d*e^5)*m^2 + 4*(10*B*c^2*d^3*e^3 + 127*A*b^2*e^6 - 12*(2*B*b*c + A*c^2)*
d^2*e^4 + 15*(B*b^2 + 2*A*b*c)*d*e^5)*m)*x^3 + 6*(5*A*b^2*d^3*e^3 - (B*b^2
 + 2*A*b*c)*d^4*e^2)*m^2 + (A*b^2*d*e^5*m^5 + (16*A*b^2*d*e^5 - 3*(B*b^...
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 20284 vs. 2(267) = 534.

Time = 4.53 (sec) , antiderivative size = 20284, normalized size of antiderivative = 71.93

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^2 \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)**m*(c*x**2+b*x)**2,x)
```

output
```
Piecewise((d**m*(A*b**2*x**3/3 + A*b*c*x**4/2 + A*c**2*x**5/5 + B*b**2*x**
4/4 + 2*B*b*c*x**5/5 + B*c**2*x**6/6), Eq(e, 0)), (-2*A*b**2*d**2*e**3/(60
*d**5*e**6 + 300*d**4*e**7*x + 600*d**3*e**8*x**2 + 600*d**2*e**9*x**3 + 3
00*d*e**10*x**4 + 60*e**11*x**5) - 10*A*b**2*d*e**4*x/(60*d**5*e**6 + 300*
d**4*e**7*x + 600*d**3*e**8*x**2 + 600*d**2*e**9*x**3 + 300*d*e**10*x**4 +
 60*e**11*x**5) - 20*A*b**2*e**5*x**2/(60*d**5*e**6 + 300*d**4*e**7*x + 60
0*d**3*e**8*x**2 + 600*d**2*e**9*x**3 + 300*d*e**10*x**4 + 60*e**11*x**5)
- 6*A*b*c*d**3*e**2/(60*d**5*e**6 + 300*d**4*e**7*x + 600*d**3*e**8*x**2 +
 600*d**2*e**9*x**3 + 300*d*e**10*x**4 + 60*e**11*x**5) - 30*A*b*c*d**2*e*
*3*x/(60*d**5*e**6 + 300*d**4*e**7*x + 600*d**3*e**8*x**2 + 600*d**2*e**9*
x**3 + 300*d*e**10*x**4 + 60*e**11*x**5) - 60*A*b*c*d*e**4*x**2/(60*d**5*e
**6 + 300*d**4*e**7*x + 600*d**3*e**8*x**2 + 600*d**2*e**9*x**3 + 300*d*e*
*10*x**4 + 60*e**11*x**5) - 60*A*b*c*e**5*x**3/(60*d**5*e**6 + 300*d**4*e*
*7*x + 600*d**3*e**8*x**2 + 600*d**2*e**9*x**3 + 300*d*e**10*x**4 + 60*e**
11*x**5) - 12*A*c**2*d**4*e/(60*d**5*e**6 + 300*d**4*e**7*x + 600*d**3*e**
8*x**2 + 600*d**2*e**9*x**3 + 300*d*e**10*x**4 + 60*e**11*x**5) - 60*A*c**
2*d**3*e**2*x/(60*d**5*e**6 + 300*d**4*e**7*x + 600*d**3*e**8*x**2 + 600*d
**2*e**9*x**3 + 300*d*e**10*x**4 + 60*e**11*x**5) - 120*A*c**2*d**2*e**3*x
**2/(60*d**5*e**6 + 300*d**4*e**7*x + 600*d**3*e**8*x**2 + 600*d**2*e**9*x
**3 + 300*d*e**10*x**4 + 60*e**11*x**5) - 120*A*c**2*d*e**4*x**3/(60*d*...
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 755 vs. $2(283) = 566$.

Time = 0.07 (sec) , antiderivative size = 755, normalized size of antiderivative = 2.68

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^2 \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^2,x, algorithm="maxima")
```

output
```
((m^2 + 3*m + 2)*e^3*x^3 + (m^2 + m)*d*e^2*x^2 - 2*d^2*e*m*x + 2*d^3)*(e*x
 + d)^m*A*b^2/((m^3 + 6*m^2 + 11*m + 6)*e^3) + ((m^3 + 6*m^2 + 11*m + 6)*e
^4*x^4 + (m^3 + 3*m^2 + 2*m)*d*e^3*x^3 - 3*(m^2 + m)*d^2*e^2*x^2 + 6*d^3*e
*m*x - 6*d^4)*(e*x + d)^m*B*b^2/((m^4 + 10*m^3 + 35*m^2 + 50*m + 24)*e^4)
+ 2*((m^3 + 6*m^2 + 11*m + 6)*e^4*x^4 + (m^3 + 3*m^2 + 2*m)*d*e^3*x^3 - 3*
(m^2 + m)*d^2*e^2*x^2 + 6*d^3*e*m*x - 6*d^4)*(e*x + d)^m*A*b*c/((m^4 + 10*
m^3 + 35*m^2 + 50*m + 24)*e^4) + 2*((m^4 + 10*m^3 + 35*m^2 + 50*m + 24)*e^
5*x^5 + (m^4 + 6*m^3 + 11*m^2 + 6*m)*d*e^4*x^4 - 4*(m^3 + 3*m^2 + 2*m)*d^2
*e^3*x^3 + 12*(m^2 + m)*d^3*e^2*x^2 - 24*d^4*e*m*x + 24*d^5)*(e*x + d)^m*B
*b*c/((m^5 + 15*m^4 + 85*m^3 + 225*m^2 + 274*m + 120)*e^5) + ((m^4 + 10*m^
3 + 35*m^2 + 50*m + 24)*e^5*x^5 + (m^4 + 6*m^3 + 11*m^2 + 6*m)*d*e^4*x^4 -
 4*(m^3 + 3*m^2 + 2*m)*d^2*e^3*x^3 + 12*(m^2 + m)*d^3*e^2*x^2 - 24*d^4*e*m
*x + 24*d^5)*(e*x + d)^m*A*c^2/((m^5 + 15*m^4 + 85*m^3 + 225*m^2 + 274*m +
 120)*e^5) + ((m^5 + 15*m^4 + 85*m^3 + 225*m^2 + 274*m + 120)*e^6*x^6 + (m
^5 + 10*m^4 + 35*m^3 + 50*m^2 + 24*m)*d*e^5*x^5 - 5*(m^4 + 6*m^3 + 11*m^2
+ 6*m)*d^2*e^4*x^4 + 20*(m^3 + 3*m^2 + 2*m)*d^3*e^3*x^3 - 60*(m^2 + m)*d^4
*e^2*x^2 + 120*d^5*e*m*x - 120*d^6)*(e*x + d)^m*B*c^2/((m^6 + 21*m^5 + 175
*m^4 + 735*m^3 + 1624*m^2 + 1764*m + 720)*e^6)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 2823 vs. $2(283) = 566$.

Time = 0.18 (sec) , antiderivative size = 2823, normalized size of antiderivative = 10.01

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^2 \, dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
((e*x + d)^m*B*c^2*e^6*m^5*x^6 + (e*x + d)^m*B*c^2*d*e^5*m^5*x^5 + 2*(e*x
+ d)^m*B*b*c*e^6*m^5*x^5 + (e*x + d)^m*A*c^2*e^6*m^5*x^5 + 15*(e*x + d)^m*
B*c^2*e^6*m^4*x^6 + 2*(e*x + d)^m*B*b*c*d*e^5*m^5*x^4 + (e*x + d)^m*A*c^2*
d*e^5*m^5*x^4 + (e*x + d)^m*B*b^2*e^6*m^5*x^4 + 2*(e*x + d)^m*A*b*c*e^6*m^
5*x^4 + 10*(e*x + d)^m*B*c^2*d*e^5*m^4*x^5 + 32*(e*x + d)^m*B*b*c*e^6*m^4*
x^5 + 16*(e*x + d)^m*A*c^2*e^6*m^4*x^5 + 85*(e*x + d)^m*B*c^2*e^6*m^3*x^6
+ (e*x + d)^m*B*b^2*d*e^5*m^5*x^3 + 2*(e*x + d)^m*A*b*c*d*e^5*m^5*x^3 + (e
*x + d)^m*A*b^2*e^6*m^5*x^3 - 5*(e*x + d)^m*B*c^2*d^2*e^4*m^4*x^4 + 24*(e*
x + d)^m*B*b*c*d*e^5*m^4*x^4 + 12*(e*x + d)^m*A*c^2*d*e^5*m^4*x^4 + 17*(e*
x + d)^m*B*b^2*e^6*m^4*x^4 + 34*(e*x + d)^m*A*b*c*e^6*m^4*x^4 + 35*(e*x +
d)^m*B*c^2*d*e^5*m^3*x^5 + 190*(e*x + d)^m*B*b*c*e^6*m^3*x^5 + 95*(e*x + d
)^m*A*c^2*e^6*m^3*x^5 + 225*(e*x + d)^m*B*c^2*e^6*m^2*x^6 + (e*x + d)^m*A*
b^2*d*e^5*m^5*x^2 - 8*(e*x + d)^m*B*b*c*d^2*e^4*m^4*x^3 - 4*(e*x + d)^m*A*
c^2*d^2*e^4*m^4*x^3 + 14*(e*x + d)^m*B*b^2*d*e^5*m^4*x^3 + 28*(e*x + d)^m*
A*b*c*d*e^5*m^4*x^3 + 18*(e*x + d)^m*A*b^2*e^6*m^4*x^3 - 30*(e*x + d)^m*B*
c^2*d^2*e^4*m^3*x^4 + 94*(e*x + d)^m*B*b*c*d*e^5*m^3*x^4 + 47*(e*x + d)^m*
A*c^2*d*e^5*m^3*x^4 + 107*(e*x + d)^m*B*b^2*e^6*m^3*x^4 + 214*(e*x + d)^m*
A*b*c*e^6*m^3*x^4 + 50*(e*x + d)^m*B*c^2*d*e^5*m^2*x^5 + 520*(e*x + d)^m*B
*b*c*e^6*m^2*x^5 + 260*(e*x + d)^m*A*c^2*e^6*m^2*x^5 + 274*(e*x + d)^m*B*c
^2*e^6*m*x^6 - 3*(e*x + d)^m*B*b^2*d^2*e^4*m^4*x^2 - 6*(e*x + d)^m*A*b*...
```

Mupad [B] (verification not implemented)

Time = 12.11 (sec) , antiderivative size = 1176, normalized size of antiderivative = 4.17

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^2 \, dx = \text{Too large to display}$$

input
```
int((b*x + c*x^2)^2*(A + B*x)*(d + e*x)^m,x)
```

output
```
((d + e*x)^m*(144*A*c^2*d^5*e - 120*B*c^2*d^6 + 240*A*b^2*d^3*e^3 - 180*B*
b^2*d^4*e^2 + 148*A*b^2*d^3*e^3*m - 66*B*b^2*d^4*e^2*m + 288*B*b*c*d^5*e +
 30*A*b^2*d^3*e^3*m^2 + 2*A*b^2*d^3*e^3*m^3 - 6*B*b^2*d^4*e^2*m^2 - 360*A*
b*c*d^4*e^2 + 24*A*c^2*d^5*e*m - 132*A*b*c*d^4*e^2*m - 12*A*b*c*d^4*e^2*m^
2 + 48*B*b*c*d^5*e*m))/(e^6*(1764*m + 1624*m^2 + 735*m^3 + 175*m^4 + 21*m^
5 + m^6 + 720)) + (x^3*(d + e*x)^m*(3*m + m^2 + 2)*(120*A*b^2*e^3 + 74*A*b
^2*e^3*m + 20*B*c^2*d^3*m + 15*A*b^2*e^3*m^2 + A*b^2*e^3*m^3 - 4*A*c^2*d^2
*e*m^2 + 11*B*b^2*d*e^2*m^2 + B*b^2*d*e^2*m^3 - 24*A*c^2*d^2*e*m + 30*B*b^
2*d*e^2*m + 22*A*b*c*d*e^2*m^2 + 2*A*b*c*d*e^2*m^3 - 8*B*b*c*d^2*e*m^2 + 6
0*A*b*c*d*e^2*m - 48*B*b*c*d^2*e*m))/(e^3*(1764*m + 1624*m^2 + 735*m^3 + 1
75*m^4 + 21*m^5 + m^6 + 720)) + (x^4*(d + e*x)^m*(11*m + 6*m^2 + m^3 + 6)*
(30*B*b^2*e^2 + 60*A*b*c*e^2 + 11*B*b^2*e^2*m - 5*B*c^2*d^2*m + B*b^2*e^2*
m^2 + 22*A*b*c*e^2*m + 6*A*c^2*d*e*m + 2*A*b*c*e^2*m^2 + A*c^2*d*e*m^2 + 1
2*B*b*c*d*e*m + 2*B*b*c*d*e*m^2))/(e^2*(1764*m + 1624*m^2 + 735*m^3 + 175*
m^4 + 21*m^5 + m^6 + 720)) + (B*c^2*x^6*(d + e*x)^m*(274*m + 225*m^2 + 85*
m^3 + 15*m^4 + m^5 + 120))/(1764*m + 1624*m^2 + 735*m^3 + 175*m^4 + 21*m^5
 + m^6 + 720) + (c*x^5*(d + e*x)^m*(50*m + 35*m^2 + 10*m^3 + m^4 + 24)*(6*
A*c*e + 12*B*b*e + A*c*e*m + 2*B*b*e*m + B*c*d*m))/(e*(1764*m + 1624*m^2 +
 735*m^3 + 175*m^4 + 21*m^5 + m^6 + 720)) - (2*d^2*m*x*(d + e*x)^m*(120*A*
b^2*e^3 - 60*B*c^2*d^3 + 72*A*c^2*d^2*e - 90*B*b^2*d*e^2 + 74*A*b^2*e^3...
```

Reduce [B] (verification not implemented)

Time = 0.29 (sec) , antiderivative size = 1922, normalized size of antiderivative = 6.82

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right)^2 \, dx = \text{Too large to display}$$

input
```
int((B*x+A)*(e*x+d)^m*(c*x^2+b*x)^2,x)
```

output
```
((d + e*x)**m*(2*a*b**2*d**3*e**3*m**3 + 30*a*b**2*d**3*e**3*m**2 + 148*a*
b**2*d**3*e**3*m + 240*a*b**2*d**3*e**3 - 2*a*b**2*d**2*e**4*m**4*x - 30*a
*b**2*d**2*e**4*m**3*x - 148*a*b**2*d**2*e**4*m**2*x - 240*a*b**2*d**2*e**
4*m*x + a*b**2*d*e**5*m**5*x**2 + 16*a*b**2*d*e**5*m**4*x**2 + 89*a*b**2*d
*e**5*m**3*x**2 + 194*a*b**2*d*e**5*m**2*x**2 + 120*a*b**2*d*e**5*m*x**2 +
 a*b**2*e**6*m**5*x**3 + 18*a*b**2*e**6*m**4*x**3 + 121*a*b**2*e**6*m**3*x
**3 + 372*a*b**2*e**6*m**2*x**3 + 508*a*b**2*e**6*m*x**3 + 240*a*b**2*e**6
*x**3 - 12*a*b*c*d**4*e**2*m**2 - 132*a*b*c*d**4*e**2*m - 360*a*b*c*d**4*e
**2 + 12*a*b*c*d**3*e**3*m**3*x + 132*a*b*c*d**3*e**3*m**2*x + 360*a*b*c*d
**3*e**3*m*x - 6*a*b*c*d**2*e**4*m**4*x**2 - 72*a*b*c*d**2*e**4*m**3*x**2
- 246*a*b*c*d**2*e**4*m**2*x**2 - 180*a*b*c*d**2*e**4*m*x**2 + 2*a*b*c*d*e
**5*m**5*x**3 + 28*a*b*c*d*e**5*m**4*x**3 + 130*a*b*c*d*e**5*m**3*x**3 + 2
24*a*b*c*d*e**5*m**2*x**3 + 120*a*b*c*d*e**5*m*x**3 + 2*a*b*c*e**6*m**5*x*
*4 + 34*a*b*c*e**6*m**4*x**4 + 214*a*b*c*e**6*m**3*x**4 + 614*a*b*c*e**6*m
**2*x**4 + 792*a*b*c*e**6*m*x**4 + 360*a*b*c*e**6*x**4 + 24*a*c**2*d**5*e*
m + 144*a*c**2*d**5*e - 24*a*c**2*d**4*e**2*m**2*x - 144*a*c**2*d**4*e**2*
m*x + 12*a*c**2*d**3*e**3*m**3*x**2 + 84*a*c**2*d**3*e**3*m**2*x**2 + 72*a
*c**2*d**3*e**3*m*x**2 - 4*a*c**2*d**2*e**4*m**4*x**3 - 36*a*c**2*d**2*e**
4*m**3*x**3 - 80*a*c**2*d**2*e**4*m**2*x**3 - 48*a*c**2*d**2*e**4*m*x**3 +
 a*c**2*d*e**5*m**5*x**4 + 12*a*c**2*d*e**5*m**4*x**4 + 47*a*c**2*d*e**...
```

3.169 $\int (A+Bx)(d+ex)^m \left(bx+cx^2\right) dx$

Optimal result

Integrand size = 22, antiderivative size = 136

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right) dx = -\frac{d(Bd-Ae)(cd-be)(d+ex)^{1+m}}{e^4(1+m)} + \frac{(Bd(3cd-2be)-Ae(2cd-be))(d+ex)^{2+m}}{e^4(2+m)} - \frac{(3Bcd-bBe-Ace)(d+ex)^{3+m}}{e^4(3+m)} + \frac{Bc(d+ex)^{4+m}}{e^4(4+m)}$$

output
```
-d*(-A*e+B*d)*(-b*e+c*d)*(e*x+d)^(1+m)/e^4/(1+m)+(B*d*(-2*b*e+3*c*d)-A*e*(
-b*e+2*c*d))*(e*x+d)^(2+m)/e^4/(2+m)-(-A*c*e-B*b*e+3*B*c*d)*(e*x+d)^(3+m)/
e^4/(3+m)+B*c*(e*x+d)^(4+m)/e^4/(4+m)
```

Mathematica [A] (verified)

Time = 0.23 (sec) , antiderivative size = 118, normalized size of antiderivative = 0.87

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right) \, dx$$
$$= \frac{(d+ex)^{1+m}\left(-\frac{d(Bd-Ae)(cd-be)}{1+m}+\frac{(Bd(3cd-2be)+Ae(-2cd+be))(d+ex)}{2+m}-\frac{(3Bcd-bBe-Ace)(d+ex)^2}{3+m}+\frac{Bc(d+ex)^3}{4+m}\right)}{e^4}$$

input
```
Integrate[(A + B*x)*(d + e*x)^m*(b*x + c*x^2),x]
```

output
```
((d + e*x)^(1 + m)*(-((d*(B*d - A*e)*(c*d - b*e))/(1 + m)) + ((B*d*(3*c*d
- 2*b*e) + A*e*(-2*c*d + b*e))*(d + e*x))/(2 + m) - ((3*B*c*d - b*B*e - A*
c*e)*(d + e*x)^2)/(3 + m) + (B*c*(d + e*x)^3)/(4 + m)))/e^4
```

Rubi [A] (verified)

Time = 0.53 (sec) , antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {1195, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int (A+Bx)\left(bx+cx^2\right)(d+ex)^m \, dx$$

$$\Big\downarrow \; 1195$$

$$\int \left(-\frac{d(Bd-Ae)(cd-be)(d+ex)^m}{e^3}+\frac{(d+ex)^{m+1}(Bd(3cd-2be)-Ae(2cd-be))}{e^3}+\frac{(d+ex)^{m+2}(Ace+bB}{e^3}\right.$$

$$\Big\downarrow \; 2009$$

$$-\frac{d(Bd-Ae)(cd-be)(d+ex)^{m+1}}{e^4(m+1)}+\frac{(d+ex)^{m+2}(Bd(3cd-2be)-Ae(2cd-be))}{e^4(m+2)}-\frac{(d+ex)^{m+3}(-Ace-bBe+3Bcd)}{e^4(m+3)}+\frac{Bc(d+ex)^{m+4}}{e^4(m+4)}$$

input
```
Int[(A + B*x)*(d + e*x)^m*(b*x + c*x^2),x]
```

output
```
-((d*(B*d - A*e)*(c*d - b*e)*(d + e*x)^(1 + m))/(e^4*(1 + m))) + ((B*d*(3*
c*d - 2*b*e) - A*e*(2*c*d - b*e))*(d + e*x)^(2 + m))/(e^4*(2 + m)) - ((3*B
*c*d - b*B*e - A*c*e)*(d + e*x)^(3 + m))/(e^4*(3 + m)) + (B*c*(d + e*x)^(4
 + m))/(e^4*(4 + m))
```

Defintions of rubi rules used

rule 1195
```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.)*((a_.) + (b_.)*(x
_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f +
 g*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x
] && IGtQ[p, 0]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

Maple [B] (verified)

Leaf count of result is larger than twice the leaf count of optimal. 356 vs. $2(136) = 272$.

Time = 0.82 (sec) , antiderivative size = 357, normalized size of antiderivative = 2.62

method	result
norman	$\frac{B c\,x^{4} {\mathrm e}^{m \ln \left(e x +d \right)}}{4+m}+\frac{\left(A c e m +B b e m +B c d m +4 A c e +4 B b e \right) x^{3} {\mathrm e}^{m \ln \left(e x +d \right)}}{e \left(m^{2}+7 m +12\right)}+\frac{\left(A b \,e^{2} m^{2}+A c d e \,m^{2}+B b d e \,m^{2}+7 A b \,e^{2} m +4 A$ … $}{e^{2} \left(m^{3}+9$ … $}$
gosper	$-\frac{\left(e x +d \right)^{1+m} \left(-B c \,e^{3} m^{3} x^{3}-A c \,e^{3} m^{3} x^{2}-B b \,e^{3} m^{3} x^{2}-6 B c \,e^{3} m^{2} x^{3}-A b \,e^{3} m^{3} x -7 A c \,e^{3} m^{2} x^{2}-7 B b \,e^{3} m^{2} x^{2}+3 B c d \,e^{2} m^{2} x$ … $}{}$
orering	$-\frac{\left(-B c \,e^{3} m^{3} x^{3}-A c \,e^{3} m^{3} x^{2}-B b \,e^{3} m^{3} x^{2}-6 B c \,e^{3} m^{2} x^{3}-A b \,e^{3} m^{3} x -7 A c \,e^{3} m^{2} x^{2}-7 B b \,e^{3} m^{2} x^{2}+3 B c d \,e^{2} m^{2} x^{2}-11 B c \,e^{3} m$ … $}{}$
risch	$-\frac{\left(-B c \,e^{4} m^{3} x^{4}-A c \,e^{4} m^{3} x^{3}-B b \,e^{4} m^{3} x^{3}-B c d \,e^{3} m^{3} x^{3}-6 B c \,e^{4} m^{2} x^{4}-A b \,e^{4} m^{3} x^{2}-A c d \,e^{3} m^{3} x^{2}-7 A c \,e^{4} m^{2} x^{3}-B b d \,e^{3} m$ … $}{}$
parallelrisch	$\frac{A \,x^{2} \left(e x +d \right)^{m} c d \,e^{3} m^{3}+3 B \,x^{3} \left(e x +d \right)^{m} c d \,e^{3} m^{2}+B \,x^{2} \left(e x +d \right)^{m} b d \,e^{3} m^{3}+5 A \,x^{2} \left(e x +d \right)^{m} c d \,e^{3} m^{2}+A x \left(e x +d \right)^{m} b d \,e^{3} m^{3}+2 B$ … $}{}$

input
```
int((B*x+A)*(e*x+d)^m*(c*x^2+b*x),x,method=_RETURNVERBOSE)
```

output
```
B*c/(4+m)*x^4*exp(m*ln(e*x+d))+(A*c*e*m+B*b*e*m+B*c*d*m+4*A*c*e+4*B*b*e)/e
/(m^2+7*m+12)*x^3*exp(m*ln(e*x+d))+(A*b*e^2*m^2+A*c*d*e*m^2+B*b*d*e*m^2+7*
A*b*e^2*m+4*A*c*d*e*m+4*B*b*d*e*m-3*B*c*d^2*m+12*A*b*e^2)/e^2/(m^3+9*m^2+2
6*m+24)*x^2*exp(m*ln(e*x+d))+1/e^3*m*d*(A*b*e^2*m^2+7*A*b*e^2*m-2*A*c*d*e*
m-2*B*b*d*e*m+12*A*b*e^2-8*A*c*d*e-8*B*b*d*e+6*B*c*d^2)/(m^4+10*m^3+35*m^2
+50*m+24)*x*exp(m*ln(e*x+d))-d^2*(A*b*e^2*m^2+7*A*b*e^2*m-2*A*c*d*e*m-2*B*
b*d*e*m+12*A*b*e^2-8*A*c*d*e-8*B*b*d*e+6*B*c*d^2)/e^4/(m^4+10*m^3+35*m^2+5
0*m+24)*exp(m*ln(e*x+d))
```

Fricas [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 427 vs. $2(136) = 272$.

Time = 0.09 (sec) , antiderivative size = 427, normalized size of antiderivative = 3.14

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right) \, dx = -\frac{(Abd^2e^2m^2 + 6\,Bcd^4 + 12\,Abd^2e^2 - 8\,(Bb+Ac)d^3e - (Bce^4m^3 + 6\,Bce^4m^2 + 11\,Bce^4m + 6\,Bce^4)x^4}{}$$

input
```
integrate((B*x+A)*(e*x+d)^m*(c*x^2+b*x),x, algorithm="fricas")
```

output
```
-(A*b*d^2*e^2*m^2 + 6*B*c*d^4 + 12*A*b*d^2*e^2 - 8*(B*b + A*c)*d^3*e - (B*
c*e^4*m^3 + 6*B*c*e^4*m^2 + 11*B*c*e^4*m + 6*B*c*e^4)*x^4 - (8*(B*b + A*c)
*e^4 + (B*c*d*e^3 + (B*b + A*c)*e^4)*m^3 + (3*B*c*d*e^3 + 7*(B*b + A*c)*e^
4)*m^2 + 2*(B*c*d*e^3 + 7*(B*b + A*c)*e^4)*m)*x^3 - (12*A*b*e^4 + (A*b*e^4
 + (B*b + A*c)*d*e^3)*m^3 - (3*B*c*d^2*e^2 - 8*A*b*e^4 - 5*(B*b + A*c)*d*e
^3)*m^2 - (3*B*c*d^2*e^2 - 19*A*b*e^4 - 4*(B*b + A*c)*d*e^3)*m)*x^2 + (7*A
*b*d^2*e^2 - 2*(B*b + A*c)*d^3*e)*m - (A*b*d*e^3*m^3 + (7*A*b*d*e^3 - 2*(B
*b + A*c)*d^2*e^2)*m^2 + 2*(3*B*c*d^3*e + 6*A*b*d*e^3 - 4*(B*b + A*c)*d^2*
e^2)*m)*x)*(e*x + d)^m/(e^4*m^4 + 10*e^4*m^3 + 35*e^4*m^2 + 50*e^4*m + 24*
e^4)
```

Sympy [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 4537 vs. $2(121) = 242$.

Time = 1.34 (sec) , antiderivative size = 4537, normalized size of antiderivative = 33.36

$$\int (A + Bx)(d + ex)^m \left(bx + cx^2\right) dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)**m*(c*x**2+b*x),x)
```

output
```
Piecewise((d**m*(A*b*x**2/2 + A*c*x**3/3 + B*b*x**3/3 + B*c*x**4/4), Eq(e,
 0)), (-A*b*d*e**2/(6*d**3*e**4 + 18*d**2*e**5*x + 18*d*e**6*x**2 + 6*e**7
*x**3) - 3*A*b*e**3*x/(6*d**3*e**4 + 18*d**2*e**5*x + 18*d*e**6*x**2 + 6*e
**7*x**3) - 2*A*c*d**2*e/(6*d**3*e**4 + 18*d**2*e**5*x + 18*d*e**6*x**2 +
6*e**7*x**3) - 6*A*c*d*e**2*x/(6*d**3*e**4 + 18*d**2*e**5*x + 18*d*e**6*x*
*2 + 6*e**7*x**3) - 6*A*c*e**3*x**2/(6*d**3*e**4 + 18*d**2*e**5*x + 18*d*e
**6*x**2 + 6*e**7*x**3) - 2*B*b*d**2*e/(6*d**3*e**4 + 18*d**2*e**5*x + 18*
d*e**6*x**2 + 6*e**7*x**3) - 6*B*b*d*e**2*x/(6*d**3*e**4 + 18*d**2*e**5*x
+ 18*d*e**6*x**2 + 6*e**7*x**3) - 6*B*b*e**3*x**2/(6*d**3*e**4 + 18*d**2*e
**5*x + 18*d*e**6*x**2 + 6*e**7*x**3) + 6*B*c*d**3*log(d/e + x)/(6*d**3*e*
*4 + 18*d**2*e**5*x + 18*d*e**6*x**2 + 6*e**7*x**3) + 11*B*c*d**3/(6*d**3*
e**4 + 18*d**2*e**5*x + 18*d*e**6*x**2 + 6*e**7*x**3) + 18*B*c*d**2*e*x*lo
g(d/e + x)/(6*d**3*e**4 + 18*d**2*e**5*x + 18*d*e**6*x**2 + 6*e**7*x**3) +
 27*B*c*d**2*e*x/(6*d**3*e**4 + 18*d**2*e**5*x + 18*d*e**6*x**2 + 6*e**7*x
**3) + 18*B*c*d*e**2*x**2*log(d/e + x)/(6*d**3*e**4 + 18*d**2*e**5*x + 18*
d*e**6*x**2 + 6*e**7*x**3) + 18*B*c*d*e**2*x**2/(6*d**3*e**4 + 18*d**2*e**
5*x + 18*d*e**6*x**2 + 6*e**7*x**3) + 6*B*c*e**3*x**3*log(d/e + x)/(6*d**3
*e**4 + 18*d**2*e**5*x + 18*d*e**6*x**2 + 6*e**7*x**3), Eq(m, -4)), (-A*b*
d*e**2/(2*d**2*e**4 + 4*d*e**5*x + 2*e**6*x**2) - 2*A*b*e**3*x/(2*d**2*e**
4 + 4*d*e**5*x + 2*e**6*x**2) + 2*A*c*d**2*e*log(d/e + x)/(2*d**2*e**4 ...
```

Maxima [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 288 vs. $2(136) = 272$.

Time = 0.05 (sec) , antiderivative size = 288, normalized size of antiderivative = 2.12

$$\int (A + Bx)(d + ex)^m \left(bx + cx^2\right) dx = \frac{(e^2(m+1)x^2 + demx - d^2)(ex+d)^m Ab}{(m^2 + 3\,m + 2)e^2} + \frac{((m^2 + 3\,m + 2)e^3x^3 + (m^2 + m)de^2x^2 - 2\,d^2emx + 2\,d^3)(ex+d)^m Bb}{(m^3 + 6\,m^2 + 11\,m + 6)e^3} + \frac{((m^2 + 3\,m + 2)e^3x^3 + (m^2 + m)de^2x^2 - 2\,d^2emx + 2\,d^3)(ex+d)^m Ac}{(m^3 + 6\,m^2 + 11\,m + 6)e^3} + \frac{((m^3 + 6\,m^2 + 11\,m + 6)e^4x^4 + (m^3 + 3\,m^2 + 2\,m)de^3x^3 - 3\,(m^2 + m)d^2e^2x^2 + 6\,d^3emx - 6\,d^4)(ex -}{(m^4 + 10\,m^3 + 35\,m^2 + 50\,m + 24)e^4}$$

input
```
integrate((B*x+A)*(e*x+d)^m*(c*x^2+b*x),x, algorithm="maxima")
```

output
```
(e^2*(m + 1)*x^2 + d*e*m*x - d^2)*(e*x + d)^m*A*b/((m^2 + 3*m + 2)*e^2) +
((m^2 + 3*m + 2)*e^3*x^3 + (m^2 + m)*d*e^2*x^2 - 2*d^2*e*m*x + 2*d^3)*(e*x
 + d)^m*B*b/((m^3 + 6*m^2 + 11*m + 6)*e^3) + ((m^2 + 3*m + 2)*e^3*x^3 + (m
^2 + m)*d*e^2*x^2 - 2*d^2*e*m*x + 2*d^3)*(e*x + d)^m*A*c/((m^3 + 6*m^2 + 1
1*m + 6)*e^3) + ((m^3 + 6*m^2 + 11*m + 6)*e^4*x^4 + (m^3 + 3*m^2 + 2*m)*d*
e^3*x^3 - 3*(m^2 + m)*d^2*e^2*x^2 + 6*d^3*e*m*x - 6*d^4)*(e*x + d)^m*B*c/(
(m^4 + 10*m^3 + 35*m^2 + 50*m + 24)*e^4)
```

Giac [B] (verification not implemented)

Leaf count of result is larger than twice the leaf count of optimal. 841 vs. $2(136) = 272$.

Time = 0.19 (sec) , antiderivative size = 841, normalized size of antiderivative = 6.18

$$\int (A + Bx)(d + ex)^m \left(bx + cx^2\right) dx = \text{Too large to display}$$

input
```
integrate((B*x+A)*(e*x+d)^m*(c*x^2+b*x),x, algorithm="giac")
```

output
```
((e*x + d)^m*B*c*e^4*m^3*x^4 + (e*x + d)^m*B*c*d*e^3*m^3*x^3 + (e*x + d)^m
*B*b*e^4*m^3*x^3 + (e*x + d)^m*A*c*e^4*m^3*x^3 + 6*(e*x + d)^m*B*c*e^4*m^2
*x^4 + (e*x + d)^m*B*b*d*e^3*m^3*x^2 + (e*x + d)^m*A*c*d*e^3*m^3*x^2 + (e*
x + d)^m*A*b*e^4*m^3*x^2 + 3*(e*x + d)^m*B*c*d*e^3*m^2*x^3 + 7*(e*x + d)^m
*B*b*e^4*m^2*x^3 + 7*(e*x + d)^m*A*c*e^4*m^2*x^3 + 11*(e*x + d)^m*B*c*e^4*
m*x^4 + (e*x + d)^m*A*b*d*e^3*m^3*x - 3*(e*x + d)^m*B*c*d^2*e^2*m^2*x^2 +
5*(e*x + d)^m*B*b*d*e^3*m^2*x^2 + 5*(e*x + d)^m*A*c*d*e^3*m^2*x^2 + 8*(e*x
 + d)^m*A*b*e^4*m^2*x^2 + 2*(e*x + d)^m*B*c*d*e^3*m*x^3 + 14*(e*x + d)^m*B
*b*e^4*m*x^3 + 14*(e*x + d)^m*A*c*e^4*m*x^3 + 6*(e*x + d)^m*B*c*e^4*x^4 -
2*(e*x + d)^m*B*b*d^2*e^2*m^2*x - 2*(e*x + d)^m*A*c*d^2*e^2*m^2*x + 7*(e*x
 + d)^m*A*b*d*e^3*m^2*x - 3*(e*x + d)^m*B*c*d^2*e^2*m*x^2 + 4*(e*x + d)^m*
B*b*d*e^3*m*x^2 + 4*(e*x + d)^m*A*c*d*e^3*m*x^2 + 19*(e*x + d)^m*A*b*e^4*m
*x^2 + 8*(e*x + d)^m*B*b*e^4*x^3 + 8*(e*x + d)^m*A*c*e^4*x^3 - (e*x + d)^m
*A*b*d^2*e^2*m^2 + 6*(e*x + d)^m*B*c*d^3*e*m*x - 8*(e*x + d)^m*B*b*d^2*e^2
*m*x - 8*(e*x + d)^m*A*c*d^2*e^2*m*x + 12*(e*x + d)^m*A*b*d*e^3*m*x + 12*(
e*x + d)^m*A*b*e^4*x^2 + 2*(e*x + d)^m*B*b*d^3*e*m + 2*(e*x + d)^m*A*c*d^3
*e*m - 7*(e*x + d)^m*A*b*d^2*e^2*m - 6*(e*x + d)^m*B*c*d^4 + 8*(e*x + d)^m
*B*b*d^3*e + 8*(e*x + d)^m*A*c*d^3*e - 12*(e*x + d)^m*A*b*d^2*e^2)/(e^4*m^
4 + 10*e^4*m^3 + 35*e^4*m^2 + 50*e^4*m + 24*e^4)
```

Mupad [B] (verification not implemented)

Time = 11.52 (sec) , antiderivative size = 400, normalized size of antiderivative = 2.94

$$\int (A+Bx)(d+ex)^m \left(bx+cx^2\right) dx$$

$$= \frac{x^2\,(m+1)\,\left(d+e\,x\right)^m\left(12\,A\,b\,e^2+7\,A\,b\,e^2\,m-3\,B\,c\,d^2\,m+A\,b\,e^2\,m^2+4\,A\,c\,d\,e\,m+4\,B\,b\,d\,e\,m+A\,c\,d}{e^2\,\left(m^4+10\,m^3+35\,m^2+50\,m+24\right)}$$

$$-\frac{d^2\,\left(d+e\,x\right)^m\left(12\,A\,b\,e^2+6\,B\,c\,d^2+7\,A\,b\,e^2\,m+A\,b\,e^2\,m^2-8\,A\,c\,d\,e-8\,B\,b\,d\,e-2\,A\,c\,d\,e\,m-2\,B\,b}{e^4\,\left(m^4+10\,m^3+35\,m^2+50\,m+24\right)}$$

$$+\frac{x^3\,\left(d+e\,x\right)^m\left(m^2+3\,m+2\right)\,\left(4\,A\,c\,e+4\,B\,b\,e+A\,c\,e\,m+B\,b\,e\,m+B\,c\,d\,m\right)}{e\,\left(m^4+10\,m^3+35\,m^2+50\,m+24\right)}$$

$$+\frac{B\,c\,x^4\,\left(d+e\,x\right)^m\left(m^3+6\,m^2+11\,m+6\right)}{m^4+10\,m^3+35\,m^2+50\,m+24}$$

$$+\frac{d\,m\,x\,\left(d+e\,x\right)^m\left(12\,A\,b\,e^2+6\,B\,c\,d^2+7\,A\,b\,e^2\,m+A\,b\,e^2\,m^2-8\,A\,c\,d\,e-8\,B\,b\,d\,e-2\,A\,c\,d\,e\,m-2\,I}{e^3\,\left(m^4+10\,m^3+35\,m^2+50\,m+24\right)}$$

input
```
int((b*x + c*x^2)*(A + B*x)*(d + e*x)^m,x)
```

output
```
(x^2*(m + 1)*(d + e*x)^m*(12*A*b*e^2 + 7*A*b*e^2*m - 3*B*c*d^2*m + A*b*e^2
*m^2 + 4*A*c*d*e*m + 4*B*b*d*e*m + A*c*d*e*m^2 + B*b*d*e*m^2))/(e^2*(50*m
+ 35*m^2 + 10*m^3 + m^4 + 24)) - (d^2*(d + e*x)^m*(12*A*b*e^2 + 6*B*c*d^2
+ 7*A*b*e^2*m + A*b*e^2*m^2 - 8*A*c*d*e - 8*B*b*d*e - 2*A*c*d*e*m - 2*B*b*
d*e*m))/(e^4*(50*m + 35*m^2 + 10*m^3 + m^4 + 24)) + (x^3*(d + e*x)^m*(3*m
+ m^2 + 2)*(4*A*c*e + 4*B*b*e + A*c*e*m + B*b*e*m + B*c*d*m))/(e*(50*m + 3
5*m^2 + 10*m^3 + m^4 + 24)) + (B*c*x^4*(d + e*x)^m*(11*m + 6*m^2 + m^3 + 6
))/(50*m + 35*m^2 + 10*m^3 + m^4 + 24) + (d*m*x*(d + e*x)^m*(12*A*b*e^2 +
6*B*c*d^2 + 7*A*b*e^2*m + A*b*e^2*m^2 - 8*A*c*d*e - 8*B*b*d*e - 2*A*c*d*e*
m - 2*B*b*d*e*m))/(e^3*(50*m + 35*m^2 + 10*m^3 + m^4 + 24))
```

Reduce [B] (verification not implemented)

Time = 0.21 (sec) , antiderivative size = 544, normalized size of antiderivative = 4.00

$$\int (A+Bx)(d+ex)^m\,(bx+cx^2)\ dx$$
$$= \frac{(ex+d)^m\,(bc\,e^4m^3x^4 + ac\,e^4m^3x^3 + b^2e^4m^3x^3 + bcd\,e^3m^3x^3 + 6bc\,e^4m^2x^4 + ab\,e^4m^3x^2 + acd\,e^3m^3x^2 + \cdots}{}$$

input
```
int((B*x+A)*(e*x+d)^m*(c*x^2+b*x),x)
```

output
```
((d + e*x)**m*( - a*b*d**2*e**2*m**2 - 7*a*b*d**2*e**2*m - 12*a*b*d**2*e**
2 + a*b*d*e**3*m**3*x + 7*a*b*d*e**3*m**2*x + 12*a*b*d*e**3*m*x + a*b*e**4
*m**3*x**2 + 8*a*b*e**4*m**2*x**2 + 19*a*b*e**4*m*x**2 + 12*a*b*e**4*x**2
+ 2*a*c*d**3*e*m + 8*a*c*d**3*e - 2*a*c*d**2*e**2*m**2*x - 8*a*c*d**2*e**2
*m*x + a*c*d*e**3*m**3*x**2 + 5*a*c*d*e**3*m**2*x**2 + 4*a*c*d*e**3*m*x**2
 + a*c*e**4*m**3*x**3 + 7*a*c*e**4*m**2*x**3 + 14*a*c*e**4*m*x**3 + 8*a*c*
e**4*x**3 + 2*b**2*d**3*e*m + 8*b**2*d**3*e - 2*b**2*d**2*e**2*m**2*x - 8*
b**2*d**2*e**2*m*x + b**2*d*e**3*m**3*x**2 + 5*b**2*d*e**3*m**2*x**2 + 4*b
**2*d*e**3*m*x**2 + b**2*e**4*m**3*x**3 + 7*b**2*e**4*m**2*x**3 + 14*b**2*
e**4*m*x**3 + 8*b**2*e**4*x**3 - 6*b*c*d**4 + 6*b*c*d**3*e*m*x - 3*b*c*d**
2*e**2*m**2*x**2 - 3*b*c*d**2*e**2*m*x**2 + b*c*d*e**3*m**3*x**3 + 3*b*c*d
*e**3*m**2*x**3 + 2*b*c*d*e**3*m*x**3 + b*c*e**4*m**3*x**4 + 6*b*c*e**4*m*
*2*x**4 + 11*b*c*e**4*m*x**4 + 6*b*c*e**4*x**4))/(e**4*(m**4 + 10*m**3 + 3
5*m**2 + 50*m + 24))
```

3.170 $\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2} dx$

Optimal result

Integrand size = 24, antiderivative size = 103

$$\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2} dx = -\frac{A(d+ex)^{1+m}\text{Hypergeometric2F1}\left(1,1+m,2+m,\frac{d+ex}{d}\right)}{bd(1+m)} - \frac{(bB-Ac)(d+ex)^{1+m}\text{Hypergeometric2F1}\left(1,1+m,2+m,\frac{c(d+ex)}{cd-be}\right)}{b(cd-be)(1+m)}$$

output
```
-A*(e*x+d)^(1+m)*hypergeom([1, 1+m],[2+m],(e*x+d)/d)/b/d/(1+m)-(-A*c+B*b)*
(e*x+d)^(1+m)*hypergeom([1, 1+m],[2+m],c*(e*x+d)/(-b*e+c*d))/b/(-b*e+c*d)/
(1+m)
```

Mathematica [A] (verified)

Time = 0.18 (sec) , antiderivative size = 93, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2} dx = \frac{(d+ex)^{1+m}\left((bB-Ac)d\,\text{Hypergeometric2F1}\left(1,1+m,2+m,\frac{c(d+ex)}{cd-be}\right)+A(cd-be)\,\text{Hypergeometric}\right.}{bd(-cd+be)(1+m)}$$

input
```
Integrate[((A + B*x)*(d + e*x)^m)/(b*x + c*x^2),x]
```

output
```
((d + e*x)^(1 + m)*((b*B - A*c)*d*Hypergeometric2F1[1, 1 + m, 2 + m, (c*(d
 + e*x))/(c*d - b*e)] + A*(c*d - b*e)*Hypergeometric2F1[1, 1 + m, 2 + m, 1
 + (e*x)/d]))/(b*d*(-(c*d) + b*e)*(1 + m))
```

Rubi [A] (verified)

Time = 0.45 (sec) , antiderivative size = 102, normalized size of antiderivative = 0.99, number of steps used = 2, number of rules used = 2, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {1200, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2}dx$$

$$\Big\downarrow \; 1200$$

$$\int \left(\frac{(bB-Ac)(d+ex)^m}{b(b+cx)}+\frac{A(d+ex)^m}{bx}\right)dx$$

$$\Big\downarrow \; 2009$$

$$-\frac{(bB-Ac)(d+ex)^{m+1}\text{Hypergeometric2F1}\left(1,m+1,m+2,\frac{c(d+ex)}{cd-be}\right)}{b(m+1)(cd-be)}-\frac{A(d+ex)^{m+1}\text{Hypergeometric2F1}\left(1,m+1,m+2,\frac{ex}{d}+1\right)}{bd(m+1)}$$

input
```
Int[((A + B*x)*(d + e*x)^m)/(b*x + c*x^2),x]
```

output
```
-(((b*B - A*c)*(d + e*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, (c*(d
+ e*x))/(c*d - b*e)])/(b*(c*d - b*e)*(1 + m))) - (A*(d + e*x)^(1 + m)*Hype
rgeometric2F1[1, 1 + m, 2 + m, 1 + (e*x)/d])/(b*d*(1 + m))
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

Maple [F]

$$\int \frac{(Bx+A)\,(ex+d)^{m}}{c\,x^{2}+bx}dx$$

input
```
int((B*x+A)*(e*x+d)^m/(c*x^2+b*x),x)
```

output
```
int((B*x+A)*(e*x+d)^m/(c*x^2+b*x),x)
```

Fricas [F]

$$\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2}\,dx = \int \frac{(Bx+A)(ex+d)^m}{cx^2+bx}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^m/(c*x^2+b*x),x, algorithm="fricas")
```

output
```
integral((B*x + A)*(e*x + d)^m/(c*x^2 + b*x), x)
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2}\,dx = \int \frac{(A+Bx)\,(d+ex)^m}{x\,(b+cx)}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**m/(c*x**2+b*x),x)
```

output
```
Integral((A + B*x)*(d + e*x)**m/(x*(b + c*x)), x)
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2}\,dx = \int \frac{(Bx+A)(ex+d)^m}{cx^2+bx}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^m/(c*x^2+b*x),x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^m/(c*x^2 + b*x), x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2}\,dx = \int \frac{(Bx+A)(ex+d)^m}{cx^2+bx}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^m/(c*x^2+b*x),x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^m/(c*x^2 + b*x), x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^m}{c\,x^2+b\,x}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^m)/(b*x + c*x^2),x)
```

output
```
int(((A + B*x)*(d + e*x)^m)/(b*x + c*x^2), x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^m}{bx+cx^2}\,dx = \frac{(ex+d)^m ae+(ex+d)^m bd+\left(\int \frac{(ex+d)^m}{ce\,x^3+be\,x^2+cd\,x^2+bdx}dx\right)abdem-\left(\int \frac{(ex+d)^m x}{ce\,x^2+bex+cdx+bd}dx\right)ac\,e^2m+\left(\int \frac{}{c}\right.}{bem}$$

input
```
int((B*x+A)*(e*x+d)^m/(c*x^2+b*x),x)
```

output
```
((d + e*x)**m*a*e + (d + e*x)**m*b*d + int((d + e*x)**m/(b*d*x + b*e*x**2
+ c*d*x**2 + c*e*x**3),x)*a*b*d*e*m - int(((d + e*x)**m*x)/(b*d + b*e*x +
c*d*x + c*e*x**2),x)*a*c*e**2*m + int(((d + e*x)**m*x)/(b*d + b*e*x + c*d*
x + c*e*x**2),x)*b**2*e**2*m - int(((d + e*x)**m*x)/(b*d + b*e*x + c*d*x +
 c*e*x**2),x)*b*c*d*e*m)/(b*e*m)
```

3.171 $\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 221

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx = \frac{c(bBd-2Acd+Abe)(d+ex)^{1+m}}{b^2d(cd-be)(b+cx)} - \frac{A(d+ex)^{1+m}}{bdx(b+cx)} - \frac{(bBd-2Acd+Abem)(d+ex)^{1+m}\,\text{Hypergeometric2F1}\left(1,1+m,2+m,\frac{d+ex}{d}\right)}{b^3d^2(1+m)} - \frac{c(2Ac^2d-bc(Bd+Ae(2-m))+b^2Be(1-m))\,(d+ex)^{1+m}\,\text{Hypergeometric2F1}\left(1,1+m,2+m,\frac{c}{...}\right)}{b^3(cd-be)^2(1+m)}$$

output
```
c*(A*b*e-2*A*c*d+B*b*d)*(e*x+d)^(1+m)/b^2/d/(-b*e+c*d)/(c*x+b)-A*(e*x+d)^(
1+m)/b/d/x/(c*x+b)-(A*b*e*m-2*A*c*d+B*b*d)*(e*x+d)^(1+m)*hypergeom([1, 1+m
],[2+m],(e*x+d)/d)/b^3/d^2/(1+m)-c*(2*A*c^2*d-b*c*(B*d+A*e*(2-m))+b^2*B*e*
(1-m))*(e*x+d)^(1+m)*hypergeom([1, 1+m],[2+m],c*(e*x+d)/(-b*e+c*d))/b^3/(-
b*e+c*d)^2/(1+m)
```

Mathematica [A] (verified)

Time = 0.40 (sec) , antiderivative size = 207, normalized size of antiderivative = 0.94

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx =$$
$$-\frac{(d+ex)^{1+m}\left(Ab^2d(cd-be)^2(1+m)+bcd(-cd+be)(bBd-2Acd+Abe)(1+m)x+x(b+cx)\left(cd\right.\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^m)/(b*x + c*x^2)^2,x]
```

output
```
-(((d + e*x)^(1 + m)*(A*b^2*d*(c*d - b*e)^2*(1 + m) + b*c*d*(-(c*d) + b*e)
*(b*B*d - 2*A*c*d + A*b*e)*(1 + m)*x + x*(b + c*x)*(c*d^2*(2*A*c^2*d + b*c
*(-(B*d) + A*e*(-2 + m)) - b^2*B*e*(-1 + m))*Hypergeometric2F1[1, 1 + m, 2
 + m, (c*(d + e*x))/(c*d - b*e)] - (c*d - b*e)^2*(2*A*c*d - b*(B*d + A*e*m
))*Hypergeometric2F1[1, 1 + m, 2 + m, 1 + (e*x)/d])))/(b^3*d^2*(c*d - b*e)
^2*(1 + m)*x*(b + c*x)))
```

Rubi [A] (verified)

Time = 0.84 (sec) , antiderivative size = 240, normalized size of antiderivative = 1.09, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {1235, 25, 1200, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx$$

$$\Big\downarrow \ 1235$$

$$-\frac{\int -\frac{(d+ex)^m((cd-be)(bBd-2Acd+Abem)-ce(bBd-2Acd+Abe)mx)}{cx^2+bx}dx}{b^2d(cd-be)}-\frac{(d+ex)^{m+1}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\,(bx+cx^2)\,(cd-be)}$$

$$\Big\downarrow \ 25$$

$$\frac{\int \frac{(d+ex)^m((cd-be)(bBd-2Acd+Abem)-ce(bBd-2Acd+Abe)mx)}{cx^2+bx}dx}{b^2d(cd-be)} - \frac{(d+ex)^{m+1}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\left(bx+cx^2\right)(cd-be)}$$

$$\Big\downarrow \text{ 1200}$$

$$\frac{\int \left(\frac{cd(Be(1-m)b^2-c(Bd+Ae(2-m))b+2Ac^2d)(d+ex)^m}{b(b+cx)} - \frac{(be-cd)(bBd-2Acd+Abem)(d+ex)^m}{bx}\right)dx}{b^2d(cd-be)} - \frac{(d+ex)^{m+1}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\left(bx+cx^2\right)(cd-be)}$$

$$\Big\downarrow \text{ 2009}$$

$$\frac{-\frac{cd(d+ex)^{m+1}(-bc(Ae(2-m)+Bd)+2Ac^2d+b^2Be(1-m))\text{ Hypergeometric2F1}\left(1,m+1,m+2,\frac{c(d+ex)}{cd-be}\right)}{b(m+1)(cd-be)} - \frac{(cd-be)(d+ex)^{m+1}\text{ Hypergeomet}}{}}{b^2d(cd-be)}$$

$$\frac{(d+ex)^{m+1}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{b^2d\left(bx+cx^2\right)(cd-be)}$$

input
```
Int[((A + B*x)*(d + e*x)^m)/(b*x + c*x^2)^2,x]
```

output
```
-(((d + e*x)^(1 + m)*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x))/(b
^2*d*(c*d - b*e)*(b*x + c*x^2))) + (-((c*d*(2*A*c^2*d - b*c*(B*d + A*e*(2
- m)) + b^2*B*e*(1 - m))*(d + e*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 +
 m, (c*(d + e*x))/(c*d - b*e)])/(b*(c*d - b*e)*(1 + m))) - ((c*d - b*e)*(b
*B*d - 2*A*c*d + A*b*e*m)*(d + e*x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2
+ m, 1 + (e*x)/d])/(b*d*(1 + m)))/(b^2*d*(c*d - b*e))
```

Defintions of rubi rules used

rule 25
```
Int[-(Fx_), x_Symbol] :> Simp[Identity[-1]   Int[Fx, x], x]
```

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

Maple [F]

$$\int \frac{(Bx+A)\,(ex+d)^m}{(c\,x^2+bx)^2}dx$$

input
```
int((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^2,x)
```

output
```
int((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^2,x)
```

Fricas [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx = \int \frac{(Bx+A)(ex+d)^m}{(cx^2+bx)^2}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^2,x, algorithm="fricas")
```

output
```
integral((B*x + A)*(e*x + d)^m/(c^2*x^4 + 2*b*c*x^3 + b^2*x^2), x)
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx = \int \frac{(A+Bx)\,(d+ex)^m}{x^2\,(b+cx)^2}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**m/(c*x**2+b*x)**2,x)
```

output
```
Integral((A + B*x)*(d + e*x)**m/(x**2*(b + c*x)**2), x)
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx = \int \frac{(Bx+A)(ex+d)^m}{(cx^2+bx)^2}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^2,x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^m/(c*x^2 + b*x)^2, x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx = \int \frac{(Bx+A)(ex+d)^m}{(cx^2+bx)^2}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^2,x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^m/(c*x^2 + b*x)^2, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx = \int \frac{(A+B\,x)\,\left(d+e\,x\right)^m}{\left(c\,x^2+b\,x\right)^2}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^m)/(b*x + c*x^2)^2,x)
```

output
```
int(((A + B*x)*(d + e*x)^m)/(b*x + c*x^2)^2, x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^2}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^2,x)
```

output
```
( - (d + e*x)**m*a*b**2*e**2*m**2 + (d + e*x)**m*a*b**2*e**2*m + 3*(d + e*
x)**m*a*b*c*d*e*m - (d + e*x)**m*a*b*c*d*e - (d + e*x)**m*a*b*c*e**2*m*x +
 2*(d + e*x)**m*a*b*c*e**2*x - 2*(d + e*x)**m*a*c**2*d**2 + (d + e*x)**m*b
**3*e**2*m*x - (d + e*x)**m*b**3*e**2*x - (d + e*x)**m*b**2*c*d*e*m*x + in
t((d + e*x)**m/(b**4*d*e**2*m**2*x - b**4*d*e**2*m*x + b**4*e**3*m**2*x**2
 - b**4*e**3*m*x**2 - 3*b**3*c*d**2*e*m*x + b**3*c*d**2*e*x + 2*b**3*c*d*e
**2*m**2*x**2 - 5*b**3*c*d*e**2*m*x**2 + b**3*c*d*e**2*x**2 + 2*b**3*c*e**
3*m**2*x**3 - 2*b**3*c*e**3*m*x**3 + 2*b**2*c**2*d**3*x - 6*b**2*c**2*d**2
*e*m*x**2 + 4*b**2*c**2*d**2*e*x**2 + b**2*c**2*d*e**2*m**2*x**3 - 7*b**2*
c**2*d*e**2*m*x**3 + 2*b**2*c**2*d*e**2*x**3 + b**2*c**2*e**3*m**2*x**4 -
b**2*c**2*e**3*m*x**4 + 4*b*c**3*d**3*x**2 - 3*b*c**3*d**2*e*m*x**3 + 5*b*
c**3*d**2*e*x**3 - 3*b*c**3*d*e**2*m*x**4 + b*c**3*d*e**2*x**4 + 2*c**4*d*
*3*x**3 + 2*c**4*d**2*e*x**4),x)*a*b**6*e**5*m**5*x - 2*int((d + e*x)**m/(
b**4*d*e**2*m**2*x - b**4*d*e**2*m*x + b**4*e**3*m**2*x**2 - b**4*e**3*m*x
**2 - 3*b**3*c*d**2*e*m*x + b**3*c*d**2*e*x + 2*b**3*c*d*e**2*m**2*x**2 -
5*b**3*c*d*e**2*m*x**2 + b**3*c*d*e**2*x**2 + 2*b**3*c*e**3*m**2*x**3 - 2*
b**3*c*e**3*m*x**3 + 2*b**2*c**2*d**3*x - 6*b**2*c**2*d**2*e*m*x**2 + 4*b*
*2*c**2*d**2*e*x**2 + b**2*c**2*d*e**2*m**2*x**3 - 7*b**2*c**2*d*e**2*m*x*
*3 + 2*b**2*c**2*d*e**2*x**3 + b**2*c**2*e**3*m**2*x**4 - b**2*c**2*e**3*m
*x**4 + 4*b*c**3*d**3*x**2 - 3*b*c**3*d**2*e*m*x**3 + 5*b*c**3*d**2*e*x...
```

3.172 $\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}\,dx$

Optimal result

Integrand size = 24, antiderivative size = 485

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}\,dx$$
$$= \frac{c(6Ac^2d^2+b^2e(2Bd-Ae(1-m))-bcd(3Bd+Ae(4+m)))\,(d+ex)^{1+m}}{2b^3d^2(cd-be)(b+cx)^2}$$
$$-\frac{A(d+ex)^{1+m}}{2bdx^2(b+cx)^2}-\frac{(2bBd-4Acd-Abe(1-m))(d+ex)^{1+m}}{2b^2d^2x(b+cx)^2}$$
$$+\frac{c(12Ac^3d^3-6bc^2d^2(Bd+3Ae)-b^3e^2(2Bd-Ae(1-m))+b^2cde(Bd(9-m)+2Ae(2+m)))\,(d+e}{2b^4d^2(cd-be)^2(b+cx)}$$
$$-\frac{(12Ac^2d^2+b^2e(2Bd-Ae(1-m))m-6bcd(Bd+Aem))\,(d+ex)^{1+m}\,\text{Hypergeometric2F1}\,(1,1+m}{2b^5d^3(1+m)}$$
$$+\frac{c^2(12Ac^3d^2-6bc^2d(Bd+Ae(4-m))+b^2ce(4Bd+Ae(4-m))(3-m)-b^3Be^2(6-5m+m^2))\,(d}{2b^5(cd-be)^3(1+m)}$$

output
```
1/2*c*(6*A*c^2*d^2+b^2*e*(2*B*d-A*e*(1-m))-b*c*d*(3*B*d+A*e*(4+m)))*(e*x+d
)^(1+m)/b^3/d^2/(-b*e+c*d)/(c*x+b)^2-1/2*A*(e*x+d)^(1+m)/b/d/x^2/(c*x+b)^2
-1/2*(2*B*b*d-4*A*c*d-A*b*e*(1-m))*(e*x+d)^(1+m)/b^2/d^2/x/(c*x+b)^2+1/2*c
*(12*A*c^3*d^3-6*b*c^2*d^2*(3*A*e+B*d)-b^3*e^2*(2*B*d-A*e*(1-m))+b^2*c*d*e
*(B*d*(9-m)+2*A*e*(2+m)))*(e*x+d)^(1+m)/b^4/d^2/(-b*e+c*d)^2/(c*x+b)-1/2*(
12*A*c^2*d^2+b^2*e*(2*B*d-A*e*(1-m))*m-6*b*c*d*(A*e*m+B*d))*(e*x+d)^(1+m)*
hypergeom([1, 1+m],[2+m],(e*x+d)/d)/b^5/d^3/(1+m)+1/2*c^2*(12*A*c^3*d^2-6*
b*c^2*d*(B*d+A*e*(4-m))+b^2*c*e*(4*B*d+A*e*(4-m))*(3-m)-b^3*B*e^2*(m^2-5*m
+6))*(e*x+d)^(1+m)*hypergeom([1, 1+m],[2+m],c*(e*x+d)/(-b*e+c*d))/b^5/(-b*
e+c*d)^3/(1+m)
```

Mathematica [A] (verified)

Time = 1.10 (sec) , antiderivative size = 437, normalized size of antiderivative = 0.90

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}\,dx =$$

$$-\frac{(d+ex)^{1+m}\left(2Ab^4d^2(cd-be)^3(1+m)-2b^3d(-cd+be)^3(2bBd-4Acd+Abe(-1+m))(1+m)x\right.}{}$$

input
```
Integrate[((A + B*x)*(d + e*x)^m)/(b*x + c*x^2)^3,x]
```

output
```
-1/4*((d + e*x)^(1 + m)*(2*A*b^4*d^2*(c*d - b*e)^3*(1 + m) - 2*b^3*d*(-(c*
d) + b*e)^3*(2*b*B*d - 4*A*c*d + A*b*e*(-1 + m))*(1 + m)*x - x^2*(2*b^2*c*
d*(c*d - b*e)^2*(1 + m)*(6*A*c^2*d^2 + b^2*e*(2*B*d + A*e*(-1 + m)) - b*c*
d*(3*B*d + A*e*(4 + m))) + (b + c*x)*(2*b*c*d*(c*d - b*e)*(1 + m)*(12*A*c^
3*d^3 - 6*b*c^2*d^2*(B*d + 3*A*e) + b^3*e^2*(-2*B*d - A*e*(-1 + m)) + b^2*
c*d*e*(-(B*d*(-9 + m)) + 2*A*e*(2 + m))) + (b + c*x)*(2*c^2*d^3*(12*A*c^3*
d^2 - 6*b*c^2*d*(B*d - A*e*(-4 + m)) + b^2*c*e*(-4*B*d + A*e*(-4 + m))*(-3
 + m) - b^3*B*e^2*(6 - 5*m + m^2))*Hypergeometric2F1[1, 1 + m, 2 + m, (c*(
d + e*x))/(c*d - b*e)] - 2*(c*d - b*e)^3*(12*A*c^2*d^2 + b^2*e*(2*B*d + A*
e*(-1 + m))*m - 6*b*c*d*(B*d + A*e*m))*Hypergeometric2F1[1, 1 + m, 2 + m,
1 + (e*x)/d])))))/(b^5*d^3*(c*d - b*e)^3*(1 + m)*x^2*(b + c*x)^2)
```

Rubi [A] (verified)

Time = 1.74 (sec) , antiderivative size = 501, normalized size of antiderivative = 1.03, number of steps used = 4, number of rules used = 4, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {1235, 1235, 1200, 2009}

Below are the steps used by Rubi to obtain the solution. The rule number used for the transformation is given above next to the arrow. The rules definitions used are listed below.

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}dx$$

$$\Big\downarrow \text{1235}$$

$$-\frac{\int \frac{(d+ex)^m\left(e(2Bd-Ae(1-m))b^2-cd(3Bd+Ae(m+4))b+6Ac^2d^2-ce(bBd-2Acd+Abe)(2-m)x\right)}{(cx^2+bx)^2}dx}{2b^2d(cd-be)}-\frac{(d+ex)^{m+1}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d(bx+cx^2)^2(cd-be)}$$

$$\Big\downarrow \text{1235}$$

$$-\frac{-\frac{\int \frac{(d+ex)^m\left((cd-be)^2\left(e(2Bd-Ae(1-m))mb^2-6cd(Bd+Aem)b+12Ac^2d^2\right)-cem\left(-e^2(2Bd-Ae(1-m))b^3+cde(Bd(9-m)+2Ae(m+2))b^2-6c^2d^2(Bd+3Ae\right.\right.}{cx^2+bx}}{b^2d(cd-be)}}{}$$

$$\frac{(d+ex)^{m+1}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d(bx+cx^2)^2(cd-be)}$$

$$\Big\downarrow \text{1200}$$

$$-\frac{-\frac{\int\left(\frac{(cd-be)^2\left(e(2Bd-Ae(1-m))mb^2-6cd(Bd+Aem)b+12Ac^2d^2\right)(d+ex)^m}{bx}+\frac{c^2d^2\left(Be^2\left(m^2-5m+6\right)b^3-ce(4Bd+Ae(4-m))(3-m)b^2+6c^2d(Bd+Ae(4-m\right.}{b(b+cx)}\right.}{b^2d(cd-be)}}{}$$

$$\frac{(d+ex)^{m+1}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d(bx+cx^2)^2(cd-be)}$$

$$\Big\downarrow \text{2009}$$

$$-\frac{(d+ex)^{m+1}(cx(2Acd-b(Ae+Bd))+Ab(cd-be))}{2b^2d(bx+cx^2)^2(cd-be)}-$$

$$-\frac{\frac{c^2d^2(d+ex)^{m+1}\left(b^2ce(3-m)(Ae(4-m)+4Bd)-6bc^2d(Ae(4-m)+Bd)+12Ac^3d^2+b^3(-B)e^2\left(m^2-5m+6\right)\right)\text{Hypergeometric2F1}\left(1,m+1,m+2,\frac{c(d+ex)}{cd-be}\right)}{b(m+1)(cd-be)}-\frac{(c}{}}{b^2d(cd-be)}$$

input
```
Int[((A + B*x)*(d + e*x)^m)/(b*x + c*x^2)^3,x]
```

output
```
-1/2*((d + e*x)^(1 + m)*(A*b*(c*d - b*e) + c*(2*A*c*d - b*(B*d + A*e))*x))
/(b^2*d*(c*d - b*e)*(b*x + c*x^2)^2) - (-(((d + e*x)^(1 + m)*(b*(c*d - b*e
)*(6*A*c^2*d^2 + b^2*e*(2*B*d - A*e*(1 - m)) - b*c*d*(3*B*d + A*e*(4 + m))
) + c*(12*A*c^3*d^3 - 6*b*c^2*d^2*(B*d + 3*A*e) - b^3*e^2*(2*B*d - A*e*(1
- m)) + b^2*c*d*e*(B*d*(9 - m) + 2*A*e*(2 + m)))*x))/(b^2*d*(c*d - b*e)*(b
*x + c*x^2))) - ((c^2*d^2*(12*A*c^3*d^2 - 6*b*c^2*d*(B*d + A*e*(4 - m)) +
b^2*c*e*(4*B*d + A*e*(4 - m))*(3 - m) - b^3*B*e^2*(6 - 5*m + m^2))*(d + e*
x)^(1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, (c*(d + e*x))/(c*d - b*e)])/
(b*(c*d - b*e)*(1 + m)) - ((c*d - b*e)^2*(12*A*c^2*d^2 + b^2*e*(2*B*d - A*
e*(1 - m))*m - 6*b*c*d*(B*d + A*e*m))*(d + e*x)^(1 + m)*Hypergeometric2F1[
1, 1 + m, 2 + m, 1 + (e*x)/d])/(b*d*(1 + m)))/(b^2*d*(c*d - b*e)))/(2*b^2*
d*(c*d - b*e))
```

Defintions of rubi rules used

rule 1200
```
Int[(((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))^(n_.))/((a_.) + (b_.)*
(x_) + (c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*((f + g*
x)^n/(a + b*x + c*x^2)), x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && In
tegersQ[n]
```

rule 1235
```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (c
_.)*(x_)^2)^(p_), x_Symbol] :> Simp[(d + e*x)^(m + 1)*(f*(b*c*d - b^2*e + 2
*a*c*e) - a*g*(2*c*d - b*e) + c*(f*(2*c*d - b*e) - g*(b*d - 2*a*e))*x)*((a
+ b*x + c*x^2)^(p + 1)/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))), x]
 + Simp[1/((p + 1)*(b^2 - 4*a*c)*(c*d^2 - b*d*e + a*e^2))   Int[(d + e*x)^m
*(a + b*x + c*x^2)^(p + 1)*Simp[f*(b*c*d*e*(2*p - m + 2) + b^2*e^2*(p + m +
 2) - 2*c^2*d^2*(2*p + 3) - 2*a*c*e^2*(m + 2*p + 3)) - g*(a*e*(b*e - 2*c*d*
m + b*e*m) - b*d*(3*c*d - b*e + 2*c*d*p - b*e*p)) + c*e*(g*(b*d - 2*a*e) -
f*(2*c*d - b*e))*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m}, x] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p]
)
```

rule 2009
```
Int[u_, x_Symbol] :> Simp[IntSum[u, x], x] /; SumQ[u]
```

Maple [F]

$$\int \frac{(Bx+A)\,(ex+d)^m}{(c\,x^2+bx)^3}dx$$

input
```
int((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^3,x)
```

output
```
int((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^3,x)
```

Fricas [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}\,dx = \int \frac{(Bx+A)(ex+d)^m}{(cx^2+bx)^3}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^3,x, algorithm="fricas")
```

output
```
integral((B*x + A)*(e*x + d)^m/(c^3*x^6 + 3*b*c^2*x^5 + 3*b^2*c*x^4 + b^3*
x^3), x)
```

Sympy [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}\,dx = \int \frac{(A+Bx)\,(d+ex)^m}{x^3\,(b+cx)^3}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)**m/(c*x**2+b*x)**3,x)
```

output
```
Integral((A + B*x)*(d + e*x)**m/(x**3*(b + c*x)**3), x)
```

Maxima [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}\,dx = \int \frac{(Bx+A)(ex+d)^m}{(cx^2+bx)^3}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^3,x, algorithm="maxima")
```

output
```
integrate((B*x + A)*(e*x + d)^m/(c*x^2 + b*x)^3, x)
```

Giac [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}\,dx = \int \frac{(Bx+A)(ex+d)^m}{(cx^2+bx)^3}\,dx$$

input
```
integrate((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^3,x, algorithm="giac")
```

output
```
integrate((B*x + A)*(e*x + d)^m/(c*x^2 + b*x)^3, x)
```

Mupad [F(-1)]

Timed out.

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}\,dx = \int \frac{(A+B\,x)\,(d+e\,x)^m}{(c\,x^2+b\,x)^3}\,dx$$

input
```
int(((A + B*x)*(d + e*x)^m)/(b*x + c*x^2)^3,x)
```

output
```
int(((A + B*x)*(d + e*x)^m)/(b*x + c*x^2)^3, x)
```

Reduce [F]

$$\int \frac{(A+Bx)(d+ex)^m}{(bx+cx^2)^3}\,dx = \text{too large to display}$$

input
```
int((B*x+A)*(e*x+d)^m/(c*x^2+b*x)^3,x)
```

output
```
( - (d + e*x)**m*a + int((d + e*x)**m/(b**4*d*e*m*x**2 - 2*b**4*d*e*x**2 +
 b**4*e**2*m*x**3 - 2*b**4*e**2*x**3 - 4*b**3*c*d**2*x**2 + 3*b**3*c*d*e*m
*x**3 - 10*b**3*c*d*e*x**3 + 3*b**3*c*e**2*m*x**4 - 6*b**3*c*e**2*x**4 - 1
2*b**2*c**2*d**2*x**3 + 3*b**2*c**2*d*e*m*x**4 - 18*b**2*c**2*d*e*x**4 + 3
*b**2*c**2*e**2*m*x**5 - 6*b**2*c**2*e**2*x**5 - 12*b*c**3*d**2*x**4 + b*c
**3*d*e*m*x**5 - 14*b*c**3*d*e*x**5 + b*c**3*e**2*m*x**6 - 2*b*c**3*e**2*x
**6 - 4*c**4*d**2*x**5 - 4*c**4*d*e*x**6),x)*a*b**4*e**2*m**2*x**2 - 2*int
((d + e*x)**m/(b**4*d*e*m*x**2 - 2*b**4*d*e*x**2 + b**4*e**2*m*x**3 - 2*b*
*4*e**2*x**3 - 4*b**3*c*d**2*x**2 + 3*b**3*c*d*e*m*x**3 - 10*b**3*c*d*e*x*
*3 + 3*b**3*c*e**2*m*x**4 - 6*b**3*c*e**2*x**4 - 12*b**2*c**2*d**2*x**3 +
3*b**2*c**2*d*e*m*x**4 - 18*b**2*c**2*d*e*x**4 + 3*b**2*c**2*e**2*m*x**5 -
 6*b**2*c**2*e**2*x**5 - 12*b*c**3*d**2*x**4 + b*c**3*d*e*m*x**5 - 14*b*c*
*3*d*e*x**5 + b*c**3*e**2*m*x**6 - 2*b*c**3*e**2*x**6 - 4*c**4*d**2*x**5 -
 4*c**4*d*e*x**6),x)*a*b**4*e**2*m*x**2 - 8*int((d + e*x)**m/(b**4*d*e*m*x
**2 - 2*b**4*d*e*x**2 + b**4*e**2*m*x**3 - 2*b**4*e**2*x**3 - 4*b**3*c*d**
2*x**2 + 3*b**3*c*d*e*m*x**3 - 10*b**3*c*d*e*x**3 + 3*b**3*c*e**2*m*x**4 -
 6*b**3*c*e**2*x**4 - 12*b**2*c**2*d**2*x**3 + 3*b**2*c**2*d*e*m*x**4 - 18
*b**2*c**2*d*e*x**4 + 3*b**2*c**2*e**2*m*x**5 - 6*b**2*c**2*e**2*x**5 - 12
*b*c**3*d**2*x**4 + b*c**3*d*e*m*x**5 - 14*b*c**3*d*e*x**5 + b*c**3*e**2*m
*x**6 - 2*b*c**3*e**2*x**6 - 4*c**4*d**2*x**5 - 4*c**4*d*e*x**6),x)*a*b...
```

CHAPTER 4

Appendix

4.1 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* Nasser: April 7,2022. add second output which gives reason for the grade *)
(*                       Small rewrite of logic in main function to make it*)
(*                       match Maple's logic. No change in functionality otherwise*)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)
```

```
(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] := Module[{expnResult,expnOptimal,leafCountResult,leaf
    expnResult  = ExpnType[result];
    expnOptimal = ExpnType[optimal];
    leafCountResult = LeafCount[result];
    leafCountOptimal = LeafCount[optimal];

    (*Print["expnResult=",expnResult," expnOptimal=",expnOptimal];*)
    If[expnResult<=expnOptimal,
        If[Not[FreeQ[result,Complex]], (*result contains complex*)
            If[Not[FreeQ[optimal,Complex]], (*optimal contains complex*)
                If[leafCountResult<=2*leafCountOptimal,
                    finalresult={"A",""}
                    ,(*ELSE*)
                    finalresult={"B","Both result and optimal contain complex but leaf count
                ]
            ,(*ELSE*)
                finalresult={"C","Result contains complex when optimal does not."}
            ]
        ,(*ELSE*)(*result does not contains complex*)
            If[leafCountResult<=2*leafCountOptimal,
               finalresult={"A",""}
            ,(*ELSE*)
               finalresult={"B","Leaf count is larger than twice the leaf count of optimal.
              ]
        ]
    ,(*ELSE*) (*expnResult>expnOptimal*)
        If[FreeQ[result,Integrate] && FreeQ[result,Int],
            finalresult={"C","Result contains higher order function than in optimal. Order "
            ,
```

```
            finalresult={"F","Contains unresolved integral."}
        ]
    ];

    finalresult
]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
```

```
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
#Nasser 4/07/2022   add second output which gives reason for the grade

GradeAntiderivative := proc(result,optimal)
local leaf_count_result,
        leaf_count_optimal,
        ExpnType_result,
        ExpnType_optimal,
        debug:=false;

        leaf_count_result:=leafcount(result);
        #do NOT call ExpnType() if leaf size is too large. Recursion problem
        if leaf_count_result > 500000 then
            return "B","result has leaf size over 500,000. Avoiding possible recursion issue
        fi;

        leaf_count_optimal := leafcount(optimal);
        ExpnType_result  := ExpnType(result);
        ExpnType_optimal := ExpnType(optimal);

        if debug then
            print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
        fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
```

```
#       antiderivative
#   "A" if result can be considered optimal

    #This check below actually is not needed, since I only
    #call this grading only for passed integrals. i.e. I check
    #for "F" before calling this. But no harm of keeping it here.
    #just in case.


    if not type(result,freeof('int')) then
        return "F","Result contains unresolved integral";
    fi;


    if ExpnType_result<=ExpnType_optimal then
        if debug then
             print("ExpnType_result<=ExpnType_optimal");
        fi;
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                if debug then
                        print("both result and optimal complex");
                fi;
                if leaf_count_result<=2*leaf_count_optimal then
                    return "A"," ";
                else
                   return "B",cat("Both result and optimal contain complex but leaf count of
                                   convert(leaf_count_result,string)," vs. $2 (",
                                   convert(leaf_count_optimal,string)," ) = ",convert(2*leaf
                end if
            else #result contains complex but optimal is not
                if debug then
                        print("result contains complex but optimal is not");
                fi;
                return "C","Result contains complex when optimal does not.";
            fi;
        else # result do not contain complex
             # this assumes optimal do not as well. No check is needed here.
            if debug then
                   print("result do not contain complex, this assumes optimal do not as well
            fi;
```

```
            if leaf_count_result<=2*leaf_count_optimal then
                if debug then
                    print("leaf_count_result<=2*leaf_count_optimal");
                fi;
                return "A"," ";
            else
                if debug then
                    print("leaf_count_result>2*leaf_count_optimal");
                fi;
                return "B",cat("Leaf count of result is larger than twice the leaf count of
                                   convert(leaf_count_result,string),"$ vs. $2(",
                                   convert(leaf_count_optimal,string),")=",convert(2*leaf_co
            fi;
        fi;
    else #ExpnType(result) > ExpnType(optimal)
        if debug then
            print("ExpnType(result) > ExpnType(optimal)");
        fi;
        return "C",cat("Result contains higher order function than in optimal. Order ",
                       convert(ExpnType_result,string)," vs. order ",
                       convert(ExpnType_optimal,string),".");
    fi;

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
```

```
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
```

```
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
```

```
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
   #sympy do not have leaf count function. This is approximation
   return round(1.7*count_ops(expr))

def is_sqrt(expr):
   if isinstance(expr,Pow):
      if expr.args[1] == Rational(1,2):
         return True
      else:
         return False
   else:
      return False

def is_elementary_function(func):
   return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
         asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
         asinh,acosh,atanh,acoth,asech,acsch
      ]

def is_special_function(func):
   return func in [ erf,erfc,erfi,
          fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
          gamma,loggamma,digamma,zeta,polylog,LambertW,
          elliptic_f,elliptic_e,elliptic_pi,exp_polar
       ]
```

```python
def is_hypergeometric_function(func):
   return func in [hyper]

def is_appell_function(func):
   return func in [appellf1]

def is_atom(expn):
   try:
      if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
        return True
      else:
        return False

   except AttributeError as error:
      return False

def expnType(expn):
   debug=False
   if debug:
      print("expn=",expn,"type(expn)=",type(expn))

   if is_atom(expn):
     return 1
   elif isinstance(expn,list):
      return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
   elif  is_sqrt(expn):
      if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
         return 1
      else:
         return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
   elif isinstance(expn,Pow):   #type(expn,'`^`')
      if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
         return expnType(expn.args[0])   #ExpnType(op(1,expn))
      elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
         if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
         else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
      else:
         return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),Expn
   elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
```

```
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)  #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)  #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)  #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)  #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    #print ("Enter grade_antiderivative for sagemath")
    #print("Enter grade_antiderivative, result=",result," optimal=",optimal)

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    #print("leaf_count_result=",leaf_count_result)
    #print("leaf_count_optimal=",leaf_count_optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        grade = "F"
        grade_annotation =""
```

```
    else:
        if expnType_result <= expnType_optimal:
            if result.has(I):
                if optimal.has(I): #both result and optimal complex
                    if leaf_count_result <= 2*leaf_count_optimal:
                        grade = "A"
                        grade_annotation =""
                    else:
                        grade = "B"
                        grade_annotation ="Both result and optimal contain complex but leaf count of result is lar
                else: #result contains complex but optimal is not
                    grade = "C"
                    grade_annotation ="Result contains complex when optimal does not."
            else: # result do not contain complex, this assumes optimal do not as well
                if leaf_count_result <= 2*leaf_count_optimal:
                    grade = "A"
                    grade_annotation =""
                else:
                    grade = "B"
                    grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(
        else:
            grade = "C"
            grade_annotation ="Result contains higher order function than in optimal. Order "+str(ExpnType


    #print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

    return grade, grade_annotation
```

SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#               Albert Rich to use with Sagemath. This is used to
#               grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#               'arctan2','floor','abs','log_integral'
#June 4, 2022  Made default grade_annotation "none" instead of "" due
#               issue later when reading the file.
#July 14, 2022. Added ellipticF. This is until they fix sagemath, then remove it.
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```
from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
   r"""
   Return the tree size of this expression.
   """
   #print("Enter tree_size, expr is ",expr)

   if expr not in SR:
      # deal with lists, tuples, vectors
      return 1 + sum(tree_size(a) for a in expr)
   expr = SR(expr)
   x, aa = expr.operator(), expr.operands()
   if x is None:
      return 1
   else:
      return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
   if expr.operator() == operator.pow:   #isinstance(expr,Pow):
      if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
         if debug: print ("expr is sqrt")
         return True
      else:
         return False
   else:
      return False

def is_elementary_function(func):
   #debug=False
   m = func.name() in ['exp','log','ln',
         'sin','cos','tan','cot','sec','csc',
         'arcsin','arccos','arctan','arccot','arcsec','arccsc',
         'sinh','cosh','tanh','coth','sech','csch',
         'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
      'arctan2','floor','abs'
      ]
   if debug:
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        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    #debug=False
    if debug:
        print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
            'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
            'Chi','cosh_integral','gamma','log_gamma','psi','zeta',
            'polylog','lambert_w','elliptic_f','elliptic_e','ellipticF',
            'elliptic_pi','exp_integral_e','log_integral',
            'weierstrassPInverse','weierstrass','weierstrassP','weierstrassZeta',
            'weierstrassPPrime','weierstrassSigma']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in sagemath

def is_atom(expn):

    #debug=False
```

```
    if debug:
         print ("Enter is_atom, expn=",expn)

    if not hasattr(expn, 'parent'):
        return False


    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic
    try:
        if expn.parent() is SR:
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
            return expn in expn.parent().base_ring() or expn in expn.parent().gens()

        return False

    except AttributeError as error:
        print("Exception,AttributeError in  is_atom")
        print ("cought exception" , type(error).__name__ )
        return False


def expnType(expn):

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))   #max(2,expnType(expn.args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:   #isinstance(expn.args[1],Integer)
```

```
            return expnType(expn.operands()[0])    #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expr
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isins
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):


    if debug:
        print ("Enter grade_antiderivative for sagemath")
        print("Enter grade_antiderivative, result=",result)
        print("Enter grade_antiderivative, optimal=",optimal)
        print("type(anti)=",type(result))
        print("type(optimal)=",type(optimal))
```

```
leaf_count_result  = tree_size(result) #leaf_count(result)
leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

#if debug: print ("leaf_count_result=", leaf_count_result, "leaf_count_optimal=",leaf_count_optimal)


expnType_result  = expnType(result)
expnType_optimal = expnType(optimal)

if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",expnType_optimal)

if expnType_result <= expnType_optimal:
    if result.has(I):
        if optimal.has(I): #both result and optimal complex
            if leaf_count_result <= 2*leaf_count_optimal:
                grade = "A"
                grade_annotation ="none"
            else:
                grade = "B"
                grade_annotation ="Both result and optimal contain complex but leaf count of result is larger
        else: #result contains complex but optimal is not
            grade = "C"
            grade_annotation ="Result contains complex when optimal does not."
    else: # result do not contain complex, this assumes optimal do not as well
        if leaf_count_result <= 2*leaf_count_optimal:
            grade = "A"
            grade_annotation ="none"
        else:
            grade = "B"
            grade_annotation ="Leaf count of result is larger than twice the leaf count of optimal. "+str(lea
else:
    grade = "C"
    grade_annotation ="Result contains higher order function than in optimal. Order "+str(expnType_re


print("Before returning. grade=",grade, " grade_annotation=",grade_annotation)

return grade, grade_annotation
```

4.2 Links to plain text integration problems used in this report for each CAS

1. Mathematica integration problems as .m file
2. Maple integration problems as .txt file
3. Sagemath integration problems as .sage file
4. Reduce integration problems as .txt file
5. Mupad integration problems as .txt file
6. Sympy integration problems as .py file